



BIBLIOGRAPHY OF THE GEOLOGY OF INDONESIA AND SURROUNDING AREAS

Edition 8.0, February 2026

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IXa. CIRCUM-INDONESIA (NW: SE Asia Tethysides, etc.)



(Metcalf 2013)

IXa. CIRCUM-INDONESIA (NW: SE Asia Tethyan terranes, etc.)

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This chapter Circum Indonesia IXa of Bibliography 8.0 contains 844 pages with 6170 references on the geology of areas surrounding Indonesia in the SE Asia region (not including North Borneo, Papua New Guinea and SE Asia Regional, which are grouped with other Indonesia chapters). It contains 11 sub-chapters. Additional Circum-Indonesia papers from the Australia-Pacific sides East, SE and South of Indonesia are listed in Volume IXb..

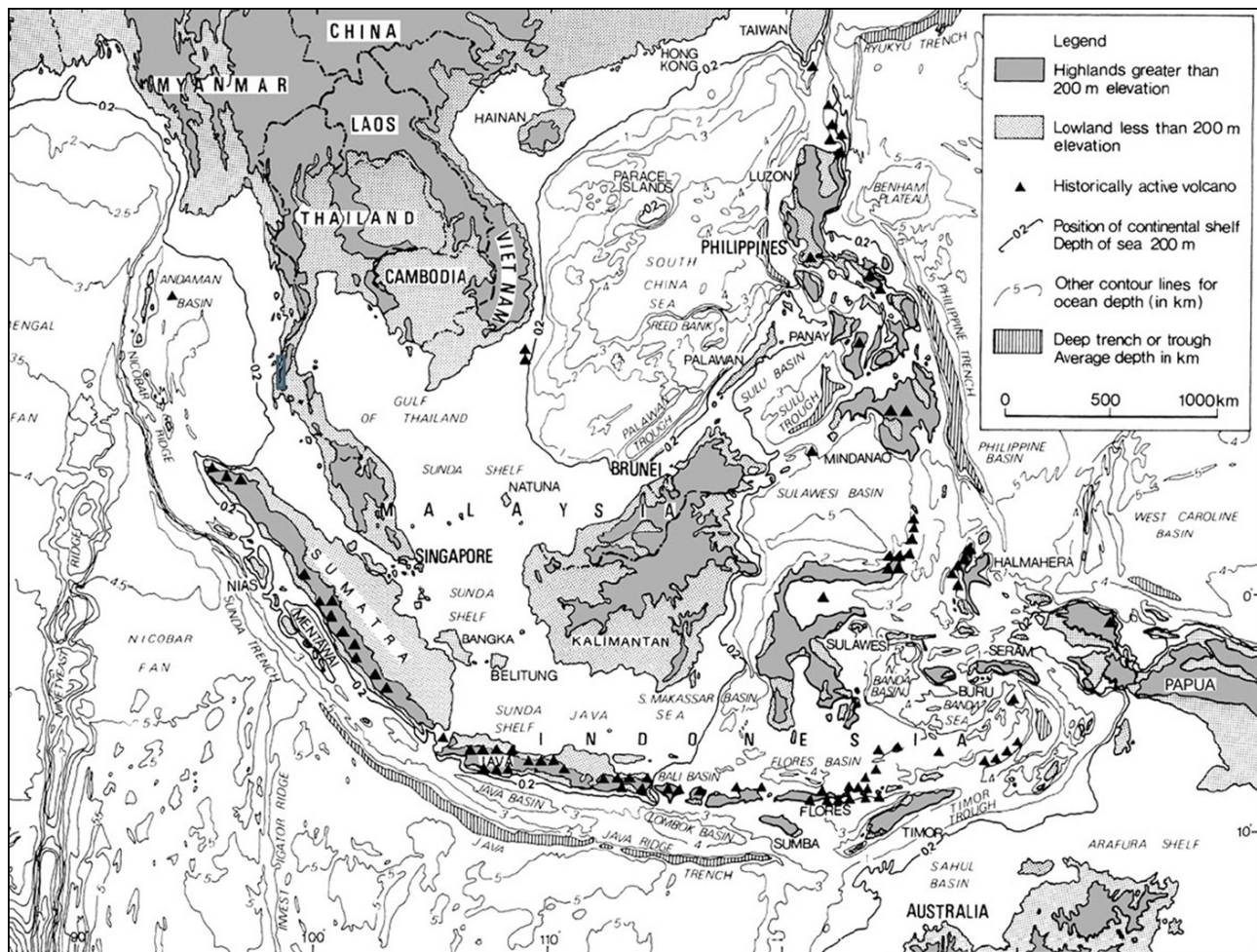


Figure IXa.1. Geography and major physiographic features of Southeast Asia (Huchison 2005)

The reason for including these titles in this Bibliography of Indonesia geology is because the regional geology of Indonesia can be better understood with knowledge of the geology across its borders. Many similarities exist between the geology of parts of Indonesia and adjacent regions.

Circum-Indonesia regions listed in this volume with similar, contiguous geology in the Indonesian region include:

- Andaman Sea Region
- Malay Peninsula, Singapore
- Thailand
- Myanmar SW Yunnan
- Cambodia, Vietnam, Laos, SE China
- Malay Basin, Gulf of Thailand
- South China Sea
- The Philippines

- ties to:* Sumatra forearc region, West Burma terrane
- ties to:* Sumatra, Tin Islands, SW Borneo?
- ties to:* Sumatra
- ties to:* Sumatra
- ties to:* Sunda Shelf, NW Borneo
- ties to:* North Sumatra, Natuna
- ties to:* Sunda Shelf, North Borneo
- ties to:* North Borneo, Sulawesi, North Moluccas



Figure IXa.2. A small selection of key volumes on the geology of Southeast Asia.)

IX.1. Andaman Sea region

Sub-chapter IX.1. of Bibliography Edition 8.0 contains 38 pages with 312 references on the geology of the Andaman Sea region. An elegant review paper on the region is Curray (2005).

The area of the Andaman islands and Andaman Sea continuation of the forearc and volcanic arc regions of the Sumatra/ Sunda Arc subduction system. Subduction in this sector is highly oblique, which led to diminished volcanic arc activity and to the development of a Neogene back-arc oceanic spreading center/ pull-apart basin at the NE termination of the Great Sumatra Fault zone, between the volcanic arc and the Malay Peninsula/ Peninsular Thailand (Figure IX.1.1; Sibumasu Terrane).

The Andaman islands are emergent parts of the Andaman- Nicobar Ridge, an outer arc accretionary prism of the Sunda Arc subduction zone. It contains Paleogene (Andaman Flysch) and Neogene bathyal turbiditic deposits and fragments of Cretaceous-age Neotethyan ophiolites, which presumably are a continuation of the ophiolites of the Naga Hills at the Eastern margin of the Indian Plate and similar ophiolites on the Sumatran outer arc islands (Acharyya and Sengupta (1990, 1991).

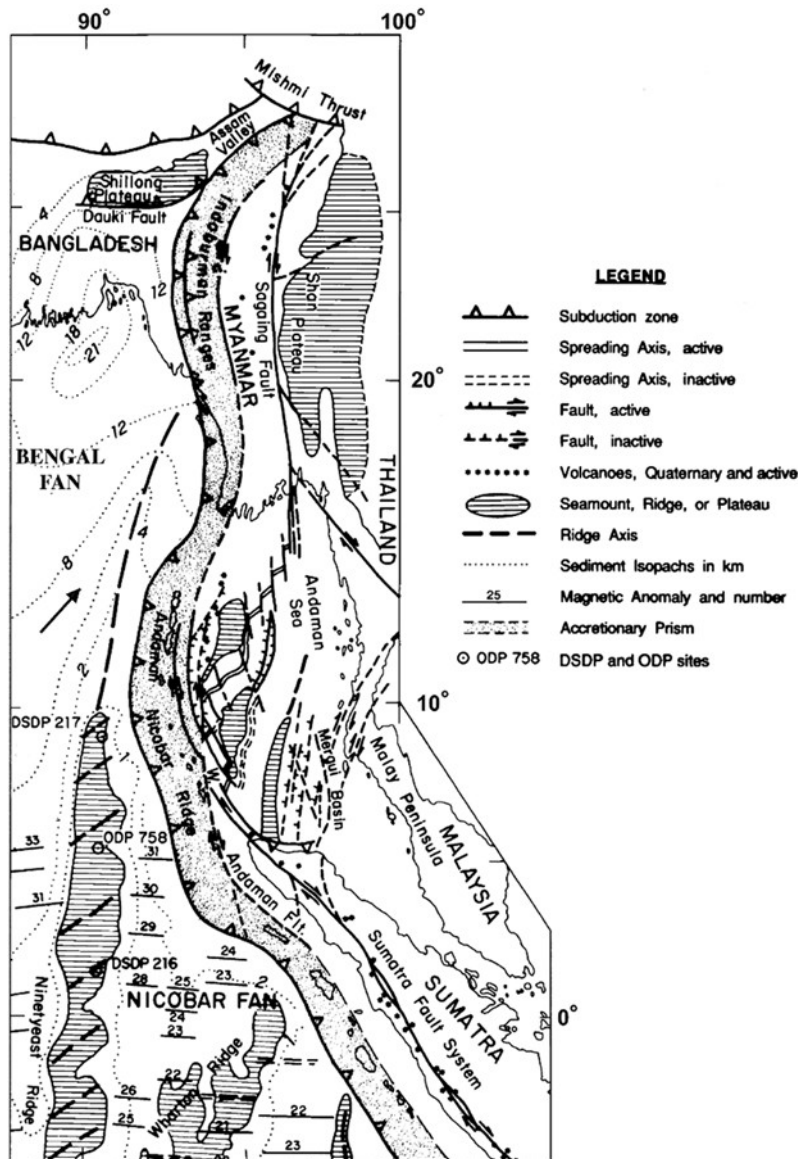


Figure IXa.3. Tectonic map of the Andaman Sea/ NE Indian Ocean region (Curray 2005).

There is some active or recent arc volcanism at the Barren Island and Narcondam volcanoes, which rise from 1000- 2300m deep seafloor of the Andaman Sea.(Streck et al. 2010, Bandopadhyay 2017).

IX. 2. Malay Peninsula, Singapore

Sub-chapter IX.2 of Bibliography 8.0 contains 100 pages with 781 references on the geology of the Malay Peninsula and adjacent Singapore. This is a subset of a more extensive collection of papers. Classic textbooks on the Malay Peninsula are by Gobbett and Hutchison (1973) and Hutchison and Tan (eds.) (2009).

The Malay Peninsula is essentially an orogenic belt, formed during the collision of the Sibumasu and Indochina (Malacca) continental plates in Middle-Late Triassic time, which closed the Paleotethys Ocean along the Bentong-Raub suture. Exposures are mainly Triassic and older rocks, primarily granites belonging to different belts of subduction-related and post-collisional magmatism (Figure IX.2.1; Searle et al. 2012):

- latest Triassic Main Range granitoid province with abundant tin mineralization, related to crustal thickening close to the suture zone after the Sibumasu collision.
- the East Malaya belt of subduction related I-type granites is generally older (Permian- Middle Triassic) and is not tin-bearing.

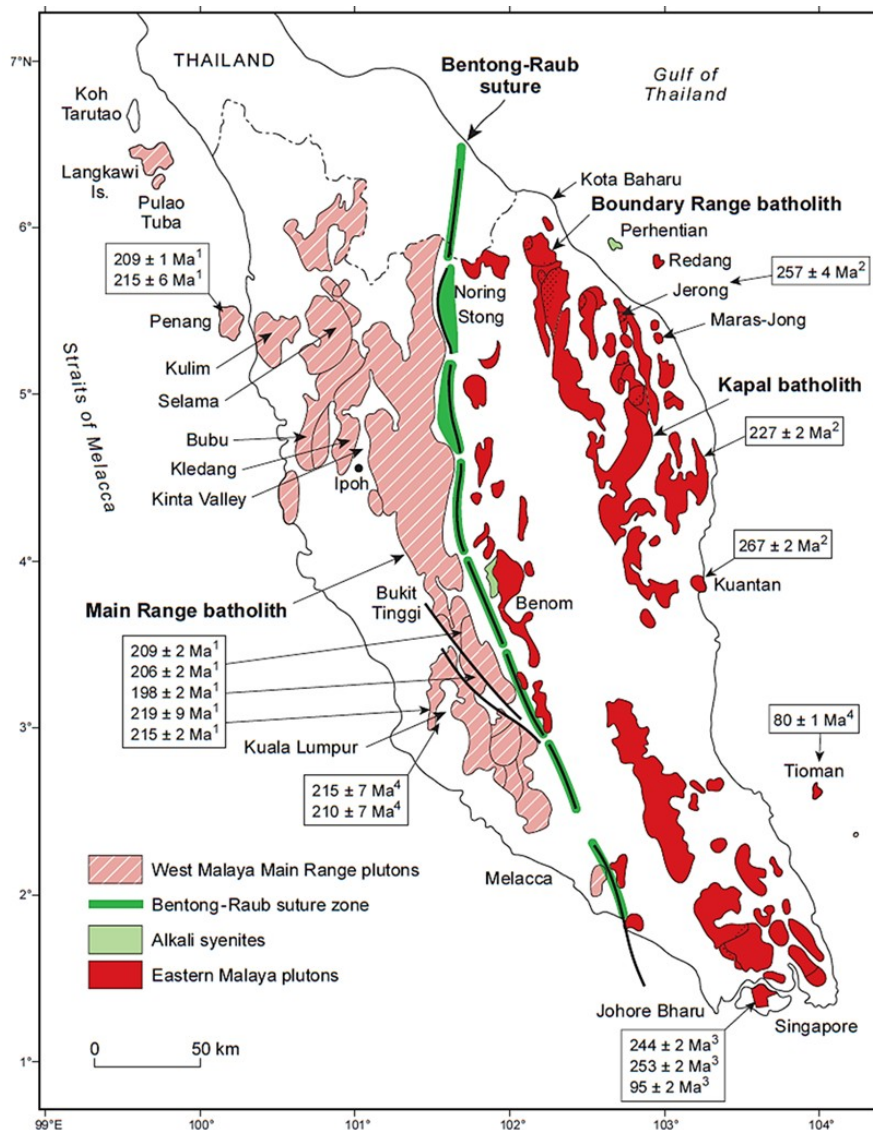


Figure IXa.4. Malay Peninsula Main Range and Eastern belts of Triassic granites and Paleotethys suture zone (Searle et al 2012).

The Sibumasu terrane in the Western part of the Peninsula contains a relatively complete Paleozoic shelfal marine succession, including earliest Permian glacial diamictites, attesting to the block's position at the margin of Gondwana at that time.

IX.3. Thailand

Sub-chapter IX.3 of Bibliography 8.0 contains 155 pages, with 1173 references on the geology of Thailand. The geology of Thailand is complex and the amount of literature is large. A major recent review is the book by Ridd, Barber and Crow (eds.) (2011).

As in the Malay Peninsula, basement of Thailand is composed of two major continental plates, the elongate Sibumasu terrane in the West and Indochina in the East (Figure IXa.6). Both terranes separated from the Gondwana supercontinent, but the Indochina terrane broke up and drifted towards low latitudes much earlier (Devonian break-up?) than the Sibumasu terrane (Early Permian break-up), and therefore has a warmer Carboniferous- Permian paleoclimate record than Sibumasu.

The collision of the two plates that amalgamated in Late Triassic time is called the Indosinian Orogeny and represents closing of the Paleotethys Ocean after long-lived subduction under the Indochina plate.

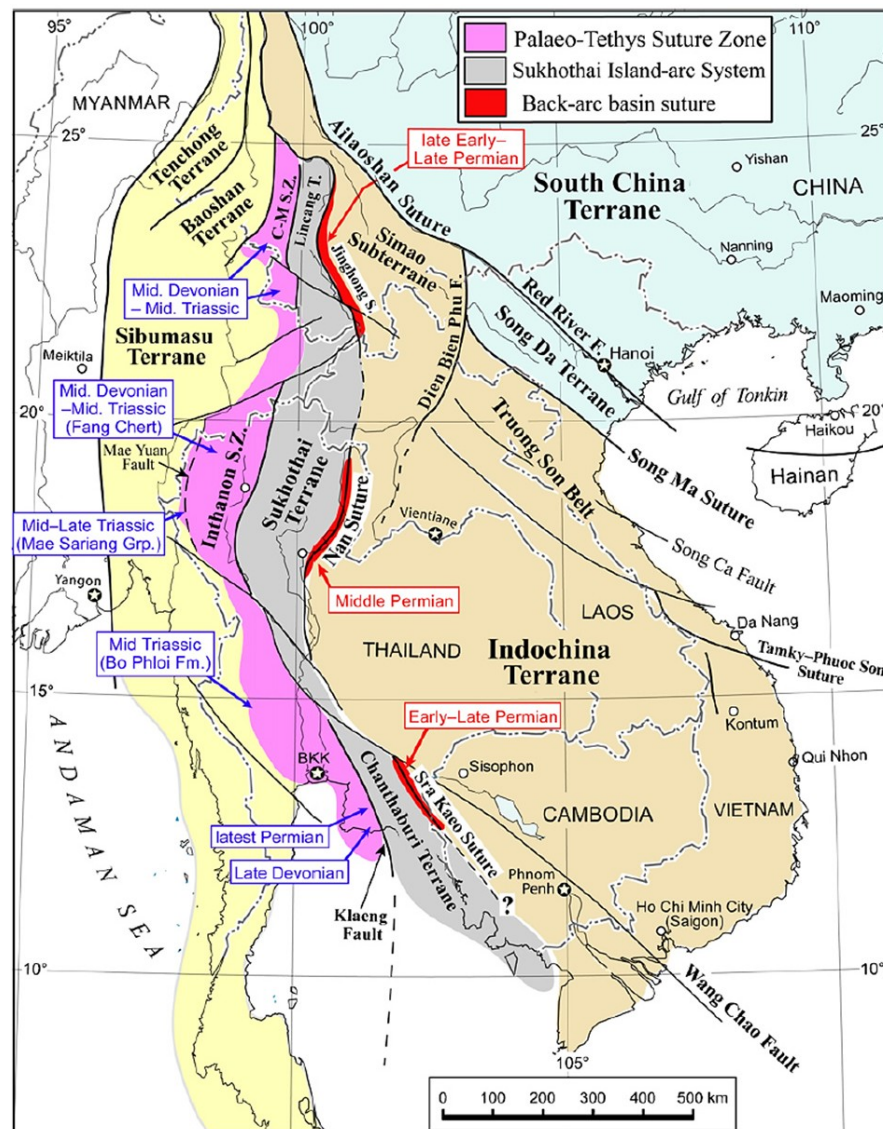


Figure IXa.6. Tectonic subdivision of mainland Southeast Asia, showing the Palaeo-Tethys suture zone (Inthanon and Changning-Menglian SZ) and back-arc marginal basin sutures East of the Sukhothai volcanic arc terrane (Sone and Metcalfe 2008).

The switch from Eastward subduction of the oceanic Paleotethys plate to collision was probably around the Middle- Late Triassic boundary (~237 Ma; Wang et al. 2016), which is reflected in the change from thin distal

pelagic sediments to thick Middle-Late Triassic syn-orogenic turbiditic sediments with Ladinian- Carnian *Halobia*.

The N-S trending Paleotethys suture zone in Thailand includes:

1. the main Paleotethys suture (Chiang Mai- Chiang Rai suture/ Inthanon zone of NW Thailand, which continues North into the Changning-Menglian zone in Yunnan, SW China;
2. a volcanic arc terrane (Sukhothai terrane) that rifted off Indochina
3. remnants of a closed Permian oceanic backarc basin between the Sukhothai Arc and the Indochina terrane (Nan-Uttaradit and Sa Kaeo sutures) (Ueno and Hisada 2001).

The Paleotethys suture in Thailand and the Malay Peninsula is characterized by remnants of ocean floor, including ophiolitic rocks, pelagic sediments (radiolarian cherts), ocean floor basalts and Permian carbonate seamounts (Feng et al. 2008). Numerous studies on radiolarian cherts document ages of ocean floor sediments as ranging from Late Devonian to Middle Triassic (works by Q. Feng, Basir Jasin et al. (op. div.), Sashida et al., Spiller and Metcalfe (2005), Hara et al. 2008, 2010, Saesaengseerung et al., Kamata et al., Thassanapak et al., Wonganan et al., Yang et al., etc.)

Like the Malay Peninsula, granites are widespread across Thailand, and have been divided into the Western (mainly Cretaceous- mid-Tertiary), Central (mainly Permian- Triassic) and Eastern provinces (mainly Late Triassic) (Cobbing et al. 1986, Charusisri et al. 1993, Hutchison, 2007).

A belt of Late Triassic (~230-220 Ma) post-collisional granites can be traced from NW to SE Thailand along the East side of the main Paleotethys suture, in the Sukhothai- Chanthaburi zone. These formed in thickened crust after the assemblage of Indochina and Sibumasu blocks. This granite belt can be linked to the North into NW Laos and SW China, and to the South with the East Malay Peninsula granites and the Indonesian Tin Islands (e.g. Qian et al. 2017))

Widespread Late Eocene- Oligocene extension created a series of mainly N-S trending intra-cratonic sedimentary basins, associated with exhumation of metamorphic core complexes (Doi Inthanon and Doi Suthep in North Thailand; e.g. Gardiner et al. 2016)

Cretaceous evaporite basin of NE Thailand- South Laos

Evaporite deposits are extremely rare in SE Asia, but one of the world's largest salt deposits is in the Upper Cretaceous of the Khorat Basin of NE Thailand, where the halite dominated Maha Sarakham Formation evaporites range in thickness from 250-1100m. The basin probably was connected in the North with the Sakon Nakhon evaporite basin, which straddles into southern Laos.

The exact age of the evaporites has long been questionable. They overlie the non-marine Khok Kruat Formation, with vertebrate fossils dated as Aptian-Albian. Proposed age ranges include:

- Mid-Albian- Cenomanian (palynological analysis by Racey and Goodall, 2009);
- Cenomanian- Campanian (isotopes study by Hansen et al. 2016);
- ~Turonian- Maastrichtian (magnetostratigraphic study in South Laos by Zhang et al. 2018).

Time-equivalent eolian sandstones support a period of (subtropical?) arid desert climate around Cenomanian and/or younger Cretaceous time in NE Thailand (Hasegawa et al. 2010).

IX.4. Myanmar (Burma), NE India, SW Yunnan (= Sibumasu- West Burma plates)

Sub-chapter IX.5 of Bibliography 8.0 contains 93 pages, with 662 references on the geology of Myanmar and adjacent Yunnan Province of southern China. Good recent reviews of Myanmar geology are the books by Barber, Khin Zaw and Crow (eds.) (2017) and Mitchell (2018). For petroleum geology of Myanmar see the book by Racey and Ridd (2015).

Myanmar is located West of Thailand, and the geology of East Myanmar is (Shan Plateau) is in many ways similar to the Sibumasu-terrane geology of Western Thailand in the East. West Myanmar is composed of younger terranes, in the collision zone between Sibumasu terrane and the collided India Plate.

Myanmar has one of the oldest oil-producing areas in the world, with shallow onshore oil production in young anticlinal structures in the Central Burma Depression since the 1850's. Today the main exploration activity is in the Andaman Sea offshore NW Myanmar, for deep water biogenic gas fields in young submarine fan systems of the Bengal Fan (Racey and Ridd 2015).

IX.5 Cambodia, Vietnam, Laos, SE China (= Indochina Plate)

Sub-chapter IX.6 of Bibliography 8.0 contains 51 pages with 401 references on the geology of Cambodia, Vietnam, Laos and SE China.

The countries in this chapter are all located on the Indochina Plate (Figure IXa.6).

The relevance of the geology of this region for Indonesia is mainly as potential analogs for NE Sumatra-Sundaland Pretertiary stratigraphy, tectonic evolution around the Paleotethys suture zone, Indochina Plate stratigraphy and biostratigraphy, etc.

IX.6. Malay Basin, Gulf of Thailand

Sub-chapter IX.3 of Bibliography 8.0 contains 31 pages with 245 references on the geology of the offshore basins in the Malay Basin/ Gulf of Thailand/ Sunda Shelf area.

This area is located on the Indochina Plate basement. The main interest in this area is the presence of numerous oil and gas fields in Late Paleogene- Neogene intra-continental rift basins (Figure IXa.5).

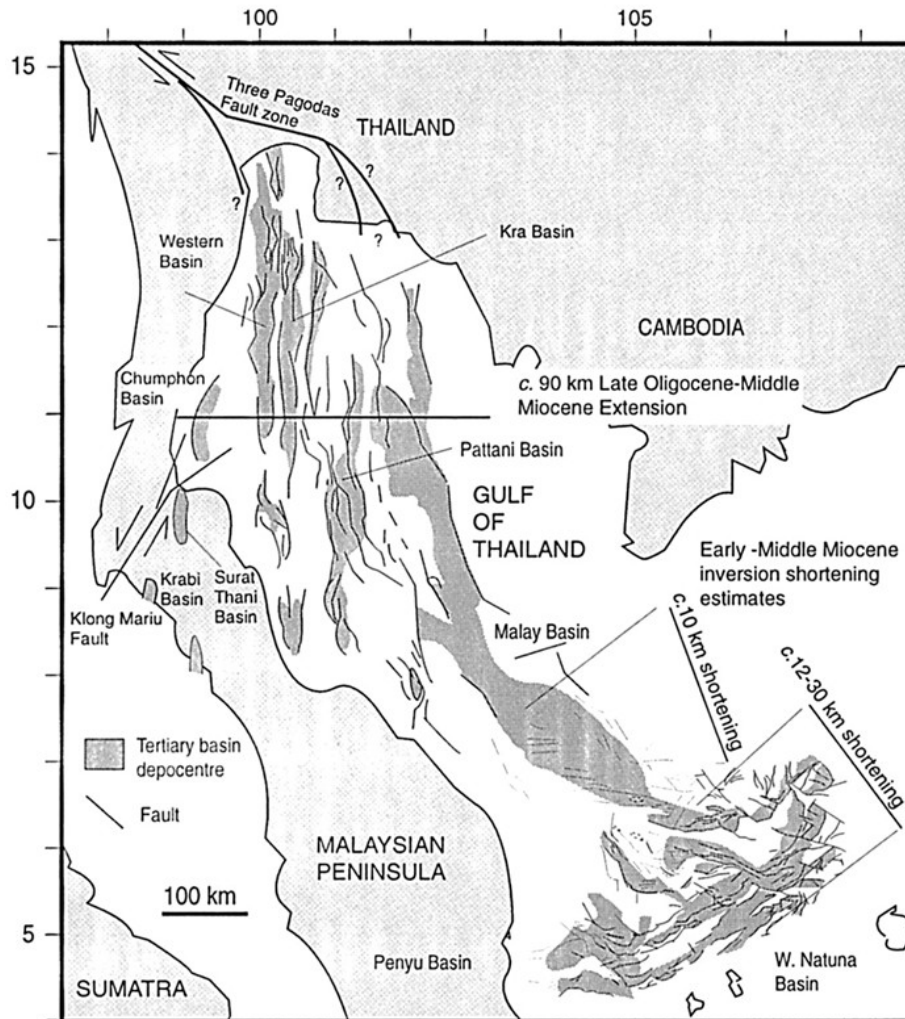


Figure IXa.5. Main Oligocene-Miocene rift basins in the Gulf of Thailand and Sunda Shelf, showing the North Gulf of Thailand basins (including Pattani), the Malay Basin and the West Natuna basin (Morley 2001).

In the Thailand sector (both onshore and offshore) rift basins are mainly relatively narrow N-S trending half-grabens, that may preferentially have formed on the Triassic Inthanon suture zone (Paleotethys suture; Morley 2011). Basin fill is almost entirely non-marine and hydrocarbons are mainly gas.

The larger Malay (and West Natun) basin contains numerous oil and gas fields in Oligocene- Miocene sandstone reservoirs, that are sourced mainly from Eocene- Oligocene lacustrine shales. For more detailed reviews see Petronas (1999) The petroleum geology and resources of Malaysia.

IX. 7. South China Sea

Sub-chapter IX.7 of Bibliography 8.0 contains 60 pages with 443 references on the geology of the South China Sea area.

The South China Sea is an unusually broad Early Oligocene- Early Miocene extensional rift-spreading zone, with oceanic seafloor spreading in its central parts from ~32-33 Ma until ~20 or 16 Ma (Briais et al. 1993, Barckhausen and Roeser 2004, Barckhausen et al. 2014, Li et al. 2015).

This rifting separated the Palawan Block (Philippines) from the South China continental margin, and the collision of this block with the North Borneo subduction zone is what ended seafloor spreading.



Figure IXa.7. Tectonic setting of the South China Sea marginal oceanic basin as proposed by Xu et al.(2014). Light blue denotes marginal basin with young oceanic crust.

IX. 8. Philippines (General, Palawan, Luzon)

Sub-chapter IX.8 of Bibliography 8.0 contains 100 pages with 806 references on the geology of The Philippines.

The geology of the Philippines is quite complicated, and mostly a young amalgamation of Cenozoic volcanic arc and ophiolite terranes; flanked by active subduction zones.

Two main tectonic domains may be distinguished in The Philippines (Figures IXa.8, IXa.9):

1. in East the Philippine Mobile Belt, that continues North from the North Moluccas in Eastern Indonesia;
2. in West an assembly of continental blocks (part of the Eurasian margin: Palawan Block, Borneo), volcanic arcs and remnant arcs and Cenozoic marginal ocean basins (South China Sea, Sulu Sea, Celebes Sea), located North of Sulawesi and Borneo (Dimalanta and Yumul 2015) (see also Chapter IX.9).

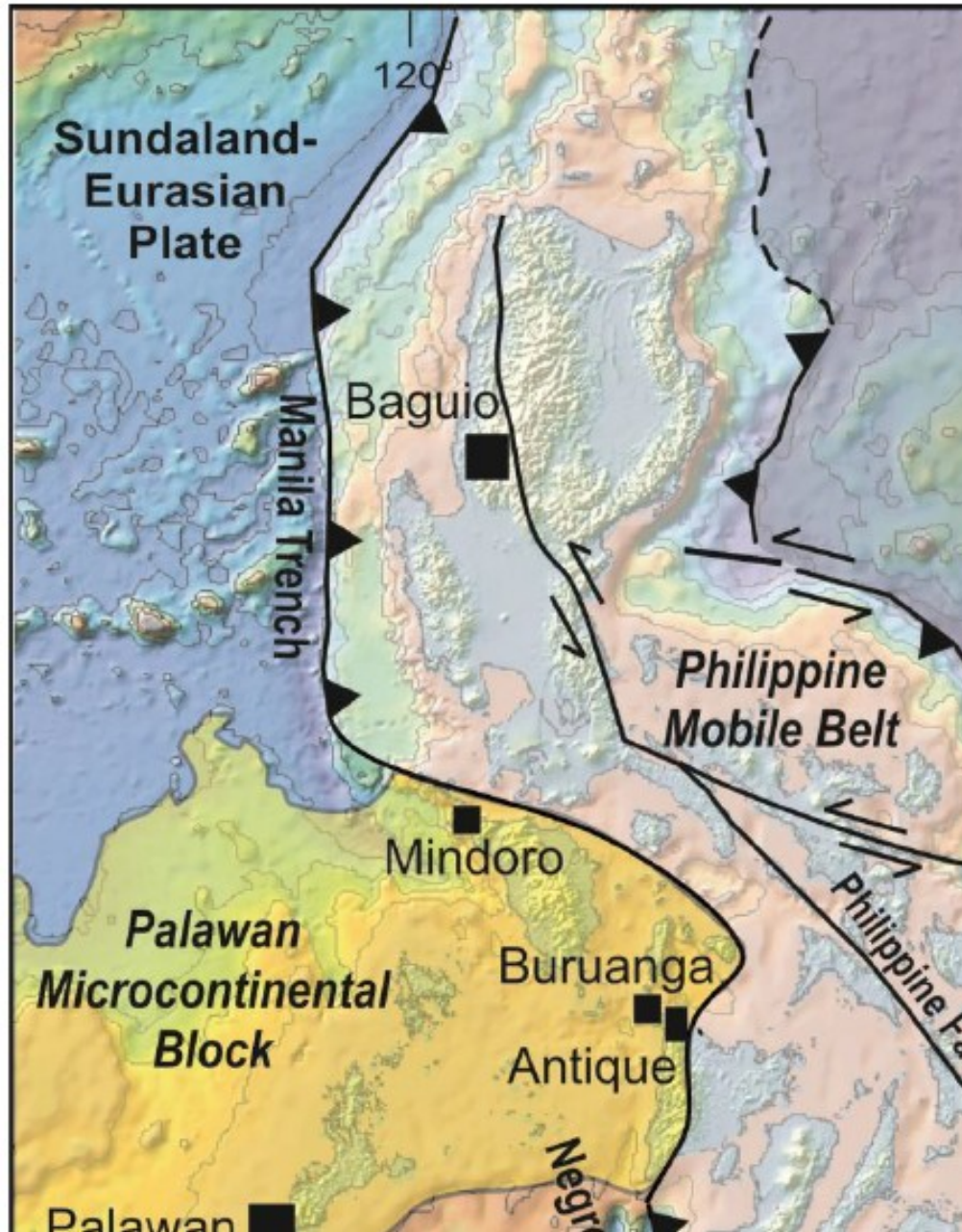


Figure IXa.8. Principal tectonic domains of The Philippines: (1) In East the Philippine Mobile Belt and (2) in West continental blocks that are part of the Eurasian margin (Palawan Block, Borneo) and Cenozoic marginal ocean basins of the South China Sea, Sulu Sea, Celebes Sea (Dimalanta and Yumul 2015).

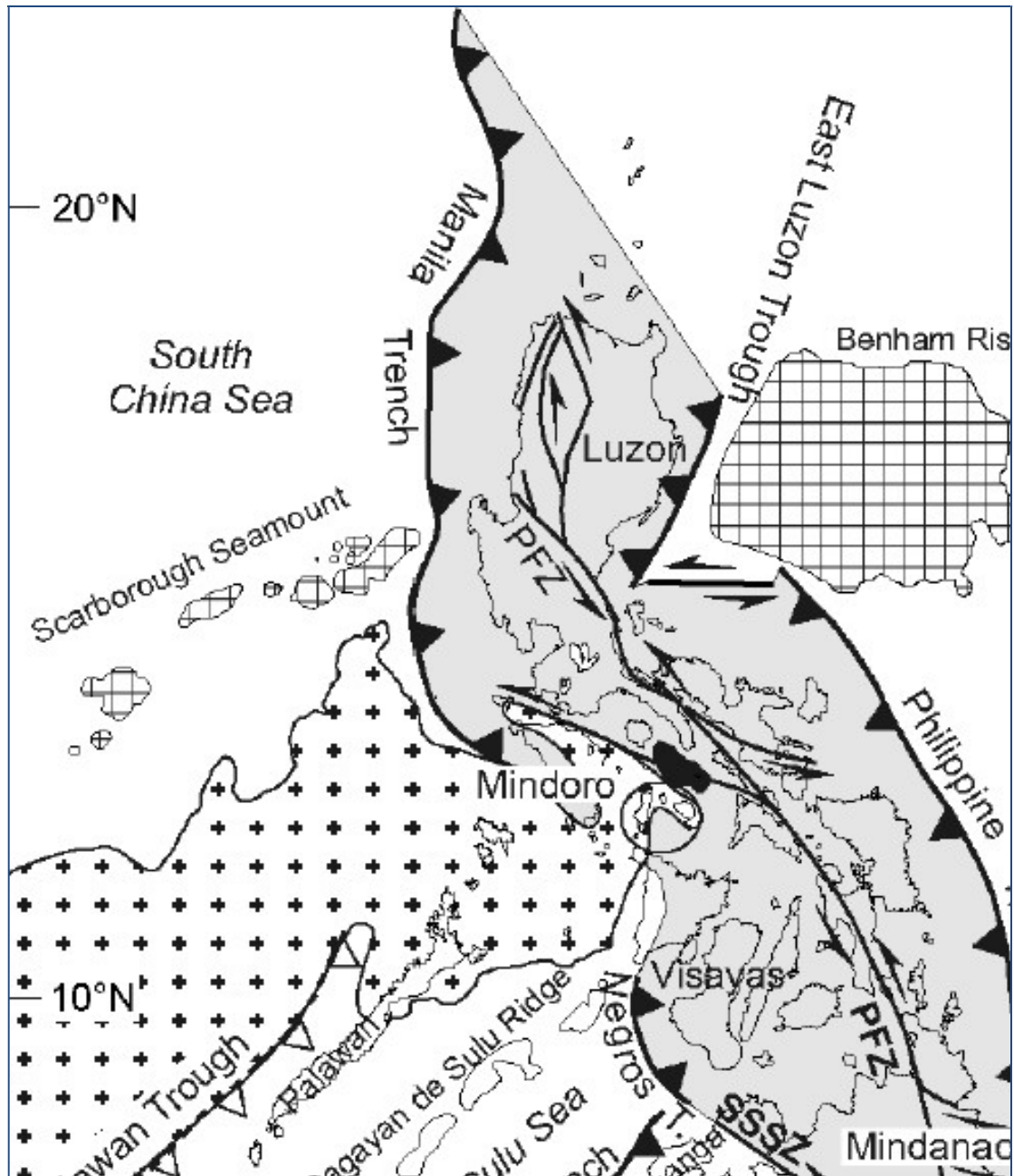


Figure IXa.9. Major tectonic provinces of The Philippines (Yumul et al. 2005). Note indentations of subduction Trenches in West (Palawan microcontinental block collision) and East (Benham Rise oceanic plateau collision).

IX. 9. South Philippines (Celebes Sea, Sulu Sea, Sandakan)

Sub-chapter IX.9 of Bibliography 8.0 contains 15 pages with 99 references on the geology of South Philippines areas around the two relatively small Cenozoic oceanic marginal basins (Celebes Sea, Sulu Sea) and surrounding magmatic arcs (North Sulawesi, Sulu island arc, Sangihe island arc) (Figure IXa.10). These include older arc/silver terranes (Cagayan Ridge). Both of the marginal basins were originally larger than today, due to partial closing by subduction under adjacent volcanic arcs.

Key general papers on these basins include Silver and Rangin (1991, 1995), Rangin and Silver (1991).

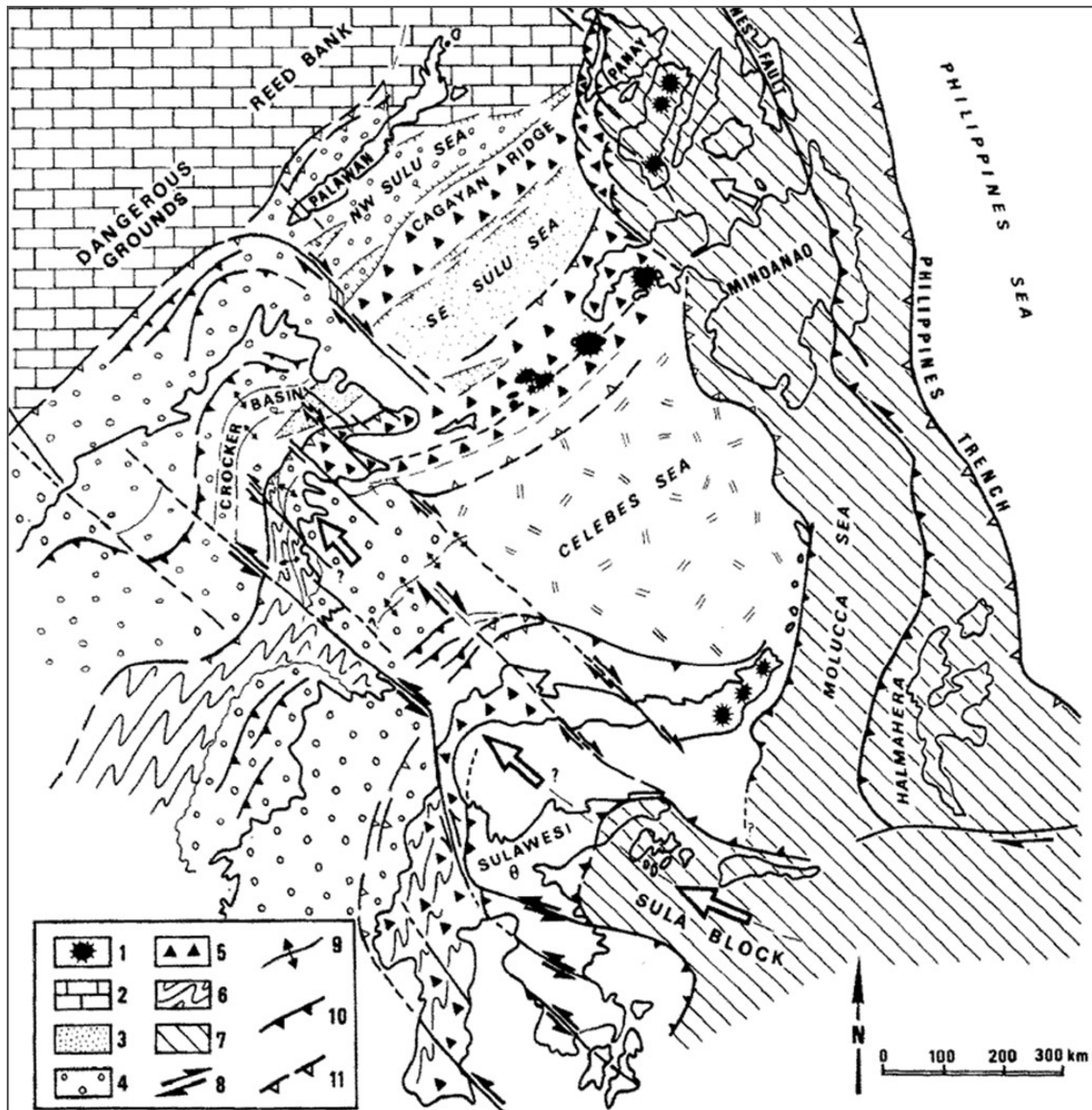


Figure IXa.10. Celebes Sea and Sulu Sea structural setting (Rangin 1989).

Celebes Sea

As discussed in chapter IV.4- Makassar Straits, the Celebes Sea formed as a back-arc marginal basin during Middle- Late Eocene S-SE directed rollback of the North-dipping subduction zone of the Eocene 'Great Indonesian Arc'. Most of the basin is >4 km deep, and deeper than 5 km in the North Sulawesi and Cobatoba Trenches (Figure IXa.11).

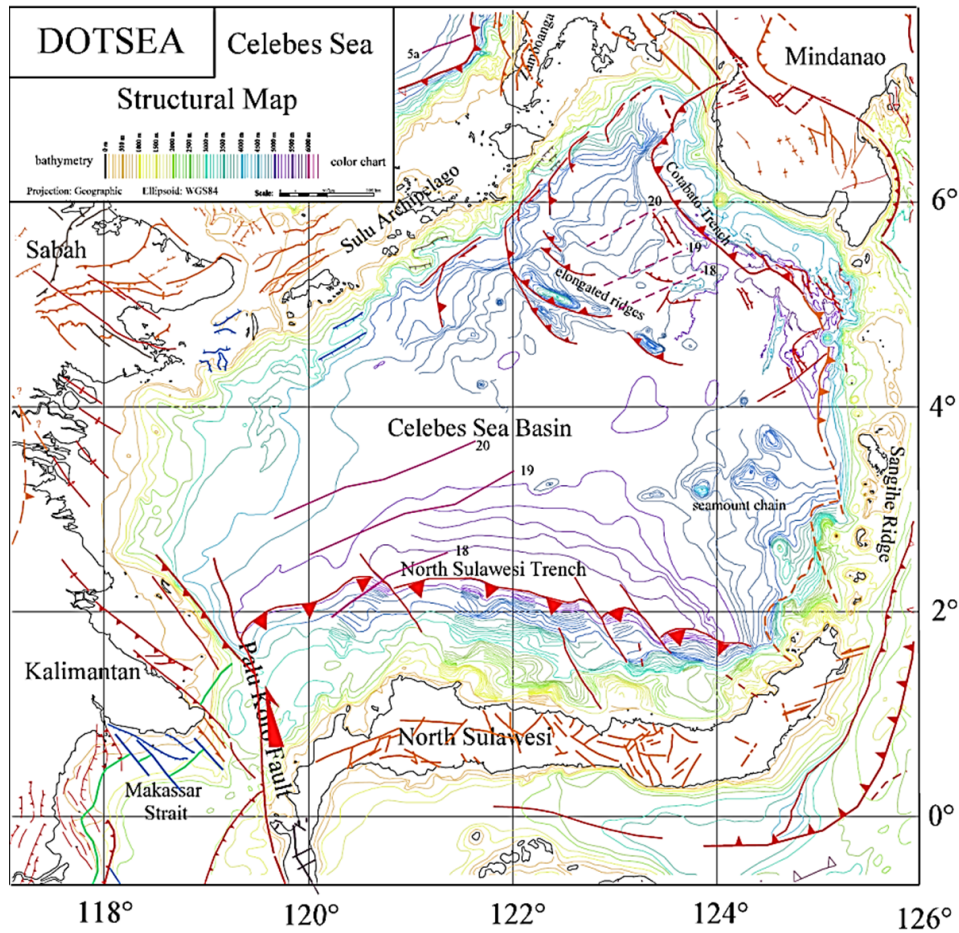
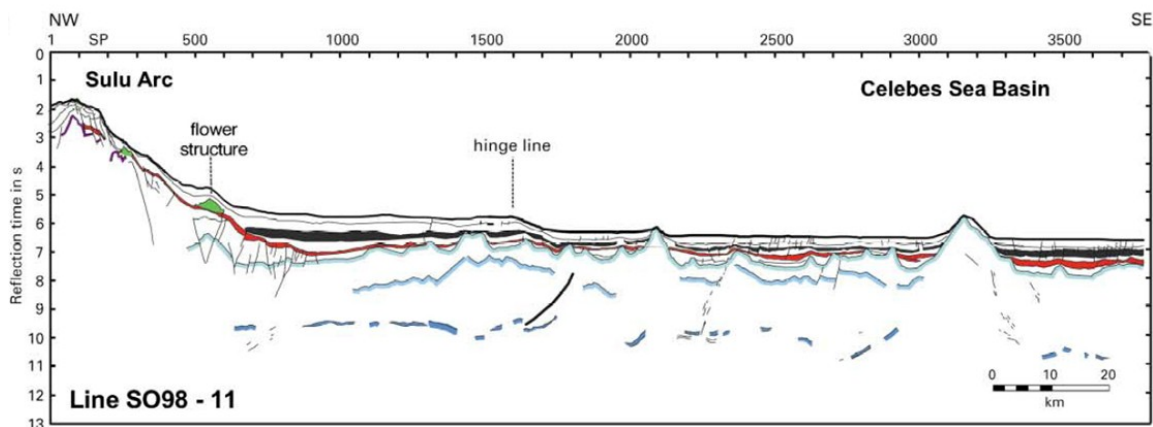


Figure IXa.11. Regional setting of the Celebes Sea, North of Borneo and Sulawesi, South of the Philippines. (Pubellier et al 2005).

Volcanic seamounts, not covered by younger sediments, are common on the Celebes Sea seafloor (Figure IXa.12).



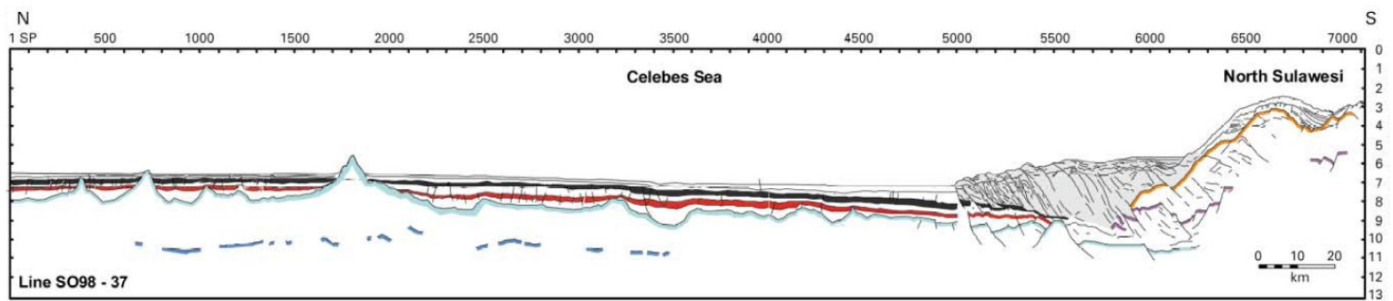


Figure IXa.12. Two segments of seismic line SO98 interpretation across the Celebes Sea from Sulu Arc in NNW (top figure) to North Sulawesi accretionary prism in SSE (bottom figure) (Schluter et al. 2001).

The Celebes Sea marginal basin was initially thought to be floored by Cretaceous oceanic crust based on water depth and interpretation of seafloor magnetic anomalies and thought to represent a trapped remnant of a Cretaceous ocean (Lee and McCabe 1986). However, the magnetic lineation patterns were re-interpreted as Middle Eocene anomalies C20-C18 by Weissel (1980; with minor revision by Gaina and Muller 2007; Figure IX.9.3.) and this predicted Middle Eocene age was confirmed by coring at ODP Sites 767 and 770 (Silver et al. 1990, 1991, etc.).

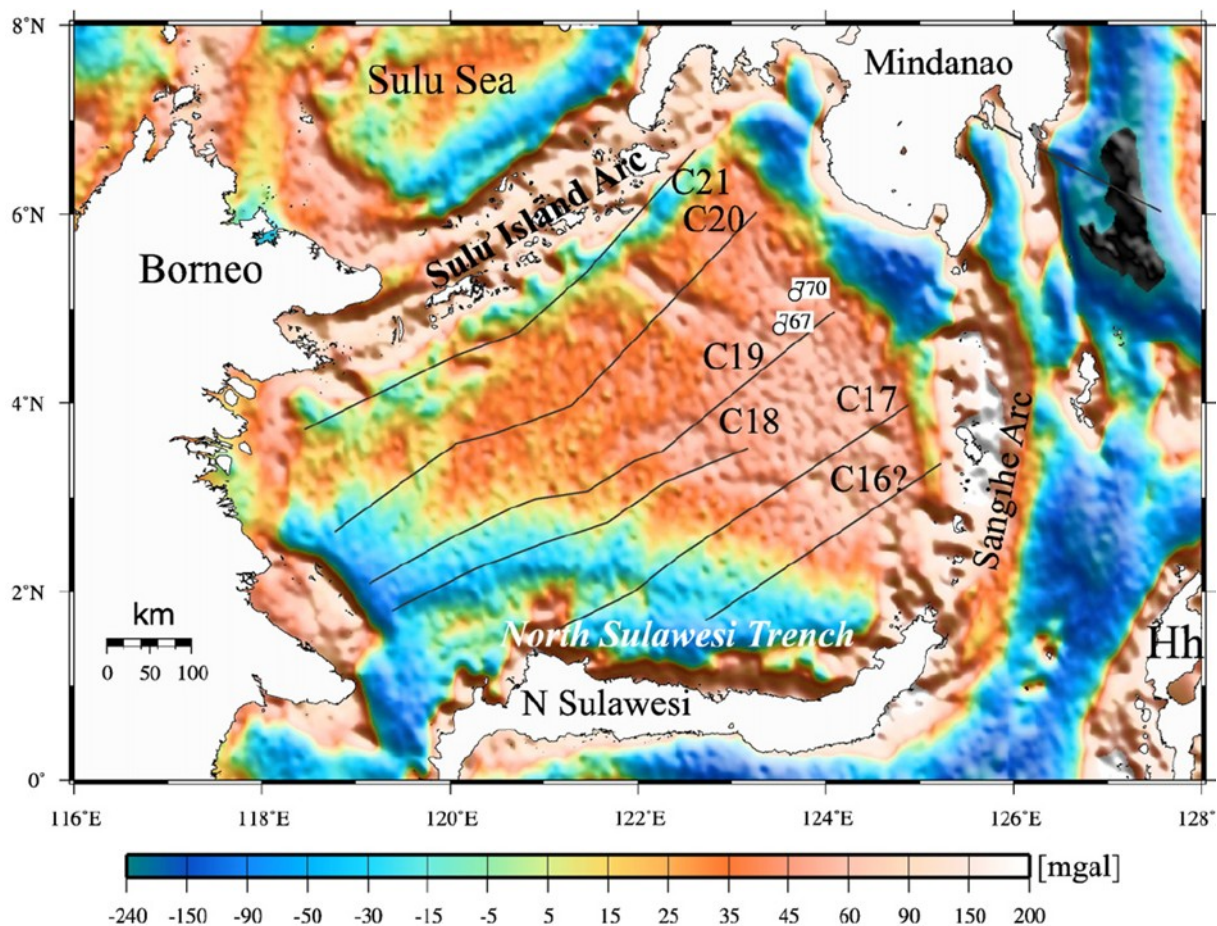


Figure IXa.13. Celebes Sea setting and satellite gravity (Gaina & Muller, 2007). Also showing interpreted Middle Eocene-age seafloor age isochrons (C21-C16?), from magnetic lineations and ODP Sites 767 and 770 drilling results.

Celebes Sea oceanic crust becomes systematically younger in SW direction, from Early Lutetian to Early Priabonian (= ~48-35 Ma; Gaina and Muller, 2007), suggesting either asymmetric seafloor spreading, or, more likely, that more than half of the original Celebes Sea basin floor has already been consumed by subduction at the North Sulawesi Trench.

Seismic tomography and recent earthquake activity confirm a clear South-dipping subducted slab under North Sulawesi down to ~400km depth (>500km long), reflecting southward subduction at least since Late Miocene time (ties to peak arc volcanism in North Sulawesi arc 7- 4 Ma).

In addition to South-directed subduction, Celebes Sea crust is also consumed by subduction in:

- NE: by ongoing subduction at the Cotobato Trench off SW Mindanao (Figure IXa.13).
- NW: by Early- Middle Miocene subduction under the Sulu Arc (driving Sulu Sea opening).

Cenozoic sediment fill in most of the Celebes Sea is relatively thin, particularly the condensed calcareous pelagic mudstones sequence from late Middle Eocene to late Early Miocene. During Middle- Late Miocene there was an increase in quartz-rich turbidites deposition, peaking at ~10 Ma, probably triggered by collisional uplift events in East Borneo (e.g. Nichols and Hall 1999).

At the west side of the Celebes Sea basin is the major Tarakan delta system of NE Kalimantan, much of which appears to be built on oceanic crust.

Sulu Sea

The Sulu Sea basin is another backarc marginal basin and is the result of splitting and SE-directed rollback of the Sulu Ridge volcanic arc, above the NW-dipping subduction zone of the Celebes Sea plate, in Early Miocene time (Silver et al. 1991, Hutchison 1992) (Figure IXa.14).

The late Early- early Middle Miocene-age oceanic crust of the Sulu Sea is thus >20 My younger than the adjacent Celebes Sea Basin. No clear magnetic anomalies have been identified in the Sulu Sea basement.

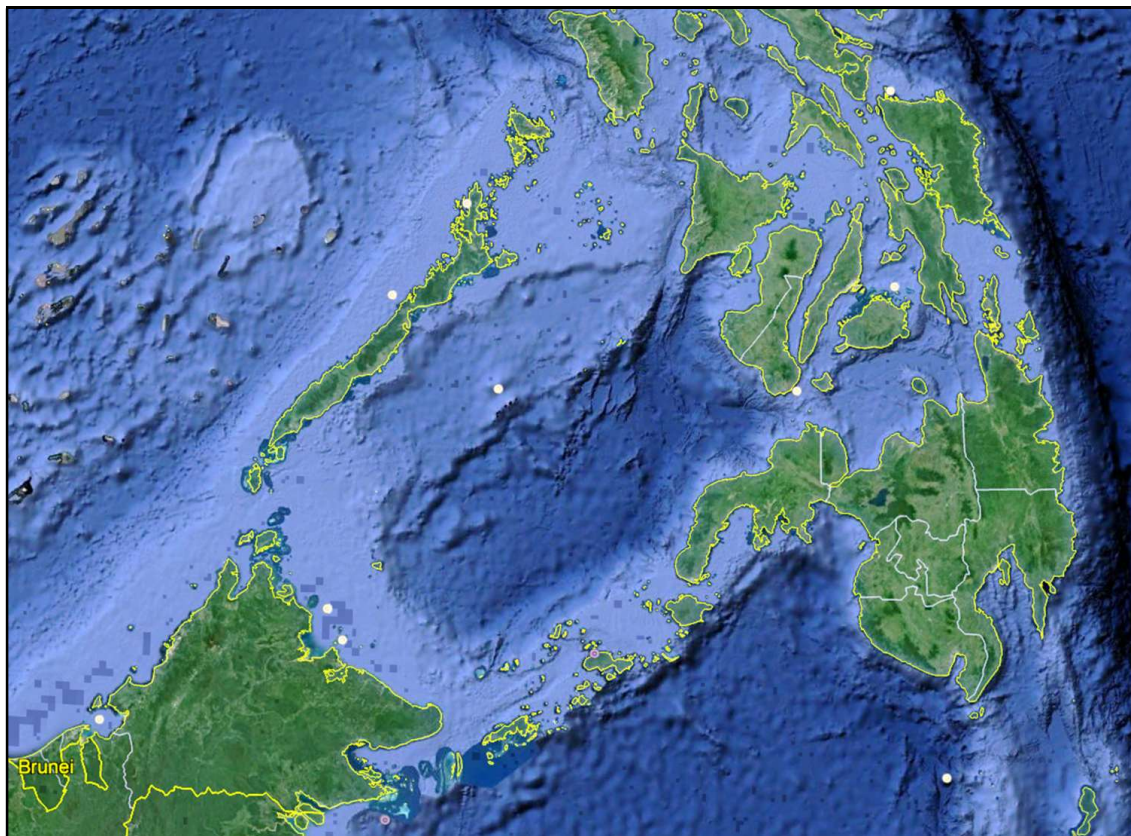


Figure IXa.14. Bathymetry of the Sulu Sea, NE of Sabah (Google Earth).

The Sulu Sea arc-splitting history left behind an inactive arc segment at the NW side, named the Cagayan Ridge (became inactive around 18 Ma; Hsu et al. 1991). Along the NW margin of the Sulu basin (NW of the

inactive Cagayan arc ridge) is the complex Sabah- Palawan-Sulu collisional belt, which contains Early Cretaceous-age ophiolites.

The SE margin of Sulu Sea basin is now being subducted under the Sulu volcanic arc, probably since latest Miocene time (Muller 1991).

Deposition within the Sula Basin is mainly pelagic in late Early Miocene. There is a major increase in sedimentation rate in Middle-Late Miocene time with widespread turbidites, probably due to collisional events in North Borneo (Nichols 1990, Bertrand et al. 1991, 1996)

The Sandakan Basin at the SW side of the Sulu Sea has been target of hydrocarbon exploration and yielded mostly minor gas discoveries (Graves and Swauger 1997). The basin is essentially a Middle Miocene- Recent depocenter of deltaic and deepwater clastic deposition along the NE Sabah margin, and is probably underlain by Sulu Sea oceanic crust (e.g. Pederson 1996, Oke et al. 2014, Jong and Futulan 2015, Murray 2015).

IX. 10. Tethyan terranes in India-Asia collision zone (Yunnan, Tibet, Tethyan Himalaya, North India)

Sub-chapter IX.10 of Bibliography 8.0 is a selection of papers from heart of the India-Asia collision zone that stretches from Myanmar into Yunnan (S China) to the Tibetan Plateau and Nepal-North India Tethyan Himalayas. It contains 48 pages with 283 references.

Although rather far removed from Indonesia, there are many similarities in stratigraphies and fossils of parts of Indonesia, reflecting similar tectonic histories of opening and closing of successive stages of Paleo- Meso- and Neotethys Oceans. The Tibetan-Himalayan area is generally better exposed and has been the subject of more modern geological studies and state-of-the-art analyses than Indonesia, and it is less affected by the post-collisional break-up processes of the Indonesian 'Tethysides'. These references may therefore contain It may therefore contain useful analog information for parts of the Indonesia puzzle.

IX. 11. SE Asia Regional Geology, Tectonics, Gondwanan-Tethyan regional paleo(bio)geography)

The final sub-chapter IX.11 of Bibliography 8.0 captures a wide variety SE Asia regional geology references. It contains 94 pages with 717 references.

REFERENCES XIa. CIRCUM INDONESIA- SE Asia (Tethyan Terranes, etc.)

Indonesia is a complex mosaic of areas with very different geological properties and histories, reflecting a long history of amalgamation of mainly Gondwana-derived continental terranes during Mesozoic and Cenozoic, with associated subduction zones and orogenic belts formed during the closing of successive stages of the Tethys Ocean. This basic pattern was further complicated by opening and closing of marginal oceanic basins, accretion of intra-oceanic arc terranes, large strike-slip fault zones, etc.

Virtually all parts of Indonesia are continuations of adjacent geological provinces with similar histories. Many of these surrounding areas have been studied extensively and parts of their histories may be better understood, so any learnings from these surrounding areas will be helpful for understanding the geology of adjacent parts in Indonesia:

- 1. The geology of Sumatra and adjacent Sunda Shelf continues to NW into the Tethyan collision zones of mainland SE Asia, from the Malay Peninsula, through Thailand and Myanmar, as far as Tibet (where the Late Paleozoic-Mesozoic history of Tethyan evolution is probably better documented and dated than anywhere else);*
- 2. To the NW, the Cenozoic basins of the Natuna Platform tie to the Cenozoic marginal basins along SE China;*
- 3. To the N/NE is Sabah, the Sangihe arc, Celebes Sea and Halmahera, areas that can be tied to geological events in the SW Pacific Realm, with its magmatic arcs, ophiolite terranes and marginal oceanic basins continuing into the Philippines and northern New Guinea;*
- 4. To the East is the New Guinea part of the Australian-New Guinea continent, as well the continuation of the accretionary margin of eastern Australia ('Tasmanides'), which continues into PNG and the Indonesian Birds Head and Banggai-Sula terranes;*
- 5. To the SE is the north-moving Australian passive continental margin, which is colliding with the Banda Arc from Indonesia Timor and-Timor Leste to the East.*
- 6. To the S and SW is the Indian Ocean, moving north in sync with the Australian Plate and is now actively subducting under the Andaman-Sumatra-Java-Sunda-Banda arc-trench system;*
- 7. The central parts of Indonesia, like East Kalimantan and Sulawesi, preserve records of Cretaceous- Paleogene subduction and collisions, representing the closing of the easternmost parts of Mesotethys and Neotethys paleo-oceans, with some events remarkably similar to Tethyan collision events in the Tibet Plateau, NE Indian Himalayas, Myanmar, etc., prior to and during the India-Asia collision.*

Below are listings of papers from areas bordering Indonesia and also slightly farther afield, many of which that all underwent similar rift-drift-collisional processes as parts of Indonesia. In many cases, more advanced, cutting-edge analyses have been applied to areas around Indonesia, the results of which could help understand analogous parts of the Indonesia geology puzzle.

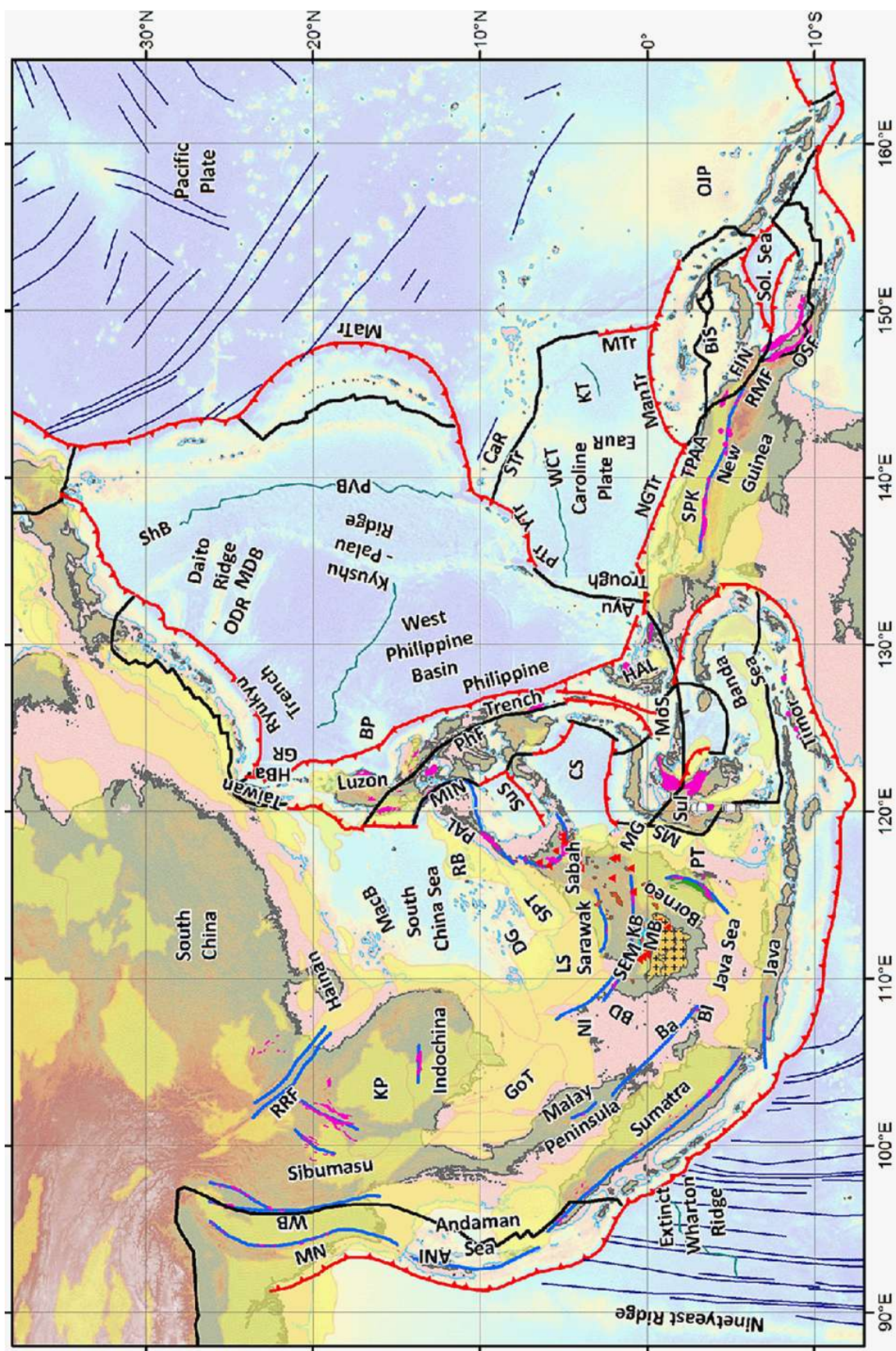


Fig. IXa.15.. Main tectonic elements of Southeast Asia (Zahirovic et al., 2013)

IX.1. Andaman Sea Region

Acharyya, S.K. (1991)- Late Mesozoic- Early Tertiary basin evolution along the Indo-Burmese range and Andaman Island. In: S.K. Tandon et al. (eds.) *Sedimentary basins of India*, p. 104-130.

Acharyya, S.K. (1997)- Stratigraphy and tectonic history reconstruction of the Indo-Burma-Andaman mobile belt. *Indian Journal of Geology* 69, p. 211-234.

Acharyya, S.K. (2007)- Collisional emplacement history of the Naga-Andaman ophiolites and the position of the eastern Indian suture. *J. Asian Earth Sciences* 29, 2-3, p. 229-242. (online at: www.academia.edu/32329632/Collisional_emplacement_history_of_the_Naga_Andaman_ophiolites_Etc.)
(*Dismembered Late Mesozoic ophiolites in 2 belts along E margin of Indian Plate: (1) E Belt follows magmatic arc of C Burma Basin high gravity, mafic and continental metamorphic rocks and two closely juxtaposed sutures; (2) W Belt along E margin of Indo-Burma Range and Andaman outer island arc (negative gravity anomalies; rootless ophiolites over Eo-Oligocene flysch); with two sets of ophiolites accreted in E Cretaceous and M Eocene in this belt, inferred to be nappes from E Belt, emplaced during Late Oligocene collision between Burmese and Indo-Burma-Andaman microcontinents. Andaman Islands Ophiolites belong to W Belt, formerly interpreted as upthrust oceanic crust, accreted due to prolonged subduction to W of island arc, but subduction began only in Late Miocene and could not have produced ophiolitic rocks accreted in E Eocene*)

Acharyya, S.K., K.K. Ray & S. Sengupta (1990)- Tectonics of the ophiolite belt from Naga Hills and Andaman Islands, India. *Proc. Indian Academy of Sciences (Earth Planetary Science)* 99, p. 187-199.
(online at: www.academia.edu/32309202/Tectonics_of_the_ophiolite_belt_from_Naga_Hills_and_Andaman_Islands_India)

(*Ophiolitic rocks of Naga Hills-Andaman belt rootless slices, gently dipping over Paleogene flysch. Blueschists in ophiolite melange indicates involvement in subduction process. Subduction initiated prior to M Eocene as proved by lower age limit of ophiolite-derived cover sediment and olistostromal trench sediment. In Late Oligocene terminal collision between India and Sino-Burmese blocks, basement slivers from Sino-Burmese block, accreted ophiolites and trench sediments thrust W-ward as nappe and emplaced over down-going Indian plate. Root-zone of ophiolite nappe (suture) marked by partially-exposed E ophiolite belt of same age and gravity high passing through C Burma-Sumatra-Java. Subduction W of Andaman islands began only in Late Miocene, later than emplacement of ophiolites. Post-collisional N-ward movement of Indian plate developed leaky dextral transcurrent faults and caused Neogene-Quaternary volcanism in C Burma*)

Acharyya, S.K., K.K. Ray & D.K. Roy (1989)- Tectono-stratigraphy and emplacement history of the ophiolite assemblage from the Naga Hills and Andaman island arc. *J. Geological Society India* 33, p. 4-18.

Acharyya, S.K., K.K. Ray & S. Sengupta (1991)- The Naga Hills and Andaman ophiolite belt, their setting, nature and collisional emplacement history. *Physics and Chemistry of the Earth* 18, 1, p. 293-315.
(*Indo-Burmese Range and Andaman-Nicobar Island Arc trend of ophiolite occurrences (dismembered mafic-ultramafic rocks with associated oceanic pelagic sediments). They occur as thrust slices at highest tectonic levels, overlying distal shelf sediments of Eocene- Oligocene age. Ophiolites unconformably overlain by M-L Eocene ophiolite-derived clastics. Ophiolites remnants of one or several intra-continental ocean basin(s), created during Cretaceous rifting of Greater India from Gondwana*)

Akhtar, S., P. Negi & A. Saikia (2021)- Cumulate gabbros in the South Andaman Island ophiolite suite (India): their bearing on the tectonic setting. *Canadian J. Earth Sciences* 58, 11, p. 1170-1186.
(*Andaman ophiolite represented by thrust slices formed in Mesozoic Neo-Tethys Ocean and consists of dismembered mafic and ultramafic rocks and associated oceanic pelagic sediments. Mafic cumulate rocks of S Andaman Island hybrid signature of island arc tholeiite (IAT) - mid-oceanic ridge basalt (MORB) settings. Formed in oceanic back-arc and oceanic arc setting in Neo-Tethys oceanic domain between Indian and Burmese plates during Late Cretaceous*)

- Akhtar, S., A. Saikia, P. Negi & B.J. Kalita (2021)- Back-arc basin origin for the basalts of the South Andaman Island Ophiolite (India). *Episodes* 45, 1, p. 5-27.
(online at: <https://www.episodes.org/journal/view.html?doi=10.18814/epiugs/2021/021001>)
(*Cretaceous pillow and massive basalts assemblage in S Andaman ophiolite records evolution of back-arc basin (between Neotethyan intra-oceanic arc and Burma Plate) from initial rifting to spreading, documenting how basaltic magmatism evolves during formation of the back-arc basin in suprasubduction zone setting*)
- Alam, M., M.M. Alam, J.R. Curray, M.L.R. Chowdhury & M.R. Gani (2003)- An overview of the sedimentary geology of the Bengal Basin in relation to the regional tectonic framework and basin-fill history. *Sedimentary Geology* 155, p. 179-208.
(*Bengal Basin at junction of three interacting plates: Indian, Burma and Tibetan (Eurasian) Plates. Major switch in sedimentation pattern during M Eocene- E Miocene as result of collision of India with Burma and Tibetan Blocks. By M Miocene, with continuing collision events and uplift in Himalayas and Indo-Burman Ranges a huge influx of clastic sediments came into basin from NE and E. From Pliocene onwards, large amounts of sediment filling basin from W and NW*)
- Alam, M.A., D. Chandrasekharam, O. Vaselli, B. Capaccioni, P. Manetti & P.B. Santo (2004)- Petrology of the prehistoric lavas and dyke of the Barren Island, Andaman Sea, Indian Ocean. *Proc. Indian Academy of Sciences (Earth Planetary Science)* 113, 4, p. 715-721.
(online at: <https://www.ias.ac.in/article/fulltext/jess/113/04/0715-0721>)
(*Quaternary volcanics of Barren Island (Andaman Sea, Indian Ocean) evolved from source similar to that of Sunda Arc lavas of Sumatra/Java and is part of the same Neogene Inner Volcanic Arc*)
- Allen, R., A. Carter, Y. Najman, P.C. Bandopadhyay, H.J. Chapman, M.J. Bickle, E. Garzanti et al. (2008)- New constraints on the sedimentation and uplift history of the Andaman-Nicobar accretionary prism, South Andaman Island In: A.E. Draut et al. (eds.) *Formation and applications of the sedimentary record in arc collision zones*. Geological Society of America (GSA), Special Paper 436, p. 223-255.
(*Andaman-Nicobar Ridge accretionary complex part of Sunda subduction zone. Tertiary rocks exposed on Andaman Islands preserve record of tectonic evolution of surrounding region. Poor biostratigraphic age control (mainly barren). Oldest unit pre-Late Cretaceous ophiolite, Late Cretaceous- Paleocene pelagic cherts-shales, arc-derived Eocene Mitakhari Gp coarse clastics, Late Eocene?-Oligocene continental-derived Andaman Flysch, major uplift episode around 20 Ma, shallow marine volcanics-rich Miocene-Pliocene Archipelago group*)
- Andreason, M.W., B. Mudford & J.E.S. Onge (1997)- Geologic evolution and petroleum systems of the Thailand Andaman Sea basin. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Int. Conference Petroleum Systems of SE Asia & Australia*, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 337-350.
(*Thailand Andaman Sea sector 12 exploratory wells, including two gas discoveries. Two back-arc basins, Mergui and N Sumatra basin N extension with >10,500' sediment. Miocene reefs and Oligo- Miocene fluvio-deltaics and turbidites major exploration plays*)
- Anju, C.S., T. Koley & S. Parhi (2016)- Trace fossils of the Palaeogene sequences of North Andaman Island and their palaeoenvironmental significance. *Indian J. Geoscience* 703, 4, 205e218, p. 1-14.
(online at: www.researchgate.net/publication/318789037_Trace_Fossils_of_the_Palaeogene_sequences_Etc)
(*14 types of deeper marine trace fossils in thick conglomeratic Eocene Andaman Flysch Group. Shale-dominated parts transitional between Skolithos and Cruziana ichnofacies (dominated by Thalassinoides), sand-dominated parts in Cruziana ichnofacies, arenaceous sequence in Skolithos ichnofacies*)
- Ankush, P. Dewangan & G. Sriram (2024)- Methane gas flares in the forearc basin of the Andaman-Nicobar subduction zone. *Frontiers in Earth Science* 12, 12:1334942, p. 1-14.
(online at: <https://www.frontiersin.org/journals/earth-science/articles/10.3389/feart.2024.1334942/full>)
(*Submarine gas flares (meaning seepage?-JTvG) from sedimentary ridge (likely anticlinal structure in accretionary prism) at ~1500m seafloor depth in southern Andaman forearc basin, 74 km from Car Nicobar island. Associated with gas hydrate deposits and Bottom-Simulating Reflector*))

ASCOPE (1985)- The stratigraphic correlation study of the Andaman Sea- Strait of Malacca. United Nations ESCAP, CCOP, Technical Paper TP/4, p. 1-28.

Aung Khin, J. (1990)- The geology of the Andaman Sea. Proc. 8th Offshore SE Asia Conference, Singapore 1990, SE Asia Petroleum Exploration Society (SEAPEX), Proc. 9, p. 81-88.

(Brief review of Andaman Sea basins. Divided into Martaban fore-arc basin in N, North Sumatra backarc basin in S)

Awasthi, N. (2012)- Geochemical and isotopic studies of sediments from the Andaman Islands and the Andaman Sea. Ph.D. Thesis Maharaja Sayajirao University of Baroda, India, p. 1-183.

(online at: https://www.prl.res.in/~library/gpdf/prl-theses/awasthi_n_2012.pdf)

(Determination of timing of past major volcanic activities in Andaman region from study of ash deposits in sedimentary records of Andaman region. Oldest record of volcanism from tephra interbedded in E-M Eocene and Mio-Pliocene age sediments on Andaman Islands. Seven discrete ash layers in a core raised from Andaman Sea reflect Late Quaternary ash layers sourced from nearby Barren Island Volcano. Etc.)

Awasthi, N. & S.A. Jafar (1990)- First fossil wood (Lauraceae) from Baratang, Andaman-Nicobar Islands, India. Current Science 59, 23, p. 1243-1244.

(online at: <https://www.currentscience.ac.in/Volumes/59/23/1243.pdf>)

(Carbonized wood fragment of Laurinoxylon Paleo-Eocene flysch sandstones of Baratang Island. No growth rings seen (= tropical). Sedimentology suggests provenance from NE, the Burma region)

Awasthi, N., J. Ray, A. Laskar, Y. Amzad & M. Yadava (2013)- Chronology of major terrace forming events in the Andaman islands during the last 40 kyr. J. Geological Society India 82, 1, p. 59-66.

(Andaman and Nicobar Islands part of accretionary prism along Andaman subduction zone. Quaternary coral reef coastal terraces up to 5m above s.l. (50m on Interview Island), tied to earthquake/ tsunami activity)

Awasthi, N., J. Ray, A. Laskar, A. Kumar, M. Sudakhar, R. Bhutani et al. (2010)- Major ash eruptions of Barren Island volcano (Andaman Sea) during the past 72 Kyr: Clues from a sediment core record. Bulletin of Volcanology 72, p. 1131-1136.

Awasthi, N., J.S. Ray & K. Pande (2015)- Origin of the Mile Tilek Tuff, South Andaman: evidence from ⁴⁰Ar-³⁹Ar chronology and geochemistry. Current Science 108, 2, p. 205-210.

(online at: <https://www.currentscience.ac.in/Volumes/108/02/0205.pdf>)

(Mile Tilek Tuff ~40m thick bedded dacitic-rhyolitic tuff deposit on S Andaman is one of several volcanic ash deposits in Andaman- Nicobar Islands that are evidence of large-scale volcanic eruption in SE Asia. Assumed ages Mio-Pliocene (~25-2 Ma), but new ⁴⁰Ar-³⁹Ar age for whole rock 0.73 ± 0.16 Ma. Chemically typical of subduction zone magmatism. Sr-Nd isotopes ($^{87}\text{Sr}/^{86}\text{Sr} = 0.7073$ and $\delta \text{Nd} < 0.9$) suggest continental crustal contamination of magma, pointing to source volcano in Sumatra, possibly Ranau volcano in S Sumatra)

Awasthi, N., J.S. Ray, A.K. Singh, S.T. Band & V.K. Rai (2014)- Provenance of the Late Quaternary sediments in the Andaman Sea: implications for monsoon variability and ocean circulation. Geochem. Geophysics Geosystems 15, 10, p.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2014GC005462>)

(Andaman Sea three major sediment provenances: (1) Irrawaddy catchment; (2) W slopes of Indo-Burman-Arakan Ranges and Andaman Islands; (3) catchments of Salween and Sittang and Bengal shelf (first two contributing 30-60% of material))

Ayyadurai, V., R. Nainar & C. Ojha (2015)- Mud volcanoes show gas hydrate potential in India's Andaman Islands. Oil and Gas Journal 113, 2, p. 44-53.

(Minutes after M9.0 Sumatra-Andaman earthquake in 2004, mud volcanoes erupted on Diglipur Island in N Andaman. Eruptions activity linked to hydrocarbons)

- Badve, R.M. & P. Kundal (1986)- Marine Cretaceous algae from the Baratang Formation, Andaman Islands, India. Bull. Geol. Min. Society India 54, p. 149-158.
(Seven types of ?Cretaceous algae in calcareous sst in Baratang Gp, most of them new: *Cayeuxia*, *Ethelia*, *Baratangia*, *Peyssonella*, *Permocalculus*, *Halimeda*, etc. (possibly Paleogene?))
- Badve, R.M. & P. Kundal (1987)- Solenoporacean algae from Paleocene to Oligocene rocks of Baratang Island Andaman, India. J. Geological Society India 13, 4, p. 81-88.
- Badve, R.M. & P. Kundal (1988)- *Distichoplax* Pia from Baratang Island, Andaman, India. Biovigyanam 14, p. 95-102.
(online at: https://www.academia.edu/4226340/Distichoplax_Pia_from_Baratang_Island_Andaman_India)
(*Distichoplax biserialis* algae in Lower Eocene-Oligocene calcareous sst of Port Blair Gp, Baratang Island)
- Badve, R.M. & P. Kundal (1998)- Dasycladacean algae from Palaeocene to Oligocene rocks of Baratang Island, Andaman, India. J. Geological Society India 51, p. 485-492.
(online at: https://www.academia.edu/4226363/Dasycladacean_Algae_From_Paleocene_to_Oligocene_Rocks_of_Baratang_Island_Andaman_India)
(*Calcareous sst in Baratang Gp (Lw Paleocene- Lw Eocene) and Port Blair Group (M Eocene- Oligocene) yielded 4 dasyclad algae: Broeckella, Dissocladella, Neomeris and Trinocladus. Tethyan affinities*)
- Ball, V. (1888)- The volcanoes of Barren Island and Narcondam in the Bay of Bengal. Geological Magazine 9, p. 404-408.
- Bandopadhyay, A. & R.R. Bandyopadhyay (1999)- Subsea channels and incidence of thermogenic hydrocarbons in the mid-proximal Bengal Fan, West of the Andaman-Nicobar Islands. Marine Georesources Geotechnology 17, p. 1-16.
- Bandopadhyay, P.C. (2005)- Discovery of abundant pyroclasts in Namunagarh grit, South Andaman; evidence for architectural element volcanism and active subduction during the Paleogene in the Andaman area. J. Asian Earth Sciences 25, 1, p. 95-107.
(*Late Eocene Namunagarh Grit clastics of S Andaman island mainly immature, locally pebbly greywacke sandstones. Abundant juvenile vesiculated fragments, pumice clasts, etc., suggest pyroclastic origin. Coarse-grained facies emplaced as debris flows, finer-grained facies turbidites, deposited in forearc environment on accretionary complex. Derived from andesitic arc volcanoes on W margin of Burma-Malaya continent in Eocene-Oligocene, indicating active subduction*)
- Bandopadhyay, P.C. (2012)- Re-interpretation of the age and environment of deposition of Paleogene turbidites in the Andaman and Nicobar Islands, Western Sunda Arc. J. Asian Earth Sciences 45, 2, p. 126-137.
(*Andaman Flysch in different areas deposited in different tectonic and sedimentary environments and at different times: Late Paleocene in N Andaman, Oligocene in S Andaman island*)
- Bandopadhyay, P.C. (2017)- Inner-arc volcanism: Barren and Narcondam islands. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 12, p. 167-192.
(*Barren and Narcondam young volcanic islands of volcanic belt that extends from Java in E to Burma in N. Below Narcondam probably continental or transitional crust, below Barren Island oceanic lithosphere*)
- Bandopadhyay, P.C. & A. Carter (2017)- Introduction to the geography and geomorphology of the Andaman-Nicobar Islands. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 2, p. 9-18.
(online at: <http://mem.lyellcollection.org/content/memoirs/47/1/9.full.pdf>)
(*Introduction to Andaman islands in NE Indian Ocean are segment of tectonically active accretionary wedge of Sunda subduction system, with dismembered ophiolites, volcanic arc rocks, trench-slope deposits, submarine fan turbidites, pelagic sediments, etc.*)

Bandopadhyay, P.C. & A. Carter (2017)- Geological framework of the Andaman- Nicobar Islands. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 6, p. 75-93.

(Andaman-Nicobar archipelago at W margin of Andaman Sea is sediment-dominated accretionary wedge (outer-arc). Andaman accretionary ridge two distinct terranes, juxtaposed and telescoped into N-S trending fold-thrust belt along E margin of Indo-Australian oceanic plate. Pre-Cretaceous meta-sedimentary rocks, U Cretaceous ophiolites and Paleogene- Neogene sediments indicate rapid changes in lithology, sedimentology, environments and paleogeographic setting)

Bandopadhyay, P.C. & A. Carter (2017)- Mithakhari deposits. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 8, p. 111-132.

(Mithakhari Melange composed of conglomerates, sandstones, andesitic tuff, siltstone, mudstones, shale, carbonaceous shale and limestones. Coherent and chaotic units with olistoliths of pre-ophiolite metasediments, ophiolitic ultramafics and basalts and pelagic-hemipelagic sediments. Active andesite volcanism on arc massif E of Andaman arc on W margin of Burma-Thai-Malaya peninsula in Eocene- Oligocene, before opening of Andaman Sea in M Miocene)

Bandopadhyay, P.C. & A. Carter (2017)- Submarine fan deposits: petrography and geochemistry of the Andaman Flysch. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 9, p. 133-140.

(Andaman Flysch of Oligocene age marine turbidites from axially fed submarine fan. Intermittently exposed across entire chain of Andaman- Nicobar Islands)

Bandopadhyay, P.C. & A. Carter (2017)- The Archipelago Group: current understanding. In: P.C. Bandopadhyay & A. Carter (eds.) The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards, Geological Society, London, Memoir 47, Chapter 11, p. 153-166.

(Neogene Archipelago Group overlies Oligocene and older turbidites and tectonic melanges of ophiolite and Mithakhari rocks. Deposited in intertidal and subtidal, nearshore and offshore shelfal environments)

Bandopadhyay, P.C. & A. Carter (2018)- Paleogene tectonic and sedimentation history of the Andaman- Nicobar accretionary arc, Northeast Indian Ocean. In: S. Bajpai et al. (eds.) The Indian Paleogene, Society of Earth Scientists Series, Springer, p. 91-112.

Bandopadhyay, P.C., U. Chakrabarti & A. Roy (2009)- First report of trace fossils from Palaeogene succession (Namunagarh grit) of Andaman and Nicobar islands. J. Geological Society India 73, 2, p. 261-267.

(Namunagarh Grit of Late Eocene age in S Andaman island is submarine fan deposit with trace fossils Thalassinoides, Teichichnus and Lorenzinia. Associated with M-L Eocene (displaced) larger foraminifera Nummulites atacicus, Pellatispira and Biplanispira)

Bandopadhyay, P.C. & M. Ghosh (1998)- Facies, petrology and depositional environment of the Tertiary sedimentary rocks, around Port Blair, South Andaman. J. Geological Society India 52, p. 53-66.

Bandopadhyay, P.C. & B. Ghosh (2015)- Provenance analysis of the Oligocene turbidites (Andaman Flysch), South Andaman Island: a geochemical approach. J. Earth System Science 124, 5, p. 1019-1037.

(online at: www.ias.ac.in/article/fulltext/jess/124/05/1019-1037)

(Oligocene turbidites of Andaman Flysch along E coast of S Andaman Island. Geochemistry of av. 71% SiO₂, etc., close to granite field. Combined geochemical, petrographic and paleocurrent data indicate mainly plutonic-metamorphic provenance, possibly Shan-Thai continental block of NE and E Myanmar)

Bandopadhyay, P.C., B. Ghosh & M. Limonta (2014)- A reappraisal of the eruptive history and recent (1991-2009) volcanic eruptions of the Barren Island, Andaman Sea. Episodes 37, 3, p. 192-205.

(online at: https://www.episodes.org/journal/download_pdf.php?doi=10.18814/epiugs/2014/v37i3/005)

(Barren Island volcano in western Sunda Arc displayed Strombolian eruptions for >2 decades. A prehistoric mafic stratocone with central caldera, a central scoria cone with summit crater and abundant basaltic lava flows of historic eruptions evidence activity during prehistoric times)

Bandopadhyay, P.C., D.J.J. van Hinsbergen, D. Bandyopadhyay, A. Licht, E.L. Advokaat, A. Plunder et al. (2022)- Paleogeography of the West Burma Block and the eastern Neotethys Ocean: constraints from Cenozoic sediments shed onto the Andaman-Nicobar ophiolites. *Gondwana Research* 103, p. 335-361.

(online at: www.sciencedirect.com/science/article/pii/S1342937X21003051)

(New petrographic and detrital zircon U-Pb data from M Paleocene-Miocene sediments overlying Andaman Ophiolite on Andaman Island. Paleocene-Eocene Namunagarh Grit likely derived from 60 Ma old arc that was likely located in ocean to N (present-day W) of W Burma Block, west of Andaman-Nicobar. Oligocene-E Miocene East Andaman Flysch contains W Burma Block debris that traveled much farther and mixed with sediments from Sundaland. History reflects late Paleocene- E Eocene collision of West Burma Block, likely then part of the Australian Plate, with Andaman forearc causing uplift and proximal sedimentation shed from the colliding arc. Subsequent N-ward motion of W Burma Block caused subsidence of the Andaman forearc, etc.)

Bandopadhyay, S., M.R. Subramanyam & N. Sharam (1973)- The geology and mineral resources of the Andaman and Nicobar Islands. Geological Survey India, Records 105, 2, p. 25-68.

Bandyopadhyay, D., B. Ghosh, C. Guilmette, A. Plunder, F. Corfu, E.L. Advokaat, P.C. Bandopadhyay & D.J.J. van Hinsbergen (2021)- Geochemical and geochronological record of the Andaman Ophiolite, SE Asia: From back-arc to forearc during subduction polarity reversal? *Lithos* 380-381, 105853, p. 1-25.

(online at: https://www.geologist.nl/wp-content/uploads/2021/01/2021_Bandyopadhyay_Lithos.pdf)

(Cretaceous Andaman Ophiolite original lithosphere formed in back-arc basin of E Cretaceous Woyla intra-oceanic arc. Subduction initiation and supra-subduction zone ophiolite formation within this basin at ~105 Ma, followed by arc magmatism between 99- 93 Ma upon subduction maturation)

Bandyopadhyay, D., D.J.J. van Hinsbergen, A. Plunder, P.C. Bandopadhyay, E. Advokaat, et al. (2020)- Andaman Ophiolite: an overview. In: J.S. Ray & M. Radhakrishna (eds.) *The Andaman Islands and adjoining offshore: geology, tectonics and palaeoclimate*, Springer Nature Switzerland, p. 1-17.

(online at: https://www.academia.edu/42776611/Andaman_Ophiolite_An_Overview)

(Still unresolved issues of age, stratigraphic coherence, and emplacement mechanisms of Andaman Ophiolite. Many elements of typical ophiolitic stratigraphy present, but not in structural coherence. Geochronological constraints suggest longer than normal time for amalgamation of ophiolite crust (~95-127 Ma). Possible multi-phase history of magmatism and ophiolite evolution)

Banerjee, D. (1967)- Upper Cretaceous microflora from middle Andaman Isles (India). *Review Palaeobotany Palynology* 5, p. 211-216.

(Baratang Fm of Middle Andaman Isles with mixed of Tertiary and Upper Cretaceous forms, the latter being more common (see also Mandal et al. 2003))

Banerji, P.K., D. Halder & G. Ghosh (1981)- Metallogenesis in the Cretaceous embryonic ophiolites of Andaman-Nicobar island arc and its northern prolongation into the mountains along the Indo-Burman border. *Proc. Int. Symposium Metallogeny of mafic and ultramafic complexes, etc., Athens 1980*, 2, p. 21-38.

Banghar, A.R. (1987)- Seismo-tectonics of the Andaman- Nicobar Islands. *Tectonophysics* 133, p. 95-104.

(Epicenters of 345 earthquakes between 1967-1982 mainly shallow focus, deepest 250km. Orientation of slip vectors deduced from thrusting mechanisms consistent with NE- directed underthrusting of Indian Ocean under Andaman-Nicobar Islands)

Bawden, M. (2011)- Andaman Sea Basin, India: hydrocarbon prospectivity from newly reprocessed seismic data. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore 2011*, 13, p. 1-16. *(Abstract + Presentation)*

Bhatta, K. & B. Ghosh (2014)- Chromian spinel-rich black sands from eastern shoreline of Andaman Island, India: Implication for source characteristics. *J. Earth System Science* 123, 6, p. 1387-1397.

(Black sands rich in chromian spinel in pockets along E shoreline of Andaman Island, near exposures of peridotites and volcanics of Cretaceous Andaman ophiolite. Volcanic chromian spinels relatively fresh, with geochemical characters of MORB of spreading centers. Peridotitic chromian spinels rounded and altered, and indicating depleted lherzolite and depleted harzburgite source of ophiolite suite)

Bhattacharya, A., T. Pal & B. Ghosh (2013)- Characterisation of the accreted ophiolite slices of Rutland Island, Andaman Sea: evolution in a suprasubduction zone setting. *Ophioliti* 38, 2, p. 121-142.

(online at: <https://ofioliti.it/index.php/ofioliti/article/view/422/413>)

(110 km² area of Rutland Island four dismembered thrust slices of Cretaceous ophiolite which are interleaved with Eocene sediments. Ophiolite sequence represented by tectonite, chromitite pods, transitional peridotite, layered ultramafic-mafic, intrusives of plagiogranite-diorite and extrusive basalt and boninite capped by Cretaceous pelagic sediments)

Bhattacharya, S., K. Pande, A. Kumar, O. Kingson & J.S. Ray (2020)- Timing of formation and obduction of the Andaman Ophiolite. In: J.S. Ray & M. Radhakrishna (eds.) *The Andaman islands and adjoining offshore: geology, tectonics and palaeoclimate*. Springer International Publishing, p. 19-42.

(Tectonic evolution of Andaman Accretionary Prism with two-fold ophiolite obduction: (1) prior to 55 Ma in intra-Neotethys subduction zone setting; and (2) at ~0.9 Ma, in current setting between Indian Ocean and Andaman Sea)

Carter, A. & P.C. Bandopadhyay (2017)- Seismicity of the Andaman-Nicobar Islands and Andaman Sea. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 14, p. 205-213.

(Seismicity across Andaman-Nicobar island arc and Andaman Sea. Magnitudes of displacements varied from dip-slip on S (Sumatran) segment to dip-slip and strike-slip on Andaman-Nicobar segment. Andaman section more steeply dipping slab and thicker sediment cover compared to Sumatra where coupling with overlying plate is stronger. Seismicity in Andaman Sea spreading center consistent with normal faulting and dyke injection)

Cawthorn, T. (2013)- Reconstructing the Late Miocene to Recent volcanic, geologic, and oceanographic evolution in the Andaman Sea and Northern Bay of Bengal, Northeast Indian Ocean. Ph.D. Thesis University of New Hampshire, p. 1-118.

(Reconstruction of volcanic, geologic, and oceanographic evolution in the Andaman Sea and N Bay of Bengal in last -9.4 Myrs. Geochemistry of volcanic ashes from Andaman Sea suggests they were derived from N Sumatra source)

Cawthorn, T., J.E. Johnson, L. Giosan, J.A. Flores, K. Rose & E. Solomon (2014)- A late Miocene–Early Pliocene biogenic silica crash in the Andaman Sea and Bay of Bengal. *Marine and Petroleum Geology* 58, p. 490-501.

(online at: www.academia.edu/29718596/A_late_Miocene_Early_Pliocene_biogenic_silica_crash_Etc.)

(Study of fluctuations in rate of biogenic opal accumulation in past ~9.4 Myrs in continental margin cores from Andaman Sea and N Bay of Bengal show biogenic silica crash at ~6 Ma. Consistent with previous studies suggesting reduced connectivity (exchange of nutrient-rich water masses) between E tropical Indian Ocean and W tropical Pacific Ocean as result of tectonic restriction of N sector of Indonesian Throughflow)

Chakraborty, A.A. & A.K. Ghosh (2015)- *Acrobotrys disolenia* Haeckel from the Late Miocene of Andaman and Nicobar Islands. *Current Science* 108, 11, p. 1990-1993.

(On radiolarian species from Late Miocene of Neill Island, Andaman Islands. Previous records of A. disolenia mainly from DSDP/ODP cores of Pacific Ocean and South China Sea)

Chakraborty, A.A. & A.K. Ghosh (2016)- Ocean upwelling and intense monsoonal activity based on late Miocene diatom assemblages from Neil Island, Andaman and Nicobar Islands, India. *Marine Micropaleontology* 127, p. 26-41.

(Late Miocene (Tortonian) diatoms from Neil Island with 82 taxa/ 35 genera. Two groups, dominated by (1) Thalassionema nitzschioides and T. longissima and (2) Actinocyclus ellipticus, Azpeitia nodulifera, Coscinodiscus asteromphalus and C. radiatus. Dominance of upwelling diatom taxon Thalassionema nitzschioides confirms strong Late Miocene monsoonal activity in study area)

Chakraborty, A.A., A.K. Ghosh, R. Dey, S. Saxena & A. Mazumder (2019)- Record of the Miocene climate optimum in the northeast Indian Ocean: Evidence from the microfossils. Palaeobiodiversity and Palaeoenvironments 99, p. 159-175.

(On Havelock island NN 4 zone calcareous nannofossils (~ 6.4 to ~15.0 Ma) and warm water assemblages, relatable with E-M Miocene Climate Optimum)

Chakraborty, A.A., A.K. Ghosh, S. Saxena, R. Dey & L. Roy (2023)- Neogene biostratigraphy and paleoceanography of Andaman and Nicobar Basin: A reappraisal. In: M. Montenari (ed.) Stratigraphy of Geo- and Biodynamic Processes, Stratigraphy & Timescales 8 (Marcelle Boudagher-Fadel Memorial Volume), Elsevier, Chapter 4, p. 121-187.

(Review of Neogene sequences in Andaman-Nicobar Basin in N Indian Ocean. Mainly deep marien facies with a few shallow-water sequences with tropical low latitude faunas/floras. Abundant microfossil. Some significant events recognized, e.g., M Miocene Climate Optimum (MCO), M Miocene rhodolith peak, upwelling and intensification of Indian Summer Monsoon (ISM), E Pliocene low biogenic silica deposition associated with warming, onset of cooling in Late Pliocene-Pleistocene, etc.)

Chakraborty, P.P. & P.K. Khan (2009)- Cenozoic geodynamic evolution of the Andaman-Sumatra subduction margin: current understanding. Island Arc 18, 1, p. 184-200.

(Review of Andaman-Sumatra margin. Subduction-related deformation along trench active since Cretaceous. Oblique subduction in N Sumatra-Andaman sector formed sliver plate between subduction zone and right-lateral fault system. Sliver fault, initiated in Eocene. N-S-trending dismembered ophiolite slices of Cretaceous age at different structural levels with Eocene trench-slope sediments, were uplifted and emplaced by E-dipping thrusts to shape outer-arc prism. Strike-slip faults controlled subsidence and development of forearc basins with Oligocene-Pliocene siliciclastic-carbonate sediments. Opening of Andaman Sea back-arc in two phases: early (~11 Ma) stretching and rifting, followed by spreading since 4-5 Ma. Inner-arc volcanism in Andaman region extends to E Miocene. Arc volcanism since Miocene evolution from felsic to basaltic composition)

Chakraborty, P.P. & T. Pal (2001)- Anatomy of a submarine fan with detached lobe: Upper Eocene- Oligocene Andaman Flysch Group, Andaman Islands, India. Gondwana Research 4, 3, p. 477-486.

(Three facies associations in Andaman Flysch Gp represent two parts of submarine, inner fan and depositional lobe in middle fan. Paleocurrent patterns and high percentages of quartz suggest dual sediment supply)

Chakraborty, P.P., T. Pal, G.T. Dutta & K.S. Gupta (1999)- Facies pattern and depositional motif in an immature trench-slope basin, Eocene Mithakhari Group, Middle Andaman, India. J. Geological Society India 53, 3, p. 271-284.

(Eocene Mithakhari Gp of Middle Andaman eight lithofacies of different paleogeographic significance and indicating sedimentation in small isolated basins in immature trench-slope setting. Lying unconformably on oceanic basement (ophiolite slices?))

Chandra, A. & R.K. Saxena (1998)- Lithostratigraphy of the Car Nicobar Island, Andaman and Nicobar Islands, India. Geophytology 26, p. 33-38.

Chandra, A., R.K. Saxena & A.K. Ghosh (1999)- Coralline algae from the Kakana Formation (Middle Pliocene) of Car Nicobar Island, India and their implication in biostratigraphy, palaeoenvironment and palaeobathymetry. Current Science 76, p. 1498-1502.

(online at: <https://www.currentscience.ac.in/Volumes/76/11/1498.pdf>)

(Coralline algae from M Pliocene Kakana Fm limestone on Car Nicobar island. 10 species, probably from 20-60m water depth)

Chandrasekharam, D., A.P. Santo, B. Capaccioni, O. Vaselli, M.A. Alam, P. Manetti & F. Tassi (2009)- Volcanological and petrological evolution of Barren Island (Andaman Sea, Indian Ocean). *J. Asian Earth Sciences* 35, p. 469-487.

(online at: <http://www.cec.uchile.cl/~ayaz/jaes.pdf>)

(*Barren Island only active volcano in Andaman Islands sector of Sunda arc system. Horseshoe-shaped caldera probably formed by giant lateral landslide of original volcanic cone. Compositional varies from low-K basalts to basaltic andesites*)

Charoensrisomboon, S. (2019)- Seismic sequence stratigraphy and deepwater turbidite characteristics in the East Andaman Basin, Offshore Myanmar. *Bull. Earth Sciences Thailand (BEST)*, 11, 2, p. 122-133.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246778/167758>)

(*Seismic stratigraphy study identifies deepwater turbidite distribution in Miocene-Recent succession in East Andaman Basin, offshore Myanmar. Four sequences (A-D) defined. Major turbidite reservoirs predicted in sequence A (Early-Middle Miocene), particularly in stacked turbidite channel*)

Chatterjee, A.K. (1964)- The Tertiary fauna of Andamans. Reports 22nd Session International Geological Congress, India 1964, VIII, Section 8, p. 303-328.

(*Paleocene-Recent sequence, including Eocene-Miocene larger forams*)

Chaturvedi, M., T. Koley, S. Jaiswal & S. Nayak (2019)- Cretaceous microfossils and calcareous nanofossils from the ophiolite associated pelagic sediments of the Middle Andaman. *Proc. XXVII Indian Colloquium on Micropalaeontology and Stratigraphy, Varanasi 2019, ICMS-131*, p. 139. (*Abstract only*)

(online at: www.researchgate.net/publication/337244927_CRETACEOUS_MICROFOSSILS_AND_CA_Etc)

(*Pelagic sediments associated with ophiolites on Andaman Islands with rich Campanian-Maastrichtian assemblages of calcareous nannofossils, radiolaria and planktonic foraminifera*)

Chopra, N.N. (1985)- Gas hydrate an unconventional trap in fore-arc regions of Andaman offshore. *Bull. Oil and Natural Gas Corporation (ONGC)* 22, 1, p. 41-54.

Clift, P.D. (2017)- Regional context of the geology of the Andaman-Nicobar accretionary ridge. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 3, p. 19-26.

(*Andaman- Nicobar accretionary ridge along N extension of Java-Sumatra convergent margin is forming by accretion and underplating of sediments off-scraped from obliquely colliding Bengal Fan. Net accretion low (~28%; rest subducted mostly into upper mantle). Subduction initiated at ~95 Ma, but large-scale subduction accretion likely accelerated in E Miocene*)

Cochran, J.R. (2010)- Morphology and tectonics of the Andaman Forearc, northeastern Indian Ocean. *Geophysical J. International* 182, 2, p. 631-651.

(online at: <https://academic.oup.com/gji/article/182/2/631/568764>)

(*Description of Andaman Sea accretionary prism and outer arc ridge, a series of forearc basins and major N-S faults, developed as result of highly oblique subduction at W Sunda Trench*)

Curry, J.R. (1999)- A new look at present tectonics and opening history of the Andaman Sea. *American Assoc. Petroleum Geol. (AAPG) Bull.* 83, 13 (Supplement), p. (*Abstract only*)

(*Andaman Sea active backarc basin behind Sunda subduction. Oblique convergence formed sliver plate between subduction zone and right lateral fault system after Oligocene. Eocene India- Asia hard collision started rotation and bending of W Sunda Arc. Sliver faulting started in Oligocene on W Andaman fault from off Sumatra through Andaman Sea into Sagaing fault. Late Oligocene Mergui Basin opening by extension of continental crust. E Miocene/ 25 Ma, backarc spreading started forming sea floor which became Alcock and Sewell Rises. From M Miocene/~15 Ma, these features separated from continental slope C Andaman Basin*)

Curry, J.R. (2005)- Tectonics and history of the Andaman Sea region. *J. Asian Earth Sciences* 25, p. 187-232.

(Major review of Andaman Sea geology. Andaman Sea active backarc basin above and behind Sunda subduction zone where convergence is highly oblique. Sliver plate formed between subduction zone and right-lateral fault system (Sagaing Fault, etc.). Late Paleocene collision of Greater India-Asia started CW rotation and bending of N and W Sunda Arc. Series of extensional pull-apart basins opened by the combined backarc extension and strike-slip motion: Mergui Basin (started at 32 Ma), Alcock and Sewell Rises (23 Ma), East Basin (15 Ma). Alcock and Sewell Rises separated by formation of C Andaman Basin, and faulting moved onshore from Mentawai Fault to Sumatra Fault System of Sumatra (NB: ages revised from earlier Curray publications)

Curray, J.R. (2014)- The Bengal depositional system: from rift to orogeny. *Marine Geology* 352, p. 59-69.
(Bengal Depositional system one of greatest sediment accumulations in world, extends from alluvial-lacustrine sediments of lower Ganges and Brahmaputra Rivers, across Bengal Delta, Bangladesh continental shelf and slope to Bengal Fan. history from Mesozoic breakup of E Gondwanaland, N-ward drift of India, collision with S margin of Asia, rotation and bending of W Sunda Arc, and penetration of Indian continental mass into S Asia. Sources and provenance of sediments changed with ultimate uplift of Tibetan Plateau and Himalayas)

Curray, J.R. (2015)- Discussion: “Is spreading prolonged, episodic or incipient in the Andaman Sea? Evidence from deepwater sedimentation” by C.K. Morley and A. Alvey. *J. Asian Earth Sciences* 111, p. 113-119.
(Disputes Morley and Alvey (2015) conclusion that crust of Alcock and Sewell Rises is continental, but is oceanic, thickened by back arc volcanism. Andaman Sea spreading not necessarily episodic, but sedimentation is episodic, caused by Plio-Pleistocene sea level fluctuations)

Curray, J.R., F.J. Emmel & D.G. Moore (2003)- The Bengal Fan: morphology, geometry, stratigraphy, history and processes. *Marine and Petroleum Geology* 19, p. 1191-1223.

Curray, J.R., D.G. Moore, L.A. Lawver, F.J. Emmel, R.W. Raitt, M. Henry & R. Kieckhefer (1979)- Tectonics of the Andaman Sea and Burma. In: J.S. Watkins et al. (eds.) *Geological and geophysical investigations of continental margins*, American Assoc. Petroleum Geol. (AAPG), Memoir 29, p. 189-198.

Curray, J.R. & T. Munasinghe (1989)- Timing of intraplate deformation, northeastern Indian Ocean. *Earth Planetary Science Letters* 94, p. 71-77.
(Seismic stratigraphy and deep sea drilling demonstrated two unconformities (E Eocene and latest Miocene age) can be traced over much of NE Indian Ocean. Eocene event major hiatus in sedimentation following collision of India with Asia. Miocene event was onset of N-S compression in Indian plate during rapid uplift in Tibet and Himalayas)

Das, S., S. Mohan, R.S. Waraich, N. Singh & S. Bankwal (2010)- Exploration targets with speculative petroleum system in different arc setups of Andaman Basin, India. *Proc. 8th Int. SPG Conf. Exp. on Petroleum Geophysics*, Hyderabad, p-126, p. 1-9.
(online at: <https://www.spgindia.org/2010/126.pdf>)
(On hydrocarbon prospectivity in three tectonic settings of Andaman basin (fore arc, volcanic arc, back arc))

Dasgupta, S. & M. Mukhopadhyay (1993)- Seismicity and plate deformation below the Andaman arc, northeastern Indian ocean. *Tectonophysics* 225, p. 529-542.

Dasgupta, S. & M. Mukhopadhyay (1997)- Aseismicity of the Andaman subduction zone and recent volcanism. *J. Geological Society India* 49, p. 513-522.
(online at: www.researchgate.net/publication/259231414_Aseismicity_of_the_Andaman_subduction_z_Etc)
(Andaman Benioff zone with seismic gap at 90-110 km depth in zone of current volcanism of Barren Island and Alcock Seamount. Interpreted as zone of partial melting in descending Indian Ocean lithosphere)

Dasgupta, S., M. Mukhopadhyay, A. Bhattacharya & T.K. Jana (2003)- The geometry of the Burmese-Andaman subducting lithosphere. *J. Seismology* 7, 2, p. 155-174.

- Dasgupta, S., M. Mukhopadhyay & D.R. Nandy (1990)- Magmatism and tectonic setting in the Burmese-Andaman Arc. *Indian Journal of Geology* 62, 2, p. 117-141.
(online at: www.researchgate.net/publication/259265386_Magmatism_and_Tectonic_Setting_in_the_Burmese-Andaman_Arc)
- Desai, B.G. (2021)- Ichnofabric analysis of bathyal chalks: the Miocene Inglis Formation of the Andaman and Nicobar Islands, India. *J. of Palaeogeography* 10, 4, p. 494-508.
(online at: www.sciencedirect.com/science/article/pii/S2095383621000055)
(*E-M Miocene Inglis Fm chalk of Andaman and Nicobar Islands with lower bathyal ichnofacies with ichnotaxa Asterosoma, Chondrites, Cladichnus, Ophiomorpha, Palaeophycus, Planolites, Taenidium, Thalassinoides and Zoophycus. Formation predates Bengal Fan stage of Indian Plate*)
- Devdas, V., S. Varghese, M. Kartikeyan & M.S. Pathan (2016)- The morphological setup of Andaman-Nicobar trench and accretionary prism: a study using multibeam bathymetry. *Indian J. Geosciences* 69, 3-4, p. 215-222.
- Diehl, T., F. Waldhauser, J.R. Cochran, K.A.K. Raju, L. Seeber, D. Schaff & E.R. Engdahl (2013)- Back-arc extension in the Andaman Sea: tectonic and magmatic processes imaged by high-precision teleseismic double-difference earthquake relocation. *J. of Geophysical Research: Solid Earth* 118, 5, p. 2206-2224.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1002/jgrb.50192>)
(*Relocated earthquake solutions show active normal faulting in NE-SW trending, obliquely opening Andaman spreading center*)
- Dinesh, A.C., N.V. Nisha, S. Varghese, R. Pillai, D. Prasad, S. Baraik, R.P. Ramesh et al. (2020)- Extensive occurrence of Fe-Mn crusts and nodules on seamounts in the Southern Andaman Sea, India. *Current Science* 119, 4, p. 704-708.
(online at: <https://www.currentscience.ac.in/Volumes/119/04/0704.pdf>)
(*Fe-Mn crusts and nodules common on West Sewell Ridge and Sewell Rise in Andaman Sea, along crest of ridge and on slopes. Crusts are more common on massive exposures at water depth of 800-900 m and nodules in foraminiferal ooze at water depth from 600-1100 m*)
- Eguchi, T., S. Uyeda & T. Maki (1979)- Seismotectonics and tectonic history of the Andaman Sea. *Tectonophysics* 57, p. 35-51.
(*Andaman Sea active spreading supported by seismicity and focal-mechanism solutions. NE Indian Ocean mid-oceanic ridge collided with W end of Sunda Trench in M or Late Miocene (10-20 Ma). Ridge-trench collision released much of compressional stress in back-arc area and continued N-ward movement of India exerted drag on the back-arc region, causing opening of Andaman Sea. Andaman Sea formed by oblique extensional rifting associated with both ridge subduction and deformation of back-arc area due to nearby continental collision*)
- Ehrenberg, C.G. (1850)- Über ein weit ausgedehnte Felsbildung aus kieselschaligen Polycystinen auf den Nicobaren-Inseln als erstes Seitenstück des Polycystinen-Gesteins von Barbados der Antillen. *Berliner Monatsberichte/ Verhandlungen Kon. Preussische Akademie Wissenschaften zu Berlin* 1850, p. 476-478.
(online at: <https://www.biodiversitylibrary.org/item/41527#page/482/mode/1up>)
(*'On an extensive rock formation composed of siliceous Polycystina on the Nicobar Islands, etc.'. Brief note on Islands Car Nicobar and Comarta with core of syenitic and serpentiferous gabbro, covered by(?) marls-calcareous siltstones rich in Polycystina (= radiolaria). Over 100 species (one of first reports of radiolaria-rich (Miocene?) rocks from Andaman-Nicobar Islands)*)
- Frerichs, W.E. (1971)- Paleobathymetric trends of Neogene foraminiferal assemblages and sea floor tectonism in the Andaman Sea area. *Marine Geology* 11, p. 159-173.
(*Benthic foraminifera from Miocene samples recovered from floor of Andaman Sea indicate deposition in water depths significantly deeper than depths from which they were dredged. Benthic foraminifera in Pliocene samples indicate depths similar to water depths from which they were dredged, suggesting uplift, probably beginning in M Miocene and culminating in Pliocene*)

- Gahalaut, V.K. & K. Gahalaut (2007)- Burma plate motion, *J. Geophysical Research* 112, B10, B10402, p. 1-9.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2007JB004928>)
(Plate motion in the Indo-Burmese Arc-Andaman-Sumatra region of Burma plate is poorly resolved. New insights from relocated aftershocks of 2004 Sumatra-Andaman and 2005 Nias earthquakes)
- Gahalaut, V.K., B. Kundu, S.S. Laishram, J. Catherine, A. Kumar, M.D. Singh, R.P. Tiwari, R.K. Chadha, S.K. Samanta, A. Ambikapathy, P. Mahesh, A. Bansal & M. Narsaiah (2013)- Aseismic plate boundary in the Indo-Burmese wedge, northwest Sunda Arc. *Geology (GSA)* 41, 2, p. 235-238.
(GPS measurements across Sagaing fault suggest ~20 mm/yr of relative plate motion of ~36 mm/yr between India and Sunda plates accommodated at Sagaing fault through dextral strike-slip motion. Steeply dipping Churachandpur-Mao fault in Indo-Burmese Wedge accommodates remaining ~18 mm/yr through dextral strike-slip)
- Garzanti, E., M. Limonta, A. Resentini, P.C. Bandopadhyay, Y. Najman, S. Ando & G. Vezzoli (2013)- Sediment recycling at convergent plate margins (Indo-Burman Ranges and Andaman-Nicobar Ridge). *Earth-Science Reviews* 123, p. 113-132.
(online at: https://www.academia.edu/22539769/Sediment_recycling_at_convergent_plate_margins_Indo_Burman_Ranges_and_Andaman_Nicobar_Ridge_)
(Large subaerially exposed subduction complexes formed by tectonic accretion above trenches choked with thick sections of remnant-ocean turbidites. Study of petrographic and heavy mineral suites of modern sands derived from Indo-Burman-Andaman-Nicobar subduction complex show 'subduction complex provenance', mainly consisting of detritus recycled from turbiditic rocks, with local supply from obducted ultramafic and mafic rocks of forearc or recycled paleovolcanic to neovolcanic sources)
- Gee, E.R. (1926)- The geology of the Andaman and Nicobar islands, with special reference to Middle Andaman island. *Records Geological Survey India* 59, 2, p. 208-232.
(Middle Andaman island core of serpentinites-peridotites, covered by Eocene sediments (incl. Assilina). Both island groups similar)
- Ghosh, A.K., A. Chakraborty & A. Mazumder (2017)- *Halimeda* bioherms from the Serravallian (Middle Miocene) of Little Andaman Island, India. *Micropaleontology* 63, 1, p. 67-76.
(*Halimeda* bioherm facies in limestones from M Miocene (Serravallian) of Butler Bay Section, Little Andaman Island (Hut Bay) (first report from Miocene of N Indian Ocean))
- Ghosh, A.K. & S. Sarkar (2013)- Facies analysis and paleoenvironmental interpretation of Piacenzian carbonate deposits from the Guitar Formation of Car Nicobar Island, India. *Geoscience Frontiers* 4, 6, p. 755-764.
(online at: www.sciencedirect.com/science/article/pii/S1674987113000285)
(Piacenzian (late Pliocene) Guitar Fm carbonates in Car Nicobar Island (S of Andaman Islands) rich in coralline algae. Deposited in shallow marine, reefal setting)
- Ghosh, B., D. Bandyopadhyay & T. Morishita (2017)- Andaman- Nicobar ophiolites, India: origin, evolution and emplacement. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 7, p. 95-110.
(online at: www.researchgate.net/publication/313273231_Andaman-Nicobar_Ophiolites_India_Etc_)
(Andaman- Nicobar ophiolites discontinuous bodies along E margin of Andaman- Nicobar Islands. Composed of mantle rocks overlain by crustal rocks with thin transition zone. Mantle peridotites and volcanic rocks great variability, demonstrating influence of subduction-related magmatism and origin in supra-subduction zone. Final emplacement unlike typical Tethyan-type ophiolites because, before final emplacement over Indo-Burma-Andaman microcontinent subduction margin charged with thick sediments from delta systems to N that accreted at leading age of overriding plate)
- Ghosh, B. & K. Bhatta (2014)- Podiform chromitites in Iherzolitic mantle rocks (Andaman ophiolite, India): the role of magma/rock interaction and parental melt composition. *Bull. Societe Geologique France* 185, 2, p. 123-130.

(Podiform chromitites from lherzolite-dominant mantle sequence of Andaman ophiolite, India, described. Mantle host rocks for chromitite pods show features of melt-mantle interaction. High-Cr chromitites have arc-spinel trend and suggest supra-subduction zone setting. Low-Cr chromitites reported elsewhere MORB-spinel trend)

Ghosh, B., T. Morishita & K. Bhatta (2012)- Detrital chromian spinels from beach placers of Andaman Islands, India: a perspective view of petrological characteristics and variations of the Andaman ophiolite. *Island Arc* 21, p. 188-201.

(online at: https://www.academia.edu/4655961/Detrital_chromian_spinel_from_beach_placers_of_Andaman_Islands_India_A_perspective_view_of_petrological_characteristics_and_variations_of_the_Andaman_Islands Etc.)
(Abundant detrital chromian spinels in black sands along E coast of Andaman Islands, derived from nearby Andaman ophiolite outcrops. Chemical compositions suggest depleted signatures, suggesting all Andaman Cretaceous ophiolite massifs affected under island-arc conditions (relatively less depleted to North))

Ghosh, B., T. Morishita & K. Bhatta (2013)- Significance of chromium spinels from the mantle sequence of the Andaman Ophiolite, India: paleogeodynamic implications. *Lithos* 164, p. 86-96.

(Andaman Ophiolite (between Rutland Island in S and N Andaman in N) with chromian spinels from mantle representing four major groups. Similar geodynamic setting to present-day also existed during Cretaceous period, with fore-arc at Rutland Island and back-arc at N Andaman)

Ghosh, B., T. Morishita, B. Sen Gupta, A. Tamura, S. Arai & D. Bandyopadhyay (2014)- Moho transition zone in the Cretaceous Andaman ophiolite, India: a passage from the mantle to the crust. *Lithos* 198-199, p. 117-128.

(Outcrop in S Andaman represents transition to arc crustal section of Cretaceous (~95 Ma) Andaman ophiolite, marked by olivine-rich troctolite, wehrlite, pyroxenite and gabbroic rocks)

Ghosh, B., S. Mukhopadhyay, T. Morishita, A. Tamura S. Arai, D. Bandyopadhyay et al. (2018)- Diversity and evolution of suboceanic mantle: constraints from Neotethyan ophiolites at the eastern margin of the Indian plate. *J. Asian Earth Sciences* 160, p. 67-77.

(online at: https://www.academia.edu/37716721/Diversity_and_evolution_of_suboceanic_mantle_Constraints_from_Neotethyan_ophiolites_at_the_eastern_margin_of_the_Indian_plate)

(Four Neotethyan Cretaceous ophiolite bodies (Nagaland, Manipur, Andaman island and Rutland island) along E margin of Indian plate, all belonging to W ophiolite belt of Indo-Burman Ranges (continuation of Sumatran fore-arc). Gross similarities with Philippine Sea samples. Geotectonic setting between mid-ocean ridge and back-arc affinity. Plagiogranites of arc affinity suggest later arc event or back-arc origin of ophiolites)

Ghosh, B., T. Pal, A. Bhattacharya & D. Das (2009)- Petrogenetic implications of ophiolitic chromite from Rutland Island, Andaman- a boninitic parentage in supra-subduction setting. *Mineralogy and Petrology* 96, p. 59-70.

(online at: https://www.researchgate.net/profile/Biswajit-Ghosh-10/publication/225558296_Petrogenetic_implications_of_ophiolitic_chromite_from_Rutland_Island_Andaman_a_boninitic_parentage_in_supra-subduction_setting)

(Chromitite in mantle ultramafic tectonite and crustal ultramafic cumulates of Rutland Island (S of S Andaman) plot in field of supra-subduction zone peridotites)

Gokarn, S.G., G. Gupta, S. Dutta & N. Hazarika (2006)- Geoelectric structure in the Andaman Islands using magnetotelluric studies. *Earth Planets and Space* 58, 2, p. 259-264.

(online at: www.journalarchive.jst.go.jp/...)

(Magnetotelluric studies over M Andaman islands delineated a NNE-SSW trending suture, along which 4-10km thick Andaman flysch and underlying igneous crust subduct W-wards along thrust with dip angle of ~60°)

Goli, A. & D.K. Pandey (2014)- Structural characteristics of the Andaman Forearc inferred from interpretation of multichannel seismic reflection data. *Acta Geologica Sinica (English Ed.)* 88, 4, p. 1145-1156.

(online at: www.geojournals.cn/...)

Gonzalez-Jimenez, J.M., S.K. Mondal, B. Ghosh, W.L. Griffin & S.Y. O'Reilly (2020)- Re-Os Isotope systematics of sulfides in chromitites and host lherzolites of the Andaman Ophiolite, India. *Minerals* (MDPI) 10, 8, 686; p. 1-21.

(online at: www.mdpi.com/2075-163X/10/8/686)

Guha, D.K. (1968)- On the Ostracoda from the Neogene of Andaman Islands. *J. Geological Society India* 9, 1, p. 58-66.

(32 species of ostracods from Andaman Islands. Most same as recorded earlier from Miocene- Recent of SE Asia; one new species, *Paracytheridea andamanensis*)

Guo, M., X. Luan, H. Zhang & B. He (2023)- Geometric and kinematic analysis of faults bordering the Andaman sea continental shelves: a 3D seismic case study. *Frontiers in Earth Science* 11, 1247665, p. 1-11.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2023.1247665/full>)

(Two large faults F1 and F2 in M15 Block in Andaman Sea, active from Eocene- Quaternary. NNE-SSW strike-slip F1 fault belongs to S Sagaing fault; NNE-SSW strike-slip F2 is E Andaman fault, with strike-slip movement controlled by impact of India-Eurasia collision. Maximum growth index in Miocene. Regional stress field is dominated by E-W tension. Rapid continental crust extension and subsidence in Oligocene-Miocene)

Gupta, S.M. & M.S. Srinivasan (1992)- Late Miocene radiolarian biostratigraphy and paleoceanography of Sawai Bay Formation, Neill Island, Andamans, India. *Micropaleontology* 38, 3, p. 209-235.

(Late Miocene radiolarian zones *Stichocorys peregrina*, *Didymocyrtis penultima* and *D. antepenultima* in mudstones of Sawai Bay Fm, Neill Island, Andamans. Cluster analysis of 45 taxa suggest colder and warmer periods due to monsoonal upwelling during warmer periods (5.0-6.3 and 8.5-7.7 Ma). Basinal shallowing during Late Miocene)

Gururaja, M.N. & B.R.J.Rao (1976)- Upper Eocene foraminifera from South Andaman Island. *Proc. 6th Indian Colloquium Micropaleontology and Stratigraphy*, Hyderabad, p. 122-125.

(*Namunagarh Grit of S Andaman Island with Late Eocene (displaced) larger foraminifera Nummulites atacicus, Pellatispira and Biplanispira*)

Guzman-Speziale, M. (1990)- Seismicity and active tectonics of the Western Sunda Arc. Ph.D. Thesis New Mexico State University, Las Cruces, p. 1-232.

(*Seismicity of Andaman Sea, Burmese Arc W Sunda Arc area of oblique convergence. Subducted Indian-Australian slab extends to depth of 160km in N portion of W Sunda Arc (Burmese Arc) with dip from 50° in N to ~30° in S. Along Andaman Arc subducted slab also reaches 160km, with dip of ~40°*)

Guzman-Speziale, M. & J.F. Ni (1993)- The opening of the Andaman Sea- where is the short-term displacement being taken up. *Geophysical Research Letters* 20, 24, p. 2949-2952.

Guzman-Speziale, M. & J.F. Ni (1996)- Seismicity and active tectonics of the Western Sunda Arc. In: A. Yin & T.M. Harrison (eds.) *Tectonic evolution of Asia*, Cambridge University Press, Cambridge, p. 63-84.

Haldar, D. (1984)- Some aspects of the Andaman ophiolite complex. *Records Geological Survey India* 115, 2, p. 1-11.

Harding, T.P. (1983)- Divergent wrench fault and negative flower structure, Andaman Sea. In: A.W. Bally (ed.) *Seismic expression of structural styles: a picture and work atlas*, American Assoc. Petroleum Geol. (AAPG), *Studies in Geology* 15, 3, p. 1-8.

Imbus, S.W., F.H. Wind & D. Ephraim (1999)- Origin and occurrence of CO₂ in the eastern Andaman Sea, offshore Myanmar. In: C.A. Caughey & J.V.C. Howes (eds.) *Proc. Conference Gas habitats of SE Asia and Australasia*, Jakarta 1998, Indonesian Petroleum Association (IPA), p. 99-111.

(M Miocene gas accumulations in E Andaman Sea have 10-90% C02. Gas composition and isotopes indicate crustal (3He/4He), principally inorganic (d13C >-10) origin for Miocene C02. In Plio- Pleistocene prospects CO2 may be less, due to Late Miocene calcareous shale seal/ source rock)

Ingersoll, R.V. & C.A. Suczek (1979)- Petrology and provenance of Neogene sand from Nicobar and Bengal fans, DSDP sites 211 and 218. *J. Sedimentary Petrology* 49, 4, p. 1217-1228.

(Bengal-Nicobar submarine fan complex with sands sourced from gneissic, sedimentary, and metasedimentary terranes of Himalayas. Neogene sands from DSDP sites 211 and 218 reveal very uniform compositions, with typical QFL percentages 55-30-15. Andesitic volcanic lithic grains are absent)

Jacob, K. (1954)- The occurrence of radiolarian cherts in association with ultramafic intrusives in the Andaman Islands and its significance in sedimentary tectonics. *Records Geological Survey India* 83, 2, p. 397-422.

(Ophiolites of Andaman Islands associated with Early Cretaceous radiolarian cherts, deposited in abyssal environment (Jafri 1986, p. 42))

Jafar, S.A. (1985)- Discovery of mixed coccoliths from mud volcanoes of Baratang Island, Andamans, India. *Current Science* 54, 4, p. 170-173.

(online at: <https://www.currentscience.ac.in/Volumes/54/04/0170.pdf>)

(Coccoliths from mud volcanoes in W Baratang Island with mixed coccolith assemblages, showing presence of Late Cretaceous-Tertiary sediments in subsurface, including uninterrupted Campanian-Danian sequence. Also latest Eocene as youngest elements)

Jafar, S.A. & O.P. Singh (1999)- Late Miocene coccoliths from Neill Island, Andam Sea, India. *J. Palaeontological Society India* 44, p. 119-134.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(Late Miocene Discoaster berggreni (CN9A)/ lower Discoaster quinqueramus zone (NN1) from Neill Island)

Jafri, S.H. (1986)- Occurrence of Hagiastrids in chert associated with Port Blair series, South Andaman, India. *J. Geological Society India* 28, p. 41-43.

(online at: www.geosocindia.org/index.php/jgsi/article/download/65972/51585)

(18 species of hagiastrid radiolarians from radiolarian ribbon chert at base of (M Eocene?) Port Blair series of S Andaman interpreted to be of Early Cretaceous age. Folded chert now part of (imbricated?) Eocene sedimentary sequence))

Jafri, S.H., V. Balaram & P.K. Govil (1993)- Depositional environments of Cretaceous radiolarian cherts from Andaman-Nicobar Islands, northeastern Indian Ocean. *Marine Geology* 112, p. 291-301.

(online at: [www.researchgate.net/profile/V-Balaram/publication/229170037_Depositional_environments Etc./](http://www.researchgate.net/profile/V-Balaram/publication/229170037_Depositional_environments_Etc./links/54e1b1e00cf27434207e1e1e/Depositional_environments_Etc.pdf))

(Cretaceous radiolarian cherts associated with pillow basalts, ultramafic rocks and turbidites in outer arc of Andaman- Nicobar Islands. Tuffaceous radiolarian claystones derived from mixed continental-basaltic source, close to continental margins, bedded radiolarian argillaceous cherts derived from distal continental source in hemipelagic environment. Radiolarian chert sequences scraped off subducting Indian plate and now part of Andaman-Nicobar ophiolite complex. No biostrat)

Jafri, S.H., V. Balaram & S.L. Ramesh (1990)- Geochemistry of Andaman-Nicobar island basalts: a case for a possible plume origin. *J. Volcanology Geothermal Research* 44, p. 339-347.

(Pillow basalts of S Andaman island associated with tectonised ultramafics, radiolarian cherts and deformed sedimentary rocks part of outer sedimentary arc of Andaman-Nicobar islands. Basalts tholeiitic, similar to plume-type basalts. Scraped off subducting Indian plate due to NNE movement of Indian plate)

Jafri, S.H., S.N. Charan & P.K. Govil (1995)- Plagiogranite from the Andaman ophiolite belt, Bay of Bengal, India. *J. Geological Society, London*, 152, p. 681-687.

(Plagiogranites on E margin of South Andaman intrude gabbros associated with pillow basalt, East Coast volcanic rocks, radiolarian cherts, conglomerate and grit. Plagiogranite intruded gabbro of Andaman ophiolite probably in Mid-Eocene (zircon dating by Sarma et al. (2010) suggests Late Cretaceous 94 Ma age-JTvG))

Jafri, S.H., D.S. Sarma, T. Khan & D.K. Singh (2020)- Geochemical characteristics of the Late Cretaceous radiolarian cherts from North Andaman Island, Bay of Bengal, India. *J. Earth System Science (Indian Academy of Sciences)* 129, 103, p. 1-10.

(online at: <https://www.ias.ac.in/article/fulltext/jess/129/0103>)

(Late Cretaceous radiolarian cherts of Andaman-Nicobar ophiolites composed of radiolarian tests in fine-grained ferruginous matrix. Deposited in continental margin environments. Later scraped off subducting plate and obducted onto leading edge of Eurasian continent during Late Cretaceous (prior to currently active Andaman-Java subduction which probably initiated in Late Miocene)

Jafri, S.H., D.S. Sarma & J.M. Sheikh (2010)- Hyaloclastites in pillow basalts, South-Andaman Island, Bay of Bengal, India. *Current Science* 99, 12, p. 1825-1828.

(online at: <https://www.currentscience.ac.in/Volumes/99/12/1825.pdf>)

(Hyaloclastites and pillow breccias of Cretaceous Andaman ophiolitic sequence in S part of S Andaman Island, characteristic of submarine basaltic volcanism)

Jafri, S.H. & J.M. Sheikh (2013)- Geochemistry of pillow basalts from Bompoka, Andaman-Nicobar islands, Bay of Bengal, India. *J. Asian Earth Sciences* 64, p. 27-37.

(Pillow basalts in Bompoka island (Nicobar islands) part of Sunda-Burmese forearc, are fractured, filled by late-stage calcite and zeolites and are overlain by Archipelago Group sediments. Formed from N-MORB-like mantle source in trench-distal back-arc basin, probably near leading edge of Eurasian continent in Cretaceous, prior to current Andaman-Java active subduction)

Jafri, S.H., M.V. Subba Rao & S.L. Ramesh (2006)- Occurrence of ash beds in radiolarian cherts from South Andaman Island, Bay of Bengal, India: evidence for Late Cretaceous explosive volcanism. *Current Science* 91, 12, p. 1614-1615.

(online at: www.currentscience.ac.in/Downloads/article_40794.pdf)

(Ash layers in radiolarian cherts in S Andaman Island suggests Late Cretaceous explosive volcanic activity)

Jha, P., D. Ros & A. degli Alessandrini (2008)- Evolution and hydrocarbon occurrences of rift basins at the Western margin of Sunda Platform and relations with East Andaman Basin. *Proc. GEO India Convention & Exh.*, New Delhi 2008, p. 1-6.

(online at: https://www.researchgate.net/publication/298721635_Evolution_and_Hydrocarbon_Occurrences_of_Rift_Basins_from_the_Western_Margin_of_Sunda_Platform_and_Relations_with_East_Andaman_Basin)

(W part of Sunda Platform bordered by Paleogene rift basins. E Andaman Basin formed at same time as North Sumatra and Mergui rift basins)

Jha, P., D. Ros, A.d. Alessandrini & M. Kishore (2010)- Speculative petroleum system and play model of East Andaman Basin from regional geology and basin evolution concepts: addressing the exploration challenges of an extreme frontier area. 8th Biennial SPG Int. Conference Petroleum Geophysics, Hyderabad 2010, P-261, p. 1-8.

(online at: <https://www.spgindia.org/2010/261.pdf>)

(Recent ENI exploration activities in deepwater East Andaman Basin revealed presence of unexplored rift set-up, on trend with North Sumatra and Mergui rift basins, but is now covered by deep water)

Jha, P., D. Ros & M. Kishore (2012)- Seismic and sequence stratigraphic framework and depositional architecture of shallow and deepwater postrift sediments in East Andaman Basin: an overview. *GEO India Conf. 2011*, New Delhi, p. 1-10. *(Extended Abstract)*

(online at: www.searchanddiscovery.com/documents/2012/50566jha/ndx_jha.pdf)

(Deepwater East Andaman Basin along W flank of NE-SW trending Mergui Ridge with Eo-Oligocene rift section overlain by up to 2500m of M Miocene and younger post-rift with typical deepwater depositional architecture. NE-SW trending sea-floor spreading center came into existence at C Andaman Basin area)

- Jin, L., X. Luan, T. D. Raveendrasinghe, L. Jiang, Y. Xue, X. Wei, J. Qiao & H. Ma (2024)- Influence of sedimentary processes and fault tectonics on the evolution of submarine canyons in the East Andaman Basin: Insights from high-resolution seismic data analysis. *Geomorphology* 454, 109179, p.
(*Matud canyon system exists in Tanintharyi region of continental slope of East Andaman Basin*)
- Jintasaeranee, P., W. Weinrebe, I. Klaucke, A. Snidvongs & E.R. Flueh (2012)- Morphology of the Andaman outer shelf and upper slope of the Thai exclusive economic zone. *J. Asian Earth Sciences* 46, p. 78-85.
(*Detailed bathymetry and subbottom profiler records of outer shelf and upper slope of Thai exclusive economic zone*)
- Jourdain, A., S.C. Singh, J. Escartin, Y. Klinger, K.A.K. Raju & J. McArdle (2016)- Crustal accretion at a sedimented spreading center in the Andaman Sea. *Geology (GSA)* 44, p. 351-354.
(*Seismic images across sedimented slow-spreading Andaman Sea spreading center. Faults in axial valley steep dips (65°-75°) in staircase pattern forming axial graben, with base coinciding with shallow-dipping (30°) reflection, defining zone of extension and magmatism. Sill-sediment sequences away from axis rotated and buried due to subsidence and faulting, forming upper oceanic crust. Gabbroic lower oceanic crust separated from mantle by complex Moho transition zone, probably containing dunite lenses*)
- Kanchan, S. (2014)- The study of the deepwater clastic depositional systems and reservoir distribution in East Andaman Basin, Thailand. *Bull. Earth Sciences Thailand (BEST)* 7, 1-2, p. 171-177.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246671/167673>)
(*3D seismic stratigraphic study of M-U Miocene deepwater deposits in E Andaman Basin off W Thailand. Identified base of slope deposits, submarine channels and fans, with potential for sand storage*)
- Karunakaran, C., M.B. Pawde, V.K. Raina, K.K. Ray & S.S. Saha (1964)- Geology of South Andaman Island, India. Reports 22nd International Geological Congress, New Delhi 1964, 11, p. 79-100.
(*incl. presence of Paleocene limestone pebbles with Distichoplax biserialis*)
- Karunakaran, C., K.K. Ray & S.S. Saha (1964)- A new probe into the tectonic history of the Andaman and Nicobar Islands, India. Reports 22nd International Geological Congress, New Delhi 1964, 4, p. 507-515.
- Karunakaran, C., K.K. Ray & S.S. Saha (1964)- Sedimentary environment of the formation of the Andaman flysch, Andaman Islands, India. Reports 22nd International Geological Congress, New Delhi 1964, 15, p. 226-232.
- Karunakaran, C., K.K. Ray & S.S. Saha (1968)- Tertiary sedimentation in the Andaman-Nicobar geosyncline. *J. Geological Society India* 9, p. 32-39.
(*Andaman orthogeosyncline continuous with Assam-Burma in N and Indonesian geosyncline in S. Andaman-Nicobar islands constitute non-volcanic outer arc of East Indian Orogen, with continuous history of sedimentation from sometime in Late Cretaceous to Recent*)
- Karunakaran, C., K.K. Ray, C.R. Sen, S.S. Saha & S.K. Sarkar (1975)- Geology of Great Nicobar island. *J. Geological Society India* 16, 2, p. 135-142.
(*Geology of Great Nicobar Island similar to geology of Andaman Islands*)
- Khan, P.K. & P.P. Chakraborty (2005)- Two-phase opening of Andaman Sea; a new seismotectonic insight. *Earth Planetary Science Letters* 229, 3-4, p. 259-271.
(*Reconstruction of Benioff zone for Burma-Java subduction margin between 2°-17° N reveals two episodes of plate geometry change, expressed as abrupt change in subduction angle. Deformation events on subducting Indian plate 4-5 and 11 Ma old. 11 Ma event recorded from S part of area correlated with early stretching and rifting phase, 4-5 Ma event interpreted as major forcing behind spreading phase of Andaman Sea. Initial Andaman Sea opening concealed in E-M Miocene forearc subsidence history. Late Miocene-Pliocene pull-apart opening and spreading possibly initiated near W part of Mergui- Sumatra region*)

Khan, T., L.A.Z.A. Bidias, S.H. Jafri, R. Pandey, N.V.C. Rao, M. Satyanarayanan & D.S. Sarma (2022)- Petrology of ultramafic and mafic rocks from the South Andaman Ophiolite, Bay of Bengal: Evidence for an arc-related high-pressure origin. *Mineralogy and Petrology* 116, p. 473-492

(Rel. small outcrops of ultramafic (dunite) and mafic (gabbroic) rocks in South Andaman Island. Dunite and gabbroic rocks intruded in Andaman Ophiolitic suite of rocks during Late Cretaceous subduction setting. These ophiolites obducted onto leading edge of Eurasian continent during M Eocene- Late Oligocene event)

Khin, Aung J. (1990)- The geology of the Andaman Sea basin. Proc. 8th Offshore South East Asia Conference, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 9, Singapore, OSEA90177, p. 81-88.

(Brief review of Andaman Sea basin and hydrocarbon potential)

Kishore, M., P. Jha & D. Ros (2010)- Structural modeling and seismic attributes analysis of synrift sequences in East Andaman Basin: a qualitative approach towards fault seal analysis in a frontier exploration area. Conference: 8th SPG Conference & Exposition on Petroleum Geophysics, Hyderabad 2010, P-262, p. 1-8.

(online at: [www.researchgate.net/publication/298719850_P-262_Structural_Modeling_and_Seismic_At_Etc.](http://www.researchgate.net/publication/298719850_P-262_Structural_Modeling_and_Seismic_At_Etc))

(East Andaman Basin is N-S oriented basin in Andaman Sea, between Mt Sewell Rise in E and Mergui Ridge in W. Basin originated in Paleogene in response to back-arc extension (rifting,-equivalent to other rift basins on W margin of Sundaland (N Sumatra, Mergui, Moattama). Currently in ultra-deepwater (>2000m).)

Kishore, S., A.K. Jauhri, S.K. Singh, B. Malakar & P.K. Misra (2015)- Coralline algae from the Neil West Coast Formation (Pleistocene) Neil Island, South Andaman, India. *J. Palaeontological Society India* 60, 2, p. 57-69.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(Pleistocene reefal limestone from Neil Island with 11 species of coralline algae)

Kishore, S., A.K. Jauhri, S.K. Singh, B. Malakar & P.K. Misra (2017)- Coralline algae from the Hut Bay Formation (Middle Miocene), Little Andaman, India. *J. Palaeontological Society India* 62, 2, p. 205-216.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(E Middle Miocene Hut Bay Fm of Little Andaman Island with 13 species of coralline algae are described. Two depth-controlled associations. Lower and relatively cooler/deeper association dominated by Mesophyllum, Lithophyllum and Phymatolithon. Upper part dominated by typical tropical coralline algal assemblage (Sporolithon, Lithoporella and Aethesolithon and associated with corals)

Koley, T., C.S. Anju, S. Parhi & S. Das (2017)- Report of foraminifera in the Andaman Flysch Group of rocks in South Andaman and its implication. *Indian J. Geosciences* 70, 2, p. 161-168.

(online at: [www.researchgate.net/publication/316041792_Report_of_foraminifera_in_the_Andaman_Flysch_Etc.](http://www.researchgate.net/publication/316041792_Report_of_foraminifera_in_the_Andaman_Flysch_Etc))

(Oligocene-age foram assemblage on S Andaman Island)

Koley, T., A. Lahiri, K.M. Wanjarwadkar & C.S. Anju (2018)- Palaeocene faunal events and fossil records of Andaman Islands, India. In: S. Bajpai et al. (eds.) *The Indian Paleogene*, Springer, p. 249-262. *(online at: https://www.researchgate.net/publication/324724192_Palaeocene_Faunal_Events_and_Fossil_Records_of_Andaman_Islands_India)*

(Two distinct Paleocene foram assemblages in Andaman Islands: (1) larger benthic foraminifera Ranikothalia, Miscellaneous, Daviesina and Discocyclina and (2) planktonic foraminifera. Some Paleocene microfauna is from limestone boulders in melange and Paleocene section associated with slivers of dismembered Cretaceous ophiolite)

(Two distinct Paleocene foram assemblages in Andaman Islands: (1) larger benthic foraminifera Ranikothalia, Miscellaneous, Daviesina and Discocyclina and (2) planktonic foraminifera. Some Paleocene microfauna is from limestone boulders in melange and Paleocene section associated with slivers of dismembered Cretaceous ophiolite)

Koley, T. & K.M. Wanjarwadkar (2013)- First report of *Ranikothalia* Caudri from Middle Andaman Island, India and its significance. *J. Geological Society India* 81, p. 549-555.

(online at: https://www.researchgate.net/publication/257789707_First_Report_of_Ranikothalia_Caudri_from_Middle_Andaman_Island_India_and_its_Significance)

(First record of U Paleocene 'Tethyan' Ranikothalia in lower argillaceous facies of Mithakhari Group (Lipa Black Shale) in NE part of Middle Andaman Island. Three species R. sidensis, R. cf. nuttalli, R. cf. tobleri.

Associated with Discocyclus (also earlier reports of Paleocene limestone on Andaman Islands reported occurrences of Daviesina, Miscellaneous, Distichoplax))

Kumar, A. (2011)- Geochemical and isotopic studies of rocks from the Barren Island Volcano and Andaman subduction zone, India. Ph.D. Thesis, Maharaja Sayajirao University of Baroda, Vadodara, India, p. 1-218.

Kumar, A., J.S. Ray, P.E. Binusarma, N. Awasthi, B.G. George, M.G. Yadava, R. Bhutani et al. (2021)- Origin of breccia in mud volcanoes of the Andaman accretionary prism: implications for forearc processes. *Chemical Geology* 586, 120595, p. 1-13.

(Clay-rich matrix of mud breccia ejected at mud volcanoes of Andaman accretionary prism and accompanying water sourced from mineral dehydration and thermogenic hydrocarbons originated from depths of >6 km in forearc, from tectonic melanges at base of accretionary prism, in decollement zone. Mud breccia ascends rapidly through deformed accretionary wedge and gets emplaced at surface, incorporating rock clasts from wedge. Matrix contains materials from both altered oceanic crust and terrigenous sediment of slab (>80%))

Kumar, P., G. Srijayanthi & M. Ravi Kumar (2016)- Seismic evidence for tearing in the subducting Indian slab beneath the Andaman arc. *Geophysical Research Letters* 43, 10, p. 4899-4904.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2016GL068590>)

(Seismological evidence for tearing of Indian oceanic plate at shallow depths along Andaman arc. Three distinct plate segments, middle lithospheric chunk has abrupt offset of ~20 km relative to N and S segments)

Kumar, S. (1981)- Geodynamics of Burma and Andaman-Nicobar region, on the basis of tectonic stresses and regional seismicity. *Tectonophysics* 79, p. 75-95.

(Well-defined zones of seismicity dipping 30-50° from Andaman trench to depth of ~180 km under Andaman Islands. Change in nature of volcanism from andesite (S) to basalt (N) in Burma suggested stress field changed from compressional to tensional)

Kumar, S. (1990)- Gravity anomalies, seismicity, subducting slab folding and surface deformations in the orogenic belts- an example from the Andaman-Nicobar region. *J. Geodynamics* 12, p. 39-63.

Kundal, P. & K.M. Wanjarwadkar (2002)- On stratigraphy, age and depositional environment of algal limestone of Middle Andaman Island, Andaman, India. *Gondwana Geological Magazine* 17, 2, p. 103-108.

(online at: https://www.researchgate.net/publication/273321606_On_Stratigraphy_Age_and_Depositional_Environment_of_Algal_Limestone_of_Middle_Andaman_Island_Andaman_India)

(Occurrence of Daviesina spp. in limestone exposed as detached mounds near Burmaderia, Tugapur and Buddanala in Middle Andaman island suggests Thanetian age)

Kundal, P. & K.M. Wanjarwadkar (2003)- Dasycladacean algae from Late Paleocene limestone of Middle Andaman Island, Andaman, India: implication to paleoenvironments, paleobathymetry and stratigraphy. *Gondwana Geological Magazine, Special Volume 6*, p. 277-288. *(online at: www.researchgate.net/publication/273321611_Dasycladacean_Algae_from_Late_Paleocene_Limestone_Etc)*

(Late Paleocene algal limestone of Burma Dera Mb of U Cretaceous- Eocene Baratang Fm of Middle Andaman Island with 6 species of dasycladacean algae, incl. Acroporella, Cymopolia spp., Furcoporella, Trinocladus, etc. Associated with foram Daviesina spp. Tropical assemblage with Tethyan affinities)

Limonta, M., A. Resentini, A. Carter, P.C. Bandopadhyay & E. Garzanti (2017)- Provenance of Oligocene Andaman sandstones (Andaman-Nicobar Islands): Ganga-Brahmaputra or Irrawaddy derived?. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 10, p. 141-152.

(Oligocene flysch exposed in Andaman-Nicobar Islands dominated by strong continental crust signal with minor arc contribution, similar to Paleogene Bengal Fan sediments. Type section on S Andaman closer affinity to provenance of modern Irrawaddy)

Ling, H.Y., R. Chandra & S.G. Karkare (1996)- Tectonic significance of Eocene and Cretaceous radiolaria from South Andaman Island, Northeast Indian Ocean. In: A. Yao et al. (eds.) Proc. INTERRAD VII Conf., Island Arc 5, 2, p. 166-179.

(Basement rocks of Andaman-Nicobar Islands consist of U Cretaceous serpentinites, ophiolites and radiolarian cherts. Cherts from SE South Andaman Island with radiolarian faunas of Campanian (Dictyomitra torquata, Pseudoaulophacus lenticulatus, Alievium galloway, etc.) and M Eocene (Podocyrthis faciolata, Eusyringium jstuligerum) ages. Similar Eocene assemblage on Nias Island. Overlying sediments in N and Middle Andaman include E-M Eocene larger foraminifera Nummulites biarritzensis and Assilina granulosa)

Ling, H.Y., V. Sharma, S. Sing, D. Mazumdar & A.K. Mahapatra (1995)- Cretaceous and Middle Eocene radiolarian from ejected sediments of mud volcanoes of Baratang Island in the Andaman Sea. J. Geological Society India 38, p. 463-469.

(Radiolarians from ejected sediments of mud volcanoes of Baratang Island in Andaman Sea provide additional evidence for presence of Cretaceous and M Eocene strata beneath island)

Ling, H.Y. & M.S. Srinivasan (1993)- Significance of Eocene radiolaria from Port Blair Group of South Andaman Island, India. J. Palaeontological Society India 38, p. 1-5.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(M Eocene radiolaria in chert in Port Blair Fm, overlying Late Cretaceous or Early Eocene ultramafic 'basement' on S Andaman. Similar to M Eocene radiolarians of Nias (Ling & Samuel, 1998))

Liu, C.S., J.R. Curran & J.M. McDonald (1983)- New constraints on the tectonic evolution of the eastern Indian Ocean. Earth Planetary Science Letters 65, p. 331-342.

(Magnetic anomalies suggest Wharton Ridge fossil spreading ridge beneath Nicobar Fan in NW Wharton Basin, which was part of plate boundary between Indian and Australian plates and ceased spreading shortly after anomaly 20 (45.6 Ma). Indian, Australian and Antarctic plates were moving relative to one another from about 90 to 45 Ma. At anomaly 19 time (45 Ma) Australia and India became single plate)

Luhr J.F. & D. Haldar (2006)- Barren Island volcano (NE Indian Ocean): island-arc high-alumina basalts produced by troctolite contamination; J. Volcanology Geothermal Research 149, p. 177-212.

Madhavan, B.B, G. Venkataraman, S.D. Shah & B.K. Mohan (1997)- Revealing the geology of the Great Nicobar Island, Indian Ocean, by the interpretation of airborne synthetic aperture radar images. Int. J. Remote Sensing 18, 13, p. 2723-2742.

(N-S trending folds and thrusts on Great Nicobar Island, with fold axis spacing of 1-2km)

Mahapatra, A.K. & V. Sharma (1994)- Trissocyclid radiolaria from the late Early Miocene sequence of Colebrook, North Passage and Great Nicobar Islands, northeast Indian Ocean. Micropaleontology 40, 2, p. 157-168.

(35 Trissocyclid species from outcrop sections six sections on Colebrook, North Passage and Great Nicobar islands. Belong to Stichocorys wolffii and Calocyclella costata Zones)

Mahattanachai, T., C.K. Morley, P. Charusiri & P. Kanjanapayont (2022)- The Andaman Basin Central Fault Zone, Andaman Sea: characteristics of a major deepwater strike-slip fault system in a polyphase rift. Marine and Petroleum Geology 128, 104997, p. 1-20.

(Major E-M Miocene NNE-SSW trending strike-slip fault (Andaman Basin Central Fault Zone) in Thai waters, which developed following change from Oligocene-earliest Miocene E-W/ ENE-WSW extension to NNW-SSE transtension)

Makar, P.S. et al. (1984)- Geochemical studies of fine-grained sediments of offshore Andaman wells for evaluation of hydrocarbon source potential. Petroleum Asia J. 6, 4, p. 175-185.

Malik, J.N., C. Banerjee, A. Khan, F.C. Johnson, M. Shishikura, K. Satake & A.K. Singhvi (2015)- Stratigraphic evidence for earthquakes and tsunamis on the west coast of South Andaman Island, India during the past 1000 years. *Tectonophysics* 661, p. 49-65.

(Stratigraphic records from W coast of S Andaman Island with evidence of three historical transoceanic tsunamis during past 1000 yrs: (I) predating AD 800, 35-40 cm t fine gravel to coarse sands with broken shell fragments; (II) ~AD 660-800, 20-25cm coarse sand and broken shell fragments; (III) ~AD 1120-1300, 50 cm thick sand. December 2004 tsunami resulted in deposition of 15cm m-c sand)

Mandal, J., A. Chandra & A.P. Bhattacharyya (2003)- Palynology of the Baratang Formation, Andaman-Nicobar Islands and the significance of reworked palynomorphs. *The Palaeobotanist* 52, p. 97-112.

(Spores-pollen and dinoflagellate cysts data from Baratang Fm of Baratang Island indicate Early- Late Eocene ages and close relationship between Andaman and Myanmar floras. Associated with common reworked Permian, Triassic and Jurassic-Cretaceous palynomorphs of Gondwanan affinity, suggesting Chindwin Basin of Myanmar mainly supplied reworked palynomorph-bearing sediments)

Martin, K.M., S.P.S. Gulick, J.A. Austin., K. Berglar, D. Franke & Udrek (2014)- The West Andaman Fault: a complex strain-partitioning boundary at the seaward edge of the Aceh Basin, offshore Sumatra. *Tectonics* 33, 5, p. 786-806.

(W Andaman Fault in NW Sumatra forearc region predominantly strike-slip in nature, and likely part of system of faults (incl. Sumatran, Mentawai Faults) that accommodate shear component of oblique subduction. Location of fault in forearc may be controlled by contrast between marginal plateau and forearc basin)

Maung, H. (1987)- Transcurrent movements in the Burma-Andaman Sea region. *Geology (GSA)* 15, 10, p. 911-912.

(N-ward movement of Indian plate caused Indoburman Ranges accretionary prism to decouple from Burma plate along Kabaw fault, and Burma plate decoupled from E Highlands of Burma along Sagaing fault. Double arc formed by Indoburman Ranges and Andaman-Nicobar-Sumatra islands was formerly one large single arc)

Maurin, T. & C. Rangin (2009)- Impact of the 90°E ridge at the Indo-Burmese subduction zone imaged from deep seismic reflection data. *Marine Geology* 266, 1, p. 143-155.

(As result of Indo-Burmese active hyper-oblique subduction, part of Bay of Bengal presently subducting E-ward below Burmese microplate)

Mehrotra K.K. & P. Kumar (1978)- Neogene planktonic foraminiferal zonation of Ritchie's Archipelago, Andaman Islands, India. *J. Palaeontological Society India* 21-22, p. 13-18.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(Lower Archipelago Gp beds in Ritchie's Archipelago with 75 species of planktonic foraminifera, defining 9 E Miocene-M Pliocene zones (N4-N19))

Mishra, S., S. Prajapati & S.S. Teotia (2020)- Mantle Transition Zones (MTZ) discontinuities beneath the Andaman Subduction Zone. *J. Asian Earth Sciences* 191, 104102. p. 1-7.

(Andaman Subduction Zone broadband seismic shows mean apparent depth of 410 and 660 km of mantle transitions discontinuities is ~357 and ~660 km. This is ~53 km shallower than expected for 410 km discontinuity, probably caused by young and steep subducting slab, which results in phase transformation of Olivine to wadsleyite at much shallower depth. No substantial depth variation of 660km discontinuity)

Misra, T.C. & T.K. Roy (1984)- Exploration in Andaman forearc basin: its evaluation, facies trend and prospects- a review. *Proc. 5th Offshore South East Asia Conference (OFFSEA 84), Singapore 1984, SE Asia Petroleum Exploration Society (SEAPEX)*, p. 4/66- 4/83.

(Andaman Sea forearc basin with subduction complex accretionary prisms and ponded Neogene sediments. Oldest exposed rocks in Andaman Islands Upper Cretaceous oceanic sediments with radiolarian chert, overlain by Upper Cretaceous- Oligocene greywacke turbidites. Late Oligocene unconformity followed by Neogene clastics and carbonates. Low heatflow)

Mitra, D. (2005)- Late Oligocene and Miocene evolution of the carbonate system in the Gulf of Martaban (northern Andaman Sea): effects of eustacy, tectonics, and siliciclastic input; comparison with the Maldives carbonate system. M.Sc. Thesis Rice University, Houston, p. 1-142. (*Unpublished*)

(Gulf of Martaban Field 13x18 km isolated carbonate platform in Myanmar part of N Andaman Sea, formed on top of E-dipping (20-24°), faulted accretionary basement that influenced Late Oligocene Lower Martaban Limestone growth. At Oligocene-Miocene boundary ~20m thick siliciclastics (age ~23 Ma/ Mi-1 SB?), temporarily inhibiting carbonate growth. Followed by growth of E Miocene U Martaban Lst platform, first aggradation, then backstepping and drowning at ~18 Ma. With common rhodoliths; red algae near top)

Moeremans, R.E. & S.C. Singh (2015)- Fore-arc basin deformation in the Andaman-Nicobar segment of the Sumatra-Andaman subduction zone: insight from high-resolution seismic reflection data. *Tectonics* 34, 8, p. 1736-1750.

(Deep seismic reflection data across the Andaman-Nicobar fore-arc basin, from 8°N to 11°N. Despite obliquity of subduction fore arc is dominated by compression, suggesting strong slip partitioning)

Mohan, K., S.G.V. Dangwal, S. Sengupta & A.G. Desai (2006)- Andaman Basin- a future exploration target. *The Leading Edge* 25, 8, p. 964-967.

(Summary of Andaman Sea basin evolution and exploration potential. Eocene-Recent basinal area >1200km from Sumatra into Myanmar. No significant hydrocarbon discoveries yet)

Morishita, T., M. Yoshikawa, A. Tamura, J.M. Guotana & B. Ghosh (2018)- Petrology of peridotites and Nd-Sr isotopic composition of their clinopyroxenes from the Middle Andaman Ophiolite, India. *Minerals* (MDPI) 8, 9, 410, p. 1-16.

(online at: <https://www.mdpi.com/2075-163X/8/9/410>)

(Andaman Ophiolite located at SE end of Mesozoic Tethyan ophiolites. Lherzolite from Middle Andaman Island. Similar to abyssal peridotites recovered from mid-ocean ridges. Etc.)

Morley, C.K. (2016)- Cenozoic structural evolution of the Andaman Sea: evolution from an extensional to a sheared margin. In: M. Nemcok et al. (eds.) *Transform margins: development, controls and petroleum systems*, Geological Society, London, Special Publ. 431, p. 39-61.

(Andaman Sea developed from margin where Palaeogene back-arc collapse closed mid-Cretaceous back-arc oceanic basin, and resulted in collision between island arc crust to W and W margin of Sundaland. Subsequent E-W to WNW-ESE extension in Late Eocene-Oligocene resulted in highly extended continental crust under Alcock and Sewell rises and E Andaman Basin, and moderately extended crust in Mergui-N Sumatra Basin. As India coupled with W Myanmar, margin became dominated by dextral strike-slip and NNW-SSE transtensional deformation during Miocene)

Morley, C.K. (2017)- Cenozoic rifting, passive margin development and strike-slip faulting in the Andaman Sea: a discussion of established v. new tectonic models. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 4, p. 27-50.

(Andaman Sea evolved from near-pure extension (WNW-ESE) in Late Palaeogene, to oblique extension (NNW-SSE) in Neogene, to strike-slip-dominated deformation in Late Miocene-Recent, probably reflecting switch from slab rollback-driven extension to India coupling with Myanmar. Possible revisions to traditional models for Andaman Sea: (1) Alcock and Sewell rises may be hyperextended continental or island arc crust, not Miocene oceanic crust; (2) E Andaman Basin mainly underlain by strongly necked to hyper-extended continental crust, not oceanic crust; or (3) C Andaman Basin oceanic crust of Miocene, not Pliocene-Recent age)

Morley, C.K. & A. Alvey (2015)- Is spreading prolongeded, episodic or incipient in the Andaman Sea? Evidence from deepwater sedimentation. *J. Asian Earth Sciences* 98, p. 446-456.

(C Andaman Basin generally accepted to be site of continuous sea floor spreading since E Pliocene (~4.0 Ma). Seismic lines across E half of spreading center show 100's m of sediment up to Central trough, suggesting either spreading in central basin was episodic or Central trough is incipient spreading center in hyper-thinned)

continental or island arc crust. Gravity indicates C Andaman Basin is oceanic crust, but adjacent Alcock and Sewell Rises and E Andaman Basin are extended continental crust (see also Discussion by Curray (2015))

Morley, C.K. & A. Alvey (2016)- Reply to discussion “Is spreading prolonged, episodic or incipient in the Andaman Sea? Evidence from deepwater sedimentation” by J.R. Curray 2015. *J. Asian Earth Sciences* 115, p. 62-68.

(Thick sediment section in axial trough of Andaman Sea spreading center incompatible with rapid influxes of sediment, but more indicative of Miocene spreading, with recently renewed, activity, if at all. Nature of crust adjacent to spreading center remains uncertain)

Morley, C.K. & M. Searle (2017)- Regional tectonics, structure and evolution of the Andaman-Nicobar Islands from ophiolite formation and obduction to collision and back-arc spreading. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 5, p. 51-74.

(Proposed model for Cretaceous- Cenozoic development of Sumatra-Andaman-Myanmar region suggests continuity of single continental mass between Myanmar and Sumatra during Cenozoic, E Cenozoic ophiolite emplacement as imbricate slices in accretionary complex and no emplacement of a major overthrusting oceanic slab. Subsequent collisional deformation further dismembered ophiolites. ~30° CW rotation of SE Asia occurred following Asia- India collision, accompanied by transition from paired Andean-type magmatic belt to regional oblique-slip and strike-slip tectonics. In Neogene Andaman sea region became dominantly transtensional, while Myanmar in Late Neogene became transpressional)

Mukhopadhyay, B., S. Dasgupta & P. Mukherjee (2016)- Slab tear and tensional fault systems in the Sunda–Andaman Benioff zone: implications on tectonics and potential seismic hazard. *Geomatics Natural Hazards Risk* 7, 3, p. 1129-1146.

(online at: www.tandfonline.com/doi/full/10.1080/19475705.2015.1011242)

(Multiple transverse slab tear faults and longitudinal trench-parallel extensional faults on top part of Benioff zone in Sunda-Andaman arc)

Mukhopadhyay, M. (1984)- Seismotectonics of subduction and back-arc thrusting under the Andaman Sea. *Tectonophysics* 108, p. 229-239.

Mukhopadhyay, M. (1988)- Gravity anomalies and deep structure of the Andaman arc. *Marine Geophysical Researches* 9, 3, p. 197-210.

(Active subduction of Indian plate beneath Andaman arc along E-dipping Benioff zone extends to depth of ~150 km; deepest part of Benioff zone below Andaman volcanic arc. Overriding Burma plate at least 50 km thick. Andaman volcanic arc split by Andaman back-arc spreading ridge, active since at least 11 Ma)

Mukhopadhyay, M., P.P. Chakraborty & S. Paul (2003)- Facies clustering in turbidite successions: case study from Andaman flysch group, Andaman Islands, India. *Gondwana Research* 6, p. 918-925.

(Bed thickness data of two turbidite sections in Oligocene Andaman Flysch Group at Corbyn's Cove, S Andaman and Kalipur section, N Andaman (forearc submarine fan system))

Nakanart, A. & N. Mantajit (1983)- Stratigraphic correlation of the Andaman Sea. *Proc. Conference on. Geology and Mineral Resources of Thailand*, Bangkok 1983, p. 171-177.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1983/10594.pdf)

(Correlation between Oligocene- Recent sediments of N Sumatra Basin and Straits of Malacca- Andaman Sea)

Oldham, R.D. (1885)- Notes on the geology of the Andaman Islands. *Records Geological Survey India* 18, 3, p. 135-145.

Padmakumari, V.M. & S.M. Ahmad (2004)- Ash layer at ~8 Ma in ODP Site 758 from the Bay of Bengal: evidence from Sr, Nd isotopic compositions and rare earth elements. *Current Science* 86, 9, p. 1323-1325.

(online at: <https://www.currentscience.ac.in/Volumes/86/09/1323.pdf>)

(Late Miocene volcanic ash layer in deep marine sediments of N Indian Ocean ODP Site 758 dated at ~8.2 Ma, compositionally similar to Toba tuffs and probably derived from Indonesian volcanic arc)

Pal, T. (2011)- Petrology and geochemistry of the Andaman ophiolite: melt-rock interaction in a suprasubduction-zone setting. *J. Geological Society, London*, 168, 4, p. 1031-1045.

(Andaman ophiolite (Cretaceous-Paleocene) occurs as thrust slices in outer arc of Andaman-Java subduction zone. Mantle sequence of layered serpentinitized lherzolite and harzburgite, intrusive and extrusive rocks. Geochemistry indicates mid-ocean ridge basalt or suprasubduction zone setting. MORB mantle of subducting Indian plate accreted into mantle wedge, then melting of accreted mantle first produced boninite melt, followed by tholeiitic melt)

Pal, T. & A. Bhattacharya (2010)- Greenschist-facies sub-ophiolitic metamorphic rocks of Andaman Islands, Burma- Java subduction complex. *J. Asian Earth Sciences* 39, 6, p. 804-814.

(online at: www.academia.edu/6052725/Greenschist_facies_sub_ophiolitic_metamorphic_rocks_of_Andaman_Islands_Burma_Java_subduction_complex)

(Greenschist facies metabasics (actinolite schist) and metasediments (garnetiferous quartzo-feldspathic mica-chlorite schist, etc.) at sole of ophiolite slices and as blocks in melange zone under Andaman ophiolite. Top part of subducting slab and overlying trench sediments metamorphosed and dislocated by thrusts in accretionary prism. Metamorphism and uplift of metamorphic rocks with ophiolite slices between Cretaceous and Oligocene, later than emplacement of ophiolites of Sumatra and Java)

Pal, T., P.P. Chakraborty & R.N. Ghosh (2003)- PGE distribution in chromite placers from Andaman ophiolite and its boninitic parentage. *J. Geological Society India* 62, 6, p. 671-679.

(Chromite placers in Rutland coast of Andaman and Nicobar Islands, derived from serpentinitised dunite with thin stringers of chromite, show PGE incidence. Derivation of source rock from boninitic melt)

Pal, T., P.P. Chakraborty, T.D. Gupta & C.D. Singh (2003)- Geodynamic evolution of the outer-arc-forearc belt in the Andaman islands, the central part of the Burma-Java subduction complex. *Geological Magazine* 140, 3, p. 289-307.

(Andaman Islands, part of Burma-Java subduction complex, expose outer-arc accretionary prism and forearc Oligocene-Pliocene turbidites. N-S-trending dismembered ophiolite slices of Cretaceous age at different levels with Eocene trench-slope sediments, uplifted and emplaced by E-dipping thrusts. Metapelites and metabasics of greenschist to amphibolite grade in melange zone of ophiolites. Eocene Mithakhari Group represents pelagic trench sediments and clastics derived from ophiolites. Eocene sediment deposited in isolated basins of immature trench-slope setting. Deposition of Oligocene Andaman Flysch Gp in forearc setting. Mio-Pliocene Archipelago Gp siliciclastic turbidites and subaqueous pyroclastic flow deposits in lower part and carbonate turbidites in upper part, suggesting deposition in shallower forearc compared to Oligocene)

Pal, T., T.D. Gupta, P.P. Chakraborty & S.C.D. Gupta (2005)- Pyroclastic deposits of Mio-Pliocene age in the Arakan Yoma- Andaman- Java subduction complex, Andaman Islands, Bay of Bengal, India. *Geochemical J.* 39, p. 69-82.

(online at: www.terrapub.co.jp/journals/GJ/pdf/3901/39010069.pdf)

(400m thick Archipelago Group Mio-Pliocene sequence of bedded tuff alternating with non-volcanogenic turbidites on Andaman Islands, overlying Andaman Flysch. Interpreted as tuffs from subaerial eruptions that landed in water and behaved as cold subaqueous flow. No lithic volcanic fragments. Origin of Andaman tuffs in convergent margin)

Pal, T., S.K. Mitra, S. Sengupta, A. Katari, P.C. Bandopadhyay & A.K. Bhattacharya (2007)- Dacite-andesites of Narcondam Volcano in the Andaman Sea; an imprint of magma mixing in the inner arc of the Andaman-Java subduction system. *J. Volcanology Geothermal Research* 168, p. 93-113.

(Narcondam volcano along with active Barren volcano lies in chain of inner arc volcanoes extending from Burma to Indonesia. Dacite, amphibole-andesite, and andesite are products of magma mixing)

Pandey, D.K., G. Anitha, R. Prerna & A. Pandey (2017)- Late Cenozoic seismic stratigraphy of the Andaman forearc basin, Indian Ocean. *Petroleum Science*, Springer, 14, 4, p. 648-661.
(online at: <https://cup.edu.cn/petroleumscience/docs/2019-08/20170402.pdf>)

Pandey, J., R.P. Agarwal, A. Dave, A. Maithani, K.B. Trivedi, A.K. Srivastava & D.N. Singh (1992)- Geology of Andaman. *Bull. Oil Natural Gas Commssion (ONGC)* 29, 2, p. 19-103.
(*ONGC review of geology and stratigraphy of Andaman Islands*)

Pedersen, R.B., M.P. Searle, A. Carter & P.C. Bandopadhyay (2010)- U-Pb zircon age of the Andaman ophiolite: implications for the beginning of subduction beneath the Andaman-Sumatra arc. *J. Geological Society, London*, 167, 6, p. 1105-1112.
(*Andaman ophiolite complex forms basement of Andaman Islands. N Andaman Island with harzburgite and lower crustal gabbros. Campanian radiolaria from cherts overlying ophiolite. U-Pb zircon age of trondhjemitic rock in S Andaman Island 95 Ma, remarkably similar to ophiolites in Oman (~93-98 Ma) and Troodos, Cyprus (92 Ma). Andaman volcanic arc built on Cenomanian ophiolite-oceanic crust and subduction initiated at this time along Tethys, from Cyprus through Oman to Andaman Islands*)

Peter, G., L.A. Weeks & R.E. Burns (1966)- A reconnaissance geophysical survey in the Andaman Sea and across the Andaman Nicobar island arc. *J. of Geophysical Research* 71, 2, p. 495-509.
(*Major tectonic trends of N Sumatra and S Burma Range can be linked through Andaman Sea on the basis of magnetic gravity and seismic data*)

Plunder, A., D. Bandyopadhyay, M. Ganerod, E.L. Advokaat, B. Ghosh, P. Bandopadhyay & D.J.J. van Hinsbergen (2020)- History of subduction polarity reversal during arc-continent collision: constraints from the Andaman Ophiolite and its metamorphic sole. *Tectonics* 39, 6, e2019TC005762, p. 1-24.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019TC005762>)
(*Ophiolitic units of Andaman- Nicobar Islands formed during initiation of new subduction zone following collision of Woyla Arc of Sumatra with Sundaland (Eurasia). Metamorphic sole amphibolites of Andaman ophiolites formed at ~0.9 GPa and 675 °C, with Ar/Ar cooling ages of ~106 Ma (Albian; = around final stage of Woyla Arc), considerably older than arc magmatic gabbros and plagiogranites of overlying ophiolite previously dated at 99-93 Ma (Cenomanian) and thought to reflect ophiolite age (but recently reinterpreted as volcanic arc built on ophiolite). Combined with ages of Woyla-Sundaland collision, we argue that subduction polarity reversal occurred in period of ~10-20 Myrs*)

Polachan, S. (1988)- The geological evolution of the Mergui Basin, S.E. Andaman Sea, Thailand. Ph.D.Thesis University of London, p. 1-231. (*Unpublished*)

Polachan, S. & A. Racey (1993)- Lower Miocene larger foraminifera and petroleum potential of the Tai Formation, Mergui Group, Andaman Sea. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 487-496.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7613.pdf)
(*First record of Tertiary larger foraminifera in Thailand, on Thai side of offshore Mergui Basin. Tai Fm reefal limestones unconformably on pre-Late Eocene quartz-chlorite schist in Central High of Mergui Basin. Three units at type locality: basal anhydrite, dolomite, shale and sandstone; middle coral/algal reefal limestones, and upper calcarenites interbedded with silty shales and sandstones. Middle and upper units with *Lepidocyclina* (N.) *japonica*, *Spirochlopeus yabei*, *Miogypsina*, *Miogypsinoidea*, etc. (= E Miocene, Upper Te; JTvG)*)

Polachan, S. & A. Racey (1994)- Stratigraphy of the Mergui Basin, Andaman Sea: implications for petroleum exploration. *J. Petroleum Geology* 17, 4, p. 373-406.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1994/2545.pdf)
(*Nine Late Oligocene- Pleistocene formations described from Mergui Basin, Andaman Sea, a transtensional back-arc basin, formed in Oligocene due to onset of oblique convergence between Indian and SE Asian plates. Major similarities between Mergui Basin and petroleum-rich N Sumatra Basin. Twelve non-commercial*)

exploration wells drilled by Esso, Union and Placid in 1970's-1980's. Oldest formation Late Oligocene Ranong Fm sandstones, in B1 unconformably on Late Cretaceous quartz monzonite (K/Ar age 75 Ma))

Prakash, A. (2017)- Gas hydrate occurrences in the Andaman deep water basin, India. 104 Gas hydrate occurrences in the Andaman deep water. Proc. Conference Society Petroleum Geophysicists (SPG) India, Jaipur-2017, Paper 104, p. 1-8.

(online at: <https://spgindia.org/Jaipur2017-proceedings-published/pid-101-a-gas-hydrate-occurrences.pdf>) (Seismic data from Andaman deep water indicate widespread gas hydrate accumulations. Drilling data also confirmed hydrate deposits. Log data show a 30m thick hydrate layer at depth of 1895 m in one accumulation)

Prakash, A., B.G. Samanta & N.P. Singh (2013)- Evidence of gas hydrate accumulation and its resource estimation in Andaman deep water basin from seismic and well log data. Marine Geophysical Research 34, p. 1-16.

Qiao, J., X. Luan, T.D. Raveendrasinghe, Y. Lu, G. Fan, X. Wei, L. Jin, J. Yin, H. Ma & L. Jiang (2023)- Unravelling Cenozoic carbonate platform fluid expulsion: Deciphering pockmark morphologies and genesis in the Tanintharyi shelf of the Andaman Sea as promising hydrocarbon reservoirs. Marine and Petroleum Geology 160, 106603, p.

(Tanintharyi region in East Andaman Basin with pockmarks on seafloor, fluid expulsion features that likely leak from Oligocene- E Miocene carbonate platform)

Racey, A. & A. Taylor (2025)- Action in Andaman. GeoExpro 2025, 1, p. 16-21.

(online at: https://geoexpro.com/wp-content/uploads/2025/02/GeoExPro_2501_web_spreads.pdf) (Review of oil and gas exploration in and around Andaman Sea and future prospectivity)

Radhakrishna, M., S. Lasitha & M. Mukhopadhyay (2008)- Seismicity, gravity anomalies and lithospheric structure of the Andaman arc, NE Indian Ocean. Tectonophysics 460, 1, p. 248-262.

(Andaman arc nearly 1100 km long active plate margin between India and Burma plates where oblique Benioff zone develops down to 200km depth. Slab gravity high of 85 mgal E of Nicobar Island, where gravity high follows Nicobar Deep. Double peaked gravity low demarcates Andaman trench-arc system. Gravity models favor presence of oceanic crust below Andaman-Nicobar Outer Arc Ridge)

Rai, J. (2006)- Late Miocene siliceous endoskeletal dinoflagellates from the Sawai Bay Formation, Neill Island, Andaman Sea, India. J. Micropalaeontology 25, 1, p. 37-44.

(online at: <https://www.j-micropalaeontol.net/25/37/2006/jm-25-37-2006.pdf>) (Rare siliceous spicules of endoskeletal dinoflagellates (Actiniscus spp.) in Late Miocene Sawai Bay Fm on Neill Island (E of South Andaman Island). Associated with calcareous nannofossils of Discoaster berggrenii subzone (CN9A/ NN11))

Rajani, P.R., R.V. Manoj, R.K. Joshi, B.K. Jishnu & M. Nagasundaram (2022)- Base metals- and Lithium-rich ferromanganese oxide deposits from the South Andaman Sea, Northeastern Indian Ocean: mode of occurrence and genesis. J. Asian Earth Sciences 234, 105272, p. 1-14.

(online at: <https://www.sciencedirect.com/science/article/pii/S136791202200195X>) (Andaman Sea hosts ferromanganese (Fe-Mn) oxide deposits as crusts and nodules over seamounts and ridges in <2000m water depths (samples from ~700-1300m on W Sewell Ridge and Sewell Rise. Preferentially accrete onto sediment-free hard substrates. Fe-Mn nodules mixed hydrogenetic-hydrothermal origin)

Rajendran, C.P., K. Rajendran, V. Andrade & S. Srinivasalu (2013)- Ages and relative sizes of pre-2004 tsunamis in the Bay of Bengal inferred from geologic evidence in the Andaman and Nicobar Islands. J. of Geophysical Research: Solid Earth 118, 4, p. 1345-1362.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/jgrb.50122>) (Geologic evidence along N part of 2004 Aceh-Andaman rupture suggests region generated five tsunamis in prior 2000 years. 2004 tsunami deposits mainly organic debris, sand sheets, coral debris and boulder deposits. Distant and geomorphologically sheltered sites higher potential for tsunami deposit preservation)

Rajendran, K. & H.K. Gupta (1989)- Seismicity and tectonic stress field of a part of the Burma-Andaman-Nicobar Arc. Bull. Seismological Society of America 79, 4, p. 989-1005.
(Direction of maximum compression in Burma- Andaman- Nicobar region NE-SW to N-S, compatible with postulated motion of Indian Plate)

Rajshekhar, C. (1992)- The genus *Hantkenina* from Baratang Island, Andaman, India. J. Geological Society India, 39, 6, p. 495-501.
(Eocene planktonic foram *Hantkenina* recovered from clayey sediments ejected from mud volcanoes on Baratang Island, Andaman. Muds also yielded abundant and mixed assemblage of Late Cretaceous- Eocene foraminifera, suggesting presence of Late Cretaceous-Eocene sediments in subsurface of Baratang)

Raju, D.S.N. & L. Chidambaram (1986)- Cretaceous and Cenozoic foraminiferal biostratigraphy of offshore deep well sections, East coast of Andaman islands. 12th Indian Colloquium on Micropaleontology and Stratigraphy, New Delhi, p. 227-240.

Raju, D.S.N. & P.K. Mishra (1991)- Miogypsinidae from the Andaman Basin, India. J. Palaeontological Society India 36, p. 15-30.

(online at: <http://palaeontologicalsociety.in/vol36/v2.pdf>)

(11 species of Miogypsinidae larger foraminifera reported from 10 offshore wells E of Andaman Island. Oldest forms latest Oligocene *Miogypsinoides complanata*, youngest *M. Miocene Miogypsina antillea*)

Raju, K.A.K. (2005)- Three-phase tectonic evolution of the Andaman backarc basin. Current Science 89, 11, p. 1932-1937.

(online at: www.iisc.ernet.in/currsci/dec102005/1932.pdf)

(Andaman backarc basin 3-phase tectonic evolution: Late Oligocene spreading center jump, *M. Miocene- E. Pliocene* rifting and extension, followed by true seafloor spreading since 4 Ma)

Raju, K.A.K., T. Ramprasad, P.S. Rao, B.R. Rao & J. Varghese (2004)- New insights into the tectonic evolution of the Andaman basin, northeast Indian Ocean. Earth Planetary Science Letters 221, p. 145-162.

(Seafloor spreading in Andaman backarc basin started at ~4 Ma, rather than 11 Ma postulated previously. Extrusive tectonics prompted extension and rifting along plane joining Sagaing (Myanmar) and Semangko (Sumatra) fault systems. Seafloor spreading in past 4 Myr resulted in formation of deep Andaman backarc basin. This phase also experienced W-ward propagation of spreading center)

Raju, K.A.K., D. Ray, A. Mudholkar, G.P.S. Murty, V.K. Gahalaut, K. Samudrala et al. (2012)- Tectonic and volcanic implications of a cratered seamount off Nicobar Island, Andaman Sea. J. Asian Earth Sciences 56, p. 42-53.

(online at: https://www.academia.edu/12289894/Tectonic_and_volcanic_implications_of_a_cratered_seamount_off_Nicobar_Island_Andaman_Sea)

(Seamount with well-developed crater at summit near center of Nicobar earthquake swarm. Rocks dredged from crater dacite, rhyolite and andesite, with veneer of ferromanganese oxide. First documentation of submarine arc-volcanism in Andaman Sea, E of Nicobar Island)

Raju, R.D. & B.S. Negi (1984)- Petrography and tectonic setting of the Andaman ophiolite suite with a note on its evolution. J. Geological Society India 25, 10, p. 655-665.

(online at: https://www.researchgate.net/publication/279938864_Petrography_and_tectonic_setting_of_the_Andaman_ophiolite_suite_with_a_note_on_its_evolution)

(Suite of ultramafic- mafic plutonic rocks, basic volcanic rocks and cherts was emplaced as linear belts along fault zones in the Port Blair group eugeosynclinal flysch series. Etc.)

Rangin, C. (2012)- Cenozoic geodynamic evolution of the Burma-Andaman platelet. AAPG Int. Conv. Exhib., Singapore 2012, Search and Discovery Article 30258, p. 1-18. (Presentation Abstract)

(online at: www.searchanddiscovery.com/documents/2012/30258rangin/ndx_rangin.pdf)

Rao, N.P., C.N. Rao, P. Hazarika, V.M. Tiwari, M.R. Kumar & A. Singh (2011)- Structure and tectonics of the Andaman subduction zone from modeling of seismological and gravity data. In: E. Sharkov (ed.) *Frontiers in tectonic research- general problems, sedimentary basins and island arcs*, p. 249-268.
(online at: <http://cdn.intechopen.com/pdfs/17113/..>)

Rao, P.B.V.S., M. Radhakrishna, K. Haripriya, B.S. Rao & D. Chandrasekharam (2016)- Magnetic anomalies over the Andaman Islands and their geological significance. *J. Earth System Science* 125, 2, p. 359-368.
(online at: www.ias.ac.in/article/fulltext/jess/125/02/0359-0368)
(*Andaman Islands part of outer-arc accretionary complex of Andaman-Sumatra active subduction zone. Regional magnetic survey shows intermediate-high amplitude magnetic anomalies over areas of exposed ophiolite rocks along E coast of N, Middle and S Andaman Islands. 2D modelling along E-W profiles indicate ophiolite bodies extend to ~5-8 km depth and correlate with mapped fault/ thrust zones*)

Raveendrasinghe, T.D., X. Luan, J. Qiao, L. Jin, Z. Wang, A. Vikum, Y. Xue, H. Ma et al. (2024)- Unveiling the transtensional geodynamics of Cenozoic depocenter changes in the Andaman sea: Seismic evidence for the existence of the East Sagaing Fault and the Andaman Basin Central Fault Zone in the Tanintharyi region. *Marine and Petroleum Geology* 164, 106814, p. 1-21.
(*Andaman Sea, shaped by transtensional geodynamics at highly oblique convergent boundary of India and Sunda Plates. Sagaing Fault system exists as active transform boundary between Burma and Eurasian Plates. Transtensional regime contributed to opening of Andaman Sea as pull-apart basin. Etc.*)

Ray, D., S. Rajan & R. Ravindra (2012)- Role of subducting component and sub-arc mantle in arc petrogenesis: Andaman volcanic arc. *Current Science* 102, 4, p. 605-609.
(online at: www.currentscience.ac.in/Volumes/102/04/0605.pdf)
(*Trace element ratios of arc lavas from Barren and Narcondam volcanoes of Andaman Islands group: Narcondam lavas (mostly andesitic) with subduction component of sediment fluid and melt. Barren Island lavas (mostly basaltic) ratios, indicative of subduction component from altered ocean crust*)

Ray, J.S., K. Pande & N. Awasthi (2013)- A minimum age for the active Barren Island volcano, Andaman Sea. *Current Science* 104, 7, p. 934-939.
(online at: www.currentscience.ac.in/Volumes/104/07/0934.pdf)
(*Barren Island of Andaman Sea is only active volcano in Indian territory. Tephra (ash) layers in Andaman Sea sediment core, 32 km to SE, with tephra layers as old as ~70 ka, and with plagioclase separates as old as 1.8 ± 0.4 Ma, possibly represents age of older rocks in plumbing system of volcano*)

Ray, J.S., K. Pande & R. Bhutani (2015)- $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology of subaerial lava flows of Barren Island volcano and the deep crust beneath the Andaman Island Arc, Burma Microplate. *Bulletin of Volcanology* 77, 57, p. 1-10.
(*Andaman Island Arc part of Indonesian volcanic arc system, contains only one active subaerial magmatic center, Barren Island volcano (two dormant volcanoes N of Barren Island, Narcondam in Andaman Sea and Mt. Popa in Myanmar). Age of oldest subaerial lava flows 1.58 Ma. Compositions of xenoliths indicate derivation from lower (oceanic) crustal olivine gabbro and suggest genetic relationship between arc crust and ophiolitic basement of Andaman accretionary prism*)

Ray, J.S. & M. Radhakrishna (eds.) (2020)- The Andaman Islands and adjoining offshore: geology, tectonics and palaeoclimate. Springer Nature Switzerland, p. 1-400.
(*Collection of 15 papers*)

Ray, K.K. (1982)- A review of the geology of Andaman and Nicobar Islands. Geological Survey India, Misc. Publ. 42, 2, p. 110-125.

Ray, K.K. (1985)- East coast volcanics- a new suite in the ophiolite of Andaman Islands. *Records Geological Survey India* 116, 2, p. 83-87.

Ray, K.K., S. Sengupta S. & J. van den Hul (1988)- Chemical characters of volcanic rocks of Andaman ophiolite, India. J. Geological Society, London, 145, 3, p. 393-400.

(Northernmost of Indonesia Arc outer arc ridge is in Andaman islands, where ophiolitic rocks occur as dismembered slices emplaced over Eocene-Oligocene turbidites. Volcanic members of ophiolitic suite pillow basalts, basaltic andesites and acid differentiates, with chemical characters comparable to MAR basalts at 45°N; REE patterns and acid differentiates suggest they represent marginal basin crust)

Ridd, M.F. (1971)- Faults in Southeast Asia and the Andaman rhombochasm. Nature 229, 2, p. 51-52.

(On presence of Andaman rhombochasm between sinistral Thai-Burma fault and dextral Sumatra fault)

Rodolfo, K.S. (1967)- Marine geology of the Andaman Basin, northeastern Indian Ocean. Ph.D. Thesis University of Southern California, Los Angeles, p. 1-316.

Rodolfo, K.S. (1969)- Sediments of the Andaman basin, Northeastern Indian Ocean. Marine Geology 7, p. 371-402.

Rodolfo, K.S. (1969)- Bathymetry and marine geology of the Andaman Basin and tectonic implications for Southeast Asia. Geological Society of America (GSA) Bull. 80, p. 1203-1230.

(Andaman Sea Basin large rhombochasm formed by Late Miocene- Recent rifting. E margin is Malay continental margin, composed of Paleozoic-Mesozoic rocks with thin Cenozoic sediment veneer. W boundary is Andaman-Nicobar Ridge, with U Cretaceous serpentinite-ophiolite-radiolarite core overlain by >3000m Paleocene-Miocene graywackes and shales. In-between are C Andaman Trough, two 220km long elongate basaltic seamounts and system of rift valleys and smaller volcanic seamounts. Maximum depths of Andaman Basin 4400m. Sediments in Central Trough 1.5 km thick)

Rose, K.K., J.E. Johnson, M.E. Torres, W. Hong, L. Giosan, E.A. Solomon et al. (2014)- Anomalous porosity preservation and preferential accumulation of gas hydrate in the Andaman accretionary wedge, NGHP-01 site 17A. Marine and Petroleum Geology 58, A, p. 99-116.

(In addition to pressure, temperature and salinity, additional parameters appear to influence concentration of gas hydrate in host sediments. Site 17A in Andaman Sea illustrates importance of grain-scale heterogeneities in controlling distribution of gas hydrate accumulations in marine sediments)

Roy, D.K., S.K. Acharyya, K.K. Ray, T.C. Lahari & M.K. Sen (1988)- Nature of occurrence, age and depositional environments of the oceanic pelagic sediments associated with the ophiolite assemblage from South Andaman Islands, India. Indian Minerals 42, 1, p. 31-56.

Roy, S.K. (1992)- Accretionary prism in Andaman forearc. Geological Survey India, Special Publ. 29, p. 273-278.

Roy, S.K. & S. Banerjee (2016)- Soft sediment deformation structures in the Andaman Flysch Group, Andaman Basin: evidence for Palaeogene seismic activity in the island arc. Berita Sedimentologi 35, p. 55-64.

(online at: www.iagi.or.id/fosi/berita-sedimentologi-no-35-palaeogene-of-the-eastern-margin-of-sundaland-part-1.html)

(Soft-sediment deformation in Late Eocene- Oligocene Andaman Flysch of uplifted accretionary prism of Andaman and Nicobar Islands interpreted as indicators of earthquake activity)

Roy, S.K. & S.D. Sharma (1993)- Evolution of Andaman forearc basin and its hydrocarbon potential. In: S.K. Biswas et al. (eds.) Proc. 2nd Seminar on Petroliferous basins of India, 1, Indian Petroleum Publ., p. 407-435.

Roy, T.K. (1983)- Geology and hydrocarbon prospects of Andaman-Nicobar Basin. In: L.L. Bhandari et al. (eds.) Petroliferous basins of India, Petroleum Asia J. 6, 4, p. 37-65.

Roy, T.K. & N.N. Chopra (1987)- Wrench faulting in Andaman forearc basin, India. Proc. Offshore Technology Conference (OTC) 19, Houston, p. 393-404.

Sachin, R., S. Verma & T. Pal (2017)- Petrochemical and petrotectonic characterisation of ophiolitic volcanics from Great Nicobar island Andaman-Sumatra belt. J. Geological Society India 90, 1, p. 85-92.

(Great Nicobar island ophiolite restricted to E coast, as small isolated outcrops in Oligocene sediments terrain. Only upper part of ophiolite suite, with pillow basalts, massive andesite and pyroclastic andesite. In Andaman Islands dismembered ophiolite with complete ophiolite stratigraphy within Eocene sediments. Ophiolitic rocks in Great Nicobar island similar to Sunda outer arc ridge)

Saha, A., A. Dhang, J. Ray, S. Chakraborty & D. Moecher (2010)- Complete preservation of ophiolite suite from South Andaman, India: a mineral-chemical perspective. J. Earth System Science 119, 3, p. 365-381.

(online at: www.ias.ac.in/jess/jun2010/jess102.pdf)

(Complete preservation of ophiolite suite from Port Blair to Chiriyatapu in SE part of S Andaman island. Serpentinite at base overlain unconformably by cumulate ultramafic-mafic members, cut by basaltic dykes and capped by pillow basalts interlayered with arkosic sediments (nothing on ages of ophiolite complex))

Saha, A., M. Santosh, S. Ganguly, C. Manikyamba, J. Ray & J. Dutta (2018)- Geochemical cycling during subduction initiation: evidence from serpentinized mantle wedge peridotite in the south Andaman ophiolite suite. Geoscience Frontiers (Beijing) 9, 6, p. 1755-1775.

(online at: <https://www.sciencedirect.com/science/article/pii/S167498711830032X>)

(Serpentinized Cretaceous- Paleocene peridotites (dunites) exposed in S Andaman representing tectonized mantle section of ophiolite suite. Geochemical features suggest contributions from boninitic mantle melts and substantiate subduction initiation process by rapid slab roll-back with extension/ seafloor spreading in intra-oceanic forearc regime)

Sahu, V.K., V.K. Gahalaut, S. Rajput, R.K. Chadha, S.S. Laishram & A. Kumar (2006)- Crustal deformation in the Indo-Burmese arc region: implications from the Myanmar and Southeast Asia GPS measurements. Current Science 90, 12, p. 1688-1693.

(online at: <https://www.currentscience.ac.in/Volumes/90/12/1688.pdf>)

(GPS observations suggest plate motion of 36 mm/yr between India and Sundaland is partitioned almost equally between Sagaing fault and Indo-Burmese arc through episodic dextral motion. E-ward motion of Indian plate generally compensated by E-ward motion of S China plate. Almost no subduction along Indo-Burmese arc)

Sarkar, S. & A.K. Ghosh (2014)- Evaluation of coralline algal diversity from the Serravallian carbonate sediments of Little Andaman Island (Hut Bay), India. Carbonates and Evaporites 30, 1, p. 1-13.

(Palaeodiversity of coralline algae in Serravallian Long Fm reefal carbonates of SE Little Andaman Island (Hut Bay). Nine genera, incl. Lithothamnium, Lithoporella, Corallina, etc.)

Sarkar, S., A.K. Ghosh & G.M.N Rao (2016)- Coralline algae and benthic foraminifera from the Long Formation (Middle Miocene) of the Little Andaman Island, India: biofacies analysis, systematics and palaeoenvironmental implications. J. Geological Society India 87, 1, p. 69-84.

(M Miocene (Serravallian) algal-foraminiferal carbonates of Long Fm Little Andaman Island. Dominance of coralline algae and larger foraminifera (incl. miogypsinids, Katacyclochypus) indicates deposition in upper photic zone)

Sarma, D.S., S.H. Jafri, I.R. Fletcher & N.J. McNaughton (2010)- Constraints on the tectonic setting of the Andaman ophiolites, Bay of Bengal, India, from SHRIMP U-Pb zircon geochronology of plagiogranite. Journal of Geology 118, 6, p. 691-697.

(online at: https://espace.curtin.edu.au/bitstream/handle/20.500.11937/5000/151435_26905_constraints%20on%20the%20Tectonic%20Setting%20-%20Journal%20of%20Geology.pdf)

(Andaman ophiolites regarded as accreted and uplifted oceanic lithosphere rocks thrust over Paleogene flysch deposited in Andaman fore-arc basin. U-Pb zircon mean age of ~93.6 Ma for plagiogranite in gabbro of

Andaman ophiolites and East Coast Volcanics, interpreted as age of crystallization. Ophiolitic rocks must be older and likely obducted onto leading edge of Eurasian continent in E Cretaceous)

Sastri, V.V. & T.S. Bedi (1962)- On the occurrence of *Miogypsina*, *Cyclocypeus*, *Orbulina* in the Miocene of the Andaman islands. *Current Science India* 31, p. 20-21.

(online at: <https://www.currentscience.ac.in/Volumes/31/01/0020.pdf>)

(Brief communication of first find of M Miocene foraminifera association of M Miocene Miogypsina irregularis, Cyclocypeus and Orbulina in calcareous sandstones of Long, Strait and Nicholson Islands, Middle and S Andaman Islands. No figures)

Sathikumar, R., S.K. Tripathi, R. Marada & S.I. Meitei (2025)- Geomorphology of submarine channel-levee system in the northernmost segment of the Andaman Backarc Basin, Andaman Sea.

(Mapping of new, young channel-levee systems in back-arc basin of the Andaman Sea from swath bathymetric survey and sub-bottom profiling)

Satyavani, N., K. Sain & V. Jyothi (2014)- Gas hydrate occurrences in the Andaman offshore, India- seismic inferences. *J. Indian Geophys. Union* 18, 4, p. 440-447.

(online at: <http://www.igu.in/18-4/3-paper.pdf>)

(Seismic data in Andaman offshore E of Andaman islands shows prominent bottom-simulating reflector (BSR) at ~575m below seafloor, indicating presence of zone of gas hydrates and free gas below BSR)

Satyavani, N., K. Sain, M. Lall & B. Kumar (2008)- Seismic attribute study for gas hydrates in the Andaman Offshore India. *Marine Geophysical Researches* 29, 3, p. 167-175.

(Seismic data of Andaman Sea E of Little Andaman Island indicate presence of gas hydrates and underlying free gas. Prominent bottom-simulating reflection (BSR) with reverse polarity around 650-700 ms)

Saxena, S., A. Chakraborty, A.K. Ghosh, R. Dey, L. Roy & J. P. Keshri (2021)- Burdigalian to Early Serravallian diatom biostratigraphy from Havelock Island, Northern Indian Ocean. *Stratigraphy and Geological Correlation* 29, p. 241-262.

(Poorly preserved diatoms from Andaman Islands indicate Burdigalian-E Serravallian age)

Saxena, R.K., A.K Ghosh & A. Chandra (2005)- Calcareous algae from the limestone unit of Hut Bay Formation (Late Middle Miocene) of Little Andaman Island, India. In: J.P. Keshri & A. Kargupta (eds.) *Glimpses of Indian phycology*, Bishen Singh Mahendra Pal Singh Press, Dehra Dun, p. 275-301.

(Late M Miocene calcareous algae assemblage from limestone in Hut Bay Fm of Little Andaman Island with 13 species of coralline red algae (Lithophyllum, Lithothamnion, Amphiroa, etc.) and Halimeda-type green algae)

Scaife, S. & A. Billings (2010)- Offshore exploration of the Andaman Sea, *GEO ExPro* 7, 5, p. 30-34.

(Brief regional overview based on reprocessing of 1982-2001 seismic in Andaman Sea, E of Andaman islands. 13 wells in basin, only one (AN 1-1) flowed gas from Miocene limestone)

Scaife, S. & A. Billings & R. Spoors (2010)- A re-evaluation of vintage Andaman offshore seismic datasets, *Proc. GEO-India, New Delhi 2011, AAPG Search and Discovery* 10322, p. 1-5. *(Extended Abstract)*

(online at: www.searchanddiscovery.com/documents/2011/10322scaife/ndx_scaife.pdf)

Schwager, C. (1866)- Fossile Foraminiferen von Kar Nikobar. In: F. Hochstetter, *Reise der Osterreichischen Fregatte Novara um die Erde in den Jahren 1857, 1858, 1859*, *Geol. Theil*, 2, Staatsdruckerei, Vienna, p. 187-268.

(Fossil foraminifera from Kar-Nikobar'. First or one of first studies on foraminifera from SE Asia. From Austrian Novara Expedition 1857-1859 Reports. Taxonomy updated by Srinivasan & Sharma (1980))

Shankar, U. & M. Riedel (2013)- Heat flow and gas hydrate saturation estimates from Andaman Sea, India. *Marine and Petroleum Geology* 43, p. 434-449.

(Gas hydrate recovered along E coast of Andaman Islands at Site NGHP-01-17, mainly in volcanic ash layers. Gas hydrate saturation values up to ~85% of pore spaces from ~270m below seafloor to base of gas hydrate stability zone (~600m below seafloor). Bottom-simulating reflector imaged along several seismic lines, with depth of BSR >600m on line over Site NGHP-01-17, one of deepest BSRs observed worldwide. BSR-derived heat flow values ~12- 41.5 mW/m². Variable BSR depths in Andaman Sea controlled mainly by overall low geothermal gradients, with lower heat flow values over topographic highs)

Shankar, U., K. Sain & M. Riedel (2014)- Assessment of gas hydrate stability zone and geothermal modeling of BSR in the Andaman Sea. *J. Asian Earth Sciences* 79, p. 358-365.

(Widespread bottom simulating reflectors (BSRs) seen on seismic profiles in Andaman Sea. BSR occurs where water depth >1000m, and identified by cross-cutting relationships with dipping reflectors. BSR represents base of gas hydrate stability field, which ranges from ~518-861m below sea floor, depending on water depths. In situ measurement at site 17 shows low geothermal gradient of 19 °C/km, responsible for deepest BSR in world)

Sharma, V. (1986)- Planktonic foraminifera of Late Eocene age from Mayabunder, Middle Andaman. *J. Paleontologica Society India* 31, p. 16-21.

(online at: <https://palaeontologicalsociety.in/vol31/v3.pdf>)

(Thick sequence of alternating sandstone-siltstone near Aves Point in northern Middle Andaman Island (formerly Port Blair series) with Late Eocene (P17) planktonic foraminifera (nearby older reports of Late Eocene Nummulites and (reworked?) U Cretaceous Globotruncana)

Sharma, V., J. Daneshian & D.L. Bhagyapati (2011)- Early Neogene radiolarian faunal turnover in the northern Indian Ocean: evidence from Andaman-Nicobar. *J. Geological Society India* 78, 2, p. 157-166.

(Two intervals of faunal turnover suggested by E-M Miocene radiolarians from Andaman-Nicobar, in Stichocorys wolffii -Calocyclus costata -Dorcadospyris alata zones: (1) latest E Miocene (upward increase in cold water species and decreasing diversity; (2) in M Miocene Dorcadospyris alata Zone at ~14.8-12.7 Ma, faunal turnover correlated with M Miocene cooling)

Sharma, V. & M.P. Ram (2003)- Early to middle Miocene radiolarian assemblages and biostratigraphy, Andaman Islands, Northeast Indian Ocean. *J. Palaeontological Society India* 48, p. 1-39.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(Neogene of Andaman and Nicobar islands mainly in deep marine facies. 145 radiolaria taxa and 10 radiolarian bio-events identified in E-M Miocene)

Sharma, V. & G.K. Sharma (1988)- Radiolaria from Neill Island, Andaman sea, and their distributional characteristics. *J. Palaeontological Society India* 33, p. 7-19.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(104 species of radiolaria in Late Miocene- E Pliocene of Neill Island, belonging to Didymocyrtis penultima and Stichocorys peregrina zones)

Sharma, V. & G.K. Sharma (1989)- Late Miocene to Early Pliocene radiolarian biostratigraphy of Neill Island, Andaman Sea. *J. Geological Society India* 34, p. 76-82.

Sharma, V. & S. Singh (1997)- Late Neogene radiolarian events in Andaman-Nicobar Islands, Northeast Indian Ocean. *Micropaleontology* 43, p. 21-28.

(11 radiolarian events identified in Late Miocene - E Pliocene of Andaman-Nicobar islands)

Sharma, V., S. Singh & N. Rawal (1999)- Early Middle Miocene radiolaria from Nicobar Islands, Northeast Indian Ocean. *Micropaleontology* 45, 3, p. 251-277.

(Neogene of Andaman and Nicobar Islands deep water marine facies rich in Radiolaria. Nicobar islands Nancowry and Kamorta radiolarian assemblages with 120 species of Dorcadospyris alata Zone (~15-13 Ma))

Sharma, V. & M.S. Srinivasan (2007)- Geology of Andaman-Nicobar: the Neogene. Capital Publishing Co., New Delhi, p. 1-163.

Sheth, H.C., J.S. Ray, R. Bhutani, A. Kumar & R.S. Smitha (2009)- Volcanology and eruptive styles of Barren Island: an active mafic stratovolcano in the Andaman Sea, NE Indian Ocean. *Bulletin of Volcanology* 71, 9, p. 1021-1039.

(online at: <http://www.mantleplumes.org/WebDocuments/shethetal2009-bv.pdf>)

(Barren Island little known volcano in Andaman Sea, and northernmost active volcano of Great Indonesian arc. Recent eruptions (1991, 1994-95, 2005-06) produced aa lava flows of basalt and basaltic andesite and tephra)

Shrivastava, J.P. & V. Sharma (2014)- Compositional variation in magma through Early Neogene in the Northeast Indian Ocean: a testimony from glass shards. *J. Geological Society India* 84, 2, p. 181-186.

(Volcanic ash/ glass shards widely distributed in E Miocene marine succession of Andaman-Nicobar Islands, also few records from early M Miocene (~21-15 Ma). Range in composition from basalt to rhyolite. Andesite/ basalt-andesite most common, implying island arc tectono-magmatic setting, possibly in Indonesian region)

Singh, O.P. & S.A. Jafar (1995)- Late Miocene discoasters from Sawai Bay Formation, Neill Island, Andaman Sea, India. *The Palaeobotanist* 44, p. 189-206.

(21 species of Late Miocene discoasters from Sawai Bay Fm. *Discoster berggrenii* and *D. quinqueramus* common forms. Calcareous nannofossil subzone CN9A = lower NN11)

Singh, O.P., S.M. Subramanya & V. Sharma (2000)- Early Neogene multiple microfossil biostratigraphy, John Lawrence island, Andaman Sea. *Micropaleontology* 46, p. 343-352.

(Planktic foraminifera, calcareous nannofossils and radiolaria examined from E Neogene of John Lawrence Island, Andaman Sea. Planktonic foraminifera referable to upper *Globigerinatella insueta* and lower *Praeorbulina glomerosa* zones (E-M Miocene boundary). Nannofossil assemblages assigned to *Helicosphaera ampliaperta* (NN4) zone, radiolarians to *Calocyclus costata* Zone)

Singh, S.C. & R. Moeremans (2017)- Anatomy of the Andaman-Nicobar subduction system from seismic reflection data. In: P.C. Bandopadhyay & A. Carter (eds.) *The Andaman- Nicobar accretionary ridge: geology, tectonics and hazards*, Geological Society, London, Memoir 47, Chapter 13, p. 193-204.

(online at: <http://mem.lyellcollection.org/content/memoirs/47/1/193.full.pdf>)

(Andaman-Nicobar subduction system is NW segment of Sunda subduction system, where Indian Plate subducts beneath Sunda Plate in nearly arc-parallel direction. Entire segment ruptured during 2004 Andaman-Sumatra earthquake (Mw 9.3). Seismic characterization of Andaman-Nicobar subduction system from W to E. Ninety-East Ridge overlain by thick continental margin sediments beneath Recent Bengal Fan sediments. Fracture zones on subducting plate beneath forearc, influence morphology of upper plate. Forearc region (accretionary wedge, forearc high and forearc basin) exceptionally wide (250 km). Forearc basin contains active backthrust and floored by continental crust of Malay Peninsula origin. Active sliver strike-slip fault in deep basin connects with Great Sumatra Fault in S and Sagaing Fault in N, via Andaman Sea spreading center and large transform)

Singh, S.C., R. Moeremans, J. McArdle & K. Johansen (2013)- Seismic images of the sliver strike-slip fault and back thrust in the Andaman-Nicobar region. *J. of Geophysical Research: Solid Earth* 118, 10, p. 5208-5224.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/jgrb.50378>)

(Great Sumatra Fault defines present day plate boundary between Sunda Plate in N and Burmese Sliver Plate in S. Continues N of Banda Aceh in Andaman Sea for >700 km until it joins Andaman Sea Spreading center. Two strands between Banda Aceh and Nicobar Island: transpression in S, and deep narrow active rift system in N with volcanoes in center, suggesting volcanic arc is coincident with rifting. N of Nicobar Island active Andaman-Nicobar strike-slip fault, cuts through rifted deep basin; volcanic arc lies just E of rift. W margin of this basin seems to be rifted continental margin, tilted W, and flooring Andaman-Nicobar fore-arc basin)

Singh, S.D. & S. Singh (2021)- Late Cretaceous to Pleistocene foraminiferal biostratigraphy and palaeogeographic reconstructions in Andaman basin, India. *J. Palaeontological Society India* 66, 2, p. 190-200.

(online at: <https://journals.sagepub.com/doi/pdf/10.1177/0971102320210206>)

(Exploration wells in offshore Andaman forearc subbasin (W and E of Andaman Islands accretionary prism) with continuous Lates Cretaceous- Pleistocene deep marine succession (pre-Late Cretaceous not penetrated))

Spicak, A. & J. Vanek (2013)- Earthquake clustering in the tectonic pattern and volcanism of the Andaman Sea region. *Tectonophysics* 608, p. 728-736.

(Earthquake swarms of S Andaman Sea zone induced by intrusions of subduction-generated calc-alkaline magmas, in N zone by intrusions of basaltic magmas associated with seafloor spreading. Earthquake swarm occurrence defines brittle, seismogenic layer at depths of 9-35 km)

Srinivasan, M.S. (1977)- Standard planktonic foraminiferal zones of the Andaman-Nicobar Late Cenozoic. *Recent Researches in Geology* 3, p. 23-79.

Srinivasan, M.S. (1980)- Early Neogene volcanism in Southeast Asia: evidence of ash beds from Andaman-Nicobar. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 227-234.

(Tephra and ash layers common in E Miocene, mainly around N4-N5 boundary, also in early M Miocene (N8) of E Andaman islands. Low volcanic activity in M-L Miocene in Andaman region. Likely sources island arc volcanoes of Narcondam and Barren Islands to NE in Andaman Sea and Indonesian volcanoes in SE (see also Shrivastava and Sharma 2014))

Srinivasan, M.S. (1984)- The Neogene of Andaman Nicobar. In: N. Ikebe & R. Tsuchi (eds.) *Pacific Neogene datum planes*, University of Tokyo Press, p. 203-207.

(Brief review of Andaman-Nicobar islands Miocene-Recent continuous marine stratigraphy and planktonic foraminifera zonation)

Srinivasan, M.S. (1986)- Neogene reference sections of Andaman-Nicobar: their bearing on volcanism, sea-floor tectonism and global sea-level changes. In: N.C. Ghose & S. Varadarajan (eds.) *Ophiolites and Indian Plate margin*, p. 295-308.

Srinivasan, M.S. (1988)- Late Cenozoic sequences of Andaman-Nicobar islands; their regional significance and correlation. *Indian Journal of Geology* 60, 1, p. 11-34.

Srinivasan, M.S. & R.J. Azmi (1976)- Contribution to the stratigraphy of Neill Island, Ritchie's Archipelago, Andaman Sea. In: M.S. Srinivasan (ed.) *Proc. VI Indian Colloquium on Micropaleontology and Stratigraphy*, Devijyoti Press, Varanasi, p. 283-301.

Srinivasan, M.S. & R.J. Azmi (1976)- New developments in the Late Cenozoic lithostratigraphy of Andaman-Nicobar Islands, Bay of Bengal. In: M.S. Srinivasan (ed.) *Proc. VI Indian Colloquium on Micropaleontology and Stratigraphy*, Devijyoti Press, Varanasi, p. 302-327.

Srinivasan, M.S. & R.J. Azmi (1979)- Correlation of late Cenozoic marine sections in Andaman-Nicobar, northern Indian Ocean and the equatorial Pacific. *Journal of Paleontology* 53, p. 1401-1415.

(Andaman-Nicobar Islands contain almost complete E Miocene- Quaternary sequence of tropical planktonic foraminiferal zones. Many of the 24 Andaman-Nicobar datum levels comparable with those established for equatorial Pacific, but some are different)

Srinivasan, M.S. & B.K. Chatterjee (1981)- Stratigraphy and depositional environments of Neogene limestones of Andaman-Nicobar Islands, Northern Indian Ocean. *J. Geological Society India* 22, 11, p. 536-546.

(On rel. widespread E Miocene- Pleistocene limestones of Andaman-Nicobar islands)

Srinivasan, M.S. & A. Dave (1984)- Neogene sequences of Long Island: their bearing on the Late Miocene paleoceanography of the Andaman Sea. In: R.M. Badva et al. (eds.) *Proc. 10th Indian Coll. Micropaleontology and Stratigraphy*, Pune 1982, p. 433-444.

Srinivasan, M.S. & V. Sharma (1969)- The status of late Tertiary foraminifera of Car Nicobar described by Schwager in 1866. *Micropaleontology* 15, p. 107-110.

(Brief revision of taxonomy of Late Tertiary foraminifera described by Schwager (1866) from Car Nicobar Island samples collected during 1858 Novara Expedition)

Srinivasan, M.S. & V. Sharma (1969)- Miocene foraminifera from Hut Bay, Little Andaman Island, Bay of Bengal. *Cushman Foundation Foraminiferal Research* 20, 3, p. 102-105.

(online at: <https://cushmanfoundation.allenpress.com/portals/default/files/pubarchive/CCFFR/20ccffr3.pdf>)
(Brief paper listing 86 species of bathyal (probably >600m water depth) small benthic and 25 species of planktonic forams (70% of fauna) in Late Miocene (Tortonian) of Little Andaman Island. No figures)

Srinivasan, M.S. & V. Sharma (1973)- Stratigraphy and microfauna of Car-Nicobar, Bay of Bengal. *J. Geological Society India* 14, 1, p. 1-11.

Srinivasan, M.S. & V. Sharma (1980)- Schwager's Car Nicobar foraminifera in the reports of the Novara Expedition: a revision. *Today & Tomorrow's Publ.*, New Delhi, p. 1-83.

(Revision of taxonomy of deep marine foraminifera originally described in classic work of Schwager (1866) on material collected by Austrian Novara Expedition in 1858, probably from E Pliocene (N19) Sawai Bay Fm)

Srinivasan, M.S. & S.S. Srivastava (1975)- Late Neogene biostratigraphy and planktonic foraminifera of Andaman- Nicobar Islands, Bay of Bengal. In: T. Saito & L.H. Burckle (eds.) *Late Neogene Epoch boundaries*, Micropaleontology Press, Special Publ. 1, p. 124-161.

Sriram, G., P. Dewangan, V. Yatheesh, A. Peketi, P. Mahesh, A. Mazumdar, V.P. Mahale, J. Jacob et al. (2023)- Gas migration signatures over the volcanic cratered seamount, off the Nicobar Islands in the Andaman Sea. *Geo-Marine Letters* 43, 3, 16, p. 1-10.

(online at: https://www.researchgate.net/publication/373160508_Gas_migration_signatures_over_the_volcanic_cratered_seamount_off_the_Nicobar_Islands_in_the_Andaman_Sea)

(Submarine volcanic arc off-Nicobar seismologically active. Two gas flares (seeps?) originate from outer flanks of cratered seamount. Seafloor sampling over gas vent shows live Bathymodiolus spp., a chemosynthetic mollusc species typically observed at methane seeps and/or hydrothermal vent sites)

Srisuriyon, K. & C.K. Morley (2014)- Pull-apart development at overlapping fault tips, oblique rifting on a Cenozoic continental margin, Northern Mergui Basin, Andaman Sea. *Geosphere* 10, p. 1, p. 80-106.

(online at: <https://pubs.geoscienceworld.org/gsa/geosphere/article/10/1/80-106/132158>)

(N Mergui Basin contains ENE-WSW to NE-SW striking normal fault-bound basins and NNW-SSE trending strike-slip faults. Two largest strike-slip faults (Manora with 4.5 km offset and Mergui with ~8 km of offset) pass into extensional or transtensional basins at tips, consistent with dextral offset. Strike-slip and extensional faulting. N part of Mergui Basin developed relatively late, in E Miocene, following WNW-ESE extension in Oligocene in S Mergui Basin, indicating rotation in extension direction to NNW-SSE with time. Basin part of major transtensional system involving Sumatra, W Andaman and Sagaing faults that accommodated N motion of W Myanmar as India moved N relative to SE Asia)

Srivastava, D.K. (2010)- Tectonic evolution of Andaman Arc system and its hydrocarbon prospectivity. In: S. Ibotombi (ed.) *Indo-Myanmar Ranges in the tectonic framework of the Himalaya and Southeast Asia*, Proc. National Seminar 2008, Memoir Geological Society India, Bangalore, 75, p. 45-54.

Srivastava, D.K., A. Dave & V. Dangwal (2021)- Sequence stratigraphy of the Andaman Basin, northern Indian Ocean. *Marine and Petroleum Geology* 133, 105298, p.

(Andaman Basin polyhistory basin with sedimentary record from Late Cretaceous- Recent. Three first-order sequences: Late Cretaceous- Eocene (Late Cretaceous ocean floor pelagics, Paleogene accretionary prism formation and subduction), Oligocene (major uplift and emergence of Andaman island chain, >2000km of Andaman Flysch) and Neogene)

Srivastava, R.K., R. Chandra & A. Shastry (2004)- High-Ti type N-MORB parentage of basalts from the South Andaman ophiolite suite, India. *J. Earth System Science* 113, p. 605-618.

(online at: www.ias.ac.in/public/Volumes/jess/113/04/0605-0618.pdf)

(Complete dismembered ophiolite sequence exposed in S Andaman region, comprising ultramafic cumulates, serpentinite mafic plutonic and dyke rocks, pillow lava, radiolarian chert and plagiogranite. Basaltic pillow lavas major part of Mesozoic Andaman ophiolite suite. They can be classified as high-Ti type basalt and are similar to N-MORB basalts emplaced in mid-oceanic ridge tectonic setting)

Streck, M.J., F. Ramos, A. Gillam, D. Haldar & R.A. Duncan (2010)- The intra-oceanic Barren Island and Narcondam Arc volcanoes, Andaman Sea: implications for subduction inputs and crustal overprint of a depleted mantle source. In: J. Ray et al. (eds.) *Topics in Igneous Petrology*, Springer Verlag, p. 241-273.

(Active Barren Island and Pleistocene Narcondam volcanoes are only two subaerially exposed Andaman arc volcanoes, rising from 1000- 2300m deep seafloor of Andaman Sea, and associated with subduction of Indian plate beneath Burma plate. Lavas at Barren Island basalt to andesite, Narcondam volcano andesite to silicic andesite/dacite. Isotopic values from Barren Island likely caused by assimilation of extended continental crust and/or sediments from Irrawaddy Delta fan at Myanmar continental margin)

Subrahmanyama, C., R. Gireesh, S. Chand, K.A.K. Raju & D.G. Rao (2008)- Geophysical characteristics of the Ninetyeast Ridge-Andaman island arc/trench convergent zone. *Earth Planetary Science Letters* 266, p. 29-45.

(Ninetyeast Ridge strongly positive gravity anomalies and causing prominent break in continuity of gravity low of Andaman island arc trench. Ninetyeast Ridge is at starting phase of collision with island arc and may not have started affecting subduction process itself)

Thompson, P. (2018)- From Indonesia to Myanmar: a review of seismic images across the Indo-Australian/Sunda plate margin: The anatomy of a subduction zone in space & time. Third AAPG/EAGE/MGS Oil and Gas Conference, Yangon 2017, Search and Discovery Article 30552, p. 1-43.

(online at: http://www.searchanddiscovery.com/documents/2018/30552thompson/ndx_thompson.pdf)

(Series of 11 previously published seismic profiles across Sunda subduction thrench- accretionary prism-forearc from North Sumatra- Andaman Islands- Myanmar. Plate margin changes from subduction margin in S to transform margin in N. May have been wholly subduction margin until ~25Ma)

Tintakorn, N., P. Pananont, T. Mahattanachai & P. Charusiri (2012)- Analysis of geologic structures in the Southern Mergui Basin, Andaman Sea. *Bull. Earth Sciences Thailand (BEST)* 5, 1, p. 68–88.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246554/167606>)

(2D seismic interpretation of S part of Late Oligocene and younger Mergui Basin in Andaman Sea offshore Peninsular Thailand, on W edge of Sundaland (opening S-ward in N Sumatra Basin))

Tipper, G.H. (1911)- The geology of the Andaman Islands with references to the Nicobars. *Memoirs Geological Survey India* 35, 4, p. 195-222.

(Incl. occurrence of 'jaspers', quartzites, and pink and white porcellaneous limestones, sometimes as isolated exposures in Eocene, but occasionally in association with serpentines)

Tripathi, S.K. (2014)- Biogenic sediment distribution around south of Central Andaman Trough, Andaman Sea: Signatures from micropaleontological studies. *Indian J. Geosciences* 68, 4, p. 337-346.

(online at: www.researchgate.net/publication/283255348_Biogenic_sediment_distribution_around_sou_Etc.)

(In Andaman Sea, calcareous oozes with 80% planktonic foraminifera on Sewell Rise (~900m water depth) and Mergui Ridge, siliceous ooze (80% radiolaria) in intervening East Basin (2500m water depth))

Tripathi, S.K., A. Carter, A. Dhar, Resmi S. & B. Ghosh (2025)- Geochemistry of volcanic rocks from the Andaman Sea: Insights into the nature of back-crust. *Lithos* 492-493, 107870, p.

(Volcanic rocks of Andaman subduction zone span entire basalt-andesite-dacite-rhyolite range. Samples from Narcondam (Northern arc), Southern arc, Sewell Rise and Alcock Rise are calc-alkaline in nature whereas Barren Island volcanics and mafic rocks (S arc) are tholeiitic. Previous suggestions that hyperextended Sundaland crust existed below much of N arc, S arc, Alcock and Sewell Rises and later covered by volcanic material is supported by inherited zircons with ages of 250, 320, 460–690, 800–1100, and 1400 Ma. These fit with Malay-Sundaland as main source of crustal contamination.)

Tripathi, S.K., M. Chaturvedi, T. Koley & R. Sathikumar (2021)- An approach to establishing the age of carbonate rock over Alcock Rise, the Andaman Sea through foraminiferal proxy. *J. Palaeontological Society India* 66, 2, p. 214-234.

(online at: <https://palaeontologicalsociety.in/publication.php>)

(Carbonate sample from S part of Alcock Rise in water depth of 258m is limestone with planktonic and benthic foraminifera, etc., in lime mud matrix. Mixed Early to Late Miocene planktonic foram assemblage points to very slow pelagic carbonate precipitation in area since formation of Alcock Rise in E Miocene)

Tripathi, S.K., R.V. Manoj, M. Chaturvedi & R. Sathikumar (2022)- Ash layers from South Andaman Sea: probably sourced from Toba caldera. *Bulletin of the Marine Geology* 37, 1, p. 11-20.

(online at: www.researchgate.net/publication/363697794_ASH_LAYERS_FROM_SOUTH_ANDAMAN_Etc.)

(Deep Sea sediment core PC-1 from S Andaman Sea in water depth of 3144m contain discrete ash layers that can be tied to Youngest Toba Tuff (YTT; at 2.10- 2.66m; 56cm thick), Middle Toba Tuff (MTT; 13.5- 14.5m) and Oldest Toba Tuff (OTT; 18-24m core depth))

Valdiya, K.S. (2015)- Andaman island arc and back-arc sea. In: *The making of India- Geodynamic evolution*, 2nd Ed., Soc. Earth Scientists Series, Springer, p. 707-722.

(850km-long chain of islands between Bay of Bengal and Andaman Sea central part of 5000-km-long Myanmar-Indonesia Mobile Belt, related to active subduction zone. Andaman Island Arc two parallel arcuate belts: W arc of >300 islands of Andaman, Nicobar and Mentawai groups, made of U Cretaceous-Tertiary flysch, with ophiolites at various structural levels. Etc.)

Venkatesan, M.I., E. Ruth, P.S. Rao, B.N. Nath & B.R. Rao (2003)- Hydrothermal petroleum in the sediments of the Andaman Backarc Basin, Indian Ocean. *Applied Geochemistry* 18, 6, p. 845-861.

(Recent sediment cores of Andaman Basin between Andaman Nicobar islands and Malay Peninsula analyzed for biomarkers. Hydrocarbons of hydrothermal origin present, derived from predominantly marine organic matter with some terrestrial input. Thermal maturity of bitumen comparable to or lower than that of other hydrothermal regions such N Juan de Fuca Ridge, Guaymas Basin and Escanaba Trough)

Verma, R.K., M. Mukhopadhyay & N.C. Bhuiin (1979)- Seismicity, gravity and tectonics in the Andaman Sea. In: S. Uyeda, R.W. Murphy & K. Kobayashi (eds.) *Geodynamics of the Western Pacific*, Proc. Int. Conference Geodynamics of the Western Pacific- Indonesian Region, *J. Physics of the Earth* 26, Suppl., p. 233-248.

(online at: https://www.jstage.jst.go.jp/article/jpe1952/26/Supplement/26_Supplement_S233/_pdf)

(Early paper documenting active subduction zone of Indian Ocean Plate under Andaman Sea Basin)

Verma, S., A. Das, Sachin R. & T. Pal (2023)- Preliminary appraisal of deformation structures from Great Nicobar Island, Andaman-Sumatra arc system. *Results in Earth Sciences* 1, 100007, p. 1-4.

(online at: <https://www.sciencedirect.com/science/article/pii/S2211714823000079>)

(Andaman and Nicobar Islands topographic high of forearc sediments in actively deforming accretionary prism on Andaman subduction margin. General Andaman-Nicobar island chain stratigraphy: (a) Lower Cretaceous pre-ophiolitic rock; (b) U Cretaceous Andaman Ophiolite; (c) M Paleocene- M Eocene Mithakari Melange (d) Oligocene- E Miocene Andaman Flysch Gp and (e) E Miocene- Quaternary Archipelago Gp. On Great Nicobar Island only upper part of Ophiolite and Andaman Flysch- Archipelago Groups. Compressional deformation)

Wang, H, F. Lv, G. Fan, C. Mao & H. Ma (2011)- Geological conditions and accumulation mechanism of shallow biogenic gas reservoirs in Andaman Basin. AAPG Annual Convention Exh., Houston 2011, Search and Discovery Article, p. 1-16. (Abstract + Presentation)

(online at: www.searchanddiscovery.com/documents/2011/10343wang/ndx_wang.pdf)

(Many shallow biogenic gas reservoirs in Miocene-Pleistocene strata in Andaman offshore area. Large biogenic gas field Zawtika 1A in Block M09 discovered in 2007, with >2 TCF proven gas reserves. Reservoirs Miocene-Pliocene delta front sandstones at 750-1580m depth, and shallower biogenic gas reservoirs in Pleistocene with burial depths <500m)

Washington, H.S. (1924)- The lavas of Barren Island and Narcondam. American J. of Science (5), 7, 42, p. 441-456.

(online at: <https://ajsonline.org/api/v1/articles/135647-the-lavas-of-barren-island-and-narcondam.pdf>)

(Two small volcanic islands in E part of Bay of Bengal, E of Andaman islands (the only active volcanoes in India). Likely northern extension of Sunda Arc. Etc.)

Weeks, L.A., R.N. Harbison & G. Peter (1967)- The island arc system in Andaman Sea. American Assoc. Petroleum Geol. (AAPG) Bull. 51, 9, p. 1803-1815.

(Early sparker survey in Andaman Sea delineated continuation to N of Sumatra volcanic arc system over 1100 km (foredeep, outer sedimentary island arc, inner volcanic arc with rift valley and backdeep))

Yadav, R. & V.M. Tiwari (2020)- Lithospheric framework of Sumatra-Andaman Subduction zone- a review. In: J.S. Ray & M. Radhakrishna (eds.) The Andaman Islands and adjoining offshore: geology, tectonics and palaeoclimate. Springer Nature Switzerland, p. 137-159.

(online at: www.researchgate.net/publication/339572475_Lithospheric_Framework_of_Sumatra-A_Etc)

(Geometry of Sumatra-Andaman subduction zone, structure of accretionary prism and Benioff zone variable along subduction axis: broad accretionary prism area in C region (~0-10° N); variations in lithospheric thickness of Indo-Australian plate; steeper subducting slab in Andaman region compared to Sumatra; missing subducting slab in N Andaman region; trench-parallel seismic anisotropy in Andaman-Nicobar in contrast to trench-perpendicular in Sumatra region, and deeper Moho under Ninety East Ridge)

Zaw, K., S.K. Acharyya & H. Maung (1989)- Comments and Reply on "Transcurrent movements in the Burma-Andaman Sea region". Geology (GSA) 17, 1, p. 93-98.

(Commentary and Reply on Maung (1987) paper)

Zhang, P., L. Mei, P. Xiong, X. Hu, R. Li & H. Qiu (2017)- Structural features and proto-type basin reconstructions of the Bay of Bengal basin: a remnant ocean basin model. J. of Earth Science (China) 28, 4, p. 666-682.

(online at: <http://en.earth-science.net/PDF/20170721112257.pdf>)

(Bay of Bengal Basin remnant ocean basin between E continental margin of India to W and Sunda trench-arc system to E. Prominent down flexure structures caused by huge amount of Bengal fan turbidite sediments accumulation. Transition from ocean basin to remnant ocean basin in Late Oligocene)

IX.2. Malay Peninsula, Singapore

Relevance for Indonesia:

- NE Sumatra (Sibumasu terrane),
- Bangka-Belitung Tin Islands, northern Sunda Shelf (Paleotethys suture and Indochina terrane),

Abdullah, I. (2004)- On the presence of pre-Carboniferous metasediments in the Eastern Belt: a structural view. Bull. Geological Society Malaysia 49, p. 79-84.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004014.pdf>)

Oldest rocks of Peninsular Malaysia E Belt Carboniferous in low-grade metaclastic facies, unconformably overlain by Late Permian continental deposits with plants, intruded by Permo-Carboniferous mafic-intermediate igneous rocks, followed by Late Permian-E Triassic biotite granite, Late Triassic granite and Jurassic-Cretaceous dolerite dykes. Most metasediments two episodes of folding. In certain areas three generations of folding, older phase probably developed in mid- Devonian)

Abdullah, N.T. (1993)- The occurrence of Upper Permian foraminifers in Northwest Pahang. Proc. Annual Geological Conference'93, Warta Geologi 19, 3, p. 112. (Abstract Only)

(Middle- upper parts of lower limestone in Modal quarry at Gua Panjang (NW Pahang) contains U Permian foraminifera Palaeofusulina, Reichelina and Colaniella)

Abdullah, N.T. (2009)- Mesozoic stratigraphy. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 87-131.

(Mesozoic on Malay Peninsula mainly Triassic (incl. 'Tethyan' limestones and redbeds) and U Jurassic- Lower Cretaceous redbeds. U Cretaceous absent)

Abdullah, N.T. & A.H. Abdul Rahman (2009)- Discovery of Upper Permian carbonates from the Kenong Wildlife Reserve, Pahang, Malaysia. Bull. Geological Society Malaysia, 38, p. 79-89.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1995008.pdf>)

(Outcrops of U Permian in N Pahang, C Malay Peninsula. Late Permian carbonates in Kenong Reserve associated with marine shales and common volcanoclastics of M Permian- M Triassic 'Guang Musang Fm'. With common algae, rare, rel. advanced Palaeofusulina, Reichelina, Colaniella cf. parva, Paraglobivalvulina)

Abdullah, W.H. & P. Abolins (1998)- Organic petrological and organic geochemical characterisation of the Tertiary coal-bearing sequence of Batu Arang, Selangor, Malaysia. J. Asian Earth Sciences 16, 4, p. 351-367.

(Selangor Batu Arang Tertiary coal-bearing sequence with oil shales dominated by Botryococcus-derived telalginite and Pediastrum-derived lamalginite. Coals hypautochthonous in origin, mainly duroclarite-type. Both thermally immature. Remarkably, oleanane and bicadinanes, linked to angiosperm plants, not observed)

Adenan, Noorhashima B., C.Aziz Ali & K.R. Mohamed (2013)- Dolomites petrography and geochemistry of the Chuping Formation, Malaysia. Proc. Universiti Kebangsaan Malaysia FST Postgraduate Colloquium, Selangor 2013, AIP Conference Proceedings 1571, p. 445-453.

(online at: <https://aip.scitation.org/doi/abs/10.1063/1.4858696>)

(Permian-Triassic Chuping Limestone exposed mainly in NW part of Malay Peninsula, conformably overlying clastic rocks of glacio-marine Singa Fm (= Sibumasu terrane stratigraphy; JTvG). Mainly massive and unfossiliferous (except at base) limestone, including two types of dolomites, formed during shallow and late burial diagenesis)

Adenan, Noorhashima B., C. Aziz Ali & K.R. Mohamed (2014)- Diagenetic history of the Chuping Limestone at Bukit Tungku Lembu, Perlis, Malaysia. Geological Society Malaysia, Proc. National Geoscience Conference (NGC), Trengganu 2014, P025, p. 86-94.

(online at: <https://gsm.org.my/articles/702001-100318/>)

(E Permian- Late Triassic Chuping Lst in Perlis, NW Malay Peninsula (= Ratburi Lst of Thailand) with 6 six major microfacies. Four dagenetic processes (1) micritization; (2) early marine fibrous rim calcite cements; (3)

burial diagenesis (mechanical compaction, formation of stylolites, cementation, dolomitization); (4) meteoric phreatic cementation. Deeper burial produced dissolution seams and stylolites, and dolomitization)

Adenan, Noorhashima B., C.Aziz Ali & K.R. Mohamed (2017)- Diagenetic history of the Chuping Limestone at Bukit Tungku Lembu, Perlis, Malaysia. *Sains Malaysiana* 46, 6, p. 887-895.

(online at: http://www.ukm.my/jsm/pdf_files/SM-PDF-46-6-2017/07%20Noorhashima.pdf)

(Same title as paper above)

Agematsu, S. (2010)- Establishment of the Lower to Middle Ordovician biostratigraphy on the Langkawi Islands, Malaysia. *J. of Geography (Chigaku Zasshi)* 119, 5, p. 872-877.

(online at: https://www.jstage.jst.go.jp/article/jgeography/119/5/119_5_872/_pdf)

(Japanese with English summary. 18 species of late Early- early M Ordovician conodonts in Kaki Bukit Fm in Lagoon Island, NE Langkawi Islands, deposited on shelfal carbonate platform. E Ordovician conodonts from SE Asia belong to Australian province)

Agematsu, S., K. Sashida & A.B. Ibrahim (2008)- Biostratigraphy and paleobiogeography of Middle and Late Ordovician conodonts from the Langkawi Islands, northwestern peninsular Malaysia. *Journal of Paleontology* 82, p. 957-973.

(M-Upper Ordovician limestones of Langkawi Islands 20 species of conodonts in four biostratigraphic zones. M Ordovician fauna belongs to low-latitude Australian Province (part of Sibumasu Block). M Arenigian deposited on shallow-water shelf, Late Arenigian- M Darriwilian limestones formed in hemipelagic deeper-water conditions)

Alexander, F.E.S. (1950)- The geology of Singapore and surrounding islands. In: Report on the availability of granite on Singapore and the surrounding islands, Appendix 1, Singapore Government Press, p. 1-24.

Alexander, J.B. (1956)- Malaisie. In: *Lexique stratigraphique international*, Stratigraphic Commission, International Geological Congress, Paris, III (Asie), Fasc. 6, p. 1-33.

(First edition of North Borneo stratigraphic lexicon; see also second edition by Fitch (1961))

Alexander, J.B. (1959)- Geology and palaeontology in Malaya: Pre-Tertiary stratigraphic succession in Malaya. *Nature* 183, p. 230-231.

(Early summary of Cambrian- Cretaceous stratigraphy of Malay Peninsula)

Alexander, J.B. (1968)- The geology and mineral resources of Bentong, Pahang and adjoining portions of Selangor and Negri Sembilan, incorporating an account of the prospecting and mining activities of the Bentong district. Geological Survey Department West Malaysia, Ipoh, Memoir 13, p. 1-250.

(Strata dip generally WNW and are tightly folded. Oldest rocks (Schist Series) are schists and phyllites lying immediately E of Main Range granite. They are overlain by Older Arenaceous Series (Bentong Gp quartzite, conglomerate, shales and bedded radiolarian chert, followed by Calcareous Series (Raub Group mudstone with intermediate tuffs and lenses of crystalline limestone) and Younger Arenaceous Series (Lipis Gp). Pyroclastics and lavas are referred to Pahang Volcanic Series. Main Range granite mainly biotite alkali granite)

Alexander, J.B., V. Sethaput, T.H. Holland, M.S. Krishnan & K. Jacob (1956)- Malaya/ Thailand/ Burma. *Lexique Stratigraphique International*, International Geological Congress, Commission de Stratigraphie, Paris, III, Asie 6B-6C-6D, p. 1-115.

(Stratigraphic lexicon of Malaya, Thailand and Myanmar)

Ali, M.A.M., E. Willingshofer, L. Matenco, T. Francois, T.P. Daanen, T.F. Ng, N.I. Taib & M.K. Shuib (2016)- Kinematics of post-orogenic extension and exhumation of the Taku Schist, NE Peninsular Malaysia. *J. Asian Earth Sciences* 127, p. 63-75.

(Triassic Indosinian orogen in Peninsular Malaysia with significant post-orogenic extension. Taku Schist, Kemahang granite and Gua Musang sediments of N Peninsular Malaysia (E of Bentong-Raub suture?). Three phases of compressional deformation, with metamorphism of Taku mica schist to amphibolite facies, mainly

from Paleozoic clastic sediments with some mafic intercalations, equivalent to ones exposed in Bentong-Raub suture zone. Serpentinities near W contact between schist and overlying Gua Musang Fm M Permian- U Triassic forearc basin clastics and volcanics. Triassic (~227 Ma). Kemahang syn-kinematic granite. Shortening followed by extension in NW-SE direction, resulting in large Taku detachment (age of exhumation uncertain). Extension probably reactivated former subduction plane as detachment and exhumed previously buried and metamorphosed rocks)

Alkhali, H.A. & C.W. Sum (2015)- The Kati Formation: a review. In: M. Awang et al. (eds.) 3rd Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2014), Kuala Lumpur 2014, Springer Verlag, p. 303-312.

(Review of stratigraphic nomenclature of intensely folded Permo-Carboniferous deep marine shales and sandstones of Kati Fm of W Malay Peninsula. Estimated thickness 800-900m. More intensely folded and probably older than Triassic Semanggol Fm; interpreted as equivalent of Kubang Pasu Fm in NW and Kenny Hill Fm of KL area. Flute casts suggest source from N-NW)

Almashoor, S.S. (1996)- The Benta migmatite complex revisited. *Warta Geologi* 22, 3, p. 227. (Abstract) (online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1996003.pdf>) (Abstract only. Re-interpretation of Hutchison 1971; see also Umor & Almashoor 2000))

Altermann, W., N.A. Harbury, M.E. Jones, M.G. Audley-Charles, K.R. Mohamed & I. Metcalfe (1991)- Discussion on structural evolution of Mesozoic Peninsular Malaysia. *J. Geological Society*, London 148, p. 417-419.

(Discussion of Harbury, Jones et al. (1990) paper and replies. Mainly on age of Raub Bentong suture)

Aminuddin, M.I.K.A., N.I. Setiawan, I.W. Warmada, K.S. Ariffin & K. Yonezu (2020)- Petrography and geochemistry of metasedimentary rocks from the Taku Schist in Kelantan, North-East Peninsular Malaysia. *J. Applied Geology (UGM)* 5, 2, p. 124-140.

(online at: <https://jurnal.ugm.ac.id/jag/article/download/61183/30351>)

(Taku Schist in NE Peninsular Malaysia is N-S oriented elongated body of metasediments, presumably former cover of Sibumasu Plate and now part of Bentong-Raub suture. Metamorphic evolution starts with Indosinian orogeny (Permo-Triassic convergence of Sibumasu continental unit and Sukhothai island arc upper plate), followed by contact metamorphism from Triassic and Late Cretaceous (Kemahang) granite intrusions)

Anaschinda, P. (1978)- Tin mineralization in the Burmese-Malayan Peninsula- a plate tectonic model. In: P. Nutalaya (ed.) *Proc. 3rd Reg. Conf. Geol. Mineral Res. SE Asia (GEOSEA III)*, Bangkok 1978, p. 293-299.

(Early plate tectonic model of Malay Peninsula granite belts, with Late Triassic collision of W and E Malaya blocks along Bentong- Raub ophiolite belt)

Arbain, N.A., Q.L. Xiang & A.A Ghani (2017)- Geochemistry of Ordovician to Silurian felsic volcanic from Gerik, Peninsular Malaysia. *Proc. 30th National Geoscience Conference Exhib. (NGC 2017)*, Kuala Lumpur, PDRG13-77, *Warta Geologi (Newsletter Geological Society Malaysia)* 43, 3, p. 309. (Abstract only)

(online at: https://gsm publ.files.wordpress.com/2017/09/ngsm2017_032.pdf)

(Record of Late Ordovician- E Silurian (~488-450 Ma) rhyolitic volcanics in W Belt of Malay Peninsula (Sibumasu Terrane). Geochemistry of S-type arc volcanics)

Ariffin, K.S. (2009)- Sediment hosted primary tin deposit associated with biotite granite and fault zone at Gunung Paku, Klian Intan, Upper Perak, Malaysia. *Resource Geology* 59, 3, p. 282-294.

(Gunung Paku in Perak is primary tin deposit in Malaysia, mined for >200 years. Located in W Tin belt of Peninsular Malaysia, associated with biotite granite (184-230 Ma; Late Triassic- E Jurassic) of Main Range granitoids. Primary tin mineralization associated with sheet-like quartz vein systems parallel to strike of host rocks, formed in low-metamorphic metasediments rock of Paleozoic Baling Fm. Mineralized veins range from quartz-cassiterite, quartz-tourmaline-cassiterite to complex quartz-cassiterite-polymetallic sulfide veins)

- Ariffin, K.S. (2012)- Mesothermal lode gold deposit Central Belt Peninsular Malaysia, In: I.A. Dar (ed.) Earth Sciences, Intechopen, p. 313-342. (online at: http://cdn.intechopen.com/pdfs/27599/InTech-Mesothermal_lode_gold_deposit_central_belt_peninsular_malaysia.pdf)
(Gold mineralization in Malay Peninsula Central Belt are low mesothermal lode gold deposits associated with accretionary prism along Raub-Bentong Suture. Mineralization took place within Permian-Triassic island arc system during collision of Sibumasu block underneath E Malaya (Indochina))
- Ariffin, K.S. & N.J. Hewson (2007)- Gold-related sulfide mineralization and ore genesis of the Penjom gold deposit, Pahang, Malaysia. Resource Geology 57, 2, p. 149-169.
(Penjom gold deposit ~20km E of Raub-Bentong Suture zone, Kuala Lipis, Pahang. Within C Belt of Permian-Lower Triassic Padang Tungku Fm argillaceous marine clastics with thin limestones and Pahang Volcanic Series intermediate to acid volcanoclastics and subordinate rhyolitic lava sequences. Intruded by tonalite and quartz porphyry. Penjom gold deposit associated with Tertiary volcanic and hydrothermal activity)
- Arman, M. (1978)- Cassiterite distribution patterns in a nearshore area off Perlak, Peninsular Malaysia. United Nations- ESCAP, CCOP, Technical Bulletin 12, p. 33-42. (online at: <https://repository.unescap.org/server/api/core/bitstreams/5863e474-3590-41cc-aaa8-f671730d78a3/content>)
(Perak offshore area with cassiterite either in Quaternary valley fills over bedrock or within narrow littoral zone parallel to granite cliff along coast)
- Asama, K. (1973)- Lower Carboniferous Kuantan Flora, Pahang, West Malaysia. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 11, p. 109-118.
(Lower Carboniferous (Visean) flora from Raub series near Kuantan, East coast Malay Peninsula. This warm-humid 'Kuantan flora' is on East Malaya/ Indochina Block and contains *Lepidodendron* spp., *Stigmaria*, etc.)
- Asnachinda, P. (1978)- Tin mineralization in the Burmese-Malayan Peninsula. In: P. Nutalya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 293-299.
- Aung, A.K. & J. Azmi (2014)- *Yatsengia jengkaensis*- a new yatsengioid rugose coral from the “Jenga Pass Limestone”, Pahang, central Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 40, 1-2, p. 1-6.
(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100339-PDF.pdf)
(*Yatsengia jengkaensis* n.sp. rugose coral from early M Permian (Wordian) Jengka Pass Limestone, ~24km E of Temerloh and 8km E of Bukit Kepayang, Pahang, C Peninsular Malaysia (= W margin of Indochina Plate). Jengka Fm steeply folded. Associated with fusulinids *Neoschwagerina katoi*, *Verbeekina verbeeki* and *Sumatrina annae*, *Pseudofusulina*, etc., indicating M Permian age. Also with corals *Michelinia* cf. *indica* and *Parawentzelella socialis* and dasyclad algae *Mizzia* sp.)
- Aung, A.K., Ng T. Fatt, K.K. Nyein & M.H. Zin (2013)- New Late Permian rugose corals from Pahang, Peninsular Malaysia. Alcheringa 37, 4, p. 1-13.
(online at: https://www.researchgate.net/publication/263074822_New_Late_Permian_rugose_corals_from_Pahang_peninsular_Malaysia)
(Late Permian rugose solitary corals *Iranophyllum aequabilis* and *I. pahangense* from limestone lens in Gua Musang Fm, Selborne Estate, Padang Tengku, Pahang (Central Malay Peninsula), belonging to *Waagenophyllidae* (*Waagenophyllum*, *Iranophyllum*). Associated with rich Late Permian Paleofusulina-Colaniella- Reichelina foraminiferal fauna, indicating Changhsingian age)
- Aung, A.K., Ng T. Fatt & K.K. Nyein (2012)- The first record of the Late Permian waagenophyllid rugose corals from Pahang, Central Peninsular Malaysia. Geological Society Malaysia, Proc. National Geoscience Conference, Kuching 2012, Paper A1, p. 7-8. (Extended Abstract)
(online at: <https://gsm.org.my/articles/702001-101659/>)
(Late Permian solitary waagenophyllid rugose corals from limestone unit of Gua Musang Fm in Selbourne Estate, Padang Tengku area, Pahang, C Peninsular Malaysia. One new genus, 5 new species. First record of *Iranophyllum* in Malaysia. See also Aung et al. 2013)

Aung, A.K., Meor H.A. Hassan & Ng T. Fatt (2013)- Discovery of Late Devonian (Frasnian) conodonts from the “Sanai limestone”, Guar Jentik, Perlis, Malaysia. Bull. Geological Society Malaysia 59, p. 93-99.

(online at: www.gsm.org.my/products/702001-100325-PDF.pdf)

(First record of Late Devonian (Frasnian) conodonts (*Ancyrodella*, *Ancyrognathus*, *Palmatolepis*, *Polygnathus*, *Icriodus*, *Ozarkodina* and *Belodella*) of linguiformis Zone from U Sanai Lst, Perlis, Malaysia. Limestone dips 60° NE, is pelagic with common tentaculitids, straight nautiloids, trilobites and bivalves. Sanai Lst limited distribution in Malaysia. Frasnian conodonts comparable to fauna (linguiformis Zone) of NW Thailand)

Aung, A.K. & M.K. Shuib (2013)- Similarities in Middle-Late Permian fossils from Myanmar and Malaysia and its paleogeographic implications. Proc. National Geoscience Conference, Ipoh 2013, Geological Society Malaysia, B14, p. 87-88. (Abstract only)

(online at: www.gsm.org.my/products/702001-101658-PDF.pdf)

(M-L Permian rugose corals from 'Plateau Limestone' of Myanmar (Sibumasu Block) include *Thomasiphyllum* ('Cimmerian' province) and *Wentzellophyllum*, suggesting mixed Cimmerian (Sibumasu) and Cathaysian provinciality in M Permian and imply M Permian Paleo-Tethys is only narrow seaway that probably closed by collision in Late Permian)

Aung, A.K., K. Simon & Ng T. Fatt (2011)- Permian foraminiferal assemblages from the limestone unit of the Gua Musang Formation in the Padang Tengku area, Pahang, Malaysia. Proc. 24th Annual National Geoscience Conference (NGC2011), Johor Baru, P2-19, p. 142. (Abstract)

(online at: http://geology.um.edu.my/gsmpublic/NGC2011/NGC2011_Proceedings.pdf)

(Permian Gua Musang Fm limestone in Selbourne Estate, 4 km NW of Padang Tengku, Pahang, C Malay Peninsula, with 18 smaller foram genera: *Tetrataxis*, *Reichelina*, *Climacammina*, *Geinitzina*, *Dagmarita*, *Pachyphloia*, *Globivalvulina*, *Paleotextularia*, *Ozawainella*, *Pseudokahlerina*, *Colaniella*, *Langella*, etc. *Fusulinids* absent. Similar assemblages in M-U Permian of E Malay Peninsula, Phra Nang Bay of Peninsular Thailand, Plateau Limestone of E Myanmar, etc. Assemblages assigned to late M- early Late Permian)

Aw, P.C. (1990)- Geology and mineral resources of the Sungai Aring Area, Kelantan Darul Naim. Geological Survey of Malaysia, District Memoir 21, p. 1-116.

Aw, P.C., K. Ishii & Y. Okimura (1977)- On *Palaeofusulina*- *Colaniella* fauna from the Upper Permian of Kelantan, Malaysia. Transactions Proceedings Paleontological Society of Japan, N.S, 104, p. 407-417.

(online at: https://www.jstage.jst.go.jp/article/prpsj1951/1977/104/1977_104_407/pdf)

(First record of uppermost Permian fusulinids (*Palaeofusulina* cf. *bella*, *Reichelina*, also *Colaniella media* and *C. parva*) in Malay Peninsula. In folded, WSW-dipping argillo-tuffaceous limestone interbedded with tuffs of Sungei Paloh, Lebir River area of S Kelantan, S of Kotabaru (= W margin of E Malaya Block?). Overlain by E Triassic with bivalve *Claraia*)

Aziz Ali, C., K.R. Mohamed, M.S. Leman, M.S.; I. Komoo & T. Unjah (2008)- Field guide to geology of Langkawi Geopark. Institut Alam Sekitar dan Pembangunan, Universiti Kebangsaan Malaysia, Selangor, p. 1-82.

Aziz Ali, C., M.S. Leman & K.R. Mohamed (2004)- Fasies karbonat dan diagenesis di dalam batu kapur Bukit Biwah dan Bukit Taat, Kenyir, Ulu Terengganu. Bull. Geological Society Malaysia 49, p. 61-65.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004011.pdf>)

(Carbonate facies and diagenesis of M Permian shallow marine limestones in Terengganu province, NE Malay Peninsula)

Aziz Ali, C. & K.R. Mohamed (2013)- Microfacies and diagenesis in the Setul Limestone in Langkawi and Perlis. Bull. Geological Society Malaysia 59, p. 59-66.

(online at: <http://gsmpubl.files.wordpress.com/2014/08/bgsm2013010.pdf>)

(Ordovician - E Devonian Setul Limestone outcrops in E Langkawi and Perlis seven microfacies. Depositional environments tidal flats to lagoon and shallow subtidal carbonate ramp. Diagenetic environments freshwater phreatic zone, marine phreatic zone, mixing zone and deep burial zone)

Azman, A.G. (2000)- The Western Belt granite of Peninsular Malaysia: some emergent problems on granite classification and its implication. *Geosciences Journal* 4, 4, p. 283-293.

(Western Belt granites of Malay Peninsula considered as exclusively 'S' type granites, but consists of mixed 'I' and 'S' type features. This implies W Belt granites not solely derived from metasediments, but mixed origin of crustal material such as metapelites, greywackes and meta-igneous rocks)

Azmi, A.S., M.S. Ismail, J. Ab Talib & N.M. Samsudin (2020)- Environment of deposition of the Jurassic-Cretaceous continental deposit in Central Pahang (Peninsular Malaysia) by sedimentary facies analysis. *Bull. Geological Society Malaysia* 70, p. 152-162.

(online at: <https://gsm.org.my/products/702001-101855-PDF.pdf>)

(Lower Cretaceous fluvial deposits of Tembeling Gp in outcrops near Jerantut, C Pahang, Malay Peninsula)

Baioumy, H., M.N. Akmal Bin Anuar, M.N.M. Nordin, M.H. Arifin & K. Al-Kahtany (2020)- Source and origin of Late Paleozoic dropstones from Peninsular Malaysia: First record of Mississippian glaciogenic deposits of Gondwana in Southeast Asia. *Geological Journal* 55, 9, p. 6361-6375.

(First record of Lower Carboniferous glacio-marine dropstone-bearing formations in Peninsular Malaysia. Dropstones subrounded-rounded clasts, 0.5-20 cm in size, scattered in red mudstone, black shales, sandstones and shales, and composed of granite, quartzite, and sandstone. Precambrian basement rocks and Cambrian-Ordovician quartzite and sandstones main sources of dropstones. Glaciomarine rocks of Rebak and Chepor Mbs of Singa Fm correlated to E Carboniferous global glaciation of Gondwana. Glaciomarine deposits of Kentut and Bukit Raja Mbs (Singa and Kubang Pasu Fms) correlated with global M Carboniferous glaciation, those of Kubang Pasu Fm, Ulang and Selang Mbs of Singa Fm and Kenny Hill Fm correlative to Late Carboniferous- E Permian glaciation episode known as apex of Late Paleozoic ice Age. Results confirm Sibumasu Terrane remained attached to N Gondwana at least until after the E Permian glacial period)

Baioumy, H., B. Lehmann, A.M.A. Salim, K. Al-Kahtany & A. El-Sorogy (2020)- Geochemical characteristics of black shales from Triassic turbidites, Peninsular Malaysia: Implications for their origin and tectonic setting. *Marine and Petroleum Geology* 113, 104137, p.

(Turbidites from Triassic Semanggol and Semantan Fms in Peninsular Malaysia are black shales deposited in deep marine distal fan setting. TOC values ~3%, from transported terrestrial organic matter, kerogen Type III)

Baioumy, H. & Y. Ulfa (2016)- Facies analysis of the Semanggol Formation, South Kedah, Malaysia: a possible Permian-Triassic boundary section. *Arabian J. Geosciences* 9, 8, 530, p. 1-16.

(NW Malay Peninsula outcrop sections of deep-marine Late Permian- Triassic Semanggol Fm. Common volcanogenic material in Late Permian, probably from E China)

Baioumy, H., Y. Ulfa, M. Nawawi, E. Padmanabhan & M.N.A. Anuar (2016)- Mineralogy and geochemistry of Palaeozoic black shales from Peninsular Malaysia: implications for their origin and maturation. *Int. J. Coal Geology* 165, p. 90-105.

(19 Cambrian- Permian black shale-bearing formations form 25% of sediment cover in Malay Peninsula. Compositions indicate changes in degree of weathering of sediment-source of shales and relatively wet climate in Cambrian, dry in Ordovician, wet from Silurian- Carboniferous, dry in Carboniferous-Permian and relatively wet in Permian. Black shales deposited under reducing conditions. Possible Devonian anoxia. Majority of Paleozoic black shales in Peninsular Malaysia anchimetamorphic and overmature)

Basori, M.B.I. (2014)- Geology and genesis of volcanic-hosted massive sulfide deposits in the Tasik Chini District, Central Peninsular Malaysia. Ph.D. Thesis, University of Tasmania, p. 1-365.

(online at: <http://eprints.utas.edu.au/22747/>)

(Two polymetallic volcanic-hosted massive sulphide deposits in Tasik Chini district ~250km E of Kuala Lumpur in Pahang, in felsic volcano-sedimentary sequence of E Permian island arc of East Malaya Block. E Permian

U-Pb zircon ages of from Bukit Botol (~273, 286, 292 Ma) and Bukit Ketaya (286, 288 Ma) deposits. Also widespread Triassic volcanic- plutonic rocks (Eastern Granite Belt), with zircon ages ~233-242 Ma (Ladinian-Carnian). Massive sulphide deposits are 'kuroko-type' volcanic-hosted seafloor deposits)

Basori, M.B.I., S. Gilbert, R.R. Large & K. Zaw (2018)- Textures and trace element composition of pyrite from the Bukit Botol volcanic-hosted massive sulphide deposit, Peninsular Malaysia. *J. Asian Earth Sciences* 158, p. 173-185.

(Bukit Botol volcanic-hosted massive sulphide deposit in Central Belt of Peninsular Malaysia, in Permian felsic volcanic and volcanoclastic rocks with volcanic arc geochemical signature. Mineralisation sulphide zone at footwall followed by barite lenses and exhalite layers (Fe-Mn ore) at top. Three types of pyrite)

Basori, M.B.I., M.S. Leman, K. Zaw, S. Meffre, R.R. Large et al. (2018)- Implications of U-Pb detrital zircon geochronology analysis for the depositional age, provenance, and tectonic setting of continental Mesozoic formations in the East Malaya Terrane, Peninsular Malaysia. *Geological Journal* 53, 6, p. 2908-2917.

(online at: https://www.researchgate.net/publication/322528254_Implications_of_U-Pb_detrital_zircon_geochronology_analysis_for_the_depositional_age_provenance_and_tectonic_setting_of_continental_Mesozoic_formations_in_the_East_Malaya_Terrane_Peninsular_Malaysia)

(U-Pb geochronology of detrital zircons in continental Late Jurassic or older formations of Central Belt of Peninsular Malaysia (E Malaya Terrane). Bertangga Fm zircon populations Jurassic (139-194 Ma), Permo-Triassic (226-274 Ma), Ordovician-Devonian (372-459 Ma), Neoproterozoic (631-876 Ma), and Mesoproterozoic- Palaeoproterozoic (1.5- 2.6 Ga). Gerek Fm significant Carboniferous grains. Detrital zircons correlate well with regional uplift and erosion to tectonic stability of East Malaya Terrane basin in Mesozoic)

Basori, M.B.I., K. Zaw, G.J. Davidson, S. Meffre & R.R. Large (2020)- Origin of Fe-Mn ± Si layers associated with the Permian volcanic-hosted massive sulphide deposits in the Tasik Chini district, Peninsular Malaysia. *J. Asian Earth Sciences* 192, 104260, p. 1-10.

(Volcanic-hosted massive sulphide deposits in Tasik Chini district, Malay Peninsula, hosted in Permian volcano-sedimentary rocks. Fe-Mn layers deposited by mixing of mainly chemical components and detrital components around seafloor hydrothermal activity)

Basori, M.B.I., K. Zaw, R.R. Large & W.F.W. Hassan (2017)- Sulfur isotope characteristics of the Permian VHMS deposits in Tasik Chini district, Central Belt of Peninsular Malaysia. *Turkish J. Earth Sciences* 26, 1, p. 91-103.

(online at: <http://journals.tubitak.gov.tr/earth/issues/yer-17-26-1/yer-26-1-5-1510-17.pdf>)

(Sulfur isotope data from E Permian volcanic-hosted massive sulfide deposits of Tasik Chini district in Central Belt of Malay Peninsula suggest source of ore fluids is seawater-dominated with minor magmatic input)

Basori, M.B.I., K. Zaw, A. McNeill & R.R. Large (2022)- A mineralogical and geochemical application for determining hydrothermal alteration zones associated with volcanic-hosted massive sulphide deposits at Tasik Chini area, Peninsular Malaysia. *Applied Geochemistry* 145, 105404, p.

(On hydrothermal alteration in volcanic-hosted massive sulphide (VHMS) deposits of Tasik Chini area, Peninsular Malaysia, hosted by Permian felsic volcanic rocks (~ 290 Ma) of rhyolitic-rhyodacitic composition and comprise two deposits (Bukit Botol and Bukit Ketaya))

Basori, M.B.I., K. Zaw, S. Meffre & R.R. Large (2016)- Geochemistry, geochronology, and tectonic setting of early Permian (~290 Ma) volcanic-hosted massive sulphide deposits of the Tasik Chini district, Peninsular Malaysia. *International Geology Review* 58, p. 929-948.

(Tasik Chini district in C Belt of Malay Peninsula hosts Bukit Botol and Bukit Ketaya VHMS deposits. Hosted by Permian felsic volcanics. Four mineralization zones: (1) stringer sulphide; (2) massive sulphide; (3) barite; and (4) Fe-Mn and Fe-Si zones. U-Pb zircon dating of rhyolites E Permian ages (~286-292 Ma). Differences between E Permian host and later Triassic igneous rocks due to tectonic progression from volcanic arc to collisional setting)

Basori, M.B.I., K. Zaw, S. Meffre, R.R. Large & W.F.W. Hassan (2016)- Pb-isotope compositions of the Tasik Chini volcanic-hosted massive sulfide deposit, Central Belt of Peninsular Malaysia: implication for source region and tectonic setting. *Island Arc* 26, 2, 12177, p. 1-8.

(online at: https://www.researchgate.net/publication/313849385_Pb-isotope_compositions_of_the_Tasik_Chini_volcanic-hosted_massive_sulfide_deposit_Central_Belt_of_Peninsular_Malaysia_Implication_Etc.)
(Lead isotopes of sulfides and host volcanic rocks of Permian Tasik Chini volcanic-hosted massive sulfide deposit. Range of lead isotopic compositions reflect mixing of bulk crust/juvenile arc and minor mantle sources, are typical for VHMS deposits in island arc- back arc setting)

Batchelor, D.A.F. (1987)- The age of Malaysian fluvial tin placers. In: N. Thiramongkol (ed.) *Proc. Workshop on Economic geology, tectonics, sedimentary processes and environment of the Quaternary in Southeast Asia*, Haid Yai, Thailand 1986, IGCP 218/ Chulalongkorn University, Bangkok, p. 103-123.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1986/5083...)

(Latest Pliocene- M Pleistocene period principal phase of economic tin placer development. Old Alluvium placers formed during E Pleistocene interglacial period when increasing and more regular precipitation and sealevel rise initially caused increased sediment supply with subsequent stream entrenchment. Present environments unfavorable for tin placer formation)

Batchelor, D.A.F. (1988)- Dating of Malaysian fluvial tin placers. *J. Southeast Asian Earth Sciences* 2, 1, p. 3-14.

(Richest fluvial and piedmont fan tin placers in Malaysia formed mainly in 'Boulder Beds', 'Old Alluvium' and 'Transitional Unit' (YU) regional lithostratigraphic units. TU deposited during early Brunhes Normal Polarity Epoch, OA and BB during Matuyama Reversed Epoch (0.73-2.48 Ma). Latest Pliocene- M Pleistocene period principal phase of economic tin placer formation. Bulk of OA placers formed in Lower Pleistocene interglacial period. M Pleistocene age for TU placers)

Batchelor, D.A.F. (1994)- Geological characteristics of the Pulai alluvial gold deposit, South Kelantan, Malaysia. *J. Southeast Asian Earth Sciences* 10, p. 101-108.

(also in *Proc. GEOSEA VI Conf. Jakarta 1987. Pulai area in Central Tectonic Belt, Peninsular Malaysia. Fluvial gold placer deposit along 17km of upper Galas River. Gold probably genetically tied to acid intrusions, with important primary sources near Kelantan-Pahang border, 3-5 km SE of Pulai village. Small granite stocks 3 km W of Pulai additional likely source. Area gold mined by Chinese settlers since late 1800's*)

Batchelor, D.A.F. (2015)- Clarification of stratigraphic correlation and dating of Late Cainozoic alluvial units in Peninsular Malaysia. *Bull. Geological Society Malaysia* 61, p. 75-84.

(online at: www.gsm.org.my/products/702001-101674-PDF.pdf)

(Review of Late Pliocene- Quaternary alluvial deposits that overlie M Pliocene 'Sundaland Regiolith' red-yellow lateritic soil development in Malay Peninsula. Old Alluvium/ Simpang Fm older than 775 ka, supported by presence of tektites (~785ka) within tin-bearing beds of Gambang tinfield in Pahang)

Batten, R.L. (1972)- Permian gastropods and chitons from Perak, Malaysia. Part 1. Chitons, bellerophontids, euomphalids and pleurotomarians. *Bull. American Museum Natural History* 147, 2, p. 1-44.

(online at: <http://digitallibrary.amnh.org/dspace/handle/2246/1103>)

(One of richest Permian gastropod faunas of Asia 92 species) in H.S. Lee No. 8 opencast tin mine near Kampar, Perak. Associated with fusulinids, all with Tethyan affinities (but on Sibumasu Terrane?; JTvG))

Batten, R.L. (1979)- Permian gastropods from Perak, Malaysia. Part 2. The trochids, patellids, and neritids. *American Museum (Natural History) Novitates*, 2685, p. 1-26.

(online at: <http://digitallibrary.amnh.org/dspace/handle/2246/5386>)

(Continuation of Batten (1972). Rich Permian gastropod fauna from white limestone in H.S. Lee Mine 8 near Kampar, Perak, associated with corals, scaphopods, bivalves, brachiopods, cephalopods and fusulinids. Fusulinids suggest Late Artinskian- E Guadalupian age, *Misellina claudiae* zone (Jones et al. 1966). Neritacean species similar to those found in Sicily, Timor and Sumatra and identified as typical Tethyan)

- Batten, R.L. (1985)- Permian gastropods from Perak, Malaysia. Part 3. The murchisoniids, cerithiids, loxonematids, and subulitids. American Museum (Natural History) Novitates, 2829, p. 1-26.
(online at: <http://digitallibrary.amnh.org/dspace/handle/2246/3583>)
(Final part of 3-part study of rich Permian gastropod fauna from H.S. Lee Mine 8 near Kampar, Perak)
- Bean, J.H. (1969)- The iron-ore deposits of West Malaysia, including geology of the Bukit Besi ore-deposits. Geological Survey West Malaysia, Ipoh, Economic Bull. 2, p. 1-194.
- Bean, J.H. (1972)- Geology, petrography and mineral resources of Pulau Tioman, Pahang. Geological Survey of Malaysia, Map Bull. 5, p. 1-92.
- Becher, H.M. (1893)- The gold- quartz deposits of Pahang (Malay Peninsula). Quarterly J. Geological Society of London 49, p. 84-88.
(Gold-quartz veins of Pahang cut Paleozoic slates, with some sandstones, and dark-coloured, impure limestone-beds strata, strike ~N-S; steep dips, mostly to East, overlain by crystalline limestones)
- Bergstrom, S.M., S. Agematsu & B. Schmitz (2010)- Global Upper Ordovician correlation by means of $\delta^{13}\text{C}$ chemostratigraphy: implications of the discovery of the Guttenberg $\delta^{13}\text{C}$ excursion (GICE) in Malaysia. Geological Magazine 147, 5, p. 641-651.
(Ordovician succession on Langgun, Langkawi Islands, off NW Malay Peninsula (Sibumasu Block), shows presence of Late Ordovician Guttenberg Carbon Excursion (GICE) known from Yangtze Platform, S China, just above conodont *Baltoniodus alobatus* Subzone and near first appearance of *Hamarodus europaeus*)
- Bignell, J.D. (1972)- The geochronology of the Malayan granites. D. Phil. Thesis, University of Oxford, p. 1-323. (Unpublished)
- Bignell, J.D. & J.B. Snelling (1977)- The geochronology of Malayan granite. Overseas Geology and Mineral Resources (Inst. Geological Sciences/ British Geological Survey), London, 47, p. 1-70.
(view online at: <https://pubs.bgs.ac.uk/publications.html?pubID=B03983>)
(Rb-St and K-Ar dating of granitic rocks of Malay Peninsula show important episodes of granite intrusion at Late Carboniferous (~280 Ma), late Permian- E Triassic (~250 Ma) and Late Triassic (~230-200 Ma) (Main Range batholith, East Coast batholiths and Gunong Benom granite in C Malaya (200 Ma)). Granites of East Coast region intruded in 2 episodes, at 250 and 220 Ma. S Malay Peninsula and Singapore granites 220 Ma. Late Triassic ages for biotite granite at Langkawi island (Rb/Sr ages 217 ± 8 Ma and 209 ± 6 Ma). Etc.)
- Bignell, J.D. & N.J. Snelling (1977)- K-Ar Ages on some basic igneous rocks from Peninsular Malaysia and Thailand. Bull. Geological Society Malaysia 8, p. 89-93.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1977005.pdf>)
(K-Ar age data from igneous rocks of E Pahang and Trengganu (Jurassic, Cretaceous Pleistocene), Johore (E Paleocene) and Ko Kut, Gulf of Thailand (Late Miocene basalt))
- Boucot, A.J., J.G. Johnson & C.R. Jones (1966)- Silurian brachiopods from Malaya. Journal of Paleontology 40, 5, p. 1027-1031.
(Four Silurian brachiopod species of genera *Capelliniella*, '*Conchidium*', *Cymbidium*, and *Atrypella* described from Kuala Lumpur dolomitic limestones. Cosmopolitan species)
- Bradford, E.F. (1961)- The occurrence of tin and tungsten in Malaya. Proc. 9th Pacific Science Congress, Bangkok 1957, 12, p. 378-398.
(online at: <http://archive.org/details/geologyandgeophy032600mbp>)
- Bradford, E.F. (1972)- The geology and mineral resources of the Gunung Jerai area, Kedah. Geological Survey of Malaysia, Memoir 13, p. 1-242.
- Burton, C.K. (1965)- Wrench faulting in Malaya. Journal of Geology 73, 5, p. 781-798.

(Propose major Bok Bak wrench fault zone, running for >650 miles NW-SE across Malay Peninsula from Baling area in NW to Pulau Tinggi in SE. Offsetting older N-S structural zones, with probable 32-36 miles of sinistral displacement (but Raj (1982) questions SE extension of Bok Bak fault beyond E Kedah/ NW Perak))

Burton, C.K. (1967)- Dacryoconarid tentaculites in the Mid-Paleozoic euxinic facies of the Malaysian geosyncline. *Journal of Paleontology* 42, 2, p. 449-454.

(45 localities with fossil tentaculites in strongly folded black shales of Mahang Fm (= Baling Fm= Sentul Fm) in NW Malay Peninsula. E-M Devonian aspect, but associated with Ordovician trilobites and Lower Silurian graptolites. Malayan tentaculites-bearing black shales in 'miogeosynclinal euxinic facies'. Called Nowakia acuaria and placed in E Devonian (Emsian) by Agematsu et al. 2006; JTvG)

Burton, C.K. (1967)- Graptolite and tentaculite correlation and palaeogeography of the Silurian and Devonian in the Yunnan- Malayan geosyncline. *Transactions Proceedings Paleontological Society of Japan* 65, p. 27-46.

(online at: www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NS65.pdf)

(Silurian- M Devonian black shales with graptolites and tentaculites present from NW Malay Peninsula (Langkawi, Kedah, Perak, etc.) into Burma, W-most Thailand and Yunnan, SW China (=Sibumau terrane))

Burton, C.K. (1967)- The Mahang Formation: a mid-Palaeozoic euxinic facies from Malaya- with notes on its conditions of deposition and palaeogeography. *Geologie en Mijnbouw* 46, 5, p. 167-187.

(online at: <https://drive.google.com/file/d/0B7j8bPm9Cse0Vi1nOGd3aklrUDA/view>)

(On Silurian- M Devonian Mahang Fm thin-bedded black carbonaceous shales from NW corner of Malay Peninsula with graptolites (monograptus spp., Climacograptus spp., etc.), tentaculids, radiolaria and trilobites)

Burton, C.K. (1970)- The palaeotectonic status of the Malay Peninsula. *Palaeogeogr. Palaeoclim. Palaeoecology* 7, p. 51-60.

(Malay Peninsula believed to formerly border E side of Indian shield, from which it detached as Gondwanaland disintegrated, with Bay of Bengal a sphenochasm formed by same phase of continental drift (this model was never generally accepted; JTvG))

Burton, C.K. (1970)- The geology and mineral resources of the Baling area, Kedah and Perak, West Malaysia. *Geological Survey of Malaysia District, Memoir* 12, p. 1-150.

Burton, C.K. (1972)- Outline of the geological evolution of Malaya. *Journal of Geology* 80, p. 293-309.

(Malay Peninsula cratonized by Late Triassic orogeny and plutonism and Malaya became part of Sunda Shield. Record starts with Cambrian- Silurian orthoquartzite-carbonate facies. Geosynclinal conditions started in Ordovician, with eugeosynclinal zone in E, miogeosynclinal in W. Ordovician- Lower Devonian euxinic facies passes up into M Devonian- E Carboniferous flysch. M- Late Carboniferous orogeny with granite emplacement. Permian widespread shallow-water limestone. Geosynclinal conditions restored in E Triassic, with tectonic and plutonic activity. Near end-Triassic intensive orogenic-plutonic revolution, finally stabilizing peninsula. Emplacement of late granitic stocks, with tin mineralization. Uplift and warping near end- Mesozoic)

Burton, C.K. (1973)- Geology and mineral resources. Johore Bahru- Kulai area, South Johore. *Geological Survey of Malaysia Map Bull.* 2, p. 1-72.

Burton, C.K. (1986)- The Baling group/Bannang Sata group of the Malay/Thai Peninsula. *J. Southeast Asian Earth Sciences* 1, 2, p. 93-106.

(Review of stratigraphy of Cambrian- Devonian shelfal marine deposits of NW Malay Peninsula- SW Thailand border area (= Sibumasu terrane stratigraphy))

Burton, C.K. (1988)- Geology and mineral resources of the Bedung area, Kedah, West Malaysia. *Geological Survey of Malaysia, Map Bull.* 7, p. 1-103.

(Bedung geological map in NW part of Malay Peninsula at scale 1:63,360. Folded Ordovician- Devonian Mahang Fm black shales with graptolites, tentaculites, etc., in NW and Triassic Semanggul Fm flysch-type clastics locally with Daonella or Halobia in E)

Cameron, W. (1924)- The deep leads of Kinta Valley. Mining Magazine, London, 31, p. 276-285.

Cameron, W. (1925)- The limestone hills of the Kinta Valley tin-field, Federated Malay States: their geology and physiographic origin. Geological Magazine 62, 1, p. 21-27.

(Limestone hills of Kinta Valley prolific tinfield form white cliff faces from an almost level plain. Mode of origin has been the subject of marked divergence of opinion amongst geologists)

Campi, M.J., S. Shen, G.R. Shi & M.S. Leman (2008)- First record of *Permianella* He & Zhu, 1979 (Permianellidae; Brachiopoda) from Peninsular Malaysia. Alcheringa 24, 1, p. 37-43.

(online at: https://www.researchgate.net/publication/233023922_First_record_of_Permianella_He_Zhu_1979_Permianellidae_Brachiopoda_from_Peninsular_Malaysia)

(First first record of permianellid brachiopod from Leptodus shales of Gua Musang Fm, NW Pahang, Peninsular Malaysia. Assigned to Permianella typica He & Zhu, and most likely late Guadalupian in age, based on association with Vediproductus. This new record is most southerly occurrence of Permianella)

Campi, M.J., G.R. Shi & M.S. Leman (2002)- The *Leptodus* shales of central Peninsular Malaysia: distribution, age and palaeobiogeographical affinities. J. Asian Earth Sciences 20, 6, p. 703-717.

(online at: https://www.academia.edu/57625990/The_Leptodus_Shales_of_central_Peninsular_Malaysia_distribution_age_and_palaeobiogeographical_affinities)

(‘Leptodus Shales’ is M Permian argillaceous facies rich in brachiopods in Central Belt of Peninsular Malaysia. Sediments often tuffaceous and in N Pahang associated with pyroclastic volcanics of probable island-arc origin. Probably represent deposits on W continental shelf of Eastern Belt/ Indochina Block. Faunas of Paleo-Equatorial affinity and closest to faunas in Indochina (S China, Cambodia, Japan))

Campi, M.J., G.R. Shi & M.S. Leman (2005)- Guadalupian (Middle Permian) brachiopods from Sungai Toh, a *Leptodus* Shale locality in the central belt of Peninsular Malaysia. Palaeontographica A 273, 3-6, p. 97-160.

(Rich M Permian brachiopod fauna of 48 species from Sungai Toh, Pahang State, in Central Belt of Malay Peninsula, characterised by Permian tuffaceous sediments and limestone. Lower Horizon with mixed plant and invertebrate assemblage, incl. brachiopods Urushtenoidea, Leptodus richthofeni, etc. Upper Horizon more abundant brachiopods: 57 species, incl. Vediproductus, Permianella, Tranrennatia, Leptodus richthofeni, Leptodus cf. tenuis, etc. Age Capitanian (late Guadalupian) possibly Wuchiapingian. Strong Paleo-equatorial affinities, but some elements more typical of cooler peri-Gondwana)

Cao, J., X. Yang, G. Du & Huan Li (2020)- Genesis and tectonic setting of the Malaysian Waterfall granites and tin deposit: Constraints from LA-ICP (MC) MS zircon U-Pb and cassiterite dating and Sr-Nd-Hf isotopes. Ore Geology Reviews 118, 103336, p. 1-12.

(Waterfall skarn-type tin deposit in S Peninsular Malaysia one of earliest exploited tin deposits of SE Asian Tin Belt. M Triassic zircon U-Pb ages 241.2 ± 2.5 Ma to 239.0 ± 3.4 Ma from granite, consistent with average age of 238.5 ± 1.7 Ma from LA-ICPMS cassiterite U-Pb dating. Magma for Waterfall granites possibly from partial melting of meta-igneous rocks of Kontum massif. Likely emplaced in syn-collision setting, triggered by subduction of Paleo-Tethys ocean floor beneath Indochina Block)

Chakraborty, K.R. (1994)- How wide and oceanic was Palaeotethys?: evidence from Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 20, 3, p. 224-225. (Abstract)

(online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1994003.pdf>)

(E and W blocks of Peninsular Malaysia were not separated by vast oceanic Palaeotethys. If vestiges of oceanic crust can be seen in serpentinites of Bentong-Raub suture zone, then linearity and persistent narrowness (<15km in most places) of zone point to no more than very narrow seaway)

Chakraborty, K.R. & I. Metcalfe (1988)- Deformation and age of limestone at Sungai Bilut near Raub, Pahang. Warta Geologi (Newsletter Geological Society Malaysia) 14, 3, p. 115-123.

(Polyphase deformation of thin-bedded Devonian or basal Carboniferous limestone-shale in Raub Gp, S of Raub. Conodont Color Alteration Index 5 (= 300-480°; low metamorphic))

Chakraborty, K.R. & I. Metcalfe (1995)- Structural evidence for a probable Paleozoic unconformity at Kg. Kuala Abang, Trengganu. *Warta Geologi* (Newsletter Geological Society Malaysia) 21, 3, p. 141-146.

Chen, B., M.K. Shuib & T.T. Khoo (2002)- Dating the Kenny Hill Formation: spores to the fore. *Warta Geologi* (Newsletter Geological Society Malaysia) 28, 5, p. 189-191.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm2002005.pdf>)

(First palynology on poorly-fossiliferous Kenny Hill Fm in Kuala Lumpur area, which overlies Silurian Kuala Lumpur Limestone. Sample with spores Leiotriletes, Punctatisporites, Dictyotriletes, Verrucosisporites microtuberculatus, Lycospora, Acanthotriletes suggest Carboniferous or Permian age)

Choong, C.M. & M. Pubellier (2015)- Geological structures of the Kinta Valley revisited using drainage anomalies. In: M. Awang et al. (eds.) 3rd Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2014), Kuala Lumpur 2014, Springer Verlag, p. 267-276.

(Kinta Valley Paleozoic limestone-shale and Late Triassic granitic intrusions covered >50% by thin alluvium. Severely deformed. NE-SW and N-S drainage anomalies may reflect slight or large normal faults. Shortening by thrust faults and subsequent extension may be rooted in lower ductile crust beneath large granitic plutons)

Choong, C.M., M. Pubellier, A. Abdeldayem & Chow W.S. (2016)- Deformation styles and structural history of the Paleozoic limestone, Kinta Valley, Perak, Malaysia. *Bull. Geological Society Malaysia* 62, p. 37-45.

(online at: www.gsm.org.my/products/702001-101695-PDF.pdf)

(Paleozoic limestone of Kinta Valley narrow deformed strip between Late Triassic- E Jurassic batholiths of N Malay Peninsula. Deformation events: (1) early extension (Permian-Triassic intra-basin extension); (2) early compression indicated by conjugate strike-slip faults; (3) compression with thrusts and folds (coeval with late stages of granite emplacement); (4) ductile high temperature normal shear near contact with granites, and (5) late extension with large normal faults (Tertiary basins formation or Late Miocene-Quaternary uplift))

Choong, C.M., M. Pubellier, B. Sautter & M.A. Beg. (2021)- Zircon U-Pb ages of the Benom Complex: implications for a Late Triassic uplift event in Central Peninsular Malaysia. *Bull. Geological Society Malaysia* 72, p. 1-13.

(online at: <https://gsm.org.my/products/702001-101926-PDF.pdf>)

(Benom Complex is 20 km wide pluton dome, E of Bentong-Raub Paleotethys suture zone, in Central Belt of Malay Peninsula. Zircon ages of diorite and syenite (alkaline series) ~222-227Ma, of granite (calc-alkaline series) 207±2 Ma. Central Belt sedimentation shifted from thick Permo-Triassic marine deposits to terrestrial redbeds at M-L Triassic boundary, marking uplift due to Sibumasu-Indochina collision. Emplacement of Benom alkaline series in early Late Triassic (227- 222 Ma) interpreted as related to slab break off and mantle upwelling. Most of Central Belt region no sedimentation since mid Late Triassic due to continuous uplift/ erosion. Emplacement of Gunung Benom granite (calc-alkaline series) at end Triassic (207 Ma) (together with S-type Main Range granite) result from Late Triassic orogenic uplift event in Peninsular Malaysia)

Choong, C.M., B. Sautter, A.A. Kadir & A. Bashardin (2025)- Post-collision reactivation of the Bentong-Raub Suture Zone and regional tectonic implications. *Bull. Geological Society Malaysia* 79, p. 57-73.

(online at: <https://gsm.org.my/wp-content/uploads/2025/05/7-Choong-et-al.pdf>)

(Bentong-Raub Suture Zone of the few remnants of the Paleo-Tethys Ocean, which completely closed in Late Triassic ('Indosinian Orogeny', Triassic). Reactivations of structures inherited from previous tectonic events during Cretaceous- Cenozoic times: ~E-W shortening (D1; Indosinian), dextral shear in N-S trend (D2; mid-late Cretaceous), and subsequent ~NW-SE extension (D3; mid-Cenozoic))

Chu, L.H., F. Chand & J. Ahmad (1984)- Favourable geological environments for uranium mineralization, Peninsular Malaysia. *J. Geochemical Exploration* 20, 2, p. 205-219.

(Geochemical anomalies in Central Belt of Malay Peninsula, Boundary Range Granite, Senting Granite, and Benom Igneous Complex appear to constitute favourable uranium exploration targets)

Chu, L.H., F. Chand & D.S. Singh (1988)- Primary tin mineralization in Malaysia: aspects of geological setting and exploration strategy. In: C.S. Hutchison (ed.) *Geology of tin deposits in Asia and the Pacific*, Selected papers from Int. Symposium Geology of tin deposits, Nanning, China, 1984, Springer Verlag, Berlin, p. 593-613.

(online at <https://repository.unescap.org/items/f0e6c175-01e9-4218-9d43-94ae4ec4573e>)

(Primary tin mineralization in Peninsular Malaysia four broad classes: (1) pneumatolytic-hydrothermal lodes, veins, stockworks and stringers, (2) pyrometamorphic skarns (Sn skarns mainly in W belt, Sn-Fe skarn in E Belt), (3) tin-bearing pegmatites and aplites, and (4) stanniferous polymetallic sulphide bodies (W belt))

Chu, L.H. & D.S. Singh (1986)- The nature and potential of gold mineralization in Kelantan, Peninsular Malaysia. In: G.H. Tan & S. Paramanthan (eds.) *Proc. GEOSEA V Congress*, Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 431-440.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986032.pdf>)

(On primary gold-silver quartz vein mineralization at Ulu Sokor are, Kelantan Province, NE Malay Peninsula)

Chua, S., A.D. Switzer, T. Li, H. Chen, M. Christie, T.A. Shaw, N.S. Khan et al. (2021)- A new Holocene sea-level record for Singapore. *The Holocene* 31, 9, p. 1376-1390.

(online at: <https://journals.sagepub.com/doi/pdf/10.1177/09596836211019096>)

(New Holocene sediment core suggests sea level rose rapidly in E Holocene from -21.0 to -0.7 m from ~9500 to 7000 yrs. BP. Thereafter rate of sea level rise decelerated, reaching mid-Holocene highstand of 4 m at 5100 yrs. BP, before falling to present level)

Cocks, L.R.M., R.A. Fortey & C.P. Lee (2005)- A review of Lower and Middle Palaeozoic biostratigraphy in west peninsular Malaysia and southern Thailand in its context within the Sibumasu Terrane. *J. Asian Earth Sciences* 24, 6, p. 703-717.

(Review of Cambrian- Devonian stratigraphy of S Thailand and NW Peninsular Malaysia (Sibumasu plate). Single depositional basin in shallow-water and cratonic areas of S Thailand, Langkawi, and mainland Kedah and Perlis, in contrast to deeper-water basin of N Perak. Area was part of Paleozoic Sibumasu Terrane, which also included C and N Thailand, E Burma (Myanmar) and part of SW China (Yunnan). Ordovician-Devonian limestones paraconformably overlain by Late Devonian Langun Redbeds)

Courtier, D.B. (1974)- Geology and mineral resources of the neighborhood of Kulim, Kedah. Geological Survey of Malaysia Map Bull. 3, p. 1-50.

Cox, L.R. (1936)- On a fossiliferous Upper Triassic shale from Pahang, Federated Malay States. *Annals and Magazine Natural History*, ser. 10, 17, p. 213-221.

(Fossils from marly shale at Sungei Taba, N of Raub gold mine, Pahang, dominated by bivalves, mainly Myophoria spp., also Grammotodon malayensis, Modiolus raubensis n.sp. Age interpreted to be pre-Rhaetian Triassic, but subsequent studies on ammonites (Sato 1963) and bivalves (Tamura 1973) suggest M Triassic age)

Cottam, M.A., R. Hall & A.A. Ghani (2013)- Late Cretaceous and Cenozoic tectonics of the Malay Peninsula constrained by thermochronology. *J. Asian Earth Sciences* 76, p. 241-257.

(Thermochronological analyses of granites from Malay Peninsula record thermal history in Late Mesozoic-Cenozoic: significant period of thermal perturbation between ~100-90 Ma, lesser perturbation between ~51-43 Ma, regional exhumation of Malay Peninsula in Late Cretaceous (~66-85 Ma), rapid regional exhumation in Late Eocene-Oligocene (30-46 Ma))

Crawford, A.R. (1972)- A displaced Tibetan massif as a possible source of some Malayan rocks. *Geological Magazine* 109, 6, p. 483-489.

(Commentary on Burton (1970) and Ridd (1971) suggestion of the westerly origin from India of sediments now in NW Malaya. Instead, Tibetan massif could have provided material now forming part of Malaya)

Cummings, R.H. (1965)- Notes on the Malayan limestones. *Overseas Geology and Mineral Resources (Inst. Geological Sciences/ British Geological Survey)*, London, 9, 4, p. 418-426.

(view online at: <https://webapps.bgs.ac.uk/data/Publications/publication.html?id=19866465>)

(Fossiliferous Permian limestones from East Malay Peninsula (= Indochina Plate): (1) Gritty Limestone of Kelantan, with fusulinids *Sumatrina* cf. *annae*, *Parafusulina*, *Padangia* cf. *perforata* and *Hemigordius* (M Permian- Guadalupian, similar to Sumatra assemblage described by Volz (1904)), (2) Limestones from Sungei Biwah, Trengganu, with M Permian *Parafusulina*, *Globivalvulina*, *Endothyra*, etc. and (3) upper M Permian limestones of Temerlah-Maran Road between Kampong Awah and Jengka Pass, Pahang (= close to Raub-Bentong suture/ W margin of Indochina Plate?- JTVG), with *Neoschwagerina*, *Climacammina*, *Globivalvulina* *graeca*, *Agathammina*, *Pachyphloia*, *Padangia perforata*, *Nummulostegina* cf. *velebitana*, *Verbeekina*, etc.)

Daanen, T. (2015)- On the structure and tectonic evolution of the Taku Schists and their surrounding units, Kelantan, NE Malaysia. M.Sc. Thesis, University of Utrecht, p. 1-72.

(online at: <http://dspace.library.uu.nl/handle/1874/316231>)

(Taku Schists in Kelantan, in Central Belt of NE Malay Peninsula, in asymmetric anticline, with steeply dipping E flank. Protoliths of schists quartz-rich E-M Permian sediments, accumulated on fore-arc of Sukhothai volcanic arc, with regional contractional event during Triassic collision of Sibumasu Terrane and Sukhothai Arc. Contact with surrounding sediments in SE mylonitic, indicating severe shearing. Stretching lineations developed throughout Taku Schists, show dominant tectonic movement top down to SE (130E). Eocene dextral transtension moves E Malaya Block to SE and causes local exhumation in core complex)

Darbyshire, D.P.F. (1988)- Geochronology of Malaysian granites. Natural Environment Research Council (NERC), Isotope Geology Centre, BGS Open File Report WI/IG/88/3, p. 1-59. (Unpublished; not online)

De Co, J.C.M. & O.E. Smit (1975)- The Triassic Kodiang Limestone formations in Kedah, West Malaysia. *Geologie en Mijnbouw* 54, p. 169-176.

(online at: <https://drive.google.com/file/d/0B7j8bPm9Cse0YnpMFZmQWo5MUE/view>)

(Many isolated limestone hills on coastal plain of NW Malay Peninsula, mainly of Paleozoic age (Permian Chuping Fm, E Paleozoic Setul Fm). S and E of Kodiang (30km N of Alor Star, Kedah) also U Triassic limestone, first identified by Ishii & Nogami (1966). Thickness at composite stratotype of Kodiang Lst in 7 hills of Bukit Kecil and Bukit Kalong ~125 m or more. Composed of algal stromatolites, intraformational breccias, limestone conglomerates, black mudstones with radiolarian chert and limestone turbidites; deposited in shelf, slope and basinal environments. Paleoslope was dipping to E. With simple foraminifera, incl. *Nautiloculina* and *Ophthalmidium*. Conodonts incl. *Gladigondolella tethydis*, suggest mainly Ladinian- E Carnian age range (Koike 1973). Kodiang Lst may be lateral equivalent of much thicker flysch sediments of Semanggol Fm in E)

Dixey, F. (1957)- Federation of Malaya. In: Colonial Geological Surveys 1947-1956: A review of progress during the past ten years, Colonial Geology and Mineral Resources, Bulletin Supplement 2, London, p. 94-98.

(Brief review of Geological Survey of Malaysia activities on 1947-1956)

Dodd, T.J.H., M.R. Gillespie, A.G. Leslie, R.S. Kendall, T. Bide, M.R. Dobbs, K.W. Lee, S.L. Chiam & K.H. Goay (2017)- A re-assessment of Mesozoic meta-sedimentary successions in Singapore: terrestrial to deep marine depositional environments and stratigraphical framework. *DRG24-61*, *Warta Geologi* 43, 3, 2p.

(online at: <https://gsm.org.my/articles/702001-101703/>)

(Conference Abstract. Geology of Singapore dominated by Permian-Triassic arc magmatism and sedimentation, succeeded by collisional accretion tectonics in latest Triassic- E Jurassic. Jurong Gp complex fore-arc succession which crops out in SW Singapore and is correlative of Raub Gp in Malaysia).

Dodd, T.J.H., M.R. Gillespie, A.G. Leslie, R.S. Kendall, T.P. Bide, M.R. Dobbs, I.L. Millar, M.K.W. Lee, K. Chiam & M. Goay (2019)- Palaeozoic to Cenozoic sedimentary bedrock geology and lithostratigraphy of Singapore. *J. Asian Earth Sciences* 180, 103878, p. 1-26.

(online at: https://www.researchgate.net/publication/333619079_Paleozoic_to_Cenozoic_sedimentary_bedrock_geology_and_lithostratigraphy_of_Singapore)

(New Carboniferous- Quaternary lithostratigraphy of Singapore based on ~20,000m of core from 121 ~205m deep boreholes and 218 field localities across island. Oldest sedimentary rocks deformed Carboniferous (Mississippian) Sajahat Fm, succeeded by M-U Triassic Jurong and Sentosa Groups that accumulated in S part

of Semantan Basin, weakly metamorphosed during Late Triassic-E Jurassic orogenic event. Sentosa Gp deposition during late Permian-Triassic arc magmatism in S part of Sukhothai forearc basin. Lower Cretaceous sediments overstepped Jurong and Sentosa Gp. Youngest deposits Neogene- Quaternary)

Dodd, T.J.H., A.G. Leslie, M.R. Gillespie, M.R. Dobbs, T.P. Bide, R.S. Kendall, T.I. Kearsey, K. Chiam & M. Goay (2020)- Deep to shallow-marine sedimentology and impact of volcanism within the Middle Triassic Palaeo-Tethyan Semantan Basin, Singapore. *J. Asian Earth Sciences* 196, 104371, p. 1-25.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912020301528>)

(BGS paper on M Triassic Pulau Ayer Chawan Fm, predominantly deep-marine turbiditic, occasionally shallow-marine sedimentary succession, deposited in Singapore sector of Palaeo-Tethyan Semantan forearc basin. Contemporaneous magmatism from adjacent Paleo-Tethys Sukhothai Arc (volcaniclastic sediments and hyaloclastites of Nanyang Mb)

Dodd, T.J.H., A.G. Leslie, R.S. Kendall, M.R. Dobbs, M.R. Gillespie et al. (2018)- Sedimentology and depositional environments of the Sentosa Group, Singapore: a fluvial to marine transition in a mature volcanic arc. British Sedimentological Research Group, AGM (Edinburgh) (Poster Presentation)

(online at: https://www.researchgate.net/publication/333894953_Sedimentology_and_depositional_environments_of_the_Sentosa_Group_Singapore_a_fluvial_to_marine_transition_in_a_mature_volcanic_arc)

(BGS work on bedrock geology of Singapore, which records evolution of complex Palaeo-Tethyan forearc basin in which sedimentation was influenced by contemporaneous arc magmatism. Steeply-dipping sedimentary rocks, younging to NE. Sentosa Island outcrops U Triassic fluvial- shallow marine deposits)

Dodge, N.N. (1977)- Mineral production on the East Coast of Malaya in the nineteenth century. *J. Malaysian Branch Royal Asiatic Society* 50, p. 89-110.

(Before widespread tin production along W coast after 1850, Malaya's main mineral product for centuries was gold from E coast, mainly produced by Chinese. Extraction of gold restricted to narrow belt from Patani in NE, down into interiors of Perak, Kelantan and Pahang and then through Negri-Sembilan into Malacca. No maps)

Drahman, F.A. & J.A. Gamez Vintaned (2017)- Stratigraphy and palaeoichnology of “Black Shale” facies: chert unit of the Semanggol Formation, Perak. In: M. Awang et al. (eds.) *Proc. Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2016)*, Kuala Lumpur 2016, Springer Verlag, p. 605-613.

(Black shales of chert unit of Semanggol Formation, exposed at Bukit Putus in abandoned quarry in Bukit Merah (NNW of Taiping, Perak). Chert unit reportedly deposited in deep oceanic basin. Black shale possibly shallower facies, with several levels with abundant Claraia (E Triassic pectinid bivalve))

Du, G., X. Yang, J. Cao & J.H.A. Aziz (2020)- Genesis and timing of the Sungai Lembing tin deposit in Pahang, East Malaysia: constraints from LA-ICP-MS zircon and cassiterite U-Pb dating, geochemical compositions and Sr-Nd-Hf isotopes. *Ore Geology Reviews* 119, 103364, p. 1-18.

(Sungai Lembing one of largest primary Sn deposits in Malaysia. Typical hydrothermal vein-type deposit with spatial and genetic relationships with underlying granites. U-Pb dating of Sn-bearing stockworks average age of 264.2 ± 2.0 Ma (M Permian), consistent with zircon U-Pb ages (~260-263 Ma) for granites. Late Permian granites sourced from magma generated by partial melting of Proterozoic meta-igneous rocks of Indochina Block. Extensive emplacement of Permian granites and Sn mineralization in Eastern Granite Belt of Peninsular Malaysia may be result of E-dipping subduction of Paleotethys under western Indochina Block)

Dzulkafli, M.A., C. Aziz Ali & M.B.I. Basori, N. Sulaiman & M.S. Leman (2022)- Radiolaria Perm Awal daripada Ladang Harmoni, Pos Blau, baratdaya Kelantan. *Sains Malaysiana* 51, 7, p. 1979-1992.

(online at: <https://journalarticle.ukm.my/20230/1/3.pdf>)

‘(Early Permian radiolaria from Ladang Harmoni, Pos Blau, South Kelantan’. 21 species of radiolaria identified from chert interbeds with tuffaceous mudstone from near Pos Blau, Gua Musang, NE Malay Peninsula (within Bentong-Raub suture zone), representing Pseudoalbaillella lomentaria Assemblage Zone (E Sakmarian, E Permian). Also with several fragments of ammonoid Agathiceras sp.)

- Dzulkaflī, M.A., Basir Jasin & M.S. Leman (2012)- Radiolaria berusia Perm Awal (Sakmarian) dari singkapan baru di Pos Blau, Ulu Kelantan dan kepentingannya. *Bull. Geological Society Malaysia* 58, p. 67-73.
(online at: www.gsm.org.my/products/702001-100348-PDF.pdf)
(*'Early Permian (Sakmarian) radiolarians from a new outcrop at Pos Blau, Ulu Kelantan and their significance'. Sakmarian radiolaria from chert beds from new outcrop in or near Bentong-Raub suture zone, with 28 species/ 13 genera, representing two radiolarian assemblage zones: Pseudoalbaillella lomentaria (E Sakmarian) and Pseudoalbaillella scalprata m. rhombothoracata (Late Sakmarian). Radiolarian cherts interbedded with shale and interpreted as continental margin chert association*)
- Dzulkaflī, M.A., Basir Jasin & M.S. Leman (2016)- Taksonomi radiolaria dari genus *Pseudoalbeillella* berusia Perm dari Pos Blau, barat daya Kelantan, Semenanjung Malaysia. *Bull. Geological Society Malaysia* 62, p. 13-21.
(online at: <https://gsmpubl.files.wordpress.com/2017/04/bgsm2016003.pdf>)
(*'Taxonomy of the Permian radiolarian genus Pseudoalbeillella from Pos Blau, SW Kelantan, Peninsular Malaysia. Seven species of Permian Pseudoalbaillella radiolarian genus in chert between Gua Musang and Cameron Highlands, SW of Kelantan. Association of Pseudoalbaillella with Hegleria mammilla indicates Pseudoalbaillella globosa Assemblage Zone (early M Permian; Roadian)*)
- Dzulkaflī, M.A., Basir Jasin, M.S. Leman & K.W. Chung (2017)- Penemuan Zon Himpunan *Pseudoalbaillella globosa* (Radiolaria) di Pos Blau, Baratdaya Kelantan, Semenanjung Malaysia dan implikasinya terhadap biostratigrafi radiolaria. *Sains Malaysiana* 46, 12, p. 2349-2357.
(online at: http://www.ukm.my/jsm/pdf_files/SM-PDF-46-12-2017/11%20Dzulkaflī%20Muhammad.pdf)
(*'Discovery of Pseudoalbaillella globosa Assemblage Zone (Radiolaria) from Pos Blau, SW Kelantan, Peninsular Malaysia and its implication for radiolarian biostratigraphy'. Well preserved radiolaria from bedded chert outcropping at km 38, of Gua Musang- Cameron Highland highway, near Pos Blau. 20 species representing Pseudoalbaillella globosa Assemblage Zone of (Roadian) E-M Permian age*)
- Dzulkaflī, M.A., Basir Jasin, M.S. Leman & N. Sulaiman (2018)- Fosil radiolaria daripada batuan bersilika-rijang di Pos Blau (Singkapan Pb-1), Baratdaya Kelantan, Semenanjung Malaysia. *Sains Malaysiana* 47, 10, p. 2259-2268.
(online at: https://www.ukm.my/jsm/pdf_files/SM-PDF-47-10-2018/03%20Muhammad%20Ashahadi%20Dzulkaflī.pdf)
(*E Permian (Sakmarian) radiolarian assemblages from siliceous-cherty rocks from Pos Blau, SW Kelantan, in Bentong-Raub Suture Zone*)
- Dzulkaflī, M.A., M.B.I. Basori, N. Sulaiman & M.S. Leman (2024)- Fosil radiolaria berusia Perm Awal (Artinskian dan Kungurian) daripada bongkah batuan bersilika-rijang di Pos Blau, Gua Musang, Kelantan, Semenanjung Malaysia. *Sains Malaysiana* 53, 5, p. 1009-1020.
(online at: http://www.ukm.edu.my/jsm/pdf_files/SM-PDF-53-5-2024/3.pdf)
(*'Early Permian radiolarian fossils (Artinskian and Kungurian) from siliceous-chert rocks boulders at Pos Blau, Gua Musang, Kelantan, Peninsular Malaysia'. Tuffaceous siliceous mudstone -shales at Ladang Tenang SW of Pos Blau in NE part of Malay Peninsula with E Permian-aged radiolaria (Pseudoalbaillella rhombothoracata Assemblage Zone (E Artinskian-E Kungurian) and Albaillella asymmetrica Assemblage zone (Kungurian)*)
- Edwards, W.N. (1926)- Carboniferous plants from the Malay States. *J. Malayan Branch Royal Asiatic Society* 4, 2, p. 171-172.
(*First record of Permo-Carboniferous plant fossils from 'Raub series' shale with thin ash beds at Sungei Chiku, Kelantan, Malay Peninsula. Incl. Pecopteris cf. cyathea (somewhat similar to P. verbeeki Gothan & Jongmans from Sumatra) and Cordaites sp.*)
- Edwards, W.N. (1933)- Triassic wood from the Malay States. *J. Malayan Branch Royal Asiatic Society* 11, 2, p. 236-241.

(Probably Late Triassic-age wood collected by Scrivenor from 2 localities on Malay Peninsula: (1) Sungei Tranang, Kelantan with Dadoxylon sp. and (2) Jerantut, Pahang with silicified log of Dadoxylon sclerosum from sandy beds overlying andesite. Apparent absence of growth rings)

Elliott, C.F. (1968)- Three new Tethyan Dasycladaceae (calcareous algae). *Palaeontology* 11, p. 491-497.
(online at: http://cdn.palass.org/publications/palaeontology/volume_11/pdf/vol11_part4_pp491-497.pdf)
(Incl. new taxa *Epimastopora malaysiana* n.sp. from M Permian of H.S. Lee Mine 8, Kinta Valley, Perak)

Endut, Z., R. Hasnur, S. Mohamed, S. Ismail and A. Prihananto (2014)- Geology of the Penjom gold deposit, Kuala Lipis, Pahang, Malaysia. In: I. Basuki & A.Z. Dahlius (eds.) *Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI), Palembang*, p. 301-308.
(Penjom gold deposit at W side of C Belt of Malay Peninsula is largest gold mine in Malaysia. Host rock Late Permian turbiditic sequence. Intruded by felsic tonalitic intrusives. Both host rocks and tonalite intrusives folded during main Late Triassic orogeny along Bentong-Raub Suture. Mineralization at Penjom and other vein-hosted deposits such as at Bukit Koman, Raub along Bentong-Raub Suture in Late Triassic- E Jurassic)

Endut, Z., T.F. Ng, J.H. Abdul Aziz, S. Meffre & C. Makoundi (2015)- Characterization of galena and vein paragenesis in the Penjom gold mine, Malaysia: trace elements, lead isotope study and relationship to gold mineralization episodes. *Acta Geologica Sinica (English Ed.)* 89, 6, p. 1914-1925.
(Penjom Gold Mine 30 km E of Bentong-Raub Suture, near W boundary of C Belt in Peninsular Malaysia. Gold mineralization in vein system with pyrite, arsenopyrite, and minor base metals including galena. Galena crystallized from two different ore fluids, probably at different times. Pb isotopic ratios suggest derivation from arc rocks associated with continental crust)

Endut, Z., T.F. Ng, J.H. Abdul Aziz & G.H. Teh (2015)- Style of veins in Penjom Gold Mine, Malaysia-implications for gold mineralisation and structural episodes. *Proc. PACRIM 2015 Congress, Hongkong, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, Publ. Ser. 2/2015*, p. 507-514.
(Extended Abstract)
(Gold mineralisation at Penjom gold deposit in C Belt of Peninsular Malaysia (Bentong-Raub Suture zone) hosted in quartz-carbonate veins of two main types: shear and extension veins)

Endut, Z., T.F. Ng, J.H. Abdul Aziz & G.H. Teh (2015)- Structural analysis and vein episode of the Penjom gold deposit, Malaysia: implications for gold mineralisation and tectonic history in the Central Belt of Malaysia. *Ore Geology Reviews* 69, p. 157-173.
(Central Belt of Peninsular Malaysia characterised by numerous vein-hosted gold deposits particularly in 50 km wide corridor on E side of Bentong-Raub Suture. Mineralised quartz-carbonate veins of Penjom Gold deposit, S of Kuala Lipis, in U Permian clastic sedimentary host rocks. K/Ar ages of alteration sericite related to mineralisation ~197-191 Ma (E Jurassic). Veins formed under compressional- transpressional regime with later displacement in transtensional- extensional regime)

Errington de la Croix, J. (1882)- *Les mines d'etain de Perak (presqu'ile de Malacca)*. Dunot, Imprimerie Nationale, Paris, p. 1-78.
(online at: https://books.google.com/books/about/Les_mines_d_%C3%A9tain_de_P%C3%A9rak.html?id=0xJDAAAIAAJ)
(‘The tin mines of Perak (Malay Peninsula)’. Description of the flourishing tin mining industry on the Malay Peninsula around 1880 by French mining engineer John Errinton de la Croix (1848-1905), initially on a scientific mission for the French government and who formed the tin mining company Societe des Mines d’etain de Perak (1881). Later he founded the Societe des Etains de Kinta (S.E.K.; 1886). Both were among the very first European companies to start industrial tin mining activities in Perak (prior mining was mostly by Chinese groups))

Errington de la Croix, J. (1888)- *Rapport sur les mines d'etain de Selangor et les concessions de Ayer-Itam, Pataling, Batu*. Imprimerie Leve, Paris, p. 1-19.
(‘Report on the tin mines of Selangor and the concessions of Ayer-Itam, Petaling, Batu’)

Faesal, A., M.I.K.A. Aminuddin, I. Warmada, K. Yonezu & N.I. Setiawan (2024)- Geochemical signatures of the Taku schist, Peninsular Malaysia: implications for sedimentary protoliths and tectonic setting. Proc. 3rd Int. Conf. Mining and Environmental Technology, Mataram 2024, IOP Conference Series: Earth and Environmental Science 1422, p. 1-7.

(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1422/1/012009>)

(Composition of unfossiliferous Taku Schist reflects episodic compressions of Sibumasu Plate sedimentary cover and Bentong-Raub melange into various greenschist facies. Amphibolite facies linked to positions in upper plate of Permian-Triassic Sukhothai Arc)

Fassihi, S., D. Vachard, P. Heinz & M.H.A.Hassan (2023)- A new species of *Eoparafusulina* (Fusulinacea, Monodiexodinidae) from the Lower Permian of the Northwest Peninsular Malaysia: its significance to Sibumasu Block (Eastern Cimmerian continent) palaeobiogeography and palaeoclimatology. FORAMS 2023 Conference, Perugia, Italy. (Abstract only)

(see also Fassihi et al., below))

Fassihi, S., D. Vachard, P. Heinz, M.H.A.Hassan & A. Azmi (2024)- A new fusulinid species from the early Permian of northwestern Peninsular Malaysia: Evidence of the Artinskian warming event in the eastern Peri-Gondwanan Sibumasu Block. Marine Micropaleontology 191, 102391, p. 1-15.

(online at: https://www.researchgate.net/publication/382994391_A_new_fusulinid_species_from_the_early_Permian_of_northwestern_Peninsular_Malaysia_Evidence_of_the_Artinskian_warming_event_Etc.)

(Lower Permian (Cisuralian) sandy limestones and calcareous sandstones in transition between Asselian-Sakmarian Upper Kubang Pasu Fm (with cold water brachiopods and diamictite beds) and overlying Chuping Limestone in NW Peninsular Malaysia (part of Gondwanan Sibumasu Block). Previous reports of fusulinids *Monodiexodina shiptoni* and *M. sutschanica*; also with *Pseudofusulina* and *Geinitzia*. Presence of fusulinid species *Crenulosepta perlisensis* confirms age as Artinskian. Area was still part of N Gondwana continental shelf in Asselian, but by late E Permian had become part of E Cimmerian microcontinent, located in subtropical Tethyan Realm)

Filipov, A., J. Jong & M. Madon (2021)- Reconnaissance of Kenny Hill Formation outcrops in the Rawang Area, Northern Selangor, Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 47, 1, p. 29-48.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101885-PDF.pdf)

(New outcrops of Paleozoic meta-sediments NW of Kuala Lumpur. Upper Paleozoic Kenny Hill Fm outcrops in N Selangor as steeply SW dipping upward-coarsening fluvial sandstones and shales. At Bukit Botak angular unconformity or decollement marks contact between Upper and Lower Paleozoic. Etc.)

Fitch, F.H. (1952)- The geology and mineral resources of the neighbourhood of Kuantan, Pahang. Geological Survey of Malaya, Memoir 6, p. 1-146.

(Incl. Lower Carboniferous argillaceous and calcareous facies, unconformably overlain by ?Triassic arenaceous series, ?Cretaceous tin-bearing biotite granite, etc.)

Fletcher, W.K. & C.H. Loh (1996)- Transport of cassiterite in a Malaysian stream: implications for geochemical exploration. J. Geochemical Exploration 57, p. 9-20.

Fletcher, W.K. & C.H. Loh (1997)- Transport and deposition of cassiterite by a Malaysian stream. Journal of Sedimentary Research 67, p. 763-775.

Fontaine, H. & D. Vachard (1988)- Discovery of lower Carboniferous limestone in Kemaman District, Terengganu, Malaysia. CCOP Newsletter 13, 2, p. 25-26. (reprinted in CCOP, Technical Publication 20, p. 105)

Fontaine, H., C. Chonglakmani, S. Piyasin, Ibrahim B. Amnan & H.P. Khoo (1993)- Triassic limestone within and around the Gulf of Thailand. In: B.K. Tan et al. (eds.) Proc. 7th Conference Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 83-95.

(online at: https://www.academia.edu/101677048/Triassic_limestone_within_and_around_the_Gulf_of_Thailand)

(Presence of Early- Late Triassic limestones at Peninsular Thailand and NW Peninsular Malaysia. Many previously included in Permian. Similar to 'Chuping Lst' and 'Kodiang Lst'. Post Triassic fracturing and karstification. Many contain *Aulatortus*, *Tubiphytes*, *Thaumatoporella parvovesiculifera*, etc.)

Fontaine, H. & Ibrahim bin Amnan (1994)- The importance of Triassic limestone in the Central Belt of Peninsular Malaysia. In: P. Angsuwathana et al. (eds.) Proc. International Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources (DMR) and IGCP 306, p. 195-205.

(More than 20 occurrences of Triassic-age limestone in Central Belt of Peninsular Malaysia, including Singapore. Generally poor in macrofossils)

Fontaine, H. & I. bin Amnan (1995)- Biostratigraphy of the Kinta Valley, Perak. Proc. Seminar on Permo-Triassic of Malaysia and associated mineralization, Selangor 1994, Geological Society Malaysia 38, p. 159-172.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100916-PDF.pdf)

(Review of fossils from thick limestone-dominated M Ordovician- M Permian stratigraphy of Kinta Valley area near Ipoh, Perak, NW Malay Peninsula. Ordovician-Silurian graptolite shale, Ordovician, Devonian, Carboniferous and Permian limestones, etc. (= part of 'Sibumasu' Paleozoic stratigraphy; JTVG). Re-description of fusulinids (*Pseudofusulina krafftii*, *Cancellina* (Maklaya) ex gr. *pamirica*) from H.S. Lee mine No. 8, here believed to signify Bolorian (= E Kungurian, late E Permian) age)

Fontaine, H. & Ibrahim bin Amnan (1999)- Carboniferous of Malaysia: biostratigraphy and paleogeography. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 26-44.

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)

(Presence of Carboniferous in Peninsular Malaysia known since 1920. All stages known from eastern region (Indochina plate). Carboniferous (with fusulinids) also known from Sarawak, N Borneo, since 1932. Four distinct geographic zones (Deepwater Bentong- Raub Paleotethys suture, flanked by shallow marine realms, and NW Malay Peninsula with Singa Fm glacio-marine deposits)

Fontaine, H., Ibrahim B. Amnan, H.P. Khoo, D.T. Nguyen & D. Vachard (1994)- The *Neoschwagerina* -zone and the *Lepidolina-Yabeina* -zones in Malaysia and the Dzhulfian-Dorashamian in Malaysia: the transition to the Triassic. Geological Survey of Malaysia (Ipoh), Geological Papers 4, p. 1-74.

Fontaine, H., Ibrahim.B. Amnan, H.P. Khoo & D. Vachard (1990)- More Triassic foraminifera from Peninsular Malaysia. United Nations ESCAP, CCOP, Technical Bulletin 21, p. 73-83.

(Anisian smaller benthic foraminifera from Bukit Tunjang (should be Bukit Tunjung) limestone quarry, Kedah. *Tubiphytes* locally abundant. Forams rel. rare, common *Tolypammina*, also *Meandrospira dinarica*)

Fontaine, H., Ibrahim B. Amnan & D. Vachard (1999)- Kinta Valley displays startling lithology and biostratigraphy. Proc. 23rd Annual Conference Geological Survey of Malaysia, Melaka 1992, p. 1-29.

Fontaine, H., Ibrahim B. Amnan & D. Vachard (1999)- Important discovery of late Early Permian limestone in Southern Terengganu, Peninsular Malaysia. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 453-460.

(online at: <https://gsm.org.my/articles/702001-100795/>)

(Small exposures of dark late E Permian shallow marine limestone, 500m from granite, in Seri Bandi area, NE Malay Peninsula. Thickness 90-300m. With stromatolites, algae (*Mizzia*, *Permocalculus*), common *Tubiphytes*, *calcispherids*, smaller foraminifers (*Tetrataxis*, *Endothyra*) and common fusulinids (incl. primitive *verbeekiniids* (*Pamirina leveni*, *Misellina*), *Levenella*, *Brevaxina*, *Toriyamaya*, *Chalaroschwagerina*, *Leeina*). Indicate late E Permian (=Artinskian-Kungurian) biozones in rocks previously considered of E Carboniferous age)

Fontaine, H., Ibrahim B.Amnan & D. Vachard (2003)- Carboniferous corals from the Kuantan area, Peninsular Malaysia, and associated microfauna: peculiar faunas for Southeast Asia and puzzling faunas for stratigraphy. Minerals and Geoscience Dept. Malaysia, Technical Papers 2, p. 69-99.

Fontaine, H., Ibrahim B.Amnan & D. Vu Khuc (1995)- Triassic limestones of southwest Kelantan (East and South of Pos Blau) and North Pahang (Merapoh Area), Peninsular Malaysia. Proc. IGCP Symposium on Geology of SE Asia, Hanoi, Journal of Geology, Hanoi, B, 5-6, p. 16-

(Triassic limestones widespread in Central Belt of Peninsular Malaysia. Beds gently undulating. New limestone localities of Anisian age in C part of Malay Peninsula contain locally rich Daonella lindstroemi and low-diversity foram fauna of Glomospira, Endothyra, Meandrosira and Pilammina, also algae Tubiphytes and Solenopora)

Fontaine, H. & H.P. Khoo (1990)- A review of paleontology and biostratigraphy of the Kelantan State. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 111-142.

(Kelantan State in N C Malay Peninsula with two major sequences: (1) Carboniferous- Triassic marine, unconformably overlain by (2) Jurassic- Cretaceous non-marine. Permian forams from SE Kelantan described by Vachard (1990) in same volume)

Fontaine, H., H.P. Khoo & D. Vachard (1988)- Discovery of Triassic fossils at Bukit Chuping, in Gunung Sinyum area and at Kota Jin, Peninsular Malaysia. J. Southeast Asian Earth Sciences 2, p. 145-162.

(Some poorly fossiliferous limestones of Peninsular Malaysia, previously considered to be Permian, yielded Triassic algae (Thaumatoporella parvovesiculifera) and foraminifera (Pilammina gemerica, Aulartortus sinuosus, Paleolituonella meridionalis) indicating Ladinian-Carnian age. New foram Malayspirina fontainei described. Strong affinity with Alpine- European faunas)

Fontaine, H. & K.W. Lee (1993)- A Triassic limestone ('Pandan limestone') discovered by drilling in Singapore. United Nations ESCAP, CCOP Newsletter 18, p. 9-19.

(About 200m Late Triassic Pandan Limestone with corals in borehole at Pandan Reservoir, Singapore, in lower part of Jurong Fm)

Fontaine, H., M. Lys & Nguyen Duc Tien (1988)- Some Permian corals from East Peninsular Malaysia: associated microfossils, palaeogeographic significance. J. Southeast Asian Earth Sciences 2, p. 65-78.

(M and Late Permian corals from three localities on E Malay Peninsula: (1) Bukit Kepayang quarry (Kampong Awah) andesite with dark limestone blocks with Waagenophyllum and Ipciphyllum, fusulinid forams (Neoschwagerina douvillei, Sumatrina annae, Verbeekina verbeeki, etc.), also Mizzia, Hemigordiopsis, etc.; (2) Jengka Pass black shale with limestone lenses with Michelinia and fusulinids a.a.; (3) Bukit Biwah M Permian massive limestone with Parawentzelella and algae. Assemblages of E Malay Peninsula corals and fusulinids different, more abundant and more diverse than NW of Malay Peninsula (= W margin of E Malaya/ Indochina Plate)

Foo, B.N. (1979)- A comparative study of paragenesis, geochemistry and fluid inclusions of selected primary tin deposits of West Malaysia. Ph.D. Thesis Imperial College, University of London, p. 1-534.

(online at: <https://spiral.imperial.ac.uk/handle/10044/1/35018>)

(Paragenetic tin mineralisation sequence and relation to host rocks and structures at two main hypogene tin deposits in Eastern Belt of SE Asian Tin Province in Malay Peninsula (Hantu and Gakak Mines at Sungei Lembing, Pahang, and Waterfall Mine at Pelapah Kanan, Johore. Mineralization preferentially in brittle calcareous Carboniferous-Permian metasediments)

Foo Khong Yee (1983)- The Palaeozoic sedimentary rocks of Peninsular Malaysia- stratigraphy and correlation. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 1-19.

(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_01.pdf)

(Paleozoic rocks account for 25% of outcrop of Malay Peninsula. W and NW zones with Lower Paleozoic sediments and conformable Late Cambrian-Permian section. In C and E zones of Malay Peninsula outcrops of Carboniferous-Permian only)

Francois, T., M.A.M Ali, L. Matenco, E. Willingshofer, T.F. Ng, N.I. Taib & M.K. Shuib (2017)- Late Cretaceous extension and exhumation of the Stong and Taku magmatic and metamorphic complexes, NE Peninsular Malaysia. *J. Asian Earth Sciences* 143, p. 296-314.

(Stong and Taku magmatic and metamorphic complexes of N Peninsular Malaysia part of Late Paleozoic-Triassic Indosinian orogeny, dismembered during Cretaceous thermal event that formed large Late Santonian-E Maastrichtian extensional detachment, associated with crustal melting, emplacement of syn-kinematic plutons and widespread migmatization. Formation of detachment and first phase of Late Cretaceous cooling followed by renewed Eocene- Oligocene exhumation (see also Ali et al. 2016))

Gazdzicki, A. & O.E. Smith (1977)- Triassic foraminifera from the Malay Peninsula. *Acta Geologica Polonica* 27, 3, p. 319-332.

(online at: <https://geojournals.pgi.gov.pl/agp/article/view/9556/8105>)

(First report on 52 species of smaller foraminifera from Middle and early Late Triassic Kodiang Lst Fm at Bukit Kechil, 2.5 km S of Kodiang, NW Malay Peninsula. With Endothyra malayensis n.sp., Glomospira densa, Glomospirella grandis, Meandrospira pusilla, G. gemerica, Agathammina austroalpina, Ophthamidium, Tolypammina gregaria, Endothyranella lombardi, Endothyra kuepperi, Involutina communis and I. gaschei, etc., indicating E Anisian-Ladinian age. Also some loose samples with Carnian- Norian Aulaturus assemblage. Faunas similar to contemporaneous assemblages of Tethyan Realm, incl. Birma, Iran, etc.)

Gebretsadik, H.T., C.W. Sum, A.Y. Gatovsky, A.W. Hunter, (2015)- Discovery of Upper Devonian Lower Carboniferous conodonts in the Kinta Limestone, Western Belt of Peninsular Malaysia: implication for continuous sedimentation in the Palaeo-Tethys. *Proc. XVIII International Congress on the Carboniferous and Permian, Kazan, Russia 2015*, p. 63. *(Abstract only)*

(online at: https://www.researchgate.net/publication/281113241_Discovery_of_Upper_Devonian_Lower_Carboniferous_Conodonts_in_the_Kinta_Limestone_Western_Belt_of_Peninsular_Malaysia_Im_Etc.)

(Lower and Upper Carboniferous conodonts from boreholes in Kinta Limestone (different from title?; JTVG) (see also Kinta Limestone papers by H. Tsegab (listed below) = same author! JTVG))

Gebretsadik, H.T., C.W. Sum, A.Y. Gatovsky, A.W. Hunter, J.A.B. Talib & S. Kassa (2017)- Higher-resolution biostratigraphy for the Kinta Limestone and an implication for continuous sedimentation in the Paleo-Tethys, Western Belt of Peninsular Malaysia. *Turkish J. Earth Sciences* 26, 5, 3, p. 377-394.

(online at: <https://journals.tubitak.gov.tr/earth/vol26/iss5/3/>)

(Massive Paleozoic Kinta Limestone in central Western Belt of Malay Peninsula (Sibumasu Terrane?) with nine diagnostic conodont species from three boreholes, including Pseudopolygnathus triangulus and Declinognathodus noduliferus. Indicate U Devonian- U Carboniferous age range and suggest continuous carbonate deposition from E Devonian- Late Carboniferous in Paleo-Tethys basin of Malay Peninsula)

Gebretsadik, H.T., C.W. Sum & A.W. Hunter (2015)- Preservation of marine chemical signatures in Upper Devonian Carbonates of Kinta Valley, Peninsular Malaysia: implications for chemostratigraphy. In: M. Awang et al. (eds.) *Proc. Int. Conference Integrated Petroleum Engineering Geosciences (ICIPEG)*, Kuala Lumpur 2014, Springer Verlag, p. 291-302.

(Kinta Limestone important Silurian-Permian unit in W Belt of Malay Peninsula. Diagenesis obscured many primary sedimentary and geochemical features. Nearly pure limestones have rel. low Mn/Sr values (1.83-3.14), suggesting minor post-depositional alteration and likely preservation of original marine compositions)

Ghani, A.A. (2000)- The Western Belt granite of Peninsular Malaysia: some emergent problems on granite classification and its implication. *Geosciences Journal* 4, 4, p. 283-293.

(Peninsular Malaysian Western Belt granites considered as constituting exclusively 'S' type granites, but commonly mixed 'T' and 'S' type features. W Belt granite not solely derived from metasediments, but probably mixed origin of crustal material such as metapelites, greywackes and meta-igneous rocks)

- Ghani, A.A. (2001)- Some problems with the classification of the 'S' type granite with particular reference to the Western Belt granite of Peninsular Malaysia. In: G.H. Teh et al. (eds.) Proc. Geological Society Malaysia Annual Geological Conference 2001, Pangkor Island, p. 123-130.
(online at: https://gsmpubl.files.wordpress.com/2014/10/age2001_20.pdf)
(*Peninsular Malaysian granites grouped into two provinces, W and E Belt granites. W Belt considered as 'S' type granites, but granites show mixed 'I' and 'S' type features. W Belt granite not solely derived from metasediments, but more likely mixed crustal material such as metapelites, greywackes and metaigneous rocks*)
- Ghani, A.A. (2003)- Geochemistry of tourmaline-bearing granite from Maras-Jong, Terengganu, Peninsular Malaysia. Bull. Geological Society Malaysia 46, p. 19-24.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2003004.pdf>)
(*Maras-Jong granite at East Coast Province, E Malay Peninsula, many similarities to the S-type granite, but is felsic I-type granite*)
- Ghani, A.A. (2004)- Chemical characteristics of some of the granitic bodies from Terengganu area, Peninsular Malaysia. In: GSM Annual Geological Conference 2004, Kangar, Perlis, Bull. Geological Society Malaysia 49, p. 31-35.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004006.pdf>)
(*Study of four Permian-Triassic granitic batholiths from Eastern granitic belt in Terengganu area: Maras Jong pluton, Jerong batholith, Perhentian pluton and Kapal batholith. All granites are high K calc alkali*)
- Ghani, A.A. (2005)- Highly evolved S type granite: Selim Granite, Main Range Batholith, Peninsular Malaysia. Bull. Geological Society Malaysia 51, p. 95-101.
(online at: www.gsm.org.my/products/702001-100540-PDF.pdf)
(*Selim granite of Western Belt in NW Malay Peninsula consists coarse grained porphyritic biotite granite to m-f grained granite. Highly evolved with high SiO₂ (>75%)*)
- Ghani, A.A. (2005)- Geochemical characteristics of S- and I-type granites: example from Peninsular Malaysia granites. In: GSM Annual Geological Conference 2005, Seremban, Bull. Geological Society Malaysia 51, p. 123-134.
(online at: www.gsm.org.my/products/702001-100538-PDF.pdf)
- Ghani, A.A. (2009)- Volcanism. In: C.S Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya/ Geological Society Malaysia, Kuala Lumpur, p. 197-210.
- Ghani, A.A. (2009)- Plutonism. In: C.S Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya/ Geological Society Malaysia, Kuala Lumpur, p. 211-231.
- Ghani, A.A. & S.L. Chung (2013)- Ar Ar geochronology of volcanic rocks from Eastern Part of Peninsular Malaysia. Proc. National Geoscience Conference, Ipoh 2013, Geological Society Malaysia, B20, p. 95-96.
(Abstract only)
(online at: <https://gsm.org.my/articles/702001-101658/>)
(*Along E margin of Bentong-Raub suture, from W Pahang to Kelantan State, elongate strip of Permian and Triassic volcanics, possibly extending to Bangka and Billiton, along W edge of Indochina Terrane. Andesitic and acidic volcanism in Permian, acidic volcanism predominates in Triassic. Hornblende separates from basalt/andesite at Kampung Awah give age of 266 Ma (M Permian). Sibul Island, SE Johore, ages around Carboniferous-Permian boundary (~298-336 Ma) from bedded pyroclastic rocks. Rhyolitic tuff from nearby Tinggi island significantly younger (mid-Cretaceous; ~85-122 Ma)*)
- Ghani, A.A., F.I. Hazad, A. Jamil, Q.L. Xiang, W.N.A.W. Ismail, S.L. Chung, Y.M. Lai, M.H. Roselee et al. (2014)- Permian ultrafelsic A-type granite from Besar Islands group, Johor, Peninsular Malaysia. J. Earth System Science 123, 8, p. 1857-1878.
(online at: <https://www.ias.ac.in/public/Volumes/jess/123/08/1857-1878.pdf>)

(Granitic rocks of Malay Peninsula traditionally divided into two provinces: (1) W Province S-type granites coarse, tin-mineralised, continental collision granite; (2) E Province granite is bimodal I-type dominated by granodiorite and associated gabbroic of arc type granite. Highly felsic A-type granite occurs in Besar, Tengah, and Hujung islands off SE coast of Peninsula (SiO₂ content 76- 78%). Shallow level of emplacement. A-type granite can be related to extensional back arc basin in Indo-China terrane during earliest Permian)

Ghani, A.A., C.H. Lo & S.L Chung (2013)- Basaltic dykes of the Eastern Belt of Peninsular Malaysia: the effects of the difference in crustal thickness of Sibumasu and Indochina. *J. Asian Earth Sciences* 77, p. 127-139. *(Jurassic (~179 Ma) and Cretaceous (~79-129 Ma) basaltic dykes of Peninsular Malaysia confined to E Belt (Indochina/ E Malaya block), not in W Belt (Sibumasu Block). Most dykes attributed to difference of crustal thickness between E and W belt (W Belt crust 13 km thicker than E and C belts, and more difficult to fracture))*

Ghani, A.A., C.H. Lo & S.L Chung (2014)- Geochronology of volcanic and plutonic rocks from the islands off Pahang and east Johor, Peninsular Malaysia. Geological Society Malaysia, National Geoscience Conference (NGC), Trengganu 2014, P059, p. 99-100. *(Extended Abstract)*
(online at: <https://gsm.org.my/articles/702001-100318/>)
(Ages of igneous rocks of islands off coast Johor-Pahang, SE Peninsular Malaysia, between 80-300 Ma. U Pb zircon age of granites of P. Tengah and P. Besar 280-282 Ma (E Permian), granite/diorite from Pemanggil and Tioman 80 Ma. Ar/Ar ages of pyroclastics from Sibu mainly ~297 Ma, from Tinggi ~85-120 Ma)

Ghani, A.A., V. Ramesh, B.T, Yong & T.T. Khoo (2004)- Geochemistry and petrology of syenite, monzonite and gabbro from the Central Belt of Peninsular Malaysia. In: GSM Annual Geological Conference 2004, Kangar, Perlis, Bull. Geological Society Malaysia 49, p. 25-30.
(online at: www.gsm.org.my/products/702001-100571-PDF.pdf)
(Benom Igneous Complex C Belt of Malay Peninsula rocks intruding into M-U Triassic sediments of Semantan Fm. Composition ranges from granitic to syenitic to monzonitic and gabbroic. Range of SiO₂ for gabbro 46.5-49.1%, syenite 52.9 -56.9% and monzonite 56.6-64.7%. High alkali content, shoshonitic with I type characteristics. Also high Ba and Sr (mantle material?))

Ghani, A.A., M. Searle, L. Robb & S.L. Chung (2013)- Transitional I-S type characteristics in the Main Range Granite, Peninsular Malaysia. *J. Asian Earth Sciences* 76, p. 225-240.
(Manuscript online at: https://www.researchgate.net/profile/A-Ghani/publication/237197562_Transitional_I-S_type_characteristics_in_the_Main_Range_Granite_Peninsular_Malaysia/data/02e7e51ba7aaf83639000000/I-s20-S136791201300299X-main.pdf)
(Dominantly Late Triassic (~200-220 Ma) Main Range Granite of Peninsular Malaysia, located W of Paleo-Tethyan Bentong-Raub suture zone and host of large tin province, regarded as S-type granite, but also many features of I-type granites (large scale of plutonism, primary titanite and amphibole, etc.). Moderately peraluminous nature of bulk of Main Range Granite, without cordierite, Fe-Mg garnet or sillimanite, consistent with derivation from metasedimentary protolith that was undersaturated with respect to Al₂SiO₅)

Ghani, A.A., I. Yusoff, Meor H.A. Hassan & R. Ramli (2013)- Geochemical study of volcanic and associated granitic rocks from Endau Rompin, Johor, Peninsular Malaysia. *J. Earth System Science* 122, 1, p. 65-78.
(online at: <https://www.ias.ac.in/article/fulltext/jess/122/01/0065-0078>)
(Late Permian-Triassic Jasin felsic volcanics (dacite/rhyolite and andesite) and Besar batholith (~214 Ma) granitic magmas from W of Johor National Park, Endau Rompin, probably from different sources. Granite produced by partial melting of quartz feldspathic rocks containing amphibole among residual phase. Magmas generated at different time during subduction of Sibumasu beneath Indochina block)

Gillespie, M.R., R.S. Kendall, A.G. Leslie, I.L. Millar, T.J.H. Dodd, T.I. Kearsey, T.P. Bide et al. (2019)- The igneous rocks of Singapore: new insights to Palaeozoic and Mesozoic assembly of the Sukhothai Arc. *J. Asian Earth Sciences* 183, 103940, p. 1-25.
(manuscript online at: www.researchgate.net/publication/334965342_The_igneous_rocks_of_Singapore_New_insights_to_P_Etc)
(Six plutons of granitic-gabbroic rocks in N and E Singapore. Five emplaced during 285-230 Ma (E Permian-Triassic arc-related magmatism at S end of Sukhothai Arc system of Thailand, Peninsular Malaysia and

Indonesia). *Volcano-sedimentary succession in SW Singapore records contemporaneous deposition in forearc basin, with largest pyroclastic unit developed as volcanic activity peaked at ~242 Ma. Part of Eastern Belt intrusions of Eastern granitoid provinces of SE Asia, and formed in Andean-type setting as Paleo-Tethys crust descended beneath Indochina–East Malaya block. Widespread hydrothermal-tuffisite in Permo-Triassic intrusions correlated with rapid uplift following slab breakoff, when arc activity ceased in Singapore at ~230–205 Ma. Sixth pluton in NE Singapore emplaced in Upper Cretaceous)*

Gobbett, D.J. (1966)- The brachiopod *Stringocephalus* from Malaya. *Journal of Paleontology* 40, 6, p. 1345–1348.

(Stringocephalus perakensis n. sp. from alluvial tin-mining area, Kinta valley, Perak, NW Malay Peninsula, indicating marine Givetian (M Devonian). Associated fauna: dasycladacean algae, stromatoporoids, tabulate corals, Murchisonia sp.)

Gobbett, D.J. (1968)- The Permian system in Malaya. *Bull. Geological Society Malaysia* 1, p. 17–22.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1967002.pdf>)

(Shallow marine limestones, shales and volcanics represent complete Permian sequence in Malaya. Correlations mainly by fusulinid foraminifera)

Gobbett, D. J. (1972)- Geological map of the Malay Peninsula. Geological Society Malaysia, scale 1:1,000,000.

Gobbett, D.J. & C.S. Hutchison (eds.) (1973)- *Geology of the Malay Peninsula*. Wiley, New York, p. 1–438.

(Classic textbook of geology of Malay Peninsula. See also updated edition by Hutchison & Tan (2009))

Goh Sing Thu, D.W. Heacock & D.E. Loveless (1983)- Exploration, development, and reservoir engineering Studies for the Tapis Field offshore Peninsular Malaysia. *J. Petroleum Technology* 35, 6, p. 1051–1060.

(Tapis field 1969 discovery by Esso in Malay Basin, S China Sea, 209 km off E coast of peninsular Malaysia. Produces from Miocene Group J (Tapis Fm) sandstone reservoirs that contain rim-type oil accumulations with associated gas caps. Three primary reservoirs, J20, J25, J30, are shoreface/barrier bar deposits separated by shale sequences)

Gowda, S.S. (1965)- Age of the Temerloh Limestone (Calcareous Series) of Malaya. *Bull. Geological Society India* 2, p. 58–61.

(Early description of M Permian corals, fusulinid forams (incl. Neoschwagerina, Sumatrina annae, Verbeekina verbeeki, Hemigordiopsis) and algae (incl. Mizzia velebitana, Macroporella, Tubiphytes, Archaeolithoporella, etc.) from Kampong Awah area, Pahang, C Malay Peninsula (see also Cummings 1965, Jones et al. 1966, Ishii et al. 1966, Fontaine et al. 1988) (= part of E Malaya Permian- E-Triassic volcano-plutonic arc?; e.g. Hutchison 1989, Madon 2010))

Grubb, P.L.C. (1968)- Geology and bauxite deposits of the Pengerang area, southeast Johore. *Memoir Geological Survey Department West Malaysia* 14, p. 1–125.

Gupta, A., A. Rahman, P.P. Wong & J. Pitts (1987)- The old alluvium of Singapore and the extinct drainage system to the South China Sea. 12, 3, p. 259–275.

(Old Alluvium of Singapore mainly matrix-supported pebbly sand and appears to be proximal braided river alluvium of possible Pleistocene age. Mixed provenance of granitic and low-grade metamorphic origin. Believed to be deposited during low sea levels, in environment of high relief, seasonal rainfall and active erosion. Such conditions may have prevailed over much of SE Asia at time of deposition of Old Alluvium)

Hada, S. (1966)- Discovery of Early Triassic ammonoids from Gua Musang, Kelantan, Malaya. *J. Geosciences, Osaka City University* 9, 4, p. 111–122.

(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090007.pdf)

(Rel. poorly preserved E Triassic ammonites from Gua Panjang, 5 mi S of Gua Musang rail station, Kelantan, incl. Owenites, Arctoceras, Paranannites, Prosphingites and Pseudosageceras (= middle Lower Triassic Meekoceras glacialitatis Zone))

Haile, N.S. (1971)- Quaternary shorelines in West Malaysia and adjacent parts of the Sunda Shelf. *Quaternaria* 15, p. 333-343.

(Review of former relative sea levels in Malay Peninsula and adjacent marine areas. Well established Holocene level of ~+6 m. Levels down to -100m shown by depths of fluvial alluvium and erosional submarine morphology. No convincing evidence for former levels higher than + 6 m)

Haile, N.S. (1975)- Postulated Late Cainozoic high sea levels in the Malay Peninsula. *J. Malaysian Branch Royal Asiatic Society* 48, 1, p. 78-88.

Haile, N.S. (1980)- Palaeomagnetic evidence from the Ordovician and Silurian of northwest Peninsular Malaysia. *Earth Planetary Science Letters* 48, p. 233-236.

(Paleomagnetic work on 37 samples from Ordovician- Silurian Setul Lst of Langkawi Islands, off NW Peninsular Malaysia, suggests paleolatitude of Langkawi at 43° (S or N))

Haile, N.S., R.D. Beckinsale, K.R. Chakraborty, A.H. Hussien & T. Hardjono (1983)- Paleomagnetism, geochronology and petrology of the dolerite dykes and basaltic lavas from Kuantan, West Malaysia. *Bull. Geological Society Malaysia* 16, p. 71-85.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1983007.pdf>)

(Cretaceous Kuantan basalt dykes, central E coast Malay Peninsula, K-Ar dated at ~104 Ma. Paleomagnetism study shows suggests ~30° CCW rotation since mid-Cretaceous. Paleomagnetic pole similar to that from U Jurassic- Lw Cretaceous redbeds of Malaya and U Cretaceous of W Kalimantan, suggesting CCW rotation on S-ward movements of all these regions since Cretaceous)

Haile, N.S. & Khoo Han Peng (1980)- Palaeomagnetic measurements on Upper Jurassic to Lower Cretaceous sedimentary rocks from Peninsular Malaysia. *Bull. Geological Society Malaysia* 12, p. 75-78.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1980006.pdf>)

(Paleomagnetic data from 3 sites of U Jurassic- Lw Cretaceous redbeds in Pahang and Johore indicate these areas were ~8° N of present position and rotating clockwise and moving N. Since Late Cretaceous Malay Peninsula rotated CCW and moved S to present position)

Haile, N.S., P.H. Stauffer, D. Krishnan, T.P. Lim & Ong G.B. (1977)- Palaeozoic redbeds and radiolarian chert: reinterpretation of their relationships in the Bentong and Raub areas, West Pahang, Peninsular Malaysia. *Bull. Geological Society Malaysia* 8, p. 45-60.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1977002.pdf>)

(Foothills Range in Bentong-Raub area E of Main Range in Pahang composed of 3 rock units: (1) earliest Devonian or older schist, (2) E Devonian chert-argillite with radiolarians and Lower Devonian graptolites and (3) Devonian- E Carboniferous fluvial redbed conglomerates. Also serpentinites in parts of Range)

Halim, R.A.A., N.A.N. Tan, H. Zainal & Meor H.A. Hassan (2017)- Carboniferous plant fossils from the Kubang Pasu Formation, Pokok Sena, Kedah. *Proc. 30th National Geoscience Conference Exhib. (NGC)*, Kuala Lumpur, PDRG08-59, *Warta Geologi (Newsletter Geological Society Malaysia)* 43, 3, p. 305. *(Abstract only)*

(online at: https://gsm publ.files.wordpress.com/2017/09/ngsm2017_032.pdf)

*(Kubang Pasu Fm near Pokok Sena, Kedah, thick interbedded marine shale-sandstone. Shale intervals with trilobite *Chlupacula* (previously known as *Macrobole kedahensis*), bivalve *Posidonia/Posidonomya becheri*, etc., indicating E Carboniferous age. Locally abundant plant fossils, incl. leaves identified as *Sphenophyllum cf. miravallis*. Possibly oldest plant fossils from W Belt of Malay Peninsula)*

Hamada, T. (1968)- Ambocoeliids from Red Beds in the Malayan Peninsula. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press 5, p. 13-25.

*(Ambocoeliid brachiopods *Echinocoeliopsis*, 'Emanuella', etc. in Devonian red beds (base Kubang Pasu Fm) of Langkawi and Perlis and Kedah, NW Malay Peninsula. See also Kobayashi & Hamada 1973)*

- Hamada, T. (1969)- Late Paleozoic brachiopods from red beds in the Malayan Peninsula. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 6, p. 251-264.
(*Fauna of small brachiopods, trilobites, ostracodes, etc, associated with bivalve 'Posidonia' (= Posidonomya) from Langgun Redbeds of Langkawi Islands, NW Malaysia, which unconformably overlie E Silurian rocks. Mainly endemic assemblage with many new species, incl. rhynchonellid Langkawia n.gen. Age believed to be around Devonian-Carboniferous boundary*)
- Hamada, T. (1969)- Devonian brachiopods from Kroh, Upper Perak in Malaysia (Malaya). In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 7, p. 1-13.
(*8 species of brachiopods from late Early-M Devonian Tentaculites (Novakia acuaria) shale from S of Kroh, NW Malay Peninsula, incl. Orbiculoidea, Plectodonta, etc.*)
- Hamada, T. (1984)- Older and Middle Palaeozoic brachiopods of Thailand and Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 183-186.
(*Brief review of Ordovician- Devonian brachiopods of W Thailand- Malay Peninsula*)
- Hamada, T., H. Igo, T. Kobayashi & T. Koike (1975)- Older and Middle Palaeozoic formations and fossils of Thailand and Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 15, p. 1-39.
(*14 macrofossil zones distinguished in Cambrian- basal Carboniferous in Thailand and W Malay Peninsula, based on shelly faunas*)
- Hamzah, U. & Ng Chiang Seng (1995)- Fosil kayu dan beberapa fosil tumbuhan dari Sg. Berok, Gua Musang, Kelantan. *Warta Geologi (Newsletter Geological Society Malaysia)* 21, 4, p. 247-253.
(online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1995004.pdf>)
(*'Wood and some plant fossils from Sg. Berok, Gua Musang, Kelantan'. Wood and plant fossils from Gua Musang Fm in Kelantan, N C Malay Peninsula. Two localities, Post Blau and SW of Sungai Berok, Gua Musang, with Cordaites sp., Araucarioxylon sp., Pecopteris sp. and Sphenopteris sp. Age Permian-Triassic*)
- Harbury, N.A., M.E. Jones, M.G. Audley-Charles, I. Metcalfe & K.R. Mohamed (1990)- Structural evolution of Mesozoic Peninsular Malaysia. *J. Geological Society, London*, 147, 1, p. 11-26. (online at: www.researchgate.net/publication/249546465_Structural_evolution_of_Mesozoic_Peninsular_Malaysia)
(*Upper Paleozoic- Mesozoic of Peninsular Malaysia two important compressional events: Late Permian and mid- to Late Cretaceous. Late Paleozoic compressional event was major orogenic phase with emplacement of Permo-Triassic granite plutons that form eastern and main ranges. No indications of Triassic orogenic compression. Raub-Bentong line was important fault zone active in Mesozoic but is not major tectonic suture since Late Paleozoic (Proposed timing of orogenesis questioned by Hutchison & Sivam 1992; JTVG)*)
- Harun, Z. (2002)- Late Mesozoic-Early Tertiary faults of Peninsular Malaysia. *Proc. GSM Annual Geological Conference 2002, Kota Bharu, Bull. Geological Society Malaysia* 45, p. 117-120.
(online at: www.gsm.org.my/products/702001-100734-PDF.pdf)
(*Samples of sheared granite from two fault zones (Bukit Berapit and Bukit Tinggi Faults). K-Ar dating of whole rock gave isotope ages for timing of fault movements at ~84, 53 and 46 Ma. Possibly tie to Late Cretaceous event of ~NW-trending sinistral strike-slip faulting and E-M Eocene movements from India- S Asia collision*)
- Harun, Z. & B. Jasin (1999)- Implications of the Bok Bak Fault movements on the structure and lithostratigraphy of the Pokok Sena area. In: G.H. Teh (ed.) *Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98)*, Kuala Lumpur 1998, *Bull. Geological Society Malaysia* 43, p. 145-153.
(online at: www.gsm.org.my/products/702001-100826-PDF.pdf)
(*Strike-slip fault in area of Paleozoic sediments in NW Malay Peninsula*)
- Harun, Z. & B. Jasin (2000)- The occurrence of thrusts in north Kedah and Perlis. *Proc. Annual Geological Conference 2000, Geological Society Malaysia, Pulau Pinang*, p. 117-120.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_02.pdf)

(Several thrust faults observed at localities in Kedah and Perlis (NW corner Malay Peninsula). Faults high angle, dipping E, displacing Lower Paleozoic Mahang and Setul Fms onto E Permian Kubang Pasu Fm)

Harun, Z. & B. Jasin (2003)- Some radiolarians from Dengkil, Selangor. Bull. Geological Society Malaysia 46, p. 133-136.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2003022.pdf>)

(Assemblage of E Carboniferous radiolarians in chert sequence, exposed SW of Dengkil, Selangor. Associated with siliceous mudstone or shale, without volcanics (passive continental shelf?). Possibly part of Kenny Hill Fm. Incl. *Astroentactinia* sp., *Entactinosphaera palimbola* and *Duplexia? parviperjorata*)

Harun, Z., B. Jasin, N. Mohsin & A. Azami (2009)- Thrust in the Semanggol Formation, Kuala Ketil, Kedah. Bull. Geological Society Malaysia 55, p. 61-66.

(online at: www.gsm.org.my/products/702001-100460-PDF.pdf)

N-directed thrusting in Permo-Triassic Semanggol Fm bedded chert unit. Rocks generally strike from ENE to ESE and gently to steeply (20°-78°) dipping to S. Cherts with late E Permian- M Triassic radiolarians. Interpreted as localised transpressional deformation during latest movement of Bok Bak fault zone)

Haseldonckx, P. (1977)- The geology of Pulau Tekong, Singapore. Bull. Geological Society Malaysia 8, p. 75-87.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1977004.pdf>)

(Geological reconnaissance of Tekong Island in Straits of Johore. Oldest rocks folded Lower Triassic? quartzites and slates, subjected to thermal metamorphism. Overlain by U Triassic molasse facies clastics. No fossils or other age dating obtained)

Hashim, A.S.H. (1985)- Discovery of an ammonoid (*Agathiceras* sp.) and crinoid stems in the Kenny Hill Formation of Peninsular Malaysia, and its significance. Warta Geologi 11, 5, p. 205-212.

(Discovery of poorly preserved ammonoid (*Agathiceras* sp.) and crinoid fragments in poorly fossiliferous Kenny Hill Fm N of Sepang area, Selangor, near C Malay Peninsula W Coast indicates age of formation is at least in part E-M Permian)

Hassan, W.F.W. & H.S. Purwanto (2004)- Radiometric age of Kampung Awah andesite. Bull. Geological Society Malaysia 48, p. 51-54.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004a11.pdf>)

(Basaltic andesite from Kampung Awah between Temerloh and Maran in central Peninsular Malaysia yielded K-Ar age of 269±46 Ma (M Permian) (analysis in GRDC, Bandung) (probably Permian arc volcanism related to Paleotethys subduction along W margin of Indochina Plate before Sibumasu collision; JTVG)

Hassan, Meor H. (2003)- Sedimentology and palaeontology of the Devonian red beds of northwest Peninsular Malaysia. Seminar Penyelidikan Jangka Pedek (Vot G), p. 1-4.

(online at: <http://eprints.um.edu.my/691/1/paper144.pdf>)

(Mid- Late Devonian redbeds throughout Perlis, Kedah and Langkawi islands, probably prodelta deposits)

Hassan, Meor H. (2013)- Post-conference field excursion to Northwest Peninsular Malaysia. Third Int. Conference on Palaeontology of South East Asia (ICPSEA 3), p. 1-28.

(online at: http://umexpert.um.edu.my/file/publication/00006513_97630.pdf)

(Fieldtrip guide to Paleozoic of NW Malay Peninsula. 'Gondwanan' stratigraphy including E Permian Singa Fm glaciomarine deposits (on Langkawi Island only) and U Kubang Pasu Fm with Kungurian-Roadian *Monodiexodina fusulinid* forams. Youngest Paleozoic unit is Permian Chuping Lst)

Hassan, Meor H. (2021)- The Devonian-Carboniferous boundary at Guar Sanai, Kampung Guar Jentik, Perlis: an updated map and stratigraphic section. Bull. Geological Society Malaysia 71, p. 57-62.

(online at: <https://gsm.org.my/articles/702001-101899/>)

(Sanai Hill B locality at Kampung Guar Jentik, Beseri district, NW corner of Malay Peninsula)

Hassan, Meor H., A.K. Aung, R.T. Becker, N.A. Abdul Rahman, T.F. Ng, A.A. Ghani & M.K. Shuib (2014)- Stratigraphy and palaeoenvironmental evolution of the mid- to upper Palaeozoic succession in Northwest Peninsular Malaysia. *J. Asian Earth Sciences* 83, p. 60-79.

(online at: https://umexpert.um.edu.my/file/publication/00004083_104753.pdf)

(Revised Devonian-Permian stratigraphy in NW Peninsular Malaysia (= Sibumasu Block stratigraphy). *E Devonian Timah Tasoh Fm black mudstone with graptolites and tentaculitids overlain by Sanai Lst with Late Devonian conodonts (Frasnian- E Famennian) or by Late Tournaisian chert of Telaga Jatoh Fm. Overlying Kubang Pasu Fm clastics include (1) Late Visean Chepor Mb with glacial marine deposits (with new ammonoid species, *Praedaraelites tuntungensis*, possibly of Visean age); (2) Carboniferous-Permian Kubang Pasu Fm clastics; (3) Kungurian uppermost Kubang Pasu Fm shallow marine clastics. Permian Chuping Lst. Mid-Paleozoic unconformity separates Early-Late Devonian from overlying Late Devonian-Carboniferous deposits, probably marking initiation of rifting on Sibumasu, which led to separation of Sibumasu from Australian Gondwana in Late Sakmarian (E Permian))*

Hassan, Meor H., A.K. Aung, R.T. Becker, N.A. Abdul Rahman, T.F. Ng, A.A. Ghani & M.K. Shuib (2014)- Carboniferous (Mississippian) dropstones and diamictite from the Chepor Member, basal Kubang Pasu Formation: earliest record of glacial-derived deposits in Peninsular Malaysia. *Geological Society Malaysia, Proc. National Geoscience Conference (NGC), Trengganu 2014*, P046, p. 38-39. (Extended Abstract)

(online at: <https://gsm.org.my/articles/702001-100318/>)

(Pebbly mudstone and diamictite intervals in Chepor Mb (= basal unit of Kubang Pasu Fm) in Perlis, NW Malay Peninsula (= Sibumasu Terrane). Trilobite *Weyeraspis* sp. and ammonoid *Praedaraelites tuntungensis* indicate Visean age (E Carboniferous) and is earliest glacial marine conditions on Peninsular Malaysia)

Hassan, Meor H. & R.T. Becker (2019)- Carboniferous ammonoids from the Kubang Pasu Formation, Hutan Aji, Perlis. *Warta Geologi (Geological Society Malaysia Newsletter)* 45, 3, p. 261 (Abstract only)

(Carboniferous Chepor Mb mudstones and dropstones of Kubang Pasu Fm rich in marine fossils. Many groups previously described by Japanese paleontologists in 1960-1970s. Horizon with ammonoids, incl *Goniatites*, *Delepinoceras* and *Praedaraelites*, pointing to Mississippian age))

Hassan, Meor H., B.D. Erdtmann, X.F. Wang & C.P. Lee (2013)- Early Devonian graptolites and tentaculitids in northwest Peninsular Malaysia and a revision of the Devonian-Carboniferous stratigraphy of the region. *Alcheringa* 37, 1, p. 49-63.

(*E Devonian tentaculitids described from new outcrops in black carbonaceous shales of Timah Tasoh Fm in Perlis, NW Peninsular Malaysia. Occurrences of graptolite *Monograptus langgunensis* and tentaculitid *Nowakia* (*Turkestanella*) acuaria acuaria give E Devonian (late Pragian or E Emsian) age for black shales. Probably rel. deep marine outer shelf or continental margin deposits of Sibumasu Terrane*)

Hassan, Meor H. & C.P. Lee (2002)- Stratigraphy of the Jentik Formation, the transitional sequence from the Setul Limestone to the Kubang Pasu Formation at Guar Sanai, Kampung Guar Jentik, Beseri, Perlis- a preliminary study. *GSM Annual Geological Conf. 2002, Kota Bharu, Bull. Geological Society Malaysia* 45, p. 171-178.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2002026.pdf>)

(Devonian of NW Malay Peninsula. New name Jentik Fm for ~300m thick E Devonian- E Carboniferous deep marine clastic sequence between Late Silurian U Setul Lst and Kubang Pasu Fm. Includes black *dacryoconarid* shales and *Langgun Red Beds*)

Hassan, Meor H. & C.P. Lee (2003)- On the occurrence of *Pleurodictyum* in the Jentik Formation of Kampung Guar Jentik, Beseri, Perlis. *Warta Geologi (Newsletter Geological Society Malaysia)* 29, 3, p. 89-92.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm2003003.pdf>)

(First report of small tabulate corals in M-L Devonian *Langgun/ Jentik Fm redbeds* of Perlis district, NW Peninsular Malaysia. In marine red mudstone below Jentik Fm black shales with *dacryoconarids* and *trilobites*)

Hassan, Meor H. & C.P. Lee (2003)- The Sanai Limestone Member- a Devonian limestone unit in Perlis. Bull. Geological Society Malaysia 46, p. 137-141.

(online at: www.researchgate.net/profile/Meor-Hassan-2/publication/331836478_The_Sanai_Etc.)

(*Sanai Lst proposed for thin pelagic limestone near top Jentik Fm. Underlain by M or Late Devonian red mudstone, overlain by mudstones interbedded with cherts. Lithology micritic limestone with thin shale partings and abundant conodonts, styliolinids, straight-cone nautiloids and trilobites. Occurrence of conodont *Palmatolepis glabra* indicates Late Devonian, Famennian age*)

Hassan, Meor H. & C.P. Lee (2004)- The depositional environment of the Mid-Palaeozoic red beds at Hutan Aji, Perlis and its bearing on global eustatic sea level change. Bull. Geological Society Malaysia 48, p. 65-72.

(online at: <https://gsm publ.wordpress.com/wp-content/uploads/2014/09/bgsm2004a14.pdf>)

(*Late Devonian- E Carboniferous red mudstones and sandstones widely distributed in NW Peninsular Malaysia. Sequence at Bumita Quarry indicative of marine prodelta-delta front environment. Major mid-Paleozoic paraconformity observed on Shan-Thai/Sibumasu Terrane between M-Famennian Sanai Lst and E Carboniferous cherts may have been caused by global regression*)

Hassan, Meor H. & C.P. Lee (2005)- The Devonian- Lower Carboniferous succession in northwest Peninsular Malaysia. J. Asian Earth Sciences 24, 6, p. 719-738.

(*New stratigraphic nomenclature for ~600m of Devonian- Carboniferous shallow marine deposits of Sibumasu continental margin: mainly clastic transitional sequence between underlying Mempelam Lst and overlying Kubang Pasu/Singa Fm in NW Malaysia. Timah Tasoh Fm 40m tentaculitid shales at base (with E Devonian *Monograptus yukonensis* and *Nowakia*) and 36m of light argillo-arenites. Chepor Fm 90m M-L Devonian red mudstone- sst. Sanai Lst with Famennian conodonts. Binjal Fm mudstone and turbiditic sst, Telaga Jatoh Fm radiolarian chert. Wang Kelian Fm thick E Carboniferous (Visean) prodelta- basinal marine red mudstones- sst. Major regressive event in latest Devonian*)

Hassan, Meor H.A., Y.A. Mustafa, M.Z.Z. Zakaria & A.A. Ghani (2015)- First record of *Homoctenus* (Tentaculitoidea, Homoctenida) from the Late Devonian of northwest Peninsular Malaysia. Alcheringa 39, 4, p. 550-558.

(online at: <http://repository.um.edu.my/101072/1/Meoretal15.pdf>)

(*First record of pelagic homoctenid tentaculitoid genus *Homoctenus* from Malay Peninsula, in U Devonian Sanai Lst in Perlis. Closely related to *Homoctenus tenuicinctus*. Associated with rich Frasnian conodont assemblage, (Late Devonian; *Palmatolepis linguiformis* Zone)*)

Hassan, Meor H.A., B.S. Yeow, C.P. Lee & A.H. Abdul Rahman (2013)- Facies analysis of the uppermost Kubang Pasu Formation, Perlis: a wave- and storm-influenced coastal depositional system. Sains Malaysiana 42, 8, p. 1091-1100.

(online at: www.ukm.my/jsm/pdf_files/SM-PDF-42-8-2013/08%20Meor%20Hakif%20Amir.pdf)

(*Facies analysis of E Permian uppermost Kubang Pasu Fm in Perlis, NW corner of Malay Peninsula (Sibumasu Terrane; with underlying diamictite). Several coarsening upward facies successions, from offshore bioturbated mudstone into lower shoreface facies association. Gradual transition from siliciclastics to overlying Chuping Lst carbonates (with *Monodioxodina* grainstone in transition zone) probably related to post rift subsidence and tectonic quiescence due to separation of Sibumasu from Gondwana in Permian*)

Hassan, Meor H.A., N.N.S.A. Zamruddin, B.S. Yeow & A.S.S.A. Zamad (2017)- Sedimentology of the Permian *Monodioxodina*-bearing bed of the uppermost Kubang Pasu Formation, northwest Peninsular Malaysia: Interpretation as storm-generated, transgressive lag deposits. Bull. Geological Society Malaysia 64 (50th Anniversary Issue 2), p. 51-58.

(online at: www.gsm.org.my/products/702001-101719-PDF.pdf)

(*Late E Permian fusulinid *Monodioxodina* commonly as dense accumulations associated with marine siliciclastics. *Monodioxodina*-bearing bed of top Kubang Pasu Fm of Perlis (NW Malay Peninsula = Sibumasu terrane) 0.5-1.5m thick, above ~15m coastal marine coarsening upward succession. Composed of *Monodioxodina* tests, bryozoa (*Rhombopora* sp.), brachiopods, crinoid ossicles and 6-27% f quartz. Bed with*

giant symmetrical ripples and smaller ripples, interpreted as transgressive deposit overlying flooding surface, with mainly wave- and storm-generated facies formed by wave ravinement)

Hassan, S.N. & Basir Jasin (2004)- Kajian awal radiolaria berusia Trias dari Formasi Semanggol di Bukit Lada, Kedah. In: GSM Annual Geological Conference 2004, Kangar, Perlis, Bull. Geological Society Malaysia 49, p. 67-70.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004012.pdf>)

('Preliminary studies of Triassic-age radiolarian from the Semanggol Fm in Bukit Lada, Kedah'. Fifteen species of radiolarians from Bukit Lada, Kedah with Busuanga., Cryptosphenidium, Cryptosphenidium verrucosum, Eptingium manfredi, Parasepsagon spp., Pseudostylosphaera spp. and Triassocampe deweveri. Presence of T.e deweveri and E. manfredi robustum zones indicate M Triassic (Anisian- Ladinian) age of chert)

Hassan, W.F.W. & H.S. Purwanto (2002)- Type deposits of primary gold mineralization in the Central Belt of Peninsular Malaysia. In: G.H. Teh (ed.) GSM Annual Geological Conference, Kota Bharu 2002, Bull. Geological Society Malaysia 45, p. 111-116.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2002016.pdf>)

(Three types of gold mineralizations in Central Belt: in quartz veins (dominant), in massive sulphides (kuroko-type marine deposit) and in skarn. Gold-bearing quartz veins in steeply dipping N-S fault and shear zones)

Hazad, F.I., A.A. Ghani & C.H. Lo (2019)- Arc related dioritic–granodioritic magmatism from southeastern Peninsular Malaysia and its tectonic implication. Cretaceous Research 95, p. 208-224.

(Late Cretaceous (95-76 Ma) plutons found in Eastern Belt of Peninsular Malaysia. Compositions diverse, from biotite granite, hornblende granodiorite, diorite, and gabbro. Aur island pluton in Johore Archipelago, with zircon U/Pb age ~77-79 Ma. Two magmatic pulses. Dioritic rocks classified as calc-alkaline volcanic arc rocks, but also mineralogies associated with active continental margin.

Henney, P.J., M.T. Styles, P.D. Wetton & D.J. Bland (1995)- Characterisation of gold from the Raub area, Pahang, Malaysia. British Geological Survey (BGS), Overseas Geology Series, Technical Report WC/95/20, p. 1-70.

(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19795382.pdf>)

(Raub area close to W margin of Central Belt of Malay Peninsula, at or just E of Raub-Bentong plate suture zone. Long history of gold mining: Raub Australian gold mine opened in 1889. Gold found in quartz veins in Carboniferous shales and phyllites)

Henney, P.J., M.T. Styles, P.D. Wetton & D.J. Bland (1995)- Characterization of gold from the Penjom area, near Kuala Lipis, Pahang, Malaysia. British Geological Survey (BGS), Overseas Geology Series, Technical Report WC/95/21, p. 1-67.

(online at: www.bgs.ac.uk/research/international/dfid-kar/WC95021_col.pdf)

(Penjom area near Kuala Lipis with gold in quartz veins in shales and phyllites of Permian Padang Tenku Fm. In tract of Paleozoic continental margin sediments, between W and E ranges of Triassic granites. Main Au-Ag vein sulphides with galena, chalcopyrite and sphalerite)

Hosking, K.F.G. (1973)- The primary tin mineralisation patterns of West Malaysia. In: B.K. Tan (ed.) Proc. Regional Conference on the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geological Society Malaysia 6, p. 297-308.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101340-PDF.pdf)

(Tin deposits on Malay Peninsula related to exposed granites. Two major tin belts (1) Main Range and (2) East coast granites. Deposits mainly along flanks of major acid intrusives. Main Range tin mineralisation more strongly developed along W flank than along its E flank)

Hosking, K.F.G. & P.R. Stauffer (1970)- Tektites from the stanniferous placers of eastern Pahang. Newsletter Geological Society Malaysia 22, p. 1-4.

(online at: www.gsm.org.my/products/702001-101619-PDF.pdf)

(Two black glass tektites from Quaternary tin placers at Sungei Reman and Gambang, E Pahang, Malay Peninsula. First finds since Scrivenor 1931. Tektites possibly near base of tin deposits)

Hotson, M., Khin Zaw, G.J.H. Oliver, S. Meffre & T. Manaka (2011)- U-Pb Zircon geochronology of granitoids from Singapore. Proc. 8th Meeting Asia Oceania Geological Society. (AOGS), Taipei, p. (Abstract)
(Gabbro, granodiorite and granite samples from Singapore Island dated using zircon U-Pb method as Late Permian- E Triassic (~254 - 230 Ma), although one granodiorite sample gave anomalous mid-Cretaceous age of 94.6 ± 0.8 Ma)

Huang, K.L., H. Baioumy, J.M. Lim, L.Y.S. Lim, S. Yong, T. Rajoo & D.M. Hareedranathan (2017)- Sedimentology of black shale in turbidite at Semanggol Formation. In: 79th EAGE Conference & Exhibition, Paris 2017, p.
(Black shales in Triassic turbiditic Semanggol Fm deposited in outer fan environment. Organic matter terrigenous-derived)

Hutchison, C.S. (1961)- The basement rocks of Malaya and their palaeo-geographic significance in Southeast Asia. American Journal of Science 259, 3, p. 181-185.
(online at: <https://ajsonline.org/article/58843.pdf>)
(Petrology of schists in N-S trending amphibolite schist belt in NE Malaya, deduced to be of Precambrian age and of igneous origin (now probably considered to be of Late Paleozoic age; JTvG))

Hutchison, C.S. (1964)- A gabbro-granodiorite association in Singapore Island. Quarterly J. Geological Society of London 120, p. 283-296.
(?Jurassic age orogenic granodiorite, part of Thai-Malayan tin-bearing granite belt, intruded into gabbro)

Hutchison, C.S. (1968)- Physical and chemical differentiation of West Malaysian Limestone Formations. Geological Society Malaysia. Bull. 1, p. 45-56.
(online at: www.gsm.org.my/products/702001-101383-PDF.pdf)
(Difficult to differentiate Malayan limestones based on mineralogy and petrography, and must therefore continue to be based on fossils)

Hutchison, C.S. (1968)- Dating tectonism in the Indosinian-Thai-Malayan orogen by thermoluminescence. Geological Society of America (GSA) Bull. 79, 3, p. 375-386.
(Thermoluminescence 'ages' of limestones from Thai-Malayan geosyncline (Ordovician- Triassic) not related to stratigraphic age, but to tectonic and magmatic events in Mesozoic Indosinian-Thai-Malayan orogeny)

Hutchison, C.S. (1971)- The Benta migmatite complex, petrology of two important localities. Bull. Geological Society Malaysia 4, p. 49-70.
(online at: www.gsm.org.my/products/702001-101363-PDF.pdf)
(Exposures of foliated gneiss, monzonite and migmatite near Benta quarry, Sungei Lipis, Pahang. Origin of Benta rocks considered to be deep seated, anatectic partial melting. No genetic relationship to Benom granite implied (see also Almashoor 1996))

Hutchison, C.S. (1973)- Volcanic activity. In: D.J. Gobbett & Hutchison (eds.) Geology of the Malay Peninsula (West Malaysia and Singapore), Wiley, New York, p. 177-214.

Hutchison, C.S. (1973)- Plutonic activity. In: D.J. Gobbett & Hutchison (eds.) Geology of the Malay Peninsula (West Malaysia and Singapore), Wiley, New York, p. 215-252.

Hutchison, C.S. (1973)- Metamorphism. In: D.J. Gobbett & Hutchison (eds.) Geology of the Malay Peninsula (West Malaysia and Singapore), Wiley, New York, p. 253-303.

Hutchison, C.S. (1973)- Synthesis of crustal evolution in the Malay Peninsula. In: D.J. Gobbett & Hutchison (eds.) Geology of the Malay Peninsula (West Malaysia and Singapore), Wiley, New York, p. 330-334.

Hutchison, C.S. (1977)- Granite emplacement and tectonic subdivision of Peninsular Malaysia. Bull. Geological Society Malaysia 9, p. 187-207.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1977030.pdf>)

(Large granitic batholiths of mainly Permian and Triassic age characterize Main Range and Eastern Belt of Malay Peninsula. Main Range granites intruded into continental sialic basement (isoclinally folded phyllitic rocks), without notable contact aureoles. This and large difference between Rb-Sr (peaks at 300, 210 Ma) and K-Ar radiometric ages (av. 190 Ma) suggest emplacement at >4 km depth and main uplift by several km, in Jurassic and Cretaceous. Eastern Belt granites mainly Triassic (peak ~220 Ma), also Permian ages, and have concordant Rb-Sr and K-Ar radiometric ages. Eastern Belt stable area since Triassic. Local post-orogenic Late Cretaceous (60-90 Ma) granites, without tin mineralization)

Hutchison, C.S. (2009)- Bentong-Raub suture. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 43-53.

(Description of 'Bentong-Raub ophiolite line', which separates W from E peninsular Malaysia. It represents suture zone with remnants of Lower Devonian- U Permian Paleotethys Ocean, which closed in Triassic with collision of Sibumasu (in W) and Indochina (E) blocks. Paleotethys deposits include Lower Devonian slaty shales with graptolite and shales with cherts with U Devonian- Permian radiolaria)

Hutchison, C.S. (2009)- Tectonic evolution. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 309-330.

Hutchison, C.S. (2009)- Mineral deposits. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 331-364.

(Malaysia produced 70% of world's tin in world in last century, with 95% from E-M Pleistocene 'Old Alluvium' placer deposits in coastal regions (with 770ka Australasian tektites at base of tin-bearing beds of Gambang tinfield in Pahang). Eastern and Western tin granite belts. Permo-Triassic iron ores. Small gold mines immediately E of Raub-Bentong suture zone. Some Tungsten, bauxite)

Hutchison, C.S. & S.P. Sivam (1992)- Discussion on structural evolution of Mesozoic Peninsular Malaysia. J. Geological Society, London, 149, p. 679-680.

(Dispute conclusions of Harbury et al. (1990) proposing pre-Triassic age of 'Indosinian orogeny'. In Peninsular Malaysia and NE Thailand Khorat Basin Late Triassic (Carnian-Norian) flysch unconformable over vertically bedded Late Permian limestones and clastics, followed by Jurassic-Cretaceous molasse, demonstrating Triassic age of folding)

Hutchison, C.S. & Snelling, N.J. (1971)- Age determination on the Bukit Paloh adamellite. Bull. Geological Society Malaysia 4, p. 97-100.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101360-PDF.pdf)

(Bukit Paloh adamellite in Pahang probably Late Carboniferous age, intruded into Lower Carboniferous (Visean) strata. (Sr radiometric dating by IGS shows 3 rather different results for total, rock, K-feldspar and biotite))

Hutchison, C.S. & D.N.K. Tan (eds.) (2009)- Geology of Peninsular Malaysia. University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 1-479.

(summaries online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101657-PDF.pdf)

(Major and most recent overview of geology of Malay Peninsula)

Ibrahim, A.M. (1999)- Geochemistry of selected Upper Paleozoic Kuantan Group and Triassic carbonaceous sediments of Pahang and South Terengganu, West Malaysia. Masters Thesis, University of Malaya, Kuala Lumpur, p. 1-222.

(online at: <http://studentsrepo.um.edu.my/1416/>)

- Ichikawa, K., K. Ishii & S. Hada (1966)- On the remarkable unconformity at the Jengka Pass, Pahang, Malaya. *J. Geosciences*, Osaka City University, 9, 4, p. 123-130.
(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090008.pdf)
(*Steeplly dipping M Permian clastics and limestones with fusulinids (Yabeina, Sumatrina annae, Verbeekina verbeeki, Schwagerina; Ishii 1966) and brachiopods, in W part of E Malaya Block. Unconformably overlain by gently dipping conglomeratic sst and mudstone of Jengka Pass Fm, containing bivalves (Aequipecten), brachiopods, Isocrinus and plants (Sagenopteris, Equisitites), likely of Late Triassic age (possibly Jurassic)*)
- Ichikawa, K. & E.H. Yin (1966)- Discovery of Early Triassic bivalves from Kelantan, Malaya. *J. Geosciences*, Osaka City University 9, p. 101-106.
(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090006.pdf)
(*Presence of bivalve Claraia intermedia multistriata n.ssp. and Eumorphotis cf. multimformis in Scythian shales 10km SSW of Gua Musang*)
- Idris, M.B. (1989)- Early Silurian multielement conodont assemblages from Pulau Tanjung Dendang, northeastern Langkawi Islands, Kedah. *Warta Geologi (Newsletter Geological Society Malaysia)* 15, 2, p. 63-68.
(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101502-PDF.pdf)
(*U Setul Limestone of NW Pulau Tanjung Dendang, NE of Langkawi, with three multi-element species, Pterospathodus pennatus procerus, Panderodus unicostatus and Walliserodus santiclairi, indicating Late Llandoveryan- E Wenlockian (E Silurian) age*)
- Idris, M.B. (1990)- *Araucarioxylon telentangensis*, a new species of fossil coniferous wood from the Ulu Endau area, Johore, Malaysia. *J. Southeast Asian Earth Sciences* 4, p. 55-59.
(*Piece of silicified wood 1.5m long, 60cm diameter at Sungai Telentang. Not sure if from Jasin Volcanics (with Late Permian limestones at Kampung Awah and intruded by Late Triassic granites) or from unconformably overlying U Jurassic- Lw Cretaceous Tebak Fm. Described as Araucarioxylon telentangensis n.sp.*)
- Idris, M.B. & M.S. Azlan (1989)- Biostratigraphy and paleoecology of fusulininids from Bukit Panching, Pahang. *Bull. Geological Society Malaysia* 24, p. 87-99.
(online at: <https://gsm.org.my/articles/702001-101310/>)
(*U Carboniferous Panching Lst near Kuantan, E Malay Peninsula, formerly believed to be massive, folded and ~600m thick now interpreted as steeply E-dipping, tightly folded and only 88m thick. U Carboniferous conodonts identified by Metcalfe (1980). Five local foraminifera zones, incl. Eostafella, Tetrataxis, Archaeodiscus, Climacamina Howchinia, etc. benthic forams (all called fusulinids, but are not?)*)
- Idris, M.B. & C.N. Hashim (1988)- An Upper Permian fossil assemblage from Gunung Sinyum and Gunung Jebak Puyoh Limestone, Pahang. *Warta Geologi (Newsletter Geological Society Malaysia)* 14, 5, p. 199-203.
(online at: www.gsm.org.my/products/702001-101505-PDF.pdf)
(*Two prominent limestone hills 50km N of Temerloh, Pahang, surrounded by younger sediments of Semantan Fm, with conodonts Neogondolella rosenkrantzi and N. serrata serrata, indicative of U Permian (Capitanian). Also forams Parafusulina, Schubertella, etc.*)
- Idris, M.B., M.B. Munawir & N.B. Norazlam (1992)- Plant fossils and some geological aspects of the Ulu Endau Area, Johore-Pahang. *Bull. Geological Society Malaysia* 31, p. 107-111.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1992007.pdf>)
(*Area at Johore-Pahang boundary. Conifer plant fossils from light grey mudstones in tributaries of Sg. Telentang: silicified wood identified as Araucarioxylon telentangensis Idris and foliage of Frenelopsis malaiana Kon'no (commonly assigned U Jurassic- Lw Cretaceous)*)
- Idris, M.B. & S.M. Zaki (1986)- A Carboniferous shallow marine fauna from Bukit Bucu, Batu Rakit, Trengganu. *Warta Geologi (Newsletter Geological Society Malaysia)* 12, 6, p. 215-219.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1986006.pdf>)

(Sediments at Bukit Bucu, Batu Rakit N of Terengganu with U Carboniferous fauna of trilobites (*Paladin ophistops*= U Carboniferous), brachiopods (*Brachythyrina strangwaysi*, *Chonetinella*), bryozoans (*Fenestella retiformes*), crinoids ('*Poterocrinus*') and bivalves (*Edmondia*). These shallow marine invertebrates also reported from Kelantan, Pahang Darul Makmur and Thailand)

Igo, H. (1964)- Permian fossils from northern Pahang, Malaya- Contributions to the Geology and Paleontology of Southeastern Asia 11. Japanese J. Geology and Geography 35, p. 57-71.

(Description of Permian corals from N Pahang, associated with late M Permian fusulinids *Yabeina*, *Verbeekina* and *Sumatrina annae*, *Kahlerina* (reprinted below))

Igo, H. (1964)- Permian fossils from northern Pahang, Malaya. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 191-208.

(Same paper as Igo (1964) above. Permian NE corner of Pahang province, C Malay Peninsula. Silicified black limestone from Ulu Sungei Atok with diverse fusulinid forams (*Climacammina*, *Pseudofusulina*, *Verbeekina verbeeki*, *Sumatrina annae*, *Yabeina*, etc.; similar to Guguk Bulat fauna, W Sumatra), corals (*Wentzella malayensis* n.sp., *Sinopora*). Grey shale from Sungei Spia with brachiopod *Spirifirellina*, *Neospirifer*)

Igo, H. (1967)- Some Permian fusulinids from Pahang, Malaya. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 3, p. 30-38.

(M Permian fusulinid limestones in intensely folded clastic- andesitic volcanics series from Jengka Pass area and Kampong Awah quarry, Pahang, C Malay Peninsula. With *Neoschwagerina*, *Verbeekina*, *Sumatrina*, *Chusenella*, *Yabeina*, *Pseudofusulina* (very similar to fauna of Padang Highlands, Sumatra; see also Cummings 1965, Gowka 1967, etc.))

Igo, H. & T. Koike (1967)- Ordovician and Silurian conodonts from the Langkawi Islands, Malaya, Part I. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 3, p. 1-29.

(Simple cone-type conodonts from Ordovician- Silurian Setul Limestone of Langgon Island, NE Langkawi. Most species similar to species known from Europe and North America)

Igo, H. & T. Koike (1968)- Ordovician and Silurian conodonts from the Langkawi Islands, Malaya, Part II. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 4, p. 1-21.

(Additional types of conodonts from Ordovician- Silurian Setul Lst of Langgon Island, NE Langkawi. 41 species described. Silurian conodonts not described from Asia before)

Igo, H. & T. Koike (1968)- Carboniferous conodonts from Kuantan, Malaya. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 5, p. 26-30.

(Five species of conodonts from described from Bukit Charas, N Pahang, E Malay Peninsula (part of Indochina Plate). Dominated by cosmopolitan forms *Idiognathoides* and *Hindeodella*, also *Spathognathodus*, *Ozarkodaina*, indicating E Namurian age (rich brachiopod fauna from area described by Muir-Wood, 1948))

Igo, H. & T. Koike (1973)- Upper Silurian and Lower Devonian conodonts from the Langkawi islands, Malaysia, with note on conodont fauna of the Thung Song Limestone, Southern Thailand and the Setul Limestone, Perlis, Malaysia. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 13, p. 1-22.

(Similar 'Setul Fm' U Silurian- Lw Devonian dark grey limestones on Langkawi islands, NW Malay Peninsula and peninsular Thailand. Nearby Silurian bituminous graptolite shales. Conodont faunas include *Spathognathodus steinhornensis* repetitor similarities with Alps and Neningha Lst of N New South Wales and lower part of Mount Holly Bed of Queensland)

Igo, H., T. Koike & E.H. Yin (1966)- Triassic conodonts from Kelantan, Malaya. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 157-171.

(Folded limestones from S Kelantan, central part of Malay Peninsula include white-grey Permian limestone with common fusulinids and grey M Triassic limestones rich in ammonoids and conodonts (dominated by Hindeodella spp and Hibbardella sp))

Igo, H., S.S. Rajah & F. Kobayashi (1979)- Permian fusulinaceans from the Sungei Sedili area, Johore, Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 20, p. 95-118.

(Low diversity fusulinid assemblages from massive lenticular Sumalayang Lst in NW-dipping argillaceous rocks of Dohol Fm (~30 miles N of Singapore; southernmost Permian limestone of Malay Peninsula). With fusulinids signifying late E Permian- early M Permian age: Misellina, Cuniculinella globosa, Eoparafusulina malayensis, Parafusulina granum-avenae (similar to Sumatra forms), P. johorensis n.sp. and other spp. and rare Monodiexodina kattaensis and M. shiptoni (but: Ueno (2003, p. 14) and Ueno et al. (2014) questioned Monodiexodina identification and re-assign to Pseudofusulina; JTvG). Many faunal similarities with 'Tethyan?' Pamir faunas))

Ingham, F.T. (1938)- The geology of the neighborhood of Tapah and Telok Anson, Perak, Federated Malay States, with accounts of mineral deposits. Geological Survey, Federation of Malaya, Memoir 2, p. 1-72.

Ingham, F.T. & E.P. Bradford (1960)- The geology and mineral resources of the Kinta Valley, Malaya Geological Survey, Federation of Malaya, Ipoh, District Memoir 9, p. 1-347.

(Kinta Valley of W Central Malay Peninsula largest alluvial tin-producing area in world. Not much detail on stratigraphy: Kinta Valley sequence mainly 700m of Carboniferous- Lower Permian limestone, poor in fossils, and surrounded by post-Triassic granite intrusive complexes. Triassic arenaceous series. With 1:63,360 scale geologic map)

Ishida, K. & F. Hirsch (2011)- The Triassic conodonts of the NW Malayan Kodiang Limestone revisited: taxonomy and paleogeographic significance. *Gondwana Research* 19, 1, p. 22-36.

(online at: https://www.academia.edu/7320900/The_Triassic_conodonts_of_the_NW_Malayan_Kodiang_Limestone_revisited_Taxonomy_and_paleogeographic_significance)

(Revision of M - early L Triassic conodonts from NW Malaya Kodiang Lst. Pseudofurnishius murcianus confers S Tethyan low-latitude character to Kodiang Lst, part of Cimmerian terranes that in Triassic formed diagonal partition between gradually closing Paleo-Tethys and widening Neo-Tethys, stretching E to Malaya (Shan Thai Terrane). Only E edge collided with Eurasia in Late Triassic, forming Sundaland platform. Jurassic Neo-Tethys ocean extended S of consolidated SE Asia block and Cimmerian terranes)

Ishida, K., A. Nanba, F. Hirsch, T. Kozai & A. Meesook (2006)- New micropalaeontological evidence for a Late Triassic Shan-Thai orogeny. *Geosciences Journal* 10, 3, p. 181-194.

(online at: https://www.researchgate.net/publication/227269364_New_micropalaeontological_evidence_for_a_Late_Triassic_Shan-Thai_orogeny)

(Shan-Thai block is remnant of Paleotethys in SE Asia. Nan-Uttaradit/Nan-Chantaburi and Bentong-Raub sutures commonly proposed as main Paleotethyan suture, but Mae Sariang Zone suture further W, and advocated here as main suture. Triassic chert-sequence in Mae-Sot and Umphang, NW Thailand, with M and Late Triassic (Ladinian- Norian-Rhaetian) radiolarians, overlain by 'Jurassic base-conglomerate' and Toarcian- E Bajocian shelf deposits. Chert clasts in conglomerate with same Norian-Rhaetian radiolarians, suggesting age of collision is latest Triassic)

Ishihara, S. (2008)- Granite series, type and concentration of HREE in the Malay Peninsula Region. *Proc. Int. Symposia on Geoscience resources and environments of Asian terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 31-35.

(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.535.6633&rep=rep1&type=pdf>)

(Reinterpretation of S/I type granites of Permo-Triassic and Cretaceous-Tertiary in Malay Peninsula region. Rare earth elements tend to be concentrated in ilmenite-series felsic I-types originated in granitic protolith)

Ishihara, S., H. Sawata, S. Arpornsuwan, P. Busaracome & N. Bungrakearti (1979)- The magnetite-series and ilmenite-series granitoids and their bearing on tin mineralization, particularly of the Malay Peninsula region. Bull. Geological Society Malaysia 10, p. 103-110.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1979004.pdf>)

(140 granitoids studied in S half Malay Peninsula. Late Paleozoic- E Mesozoic granitoids of Main Range and also E belt mainly composed of ilmenite-series granitoids (91%), and associated with tin deposits. Small plutons of Central intrusive belt and Cretaceous granitoids generally magnetite-series, and without tin)

Ishii, K.I. (1966)- On some fusulinids and other foraminifera from the Permian of Pahang, Malaya. J. Geosciences Osaka City University 9, p. 131-142.

(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090009.pdf)

(Grey upper M Permian (Wordian) limestone bodies within andesitic series from two localities: ENE of Jengka Pass (steeply dipping interbedded limestones and clastics) and Kampung Awah quarry (thin grey limestones in thick andesitic pyroclastic- volcanic series). Both localities with similar assemblages of primitive Yabeina (*Y. asiatica* n.sp.), *Sumatrina annae*, *Verbeekina verbeeki*, *Neoschwagerina douvillei*, *Schwagerina*, etc. Also small forams *Pachyphloia*, *Hemigordiopsis*, *Glomospira*, *Tetrataxis*, etc. (Pahang series = W part of E Malaya terrane?; similar to Guguk Bulat fauna of W Sumatra?; JTVG))

Ishii, K. (1966)- Preliminary notes of the Permian fusulinids of the H.S. Lee Mine No. 8 Limestone near Kampar, Perak, Malaya. J. Geosciences, Osaka City University 9, p. 145.

(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090010.pdf)

(Short note on E Permian H.S. Lee limestone with fusulinid foraminifera in H.S. Lee No. 8 Mine, W Malay Peninsula (Sibumasu Terrane). Basal fusuline limestone assigned to *Pseudofosulina krafftii* zone, overlying grey-white limestone rich in gastropods, etc., assigned to *Misellina claudiae* zone (~Sakmarian- Artinskian age?))

Ishii, K., M. Kato, K. Nakamura & Y. Nogami (1972)- Permian brachiopods from Bukit Tungku, Lembu, Perlis, Malaya. J. Geosciences, Osaka City University 15, 3, p. 65-76.

(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0150003.pdf)

(Tungku Lembu hill in NW Malay Peninsula near Thai border (= Sibumasu terrane), with brachiopods in sandstone near base of M Permian limestone: *Derbyia*?, *Monticulifera*, *Cancrinella cancrini*, etc. (from same range Newton 1926 described *Fusulina granum-avenae* which probably belongs to M Permian *Monodioxodina*))

Ishii, K. & Y. Nogami (1966)- Discovery of Triassic conodonts from the so-called Palaeozoic limestones in Kedah, Malaya. J. Geosciences, Osaka City University 9, p. 93-95.

(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0090005.pdf)

(First report of Triassic conodonts in Kodiang Lst in limestone hills near Kodiang station, Kedah, NW Malay Peninsula. With two M-U Triassic conodont assemblages: *Gladigondolella* cf. *abneptis* and *Gladigondolella tethydis* faunules (see also Nogami 1968, Koike 1973, 1982))

Ismail, H.H., M. Madon & Z.A. Abu Bakar (2007)- Sedimentology of the Semantan Formation (Middle-Upper Triassic) along the Kerak- Kuantan highway, Central Pahang. Bull. Geological Society Malaysia 53, p. 27-34.

(online at: www.gsm.org.my/products/702001-100507-PDF.pdf)

(M-L Triassic Semantan Fm probably deeper marine 'flysch-type' slope to outer fan deposits in foreland basin associated with closure of Paleo-Tethys during final E-ward subduction of West Malaya lithosphere beneath East Malaya. Mudstone layers with (displaced) bivalves *Entolium*, *Neoschizodus*, *Costatoria pahangensis*, *Costatoria chegarpahangensis*, supporting M-U Triassic age. Widespread volcanic and tuffaceous sediments indicate proximity to volcanic arc. No isoclinal folding or imbrication of strata.)

Ismail, H.H., M. Madon & Z.Affendi Abu Bakar (2008)- Distal turbidites of the Semantan Formation (Middle-Upper Triassic) in the Central Pahang, Peninsular Malaysia. Proc. Petroleum Geology Conference Exhibition (PGCE), 2008, Kuala Lumpur, p. 187-189.

(Extended Abstract only. Outcrop study of deep-marine M-U Triassic Semantan Fm near Temerloh. Shale-dominated section deposited in distal parts of submarine fans and basin plain, in remnants of closing Paleo-Tethys Ocean ocean in Central Belt of Peninsular Malaysia)

Ismail, H.H., H. Zhao, S. Rajput, E.A. Jones, S.W. Tan & B.I. Basori (2023)- Serpentinization in Peninsular Malaysia: implication for hydrogen generation. Proc. ADIPEC, Abu Dhabi 2023, Society of Petroleum Engineers, SPE-216544-MS, p. 1-9.

(online at: https://www.researchgate.net/publication/374382309_Serpentinization_in_Peninsular_Malaysia_Implication_for_Hydrogen_Generation)

(Study of serpentinization in ophiolitic rocks along Raub-Bentong Paleotethys suture and hydrogen generation)

Iwai, J. (1972)- Reconnaissance of Mesozoic stratigraphy in Central Pahang, Malaysia. Part 2. Between Mentakab and Jerantut, and from Temerloh to the Jengka Pass. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 10, p. 243-256.

(Triassic stratigraphy in C part of Malay Peninsula. Rocks generally tuffaceous and of M Triassic age. Between Mentakab and Jerantut two clastic units: (1) lower, 1400m thick 'flysch-type' shales-sands with some tuffs; (2) upper part ~1000m thick, mainly arenaceous with conglomerates (= Semanggol/ Semantan Fm?; JTvG))

Jaafar, A. (1976)- Geology and mineral resources of the Karak and Temerloh areas, Pahang. Geological Survey of Malaysia, District Memoir 15, p. 1-127.

(Includes discovery of Lower Devonian graptolite shale S of Karak, which represents oldest known Paleotethys Ocean rocks. Semantan Fm new name for thick series of marine Triassic clastics and rhyolitic tuffs with *Daonella* in W and shallower *Myophoria* sandstone facies in E)

Jaafar, A. (1979)- The petrology of the Benom igneous complex. Geological Survey of Malaysia, Special Paper 2, p. 1-141.

(On petrology of Benom batholith in Central zone of Malay Peninsula)

Jamil, A. & A.A. Ghani (2014)- Petrology, geochemistry & geochronology of Jerai Granite, Kedah. Geological Society Malaysia, National Geoscience Conference (NGC), Terengganu 2014, p. 76-83.

(online at: <https://gsm.org.my/articles/702001-100318/>)

(New U-Pb zircon ages for Jerai Granite (biotite-muscovite granite, tourmaline granite and pegmatite): 205.5 ± 2.0 Ma and 204.6 ± 4.3 Ma (latest Triassic). Transitional I-S type granite. W of, but part of syncollisional Main Range batholith of W Malay Peninsula, formed by partial melting of Sibumasu crust subducted beneath Paleotethys accretionary complex, intruded W of Bentong-Raub Suture zone (previously dated as ~135 Ma))

Jamil, A., A.A. Ghani, K. Zaw, S. Osman & L.X. Quek (2016)- Origin and tectonic implications of the ~200 Ma, collision-related Jerai pluton of the Western Granite Belt, Peninsular Malaysia. J. Asian Earth Sciences 127, p. 32-46.

(Triassic granitoids (~200–225 Ma) widespread in W Belt of Peninsular Malaysia. Jerai granitic pluton in NW Malay Peninsula at NW part of S-type Main Range granite batholith. Mainly biotite-muscovite granite, also tourmaline granite. U-Pb zircons ages ~204-205 $\pm$ 4Ma. Represents latest magmatic event of continental Sibumasu- Indochina collision)

Jantan, A., Basir Jasin, I. Abdullah, U. Said & A.R. Samsudin (1989)- The Semanggol Formation- lithology, facies association and distribution and probable basin setting. Geological Society Malaysia, Annual Geological Conference '89, Warta Geologi (Newsletter Geological Society Malaysia) 15, 1, p. 28. (Abstract only)

(Triassic Semanggol Fm rocks interpreted as submarine fan deposits in half-grabens, with source area in E and basinal area in W in some areas, but from W in others)

Jantan, A., Basir Jasin, I. Abdullah, A.R. Samsudin & U. Said: (1987)- Note on the occurrence of limestone in the Semanggol Formation, Kedah, Peninsular Malaysia. Warta Geologi 13, 4, p. 151-159.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1987004.pdf>)

(First report of thin, lenticular (pelagic) micritic limestone in Semantan Fm, at Kuala Nerang, Kedah, NW Malay Peninsula. Associated with bedded cherts. Conodonts identified by Metcalfe suggest Late Ladinian- E Carnian age)

Jasin, Basir (1991)- Significance of *Monodioxodina* (Fusulininacea) in geology of Peninsula Malaysia. Bull. Geological Society Malaysia 29, p. 171-181.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1991015.pdf>)

(late E Permian- early Late Permian *Monodioxodina* rare genus of Permian fusulinids and restricted to narrow sliver from C Afghanistan in W to Malaysia and Japan in E. In Malaysia present on Sibumasu Block, overlying glacio-marine pebbly mudstones (*M. sutschanica* and *M. shiptoni*) and also on E Malaya Block Sumalayang Lst (*M. shiptoni* and *M. kattaensis*), associated with many other species of fusulinids)

Jasin, Basir (1994)- Middle Triassic radiolaria from the Semanggol Formation, northwest Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 20, 4, p. 279-284.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1994004.pdf>)

(13 species of radiolaria in chert from gently folded Semanggol Fm outcrops in N and S Kedah areas, NW Malay Peninsula. Assemblages with *Pseudostylosphaeracocostyla*, *Pseudostylosphaera* spp., *Parasepsagon* spp., *Eptigium manfredi*, *Triassocampe deweveri*, etc., indicating Anisian- Ladinian (M Triassic) age range (Sashida et al. 1992, 1993 also reported Permian rads from Semanggol Fm) (see also Jasin 1997, Jasin et al. 2005))

Jasin, Basir (1995)- Occurrence of bedded radiolarian chert in the Kubang Pasu Formation, North Kedah, Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 21, 2, p. 73-79.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1995002.pdf>)

(E Carboniferous radiolarians from bedded continental margin chert of Kubang Pasu Fm. in NW Malay Peninsula dominated by *Entactinia variospina* and *Callella* sp. (Sibumasu Terrane; more recent study see Jasin & Harun 2001))

Jasin, Basir (1996)- Discovery of Early Permian radiolaria from the Semanggol Formation, Northwest Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 22, 4, p. 283-287.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1996004.pdf>)

(Radiolarians from chert sequence at Bt Kampung Yoi and Bt Larek indicates latest Wolfcampian, E Permian *Pseudoalbaiella scalprata* m. *rhombothoracata* Zone. Age of Semanggol Fm now E Permian- M Triassic)

Jasin, Basir (1996)- Rijang beradiolaria Semenanjung Malaysia: kewujudan, usia dan sekitaran pengendapan. Sains Malaysiana 25, 2, p. 103-113.

(*'Radiolarian chert of Peninsular Malaysia: occurrence, age and depositional environment'. Chert-clastic associations common in Peninsular Malaysia and represent continental margin settings (E Carboniferous Kubang Pasu chert, E Permian Ulu Kelantan chert, Late Permian- M Triassic Semanggol chert). Carnian-Norian Kodiang chert-limestone represents subsidence environment. Late Permian Jengka area chert-pyroclastic association represents island-arc environment*)

Jasin, Basir (1997)- Permo-Triassic radiolaria from the Semanggol Formation, northwest Peninsular Malaysia. J. Asian Earth Sciences 15, p. 43-53.

(32 species of radiolaria from 20 chert samples of folded/faulted Semanggol Fm in N and S Kedah. Early and Late Permian and M Triassic assemblages, indicating chert sequence in Semanggol Fm ranges from E Permian- M Triassic. With *Albaiella*, *Pseudoalbaiella*, *Follicucullus*, *Triassocampe*, etc. Associated terrigenous detritus suggest deep continental margin setting. M Triassic cherts interfingers with Ladinian-Norian mudstone with *Posidonia kedahensis*, *Halobia comata*, etc.)

Jasin, Basir (1999)- Significance of radiolarian chert in the northwest zone of Peninsular Malaysia. Proc. Dynamic stratigraphy and tectonics of Peninsular Malaysia, Seminar II- The Western Belt and Paleozoic of Peninsular Malaysia and neighbouring areas, p. 1-18.

Jasin, Basir (2008)- Some Permian radiolarians from Bukit Yoi, Pokok Sena, Kedah. Bull. Geological Society Malaysia 54, p. 53-58.

(online at: <http://geology.um.edu.my/gsmpublic/BGSM/bgsm54/bgsm2008009.pdf>)

(2m thick chert sequence in Semanggol Fm at N slope of Bukit Yoi, S of Pokok Sena, near Thailand border. Interbedded with siliceous and tuffaceous mudstone. Three E-M Permian radiolarian assemblage zones identified: *Pseudoalbaillella scalprata. rhombothoracata* (late Sakmarian, late E Permian), *P. longtanensis* Zone and *P. globosa* Zone (Kungurian-Roadian, M Permian))

Jasin, Basir (2010)- Warisan geologi Negeri Perlis. Bull. Geological Society Malaysia 56, p. 87-93.

(online at: http://geology.um.edu.my/gsmpublic/GSM_Bulletin/GSM_Bulletin56_Paper13.pdf)

('Geological heritage of Perlis State'. Overview of geology of Perlis province, NW Malay Peninsula and need for protection of sites. 'Sibumasu Blocks' sequence of Cambrian-Triassic sediments, including Ordovician-Devonian Setul Fm with stromatolites, trilobites, graptolites, tentaculites and brachiopods, Carboniferous-Permian Kubang Pasu Fm with bivalves, corals, brachiopods, cephalopods and trilobites and E Permian *Monodioxodina shiptoni* fusulinid forams ('anti-tropical' genus, also in Sibumasu- Cimmerian terranes; JTvG)).

Jasin, Basir (2013)- *Posidonia* (Bivalves) from northwestern Peninsular Malaysia and its significance. Proc. National Geoscience Conference, Ipoh 2013, Geological Society Malaysia, B05, p. 69-71. (Extended Abstract)

(online at: www.gsm.org.my/products/702001-101658-PDF.pdf)

(Planktonic bivalve *Posidonia* common in Kubang Pasu and Singa Fms in NW Peninsular Malaysia and Langkawi Islands (= Sibumasu terrane). Probably Early Carboniferous age. Most of *Posidonia* in Malaysia closely related to *Posidonia becheri* (= *Posidonomya*; see Jasin 2015))

Jasin, Basir (2013)- Chert blocks in Bentong-Raub Suture Zone: a heritage of Palaeo-Tethys. Bull. Geological Society Malaysia 59, p. 85-91.

(online at: www.gsm.org.my/products/702001-100326-PDF.pdf)

(Bentong-Raub Suture Zone is Triassic collision zone between Sibumasu and E Malaya terranes. Remnants of now-closed E-M Devonian- Permian Paleo-Tethys Ocean include blocks of oceanic sedimentary rocks such as bedded chert blocks in several localities. Radiolarian assemblages in cherts: (1) E Frasnian, (Late Devonian) *Trilonche minax* Zone, (2) Tournaisian (E Carboniferous) *Albaillella deflandrei* Zone and (3) Permian radiolarians, incl. M Permian/ Wordian *Follicucullus monacanthus* Zone)

Jasin, Basir (2015)- *Posidonomya* (Bivalvia) from Northwest Peninsular Malaysia and its significance. Sains Malaysiana 44, 2, p. 217-223.

(online at: www.ukm.my/jsm/pdf_files/SM-PDF-44-02-2015/08%20Basir%20Jasin.pdf)

(Thin-shelled pseudopelagic bivalve *Posidonomya* common in NW Malay Peninsula, in redbeds of Langkawi Island (Singa Fm) and Perlis and Kedah (Kubang Pasu Fm; above Tournaisian radiolarian cherts). Two taxa: *Posidonomya becheri* and *P. cf. kochi* (von Koenen). Occurrence of *Posidonomya* indicates E Carboniferous age of lower Kubang Pasu/ Singa Fms. Part of widespread tropical-subtropical Paleo-Tethys domain)

Jasin, Basir (2018)- Radiolarian biostratigraphy of Malaysia. Bull. Geological Society Malaysia 65, p. 45-58.

(online at: <https://gsmpublic.files.wordpress.com/2018/08/bgsm201805.pdf>)

(Two types of radiolarian cherts in Malaysia: bedded chert and chert blocks. Bedded cherts in Peninsular Malaysia mainly in Western Belt (Kubang Pasu, Kenny Hill and Semanggol Fms). In Sabah in Sabah Ophiolite Complex. In Sarawak bedded cherts in Serian Volcanic Fm and at basal part of Pedawan Fm. Chert blocks mainly in Bentong Raub Suture Zone of Peninsular Malaysia and in melanges of Sabah and Sarawak. Radiolarians from Peninsular Malaysia Late Devonian-Triassic, with 16 biozones identified. Radiolarians from Sabah and Sarawak E Jurassic- Cretaceous ages. Five hypersiliceous periods, related to volcanism: Late Devonian-E Carboniferous, Permian, Triassic, E Jurassic and Late Jurassic-Cretaceous)

Jasin, Basir & C.A. Ali (1997)- Lower Permian Radiolaria from the Pos Blau area, Ulu Kelantan, Malaysia. J. Southeast Asian Earth Sciences 15, p. 327-337.

(22 radiolaria species from 30m folded chert sequence in roadcut near Pos Blau, Ulu Kelantan, Malay Peninsula. Located near E margin of Bentong suture and above andesitic volcanics and sheared olistostrome unit. Fauna represents upper *Pseudoalbaillella lomentaria* Zone, upper Wolfcampian (= Sakmarian; Lower Permian). Associated with ammonoid *Agathiceras*)

Jasin, Basir & C.A. Ali (1997)- Significance of Early Carboniferous radiolaria from Langkap, Negeri Sembilan, Malaysia. Bull. Geological Society Malaysia 41, p. 109-125.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1997028.pdf>)

(Thin-bedded folded-sheared mudstone in Langkap chert in Bentong Gp in S-C Malay Peninsula, with 34 radiolarian taxa, incl. *Albaillella comuta*, *A. deflandrei* and *A. undulata*, indicating *A. deflandrei* Zone of Late Tournaisian age. Assemblage similar to W Europe and suggests deposition in equatorial regions of Tethys. (Late Devonian and E Carboniferous radiolaria from Langkap also studied by Spiller and Metcalfe (1995))

Jasin, Basir, C.A. Ali & K. Roslan Mohamed (1995)- Late Triassic radiolaria from the Kodiang Limestone, northwest Peninsular Malaysia. J. Southeast Asian Earth Sciences 12, p. 31-39.

(Cherty packstone-wackestone in Bukit Kodiang quarry, Kedah, NW Malay Peninsula. With Late Triassic (Late Carnian- M Norian) radiolarian assemblage, not well preserved, 18 species (see also Jasin & Harun 2001))

Jasin, Basir, A. Bashardin & Z. Harun (2013)- Middle Permian radiolarians from the siliceous mudstone block near Pos Blau, Ulu Kelantan and their significance. Bull. Geological Society Malaysia 59, p. 33-38.

(online at: www.gsm.org.my/products/702001-100333-PDF.pdf)

(Large siliceous sediment block in melange in Bentong-Raub Suture, exposed near Pos Blau, Ulu Kelantan, N central Malay Peninsula. Steeply dipping to SE; lower part ribbon chert, upper part interbedded siliceous mudstone and tuffaceous mudstone. Fourteen radiolaria taxa, divided into two zones, *Pseudoalbaillella fusiformis* and *Follicucullus monacanthus*, indicating M Permian age. Tuffaceous material related to volcanic activity on E Malaya terrane. Tuffaceous sediments became widespread in Late Permian and Triassic)

Jasin, Basir, A. Bashardin, N. Jamaluddin & N. Ishak (2010)- Occurrence of slate in Perlis and its significance. Bull. Geological Society Malaysia 56, p. 75-78.

(online at: www.gsm.org.my/products/702001-100384-PDF.pdf)

(>100m thick unfossiliferous slate exposed at Bukit Tuntung, Pauh, Perlis, NW Malay Peninsula. Overlain by bedded chert of Kubang Pasu Fm with Tournaisian (basal Carboniferous) radiolarians)

Jasin, Basir & Z. Harun (2001)- Some Triassic radiolarians from the Kodiang Limestone, northwest Peninsular Malaysia. In: G.H. Teh et al. (eds.) Proc. Geological Society Malaysia Annual Geological Conference 2001, Pangkor, p. 105-109.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2001_17.pdf)

(Kodiang Lst of NW Malay Peninsula yielded Late Permian- and early Late Triassic conodonts (Metcalfe 1984, 1992). New samples from clastic-chert sequence at base of Bukit Kechil with 11 taxa of radiolarians. Presence of *Entactinia chiakensis*, *E. nikorni*, *Thaisphaera minuta*, *Cenosphaera andoi* and *Pantanellium? virgeum* suggestive of Parentactinia nakatsugawaensis Zone, late Spathian age (E Triassic). Overlying limestone at Bukit Kechil with M Triassic conodonts (Koike 1973) and foraminifera (Gazdzicki & Smit 1977))

Jasin, Basir & Z. Harun (2001)- Some radiolarians from bedded chert of the Kubang Pasu Formation. In: G.H. Teh et al. (eds.) Proc. Geological Society Malaysia Annual Geological Conference 2001, Pangkor, p. 110-114.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2001_18.pdf)

(Radiolarians from chert sequence at Bukit Binjal, Kedah, incl. *Entactinia variospina*, *Callela hexatinian*, *C. cf. parvispinosa*, *Treanosphaera hebes*, *Duplexia parviporata*, etc. Assemblage indicates Late Tournaisian (E Carboniferous) age. Chert deposited on outer shelf of passive margin during high siliceous productivity)

Jasin, Basir & Z. Harun (2004)- Discovery of some Early Carboniferous radiolarians from North Perak and their significance. Bull. Geological Society Malaysia 49, p. 19-24.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004004.pdf>)

(*Albaillella deflandrei* radiolarian assemblage from folded bedded chert at NW Malay Peninsula- Thailand border area indicates Tournaisian, E Carboniferous age. Presumably from S side of Paleotethys Ocean (Sibumasu). Tournaisian radiolarian cherts widespread in Paleo-Tethys ocean)

- Jasin, Basir & Z. Harun (2007)- Stratigraphy and sedimentology of the chert unit of the Semanggol Formation. Bull. Geological Society Malaysia 53, p. 103-109.
(online at: <http://geology.um.edu.my/gsmpublic/v53/Pdf%20individual%20papers/16%20Paper.pdf>)
(Semanggol Fm outcrops in NW Malay Peninsula. Deep marine clastics with cherts with 5 Permian and 4 E-M Triassic radiolarian biozones. Common tuffaceous material in lower Semanggol Fm, older than Sakmarian, E Permian. Thickness of formation hard to determine due to intense folding-thrusting)
- Jasin, Basir & Z. Harun (2009)- Radiolarian biostratigraphy of Peninsular Malaysia- an update. In: 11th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA 2009), Kuala Lumpur, p. 57-58. (Abstract) (online at: www.gsm.org.my/products/702001-101669-PDF.pdf)
(16 radiolarian assemblage zones from Late Devonian- Late Triassic in Malay Peninsula)
- Jasin, Basir & Z. Harun (2011)- Radiolarian biostratigraphy of Peninsular Malaysia- an update. Bull. Geological Society Malaysia 57, p. 27-38.
(online at: <http://geology.um.edu.my/gsmpublic/BGSM/bgsm57/bgsm2011005.pdf>)
(Deep marine radiolarian cherts common in Late Paleozoic- E Mesozoic of W belt of Peninsular Malaysia. Sixteen radiolarian assemblage zones recognized, from Frasnian (Late Devonian) to Triassic. Most of Permo-Triassic biozones identified from Semanggol Fm)
- Jasin, Basir & Z. Harun (2011)- Lower Carboniferous (Tournaisian) radiolarians from Peninsular Malaysia and their significance. Bull. Geological Society Malaysia 57, p. 47-54.
(online at: <http://geology.um.edu.my/gsmpublic/BGSM/bgsm57/bgsm2011007.pdf>)
(Tournaisian radiolarians widespread in Peninsular Malaysia especially in W Belt, due to high radiolarian productivity during Tournaisian, related to upwelling of cold dense bottom water, which developed at glacial N Gondwana. Chert is marker bed for Tournaisian age and defines base of Kubang Pasu Fm)
- Jasin, Basir, Z. Harun & Siti N. Hassan (2003)- Black siliceous deposits in Peninsular Malaysia: their occurrence and significance. Bull. Geological Society Malaysia 46, p. 149-154.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm2003025.pdf>)
(Paleozoic black radiolarian cherts in NW Malay Peninsula in Setul, Mahang (Ordovician-Silurian), Kubang Pasu (Carboniferous) Fms. Related to high plankton productivity. Lithologic association of chert represents passive continental margin association, with episodic supply of terrigenous material from continent)
- Jasin, Basir, Z. Harun & U. Said (2004)- Some Devonian radiolarians from chert blocks in the Bentong-Raub Suture Zone, Pahang. Bull. Geological Society Malaysia 48, p. 81-84.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm2004a16.pdf>)
(Ten radiolarian species from chert blocks along Bentong-Raub road (mainly Trilonche spp. and Stigmosphaerostylus herculea), representing Famennian (Late Devonian) age)
- Jasin, Basir, Z. Harun & U. Said (2005)- Triassic radiolarian biostratigraphy of the Semanggol Formation, South Kedah, Peninsular Malaysia. Bull. Geological Society Malaysia 51, p. 31-39.
(online at: <http://gsmpublic.files.wordpress.com/2014/09/bgsm2005005.pdf>)
(27 taxa of E-M Triassic radiolaria from outcrop of chert units in Semanggol Fm, 4.5 km E of Kuala Ketil, S Kedah, NW Peninsular Malaysia. Four assemblage zones, Entactinosphaera chiakensis (late Spathian), Triassocampe coronata (M Anisian), Triassocampe deweveri (late Anisian) and Oertlispongia inaequispinosa (E Ladinian))
- Jasin, Basir, Z. Harun, U. Said & S. Saad (2005)- Permian radiolarian biostratigraphy of the Semanggol Formation, south Kedah, Peninsular Malaysia. Bull. Geological Society Malaysia 51, p. 19-30.
(online at: <http://gsmpublic.files.wordpress.com/2014/09/bgsm2005004.pdf>)
(37 taxa of Permian radiolaria from Semanggol Fm interbedded siliceous shale-chert-tuff in outcrop 4.5 km E of Kuala Ketil, S Kedah, NW Malay Peninsula. Five radiolarian zones recognized (Pseudoalbaillella scalprata, Folliculus monacanthus, F. porrectus, Neoalbaillella ornithoformis and N. optima), ranging in age from late E Permian (Sakmarian) to Late Permian)

- Jasin, Basir, W.F.W. Hassan & M.S. Leman (1992)- The occurrence of bryozoan bed in the Singa Formation, Bukit Durian Perangin, Langkawi. *Warta Geologi* (Newsletter Geological Society Malaysia) 18, 2, p. 29-35.
(online at: www.gsm.org.my/products/702001-101484-PDF.pdf)
(A 1m thick bed of E Permian thin-bedded bryozoan-bearing limestone and calcareous sandstone at Bukit Durian Perangin, 14km N of Kuah, Langkawi. Located near top of glacio-marine clastic Singa Fm, probably in transition zone to overlying Chuping Lst. Bryozoan genera *Fenestella*, *Polypora*, *Dyscritella* and *Streblascopora exilis* indicate Artinskian age, E Permian (similar to Late Artinskian assemblage described by Sakagami (1970) from nearby Ko Muk Island, SW Thailand))
- Jasin, Basir, A. Jantan, I. Abdullah & U. Said (1987)- Volcanic ash beds at Kampung Temong, Kuala Kangsar, Perak. *Warta Geologi* (Newsletter Geological Society Malaysia) 13, 5, p. 205-211
(online at: www.gsm.org.my/products/702001-101511-PDF.pdf)
(2.5m thick Quaternary volcanic ash on Malay Peninsula composed of 6 reverse-graded ash layers 0.2-0.7m thick. Believed to be derived from Toba eruptions in North Sumatra at ~75,000 years ago)
- Jasin, Basir & L.T. Koay (1990)- Permian fusulinids from Bukit Wang Pisang, Perlis. *Sains Malaysiana* 19, 1, p. 35-44.
(Late Early Permian fusulinid *Monodioxodina shiptoni* from transitional beds between Kraeng Krachan Group clastics and overlying Ratburi Lst-equivalent in NW Malay Peninsula (= 'anti-tropical' fusulinid genus from Kungurian or Artinskian on Sibumasu Terrane; JTvG))
- Jasin, Basir, P. Pengajian, S. Sekitaran & D.S. Alam (2006)- Some deep water Middle Triassic foraminifera from the Semanggol Formation. *Bull. Geological Society Malaysia* 52, p. 27-33.
(M Triassic benthic foraminifera from Semanggol Fm siliceous mudstones at Bukit Lada and Merbau Pulas include *Pseudonodosaria densa*, *P. lata*, *P. obconica*, *P. simpsonensis*, *Prodentalina* spp., *Cryptoseptida*, *Protonodosaria* spp., Associated with radiolaria *Eptingium manfredi*, etc. Indicate deep marine depositional environment above calcite compensation depth)
- Jasin, Basir, U. Said & R. Abdul Rahman (1995)- Late Middle Permian radiolaria from the Jengka area, central Pahang, Malaysia. *J. Southeast Asian Earth Sciences* 12, p. 79-83.
(Nine species of radiolarians from tin, bedded chert in quarry in folded Semantan Fm(?)N of Jengka Pass, at E side of Central basin of Malay Peninsula. Assemblage with *Entactinia* spp., *Hegleria* spp., *Follicucullus* spp. and *Pseudobaillella* indicative of late M Permian *Follicucullus japonicus* Zone. Assemblage similar to those described from China and Japan)
- Jennings, J.R. & C.P. Lee (1985)- Preliminary note on the occurrence of Carboniferous-age coals and in situ plant fossils in eastern Peninsular Malaysia. *Warta Geologi* 11, 3, p. 117-121.
(online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1985003.pdf>)
(On Carboniferous 'Cathaysian' plant fossils from E Pahang and Terengganu, on E Malaya Block, Malay Peninsula. With cf. *Lepidodendron*, cf. *Archaeocalamites* sp., *Sphenophyllum tenerrimum*, *Sphenopteris* spp., etc., interpreted as late Lower Carboniferous age (see also Asama 1973, Ohana et al. 1991))
- Joeharry, N.A.M., M.S. Leman, C.A. Ali & K.R. Mohamed (2016)- Microfacies and diagenesis of Gua Bama Limestone, Pahang Darul Makmur, Malaysia. In: AIP Conference Proceedings, 1794, 060022, p. 1-7.
(online at: www.researchgate.net/publication/310483472_Microfacies_and_diagenesis_of_Gua_Bama_Etc.)
(Gua Bama limestone hill in Lipis District, Pahang, central Malay Peninsula, latest Permian- M Triassic massive limestone around Permo-Triassic boundary)
- Joeharry, N.A.M., M.S. Leman, C.A. Ali & K.R. Mohamed (2018)- Earliest Triassic conodonts of Gua Panjang, Merapoh, Pahang and their bearing towards Permian-Triassic mass extinction in Malaysia. *Sains Malaysiana* 47, 7, p. 1423-1430.
(online at: www.ukm.my/jsm/pdf_files/SM-PDF-47-7-2018/09%20Nelisa%20Ameera%20Mohamed%20Joeharry.pdf)

(Sample from E side of Gua Panjang limestone hill, SW of Kubang Rasa Village, Merapoh, Central Belt of Malay Peninsula, yielded black (CAI 5) E Triassic conodonts: *Hindeodus parvus*, *H. latidentatus*, *H. postparvus*, *H. euryptge* and *Isarcicella staeschi*. Located 2.5 m above bioclastic grainstone with Late Permian foraminifera)

Joeharry, N.A.M., M.S. Leman, C.A. Ali & K.R. Mohamed (2018)- Constraining the Permian-Triassic boundary in the Gua Panjang Hill, Merapoh, Pahang state, Malaysia. Bull. Geological Society Malaysia 66, p. 75-80.

(online at: <https://gsm.org.my/products/702001-101753-PDF.pdf>)

(Permian- Triassic boundary in Gua Panjang limestone hill in Merapoh, Pahang (Central Belt of Malay Peninsula). Basal beds with Late Permian foraminifera (*Colaniella* sp., *Ichtyofrondina* sp., *Palaeotextularia* sp.) overlain by dolomitized horizon with earliest Triassic conodonts (*Hindeodus parvus*, *Isarcicella staeschi*). Negative carbon isotope excursion, often seen in P-T Boundary sections worldwide, not observed here)

Jones, C. R. (1957) (1961)- A revision of the stratigraphical sequence of the Langkawi Islands, Federation of Malaya. Proceedings Ninth Pacific Science Congress, Bangkok 1957, 12, p. 287-300.

(Announcement of first discovery of Early Paleozoic rocks in NW Malay Peninsula during 1957 meeting)

Jones, C. R. (1959)- Geology and palaeontology in Malaya: graptolites recorded from Malaya. Nature 183, p. 231-232.

(First discovery of E Paleozoic fossils from Malay Peninsula, in 1955: graptolite-bearing sediments on Langkawi islands)

Jones, C.R. (1966)- Geologic map of Pulau Langkawi. Geological Survey of Malaysia, scale 1:63,360.

Jones, C.R. (1967)- Graptolites of the *Monograptus hercynicus* type recorded from Malaya. Nature 215, 5100, p. 497.

(online at: <https://www.nature.com/articles/215497a0>)

(Brief note on presence of graptolites at many localities of NW Malay Peninsula (Kedah, Perak, Pahang) and Langkawi island, presumed to be of Silurian and E Devonian ages. Presence of monograptids of *Monograptus hercynicus* type suggestive of Early Devonian, as is presence of associated tentaculitid *Nowakia acuaria*)

Jones, C. R. (1968)- Malayan Early to Mid-Palaeozoic stratigraphy and the Siluro-Devonian graptolite faunas of the Malay Peninsula. Ph.D. Thesis, University of Birmingham, p. . (Unpublished)

(Ph.D. Thesis of Clive Roderick Jones, British geologist who worked for the Geological Survey of Malaysia from 1954 1961?, and who fdiscovered the first Lower Paleozoic sediments graptolites and associated fauna on Langkawi in 1955 and in other parts of Malay Peninsula)

Jones, C.R. (1968)- Lower Paleozoic rocks of Malay Peninsula. American Assoc. Petroleum Geol. (AAPG) Bull. 52, 7, p. 1259-1278.

(Lower Paleozoic in W part of Malay Peninsula comprises U Cambrian-Lower Devonian sediments, including Ordovician- Silurian shelf carbonates, Silurian euxinic facies graptolite argillite and a thick flysch-type series to East. Acid pyroclastic rocks and ophiolitic igneous rocks associated with eugeosynclinal trough deposits)

Jones, C.R. (1970)- On a Lower Devonian fauna from Pahang, West Malaysia. Bull. Geological Society Malaysia 3, p. 63-75.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101373-PDF.pdf)

(Foothills Formation of W Pahang contains shales with reticulate sponges, brachiopods (*Orbuciloidea sinensis*) and graptolites. *Monograptus* cf. *praehercynicus* indicates early Lower Devonian age)

Jones, C.R. (1973)- Lower Palaeozoic. In: D.J. Gobbett & Hutchison (eds.) Geology of the Malay Peninsula (West Malaysia and Singapore), Wiley, New York, p. 25-60.

(Lower Paleozoic of Malay Peninsula includes well-developed Ordovician-Silurian Setul Lst in NW, mainly argillaceous Mahang Fm with Silurian- E Devonian graptolites and tentaculites in Kedah, etc.)

Jones, C.R. (1973)- The Siluro-Devonian graptolites of the Malay Peninsula. Institute of Geological Sciences (IGS; Great Britain), Overseas Geology and Mineral Resources (Inst. Geological Sciences/ British Geological Survey), London, 44, p. 1-28.

(view online at: <https://webapps.bgs.ac.uk/data/Publications/publication.html?id=19865985>)

(Graptolite-bearing formations of Malay Peninsula in West Malay Peninsula and Pulau Langgun (Langkawi) (= Sibumasu Terrane Mahang and Baling Groups) and Central Malay Peninsula (Raub-Bentong suture; Bentong Group). First discovered by Jones in 1955. >120 species. Zonal succession compares closely to Europe and Asiatic Russia. No Ordovician species known)

Jones, C.R. (1978)- The geology and mineral resources of Perlis, north Kedah, and the Langkawi Islands. Geological Survey of Malaysia, District Memoir 17, p. 1-257.

Jones, C.R., D.J. Gobbett & T. Kobayashi (1966)- Summary of fossil record in Malaya and Singapore 1900-1965. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 309-359.

(Substantial review of mainly U Cambrian- Triassic marine fossils known from Malay Peninsula in 1965, compiled from publications and Malaysian Geological Survey and British Museum files)

Jones, W.R. (1916)- The origin of the secondary stanniferous deposits of the Kinta District, Perak (Federated Malay States). Quarterly J. Geological Society of London, 72, p. 165-194.

Jusop, S. (2017)- Pyritization of coastal sediments in the Kelantan Plains as evidence for the sea level rise in the Malay Peninsula during the Holocene. Bull. Geological Society Malaysia 64 (50th Anniversary Issue 2), p. 59-63.

(online at: www.gsm.org.my/products/702001-101718-PDF.pdf)

(Widespread pyritization (2-3%) of low-lying plains in Malay Peninsula linked to inundation by seawater due to sea level rise of 3-5m, ~43,000 years ago))

Kadir, A.A., B.J. Pierson, Z.Z.T. Harith & Chow W.S. (2009)- Kinta Valley Limestone: clues for a new play? AAPG Convention, Denver, Search and Discovery Article 1019826, p. (Abstract and Presentation)

(online at: www.searchanddiscovery.com/documents/2009/10198kadir/ndx_kadir.pdf)

(Karst hills of Ordovician-Permian limestone in Kinta Valley, Malay Peninsula, remnants of large Paleozoic carbonate complex on Sibumasu terrane. Limestones interbedded with sandstone, siltstone and carbonaceous shale over thickness of up to 3000m (?). Slumps and breccia beds indicate slope deposition, slumping to West and N-S platform margin orientation. Potential unexplored new carbonate play E of Malay Peninsula)

Kadir, A.A., B.J. Pierson, Z.Z.T. Harith & Chow W.S. (2010)- Elements of Paleozoic hydrocarbon plays around Peninsular Malaysia. Proc. 46th CCOP Annual Session, Vung Tau 2009, p. 18-29.

(Presence of effective Paleozoic hydrocarbon system in Peninsular Malaysia- Malay Basin cannot be ruled out. Permian limestones rel. common in Peninsular Malaysia and may extend offshore, but many are affected by contact metamorphism from Triassic granites)

Kasim, S.A., M.S. Ismail, N. Ahmed & A. Rashid (2023)- Facies analysis, petrography and textural characteristics of the onshore Paleogene-Neogene Lawin Basin, Perak, Peninsular Malaysia: Insights into palaeodepositional environment and provenance. J. Asian Earth Sciences: X, 9, 100150, p. 1-18.

(Sedimentological features of onshore Paleogene-Neogene Lawin Basin in Western Belt of Peninsular Malaysia. N-S trending extensional basin that formed during sinistral movement of Bok Bak Fault zone. sandstones provenance from nearby granitic source (Bintang granite) and recycled Ordovician-Devonian sedimentary rocks)

Kassa, S., H. Tsegab, C.W. Sum & C.M. Choong (2019)- Fission-track data and U-Pb dating of granites from Cameron Highland, Peninsular Malaysia: Evidence to comprehend exhumation episodes. Data in Brief 25, 104162, p. 1-8.

(online at: <https://www.sciencedirect.com/science/article/pii/S2352340919305165>)
(Main Range granite at foot of the Cameron Highlands. Two rapid cooling episodes from apatite: Late Eocene-E Oligocene and Late Miocene)

Kato, M. & Y. Ezaki (1986)- Permian corals from Pahang and Trengganu, Malaysia. J. Faculty of Science, Hokkaido University, Ser. 4, 21, 4, p. 645-668.

(online at: https://eprints.lib.hokudai.ac.jp/dspace/bitstream/2115/36745/1/21_4_p645-668.pdf)

(M Permian corals in black limestone breccia associated with andesites in Kampong Awah Quarry, Pahang, C Malay Peninsula. Assigned to Yabeina and Neoschwagerina Zones. Six species, including Waagenophyllum, Michelinia, Wentzelloides, Ipciphyllum, etc., all Tethyan elements (=Cathaysian; E Malaya Plate; JTVG))

Khan, A.A. & M.K. Shuib (2016)- A review of the Bentong-Raub suture vis-a-vis new insight of the tectonic evolution of Malay Peninsula, South East Asia. Acta Geologica Sinica (English Ed.) 90, 5, p. 1865-1886.

(online at: https://www.researchgate.net/publication/337311972_A_Review_of_the_Bentong-Raub_Suture_vis-a-vis_New_Insight_of_the_Tectonic_Evolution_of_Malay_Peninsula_South_East_Asia)

(Raub-Bentong suture does not fit model of subduction-related collision, but evolved from transpression tectonics after closure and exhumation of inland basin that underwent back-arc extension during Triassic)

Kimura, T. & C.R. Jones (1967)- Geological structures in the northeastern and southern parts of the Langkawi Islands, North-west Malaya. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 3, p. 123-134.

(Langkawi Islands off NW coast Malay Peninsula with complete Late Cambrian- Permian section, intruded by Mesozoic granites. Thrust zones between upper and lower Paleozoic. Probably multiple periods of folding)

Khin, K. (2021)- Geology along the Deep Tunnel Sewerage System Phase 2 (DTSS2) as observed during deep excavations. Underground Singapore 2021 Conf., p. 1-12.

(online at: www.researchgate.net/publication/354857326_Geology_along_the_Deep_Tunnel_Sewerage_Etc.)

(New data in coreholes, deep shaft excavations and tunnel borings largely confirm geology of parts of SW Singapore, as outlined in the Building and Construction Authority (BCA) Report of 2018. Mainly folded Triassic Jurong Fm volcanoclastics)

Khin, K. & Khin Latt (2016)- Some geological outcrops and their brief description of Singapore. Unpublished Presentation, p. 1-56.

(online at: www.academia.edu/72192222/Some_Geological_Outcrops_and_Their_Brief_Description_of_Singapore)

Khoo, Han Peng (1983)- Mesozoic stratigraphy in Peninsular Malaysia. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 370-383.

(online at: https://gsm publ.files.wordpress.com/2014/10/sctm_26.pdf)

(Mesozoic of Malay Peninsula in two separate belts: (1) NW corner and (2) N-S axial region. Two main sequences, mainly Triassic flysch sequence and Late Jurassic- E Cretaceous molasse sequence. In NW corner M-L Triassic Kodiang Lst is time equivalent of deeper marine Semanggol Fm with Halobia, Daonella)

Khoo, K.K. (1978)- Serpentinite occurrence at Telok Mas, Melaka. Warta Geologi (Newsletter Geological Society Malaysia) 4, 1, p. 1-6.

(online at: www.gsm.org.my/content.php?id=54&pid=702001-101569)

(Serpentinite in drill core ~11km SE of Malacca town. First in situ occurrence reported W of Main Range)

Khoo, T.T. (1984)- The terrane of the Patani Metamorphics. Bull. Geological Society Malaysia 17, p. 79-95.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1984006.pdf>)

(Regional metamorphic terrane in W Kedah, trending NW-SE, ~30km wide and >650 km² in size. Regional metamorphism is believed to have ended by M Carboniferous followed by emplacement of Jerai granite in M-L Carboniferous. Onset of regional metamorphism believed to be E Devonian (NB: Jerai granite dated as 204-206 Ma by Jamil and Ghani 2014; typical latest Triassic Main Range granite; JTVG))

Khoo, T.T. (1984)- Evidence of polymetamorphism in the Rebak Islands, Langkawi, Kedah. Bull. Geological Society Malaysia 17, p. 265-281.

(online at: www.gsm.org.my/products/702001-101151-PDF.pdf)

(Clastics of Rebak islands (SW Langkawi) underwent low-grade regional metamorphism followed by contact metamorphism from granitic source (tourmalinization and pyritization evidence of metasomatism))

Khoo, T.T. & S.P. Lim (1983)- Nature of the contact between the Taku Schists and adjacent rocks in the Manek Urai area, Kelantan and its implications. Bull. Geological Society Malaysia 16, p. 139-158.

(online at: www.gsm.org.my/products/702001-101170-PDF.pdf)

(Taku Schists widespread (750 km²) in N Kelantan Province, NE Malay Peninsula. Contact between schist and adjacent rocks interpreted to be conformable (but tectonic disconformity suggested by Hutchison 1973). Age of protoliths Permo-Triassic, possibly also older. Age of regional metamorphism may be E-M Triassic, uplift likely in Late Triassic)

Khoo, T.T. & B.K. Tan (1983)- Geologic evolution of Peninsular Malaysia. In: T. Thanasuthipitak et al. (eds.) Proc. Workshop on Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, 1, p. 253-290.

(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_15.pdf)

(Peninsular Malaysia three longitudinal belts, E, C and W, each with own geological development. Post mid-Permian deposition of carbonates and clastics and whole region uplifted by culminating late Triassic orogenic event which affected entire peninsula. Aborted rift model for the tectonic development of Central Belt. Etc.)

Khoo, T.T., B.S. Yaw, T. Kimura & J.H. Kim (1988)- Geology and palaeontology of the Redang islands, Trengganu, Peninsular Malaysia. J. Southeast Asian Earth Sciences 2, p. 123-130.

(Redang islands highly folded clastic sediments, contact metamorphosed by granitic intrusion. Fluvial-nearshore Redang beds and deeper marine Pinang beds. Fossil plants in Redang beds include Calamites, Pecopteris, Cordaites and Taenopteris, resembling Late Carboniferous-Permian species)

Kobayashi, T. (1959)- On some Ordovician fossils from the northern Malaya and her adjacence. J. Faculty of Science, University of Tokyo, 2, 11, p. 387-407.

(Early study of Ordovician fossils from NW Malay Peninsula/ Langkawi. Incl. gastropod *Teichispira zonata*)

Kobayashi, T. (1963)- On the Triassic *Daonella* beds in central Pahang, Malaya (Contributions to the geology and Palaeontology of Southeast Asia 3). Japanese J. Geology and Geography 34, p. 101-112.

(Triassic *Daonella* faunas with 5 species incl. *D. indica*, *D. lommeli*, *D. pichleri* and *D. pahangensis* n.sp., from Temerloh area, Pahang, Central Malay Peninsula. Triassic shales of Temerloh associated with Pahang Volcanics tuffs. Typical Tethyan fauna, mainly of Ladinian age. Similar distribution to *Myophoria* sandstones across Malay Peninsula)

Kobayashi, T. (1963)- *Halobia* and some other fossils from Kedah, northwest Malaya (Contributions to the geology and Palaeontology of Southeast Asia 4). Japanese J. Geology and Geography 34, p. 113-128.

(Occurrence of Ladinian-Norian hemipelagic bivalves *Posidonia kedahensis* n.sp., *Halobia talauana* Wanner, *Halobia parallella* Kobayashi and *Halobia comata* Bittner in Semanggol Fm, NW Malay Peninsula)

Kobayashi, T. (1964)- On the Triassic *Daonella* Beds in Central Pahang, Malaya. In: T. Kobayashi (ed.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 53-68.

(Same paper as Kobayashi 1963. Five species of *Daonella* (one new species *Daonella pahangensis*) from M Triassic shales NW of Temerloh. Same paper as Kobayashi 1963)

Kobayashi, T. (1964)- *Halobia* and some other fossils from Kedah, northwest Malaya. In: T. Kobayashi (ed.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 69-87.

(Same paper as Kobayashi 1963. Occurrence of Ladinian-Norian hemipelagic bivalves *Posidonia kedahensis* n.sp., *P. siamensis*, *P. cf. japonica*, *Halobia talauana* Wanner, *H. charlyana*, *H. parallella* Kobayashi and *Halobia comata* Bittner, *Daonella indica*, etc., in Semanggol Fm, NW Malay Peninsula))

Kobayashi, T. (1984)- On the geological history of Thailand and West Malaysia. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 3-42.
(Stratigraphy-oriented review of Paleozoic- Recent of Thailand-Malay Peninsula area)

Kobayashi, T., C.K. Burton, A. Tokuyama & E.H. Yin (1967)- The *Daonella* and *Halobia* facies of the Thai-Malay Peninsula compared with those of Japan. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 3, p. 98-122.
(M-L Triassic mollusc-bearing beds in Malay Peninsula E and W zones. *Daonella* and *Halobia* widespread in deep-water W zone, from S Thailand through Kedah to N Perak ('Semanggol Fm'). *Daonella* Beds mainly Ladinian, *Halobia* beds mainly Carnian- E Norian. E zone on E side of Main Range, from Kelantan via Pahang and Johore to Singapore, characterized mainly by nearshore *Myophoria* sandstones)

Kobayashi, T. & T. Hamada (1964)- On a new Malayan species of *Dalmanitina*. In: T. Kobayashi (ed.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 221-235.
(Early Silurian (Landoverian) trilobite *Dalmanitina malayensis* n.sp. from Langkawi Island. Comparable to *D. hastingsi* from basal Silurian of Shan States, Myanmar)

Kobayashi, T. & T. Hamada (1966)- A new proetoid trilobite from Perlis, Malaysia (Malaya). In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 2, p. 245-250.
(New trilobite *Cyrtosymbole* (*Waribole*) *perlisensis* from Kubang Pasu Fm in Perlis, NW Malay Peninsula (probably E Carboniferous age))

Kobayashi, T. & T. Hamada (1970)- A Cyclopygid-bearing Ordovician faunule discovered in Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 8, p. 1-16.
(Ordovician trilobites from Malay Peninsula)

Kobayashi, T. & T. Hamada (1971)- Agnostoid trilobites in a Devonian formation in West Malaysia. *Proc. of the Japan Academy* 47, 4, p. 396-400.
(online at: https://www.jstage.jst.go.jp/article/pjab1945/47/4/47_4_396/pdf-char/en)
(Devonian trilobites in 'Kroh Fauna' from NW Malay Peninsula. Includes *Pseudotrinodus aenigma* n. gen., n.sp.)

Kobayashi, T. & T. Hamada (1971)- Silurian trilobites from the Langkawi islands, West Malaysia, with notes on the *Dalmanitidae* and *Raphiophoridae*. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 9, p. 87-134.

Kobayashi, T. & T. Hamada (1972)- A unique trilobite assemblage of the Devonian Kroh fauna in West Malaysia, with notes on the *Tentaculites* facies and the older Palaeozoic faunal sequence in Thailand-Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 10, p. 1-34.
(Trilobite assemblage from Kroh, Upper Perak, NW Malay Peninsula with 13 species, incl. *Pseudotrinodus* spp., *Perakaspis* spp., *Blanodalmanites* spp., etc. Associated with tentaculites (*Nowakia acauria*))

Kobayashi, T. & T. Hamada (1973)- *Cyrtosymbolids* (Trilobita) from the Langgon red beds in northwest Malaya, Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 1-28.
(Trilobites associated with brachiopods from 4 localities U Devonian- Lower Carboniferous Langgun Fm marine red mustones of NW Malay Peninsula and Langkawi. Four species, incl. *Cyrtosymbole* (*Waribole*) *perlisensis*, *Macrobole kedahensis*, etc.)

Kobayashi, T. & T. Hamada (1978)- Upper Ordovician trilobites from the Langkawi islands, Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 19, p. 1-27.

Kobayashi, T. & T. Hamada (1979)- Permo-Carboniferous trilobites from Thailand and Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 20, p. 1-21.
(*New collections of trilobites from U Carboniferous- Lw Permian from Loei District. Seven new species of M-L Permian trilobites Paladin, Thaiaspis, etc. described. Also two M Permian pygidia from N Pahang, Malay Peninsula: Ditomopyge sp and a Neoproetus from near Kuala Lipis, Pahang*)

Kobayashi, T. & T. Hamada (1981)- Trilobites of Thailand and Malaysia. *Proc. of the Japan Academy, Series B*, 57, 1, p. 1-6.

(online at: www.jstage.jst.go.jp/article/pjab1977/57/1/57_1_1/_pdf)

(*Brief review of 11 occurrences of Late Cambrian- Permian trilobites from Thailand and NW Malaysia (mainly from Sibumasu terrane?)*)

Kobayashi, T. & T. Hamada (1984)- Trilobites of Thailand and Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 273-284.

(*Same paper as Kobayashi & Hamada (1981)*)

Kobayashi, T., C.R. Jones & T. Hamada (1964)- On the Lower Silurian shelly fauna in the Langkawi Islands, northwest Malaysia. In: T. Kobayashi (ed.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 209-220.

(*Pulau Langgon (Langkawi Islands) with >2400' thick Setul Fm limestone-dominated section. With detrital bands with graptolites (Climacograptus), trilobites (Dalmanitina malayensis), etc.*)

Kobayashi, T., G.A. Sai & K.N. Murthy (1984)- On the geological age of the Tanjong Malim Limestone in Peninsular Malaysia. *Proc. of the Japan Academy, Series B*, 55,6, p. 259-263.

(online at: https://www.jstage.jst.go.jp/article/pjab1977/55/6/55_6_259/_pdf)

(*Macrofossils in limestone intercalated with argillaceous rocks and quartzite at Tanjung Malim, 80km NNW of Kuala Lumpur. thermally metamorphosed by Triassic granite intrusion. Fossils incl. straight nautiloids (Endoceras, Orthoceras, Ormoceras) and gastropods (Lophospira). Most likely of M Ordovician age*)

Kobayashi, T. & M. Tamura (1968)- *Myophoria* (s.l.) in Malaya with a note on the Triassic Trigoniacea. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 88-137.

(*Taxonomic review of 13 species of M-U Triassic Trigoniacea bivalves from 'Myophoria Sandstone belt' in Central Belt at E side of Main Range of Malay Peninsula (Chegar Perah, Temerloh, Jurong-Singapore, Kuala Lipis). Presence of Neoschizodus, Myophoria, Costatoria (7 species, incl. C. myophoria, C. pahangensis, C. chegapahangensis n. sp.), Elegantinia, etc. (Deposits now called Semantan Fm, viewed as M-U Triassic foreland or fore-arc basin along W side of E Malaya Terrane (Ismail 2007); Myophorids from Padang Beds of Sumatra limited to 3 Norian species of Costatoria)*)

Kobayashi, T. & M. Tamura (1968)- Upper Triassic pelecypods from Singapore. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 138-150.

(*Rel. poorly preserved Late Triassic neritic bivalves from Jurong Industrial Estate, SW Singapore. With 17 species, incl. Halobia ex. gr. verbeeki, Costatoria cf. myophoria and other spp., Cassianella cf. verbeeki, Pecten (Entolium?), Cardium scrivenori n.sp. (with affinities to Cardium martini of Sumatra), etc., probably of E Norian age. Fauna similar to Katialo Fauna of Sumatra described by Krumbeck (1914) and also to Mount Faber, Singapore, fauna described by Newton (1923))*)

Koike, T. (1973)- Triassic conodonts from Kedah and Pahang, Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 91-113.

(Triassic conodonts from N Kedah, Bukit Kecil (probably Ladinian, with *Epigondiella mungoensis*, *Paragondolella polygnathiformis*, *Neogondolella*, etc.) and Bukit Kodiang (E Carnian?; mainly *P. polygnathiformis*). Also samples from chert of Semanggol Fm at Tawar (S Kedah; within late Ladinian- E Carnian) and 3 km NW of Kampong Awah (C Pahang; E Carnian))

Koike, T. (1982)- Triassic conodont biostratigraphy in Kedah, West Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 23, p. 9-52.

Kon'no, E. (1967)- Some younger Mesozoic plants from Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 3, p. 135-164.

(Nine fossil plants from 'Gagau Flora' from 'post-orogenic' Gagau/ Tebak Fm clastics from 3 areas in median zone of Malay Peninsula, incl. in Gunong Gagau area of N Pahang. Most likely age early E Cretaceous, possibly including Late Jurassic. Descriptions of *Equisetites*, *Gleichenites*, *Ptilophyllum*, *Frenelopsis*, etc. Floral affinity with East Asia, very different from India flora. See also Kon'no 1968, Smiley 1970)

Kon'no, E. (1968)- Addition to some younger Mesozoic plants from Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 139-155.

(Nine fossil plants of E Cretaceous 'Gagau Flora', newly collected from Sungei Pertang, Kelantan, incl. *Gleichenoides* spp., *Otazamites*, *Pelourdea*, *Cupressinocladus*, *Conites*, etc.)

Kon'no, E. & K. Asama (1970)- Some Permian plants from the Jengka Pass, Pahang, West Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 8, p. 97-132.

(U Permian 'Cathaysian' flora with 24 species, incl. *Bicoemphleopteris hallei* (also common in Cathaysian *Gigantopteris* flora of S China)

Kon'no, E. & K. Asama (1975)- Younger Mesozoic plants from Ulu Endau, Pahang, West Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 91-102.

Kon'no, E., K. Asama & S. Rajah (1970)- The Late Permian Linggiu flora from the Gunung Blumut area, Johore, Malaysia. *Bull. National Science Museum, Tokyo*, 13, 3, p. 491-580.

(Rel. rich early Late Permian flora from C Johore, SE part of Malay Peninsula. In ~1000-2000' thick Linggiu Fm folded sand-shale-volcanics series. 35 species, many index fossils of North Cathaysian *Gigantopteris-Lobatannularia* spp. Fauna (correlative with Upper Shihhotse Series of N Cathaysia). Also *Pecopteris*, *Rahajia*, *Taeniopteris*, etc. Only 5 species in common with Jambi flora of Sumatra, which is deemed to be older (Artinskian; tied to Shansi series of N Cathaysia, but lacks some key taxa of that flora))

Kon'no, E., K. Asama & S. Rajah (1971)- The Late Permian Linggiu flora from the Gunung Blumut area, Johore, Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 9, p. 1-85.

(Same paper as Kon'no et al. (1970). Linggiu flora from C Johore with 35 early Late Permian species characteristic of N Cathaysian *Gigantopteris-Lobatannularia* assemblage. Different from nearby, older Permian Jambi Flora)

Koopmans, B.N. (1965)- Structural evidence for a Palaeozoic orogeny in northwest Malaya. *Geological Magazine* 102, p. 501-520.

(Lower Paleozoic rocks in Langkawi Islands subjected to late Silurian-Devonian 'Langkawi folding phase' (dynamo-metamorphic slates in SE with NNW cleavage; in unmetamorphosed N part of area cross-folding with NW trend superimposed on NNE trending folds). In U Paleozoic sediments such deformations are missing: Permian and Carboniferous only slightly warped around Jurassic granite batholith. Lack of Devonian strata in Thailand and incompleteness of Devonian sequence in Malaya may indicate Langkawi folding phase not restricted to Langkawi Islands (comparable to U Paleozoic unconformity in N Sumatra, described by

Zwierzynski 1919, Klein 1917?) (see also critique of Burton (1966), who argues for 'Langkawi folding phase' of M-U Carboniferous age)

Koopmans, B.N. (1966)- Palaeozoic orogeny in North-West Malaya- A reply. Geological Magazine 103, 6, p. 565-567.

(Reply to critique of Burton (1966))

Koopmans, B.N. (1968)- The Tembeling Formation- a litho-stratigraphic description (West Malaysia). Bull. Geological Society Malaysia 1, p. 23-43.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1967003.pdf>)

(Tembeling Fm 'molasse facies' fluvial-deltaic lacustrine post-orogenic sediments in E Malay Peninsula. Thickness at type section in Pahang >3000m. Age probably late Triassic- Jurassic. Incl. thick polymict conglomerates, argillaceous red-beds, etc. Unconformably overlies Carboniferous, Permian and Triassic rocks. Folded Tembeling Fm unconformably overlain by flat-lying beds of Late Jurassic- E Cretaceous Gagau Gp)

Koraini, A.M., Z. Konjing & M. Malihan (2012)- Tertiary palynomorph assemblage from eastern Chenor, Pahang. Bull. Geological Society Malaysia 58, p. 37-42.

(online at: www.gsm.org.my/products/702001-100353-PDF.pdf)

(Palynological assemblages from clastic sediments in outcrop in C Pahang dominated by Late Miocene or younger palynomorphs such as *Lanagiopollis emarginatus*, *Stenochlaenidites papuanus*, *Discoidites borneensis*, *Taxodiaceae*, etc. Suggestive of ephemeral peat swamp and riparian fringe type environment)

Krahenbuhl, R. (1991)- Magmatism, tin mineralization and tectonics of the Main Range, Malaysian Peninsula: consequences for the plate tectonic model of Southeast Asia based on Rb-Sr, K-Ar and fission track data. Bull. Geological Society Malaysia 29, p. 1-100.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1991010.pdf>)

(Malaysian Peninsula divided by suture into 2 different magmatic provinces. Major magmatic event in Main Range Late Permian. Also common Later Triassic post-collision granites, with major tin mineralization. Apatite fission track data show rapid Oligocene (33-24 Ma) exhumation of Malay Peninsula Tin granites, etc.)

Kumar, S.C. (1981)- Gabbroic rocks from the southern Malay Peninsula and their relation to similar rocks of other orogenic zones. Geological Society Malaysia, Bull. 14, p. 75-100

(online at: www.gsm.org.my/products/702001-101197-PDF.pdf)

(Linden (NW of Johore) and Gombak (Singapore) gabbroic stocks outcrop as two discrete bodies in S tip of Malay Peninsula. Together with gabbroic rocks in Billiton Island represent elements of Eastern volcanic-plutonic belt, active from Carboniferous- Late Triassic)

Kummel, B. (1960)- Anisian ammonoids from Malaya. Breviora 124, p. 1-8.

(online at: www.archive.org/details/breviora121178harv)

(M Triassic ammonites from folded dark grey shales 10.5 miles SSW of Kuala Lipis, Pahang, Central Malay Peninsula (= E Malaya/ Indochina terrane?: JTvG). Contains Tethyan species *Paraceratites trinodosus*, *Sturia sansovinii*, *Acrochordiceras* and *Ptychites*)

Kwan, T.S., R. Krahenbuhl & E. Jager (1992)- Rb-Sr, K-Ar and fission track ages for granites from Penang Island, West Malaysia: an interpretation model for Rb-Sr whole-rock and for actual and experimental mica data. Contributions to Mineralogy and Petrology 111, 4, p. 527-542.

(Penang Island NW extension of Peninsular Malaysia Western Magmatic Belt. Three granite emplacement episodes: ~307 Ma (Late Carboniferous), ~251 Ma (Permian-Triassic boundary) and ~211 Ma (Late Triassic). Late-Triassic hydrothermal system responsible for Rb-Sr and K-Ar biotite age resetting of older granites. Change in tensional regime since Oligo-Miocene, accompanied by SW tilting of island)

Kwan, T.S. & F.L. Yap (1986)- The pattern of K/Ar ages of biotites from the granites of Penang: its interpretation in the light of available Rb/Sr and U/Pb data. In: G.H. Teh & S. Paramananthan (eds.) Proc. 5th

- Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 281-289.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986021.pdf>)
(*Rb/Sr whole-rock and zircon U/Pb data indicate granites of Penang Island emplaced in late Triassic between 222 Ma and 209 Ma. K/Ar analysis of 31 biotite samples show younger apparent ages, decreasing to SSE from 209 Ma to 160 Ma. Trend of younging apparent ages suggests rejuvenation on regional scale*)
- Lane, H.R., K.J. Muller & W. Ziegler (1979)- Devonian and Carboniferous conodonts from Perak, Malaysia. *Geologica et Palaeontologica* 13, p. 213-222.
(*Devonian and Carboniferous conodonts from J.K.R. quarry in S part Gunung Kanthan, Perak, NW Malay Peninsula*)
- Latiff, A.H.A. & A.E. Khalil (2018)- Crustal thickness and velocity structure of southern Peninsular Malaysia. *Bull. Geological Society Malaysia* 66, p. 7-13.
(online at: <https://gsm.org.my/products/702001-101761-PDF.pdf>)
(*Broadband seismometer station earthquake data suggest crust-mantle boundary at 34 km and 30 km beneath Kota Tinggi and Bukit Timah (Singapore) stations*)
- Latiff, A.H.A. & A.E. Khalil (2019)- Crustal thickness and velocity structure of Malay Peninsula inferred from joint inversion of receiver functions and surface waves dispersion. *J. Asian Earth Sciences* 169, p. 105-116.
(online at: <https://www.sciencedirect.com/science/article/pii/S136791201830350X>)
(*Seismic inversion indicates Moho boundary shallower to N of Malay Peninsula: depth of crust-mantle boundary from 34 km in S to 26 km in S Thailand*)
- Laveine, J.P. & A.H. Hussin (2003)- The Carboniferous flora of Eastern Peninsular Malaysia. *Revue de Paleobiologie*, Geneve, 22, 2, p. 811-830.
(*Carboniferous floras of E Peninsular Malaysia and NE Thailand typical Euramerican aspect. Indochina Block (NE Thailand) and probably also E Malaya Block (E Peninsular Malaysia) in terrestrial connection with N Palaeotethyan land mass, most probably S China Block, at least since E Carboniferous*)
- Lee, C. (1980)- Two new Permian ammonoid faunas from Malaysia. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 63-72.
(*Two new E-M Permian ammonoid occurrences on: (1) Prostacheoceras, Neocrinites and Adrianites from Lee Mines in Perak, NW Malay Peninsula (Artinskian), and (2) Agathiceras suessi, Adrianites eleans and Popanocera from S. Cheroh, Pahang, C Malay Peninsula (Wordian). Faunas transitional between those from Sicily and Bituani-Basleo, Timor*)
- Lee, C.P. (1983)- Stratigraphy of the Tarutao and Machinchang Formations. In: P. Nutalaya (ed.) *Proc. Workshop Stratigraphic correlation of Thailand and Malaysia*, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 20-38.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_02.pdf)
(*Review of ~3000m thick mainly shallow marine clastic sections of age-equivalent Cambro-Ordovician Machinchang Fm (NW Malaysia, Langkawi island) and Tarutao Fm (SW Thailand, Ko Tarutao). Somewhat thicker and coarser in S. Overlain by Ordovician limestones of Setul Fm (part of 'Sibumasu Terrane'; similar to Arafura- W Papua stratigraphy?; JTVG)*)
- Lee, C.P. (1993)- Fossil localities in Malaysia: their conservation and significance. Background Paper, Malaysian National Conservation Strategy, Economic Planning Unit, Kuala Lumpur, p. 1-35.
(online at: http://repository.wwf.org.my/technical_reports/...)
(*Overview of significant fossil localities on Malay Peninsula, Sarawak and Sabah*)
- Lee, C.P. (2001)- Scarcity of fossils in the Kenny Hill Formation and its implications. *Gondwana Research* 4, 4, p. 675-677.

(Permian Kenny Hill Fm is 1200-1500m thick sequence of clastic sediments W and S of Kuala Lumpur. Part of Sibumasu terrane, just W of Bentong Raub suture. Except for single find of E-M Permian ammonoid, Agathiceras no datable body fossils reported. Shallowing-upward succession, reflecting closing of Raub suture)

Lee, C.P. (2001)- Occurrences of *Scyphocrinites* loboliths in the Upper Silurian Upper Setul limestone of Pulau Langgun, Langkawi, Kedah and Guar Sanai, Berseri, Perlis. Proc. Geological Society Malaysia Annual Geological Conference, Pangkor Island 2001, Perak, p. 99-104.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2001_16.pdf)

(Scyphocrinites loboliths (bulbous floats attached to roots of Late Silurian- E Devonian crinoid) in U Silurian U Setul Lst of Pulau Langgun, Langkawi and in quarry at Guar Sanai, near Guar Jentik, Berseri, Perlis)

Lee, C.P. (2004)- Palaeozoic. In: C.P. Lee et al. (eds.) Stratigraphic Lexicon of Malaysia, Geological Society Malaysia, p. 3-26.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/lexicon.pdf>)

(Paleozoic sedimentary rocks ~25% of outcrop of Malay Peninsula. In Sarawak only pre-Upper Carboniferous Tuang formation and U Carboniferous- Lower Permian Terbat Fms. No Paleozoic rocks known from Sabah. Paleozoic formations of Peninsular Malaysia in 3-4 NW/N trending zones. Lower Paleozoic rocks confined to W part of peninsula)

Lee, C.P. (2005)- Discovery of plate-type scyphocrinoid loboliths in the uppermost Pridolian- lowermost Lochkovian Upper Setul limestone of Peninsular Malaysia. Geological Journal 40, 3, p. 331-342.

(Floats attached to roots of Late Silurian to Early Devonian crinoids up to 16cm in diameter in top part of U Setul Limestone of Langgun, Langkawi Island, and Guar Jentik on adjacent NW Malay Peninsula (Sibumasu Terrane))

Lee, C.P. (2006)- The Cambrian of Malaysia. Palaeoworld 15, p. 242-255.

(Cambrian of Malaysia best represented by few 1000m thick quartzose Machinchang Fm in Langkawi, Kedah, NW Peninsular Malaysia. Basal part prograding prodelta clastics, middle part estuarine channel-fills and upper shoreface, beach, etc. deposits, youngest member shoreface to lagoonal. Grades upward into Ordovician Setul Fm limestone)

Lee, C.P. (2009)- Palaeozoic stratigraphy. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University Malaya and Geological Society Malaysia, Kuala Lumpur, p. 55-86.

(Paleozoic rocks outcrop over ~25% of Malay Peninsula. Peninsula subdivided into 3 belts and a NW Domain. W and NW domains are 'Gondwanan' Late Cambrian- Triassic stratigraphy (incl. thick Ordovician- Devonian limestones and Carboniferous- E Permian glacial diamictites). C and E belts are 'Cathaysian', highly deformed marine Carboniferous- Permian sediments (including Permian fusulinid limestone and shale with Gigantopteris flora), unconformably overlain by U Triassic- Lw Jurassic redbeds)

Lee, C.P. (2013)- Review of the Palaeozoic stratigraphy of the Langkawi Islands, Malaysia. Berita Sedimentologi 27, p. 5-14.

(online at: <https://journal.iagi.or.id/index.php/FOSI/article/viewFile/157/127>)

(Langkawi, off NW Malay Peninsula, part of W Belt ('Sibumasu' microcontinent), with rel. complete Paleozoic section exposed. Machinchang Fm Cambrian quartzose sandstones, Setul Fm Ordovician- E Devonian limestones, Singa Fm Carboniferous- E Permian marine clastic with glacial diamictite, Chuping Fm E-M Permian limestone with fusulinids, Late Triassic and Late Cretaceous granite)

Lee, C.P., M.S. Leman, K. Hassan, B.M. Nasib & R. Karim (2004)- Stratigraphic Lexicon of Malaysia. Geological Society Malaysia, Kuala Lumpur, p. 1-162.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101655-PDF.pdf)

(Compilation and systematic description of 160 Malaysian Paleozoic- Quaternary stratigraphic units. Also with bibliographic and chronologic information as well as fossil records)

Lee, C.P. & H.H. Meor (2005)- Contributions from the geology of Northeast Langkawi to refining the Mid-Palaeozoic stratigraphy and palaeogeography of Peninsular Malaysia. *Malaysian J. Science* 24 (Langkawi Special Issue), p. 9-14.

(New stratigraphic nomenclature based on observations on Pulau Langgun. Kilim brachiopod beds clues to Late Paleozoic glacial event, indicating proximity of Langkawi to Gondwana during that time)

Lee, C.Y. (1998)- The Bukit Arang Tertiary basin in Chuping, Perlis. *Bull. Geological Society Malaysia* 42, p. 179-186.

(online at: www.gsm.org.my/products/702001-100847-PDF.pdf)

(Bukit Arang small Late Tertiary Basin in N Malay Peninsula-Thailand border area. Thickness from gravity data up to 800m thick. Underlain by Carboniferous clastics of Kubang Pasu Fm. May be correlated with Batu Arang Tertiary Basin of Late Oligocene- Late Miocene age in Selangor and other Tertiary basins in peninsula)

Leman, M.S. (1990)- Permian Productidina of Britain and Malaysia. Ph.D. Thesis, Durham University, p. 1-286.

(online at: http://etheses.dur.ac.uk/6293/1/6293_3648.PDF)

(Malaysian Permian Productidina dominated by the Productacea with 20 species of 16 genera. Usually associated with late Lower Permian (Artinskian) fusulines, and U Permian fusulines as well as lyttoniids. Lower Permian Productidiniids widespread in W Peninsular Malaysia, dominated by linoproductid genus Cancrinella. Fauna resembles Lower Permian cold water fauna from S (Paleo-)Tethys. M Permian fauna not well known. U Permian productidina widespread in C Peninsular Malaysia. Liosotella and associated 'N Cathaysian' flora from Maran area. Widespread lyttoniid fauna during late Permian indicates spreading of warm tropical conditions in Malaysia)

Leman, M.S. (1993)- Upper Permian brachiopods from northwest Pahang, Malaysia. In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA)*, Chiang Mai 1993, 1, p. 202-218.

(U Permian- M Triassic Gua Musang Fm in NW Pahang in central belt of Malay Peninsula (= W margin of E Malaya Block?) with rich U Permian 'S Tethyan' brachiopod assemblages, in tuffaceous shales. Most of fauna warm water olhaminids and may be regarded as 'Leptodus Shale', which seems to have flourished on shallow shelf or on volcanic islands. Two zones: Oldhamina dicipens and Haydenella minuta (Leptodus shale of C Malay Peninsula also described by Muir-Wood 1948). Associated with pectinid bivalves, one fusulinid horizon and rare plant remains (incl. Lobatanularia, Taenopteris, Pecopteris= Cathaysian?))

Leman, M.S. (1994)- The significance of Upper Permian brachiopods from Merapoh area, northwest Pahang. *Bull. Geological Society Malaysia* 35, p. 113-121.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1994011.pdf>)

(Rich U Permian brachiopod-dominated shelly fauna in M Permian- E Triassic Gua Musang Fm of Merapoh area, NW Pahang, C Malay Peninsula, wit 40 species, incl. Leptodus nobilis, L. cf. catenata. and Oldhamina decipiens. With horizon of 'U Permian Leptodus Shale', which developed on shallow carbonate and volcanic highs during period of active volcanism (Capitanian?))

Leman, M.S. (1995)- Permian ammonoids from Kuala Betis area, Kelantan and their paleogeographic significance. *Bull. Geological Society Malaysia* 38, p. 153-158.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995014.pdf>)

(Two new Permian ammonoid localities in tuffaceous mudstones in Gua Musang Fm metasedimentary-pyroclastic sequence in Kuala Betis area, SW Kelantan. Fauna with Agathiceras cf. suessi, Adrianites, Popanoceras., Propinacoceras, Hoffmannia, etc. and small orthoconic cephalopods. Assemblages resemble M Permian Sg Cheroh cephalopod fauna and are associated with deep water sediment in Bentong (Paleotethys) suture zone. Similarities with Italian Socio, Timor Basleo fauna and other ammonoid occurrences in Europe, N Africa and W Asia indicate oceanic link between these pelagic faunas in M Permian)

Leman, M.S. (1996)- The occurrence of brachiopods from pebbly mudstone near Kilim, Langkawi: their age, paleobiogeography and paleoclimatic implication. *Warta Geologi* 22, 2, p. 100-102. (Conference Abstract)

(online at: www.gsm.org.my/products/702001-101460-PDF.pdf)

(Gondwanan cold water brachiopod assemblage of 8 species in upper Singa Fm in Kilim quarry, Langkawi islands (= Sibumasu terrane). Includes *Spirelytha*, *Sulciplica*, *Bandoproductus*, etc. Indicating late E Permian (Sakmarian) age. Same species also reported from Ko Muk (Thailand))

Leman, M.S. (1997)- The age and paleobiogeography of brachiopod fauna discovered in pebbly mudstone at Kilim, Langkawi. Bull. Geological Society Malaysia 40, p. 233-240.

(online at: www.gsm.org.my/products/702001-100877-PDF.pdf)

(Rich, thick-shelled cold water brachiopod assemblage near top of pebbly mudstone of Singa Fm in Kilim area, E Langkawi, with *Spirelytha buravasi*, *Sulciplica thailandica*, *Lamniplica cf sapa*, *Rhynchopora*, *Streptorhynchus*, *Arctitreta*, etc. Similar to assemblage described by Waterhouse (1982) from Ko Muk, Thailand. Presence of *Bandoproductus monticulus* suggests E Permian (Late Asselian- Sakmarian) age. Kilim brachiopod fauna close affinity with other E Permian south temperate or peri-Gondwana fauna. Faunas support marine glacial diamictite origin for pebbly mudstone)

Leman, M.S. (1997)- Batuan Formasi Singa di Pulau Langkawi. In: I. Komoo et al. (eds.) Geological heritage of Malaysia: conservation geology for ecotourism, LESTARI UKM, p. 185-207.

(*'Rocks of the Singa Formation on Langkawi Island'. E Permian glaciogenic sediments*)

Leman, M.S. (2000)- Langkawi dropstones: outstanding glaciogenic sedimentological features in Malaysia. In: I. Komoo & H.D. Tjia (eds.) Geological heritage of Malaysia: resource development for conservation and nature tourism. LESTARI UKM Publ. Bangi, p. 59-82

Leman, M.S. (2003)- An Early Permian (Early Sakmarian) brachiopod fauna from the Sungai Itau Quarry and its relationship to other Early Permian brachiopod horizons in Langkawi, Malaysia. Bull. Geological Society Malaysia 46, p. 155-160.

(online at: www.gsm.org.my/products/702001-100666-PDF.pdf)

(Rich brachiopod bed with 12 species in quarry at Kampung Sllngai Itau, Langkawi, right above beds previously interpreted as E Permian deglaciation deposits. Fauna dominated by spinose genus *Spirelytha* spp., large thick-shelled *Sulciplica thailandica* and *Bandoproductus cf. monticulus*. Assigned to upper *Arctitreta*-*Bandoproductus* Zone of E Permian (E Sakmarian))

Leman, M.S. (2003)- The discovery of a *Paleodictyon*-like trace fossil from the Late Cambrian Machinchang Formation in Pulau Jemuruk, Langkawi, Malaysia. Bull. Geological Society Malaysia 46, p. 421-424.

(online at: <https://gsm.org.my/articles/702001-100624/>)

(Trace fossil *Paleodictyon* in shallow marine, fine-grained Late Cambrian clastics on small island off NW Langkawi Island)

Leman, M.S. (2004)- Mesozoic. In: C.P. Lee et al. (eds.) Stratigraphic Lexicon of Malaysia, Geological Society Malaysia, p. 37-64.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/lexicon.pdf>)

Leman, M.S., I. Komoo, K. Roslan, C.A. Ali & T. Unjah (2007)- Geopark as an answer to geoheritage conservation in Malaysia- The Langkawi Geopark case study. Bull. Geological Society Malaysia 53, p. 95-102.

(online at: <http://geology.um.edu.my/gsmpublic/v53/Pdf%20individual%20papers/15%20Paper.pdf>)

(On preservation of famous 'Sibumasu' Paleozoic section outcrops of Langkawi island, off Malay Peninsula)

Leman, M.S., K.R. Mohamed & M. Sone (2000)- On the new Permian Bera Formation from the Bera District, Pahang, Malaysia. In: G.H. Teh et al. (eds.) Proc. Geological Society Malaysia Annual Geological Conference 2000, Pulau Pinang, p. 151-158.

(online at: https://gsmpublic.files.wordpress.com/2014/10/agc2000_21.pdf)

(New Bera Formation introduced for M Permian strata exposed in Bera District, Pahang, C Malay Peninsula. Lithology mainly shale, siltstone and sandstone, deposited in shallow marine environment. With ammonoid *Agathiceras*, trilobite *Pseudophillipsia*, brachiopods incl. lyttoniid genus *Gubleria* (similar to *Leptodus nobilis*;

see also Sone et al. 2001). Upper part of Bera Fm equivalent to limestones at Jengka Pass and Kampung Awah with late M Permian fusulinid foraminifera)

Leman, M.S., N. Ramli, S. Mohamed & C. Molujin (2004)- The discovery of Late Permian (early Changshingian) brachiopods from Penjom, Pahang Darul Makmur. Bull. Geological Society Malaysia 48, p. 91-95.

(online at: www.gsm.org.my/products/702001-100582-PDF.pdf)

(Late Permian brachiopod fauna with *Peitichia kwangtungensis* and *Semibrachythyridina rhombiformis* in dark grey calcareous shale dipping ~45° to WSW, near Penjom gold mine, SW of Kuala Lipis)

Leman, M.S. & G. Shi (1998)- The Permian of Langkawi Islands and North West Peninsular Malaysia with comments on the significance of the Kisap Thrust. In: G.R. Shi et al. (eds.) Strzelecki Int. Symposium Permian of Eastern Tethys: biostratigraphy, palaeogeography and resources, Proc. Royal Society of Victoria 110, p. 405-418.

(W part of Peninsular Malaysia part of Shan-Tai/ Sibumasu block. Carboniferous- Permian sequences deposited in two paleogeographically distinct settings: (1) West Langkawi (with Carboniferous- Lw Permian Singa Fm glacio-marine pebbly mudstone) and (2) Perlis-Kedah (Carboniferous- Lw Permian shallow water Kubang Pasu Fm in W (with E Permian *Monodioxodina fusulinid* fauna) and deep-water Semanggol Fm in E, no well-defined glacial diamictites, transitional climate between typical cold Gondwana and warm Cathaysian faunas. Two terranes brought close to each other by post-Permian Kisap Thrust, thrusting E block (Perlis-Kedah) over W block (W Langkawi))

Leman, M.S. & M. Sone (2001)- Conglomerate from Setia Jasa near Temerloh, Pahang, Peninsular Malaysia: its stratigraphic position and depositional environment. In: G.H. Teh et al. (eds.) Proc. Geological Society Malaysia Annual Geological Conference 2001, Pangkor Island, p. 115-119.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2001_19.pdf)

(Thick series of conglomerate, tuffaceous sandstone and shale in Setia Jasa area, E of Temerloh, C Malay Peninsula. Anisian (early M Triassic) age is indicated by presence of ammonoid *Paraceratites* sp. in lower shale bed. Also bivalves *Costatoria* and *Neoschizodus* and some plant fragments. Clasts mainly tuffaceous sandstone. Possibly deposited in deep marine environment and probably part of Semantan Fm)

Leman, M.S. & M. Sone (2002)- A Permian phillipsiid trilobite from Peninsular Malaysia. Geosciences Journal 6, 2, p. 125-129.

(online at: https://www.academia.edu/4148898/A_Permian_phillipsiid_trilobite_from_Peninsular_Malaysia)

(Pygidia of trilobite *Pseudophillipsia* sp. reported from M Permian Bera Fm sand-shale, Pahang, Central Malay Peninsula, with rich brachiopod fauna of E Capitanian age. Resembles slightly younger Capitanian species of N Laos, suggesting faunal link between Indochina and Peninsular Malaysia (E Malaya terrane) in Capitanian. Also some similarities with *Pseudophillipsia timorensis* (Gheyselinck, 1937) from Basleo, W Timor)

Leman, M.S. & A. Yop (2002)- Early Permian sequence from Sungai Itau quarry, Langkawi: its age, depositional environment and palaeoclimatic implication. In: G.H. Teh (ed.) GSM Annual Geological Conference, Kota Bharu 2002, Bull. Geological Society Malaysia 45, p. 163-170.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2002025.pdf>)

(Thick bedded sandstones and mudstones with fossiliferous calcareous horizons in quarry in Kampung Sungai Itau, Langkawi. Lower sandstone interbedded with black pebbly mudstone (diamictite), indicating glaciation. Deposition took place on outer shelf. Overlying silty shale yields E Permian (late Asselian- E Sakmarian) brachiopod assemblage of Gondwanan affinity with *Spirelytha* spp., *Sulciplica*, *Spiriferella*, etc.)

Leonova, T.B., M.S. Leman & G.R. Shi (1999)- Discovery of an Early Permian (Late Sakmarian) ammonoid from Langkawi Island, Malaysia. Alcheringa 23, p. 277-281.

(Ammonite *Metalegoceras* sp. from thin-bedded sands-shales in uppermost part of Singa Fm at Batu Asah, NW part of Kuah town, S Langkawi. Confirms Sakmarian (E Permian) age suggested by brachiopods)

Leslie, A.G., T.J. Dodd, M.R. Gillespie, R.S. Kendall, T.P. Bide, T.I. Kearsley, M.R. Dobbs, M.K.W. Lee & K. Chiam (2019)- Ductile and brittle deformation in Singapore: a record of Mesozoic orogeny and amalgamation in Sundaland, and of post-orogenic faulting. *J. Asian Earth Sciences* 181, 103890, p. 1-18. (*manuscript online at: https://nora.nerc.ac.uk/id/eprint/525127/1/SingaporeStructuralGeology_Leslie_et_al_Rev02.pdf*)

(*Singapore bedrock geology dominated by late Permian- Triassic arc magmatism and related M-U Triassic volcano-sedimentary inner forearc succession. Mesozoic strata deformed into NE-translated structures in latest Triassic- earliest Jurassic collision and amalgamation of Sibumasu block with S part of Sukhothai Arc. Subduction-related magmatic complex represented in Singapore by plutons of Bukit Timah Centre, which acted as backstop to thrusting. In Singapore, Murai and Pasir Laba Thrusts associated with SW-dipping imbricate duplex slices. Two E Cretaceous (Berriasian and Barremian) sedimentary successions overstep collisional structures. NE-SW and ENE-WSW trending faults most likely generated by Cenomanian dextral shear stress*)

Leslie, A.G., M.R. Dobbs, Ng Tham Fatt, Q.A. Rosle, M.R. Mohd Noh, T.J.H. Dodd & M.R. Gillespie (2020)- The Ukay Perdana shear zone In Kuala Lumpur: a crustal-scale marker of Early Jurassic orogenic deformation in Peninsular Malaysia. *Bull. Geological Society Malaysia* 69, p. 135-147.

(*online at: <https://gsm.org.my/products/702001-101827-PDF.pdf>*)

(*UPSZ ultramylonite zone in NE Kuala Lumpur ~250-300 m thick, E-verging, and superimposed on ~200 Ma S-type 'Western Belt' granite plutons generated by crustal thickening and assigned to Main Range Granite Province. Younger S-type granitic rocks cut shear zone. Deformation accommodated final stages of collision between Sibumasu and Sukhothai Arc, and involved now E-directed (080°N, then generally N-ward) overthrusting of leading edge of Sibumasu onto Sukhothai Arc/ Indochina-E Malaya block after ~198 Ma. Dextral strike-slip tectonics superimposed on collisional framework in later Mesozoic and Cenozoic*)

Leslie, A.G., Ng Tham Fatt, Q.A. Rosle, M.R. Mohd Noh, T.J.H. Dodd, M.R. Gillespie & M.R. Dobbs (2019)- The Jalan Wangsa Thrust in eastern Kuala Lumpur; a marker for a major crustal boundary between the leading edge of the Sibumasu Block and the Sukhothai Arc? *Proc. 32nd National Geoscience Conference (NGC 2019)*, Kota Kinabalu, *Warta Geologi (Newsletter Geological Society Malaysia)* 45, 3, p. 174-175. (*Abstract only*)

(*online at: <https://gsm.org.my/articles/702001-101799/>*)

(*KL and Singapore at opposite sides of Bentong-Raub suture, with KL on E edge of Sibumasu Block*)

Li, B., S.Y. Jiang, H.Y. Zou, M. Yang & J.Q. Lai (2015)- Geology and fluid characteristics of the Ulu Sokor gold deposit, Kelantan, Malaysia: implications for ore genesis and classification of the deposit. *Ore Geology Reviews* 64, p. 400-424.

(*Ulu Sokor in Central Gold Belt one of largest gold deposits in Malaysia. Three major orebodies related to N-S and NE-striking fractures in fault zones in Permian-Triassic meta-sedimentary and volcanic rocks of E Malaya Block. Gold mineralization quartz-dominant vein systems with sulfides and carbonates. Hydrothermal alteration and mineralization during three stages. Classified as orogenic gold deposit*)

Liew, T.C. (1983)- Petrogenesis of the Peninsular Malaysia granitoid batholiths. Ph.D. Thesis, Australia National University (ANU), Canberra, p. 1-291. (*Unpublished*)

Liew, T.C. & M.T. McCulloch (1985)- Genesis of granitoid batholiths of Peninsular Malaysia and implications for models of crustal evolution: evidence from Nd-Sr isotopic and U-Pb zircon study. *Geochimica Cosmochimica Acta*, 49, p. 587-600.

(*Nd, Sr and U-Pb isotopic data for Late Triassic W Coast Province batholiths and Permian-Triassic E Coast Province batholiths of Peninsular Malaysia. U-Pb zircon inheritance ages interpreted to correspond to Mid-Proterozoic (~1300-1900 Ma) 'crust formation' ages of continental fragments represented by W Coast and E Coast batholithic provinces. Absence of Archean signatures*)

Liew, T.C. & R.W. Page (1985)- U-Pb zircon dating of granitoid plutons from the West coast of Peninsular Malaysia. *J. Geological Society, London*, 142, p. 515-526.

(*U-Pb zircon dating of granitoid plutons from W Coast Province of Malaysia yields ages of 198-220 Ma (Late Triassic), older than previous K-Ar mica ages. U-Pb zircon ages are considered to represent best estimate of intrusive ages of plutons. Zircons from some plutons yield ages of ~1500-1700 Ma, dating source-derived,*

inherited zircon components, suggesting W Coast Province S-type granitoids derived from sedimentary sources recycled, at least in part, from mid-Proterozoic crystalline basement sources)

Lim, K.K. & N.T. Abdullah (1994)- Development of Permian volcanoclastics limestone succession at Gua Bama, Pahang Darul Makmur. *Warta Geologi (Newsletter Geological Society Malaysia)* 20, 3, p. 243-244. (Abstract)

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1994003.pdf>)

(Late Permian volcanic and volcanoclastic facies interfingering with minor limestone reported to be ubiquitous from Padang Tengku to Terengan catchment area. Limestone sequence at Gua Bama underlain by stratified volcanoclastics (crystal tuffs). With Tubiphytes and colaniellid foraminifera, indicating Late Permian age)

Lim Teng Chye, S., M. Sharafuddin, M. Sulaiman, G.H. Teh & J.H.A. Aziz (2001)- Geology, structure, mineralization and geochemistry of the Penjom gold deposit, Penjom, Pahang. *Proc. Geological Society Malaysia Annual Geological Conference, Pangkor Island*, p. 59-63.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2001_10.pdf)

(Penjom Gold Mine near Bentong-Raub suture in Permian tuffs and sediments of Padang Tengku Fm, striking E-W with 30° dip S, close to E boundary with Triassic. Gold mineralization associated with early felsite sills)

Liu, L., R.Z. Hu, H. Zhong, J.H. Yang, L.F. Kang, X.C. Zhang, Y.Z. Fu, W. Mao & Y.W. Tang (2020)- Petrogenesis of multistage S-type granites from the Malay Peninsula in the Southeast Asian tin belt and their relationship to Tethyan evolution. *Gondwana Research* 84, p. 20-37. (online at:

www.researchgate.net/publication/340440497_Petrogenesis_of_multistage_S-type_granites_from_the_Etc.)

(Malay Peninsula Sn belt 4 generations of Permian-Triassic S-type granites: 276-272, 262-260, 231-222, and 202 Ma. Distinct in-situ zircon Hf and apatite Nd isotopic compositions imply generation from different sedimentary protoliths. Formation of granites corresponds to Paleo-Tethys evolution (i.e. early subduction of Paleo-Tethyan oceanic lithosphere and subsequent collision between Sibumasu and Indochina blocks))

Liu, Y., Z. Li, J. Li, F. Shao, Z. Kong, X. Liu, W. Li & X. Yin (2025)- Petrogenesis of Late Triassic granitoids in Peninsular Malaysia, Southeast Asia: Implication for crystal-melt fractionation and melt-fluid interaction during granitic magma differentiation. *J. Asian Earth Sciences* 279, 106442, p.

(Petrography, zircon U-Pb ages, whole-rock geochemical and Sr-Nd-Pb-Hf isotopic data of Late Triassic (Norian; 217-215 Ma) fine-grained biotite granitoids from Gerik pluton in Malay Peninsula Main Range)

Logan, J.R. (1849)- The rocks of Pulo Ubin. With some remarks on the formation and structure of hydrogene rocks and on the metamorphic theory. *Verhandelingen Bataviaasch Genootschap Kunsten Wetenschappen* 22, p. 4-45.

(online at: <https://www.biodiversitylibrary.org/item/127848page/258/mode/1up>)

(Early paper on geology of Palau Ubin, off Singapore, first published in Batavia. No figures)

Logan, J.R. (1851)- Notices of the geology of the Straits of Singapore. *Proc. Geological Society, London* 7, p. 310-344.

(Early description of sedimentary and plutonic rocks of Singapore archipelago and southernmost Malay Peninsula. With one map)

Loke, M.H., C.Y. Lee & G. van Klinken (1983)- Interpretation of regional gravity, and magnetic data in Peninsular Malaysia. *Bull. Geological Society Malaysia* 16, p. 1-21.

(online at: www.gsm.org.my/products/702001-101180-PDF.pdf)

(Gravity maximum of up to 20 mgals, and broad magnetic minimum over Central Belt, indicating underlying denser and more basic upper crust. Gravity minimum over Main Range and smaller gravity minimum over E Belt granites, due to lower densities of granite batholiths than surrounding rocks)

Long, X.Q., A.A. Ghani, M. Saidin & Z.Z.T. Harith (2016)- Durbachite-like melagranite in Taiping Pluton of Bintang Batholith, Peninsular Malaysia. *Bull. Geological Society Malaysia* 62, p. 1-6.

(online at: <https://gsmpubl.files.wordpress.com/2017/04/bgsm2016001.pdf>)

(Triassic (218 ± 1.3 Ma) ultrapotassic durbachite-type rocks (K-Mg-rich melagranite) in Taiping Pluton, Bintang Batholith, NW Malay Peninsula. Petrogenesis believed to require crustal component and enriched lithospheric mantle source. Taiping Pluton on Sibumasu plate, emplaced during Sibumasu-Indochina collision)

Lye, Y.H. (1984)- Studies of pegmatitic cassiterites from the Gunung Jerai (Kedah), Bakri (Johore) and Kathu Valley (Phuket) regions. Bull. Geological Society Malaysia 17, p. 107-161.
(online at: www.gsm.org.my/products/702001-101157-PDF.pdf)

MacDonald, S. (1968)- The geology and mineral resources of North Kelantan and North Trengganu. Geological Survey West Malaysia, Ipoh, Memoir 10, p. 1-202.
(Geology of NE part of Malay Peninsula. Oldest rocks Pre-Carboniferous Taku Schists. Overlain by Carboniferous- Permian sediments with Pecopteris plants and ?Triassic -?Jurassic clastics. Also common ?Cretaceous granites)

Madon, M. (2010)- Submarine mass-transport deposits in the Semantan Formation (Middle-Upper Triassic), central Peninsular Malaysia. Bull. Geological Society Malaysia 56, p. 15-26.
(online at: <http://geology.um.edu.my/gsmpublic/BGSM/bgsm56/bgsm2010003.pdf>)
(Exposures of M-U Triassic Semantan Fm along East Coast Highway between Karak and Kuantan of Triassic flysch basin that once separated W and E Malaya. E-ward change from distal to proximal facies)

Madon, M. (2017)- A brief review of gravity and magnetic data for Malaysia. Warta Geologi 43, 2, p. 41-49.
(online at: https://gsmpublic.files.wordpress.com/2017/09/ngsm2017_02.pdf)
(Brief review of main sources of public domain gravity- magnetic data for Malaysia and surrounding region)

Madon, M. (2021)- On the supposed onshore extension of the Penyu Basin, Peninsular Malaysia. Warta Geologi. 47, 3, p. 204-210.
(online at: <https://gsm.org.my/wp-content/uploads/2023/01/NGSM2021032.pdf>)
(Tertiary Penyu Basin probably located entirely offshore)

Madon, M., Z. Affendi Abu Bakar & H.H. Ismail (2010)- Jurassic-Cretaceous fluvial channel and floodplain deposits along the Karak-Kuantan Highway, central Pahang (Peninsular Malaysia). Bull. Geological Society Malaysia 56, p. 9-14.
(Fluvial succession of probable Jurassic-Cretaceous age Gagau Group along Karak-Kuantan highway, C Pahang. Depositional environment, unmetamorphosed nature and low structural dips compared to surrounding rocks, suggest they are 'post-orogenic' continental deposits)

Mahmoodi, I. & E. Padmanabhan (2017)- Exploring the relationship between hydrocarbons with total carbon and organic carbon in black shale from Perak, Malaysia. Petroleum and Coal 59, 6, p. 933-943.
(online at: https://www.vurup.sk/wp-content/uploads/2017/12/PC_6_2017_Mahmoodi_82cor1.pdf)
(Organic geochemistry of Paleozoic black shale from U Carboniferous Batu Gajah Fm, Ipoh, Malay Peninsula)

Mahmud, N.L. & B. Sautter (2022)- Major structural unconformities across Malaysia: geodynamics and basin development of Lawin, Perak. In: 2nd Int. Conf. Earth Resources (ICER 2020), Sarawak, IOP Conference Series: Earth and Environmental Science 1003, 012011, p. 1-8.
(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1003/1/012011/pdf>)
(On regional unconformity throughout the Western Sundaland, with Late Cretaceous- Paleogene sections missing and resumption of sedimentation only from Eocene onwards. Conglomerates of small Lawin Basin in NW Malay Peninsula developed as pull-apart basin)

Mahmud, N.L. & B. Sautter (2022)- Structural and palynomorph evidence for Early Palaeogene-Neogene conglomerate series in Peninsular Malaysia: implication for basin development and tectonic history. Geological Journal 57, 11, p. 4529-4549.
(Malay Peninsula large crustal horst, largely bypassed by widespread Cenozoic rifting of W Sundaland. Onshore Cenozoic isolated conglomerates include Lawin and Chenderoh series in Perak Valley. From

Oligocene Chenderoh shale unit, a Miocene age of conglomeratic series is inferred, and probably developed within pre-existing isolated depressions formed during regional Oligo-Miocene transtension)

Makoundi, C. (2012)- Geology, geochemistry and metallogenesis of selected sediment-hosted gold deposits in the central gold belt, Peninsular Malaysia. M.Sc. Thesis, University of Tasmania, p. 1-206.

(online at: <http://eprints.utas.edu.au/14712/>)

(On Tersang, Selinsing and Penjom gold deposits at E side of Bentong-Raub suture zone, Pahang, C Malaysia. Tersang gold deposit hosted in Triassic sandstone, intruded by Late Triassic (219 Ma) alkali rhyolite. Penjom gold deposit hosted in Permian tuffaceous clastics, intruded by rhyodacitic and trachyandesitic igneous rocks)

Makoundi, C. (2016)- Geochemistry of Phanerozoic carbonaceous black shales, sandstones and cherts in Malaysia: insights into gold source rock potential. Ph.D. Thesis, University of Tasmania, p. 1-318.

(online at: https://eprints.utas.edu.au/23088/1/Makoundi_whole_thesis.pdf)

(Trace element geochemistry of Paleozoic- M Triassic marine black shales from central gold belt/E Malaya and Sibumasu terranes as possible sources of orogenic gold deposits)

Makoundi, C., Z. Endut, R.R. Large, K. Zaw, E. Lounejeva, M.S. Leman, K.R. Mohamed & M.B.I. Basori (2021)- Geochemistry of pyritic mudstones from the Singa Formation, Malaysia: insights into gold potential, source of sulfur and organic matter. *Geosciences* (MDPI) (Basel, Switzerland) 11, 7, 279, p. 1-22.

(online at: <https://www.mdpi.com/2076-3263/11/7/279>)

(Geochemistry of Carboniferous- Early Permian glaciomarine pebbly mudstones of Singa Fm on Langkawi island (correlates with 'Gondwanan' Bohorok Fm in Sumatra, Kaeng Krachang Gp in Thailand and Lebyin Gp in Myanmar). Deposited under suboxic-oxic conditions. Gold enrichment in early diagenetic pyrite)

Makoundi, C., Z. Endut & K. Zaw (2023)- Geochemistry of the Devonian and Permo-Triassic black shales in Peninsular Malaysia: Insights into provenance, tectonic setting, and source rock weathering. *Minerals* (MDPI) 13, 7, 911, p. 1-21.

(online at: <https://www.mdpi.com/2075-163X/13/7/911>)

(Chemistry of Permo-Triassic and Devonian black shales in Central Belt of Malay Peninsula (E of Bentong-Raub suture zone). Semantan, and Gua Musang black shales derived from felsic and intermediate parental source rocks. All samples reflect intense chemical weathering in warm and wet paleoclimatic conditions. Etc.)

Makoundi, C., K. Zaw & Z. Endut (2020)- Fluid inclusion study of the Penjom, Tersang, and Selinsing orogenic gold deposits, Peninsular Malaysia. *Minerals* (MDPI) 10, 2, 111, p. 1-20.

(online at: <https://www.mdpi.com/2075-163X/10/2/111>)

Makoundi, C., K. Zaw & Z. Endut (2023)- U-Pb dating, lead isotopes, and trace element composition of pyrite hosted in black shale and magmatic rocks, Malaysia: implications for orogenic gold mineralization and exploration. *Minerals* (MDPI) 13, 2, 111, p. 1-25.

(online at: <https://www.mdpi.com/2075-163X/13/2/221>)

(Several orogenic/sediment-hosted gold deposits (Selinsing, Tersang) in Triassic of Central Belt of Peninsular Malaysia, E of Late Triassic Bentong-Raub suture zone. S-type magmatic rocks crystallisation ages ~204- 223 Ma. Pb isotope composition of cores of pyrite grains indicate model age of gold mineralization is ~200 Ma, close to 197-199 Ma (earliest Jurassic), previously determined by K-Ar dating of sericite, and interpreted to be age of gold mineralization)

Makoundi, C., K. Zaw & R.R. Large (2017)- Laser Ablation ICPMS analysis of pyrite and U-Pb zircon dating of host rocks from the Tersang gold deposit, Malaysia. *AIMS Geosciences* 3, 3, p. 396-437.

(online at: <https://www.aimspress.com/article/id/1575>)

(Tersang gold deposit in Central gold belt of peninsular Malaysia located E of Bentong-Raub Suture Zone, is mesothermal, orogenic gold deposit, hosted in sandstone, shale, rhyolite and breccia. Detrital zircons from host sandstones show maximum depositional ages from E Carboniferous to E Permian (~334 - 261 Ma). Rhyolite zircons indicate crystallization age of ~219 Ma (Late Triassic). Pyrite phases 2 and 3 main Au mineralisation)

- Makoundi, C., K. Zaw, R.R. Large, S. Meffre, C.K. Lai & T.G. Hoe (2014)- Geology, geochemistry and metallogenesis of the Selinsing gold deposit, central Malaysia. *Gondwana Research* 26, p. 241-261.
(*Selinsing gold deposit orogenic gold deposit E of Bentong-Raub Suture Zone, in Carboniferous Raub Gp (meta-)sedimentary units. Deposits affected by later Triassic deformation and metamorphism due to collision of Sibumasu Terrane with Sukhothai Arc. Zircon dating of host rocks indicates Carboniferous (~331-300 Ma) maximum depositional age. Selinsing similar to other SE orogenic gold deposits, like Sepon (Laos), Langu (Thailand), Modi Taung and Meyon (Myanmar) and Phuoc Son (C Vietnam)*)
- Malaysian and Thai Working Groups (2006)- Geology of the Gubir-Sadao transect area along the Malaysia-Thailand Border. Malaysia-Thailand Border Joint Geological Survey Committee (MT-JGSC), Department of Mineral and Geoscience Malaysia and Dept. Mineral Resources (DMR) Papers, p. 1-32.
(online at: www.dmr.go.th/download/Malaysia_Thai/Sadao.pdf. Mainly on Carboniferous- Triassic stratigraphy of border area))
- Malaysian-Thai Working Groups (2009)- Geology of the Pengkalan Hulu-Betong transect area along the Malaysia-Thailand Border. Malaysia-Thailand Border Joint Geological Survey Committee (MT-JGSC), Department of Mineral and Geoscience Malaysia, Geological Papers 7, p. 1-84.
- Malaysian and Thai Working Groups (2009)- Geology of the Bukit Batu Puteh- Satun transect area along the Malaysia- Thailand border. Malaysia-Thailand Border Joint Geological Survey Committee (MT-JGSC), Department of Mineral and Geoscience Malaysia, Geological Papers 8, Kuala Lumpur, p. 1-111.
(online at: www.dmr.go.th/download/Malaysia_Thai/Satun.pdf)
(*Geological mapping and transect of Ordovician- Triassic rocks in outcrops of NW Malay Peninsula- SW Peninsular Thailand border area. With many outcrop, rock and fossil photos*)
- Malaysian-Thai Working Group (2012)- Litho- and biostratigraphic correlations of chert beds in various rock units along the Malaysia- Thailand border. The Malaysia-Thailand Border Joint Geological Survey Committee (MT-JGSC), Department of Mineral and Geoscience Malaysia and Dept. Mineral Resources, Bangkok, p. 1-73.
(online at: www.dmr.go.th/download/Malaysia_Thai/Biostratigraphic_chert.pdf)
(*Carboniferous-Triassic chert horizons and radiolarians in Malaysia-Thailand border area. Fifteen radiolarian assemblage zones identified on Malaysian side, ranging in age from Carboniferous-Triassic. Deep sea deposition on Peninsular Malaysia terminated at end of Triassic due to tectonic uplift episode*)
- McElhinny, M.W., N.S. Haile & A.R. Crawford (1974)- Palaeomagnetic evidence shows Malay Peninsula was not a part of Gondwanaland. *Nature* 252, 5485, p. 641-654.
(*Paleomagnetic results suggest Malay Peninsula was at 15° N in Late Paleozoic, incompatible with once forming part of Gondwanaland. In Cretaceous Peninsula was not finally welded to Asian mainland (rather unlikely; JTVG)*)
- Metcalf, I. (1979)- Carboniferous conodonts from Perak, Malaysia. *Warta Geologi (Newsletter Malaysian Geological Society)* 5, 3, p. 35-39.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1979003.pdf>)
(*Carboniferous (Namurian) conodonts from Idiognathoides noduliferus- Streptognathodus lateralis zone in quarry in N part of Gunung Kanthan, Perak (also M Devonian conodonts near base of section; Lane et al. 1979)*)
- Metcalf, I. (1980)- Upper Carboniferous conodont faunas of the Panching Limestone, Pahang, West Malaysia. *Palaeontology* 23, p. 297-314.
(online at: www.palass-pubs.org/palaeontology/pdf/Vol23/Pages%20297-314.pdf)
(*Panching Lst of Pahang, E Malay Peninsula, rich conodont faunas around L-U Carboniferous boundary (= East Malaya/Indochina terrane)*)
- Metcalf, I. (1980)- Ordovician conodonts from the Kaki Bukit area, Perlis, West Malaysia. *Warta Geologi (Newsletter Geological Society Malaysia)* 6, 3, p. 63-68.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1980003.pdf>)
(Ordovician conodonts from Setul Lst of Perlis, NW corner of Malay Peninsula. Incl. *Serratognathus bilobatus*, *Loxodus bransoni*, *Scolopodus* spp.)

Metcalf, I. (1980)- Palaeontology and age of the Panching Limestone, Pahang, West Malaysia. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 11-18.
(Carboniferous Panching Lst in Kuantan Group Pahang, NW of Kuantan, Pahang, E Malay Peninsula (on East Malaya Block). Conodont fauna represents Namurian *Idiognathoides noduliferus*- *Streptognathus lateralis* zone of Britain (conflicts with Muir-Wood 1948 Visean age interpretation of Panching Limestone))

Metcalf, I. (1981)- A late Wolfcampian (Early Permian) conodont fauna from Perak, Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 7, 3, p. 76-79.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1981003.pdf>)
(Conodonts from limestones of JKR Quarry at Gunung Kantham, Perak NW Malay Peninsula. Fauna with *Anchignathodus minutus* and *Neogondolella bisseli* indicates late Wolfcampian N. *bisseli*- *Sweetognathus whitei* Zone, ranging in age from late Early Devonian- E Permian)

Metcalf, I. (1981)- Permian and Early Triassic conodonts from Northwest Peninsular Malaysia. Bull. Geological Society Malaysia 14, p. 119-126.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1981006.pdf>)
(Limestones exposed at Gunung Keriang, Kedah, have E Permian (Wolfcampian) *Neogondolella bisseli*- *Sweetognathus whitei* and E Triassic (Smithian) *Neospathodus waageni* Zones conodonts. Kodiang Lst at Bukit Hantu near Kodiang, Kedah, yielded Late Permian *Neogondolella rosenkrantzi*-*Neospathodus divergens* Zone and E Triassic conodonts)

Metcalf, I. (1983)- Observations on the ornamentation and ultra-structure of some well preserved, specimens of *Idiognathoides noduliferus inaequalis* Higgins (Pennsylvanian conodont). Bull. Geological Society Malaysia 16, p. 31-36.
(online at: www.gsm.org.my/products/702001-101178-PDF.pdf)
(Pennsylvanian conodont from Panching Limestone of Pahang, Malay Peninsula)

Metcalf, I. (1983)- Devonian conodonts from Batu Gajah, Perak, Peninsular Malaysia. Warta Geologi (Newsletter Geological Society Malaysia) 9, 4, p. 152-154.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1983004.pdf>)
(Brief note on presence of M Devonian conodont *Polygnathus linguiformis* in limestones in Lee Fatt No. 1 tin mine at Batu Gajah, S Kinta Valley, which is older than previously suggested. Conodont Colour Alteration Index of 5 indicates limestones were heated to 300-400°C)

Metcalf, I. (1984)- The Permian-Triassic boundary in northwest Malaya. Warta Geologi 10, p. 139-147.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1984004.pdf>)

Metcalf, I. (1987)- Permian and Early Triassic conodonts from an olistostrome near Raub, Pahang and their implications. Laporan Teknik Fakulti Sains Fizis dan Gunaan, Universiti Kebangsaan Malaysia 1, p. 100-106.
(*Diamictites* in Raub area (Raub-Bentong Line), Pahang, with clasts up to several m (incl. limestones with Late Permian conodonts *Neogondella*, etc.) in sheared muddy matrix. Interpreted as olistostrome associated with active normal faults along W margin of Central graben of Malay Peninsula. 'Tethyan' conodonts in diamictite matrix late Early Triassic age (*Neospathodus* spp., etc), with reworked Permian and earliest Triassic species)

Metcalf, I. (1987)- An occurrence of sheared diamictite near Genting Sempah. Warta Geologi 13, p. 97-103.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1987003.pdf>)
(Diamictite along Kuala Lumpur- Karak highway, 2 km SW of Genting Sempah, turbiditic beds now in tectonic melange or sheared olistostrome. Similar diamictites also in Raub-Bentong-Karak area where they define

narrow zone along Bentong-Raub line. Diamictites in Raub area dated as probably late E Triassic; Genting Sempah diamictite may form part of this E Triassic melange/olistostrome belt)

Metcalf, I. (1989)- Triassic sedimentation in the central basin of Peninsular Malaysia. In: T. Thanasuthipitak & P. Onchanum (eds.) Proc. Int. Symposium Intermontane basins, geology and resources, Chiang Mai University, Department of Geological Sciences, p. 173-186.

(C Basin of Malay Peninsula extensional graben on E Malaya Block, bound in W by faults of Bentong-Raub Line and in E by Lebir fault zone. Triassic faulting along Raub-Bentong produced graben with 2-3 km of marine Triassic, followed by 1.5- 2 km of non-marine Jurassic- E Cretaceous Tembeling Gp. E Triassic includes olistostrome with Permian limestone clasts, etc. In C part of graben deeper marine Semanggol Fm with Claraia in E Triassic and Posidonia, Daonella, Halobia in pelagic interbeds in M-L Triassic volcanics-rich turbidites (no Triassic volcanics on adjacent Sibumasu Block). Basin margin shallow marine fauna with myophoriid bivalves (Costatoria). Triassic folded in single folding phase, with NNW-SSE trending folds)

Metcalf, I. (1990)- Triassic conodont biostratigraphy in the Malay Peninsula. Bull. Geological Society Malaysia 26, p. 133-145.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1990011.pdf>)

(Conodonts representative for all Triassic stages, except Rhaetian, found in Malay Peninsula. Best known sequence of Triassic conodonts in Kodiang Lst of Kedah)

Metcalf, I. (1990)- Lower and Middle Triassic conodonts from the Jerus Limestone, Pahang, Peninsular Malaysia. J. Southeast Asian Earth Sciences 4, 2, p. 141-146.

(Steeply dipping, dark grey Jerus Limestone, Cheroh, Pahang (just E of Raub-Bentong suture?), previously considered part of Permo-Carboniferous Raub Group yielded rich Lower and Middle Triassic conodont faunas (late Dienerian Neospathodus pakistanensis Zone, with common Neospathodus spp.))

Metcalf, I. (1990)- Stratigraphic and tectonic implications of Triassic conodonts from Northwest Peninsular Malaysia. Geological Magazine 127, p. 567-578.

(online at: www.researchgate.net/publication/231961369_Stratigraphic_and_tectonic_implications_of_Etc.)

(Chuping Lst of NW Malay Peninsula with Late Triassic (E Norian) conodonts and spans late E Permian- Late Triassic. Part equivalent to Kodiang Lst (Late Permian- Triassic) in Kedah and similar limestones in S Thailand and N Sumatra. Early Late Triassic (Carnian) conodonts also in pelagic limestones associated with bedded cherts of Semanggol Fm. Triassic of Malay Peninsula three regions: (1) elongate carbonate platform complex on Sibumasu block (Chuping Lst, Kodiang Lst); (2) pelagic/ turbidite basinal sequence (Semanggol Fm; foredeep or intracratonic pull-apart basin) and (3) volcanic-sourced volcanoclastic basinal sequence on E Malaya block (Semantan Fm and equivalents; forearc/ intra-arc or post-orogenic rift))

Metcalf, I. (1992)- Lower Triassic (Smithian) conodonts from northwest Pahang Peninsular Malaysia. J. Micropalaeontology 11, 1, p. 13-19.

(online at: <https://www.j-micropalaeontol.net/11/13/1992/jm-11-13-1992.pdf>)

(Lower Triassic conodonts from limestones (possibly submarine slump) along new Kuala Lipis -Gua Musang highway, NW Pahang, NW Peninsular Malaysia (in Central Basin, E of Bentong-Raub suture). Co-occurrence of Neospathodus triangularis, Platyvillosus costatus, Neospathodus dieneri and Platyvillosus hamadai indicates Scythian age. P. hamadai unknown from Peri-Gondwana, supporting pre-E Triassic rifting of W Malay Peninsula (Sibumasu) from Gondwana)

Metcalf, I. (1992)- Upper Triassic conodonts from the Kodiang Limestone, Kedah, Peninsular Malaysia. J. Southeast Asian Earth Sciences 7, p. 131-138.

(Conodonts from Kodiang Lst at Kedah, NW corner of Peninsular Malaysia (= Sibumasu Terrane). Document presence of U Carnian- Lower Norian and conodonts, incl. Epigondolella spp. and Metapolygnathus spp. Faunas correlate with similar faunas from Chuping Lst of Perlis, Malaysia, and limestones from Lake Toba area and Sungei Kalue, N Sumatra)

Metcalf, I. (1993)- Permian conodonts from the Raub Gold Mine, Pahang, Peninsular Malaysia. *Warta Geologi* (Newsletter Geological Society Malaysia) 19, 3, p. 85-88.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1993003.pdf>)

(Isoclinally folded sediments of 'Raub Group' at Raub Gold Mine, Pahang, with conodont Neogondolella rosenkrantzi, indicating Late Permian age. Overlain by less-deformed M-U Triassic Semantan Fm, suggesting structural discontinuity which may correspond to age of suturing of Sibumasu and East Malay blocks)

Metcalf, I. (1995)- Mixed Permo-Triassic boundary conodont assemblages from Gua Sei and Kampong Gua, Pahang, Peninsular Malaysia. *Contributions to the First Australian Conodont Symposium (AUSCOS 1)*, Sydney 1995, Courier Forschungsinstitut Senckenberg, Frankfurt, 182, p. 487-495.

(online at: www.researchgate.net/publication/273144817_Mixed_Permo-Triassic_boundary_conodont_Etc.)

(Merapoh Lst at Kampong Gua and Gua Sei, Pahang, C Peninsular Malaysia, previously assigned to Carboniferous, with E Triassic (Griesbachian) conodont assemblages (Clarkina changxingensis, Hindeodus spp., incl. H. latidentatus))

Metcalf, I. (1999)- Geological origins and natural resources. In: A. Kaur & I. Metcalf (eds.) *The shaping of Malaysia*, Macmillan Press Ltd, p. 11-41.

(online at: http://library.perdana.org.my/Digital_Content/NLM/pnm_bk/M959.5SHA.pdf)

Metcalf, I. (2002)- Devonian and Carboniferous conodonts from the Kanthan Limestone, Peninsular Malaysia and their stratigraphic and tectonic implications. In: L.V. Hills et al. (eds.) *The Carboniferous and Permian of the World*, Canadian Society of Petroleum Geologists, Memoir 19, p. 552-579.

(online at: www.researchgate.net/publication/278739332_Devonian_and_Carboniferous_conodonts_fr_Etc.)

(Lower Devonian- Lower Permian Gunong Kanthan Lst in Kinta Valley area, Perak, formed in shallow passive margin sequence of Sibumasu block, when still attached to E Gondwana. Conodonts from Devonian Carboniferous part suggest E and M Devonian and Tournaisian and Visean ages (Polygnathus spp., Gnathodus spp., Tortodus, etc. Color Alteration Index 5-8 suggest limestone has been heated to 300-400°C)

Metcalf, I. (2003)- Colour and textural alteration of Paleozoic and Triassic conodonts from Peninsular Malaysia: implications for tectonic evolution and hydrocarbon generation. *Courier Forschungsinstitut Senckenberg*, Frankfurt 245, p. 261-280.

(Color Alteration Index of conodonts in Malay Peninsula ranges from 1.5- 8, with lowest values in NW Malay Peninsula, highest near granitoid intrusives. Paleozoic conodonts of Sibumasu terrane background CAI 5 (= 7500-10000m overburden?). Lowest Triassic values of 1.5-2.5 in Sibumasu Kodiang-Chuping Lst, equivalent to maturation in oil window. High Triassic values of CAI 5 from E-M Triassic limestones along W margin of Central Belt (reflecting heating by Main Range granitoids?) and M Triassic limestones-cherts from Semanggol Fm in Kedah (implying overburden of 7500- 10,000m, but unrealistic?))

Metcalf, I. (2013)- Tectonic evolution of the Malay Peninsula. *J. Asian Earth Sciences* 76, p. 195-213.

(online at: https://www.academia.edu/12539859/Tectonic_evolution_of_the_Malay_Peninsula)

(Malay Peninsula three N-S belts: (1) W Belt part of Sibumasu Terrane, derived from Gondwana margin in late E Permian, (2) C and E Belts represent Sukhothai Arc, built in Late Carboniferous- E Permian on margin of Indochina Block and separated from Indochina by back-arc spreading in E Permian. Bentong-Raub suture is boundary between Sibumasu Terrane in W and Sukhothai Arc in E, and preserves remnants of Devonian-Permian Paleo-Tethys ocean basin destroyed by subduction beneath Indochina Block/ Sukhothai Arc, which produced Permian-Triassic andesitic volcanism and I-Type granitoids of C and E Belts of Malay Peninsula. Collision between Sibumasu and Sukhothai Arc began in E Triassic times, completed by Late Triassic. Triassic cherts and turbidites of Semanggol Fm deposited in foredeep basin on leading edge of Sibumasu and uplifted accretionary complex. Collisional crustal thickening produced Main Range Late Triassic- E Jurassic S-type granitoids of W Belt and Bentong-Raub suture zone. Sukhothai back-arc basin closed in M-L Triassic. Jurassic- Cretaceous continental red beds cover sequence. Late Cretaceous tectono-thermal event affected Malay Peninsula with faulting, granitoid intrusions and re-setting of paleomagnetic signatures)

Metcalf, I. (2016)- A new Lower Triassic (Induan) Jerus Limestone locality in northwest Pahang, Peninsular Malaysia: conodont fauna, depositional and tectonic settings. *Island Arc* 25, 2, p. 126-136.

(*Limestones N of Raub, sandwiched between Bentong-Raub suture and W margin of Sukhothai Arc terrane, yield Lower Triassic (late Dienerian/ late Induan) conodont fauna. With Neospathodus dieneri and Neospathodus pakistanensis. Interpreted as N-ward extension of Jerus Limestone, interpreted as hemipelagic deposit in foredeep or forearc on top of accretionary complex in E-M Triassic (see also Metcalfe 1990))*)

Metcalf, I. (2017)- Devonian and Carboniferous stratigraphy and conodont biostratigraphy of the Malay Peninsula in a regional tectonic context. *Stratigraphy* 14, p. 259-283.

(*Devonian- Carboniferous stratigraphy of Malay Peninsula tied to Sibumasu Terrane in W and Sukhothai Arc (Indochina) block in E Bentong-Raub Suture is in former Devonian-Triassic Paleo-Tethys Ocean. Devonian-Carboniferous sediments/ faunas of W belt support placement of Sibumasu Terrane on Paleozoic margin of Australian Gondwana until E Permian (Sakmarian). Carboniferous sediments of E Belt deposited on margin of equatorial Indochina Block, on which Sukhothai Arc was constructed*)

Metcalf, I. (2023)- Lower Permian (Late Kungurian) conodonts from the Sibumasu Terrane, Malaysia: paleoecological, paleobiogeographical and tectonic implications. *Geological Magazine* 160, 6, p. 1177-1192.

(*online at: [https://www.cambridge.org/core/journals/geological-magazine/article/lower-permian-late-kungurian-conodonts-from-the-sibumasu-terrane-malaysia-paleoecological-paleobiogeographical Etc.](https://www.cambridge.org/core/journals/geological-magazine/article/lower-permian-late-kungurian-conodonts-from-the-sibumasu-terrane-malaysia-paleoecological-paleobiogeographical-Etc)*)

(*Latest Kungurian (E Permian) conodonts from Gunung Kanthan (Kinta Valley, Perak) for first time from Sibumasu Terrane of Malay Peninsula. Represent Mesogondolella lamberti IC Zone and broadly equivalent Mesogondolella siciliensis Regional Conodont Zone. Deposited in relatively deep-water on N passive margin of Sibumasu Terrane of E Cimmerian Continent, at ~35°S latitude (southern peri-Gondwana cool water province)*)

Metcalf, I. & K.R. Chakraborty (1988)- Diamictite along the eastern margin of the Central Basin of the Malay Peninsula. *Warta Geologi (Newsletter Geological Society Malaysia)* 14, p. 191-198.

(*online at: www.gsm.org.my/products/702001-101505-PDF.pdf*)

(*Diamictite unit of probable E Triassic age in E part of Central Basin, E of Bentong-Raub suture, with clasts on steeply dipping, sheared muddy matrix. Interpreted as olistostrome, formed along fault scarps of developing graben*)

Metcalf, I. & K.R. Chakraborty (1994)- A stratigraphic log of Semantan Formation along part of the Mentakab-Temerloh bypass, Pahang. *Bull. Geological Society Malaysia* 35, p. 37-46.

(*online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994005.pdf>*)

(*Thickness of M-U Triassic Semantan Fm in Malay Peninsula central basin ~2km. Continuous stratigraphic sequence of 1.25 km logged along Mentakab bypass. Consistent W-ward dip, no evidence of isoclinal folding or imbricate thrusts, so not part of accretionary prism but part of forearc or intra-arc basin constructed over accretionary wedge. Horizons with bivalves (mainly Posidonia, some Daonella) and ammonite (Arpadites), all suggestive of M Triassic age. Interbedded tuffs and mudstones, deposited by turbidity currents; dominant flow to W?. Overall fining-upward indicates waning of coarser volcanoclastic material supply during M Triassic*)

Metcalf, I., K.R. Chakraborty, C.A. Foss & H.T. Samsudin (1985)- A Middle Triassic fauna from the Bt. Jeram Padang Ridge at Bahau, Negri Sembilan, Peninsular Malaysia. *Warta Geologi* 11, 3, p. 111-115.

(*online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1985003.pdf>*)

(*Bukit Jeram Padang Ridge SE of Bahau with folded clastics with M Triassic 'Myophoria biofacies' bivalves, incl. Costatoria malayensis, C. chegarperahensis and Neoschizodus ovatus elongatus*)

Metcalf, I. & J.L. Crowley (2020)- Upper Permian and Lower Triassic conodonts, high-precision U-Pb zircon ages and the Permian-Triassic boundary in the Malay Peninsula. *J. Asian Earth Sciences* 199, 104403, p. 1-28.

(*Conodont biostratigraphic and high-precision U-Pb isotope ages for Permian-Triassic transition in limestone hills Gua Bama, Gua Panjang and Gua Sei in Pahang, Malay Peninsula, E of Raub-Bentong suture. With Clarkina orientalis (Permian), C. wangi and C. subcarinata (E Triassic) zones*)

- Metcalfe, I. & A.H. Hussin (1995)- Implications of new biostratigraphic data for stratigraphic correlation of the Permian and Triassic in Peninsular Malaysia. Bull. Geological Society Malaysia 38, p. 173-177.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1995016.pdf>)
(Review and correlation chart of Permian-Triassic sediments of Malay Peninsula. Western belt mainly Permian- Triassic Kodiang and Chuping limestones, Raub Bentong suture Permian bedded cherts, Central Belt mainly clastics, with Late Permian and Triassic limestones, Eastern Belt almost no limestones. Semanggol Fm usually considered to be entirely of Triassic age, but also contains Lw, M and U Permian radiolaria)
- Metcalfe, I., M. Idris & J.T. Tan (1980)- Stratigraphy and palaeontology of the Carboniferous sediments in the Panching areas, Pahang, West Malaysia. Bull. Geological Society Malaysia 13, p. 1-26.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1980008.pdf>)
(New lithostratigraphy proposed for Carboniferous of Panching area, Pahang: (1) Charu Fm shallow marine clastics with Visean- basal Namurian brachiopods; (2) Panching Lst reefal limestone with Namurian fauna (believed to be Visean by Toriyama 1984; JTvG); (3) Sagor Fm ?Late Carboniferous shallow marine clastics with rare limestone lenses)
- Metcalfe, I., S.P. Sivam & P.H. Stauffer (1982)- Stratigraphy and sedimentology of Middle Triassic rocks exposed near Lanchang, Pahang, Peninsular Malaysia. Bull. Geological Society Malaysia 15, p. 19-30.
(online at: www.gsm.org.my/products/702001-101189-PDF.pdf)
(M Triassic Semantan Fm outcrops E of Lanchang in C Malay Peninsula NE of Kuala Lumpur. NW dipping tuffs, mudstones with locally common bivalves (*Daonella lommeli*, *D. sakawana*, *Posidonia*) and ammonoids, (*Arpadites*). Also locally common plant fragments (unidentifiable). Mainly marine gravity flows, derived entirely from volcanic source, with downslope transport directions to W or SW (contemporaneous shallow marine *Myophoria* sandstone ~5-10km E of Lanchang section))
- Mohamed, K.R., N.A.M. JoeHarry, M.S. Leman & C.A. Ali (2016)- The Gua Musang Group: a newly proposed stratigraphic unit for the Permo-Triassic sequence of Northern Central Belt, Peninsular Malaysia. Bull. Geological Society Malaysia 62, p. 131-142.
(online at: <https://gsmpubl.files.wordpress.com/2017/04/bgsm2016012.pdf>)
(Permian- Triassic Gua Musang Fm, Telong Fm, Aring Fm and Nilam Marble reflect lateral facies changes within newly defined Gua Musang Gp of argillites-carbonates-volcanics in Central Belt of Malay Peninsula)
- Mohamed, M.A., M. Nasir, M.S. Said, C.M. Choong, M.S. Sokiman et al. (2022)- Facies analysis and depositional model of the Middle-Upper Triassic Semantan Formation, Central Pahang, Malaysia. Universiti Teknologi Malaysia (UTM) ASEAN Engineering J. 12, 2, p. 195-203.
(online at: <https://journals.utm.my/aej/article/view/17312/7913>)
(M-U Triassic Semantan Fm in Central Belt of Peninsular Malaysia is deep-water sand-rich submarine fan system, with 8 turbiditic lithofacies)
- Muir-Wood, H.M. (1948)- Malayan Lower Carboniferous fossils and their bearing on the Visean palaeogeography of Asia. British Museum (Natural History), London, p. 1-118.
(Lower Carboniferous brachiopod-dominated macrofauna from 4 localities in Kuantan district, E side of Malay Peninsula. With appendices on Carboniferous *Lepidodendroid* remains by W.N. Edwards, bryozoa, mollusca and crinoidea by K.P. Oakley, corals by S. Smith and trilobites by C.J. Stubblefield. No indications of Permo-Carboniferous glacial beds in area. Many brachiopods similarities to W European species)
- Muller, K.J. (1967)- Devonian of Malaya and Burma. Proc. International Symposium of the Devonian system, 1, Canadian Society of Petroleum Geologists, Special Publ., p. 565-568.
(Devonian rocks widespread in Malay Peninsula and Myanmar, but not yet recognized in Thailand)
- Nakazawa, K. (1973)- On the Permian fossils from Jengka Pass, Pahang, Malay Peninsula. Science Reports Tohoku University, Ser. 2 (Geology), Special Volume 6 (Hatai Memorial Volume), p. 277-296.
(online at: <https://tohoku.repo.nii.ac.jp/record/10840/files/KJ00004163218.pdf>)

(Permian at Jengka Pass 160 km NE of Kuala Lumpur, upper M Permian limestone with corals and abundant fusulinids (*Yabeina asiatica*- *Verbeekina*- *Sumatrana annae* fauna of Ishii, 1964), overlain by U Permian sandstone-shale with brachiopods and bivalves. Unconformably overlain by M-U Triassic (now called Upper Triassic- Lower Jurassic Tembeling Group) (supposedly Cathaysian/ E Malaya-Indochina block; JTvG))

Nakazawa, K. (2002)- Permian bivalves from the H.S. Lee Formation, Malaysia. Paleontological Research (Palaeontological Society of Japan) 6, 1, p. 67-72.

(online at: <https://ia600205.us.archive.org/27/items/biostor-118094/biostor-118094.pdf>)

(Three bivalve species from Permian H.S. Lee Fm at H.S. Lee No. 8 flooded tin mine in Perak: *Sanguinolites ishii*, *Megalodon yanceyi* and *Myalina cf. wyomingensis*)

Nazaruddin, D.A. & H. Duerrast (2021)- Intraplate earthquake occurrence and distribution in Peninsular Malaysia over the past 100 years. SN Applied Sciences 3, 693, p. 1-20.

(online at: <https://link.springer.com/content/pdf/10.1007/s42452-021-04686-2.pdf>)

(Malay Peninsula on stable craton with low seismicity. Earthquake data from 59 events from 1922- 2020. Most epicenters associated with preexisting fault zones and possibly fault reactivations associated with major earthquakes near Sumatra. Magnitudes Mw 0.7 -5.4, mainly Mw 1.0+ and 2.0+. Majority shallow earthquakes (1-70 km). Deepest earthquakes in Malacca Straits (167 km, up to Mw 5.4), associated with slab detachment from Sumatran Subduction Zone)

Newell, R.A. (1971)- Characteristics of the stanniferous alluvium in the southern Kinta valley, West Malaysia. Bull. Geological Society Malaysia 4, p. 15-37.

(online at: www.gsm.org.my/products/702001-101365-PDF.pdf)

(Kinta Valley near Kampar, Perak, flanked by granite ranges (Main Range to East) and Late Paleozoic sediments. Up to >100' fluvial/alluvial deposits, with basal granite wash which is main placer ore zone of tin mines in valley. Heavy mineral content average 0.59% (0.05- 3.2%), generally highest in coarsest sands)

Newton, R.B. (1900)- On marine Triassic lamellibranchs discovered in the Malay Peninsula. Proc. Malacological Society, London, 4, p. 130-135.

(Late Triassic sandstone rich in bivalve shells in from Kuala Lipis, Pahang. Mainly *Myophoria* spp., also *Chlamys valoniensis*, *Pteria* (= *Avicula*) *pahangensis*, *Gervillia*. (*Pteroperna malayensis* Newton=also *Gervillia*?; JTvG)

Newton, R.B. (1906)- Notice on some fossils from Singapore. Geological Magazine (5), 3, p. 487-496.

(First record of Mesozoic fossils from Singapore. Jurassic fauna dominated by marine bivalves, also fragments of land plants)

Newton, R.B. (1923)- On marine Triassic shells from Singapore. Annals and Magazine Natural History 9, p. 300-321.

(Discovery of Triassic fauna in Singapore by Scrivenor. Mainly bivalve molluscs in friable sandstone, a.o. with *Myophoria* spp., *Palaeocardita*, *Gervillia*. Fauna regarded as Late Triassic age. Singapore beds extension of *Myophoria* Sst of Pahang, first described by Newton in 1900)

Newton, R.B. (1925)- On marine Triassic fossils from the Malayan Provinces of Kedah and Perak. Geological Magazine 62, p. 76-85.

(Triassic fauna from black shales in Kedah and Semanggol, Perak: small bivalves (*Posidonomya*, *Halobia moussoni*) and indeterminate ammonites (probably *Juvavites* or *Anatomites* and *Hammoceras*; Kummel 1960). Probably older than *Myophoria* fauna of Kedah)

Newton, R.B. (1926)- On *Fusulina* and other organisms in a partially calcareous quartzite from near the Malayan-Siamese frontier. Annals and Magazine Natural History, Ser. 9, 17, 97, p. 49-64.

(First record of Permo-Carboniferous *Fusulina* from calcareous shale- quartzite near Goa Laman Maling, N Perlis. Associated with corals, crinoids and *Fenestellidae* bryozoa)

Ng, S.W.P., S.L. Chung, L.J. Robb, M.P. Searle, A.A. Ghani, M.J. Whitehouse, G.J.H. Oliver, M. Sone, N.J. Gardiner & M.H. Roselee (2015)- Petrogenesis of Malaysian granitoids in the Southeast Asian tin belt: Part 1. Geochemical and Sr-Nd isotopic characteristics. Geological Society of America (GSA) Bull. 127, 9-10, p. 1209-1237.

(online at: www.researchgate.net/publication/271507230_Petrogenesis_of_Malaysian_tin_granites Etc.)
(Malaysian granitoids of SE Asian tin belt traditionally divided into Permian- Late Triassic 'I-type'-dominated arc-related E Province (Indochina terrane) and Late Triassic 'S-type'-dominated collision-related Main Range province (Sibumasu terrane), separated by Bentong-Raub Paleo-Tethyan suture that closed in Late Triassic. This model is oversimplified. Incorporation of sedimentary-sourced melts in E Province is insignificant, but more common sedimentary protolith in melt ore in Main Range, leading to more significant tin endowment)

Ng, S.W.P., M.P. Searle, M.J. Whitehouse, S.L. Chung, L.J. Robb, A.A. Ghani & M. Sone (2012)- High-spatial resolution SIMS U-Pb zircon dating on Malay tin granites: new insights to crustal evolution of the Malaysian Peninsula. AGU Fall Meeting, San Francisco 2012, V23A-2794 (Poster Abstract)

(SE Asian tin granite province previously recognized as comprising three distinct granitic belts (1) M Permian-Late Triassic E Province with mainly subduction-related I-type granites with Cu-Au deposits, (2) Late Permian-E Jurassic Main Range Province mainly S-type granites with Sn-W deposits; (3) Late Triassic- Cretaceous W Province mixed I- and S-type granites with Sn-W deposits. Ages based mainly on Rb-Sr and K-Ar whole rock geochronology, no longer considered suitable for crystallization ages of granites due to unstable behaviour of isotopes in hydrothermal systems. New SIMS dates reveal W-ward younging trend across Malay Peninsula: E Province granites in E Malaysia formed by subduction processes between 220-285 Ma; Main Range Province S-type granites ages between 206-226 Ma (Late Triassic). Some young Cretaceous zircon rim ages. Granites in Malaysia cannot be simply categorized as I, S or A-type. Tin mineralization not restricted to S-type granites)

Ng, S.W.P., M.J. Whitehouse, M.P. Searle, L.J. Robb, A.A. Ghani, S.L. Chung, G.J.H. Oliver, M. Sone, N.J. Gardiner & M.H. Roselee (2015)- Petrogenesis of Malaysian granitoids in the Southeast Asian tin belt: Part 2. U-Pb zircon geochronology and tectonic model. Geological Society of America (GSA) Bull. 127, 9-10, p. 1238-1258.

(online at: www.researchgate.net/publication/273776330_Petrogenesis_of_Malaysian_granitoids_in_th Etc.)
(New U-Pb zircon ages for 39 granitoids across Malay tin-bearing granite province. Two belts: (1) Mostly I-type granitoids from E Malay province span 289-220 Ma (pre-collisional, subduction-related Andean-type magmas formed during E-ward subduction of Paleo-Tethys beneath Indochina in Permian- M-L Triassic; General westerly younging magmatic trend across Malay Peninsula considered to reflect steepening and roll-back of Bentong-Raub subduction zone during closure of Paleo-Tethys); (2) W Main Range Province granitoids all Late Triassic (227-201 Ma; syn- and post-collisional crustal melting of Sibumasu crust in Late Triassic; Tin mineralization mainly associated with this phase. Two models for Triassic evolution: (1) with second Late Triassic- Jurassic or E Cretaceous E-dipping subduction zone W of Sibumasu; (2) W-ward underthrusting of Indochina beneath W Malaya Main Range province. Cretaceous granitoids reflect localized crustal melting)

Niko, S., M. Sone & M.S. Leman (2005)- A new Permian species of *Mooreoceras* (Cephalopoda: Orthocerida) from northwestern Peninsular Malaysia. Proc. of the Japan Academy, Series B, 81, p. 329-333.

(online at: www.jstage.jst.go.jp/article/pjab/81/8/329/_pdf)
(New late E Permian (Kungurian?) orthocerid cephalopod species *Mooreoceras sibumasuense* from basal Chuping Fm in Bukit Tungku Lembu in Perlis, NW Malaysia. Associated with *Monodioxidia fusulinids*, and part of Sibumasu Terrane. Most Permian *Mooreoceras* species confined to Australian Gondwana- Sibumasu; also *Mooreoceras* sp in Atahoc Fm of Timor)

Niko, S., M. Sone & M.S. Leman (2007)- Two new species of orthocerid cephalopods from the Carboniferous Panching Limestone, West Malaysia. Paleontological Research (Palaeontological Society of Japan) 11, 4, p. 331-336.

(online at: https://bioone.org/journals/paleontological-research/volume-11/issue-4/1342-8144_2007 Etc.)
(Two new species of orthocerid cephalopods *Kionoceras* and *Dolorthoceras* from Bashkirian (Late Carboniferous) Panching Lst in Pahang, NE Malay Peninsula)

- Niko, S., M. Sone & M.S. Leman (2018)- Late Silurian cephalopods from Langkawi, Malaysia, with peri-Gondwanan faunal affinity. *J. Systematic Palaeontology* 16, 7, p. 595-610.
(online at: https://umexpert.um.edu.my/file/publication/00011532_136895.pdf)
(Nine species of latest Silurian orthocerid cephalopods from U Setul Lst of Langgun, Langkawi Islands, incl. orthoceratids (*Michelinoceras* cf. *micelini*, *Kopaninoceras setulense* n.sp., *Mimogeisonoceras?* *langgunense* n.sp., *Kionoceras?*, *Orthocycloceras*), arionoceratids (*Arionoceras mahsuri* n.sp., *Caliceras mempalamense* n.sp.) and geisonoceratid *Murchisoniceras?* sp. Assemblage belongs to newly defined *Kopaninoceras* Fauna, widely distributed along N margin of Gondwana and around Prototethys Ocean)
- Niko, S., M. Sone & M.S. Leman (2020)- Ordovician Orthocerida and Pseudorthocerida (Cephalopoda: Nautiloidea) from the Lower Setul Limestone of the Langkawi Islands, Malaysia. *J. Systematic Palaeontology* 18, p. 381-414.
(Ordovician Lower Setul Lst in Langkawi Islands of Peninsular Malaysia part of an extensive carbonate platform in West Malaya (=Sibumasu) Block, and known for continuous succession for most of Ordovician. Highly endemic cephalopods of orders Orthocerida and Pseudorthocerida in late Early- early Late Ordovician. Six genera (incl. *Sibumasuoceras*, *Malayorthoceras*) and 10 species, most new)
- Nishimura, S. & P.H. Stauffer (1981)- Fission-track of zircons from the Serdang volcanic ash, Peninsular Malaysia. *Warta Geologi* 7, 2, p. 39-40
(online at: <https://gsmpubl.wordpress.com/wp-content/uploads/2014/09/ngsm1981002.pdf>)
(Layer of volcanic ash in clay pit at Serdang, near Kuala Lumpur, ~90 cm thick, with numerous crystals of quartz, feldspar, biotite and zircon. Zircon fission-track dating suggests age of ~30,000 years. Similar age ash in other parts of Malay Peninsula and N Sumatra, and likely from eruption of Toba volcano in N Sumatra)
- Ogura, Y. (1972)- *Psaronius* from Linggiu, Johore, Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 10, p. 117-124.
(Permian plant *Psaronius johorensis* (fern stem) from Linggiu flora, Spart Malay Peninsula. See also Kon'no et al. 1971)
- Ohana, T., T. Kimura & T.T. Khoo (1991)- Further discovery of some Carboniferous plant fossils from Tanjung Mat Amin, Trengganu, Peninsular Malaysia. *J. Southeast Asian Earth Sciences* 6, p. 93-101.
(New locality with Carboniferous 'Euramerican' plant fossils *Rhacopteris*, *Sphenopteridium* and *Sphenopteris* at Tanjung Mat Amin, Trengganu. Belong to Kuantan Flora, which was widespread in E Belt of Peninsular Malaysia N of Pahang River. Kuantan Flora indicates warm-humid, low latitudes during Carboniferous)
- Oliver, G.J.H. & A. Gupta (2017)- A field guide to the geology of Singapore. Lee Kong Chian Natural History Museum, National University of Singapore, p. 1-107. (also 2nd Edition, 2019)
(online at: <https://eresources.nlb.gov.sg/printheritage/detail/f1871a29-1500-4d69-9755-24d41b7c9d0a.aspx>)
- Oliver, G. & A. Prave (2013)- Palaeogeography of Late Triassic red-beds in Singapore and the Indosinian Orogeny. *J. Asian Earth Sciences* 76, p. 214-224.
(online at: https://www.academia.edu/2788118/Palaeogeography_of_the_Jurong_Formation_Singapore_and_the_Indosinian_Orogeny)
(300m thick section of red-bed facies of U Triassic Jurong Fm on Sentosa Island, Singapore. Overall coarsening and thickening-upward pattern lacustrine mudstones in lower 100m to fluvial sequence. Detrital zircon U-Pb ages from 2700- 209 Ma, mainly Permo-Triassic, with significant populations at ~245 Ma and 220 Ma. Deposited in half graben formed in hanging wall of Bukit Timah Fault when C Peninsular Malaysia went into extension following climax of Indosinian Orogeny in Late Triassic)
- Oliver, G.J.H., K. Zaw & M.D. Hotson (2011)- Dating rocks in Singapore: plate tectonics between 280 and 200 million years ago. *Innovation Magazine* 10, 2, p. 22-25.

Oliver, G., K. Zaw, M. Hotson, S. Meffre & T. Manka (2013)- U-Pb zircon geochronology of Early Permian to Late Triassic rocks from Singapore and Johor: a plate tectonic reinterpretation. *Gondwana Research* 26, p. 132-143.

(U-Pb zircon geochronology of Permian- M Triassic granitoids from Singapore and Johor: rhyolite from Pulau Sibü 276 Ma (Permian), gabbros from Singapore 260-249 Ma (Late Permian), granites from Singapore 249-230 Ma (E-M Triassic) and rhyolite from Telkuma 238 Ma. Detrital zircon ages from Late Triassic Jurong Fm conglomerate from Singapore show Carboniferous- Late Triassic spikes at 350, 245 and 217 Ma. Plate tectonic evolution of Malaysian Peninsula region: active E Permian- M Triassic tin-bearing magmatic arc in E Malaysian Peninsula part of Indochina during Paleo Tethys Ocean subduction. Granitoid ages decrease from E to W. Late Triassic Sibumasu collision with Indochina (Indosinian Orogeny) caused W Belt (Sibumasu) to overthrust C Belt (Indochina) along Bentong Raub Suture. Lower half of thickened crust (tin-bearing Indochina Plate) partially melted and predominantly S-type tin-bearing granites intruded into upper crust (Sibumasu))

Ong, S.T. & B. Jasin (2007)- Discovery of a Lower Devonian Dacryoconarid bed from Hill B, Guar Jentik, Perlis: its significance and implications. *Bull. Geological Society Malaysia* 53, p. 1-6.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100512-PDF.pdf)

(Lower Devonian 'Tentaculites limestone' from Perlis, NW corner of Malay Peninsula)

Ooi, P.C., S.N.F. Jamaludin & A.H.A. Latif (2017)- Fracture network analysis of metasedimentary rock in East Coast Terengganu- an analogue to fractured Basement in Malay Basin. In: M. Awang et al. (eds.) *Proc. Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2016)*, Kuala Lumpur 2016, Springer Verlag, p. 453-467.

(Outcrop study of Carboniferous metasediments at Kuala Abang, E coast of Terengganu, as analogue for fractured basement in Malay Basin (Puteri Field))

Othman, A.R. (2012)- Fosil moluska Trias Akhir dari kawasan Binjui, Kedah. *Warta Geologi (Newsletter Geological Society Malaysia)* 38, 2, p. 27-34.

(online at: https://gsmpubl.files.wordpress.com/2014/09/warta38_21.pdf)

('Late Triassic molluscan fossils from Binjui area, Kedah'. Fossils ammonoids Frankites apertus, Zestoceras birwicki, Anolcites anguinus and bivalve Halobia charlyana in Semanggol Fm in road-cut near Binjui, Kedah, W Malay Peninsula. Assemblage characteristic of Lower Carnian (Upper Triassic))

Othman, A.R. & M.S. Leman (2009)- The discovery of Middle Triassic bivalve *Daonella pahangensis* Kobayashi from Aring, Kelantan. *Warta Geologi (Newsletter Geological Society Malaysia)* 35, 3, p. 111-114.

(online at: https://gsmpubl.files.wordpress.com/2014/09/warta35_3.pdf)

(Single specimen of bivalve Daonella pahangensis (Kobayashi) from Telong Fm near Aring, Gua Musang. First discovery of species besides those in Kobayashi (1964) from Temerloh, Pahang. Tethyan species, probably of Ladinian, Middle Triassic age)

Othman, A.R. & M.S. Leman (2010)- Fosil ammonoid berusia Trias Tengah dari Aring, Kelantan, Malaysia. *Bull. Geological Society Malaysia* 56, p. 53-59.

(online at: <https://gsmpubl.files.wordpress.com/2014/08/bgsm2010008.pdf>)

('Middle Triassic ammonoid fossils from Aring, Kelantan, Malaysia'. Two localities with 13 species from Telong Fm on N Malay Peninsula. Assemblages represent 'Paleo-Tethys' ammonoid Zones Balatonicus Subzone of Balatonites Zone (M Anisian) and Regoledanus Subzone of Protrachyceras Zone (Late Ladinian). Area can be correlated to Sukhothai Terrain of Shan-Thai (=Sibumasu) Block, belonging to Cathaysian domain)

Othman, A.R. & M.S. Leman (2011)- Fosil bivalvia *Daonella* dari Sg. Jentar, Mentakab, Pahang. *Warta Geologi (Newsletter Geological Society Malaysia)* 36, 3-4, p. 221-227.

('Daonella bivalve fossils from Sg. Jentar, Mentakab, Pahang'. M Triassic Daonella bivalve fossils from tuffaceous shale of Semantan Fm near Mentakab, Pahang, in Eastern Triassic Rocks Zone. Five species, assigned to U Ladinian Daonella lommeli Zone. Species commonly found in deep marine environment)

- Othman, A.R. & M.S. Leman (2012)- Rekod penemuan fosil Trias bivalvia *Daonella* dari Aring, Kelantan. *Warta Geologi* (Newsletter Geological Society Malaysia) 38, 1, p. 4-10.
(online at: https://gsmpubl.files.wordpress.com/2014/09/warta38_1.pdf)
(*Note on discovery of the Triassic bivalve Daonella from Aring, Kelantan'. M Triassic (U Ladinian) bivalves Daonella lommeli and D. cf. pichleri in Telong Fm gray mudstone near Aring, Gua Musang. Located in Eastern Triassic Rocks Zone. Associated with M Triassic ammonoids (Frankites spp., Sirenotrachyceras, Zestoceras spp., Clionites, Megaphyllites, Joannites). Bivalves restricted to Paleo-Tethys Ocean. Discovery of species in Kelantan shows that deep marine Semantan basin extended from Singapore to S Kelantan*)
- Othman, A.R. & M.S. Leman (2013)- Kajian semula fosil ammonoid Trias dari Yong Peng, Johor. *Warta Geologi* (Newsletter Geological Society Malaysia) 39, 3-4, p. 59-61.
(online at: https://gsmpubl.files.wordpress.com/2014/09/warta-39_34.pdf)
(*A revision of the Triassic ammonoid fossils from Yong Peng, Johor'. U Triassic ammonoids from Semantan Fm in Yong Peng area, Johor, S C Malay Peninsula. Include 'Tethyan' Frankites apertus and Sirenotrachyceras thusneldae, indicating Carnian canadensis subzone (fauna originally included in study by Sato (1964))*)
- Otofuji, Y., Y.T. Moriyama, M.P. Arita, M. Miyazaki, K. Tsumura, Y. Yoshimura, M.K. Shuib, M. Sone, M. Miki, K. Uno, Y. Wada & H. Zaman (2017)- Tectonic evolution of the Malay Peninsula inferred from Jurassic to Cretaceous paleomagnetic results. *J. Asian Earth Sciences* 134, p. 130-149.
(*Magnetization in Jurassic-Cretaceous red bed sandstones of Tembeling Gp indicates two-stages of tectonic movement in S Malay Peninsula: (1) CW rotation of $61^{\circ} \pm 12^{\circ}$ accompanied by $13^{\circ} \pm 8^{\circ}$ S-ward displacement after Cretaceous (caused by indentation of India into Asia after 55 Ma); and (2) subsequent CCW rotation of $18^{\circ} \pm 5^{\circ}$ to present position (collision of Australian Plate with SE Asia after 30-20 Ma))*)
- Owusu, E.B., H. Tsegab, Chow Weng Sum & E. Padmanabhan (2019)- Organic geochemical analyses of the Belata black shale, Peninsular Malaysia; implications on their shale gas potential. *J. Natural Gas Science Engineering* 69, 102945, p.
(*Carboniferous Belata Fm black shales in Peninsular Malaysia with rel. high TOC (1.9- 4.1 %) and gas prone, but generally overmature and minimal remaining potential for working petroleum system*)
- Ozawa, T. (1976)- Late Visean *Eostaffella* (Fusulinina Foraminifera) from West Malaysia. In: T. Kobayashi & W. Hashimoto (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 17, p. 117-128.
(*First record of early fusulinid foram genus Eostaffella from Late Visean limestone of Bukit Charas, 23 km NW of Kuantan, Pahang, Malay Peninsula (brachiopods from same locality described by Muir-Wood 1948, conodonts by Igo & Koike 1968, foraminifera by Mamet & Saurin 1970, etc.)*)
- Palmer, D. & M. Joll (2011)- Tin mining in Malaysia, 1800-2000: the Osborne & Chappel story. *Muzium Gopeng, Perpustakaan Negara Malaysia*, p. 1-328.
(*Small-scale mining of alluvial tin in Malay Peninsula started 100s of years ago by native Malay miners (Cornwall was main global tin mining center at that time). Around 1850 larger operations started, mainly by Chinese merchants and with Chinese laborers. By late 1800s British capital, equipment and hydraulic mining methods started to dominate the Malaysian tin industry. The British Osborne & Chappel company, starting out as Gopeng Mines Ltd., became one of the main tin mining companies in Kinta Valley, Perak, from the 1890s until the tin market collapse in mid-1980s*)
- Parham, P.R. (2016)- Late Cenozoic relative sea-level highs and record from Peninsular Malaysia and Malaysian Borneo: implications for vertical crustal movements. *Bull. Geological Society Malaysia* 62, p. 91-115.
(online at: <https://gsmpubl.files.wordpress.com/2017/04/bgsm2016012.pdf>)
(*Peninsular Malaysia no evidence to indicate Relative Sea Level higher than M Holocene maximum ($\sim +5\text{m}$ at $\sim 7\text{ ka}$). RSL record of Malaysian Borneo more complex, even W Sarawak on Sundaland. Possible strandplain deposits over coarse alluvium in Kuching area could reflect last interglacial highstand deposition but more likely result of uplift. Ongoing subsidence of coastal plain from Kuching to Bintulu mainly due to sediment loading. N of Lupar Line, coast and interior from Bintulu to Bongawan, Sabah, has undergone Quaternary*)

uplift. Geomorphic indicators and lack of emergent RSL indicators along W Sabah coast, N of Bongawan, suggest ongoing subsidence. RSL record from E Sabah very complex)

Parham, P.R., Y. Saito, N. Sapon, R. Suriadi & N.A. Mochtar (2014)- Evidence for ca. 7-ka maximum Holocene transgression on the Peninsular Malaysia east coast. *J. Quaternary Science* 29, 5, p. 414-422.
(Coral and shelly marine deposits up to 50 cm above mean sea level in NE Peninsular Malaysia, with radiocarbon ages 7238-6909 yrs BP. Maximum transgression at ~7 ka, relative sea 1.4- 3m above present)

Penrose, R.A.F. (1903)- The tin deposits of the Malay Peninsula with special reference to those of the Kinta District. *Journal of Geology* 11, 2, p. 135-154.
(Brief review of early tin operations on Malay Peninsula, which are mainly W of Main range. Cassiterite derived from granites, but mined mainly from alluvial placers. Most mines operated by Chinese)

Pfeiffer, D. (1975)- The hydrogeologic map of the islands of Singapore, 1: 100,000. *Geologisches Jahrbuch C*, 9, p. 3-14.

Pierson, J.B., A.K. Askury, W.S. Chow & Z.T.H. Zuhar (2009)- Palaeozoic hydrocarbon plays in and around Peninsular Malaysia: any chance of exploration success? *PETRONAS Techn. J.* 2, p. 16-25.

Pierson, J.B., A.K. Askury, W.S. Chow & Z.T.H. Zuhar (2009)- Paleozoic sedimentary sequences exposed in the Kinta Valley: possible clues to a Paleozoic hydrocarbon system in and around Peninsular Malaysia? *Platform (Universiti Teknologi Petronas)* 7, 1, p. 56-65.
(Paleozoic sediments exposed in Kinta Valley suggest presence of source rocks, reservoirs and seals in Paleozoic interval. Limestone hills part of Paleozoic carbonate complex that covered large parts of SE Asia. Permian carbonate reservoirs may be found in E and off E coast of Peninsular Malaysia)

Pierson, J.B., S. Kassa, H. T. Gebretsadik, A.A. Kadir, W.S. Chow, A.W. Hunter & Z.T. Harith (2011)- Sedimentology of the Paleozoic limestone of the Kinta Valley, Peninsular Malaysia. *Proc. First EAGE South-East Asia Regional Geology Workshop, Ipoh 2011*, p. 1-5. *(Extended Abstract)*
(online at: https://www.researchgate.net/publication/275886372_Sedimentology_of_the_Palaeozoic_Limestone_of_the_Kinta_Valley_Malaysia)
(Karstified limestone hills of Kinta Valley are remnants of extensive Paleozoic carbonate complex. Altered by contact metamorphism of Triassic granite intrusion, but in N part of valley rel. unaltered. Mainly thin-bedded micritic limestone. Slump folds and breccias suggestive of marine slope deposition. Direction of slumping mainly to W, implying platform margin and lagoon facies should be E of Kinta Valley)

Pimm, A.C. (1967)- Triassic volcanic rocks in East and West Malaysia. *Geological Survey of Malaysia, Borneo Region, Kuching, Bull.* 8, p. 36-40.
(Predominantly basic-acid lavas in E Malaysia and intermediate-acid pyroclastics in W Malaysia are associated with Triassic neritic sediments. Volcanic rocks in these areas do not belong to same province but are related to separate tectonic belts in Sunda Region)

Pour, A.B. & M. Hashim (2015)- Structural mapping using PALSAR data in the Central Gold Belt, Peninsular Malaysia. *Ore Geology Reviews* 64, p. 13-22.
(SAR radar mapping of structural features in Central Gold Belt, mainly E of Bentong-Raub Suture Zone, identified high potential areas for gold prospecting. Four sets of lineaments, trending N-S, NE-SW, NNW-SSE and ESE-WNW)

Pour, A.B., M. Hashim, C. Makoundi & K. Zaw (2016)- Structural mapping of the Bentong-Raub suture zone Using PALSAR remote sensing data, Peninsular Malaysia: implications for sediment-hosted/orogenic gold mineral systems exploration. *Resource Geology* 66, 4, p. 368-385.
(Bentong-Raub Suture between Gondwana-derived Sibumasu terrane and Sukhothai Arc genetically related to the sediment-hosted/orogenic gold deposits associated with major lineaments in Central Gold Belt of Peninsular Malaysia)

Qian, X., T. Bai, Y. Yu, K.A. Mustapha, T.C. Sheldrick, C. Gan & Y. Wang (2023)- Multiple stages of continental rifting in Eastern Peninsular Malaysia: new insights from Jurassic-Cretaceous granitoids. J. Geological Society, London, 180, 5, jgs2023-025, p.

(New ages and geochemical data for newly identified Jurassic-Cretaceous granites and meta-granites from E Malay Peninsula. Three groups of Jurassic-Cretaceous granitoids, formed during multiple stages of continental rifting in response to Paleo-Pacific slab rollback pulses rather than by Tethyan evolutionary processes)

Quek, L.X., A.A. Ghani, S.L. Chung, S. Li, Y.M. Lai, M. Saidin, M.H.A. Hassan et al. (2017)- Mafic microgranular enclaves (MMEs) in amphibole-bearing granites of the Bintang batholith, Main Range granite province: evidence for a meta-igneous basement in Western Peninsular Malaysia. J. Asian Earth Sciences 143, p. 11-29.

(Mafic microgranular enclaves in Late Triassic amphibole-bearing I-type Bintang granite of Main Range granite province. MMEs slightly older zircon age (224 ± 1 Ma) than granite host (216 ± 1 Ma). Oldest inherited zircons 2.0 and 1.3 Ga, oldest xenocrystic zircons 2.5 and 1.5 Ga. Rocks generated from similar, ancient source in basement (E Proterozoic- Late Archean (~ 2.5 Ga) meta-igneous rock))

Quek, L.X., A.A. Ghani, Y.M. Lai, H.Y. Lee, M. Saidin, M.H. Roselee, M.H. Badrudin, A. Hassan et al. (2018)- Absolute age evidence of Early to Middle Ordovician volcanism in Peninsular Malaysia. Current Science 115, 12, p. 2291-2296.

(online at: https://www.researchgate.net/profile/A-Ghani/publication/330192306_Absolute_Age_Evidence_of_Early_to_Middle_Ordovician_Volcanism_in_Peninsular_Malaysia..._etc.)

(Zircon U-Pb ages of Gerik-Dinding metavolcanics (part of Sibumasu Terrane of W Malay Peninsula). E-M Ordovician weighted mean $206\text{Pb}/238\text{U}$ ages between 480-460 Ma. Age coincides with post-collision stage from final amalgamation of Asian micro-continental fragments with East Gondwana Proto-Tethys margin)

Quek, L.X., Y.M. Lai, A.A. Ghani, S. Li, M.H. Roselee, H.Y. Lee & R. Rahmat (2021)- New constraints from detrital zircon U-Pb data from Middle Paleozoic strata in Western Peninsular Malaysia: a potential detrital zircon contributor to East Sumatra. Goldschmidt 2021 Conference, Abstract, 1p.

(online at: <https://goldschmidtabstracts.info/abstracts/abstractView?id=2020007815>)

(East Sumatra similar Early Proterozoic detrital zircon age profile with W Australia while N Sibumasu mainly received detritus sourced from N India. W Malaya (part of Sibumasu) similar detrital zircon age spectra as E Sumatra (zircon age peaks of ca. 1300-1000 Ma (1170 Ma, 1070 Ma) and 590-510 Ma), suggesting E Sumatra-West Malaya once single tectonic unit. Northern Sibumasu different, with prominent 980-860 Ma population. Hypothetical suture between E Sumatra/West Malaya and N Sibumasu possibly to E of West Malaya)

Quek, L.X., Y.M. Lai, A.A. Ghani, M.H. Roselee, H.L. Lee, Y. Iizuka, M.R. Umor et al. (2021)- Peninsular Malaysia transitional geodynamic process from Gondwana to Pangaea: New constraints from 500 to 200 Ma magmatic zircon U-Pb ages and Hf isotopic compositions. Gondwana Research 94, p. 56-72.

(online at: https://researchmap.jp/yiizukaies/published_papers/32268365/attachment_file.pdf)

(West Malaya (Sibumasu) magmatic zircon Hf crustal model ages are older than East Malaya (part of Chanthaburi-Sukhothai-Lincang arc of Indochina terrane))

Quek, L.X., T.Y. Lee, A.A. Ghani, Y.M. Lai, M.H. Roselee, H.Y. Lee, Y. Iizuka et al. (2021)- Tracing detrital signature from Indochina in Peninsular Malaysia fluvial sediment: Possible detrital zircon recycling into West Borneo Cenozoic sediments. J. Asian Earth Sciences 218, 104876, p. 1-15.

(Permo-Triassic (292-198 Ma) Malayan granitic plutons and volcanics dominate detrital sources in fluvial sediments of Peninsular Malaysia. In SE Coastal Zone also contributions from Jurassic-Cretaceous strata in NW, comparable with sources from Indochina and Lower Cretaceous strata in Singapore. If sink connects with Sundaland paleoriver system, it might contribute to 'Indochina signature' provenance in W Borneo)

Rahman, A.H. & M.K. Shuib (1999)- The Upper Paleozoic Singa-Kubang Pasu megasequence: Some thoughts on basin initiations, depositional and tectonic history. Proc. GSM Dynamic stratigraphy & tectonics of

Peninsular Malaysia, Second Seminar- The Western Belt and Palaeozoic of Peninsular Malaysia and neighbouring areas, Kuala Lumpur, p. 58-67

Rahman, A.H. & M.K. Shuib (2000)- The Mesozoic of the Central Belt of the Malay Peninsula- Part I: Stratigraphy and depositional sequence. Proc. Geological Society Malaysia Conf. Dynamic stratigraphy and tectonics of Peninsular Malaysia, Third Seminar, The Mesozoic of Peninsular Malaysia, Kuala Lumpur 2000, p. 55-73.

(see Shuib & Abd Rachman & (2000) for Part II)

Raj, J.K. (1998)- A reappraisal of the Bok Balt fault zone. Warta Geologi (Newsletter Geological Society Malaysia) 8, 2, p. 36-41.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1982002.pdf>)

Raj, J.K. (1998)- Tectonic evolution of the Tertiary basin at Batu Arang, Selangor Darul Ehsan, Peninsular Malaysia. Bull. Geological Society Malaysia 42, p. 197-210.

(online at: www.gsm.org.my/products/702001-100845-PDF.pdf)

(Small Tertiary Batu Arang basin on W Central Malay Peninsula, N of Kuala Lumpur. Estimated area ~15km², depth 1000-1500'. Up to 265m basal clastics with coal, overlain by 'Boulder beds'. Unconformably over steeply dipping Permian meta-sediments)

Raj, J.K., Abdul Hadi Abd. Rahman & M.K. Shuib (1998)- Tertiary basins of inland Peninsular Malaysia: review and tectonic evolution. Bull. Geological Society Malaysia 42, p. 211-216.

(online at: www.gsm.org.my/products/702001-100844-PDF.pdf)

(Unlike Malaysia offshore regions, Tertiary sediments rare on Malay Peninsula. Seven small basins identified, all <300-400m thick, most with lignite seams)

Raj, J.K., D.N.K. Tan & W.H. Abdullah (2009)- Cenozoic stratigraphy. In: C.S. Hutchison & D.N.K. Tan (eds.) Geology of Peninsular Malaysia, University Malaya and Geological Society Malaysia, Kuala Lumpur, p. 133-173.

(Malay Peninsula almost entirely emergent during Cenozoic, with thin Cenozoic deposits mainly along W and E coasts. Isolated small Tertiary pull-apart basins. Batu Arang basin, Selangor, with 7-15m thick Eo-Oligocene thermally immature coal beds and lacustrine oil shale. E-M Pleistocene Simpang Fm (Old Alluvium) aggraded to 70m above s.l. Patches of up to 9m thick rhyolitic ash probably from Toba volcano, Sumatra)

Rajah, S.S. (1969)- Younger Mesozoic sedimentary rocks, State of Johore, West Malaysia. American Assoc. Petroleum Geol. (AAPG) Bull. 53, p. 2187-2189.

(Flat-lying, post-orogenic, fluvio-deltaic Tebak Fm (possibly same as Gagau, Panti Fms) of Johore Province, W Malaysia, most likely Lower Cretaceous age, and predominantly arenaceous)

Rajah, S.S. (1970)- Limestone occurrences in Johore. Bull. Geological Society Malaysia 3, p. 131-133.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1970010.pdf>)

(First record of E-M Permian limestones with fusulinids from Sungei Sedili and Sungei Lenggong areas in S part Malay Peninsula)

Rajah, S.S. (1979)- The Kinta tinfield, Malaysia. Bull. Geological Society Malaysia 11, p. 111-136.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101229-PDF.pdf)

(Kinta tinfield in Perak, NW Malay Peninsula, one of world's richest fields. Mainly in placer deposits in area with Triassic-Jurassic? granites intruded into steeply dipping, N/NW striking Silurian-Permian sediments (incl. Permian limestones)

Rajah, S.S., F. Chand & D. Santokh-Sing (1977)- The granitoids and mineralization of the Eastern Belt of Peninsular Malaysia. Bull. Geological Society Malaysia 9, p. 209-232.

(online at: www.gsm.org.my/products/702001-101290-PDF.pdf)

(Malay Peninsula 3 mineral belts: Western Tin belt, Central Gold and base metal belt and Eastern Tin belt. Eastern Belt granites emplaced in Upper Carboniferous- U Jurassic, peaking in U Permian. Invaded country rocks tightly folded and weakly regionally metamorphosed. Tin, tungsten and iron mineralization in marginal and apical parts of plutons)

Rajah, S.S. (1985)- Bauxite in the Kuantan Area, Peninsular Malaysia. Proc. 20th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Kuala Lumpur 1983, 2, Technical Reports, p. 214-224. *(same as Rajah (1986), below)*
(online at: <https://repository.unescap.org/items/904fe6cc-d317-490d-8289-296e15f5d015>)

Rajah, S.S. (1986)- Bauxite in the Kuantan area, Peninsular Malaysia. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 315-325.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986024.pdf>)
(Significant reserves of ferruginous bauxite in Kuantan area, E part of Malay Peninsula. Bauxite is tropical laterite, formed by decomposition of underlying Kuantan basalt of probable Miocene or younger age)

Rajah, S.S. & E.H. Yin (1980)- Summary of the geology of the Central Belt, Peninsular Malaysia. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University Tokyo Press, 21, p. 319-342.
(Comprehensive review of geology of Central Belt. Mainly Permian and Triassic sediments and intrusive rocks)

Ramkumar, Mu, N.A. Siddiqui, M. Mathew, B. Sautter, P.X. Hui, R. Nagarajan, H.T. Breitfeld, M. Santosh, D. Menier & M. Poppelreiter (2019)- Structural controls on polyphase hydrothermal dolomitization in the Kinta Valley, Malaysia: Paragenesis and regional tectono-magmatism. J. Asian Earth Sciences 174, p. 364-380.
(manuscript online at: <https://archimer.ifremer.fr/doc/00637/74938/83485.pdf>)
(Hydrothermal dolomites in Permo-Carboniferous? carbonates of Kinta Valley, W Malay Peninsula, between two granite plutons. Occurrence, geometry and structural relationships of dolomites controlled by successive magmatic events, whereas, intensity of replacement dolomitization controlled by host rock texture, bulk chemistry and nature of circulating fluids)

Rao, C.P. (1988)- Paleoclimate of some Permo-Triassic carbonates of Malaysia. Sedimentary Geology 60, p. 163-171.
(Study of Permian and Triassic carbonates of Malaysia. Permian Chuping Lst at Langkawi (= part of Sibumasu terrane; JTvG) with common brachiopods with oxygen/carbon isotope signature similar to E Australian faunas. Paleoclimate was cool- temperate ('Gondwanan'). Permian Summalayang Lst of NE Malay Peninsula rich in fusulinids, but no corals, etc., Foramol facies and predominantly Mg calcite mineralogy reflect temperate climate. Late Triassic Kodiang Lst with corals, algae, stromatolites, etc., and formed in tropical setting)

Rashid, A., N.A. Siddiqui, N. Ahmed, M. Jamil, M.A.K. El-Ghali, S.H. Ali, F.K. Zaidi & A. Wahid (2022)- Field attributes and organic geochemical analysis of shales from early to middle Permian Dohol Formation, Peninsular Malaysia: Implications for hydrocarbon generation potential. J. King Saud University- Science 34, 8, 102287, p. 1-12.
(online at: <https://doi.org/10.1016/j.jksus.2022.102287>)
(E-M Permian Dohol Fm of Eastern Belt of Peninsular Malaysia in E Johor area composed of several metasedimentary, metamorphic, volcanic, and siliciclastic rocks. Different types of deep marine shale facies, all with low TOC and type II-III kerogens. Samples thermally mature. Dohol Fm low potential for generating hydrocarbons)

Rashid, A., N.A. Siddiqui, C.B. Bavoh, A.K.M.E. Haque, M. Usman, S.A. Kasim et al. (2022)- Organic matter distribution and characteristics among rock formations in Malaysia: implications on hydrocarbon generation potential. Applied Sciences (MDPI) 12, 9470, p. 1-32.
(online at: <https://www.mdpi.com/2076-3417/12/19/9470>)

(Extensive review of Silurian-Tertiary potential hydrocarbon source rocks across Malaysia (incl. N Borneo). Bintulu, Pinangah, Begrih, Liang, and Tanjong Fms highest potential. Formations with highest hydrocarbon potential are of Tertiary age, in Sarawak and Sabah, and contain coal and carbonaceous shale)

Rastall, R.H (1927)- The geology of the Kinta Valley. Mining Magazine 36, p. 328-338.
(Discussion of geology of Kinta Vally, after paper by W.E. Cameron. All limestones of Permo-Carboniferous age. Etc.)

Rastall, R.H (1927)- The limestone of the Kinta Valley, Federated Malay States. Geological Magazine 64, p. 410-432.
(Kinta Valley with steep hills of thick, probably Permo-Carboniferous limestone. No biostrat)

Rastall, R.H (1931)- The metamorphic rocks of Gunong Terendum, Kinta Valley, Federated Malay States. Geological Magazine 68, p. 193-206.
(?Triassic schist, in vertical contact with ?Permo-Carboniferous limestone, both with veins of granite)

Richardson, J.A. (1939)- The geology and mineral resources of the neighbourhood of Raub, Pahang, Federated Malay States: with an account of the geology of the Raub Australian Gold Mine. Geological Survey Department, Federated Malay States, Memoir 3, Singapore, p. 1-166.

Richardson, J.A. (1946)- The stratigraphy and structure of the Arenaceous Formation of the Main Range Foothills, F.M.S. Geological Magazine 83, 5, p. 217-229.
(Unfossiliferous Triassic? Arenaceous Formation E of Main Range Granite of Malay Peninsula, associated with amphibolites (following Raub-Bentong suture?; JTvG) (by Malay Geological Survey geologist James A. Richardson, based on his fieldwork before 1942))

Richardson, J.A. (1947)- The origin of the amphibole-schist series of Pahang, Malaya. Geological Magazine 84, p. 241-249.
(Amphibole-Schist Series confined to Malay Peninsula East of Main Range, and is most abundant in NW Pahang. Associated with serpentine. Parent rocks may have been sediments or pyroclastics of Permo-Carboniferous. Associated with Arenaceous Formation of Main Range Foothills, quartzites, quartzite-conglomerates, shales, cherts, phyllites, quartz- and mica-schists, which may be either Triassic or perhaps older than adjacent Permocarboniferous shales and limestones)

Richardson, J.A. (1947)- Facies changes and lithological variation in the Permo-Carboniferous Formation of North-West Pahang and South-West Kelantan, Malaya. Geological Magazine 84, 5, p. 281-288.
(Facies change and lithological variation traceable in outcrop of Permocarboniferous rocks exposed over large jungle area of NW Pahang and SW Kelantan. Three major facies: (1) calcareous facies; (2) argillaceous facies (incl. mixed shale-rhyolite tuff sub-facies); (3) volcanic facies (Pahang Volcanic Series); mainly rhyolite and andesite tuffs)

Richardson, J.A. (1950)- The geology and mineral resources of the neighbourhood of Chegar, Perah and Merapoh, Pahang. Geological Survey Department, Federated Malay States, Ipoh, Memoir 4, p. 1-162.

Richter, B., E. Schmidtke, M. Fuller, N. Harbury & A.R. Samsudin (1999)- Paleomagnetism of Peninsular Malaysia. J. Asian Earth Sciences 17, p. 477-519.
(Paleomagnetic results from Peninsular Malaysia. Peninsular Malaysia in low N latitudes since Late Triassic. Jurassic- Paleocene counterclockwise (CCW) rotations, while clockwise rotations (CW) predominant in older rocks. 'S Sundaland' block (Malay Peninsula, Borneo, Sulawesi, Celebes Sea) rotated ~30°- 40° CCW between Late Eocene (~40-45 Ma) and M Miocene (~10-15 Ma). Regional CCW rotations not consistent with extrusion tectonic models)

Rishworth, D.E.H. (1974)- The Upper Mesozoic terrigenous Gagau Group of Peninsular Malaysia. Geological Survey of Malaysia, Kuala Lumpur, Special Paper 1, p. 1-78.

(Gagau Gp thick sequence of non-marine clastic sediments in isolated areas of E Malay Peninsula. Rel. gently dipping and unconformable over highly folded Permian- Triassic strata. Plant remains suggest mainly Late Jurassic- E Cretaceous age. Two formations, unfossiliferous Badong Conglomerate (400-500m) overlain by Lotong Sandstone (600m), locally with plant remains (Equisetites, Gleichenoides, Otozamites, Frenelopsis, etc.; first described by Kon'no 1967, 1968) and rare small chitinous bivalves. With volcanic interbeds. Gagau Gp similar to rocks of Khorat Plateau (NE Thailand) and also Bintan Fm of Bintan Island (Indonesia, SE of Singapore))

Roe, F.W. (1951)- The geology and mineral resources of the Fraser's Hill area, Selangor, Perak and Pahang, Federation of Malaya, with an account of the mineral resources. Geological Survey Department, Federation of Malaya, Memoir 5, p. 1-138.

(Pahang area with extensive Main Range granites, Pahang Volcanics. Widespread tin mining)

Roe, F.W. (1953)- The geology and mineral resources of the neighbourhood of Kuala Selangor and Rasa, Selangor, Federation of Malaya, with an account of the geology of Batu Arang coal-field. Geological Survey Department, Federation of Malaya, Memoir 7, p. 1-163.

Romang, M. (1922)- Petrographische Untersuchung zinnerzführender Gesteine aus Kinta (Malakka). *Eclogae Geologicae Helvetiae* 17, 2, p. 178-252.

(online at: <https://www.e-periodica.ch/digbib/view?pid=egh-001%3A1922%3A17%3A%3A273>)

('Petrographic investigations of tin-bearing rocks from Kinta (Malakka)'. Descriptions of samples from western Malay Peninsula collected by Dr. Pannekoek van Rheden in 1907-1909). Inaugural-Dissertation at University of Basel under Prof. C. Schmidt. Granites, pegmatites, greisen, hornfels, metamorphic limestones, etc.)

Roselee, M.H., A.A. Ghani, S.L. Chung, M.R. Umor & L.X. Quek (2016)- 'A-type' signature of volcanics suite from Teluk Ramunia, Southeastern of Johor, Peninsular Malaysia: Geochemical evidence of Paleo-Tethys slab rollback extension. *Proc. 14th Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA XIV) and 45th Annual Conv. Indonesian Association Geologists (IAGI) (GIC 2016)*, Bandung, p. 739-742.

(Triassic (Late Carnian; 229, 231 Ma) volcanics of SE tip of Malay Peninsula)

Roselee, M.H., A.A. Ghani & M.R. Umor (2016)- Petrology and geochemistry of igneous rocks from southern Tioman Island, Pahang, Peninsular Malaysia. *Bull. Geological Society Malaysia* 62, p. 79-89.

(online at: <https://gsm publ.files.wordpress.com/2017/04/bgsm2016011.pdf>)

(Plutonic (hornblende diorite, biotite granite) and volcanic rocks (rhyolite-dacite; andesite on other part of island) in S part of Tioman Island, E of Pahang coast. Late Cretaceous granite (~80 Ma) intruded Tioman Volcanics (~88.9 Ma). Biotite granite formed in calc-alkaline volcanic arc setting (Neotethys subduction?))

Roslan, K. (1988)- The stratigraphy and sedimentology of Triassic rocks of Peninsular Malaya. Ph.D. Thesis University College, London, p. 1-344. *(Unpublished)*

Roslan, M.H.K., C.A. Ali & K. Roslan Mohamed (2016)- Fasies dan sekitaran sedimen Formasi Singa di Langkawi, Malaysia. *Sains Malaysiana* 45, 12, p. 1897-1904.

(online at: www.ukm.my/jsm/pdf_files/SM-PDF-45-12-2016/14%20Mohamad%20Hanif%20Kamal.pdf)

('Facies and sedimentary environment of the Singa Formation of Langkawi, Malaysia'. Depositional model of Carboniferous- E Permian shallow marine clastics of Singa Fm, widespread on Langkawi. With pebbly mudstone facies indicative of cold climate)

Runnegar, B. & D. Gobbett (1975)- *Tanchintongia* gen.nov., a bizarre Permian myalinid bivalve from West Malaysia and Japan. *Palaeontology* 18, 2, p. 315-322.

(online at: <http://palaeontology.palass-pubs.org/pdf/Vol%2018/Pages%20315-322.pdf>)

(New large, thick-shelled myalinid bivalve species and genus Tanchintongia perakensis from open-cut tin mine H.S. Lee No. 8, Kinta Valley, Perak. Associated with E Permian ammonoids and Pseudofusulina (tropical E Permian alatoconchid, also discussed in Isozaki et al. 2009))

Roslan, M.H.K., C. Aziz Ali & K.R. Mohamed (2018)- Pengelasan litostratigrafi baru untuk Formasi Singa di Langkawi, Kedah, Malaysia. *Sains Malaysiana* 47, 10, p. 2251-2258. (online at: https://www.ukm.my/jsm/pdf_files/SM-PDF-47-10-2018/02%20Mohamad%20Hanif%20Kamal%20Roslan.pdf) ('New classification of the lithostratigraphy of the Singa Formation in Langkawi, Kedah, Malaysia'. Carboniferous- E Permian Singa Fm of Langkawai island mainly black mudstones, interbedded with sandstone and some conglomerate layers (with glacial dropstones). Four members)

Ryall, P.J.C. (1982)- Some thoughts on the crustal structure of Peninsular Malaysia: results of a gravity traverse. *Bull. Geological Society Malaysia*, 15, p. 9-18. (online at: www.gsm.org.my/products/702001-101190-PDF.pdf) (Gravity profile across Malay Peninsula from Kuala Lumpur to Selangor)

Saaïd, N.S.M. & Basir Jasîin (2014)- Litho and biostratigraphy of the Tournaisian chert, the Kubang Pasu Formation of the Kedah and Perlis, Malaysia. *Geological Society Malaysia, Proc. National Geoscience Conference (NGC), Terengganu 2014*, P045, p. 35-36. (Abstract) (online at: <https://gsm.org.my/articles/702001-100318/>) (Kubang Pasu Fm of NW Peninsular Malaysia equivalent to Singa Fm of Langkawi Island. Current age interpretation of formation E Carboniferous- E Permian. Age of lower boundary based on common Tournaisian radiolarian chert with *Stigmosphaerostylus variospina*, *S. vulgaris*, *Astroentactinia multispinosa*)

Said, Uyop (1997)- Palinologi batuan Jura-Kapur Taman Negara. In: I. Komoo et al. (eds.) *Warisan Geologi Malaysia, Lestari, Universiti Kebangsaan Malaysia*, p. 249-368. ('Palynology of Jurassic- Cretaceous rocks of Taman Negara'. Cretaceous palynology of non-marine Tembeling Gp in C part of Malay Peninsula)

Said, Uyop (2002)- Palynomorph assemblage from Keratong, Pahang: its age and emergence of angiospermlike pollen. *GSM Annual Geological Conf. 2002, Kota Bharu, Bull. Geological Society Malaysia* 45, p. 179-185. (online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm2002027.pdf>) (Palynomorph assemblage from outcrop at Felda Keratong, SE Pahang, resembles *Paradoxa* Assemblage, of late E Cretaceous (Barremian-Albian) suggested age. Occurrence of monosulcate pollen *Clavatipollenites hughesii* indicates emergence of angiosperms during deposition of these sediments)

Said, Uyop & Che Aziz Ali (2000)- On the palynomorph assemblage from the Panti Sandstone, Kota Tinggi, Johor. In: G.H. Teh et al. (eds.) *Proc. Geological Society Malaysia Annual Geological Conference 2000, Pulau Pinang*, p. 137-141. (online at: https://gsmpublic.files.wordpress.com/2014/10/agc2000_19.pdf) (Palynomorphs from Panti Sst in quarry N of Kota Tinggi, Johor, which overlies older granite body. Most common palynomorphs *Classopollis*, *Cicatricosisporites*, *Aequitriradites*, *Ischyosporites* and *Ephedripites*. Age Lower Cretaceous (Berriasian-Valanginian) and climate during was warm and dry)

Said, Uyop, M. Malihan & Z. Konjing (2007)- Neocomian palynomorph assemblage from Central Pahang, Malaysia. *Bull. Geological Society Malaysia* 53, p. 21-25. (online at: <http://geology.um.edu.my/gsmpublic/v53/Pdf%20individual%20papers/5%20Paper0.pdf>) (Road-cuts in central Pahang with distinct palynomorph assemblage with *Cicatricosisporites australiensis*, *C. ludbrookiae*, *Biretisporites eneabbaensis* and *Baculatisporites comaumensis*. Assigned to lowest speciosus Assemblage zone (Valanginian- Hauterivian))

Said, Uyop & S. Salehudin (2001)- A palynological study on an Early Cretaceous rock sequence at Bukit Belah, Batu Pahat, Johor. In: G.H. Teh et al. (eds.) *Proc. Geological Society Malaysia Annual Geological Conference, Pangkor 2001*, p. 91-97. (online at: https://gsmpublic.files.wordpress.com/2014/10/agc2001_15.pdf) (New outcrops at Bukit Belah, N of Batu Pahat, Johor, with Late Jurassic- E Cretaceous plant fossils attributed to *Gleichenites pantiensis*, *Frenelopsis malaiana*, *Cupressinocladus acuminifolia*, *Otozamites malayana* and

Ptilophyllum spp. Palynomorphs include *Cicatricosisporites australiensis*, *C. ludbrookii* and *Reticulatisporites pudens* suggesting E Cretaceous age, probably Speciosus Assemblage (Valanginian- ?Hauterivian))

Sajid, Z., M.S. Ismail & T. Hanif (2020)- Mineralogical and geochemical imprints to determine the provenance, depositional history and tectonic settings of Triassic turbidites in the Semanggol and Semantan Basins, Peninsular Malaysia. *J. Asian Earth Sciences* 203, 104539, p. 1-27.

(Turbidite deposits of Triassic Semanggol and Semantan Fms extensively distributed in Peninsular Malaysia. Predominantly deep-marine and occasional shallow-marine deposits, characterizing a deep-marine fan system. Chemistry suggests passive margin for Semanggol and active-continental margin for Semantan turbidites (Triassic Semanggol foredeep basin above subducting Sibumasu Plate))

Sajid, Z., M.S. Ismail, T. Hanif, H. Tsegab, S. Ali & N. Ahmed (2020)- Sedimentary characteristics, XRD, FTIR, UV-Vis and Rock-Eval pyrolysis of black shale intervals of the Semantan Formation, Peninsular Malaysia. *ARPJ. Engineering and Applied Sciences* 15, 23, p. 2778-2793.

(online at: https://www.academia.edu/101954840/Rock_Eval_Pyrolysis_of_Black_Shale_Intervals_of_the_Semantan_Formation_Peninsular_Malaysia)

(Characterization of black shales in distal turbidites of Triassic of Semantan Fm, extensively distributed in Central Belt of Peninsular Malaysia. TOC highly variable (0.2- 3.7%, av. 1.4%) and sourced from allochthonous organic material. Type-III kerogens suggest input from terrestrial high plants)

Sajid, Z., M.S. Ismail H. Tsegab & T. Hanif & N. Ahmed (2020)- Sedimentary geology and geochemical approach to determine depositional environment of the Triassic turbidites bearing Semanggol Formation, NW Peninsular Malaysia. *J. Natural Gas Geoscience* 5, 4, p. 207-226.

Sajid, Z., M.S. Ismail, M.N.A. Zakariah, H. Tsegab, J.A.G.Vintaned, T. Hanif & N. Ahmed (2020)- Impact of paleosalinity, paleoredox, paleoproductivity/preservation on the organic matter enrichment in black shales from Triassic turbidites of Semanggol Basin, Peninsular Malaysia. *Minerals (MDPI)* 10, 915, p. 1-34.

(online at: <https://www.mdpi.com/2075-163X/10/10/915>)

(Turbidite-associated black shale of Semanggol Formation widely distributed in NW Peninsular Malaysia. Black shale represents distal part of submarine fan system (in foredeep basin of colliding Sibumasu Plate?). Mainly Type-III kerogens, suggesting terrestrial organic source. Inorganic geochemical data suggest deposition in passive margin setting with moderate-strong weathering, in semi-arid to hot arid climate)

Sakagami, S. (1963)- Bryozoa from Pulau Jong, the Langkawi Islands, Northwest Malaya. *Contributions to the Geology and Palaeontology of Southeast Asia* 8, Japanese J. Geology and Geography 34, 1-2, p. 205-209.

Sakagami, S. (1964)- Bryozoa from Pulau Jong, the Langkawi Islands, Northwest Malaya. In: T. Kobayashi (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 135-141.

(Same paper as Sakagami (1963). Short paper on 4 species of Permian (Artinskian- Kungurian) bryozoa from Jong Island, Langkawi islands: Cyclotrypa, Fistulipora, Polypora aff. timorensis, P. gigantea)

Sakagami, S. (1970)- On the Paleozoic bryozoa of Japan and Thai-Malayan districts. *Journal of Paleontology* 44, 4, p. 680-692.

Sakagami, S. (1972)- Carboniferous bryozoa from Bukit Charas, near Kuantan, Pahang, Malaya. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 10, p. 35-62.

(24 species of Visean bryozoa from E part Malay Peninsula)

Sakagami, S. (1973)- Some Permian Bryozoa from Pahang, Malaysia. In: T. Kobayshi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 63-73.

(M Permian bryozoa from limestone blocks in andesite volcanoclastic matrix in Kampong Awah quarry, Pahang and Jenka Pass: Fistulipora, Araxopora, Clausotrypa, etc. Associated with fusulinids Yabeina asiatica,

Neoschwagerina cheni, *N. douvillei*, *Sumatrana annae*, *Verbeekina verbeeki*, *Chusenella tingi*, suggesting early *M Permian* (Wordian) age (= continuation of Sukhothai Arc?, just E of Raub Bentong suture; JTvG))

Sakagami, S. (1976)- Palaeobiogeography of the Permian bryozoa on the basis of the Thai-Malayan district. In: T. Kobayshi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 155-172.

(121 species of Lower Permian and 7species of Upper Permian bryozoa known from Thai-Malayan region. Thai-Malayan bryozoa are common with those of Timor, W Australia and the Urals)

Samah, M.E.A., C.A. Ali, K.R. Mohamed & N.A.M. Radzir (2018)- Pencirian dan tafsiran paleo-sekitaran stromatolit dan thrombolit dalam jujukan batu kapur Setul di Langkawi dan Perlis. *Bull. Geological Society Malaysia* 66, p. 99-105.

(online at: <https://gsm.org.my/products/702001-101747-PDF.pdf>)

(‘Characterisation and interpretation of stromatolites and thrombolites paleo-environment in Setul Limestone succession, Langkawi and Perlis’. *Microbial deposits in Paleozoic Setul Lst (stromatolites, thrombolites, oncolites)*)

Samah, M.E.A., C.A. Ali & K.R. Mohamed (2021)- Analisis sedimentologi dan stratigrafi jujukan Formasi Kaki Bukit (Ahli Batu Kapur Setul Bawah) di Teluk Ewa, Pulau Langkawi. *Bull. Geological Society Malaysia* 72, p. 25-35.

(online at: <https://gsm.org.my/products/702001-101924-PDF.pdf>)

(‘Sedimentological and stratigraphical analysis of mixed siliciclastic–carbonate shallow marine Kaki Bukit Fm (Lower Setul Member) at Teluk Ewa, Pulau Langkawi’. *Ordovician Limestone*).

Samsudin, A.R., Basir Jasin, I. Abdullah, A. Janlan & U. Said (1991)- Beberapa aspek geologi batuan klastik Trias zone barat Semenanjung Malaysia. *Sains Malaysiana* 20, 1, p. 55-74.

(‘Some aspects of the geology of Triassic clastic rocks in the western zone of Malaysia’)

Samsudin, A.R., N S. Ahmad, N.D. Johari & U. Hamzah (2014)- Geophysical evidences of a possible meteorite impact crater at Langkawi Island, Kedah, Malaysia. *Electronic J. Geotechnical Engineering (EJGE)* 19, Bund. R, p. 4741-4749.

(Semi-circular rim structure on Langkawi island previously identified by Tjia (2001) as possible remnant of impact crater. Gravity and magnetic surveys over ~35 km² area shows low gravity negative anomaly of ~1.5 km in diameter. Modelled as simple type crater with ~1500m of low density sedimentary fill)

Saparin, M.A. & M.S. Ismail (2022)- Review on the Graptolites from the *Lituigraptus convolutus* and *Stimulograptus sedgwickii* biozones of Pulau Langgun, Langkawi, Malaysia. *Proc. Int. Conf. Earth Resources (ICER 2020)*, Sarawak 2021, IOP Conference Series: Earth and Environmental Science 1003, 012010, p. 1-18.

(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1003/1/012010/pdf>)

(Revised graptolite assemblages suggest only *Stimulograptus sedgwickii* biozone (Silurian?) present in top 270 cm of Tanjung Dendang Fm (formerly Lower Detrital Mb of Setul Fm), Pulau Langgun, NE Langkawi)

Saparin, M.A. & M.S. Ismail (2023)- Latest Ordovician to earliest Silurian graptolites of northwest Peninsular Malaysia. *Journal of Paleontology* 97, 2, p. 395-420.

(Graptolites from Late Ordovician-E Silurian shales of basal Tanjung Dendang Fm in Pulau Langgun, Langkawi, NW Malay Peninsula. Latest Ordovician strata also include Hirnantia fauna bed between *Metabolograptus extraordinarius* and *Metabolograptus persculptus* biozones, in which shelly fossils such as *Mucronaspis* sp. could be recovered)

Saparin, M.A., K.A. Mustapha & M.S. Ismail (2023)- Biostratigraphy, organic petrography and carbon isotope chemostratigraphy of the Ordovician-Silurian black shales from the northwestern domain of Peninsular Malaysia. *Int. J. Coal Geology* 277, 104355, p. 1-16.

(Latest Ordovician- E Silurian basin in NW Domain of Peninsular Malaysia (Sibumasu Terrane). Graptolite biostratigraphy for Tanjung Dendang Fm in Pulau Langgun, Langkawi. indicate Hirnantian-Aeronian age and

close association with *S China* faunas. *Vitrinite Reflectance* ~1.8-3.1% *Ro*, suggesting overmature for hydrocarbon generation. *TOC of Langkawi black shale* av. 2.1 wt%)

Sarkar, S.S. (1972)- On *Posidonia* from Rebak Island, Langkawi, West Malaysia. Geological Society Malaysia Newsletter 37, p. 5-9.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1972005.pdf>)

(*E Carboniferous thin-shelled bivalve molluscs from Rebak, Langkawi Islands. New species: Posidonia elongata, P. dilatata, P. intermedia, P. conspicua (= Posidonomya; see also Basir Jasin 2013, 2015)*)

Sashida, K., S. Adachi, H. Igo, T. Koike & A.B. Ibrahim (1995)- Middle and Late Permian radiolarians from the Semanggol Formation, northwest Peninsular Malaysia. Transactions Proceedings Paleontological Society of Japan, New Series, 177, p. 43-58.

(online at: <http://ci.nii.ac.jp/naid/110002703388/en>)

(*Semanggol Fm in NW Malay Peninsula subdivided into lower Chert, middle Rhythmite (with Triassic Daonella and Halobia) and upper Conglomerate Members. Allochthonous siliceous limestone block in lower Chert Member at Bukit Barak, 25km NE of Alor Setar, with late M Permian radiolarians, including Follicucullus monacanthus. Late Permian radiolarians of Neoalbaillella optima and N. ornithoformis assemblages in chert beds of same member at Bukit Nyan, E of Alor Setar. Permian radiolarian faunas similar to Japan, Philippines, and S China. Eight species and five unidentified species of radiolaria described*)

Sato, T. (1964)- Ammonites du Trias de la Malaisie. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 43-51.

(*'Ammonites from the Triassic of Malaysia'. Three new localities with Triassic ammonites in Peninsular Malaysia: (1) Yong Peng (Johore; Carnian with Paratrachyceras, Joannites, Lobites), (2), (3) Temerloh and Kulal Lipis (Anisian-Ladinian, with Paraceratites aff. trinodosu, Arpadites)*)

Sautter, B. (2017)- Influence de l'heritage structural sur le rifting: exemple de la marge Ouest de La Sonde. Doct. Thesis Ecole Normal Superiere, Universite de Paris, p. (Unpublished)

(*'Influence of pre-existing structural fabric on rifting: example from the western margin of Sunda Plate'*)

Sautter, B., M. Pubellier, P. Jousselin, P. Dattilo, Y. Kerdraon, C.M. Choong & D. Menier (2017)- Late Paleogene rifting along the Malay Peninsula thickened crust. Tectonophysics 710-711, p. 205-224.

(*Continental core of Malay Peninsula relatively undeformed after Triassic Indosinian orogeny. Thick crustal mega-horst bounded by shear zones (Ranong, Klong Marui, Main Range Batholith Fault Zones), initiated in latest Cretaceous and reactivated in Late Paleogene. Extension localized on sides with Late Cretaceous deformation. In W continental shelf three major crustal steps (crustal-scale tilted blocks bounded by deep-rooted normal faults; Mergui Basin). To E rift systems with large tilted blocks (W Thai, Songkhla, Chumphon) which may reflect large crustal boudins. Central domain extension limited to narrow N-S half grabens. Rifted basins resemble N-S en-echelon structures along large NW-SE shear bands. Deep Andaman, Malay and Pattani basins on weaker crust inherited from Gondwanan continental blocks (Burma, Sibumasu, Indochina)*)

Sautter, B., M. Pubellier, S. Kralikova Schlogl, L. Matenco, P. Andriessen & M. Mathew (2019)- Exhumation of west Sundaland: A record of the path of India? Earth-Science Reviews 198, 102933, 1-15.

(*N-S transect from S Malay Peninsula to E Himalayan Syntaxis with 5 major metamorphic domes with similar geodynamic evolution. Exhumation of domes migrated with time between Late Cretaceous in Stong Complex (N Malaysia) in S and Late Miocene in Gaoligong Shear Zone (S China) in N. Deformation characterized by N-S extension that followed regional E-W oriented plate tectonic shortening. N-S extension associated with onset of hanging-wall deposition in sedimentary basins of W Sundaland (e.g. Malay, Sumatra, Thai Basins) during exhumation of footwall to upper brittle levels. Driven by N-ward migration of India starting from Cretaceous times. Subduction of excess topography of Greater India rifted continental margin during underplating, resulting in uplift, thermal anomalies, extensional exhumation and associated subsidence*)

Schwartz, M.O. & A.K. Askury (1989)- Geological, geochemical, and fluid inclusion studies of the tin granites from the Bujang Melaka pluton, Kinta Valley, Malaysia. Economic Geology 84, p. 751-779.

(Bujang Melaka pluton of Kinta Valley has area of 20x10 km, and belongs to Permo-Triassic Main Range batholith, or W granite belt of Peninsular Malaysia. Mainly S-type biotite granites, emplaced into Devonian-Lower Permian sediments.

Savage, H.E.F. (1938)- The geology of the neighbourhood of Sungai Siput, Perak, Federated Malay States, with an account of the mineral deposits. Geological Survey Department, Federated Malay States, new series, Memoir 1, p. 1-46.

(online at: http://myrepositori.pnm.gov.my/bitstream/123456789/2825/1/MN1100008_FAMD.pdf)

Scrivenor, J.B. (1908)- Note on the sedimentary rocks of Singapore. Geological Magazine Dec. 5, 7, p. 289-291.

(Early note on sediments of Singapore. Steeply dipping NW-SE striking sandstone and conglomerates with red and grey shales at Blakang Mati island contain chert pebbles, probably an extension of Late Triassic Tembeling Series of Pahang, Malay Peninsula, which are probably unconformable on Raub series)

Scrivenor, J.B. (1909)- Obsidianites in the Malay Peninsula. Geological Magazine 6, 9, p. 411-413.

(Obsidianites of probable meteoric origin (tektites) and similar to material from Billiton and Java described by Verbeek, also known from tin-ore bearing alluvium of Pahang and Negri Sembilan on Malay Peninsula)

Scrivenor, J.B. (1910)- The rocks of Pulau Ubin and Pulau Nanas (Singapore). Quarterly J. Geological Society of London 66, p. 420-434.

(Rocks of Singapore islands mainly granites and tuffs)

Scrivenor, J.B. (1911)- The geology and mining industries of Ulu Pahang, with a sketch map showing the geological structure of the country. F.M.S. Government Printing Office, Kuala Lumpur, p. 1-61.

(online at: <https://books.googleusercontent.com/books/content> Etc.)

(Report based on 1904 and 1907 fieldwork, mainly with economic objectives, to investigate the many old, small native alluvial gold workings and their relations to geology in the Pahang State, Malay Peninsula E of the Main Range granites. Gold deemed not abundant here, mainly limited to Raub gold lode mines. No tin ores encountered. Mainly Carboniferous-Triassic rocks, incl. clastics, limestones, radiolarian cherts, Pahang Volcanics, etc.)

Scrivenor, J.B. (1912)- The Gopeng beds of Kinta (Federated Malay States). Quarterly J. Geological Society of London 68, p. 140-163.

(Remains of 'ancient Gondwanaland tin-field' near Gopeng tin mining center at E side Kinta Valley, older than Mesozoic granite of Main range of Peninsula, altered by it, and further enriched in tin-ore by it near contact. Steeply dipping Gopeng Beds overlie Permo-Carboniferous limestone, and include polymict boulder clays that were deposited under glacial conditions and probably equivalents of (E Permian) Bacchus Marsh and Murree marine beds of Australia (now viewed as Quaternary alluvial deposits (Hutchison & Tan 2009))

Scrivenor, J.B. (1913)- The geology and mining industry of the Kinta District, Perak, Federated Malay States, with a geological sketch map. F.M.S. Government Printing Office, Kuala Lumpur, p. 1-91.

(online at: <https://books.google.com/books...>) (without the map)

(Much of Kinta District in Perak occupied by granite of Main Range. Also Paleozoic limestone and 'Gondwana rocks': clays and boulder clays (probably of glacial origin), phyllites and quartzites. Kinta Valley with steep Carboniferous limestone hills, etc. Many tin mines in alluvial deposits)

Scrivenor, J.B. (1913)- The geological history of the Malay Peninsula. Quarterly J. Geological Society of London 69, p. 343-371.

(Early summary of Malay Peninsula geology. Sparsely illustrated)

Scrivenor, J.B. (1923)- The structural geology of British Malaya. Journal of Geology 31, 7, p. 556-570.

(Early essay on geology of Malay Peninsula)

- Scrivenor, J.B. (1924)- The geology of Singapore Island, with a geological sketch map. J. Malayan Branch Royal Asiatic Society 2, p. 1-8.
(*Brief account of geology of Singapore Islands. Greater part Singapore is built on locally steeply dipping sandstone and shale, probably of Triassic age, intruded by granites*)
- Scrivenor, J.B. (1925)- Summary of the geological history of British Malaya and British Borneo. Verhandeligen Geologisch-Mijnbouwkundig Genootschap Nederland Kolonien, Geologische Serie 8 (Gedenkboek Verbeek, memorial volume), p. 441-447.
(online at: <https://books.google.com/books?id=Yy0RAAAIAAJ&pg>)
- Scrivenor, J.B. (1926)- The palaeontology of British Malaya. J. Malayan Branch Royal Asiatic Society 4, p. 173-184.
(*On fossils collected in Malay Peninsula since 1900: Triassic Myophoria sandstone, Jurassic and Late Triassic marine molluscs from Singapore, radiolarian cherts, Carboniferous plants, Permian fusulinids in NW Malay Peninsula, etc.*)
- Scrivenor, J.B. (1928)- The geology of Malayan ore deposits. Macmillan, London, p. 1-216.
(*Review of mineral deposits of Malaysia, mainly gold and tin*)
- Scrivenor, J.B. (1928)- Geological map of British Malaya, issued as Folio II of the general geological map of the Netherlands East Indies, scale 1:1000.000. Jaarboek Mijnwezen Nederlandsch-Indie 54 (1925), Verhandeligen 2, p. 81-96.
(*Overview map of Malay Peninsula and Riau Islands, with very brief explanatory notes*)
- Scrivenor, J.B. (1929)- Radiolaria-bearing rocks in the Malay Peninsula. De Mijningenieur 10, 11, p. 238-239.
(*Brief review of radiolarian rocks of Malay Peninsula. Present in numerous localities of Malay Peninsula, often in steeply dipping deformed series. Bulk of radiolarian rocks at base of Triassic series of quartzites and shales and above Carboniferous limestone; some chert horizons may be younger*)
- Scrivenor, J.B. (1931)- The geology of Malaya. Macmillan and Co., London, p. 1-250.
(*First textbook on geology of Malay Peninsula*)
- Scrivenor, J.B. (1941)- Geological research in the Malay Peninsula and Archipelago. Geological Magazine 78, 2, p. 125-150.
(*Review of status of geological research in Malay Peninsula and Indonesian Archipelago*)
- Scrivenor, J.B. & W.R. Jones (1919)- The geology of South Perak, North Selangor and the Dindings. Geological Department Federated Malay States, Kuala Lumpur, p. 1-212 + plates.
(online at: <https://books.google.com/>)
- Scrivenor, J. B. & E.S. Willbourn (1923)- The geology of the Langkawi Islands, with a geological sketch map. J. Malayan Branch Royal Asiatic Society, Singapore, 1, 2, p. 338-347.
(online at: <https://www.sabrizain.org/malaya/library/jmbras/jmbrasvol01-2.pdf>)
(*Geology of Langkawi islands, off NW Malay Peninsula, based in fieldwork in 1919-1920*)
- Seong, K.T. (1990)- K-Ar dating of micas from granitoids in the Kuala Lumpur-Seremban area. Bull. Geological Society Malaysia 26, p. 77-96.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1990008.pdf>)
(*Granitoids near Kuala Lumpur part of Main Range. U-Pb zircon ages of 211 and 215 Ma suggest Late Triassic emplacement age. K-Ar ages similar and also younger ages, suggesting partial resetting in Cretaceous*)
- Serra, C. (1968)- Sur quelques empreintes Mesozoïques de Malaisie. Archives Geologiques Vietnam 11, p. 43-51.

('On some Mesozoic (plant) imprints of Malaysia'. Poorly preserved plant fossils, Ptilophyllum, Zamites and Klukia? collected from middle part of Tembeling Fm, N of Maran, Pahang. Affinities with Rhaetian and Liassic species. Also Paracalamites, probably of Triassic age described from N of Mentakab, Pahang)

Sevastjanova, I. (2007)- Detrital heavy minerals from the Malay Peninsula. M.Sc. Thesis, Royal Holloway, University of London, p. 1-155. *(Unpublished)*

Sevastjanova, I., B. Clements, R. Hall, E.A. Belousova, W.L. Griffin & N. Pearson (2011)- Granitic magmatism, basement ages, and provenance indicators in the Malay Peninsula: insights from detrital zircon U-Pb and Hf-isotope data. *Gondwana Research* 19, 4, p. 1024-1039.

(online at: http://searg.rhul.ac.uk/pubs/sevastjanova_etal_2011%20Malay%20zircons.pdf)

(Malay Peninsula two continental blocks, Sibumasu and E Malaya, with two granitoid provinces: Main Range and Eastern. U-Pb analyses on zircons from Malay Peninsula river sands suggest three Permian-Triassic episodes of granitoid intrusives, two in E Province: (a) Permian, crustally-derived (~280 Ma), (b) E-M Triassic, Eastern Province, mixed mantle-crust sources (~220-250 Ma), (c) Late Triassic Main Range, crustally-derived (~180-220 Ma). Sibumasu- E Malaya collision probably in Late Permian-E Triassic. Mainly Paleoproterozoic basement ages for Sibumasu (1.9-2.0 Ga) and East Malaya (1.7-2.0 Ga) blocks)

Shah, A.K. & M.A.K. Azizi (1995)- An overview of the mineralization and mineralogical characteristics of the goldfields from Central Belt of Peninsular Malaysia., *Proc. International Conference Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005)*, Khon Khean, p. 188-199.

Sharma, J.S., J. Chu & J. Zhao (1999)- Geological and geotechnical features of Singapore: an overview. *Tunneling and Underground Space Technology* 14, 4, p. 419-431.

(One-third of Singapore Island underlain by Triassic Bukit Timah granite and Gombak norite in center and N. In W common intensely folded (strike NW-SE), low-metamorphic Late Triassic or E-M Jurassic Jurong Fm sediments (incl. Late Triassic Pandan Limestone in borehole at Pandan Reservoir in lower part))

Shi, G.R., M.S. Leman & B.K. Tan (1997)- Early Permian brachiopods from upper Singa Formation of Langkawi Island, northwestern Peninsular Malaysia: biostratigraphical and biogeographical implications. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok, Dept. Mineral Resources (DMR), 1, p. 62-72.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(Two assemblages of E Permian (Sakmarian) brachiopods from pebbly mudstones and associated bryozoan limestones of U Singa Fm of Langkawi island, incl. Kasetia, Bandoproductus, Stenosisma, Sulciplica, Spinomartinia prolifica, etc. Comparable to peri-Gondwanan assemblages now in Cimmerian terranes (S Thailand, Lhasa, Baoshan, SE Pamir). Transitional between cool Gondwanan and warm Cathaysian faunas)

Shi, G.R. & J.B. Waterhouse (1991)- Early Permian brachiopods from Perak, West Malaysia. *J. Southeast Asian Earth Sciences* 6, p. 25-39.

(New Permian brachiopod fauna of probable Sakmarian (E Permian) age from Nam Loong 1 Mine of Kinta Valley, W of Kampar, Perak, on Sibumasu Terrane. Material collected by Gobbett below fossiliferous H.S. Lee Beds (Pseudofosulina krafftii and Misellina claudiae fusulinid zones; Ishii 1966). Nam Loong beds ~150m thick, with crinoid limestone of at base, overlain by brachiopod limestone)

Shoieb, M.A., H.T. Gebretsadik, S.M. Ibad & O. Rahmani (2022)- Depositional environment and hydrocarbon distribution in the Silurian-Devonian black shales of Western Peninsular Malaysia using spectroscopic characterization. *Minerals (MDPI)* 12, 1501, p. 1-17.

(online at: <https://doi.org/10.3390/min12121501>)

(Silurian-Devonian Kroh black shales of W Malay Peninsula. Total organic carbon content 0.33- 8.5 %, organic matter thermally overmature, organic matter with plant-derived hydrophilic minerals, etc.)

Shoieb, M.A., C.W. Sum, M.S. Ismail, H.T. Gebretsadik & O. Esther (2020)- Geological field characteristic of the Kroh Formation in the Upper Perak shales, western Peninsula Malaysia. *J. Natural Gas Geoscience* 5, 1, p. 29-32.

(online at: <https://www.sciencedirect.com/science/article/pii/S2468256X20300018>)

(25% of sedimentary rocks of Peninsular Malaysia made up of Paleozoic black shales. Samples of carbonaceous black shales from the Paleozoic Kroh Fm in Western Belt (Sibumasu) with TOC 2-7%, indicating good (unconventional?) hydrocarbon potential)

Shuib, M.K. (2000)- Synsedimentary tectonic control of the Permo-Triassic Central Basin sedimentation. In: G.H. Teh et al. (eds.) *Proc. Geological Society Malaysia Annual Geological Conference 2000*, Pulau Pinang, p. 45-49.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_07.pdf)

(Sediments in C basin 2 depositional sequences: (1) Permian-E Triassic continental sediments at base, grading into shallow marine to deeper marine at top, marking opening of basin; (2) (M - Late Triassic deep marine turbidites and volcanoclastics grading upward into shallow marine sediments, marking rifting of basin followed by closure. Evidences for syn-sedimentary tectonism: shumps, normal and strike-slip faults, syn-sedimentary folds and shale injection structures. Permo-Triassic Central Basin N-S graben-like configuration with Bentong-Raub Zone as W margin and Lebir Fault Zone in E. Deep basin in central areas represented by Semantan Fm. Dextral transpressive and transtensive faults suggest basin is strike-slip control basin)

Shuib, M.K. (2000)- The olistostromes in the Bentong Area, Pahang and their tectonic implications. In: G.H. Teh et al. (eds.) *Proc. Geological Society Malaysia Annual Geological Conference 2000*, Pulau Pinang, p. 51-55.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_08.pdf)

(Two types of (Permian?) olistostromes in Bentong area: (1) intercalated with cherts (deep marine gravity flow deposits) and (2) intercalated with sandstone/shale layers (may be shallow marine to continental sediments). Deformed by sub-vertical strike-slip faults. Interpreted as deep continental margin deposits along Bentong-Raub Zone suture zone, inverted by Late Triassic time (no mention of possibility of glacio-marine facies))

Shuib, M.K. (2000)- Syndepositional deformation in the Permo-Triassic and Latest Triassic to Cretaceous Central belt of Peninsular Malaysia. *Proc. Geological Society Malaysia Conference Dynamic stratigraphy and tectonics of Peninsular Malaysia, Third Seminar, The Mesozoic of Peninsular Malaysia*, Kuala Lumpur 2000, p. 30-47.

Shuib, M.K. (2000)- The Mesozoic tectonics of Peninsular Malaysia. *Proc. Geological Society Malaysia Conf. Dynamic stratigraphy and tectonics of Peninsular Malaysia, Third Seminar, The Mesozoic of Peninsular Malaysia*, Kuala Lumpur 2000, p. 106-126.

Shuib, M.K. (2009)- Structures and deformation. In: C.S. Hutchison & D.N.K. Tan (eds.) *Geology of Peninsular Malaysia*, University Malaya and Geological Society Malaysia, p. 271-308.

Shuib, M.K. & A.A. Ghani (2003)- 'Mantle plume' type magmatism in the Central Belt of Peninsular Malaysia and its tectonic implications. *Bull. Geological Society Malaysia* 42, p. 365-371.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2003058.pdf>)

(Central Belt granitoids just E of Bentong-Raub Line, with distinct geochemical characteristics. Late Jurassic-Lower Cretaceous K/Ar ages, but also more reliable Rb/Sr age of 207 Ma (latest Triassic) for Benom Pluton. High Ba and Sr values may result from penetration of lower lithosphere by mantle material ('mantle plume' type magmatism). Bimodal magmatism, with significant time (up to 30 Myrs) between first mafic magmatism and later felsic magmatism. C Belt plutons post-orogenic and penecontemporaneous with rapid post-orogenic uplift and erosion with development of Jurassic-Cretaceous continental deposits of C Basin Model proposed involves oblique convergence of two tectonic provinces of Peninsular Malaysia, followed by slab breakoff leading to linear belt of single plutons characterized by high-K, shoshonitic granitoids with high Ba and Sr)

Shuib, M.K. & A.Hadi Abd Rahman (1999)- A five-fold stratigraphic and tectonic subdivision of the Malay Peninsula and the implications on its tectonic evolutionary history. Proc. First Seminar Problem & issues relating to the stratigraphy and tectonic of Peninsular Malaysia, Kuala Lumpur 1999, Geological Society Malaysia, p. 38-64.

Shuib, M.K. & A.Hadi Abd Rahman (2000)- The Mesozoic of the Central Belt of the Malay Peninsula- Part II: Basin configuration and tectonism. Proc. Geological Society Malaysia Conference Dynamic stratigraphy and tectonics of Peninsular Malaysia, Third Seminar, The Mesozoic of Peninsular Malaysia, Kuala Lumpur 2000, p. 74-95.

(see Abd Rachman & Shuib (2000) for Part I)

Singh, D.S., L.H. Chu, L.H. Teoh, P. Loganathan, E.J. Cobbing & D.I.J. Mallick (1984)- The Stong Complex: a reassessment. Bull. Geological Society Malaysia 17, p. 61-77.

(online at: www.gsm.org.my/products/702001-101160-PDF.pdf)

(Stong Complex of plutonic and metamorphic rocks in NW Kelantan with three granitoid components. Earliest two phases Triassic or younger deformed; third phase undeformed Late Cretaceous (64, 67 Ma) pink granites)

Smiley, C.J. (1970)- Later Mesozoic flora from Maran, Pahang, West Malaysia, Part 1: Geological considerations. Bull. Geological Society Malaysia 3, p. 77-88.

(online at: www.gsm.org.my/products/702001-101372-PDF.pdf)

(Plant fossils from Tembeling Fm 4 mi N of Maran, C Malay Peninsula. Include tree fern *Gleichenoides* spp., conifer *Frenelopsis* and others. Maran florules identical to Gagau flora from N Pahang (Kon'no 1967, 1968) and resemble Neocomian species from other areas. Probably represents open forest flora under climate with distinct dry season)

Smiley, C.J. (1970)- Later Mesozoic flora from Maran, Pahang, West Malaysia, Part 2: Taxonomic considerations. Bull. Geological Society Malaysia 3, p. 89-113.

(online at: www.gsm.org.my/products/702001-101371-PDF.pdf)

(16 plant megafossil species in Maran area: 5 pteridophytes (*Gleichenoides*, *Equisetites*), 5 cycadophytes (*Olozmites*, *Ptilophyllum*, *Zamites*, 1 conifer (*Frenelopsis*). No records of *Ginkgophytes* or *Angiosperms* (*Dicotyledons*) in Neocomian floras of W Malaysia)

Snelling, N.J., J.D. Bignell & R.D. Harding (1968)- Ages of Malayan granites. *Geologie en Mijnbouw* 47, 5, p. 358-359.

(online at: <https://drive.google.com/file/d/0B7j8bPm9Cse0dzhzY3RmVEdvWFk/view>)

(Summary of results of Rb-Sr whole rock age determinations on Malayan granites. Ages of intrusion Late Carboniferous (280-300 Ma), M Triassic and Late Cretaceous (~70 Ma). Triassic granites intruded in two episodes at ~230 Ma and 200 Ma. Most K-Ar ages on micas disturbed by younger intrusions and events)

Sone, M. & M.S. Leman (2000)- Some mid-Permian fossils from Felda Mayam, Central Peninsular Malaysia. Proc. Geological Society Malaysia Annual Conference 2000, Pinang, p. 143-150.

(online at: https://gsmpubl.files.wordpress.com/2014/10/age2000_20.pdf)

(Small suites of early M Permian ammonoids (*Agathiceras*, *Bamyaniceras*), brachiopods (*Dicystoconcha*, *Leptodus*), bivalves, crinoids and plants (*Taeniopteris*) from Felda Mayam area, C Pahang. Represents N-most extent of Bera Fm. Permianellid brachiopod genus recorded in Malaysia for first time. Age Roadian-Wordian. Brachiopod assemblage suggests warm-water Tethyan affinities)

Sone, M. & M.S. Leman (2005)- Permian linoproductoid brachiopod *Permundaria* from Bera South, Peninsular Malaysia. *Journal of Paleontology* 79, 3, p. 601-606.

(*Permundaria* is uncommon genus confined to M- early Late Permian of (Paleo-)Tethys New species *Permundaria perplexus* in Wordian, Middle Permian Bera Fm, Pahang, Malay Peninsula (genus also recorded from Jambi, C Sumatra as *Strophomena analoga*; Meyer 1922) (in or near Paleotethys suture?; JTVG))

- Sone, M. & M.S. Leman & M. Ehiro (2001)- Middle Permian cephalopods from central Peninsular Malaysia: implications for faunal migration through the southern Tethys. *J. Asian Earth Sciences* 19, 6, p. 805-814.
(*Wordian (early M Permian) cephalopod fauna in steeply dipping shales- tuffaceous sandstones at Bera South, S Pahang, dominated by Agathiceras. Also ammonoids Tauroceras, Bamyaniceras and Pronoritidae and nautiloids Tainoceras and Orthocerida. Presence of Tauroceras. aff. scrobiculatum suggests correlation with S Tethys strata of NE Iraq, N Oman and Sicily*)
- Sone, M., M.S. Leman & I. Metcalfe (2004)- Triassic nautiloid *Sibyllonautilus* from Gua Bama, Peninsular Malaysia and its regional stratigraphic implications. *Alcheringa* 28, 2, p. 477-483.
(*E Triassic coiled nautiloid Sibyllonautilus bamaensis n.sp. from top of Gua Bama limestone hill in Pahang, Peninsular Malaysia, suggests Late Permian- earliest Triassic (Lopingian- Anisian) age for Gua Bama sponge-algal reefal limestone section, just E of Bentong-Raub suture. Overlies Permian tuffaceous Leptodus brachiopod shales*)
- Sone, M., M.S. Leman & G.R. Shi (2001)- Middle Permian brachiopods from central Peninsular Malaysia-faunal affinities between Malaysia and west Cambodia. *J. Asian Earth Sciences* 19, p. 177-194.
(*online at: https://www.academia.edu/4148889/Middle_Permian_brachiopods_from_central_Peninsular_Malaysia_faunal_affinities_between_Malaysia_and_west_Cambodia*)
(*Moderately diverse M Permian brachiopod fauna from Bera District, C Pahang, 'Central Basin' of Peninsular Malaysia (on E Malaya Plate). In N Bera Fm associated with Late Permian andesitic volcanics. Near top of section fusulinids Sumatrina, Verbeekina, etc. and common Leptodus-like lyttonid brachiopods here called Gubleria. Brachiopods 19 species, typically warm-water Tethyan. Strong linkage to Yabeina beds of Sisophon Lst, W Cambodia. Possible E Capitanian (M Permian) age*)
- Sone, M., I. Metcalfe & M.S. Leman (2003)- Palaeobiogeographic implications of Middle Permian brachiopods from Johore (Peninsular Malaysia). *Geological Magazine* 140, 5, p. 523-538.
(*online at: <https://rune.une.edu.au/web/bitstream/1959.11/1269/5/open/SOURCE02.pdf>*)
(*New M Permian brachiopods fauna from folded tuffaceous sandstone at Sermin, N Johore, with Pseudoleptodus, Neochonetes, etc., associated with ammonoid Agathiceras sp. No diagnostic Cathaysian taxa, but minor Sibumasu elements present. Locality just E of Bentong-Raub suture on E Malaya terrane of Cathaysian province, suggesting species interchange between shallow waters of E Malaya and Sibumasu across Paleo-Tethys (Sibumasu, Timor (Bitauni) and W Irian Jaya dominantly Gondwanan affinity and cooler, higher latitude than E Malaya)*)
- Sone, M., I. Metcalfe & M.S. Leman (2008)- Search for the Permian-Triassic boundary in central Peninsular Malaysia: preliminary report. *Permophiles* 51, p. 32-34.
(*online at: <http://permian.stratigraphy.org/files/20121027153250868.pdf>*)
(*Permian- Triassic transition in C Malay Peninsula present in basal parts of Gua Bama and Gua Sei limestones. Conodonts Isarcicella isarcica and Hindeodus parvus indicate basal Triassic age of limestone overlying Upper Permian Colaniella-bearing limestone and lyttonoid brachiopod (Leptodus) shales*)
- Sone, M., I. Metcalfe & M.S. Leman (2011)- Where is the Permian-Triassic boundary (PTB) in central Peninsular Malaysia? *Proc. 24th National Geoscience Conference (NGC 2011), Johor Baru*, P2-25, p. 152.
(*Abstract only*)
(*online at: http://geology.um.edu.my/gsmpublic/NGC2011/NGC2011_Proceedings.pdf*)
(*Permian- Triassic boundary defined by first appearance of conodont species Hindeodus parvus, now indicated to be 252.3 Ma by zircon U-Pb dating. In Pahang, C Peninsular Malaysia, several limestone sections contain Permian- Triassic boundary, incl. Gua Bama and Gua Sei*)
- Spiller, F.C.P. (1996)- Late Paleozoic radiolarians from the Bentong-Raub suture zone, Peninsular Malaysia. *The Island Arc* 5, 2, p. 91-103.
(*Radiolarians from deep marine siliceous sediments in melange of Bentong-Raub suture zone contain 7 radiolarian zones from 10 localities: Late Devonian (Famennian), E Carboniferous (Tournaisian and Visean)*)

and E Permian. Suggests (Paleotethys) ocean existed between Sibumasu and East Malaya terranes from at least Late Devonian- late E Permian time)

Spiller, F.C.P. (1997)- Radiolarian biostratigraphy of Peninsular Malaysia and implications for regional palaeotectonics and palaeogeography. Ph.D. Thesis, University of New England, Armidale, p. 1-292?

(online at: <https://rune.une.edu.au/web/handle/1959.11/10916>)

(Study of 97 species of radiolara from 1289 samples from Malay Peninsula. Palaeo-Tethyan suture zone not narrow 13-18 km wide zone, but may extend further W. Gondwanan-affinity Sibumasu terrane narrower than commonly defined and includes only passive margin continental sequences. All radiolarian-bearing chert and argillite, belts of melange and imbricate thrust slices of marine sedimentary rocks in accretionary complexes are of Palaeo-Tethyan origin, and form distinct accretionary complex terrane which has been thrust W-wards over E-ward-dipping Sibumasu terrane. Similar U Devonian- M Triassic (Ladinian) radiolarian faunas in Bentong-Raub, Uttaradit-Nan/Sra Kao and Changning-Menglian Paleotethys suture zone)

Spiller, F.C.P. (2002)- Radiolarian biostratigraphy of Peninsular Malaysia and implications for regional palaeotectonics and palaeogeography. *Palaeontographica Abt. A*, 266, p. 1-91.

Spiller, F.C.P. & I. Metcalfe (1995)- Late Palaeozoic radiolarians from the Bentong-Raub suture and the Semanggol Formation of Peninsular Malaysia- initial results. *J. Southeast Asian Earth Sciences* 11, 3, p. 217-224.

(Cherts and tuffaceous siltstones from Bentong-Raub suture zone, Peninsular Malaysia, with Late Devonian and E Carboniferous radiolarians. Cherts deposited in Paleo-Tethys ocean between Sibumasu and East Malaya. Also radiolarians from siliceous Semanggol Fm of NW Peninsular Malaysia (Sibumasu Block), with E and Late Permian and M Triassic ages, extending age of Semanggol Fm down to E Permian and confirms presence of deep-marine basin in NW Malay Peninsula during Permian)

Spiller, F.C.P. & I. Metcalfe (1995)- Paleozoic and Mesozoic radiolarian biostratigraphy of Peninsular Malaysia. *Proc. IGCP Symposium on Geology of SE Asia, Journal of Geology, Hanoi, ser. B*, 5-6, p. 75-93.

(Similat to Spiller & Metcalfe 1995. Late Devonian- late E Permian radiolaria from highly deformed pelagic marine sediments in ~13-18 km wide tectonic melange/ imbricate thrust slices of Raub-Bentong suture (Paleotethys) of Malay Peninsula)

Stait, B.A. & C.F. Burrett (1982)- *Wutinoceras* (Nautiloidea) from the Setul Limestone (Ordovician) of Malaysia. *Alcheringa* 6, p. 193-196.

(Common straight nautiloid Wutinoceras robustum in Ordovician Setul Limestone of Langkawi islands)

Stauffer, P.H. (1969)- Tin mineralisation and faults in the Kuala Lumpur region. *Newsletter Geological Society Malaysia* 20, p. 5-7.

(Tin mineralisation in KL area may be related to fault zones, especially WNW trending faults, which may sinistrally offset primary tin lodes by ~70 km)

Stauffer, P.H. (1971)- Quaternary volcanic ash at Ampang, Kuala Lumpur; West Malaysia. *Newsletter Geological Society Malaysia* 33, p. 5-8.

(White fine-grained and rhyolitic ash layer, 0.45m thick, in sequence of alluvium and peat exposed by tin mining. Correlated with ash previously reported from Perak and Pahang (= Young Toba Tuff?; JTvG))

Stauffer, P.H. (1973)- The Kuala Lumpur fault zone- a proposed major strike-slip fault across Malaya. *Geological Society Malaysia Newsletter* 15, p. 2-4.

Stauffer, P.H. (1973)- Kenny Hill Formation. In: D.J. Gobbett & C.S. Hutchison (eds.) *Geology of the Malay Peninsula*, John Wiley Interscience, New York, p. 87-91.

(Thick, gently folded, unfossiliferous ?Permian clastics formation near Kuala Lumpur)

Stauffer, P.H. (1974)- Malaya and Southeast Asia in the pattern of continental drift. Bull. Geological Society Malaysia 7, p. 89-138.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1973026.pdf>)

(Review of early plate tectonic models of SE Asia)

Stauffer, P.H. (1974)- Petrology of some Malayan conglomerates and their implications. Geological Society Malaysia Newsletter 47, 1, p. 7-8. (Abstract only)

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1974002.pdf>)

(Submarine channel fill in (E Permian, glacio-marine) Singa Fm at Pulau Singa Besar, Langkawi, evidently, emplaced by mass flow, possibly in deep water. It is highly calcareous and contains shell fragments, implying resedimentation from shallow marine waters. Megaclasts include variety of rock types: sandstone, fossiliferous limestone, shales, acid tuffs and ignimbrites and acid plutonics. Relative absence of metamorphic rocks suggests plutonics formed crystalline basement beneath sediments)

Stauffer, P.H. (1980)- The Singa Formation: is it a glacial deposit? Warta Geologi (Newsletter Geological Society Malaysia) 6, p. 33-34. (Abstract only)

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1980002.pdf>)

(Singa Fm in Langkawi forms most of clastic interval between Lower Paleozoic (Setul Fm.) and Permian (Chuping/Jong Fm.) carbonates. Generally unfossiliferous, fine-grained and carbonaceous, but with numerous scattered pebbles and boulders. Pebbly mudstone facies part of 2000 km long facies belt. Clasts of plutonic rock are exotic, as no pre-Carboniferous acid plutons known in Malaya, S Thailand or Sumatra. Most likely of glacial origin, at Gondwana margin (see also Stauffer & Lee 1986))

Stauffer, P.H. (1984)- Distribution of tektite finds in Malaysia and immediately adjacent territories. Federation Museums Journal, Kuala Lumpur, 29, p.

Stauffer, P.H. & C.P. Lee (1986)- Late Paleozoic glacial marine facies in Southeast Asia and its implications. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 363-397.

(Carbo-Permian glacial-marine pebbly mudstones in S. Thailand, Langkawi islands (Singa Fm) and other areas form 2000 km long belt from Sumatra to C Burma. This suggests W side of Western SE Asia was attached to Gondwanaland in Carbo-Permian, while warm-climate Permian floras on other blocks suggest separate drift histories)

Stauffer, P.H. & C.P. Lee (1987)- The Upper Palaeozoic pebbly mudstone facies of peninsular Thailand and western Malaysia- continental margin deposits of Palaeoeurasia- Discussion. Geologische Rundschau 76, p. 945-948.

(Discussion of Altermann (1986) paper. Disputes Altermann's conclusions that Paleozoic pebbly mudstones are not glacial deposits)

Stauffer, P.H. & N. Mantajit (1981)- Late Palaeozoic tilloids of Malaysia, Thailand and Burma. In: M.J. Hambrey & W.B. Harland (eds.) Earth's Pre-Pleistocene glacial records. Cambridge University Press, p. 331-335.

(Brief review of Carboniferous- earliest Permian glacial deposits. Extend from southern Malay Peninsula through W Thailand (Phuket region), Myanmar, into SW China. Best known section is thick Singa Fm of Langkawi islands, NW Malaya. Most common clasts quartz sandstones, minor limestone, granite, trondhjemite. Generally overlain by late E- M Permian limestone (Chuping Lst in Malaya, Ratburi Lst in Thailand, Plateau Lst in E Myanmar))

Stauffer, P.H. & N.J. Snelling (1977)- A Precambrian trondhjemite boulder in Palaeozoic mudstones of NW Malaya. Geological Magazine 114, 6, p. 479-482.

(Possible Precambrian-age leucotonalite clasts with K-Ar age of 1029 ± 15 Ma in 'pebbly mudstone' of E Permian Singa Fm of Pulau Tepor, SW Langkawi Islands, NW Malaysia)

Styles, M.T., D.J. Bland & P.D. Wetton (1995)- Characterisation of gold from Mersing, Johore, Malaysia British Geological Survey (BGS), Overseas Geology Series, Technical Report WG/94/7, p. 1-23.
(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19797716.pdf>)
(*Mersing gold in mesothermal quartz veins in Permo-Carboniferous shale sequence, a type of mineralization common in Malay Peninsula (but no bedrock gold found here, only alluvial gold)*)

Sulaiman, A., K. Hassan & H.D.Tjia (2003)- The Holocene optimum in Malaysia. Minerals and Geoscience Department Malaysia, Technical Papers 2, p. 37-67.
(*In Peninsular Malaysia Holocene climate optimum coincides with peak of Holocene transgression. Between ~6500- 4000 years BP sea levels of >2 m above present known from many localities in Peninsular Malaysia (maximum at ~4m above sealevel at ~5 ka)*)

Suntharalingam, T. (1968)- Upper Palaeozoic stratigraphy of the area west of Kampar, Perak. Bull. Geological Society Malaysia 1, p. 1-15.
(online at: www.gsm.org.my/products/702001-101386-PDF.pdf)
(*Marine sediments of tin mines area of Kampar W Central Malay Peninsula, estimated to be >5500' thick, divided into six units of M Devonian- M Permian ages, dominated by oolitic-shelly limestones, with thick dolomites in lower unit (= part of Sibumasu Block Late Paleozoic). With molluscs and tabulate corals*)

Suntharalingam, T. (1983)- Cenozoic stratigraphy of Peninsular Malaysia. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 149-158.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_08.pdf)

Surjono, S.S. & M.S. Leman (2010)- Origin of the Late Paleozoic metamorphic rocks in East Johor, Peninsular Malaysia. J. Southeast Asian Applied Geology (UGM) 2, 2, p. 70-80.
(*Late Carboniferous low-grade metasediments widely distributed in E Johor and extend N to N Terengganu area. Protolith >5000m thick shallow marine clastics, formed in rift-passive margin at W side of W Indochina-E Malaya continental block during rifting of this block from Gondwanaland*)

Surjono, S.S., M.S. Leman, C. Aziz Ali & K.R. Mohamed (2004)- A review of the Palaeozoic lithostratigraphy of East Johor, Malaysia. Bull. Geological Society Malaysia 49, p. 71-78.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004013.pdf>)
(*E Johore, SE Malay Peninsula, Carboniferous metasediments unconformably overlain by Permian clastics, E-M Permian limestones and ?Late Permian volcanics, intruded by Triassic-Jurassic granites*)

Surjono, S.S., M.S. Leman, K.R. Mohamed & C. Aziz Ali (2007)- The Paleozoic continental rudaceous rock in East Johor. Proc. Joint Convention 32nd HAGI, 36th IAGI and 29th IATMI, Bali 2007, JCB2007-095, p. 580-592.
(online at: https://www.iagi.or.id/web/digital/28/2007_IAGI-Bali_The-Palaeozoic-Continental-Rudaceous-Rock-in-East-Johor.pdf)
(*Late Carboniferous- Late Permian conglomeratic sandstones in Murau, Tanjung Leman and Linggiu formations in E Johore, suggesting E Johore was continental to shallow marine depositional environment*)

Surjono, S.S., M.S. Leman, K.R. Mohamed & C. Aziz Ali (2009)- The occurrence of Palaeozoic conglomeratic rocks in East Johor, Peninsular Malaysia. J. Southeast Asian Applied Geology (UGM) 1, 2, p. 49-59.
(online at: <https://jurnal.ugm.ac.id/jag/article/view/7227/5666>)
(*Conglomeratic rocks in East Johor, SE Malay Peninsula, in three formations, believed to be of Late Carboniferous- Late Permian age. Formations near E coast interpreted as fan delta and braided stream deposits. In C Johor deposited by debris flows in shallow marine environment. Permian conglomerates with volcanic clasts, probably deposited in forearc environment*)

- Surjono, S.S., M.S. Leman, C. Aziz Ali, K.R. Mohamed & F.H. Mada M. (2019)- Petrogenesis and depositional environment of Paleozoic Sedili and Pengerang volcanoclastics in East Johor Basin, Peninsular Malaysia. Proc. 4th Int. Conference Science and Technology (ICST 2018) E3S Web of Conferences 76, 2, 04009, p. 1-10.
(online at: www.e3s-conferences.org/articles/e3sconf/pdf/2019/02/e3sconf_icst2018_04009.pdf)
(Permian volcanic rocks in Sedili and Pengerang Fms in E Johore basin, SE Malay Peninsula E Malaya block, similar characteristics. Calk-alkaline, mainly acidic rocks, presumably in active margin subduction setting)
- Surjono, S.S., M.S. Leman, K.R. Mohamed & C.Aziz Ali (2021)- A combined petrographic-geochemical provenance and tectonic setting study of Palaeozoic Rocks, in East Johor Basin, Peninsular Malaysia. Indonesian J. on Geoscience (IJOG) 8, 1, p. 11-24.
(online at: <http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/496/323>)
(Paleozoic greywacke sandstones in three different formations in East Johor Basin. Magmatic arc provenance for Dohol Fm, change from magmatic to recycled orogen for Linggiu Fm and recycled orogen for Tanjung Leman Fm. Sediments in E Johor deposited in subduction-related basin (fore-arc, magmatic arc, back-arc)
- Takahashi, Y., S. Agematsu, M.N. Abdul Rahman & K. Sashida (2017)- Lowermost Devonian conodonts from the Setul Group, northwestern Peninsular Malaysia. J. Geological Society Japan 123, 11, p. 989-997.
(online at: https://www.jstage.jst.go.jp/article/geosoc/123/11/123_2017.0040/_pdf)
(Lowermost Devonian conodont fauna with *Flajsella stygia* and *F. streptostygia* from 'Mempelam Lst' (U Setul Gp) near Kaki Bukit, NW Malay Peninsula, previously considered to be Ordovician. Nine species of conodonts)
- Tamura, M. (1968)- *Claraia* from North Malaya, with a note on the distribution of *Claraia* in Southeast Asia. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 5, p. 78-87.
(Two species of E Triassic (M Scythian) thin-shelled marine bivalve *Claraia* from folded limestone-shale series in N Pahang and S Kelantan, C Malay Peninsula: *C. intermedia multistriata* and *C. griesbachi concentrica* (latter species also described from Timor by Krumbeck 1924))
- Tamura, M. (1970)- Pteriacea from Malayan Triassic. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 8, p. 133-149.
(Species of *Pteria*, *Cassianella*, *Hoernesia* and *Bakevellia* from Chegar Perah, Kuala Lipis, Temerloh and Fort Iskandar, Pahang. Temerloh faunas may be slightly younger, but others of M Triassic affinities)
- Tamura, M. (1973)- Pectinids from Malayan Triassic. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 12, p. 115-131.
(M Triassic pectinid bivalves from 'Myophoria sandstone' from central- east parts of Malay Peninsula. With *Chlamys*, *Entolium*, etc.)
- Tamura, M. (1973)- Some Triassic bivalves from Malaya. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 12, p. 133-148.
(Descriptions of bivalve molluscs of M Triassic, mainly Chegar Perah area (not incl. myophoriids and pectiniids described by Tamura 1970, 1973). *Nuculana*, *Palaeonucula*, *Grammatodon*, *Pinna*, etc.)
- Tamura, M., W. Hashimoto, H. Igo, T. Ishibashi, J. Iwai, T. Kobayashi, T.Koike, K.Pitakpaivan, T. Sato & E.H. Yin (1975)- The Triassic system of Malaysia and adjacent areas. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 15, p. 103-149.
- Tan, B.K. (1981)- On the supposed existence of the Kisap thrust in the Langkawi Islands, Northwest Peninsular Malaysia. Bull. Geological Society Malaysia 14, p. 127-134.
(online at: www.gsm.org.my/products/702001-101194-PDF.pdf)
(Kisap thrust described by Koopmans (1965) in E part of Langkawi islands is only large thrust fault described in Peninsular Malaysia, but existence of large scale thrusting questionable. Nature of contact between Lower and U Paleozoic rocks interpreted as thrust cannot be satisfactorily resolved at present)

- Tan, B.K. (1981)- Structures in Peninsular Malaysia and their interpretations. Bull. Geological Society Malaysia 15, p. 1-7.
(online at: www.gsm.org.my/products/702001-101191-PDF.pdf)
- Tan, B.K. (1984)- The tectonic framework and evolution of the Central Belt and its margins, Peninsular Malaysia. Bull. Geological Society Malaysia 17, p. 307-322.
(online at: www.gsm.org.my/products/702001-101149-PDF.pdf)
(On difficulties in defining boundaries of Central Belt of Malay Peninsula, and interpretation of Bentong-Raub suture as graben instead of suture zone)
- Tan, B.K. (1996)- 'Suture zones' in peninsular Malaysia and Thailand: implications for palaeotectonic reconstruction of Southeast Asia. J. Southeast Asian Earth Sciences 13, p. 243-249.
(Critical review of suture zones postulated in many paleotectonic reconstructions (Bentong-Raub and Kuala Lebir fault zone in Peninsular Malaysia and Chiang Mai-Chiang Rai, Nan-Uttaradit, etc. in Thailand))
- Tan, B.K. & T.T. Khoo (1978)- Review of the development in the geology and mineral resources of Malaysia and Singapore. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, Asian Institute of Technology, p. 655-671.
- Tan, B.K. & T.T. Khoo (1981)- Ultramafic rocks in Peninsular Malaysia and their tectonic implications. In: P. Nutalaya (ed.) Proc. 4th Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA IV), Manila 1981, Geological Society Philippines, p. 259-264.
(Argue that serpentinitised ultramafics in Bentong-Raub zone not remnants of ancient oceanic lithosphere)
- Tan, B.K. & T.T. Khoo (1993)- Clinopyroxene composition and tectonic setting of the Bentong-Raub belt, Peninsular Malaysia. In: B.K. Tan et al. (eds.) Proc. 7th Conf. Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 539-545.
(Bentong Raub belt is N-S trending topographically negative feature across Malay Peninsula from Tomo in S Thailand to Malacca, with small bodies of serpentinitized mafic and ultramafic rocks. Clinopyroxenes from pyroxenite, metagabbro and amphibolite indicate alkaline character, suggesting continental rather than subduction zone origin)
- Tan, B.K. & S.P. Sivam (1971)- A fossil "Portuguese Man-of-War" (Velellidae) from the Paleozoic of the Raub area, Pahang, West Malaysia. Newsletter Geological Society Malaysia 33, p. 8-12.
(Well preserved imprints of jellyfish occur in metasedimentary rocks of probable Carboniferous age along Cheroh River)
- Tan, D.N.K. (1980)- Siliceous deposits of Malaysia. Geological Survey of Malaysia, Geological Papers 3, p. 100-113.
(Review of chert occurrences in Peninsular Malaysia (mainly Lower Paleozoic- Lower Mesozoic) and W Sarawak- E Sabah (some U Carboniferous- Lower Permian, mainly Mesozoic, some Tertiary))
- Tang, H.Y. (2022)- Systematic palaeontology of marine Carboniferous fossils from Bukit Buchu, Terengganu, Peninsular Malaysia. M.Sc. Thesis, University of Malaya, Kuala Lumpur, p. 1-147. (Unpublished)
- Tang, H.Y., E.V. Mychko, R.M Feldmann, C.E. Schweitzer. H. Shaari & M. Sone (2021)- *Malayacyclus* gen. nov., the first Southeast Asian Cyclida (Crustacea) from the Early Carboniferous of Terengganu, Malaysia. Geological Journal 56, p. 6022-6030.
(online at: https://www.researchgate.net/publication/350722895_Malayacyclus_gen_nov_the_first_Southeast_Asian_Cyclida_Crustacea_from_the_Early_Carboniferous_of_Terengganu_Malaysia)
(New genus and species of Cyclida (Crustacea) from E Carboniferous (Visean) of Terengganu, eastern Malay Peninsula (East Malaya Block))

Tang, H.Y., M. Sone, D.K. Brezinski, H. Shaari, Y.H. Teng & F.I. Minhat (2024)- Revision of the Early Carboniferous trilobite *Linguaphillipsia*, with a new species from Terengganu in Peninsular Malaysia. *Alcheringa* 48, 3, p. 1-16.

(online at: https://www.academia.edu/130494621/Revision_of_the_Early_Carboniferous_trilobite_Linguaphillipsia_with_a_new_species_from_Terengganu_in_Peninsular_Malaysia)

(*E Carboniferous trilobite Linguaphillipsia restricted paleogeographical distribution around tropical Paleotethys Ocean, together with shallow marine margins of E Gondwana (Australia). New species, Linguaphillipsia buchuensis, from Bukit Buchu in Terengganu, NE Peninsular Malaysia (East Malaya Block)*).

Tate, R.B., D.N.K.Tan & T.F. Ng (2008)- Geological map of Peninsular Malaysia, scale 1:1,000,000. Geological Society Malaysia and University Malaysia.

Taylor, D. (1986)- Some thoughts on the development of the alluvial tinfields of the Malay-Thai Peninsula. In: G.H. Teh & S. Paramanathan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 1, *Bull. Geological Society Malaysia* 19, p. 375-392.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986028.pdf>)

(*Three categories of economic cassiterite placers in SE Asia: (1) 'kulit' residual deposits, formed in situ, without major lateral transport or sorting; (2) 'kaksa' washed-out residual deposits where coarser and heavier minerals remain close to source while finer and lighter minerals are removed; (3) 'mintjan' transported deposits. Phuket-Takuapa area of Thailand cassiterite derived largely from pegmatites and yields essentially kaksa placers. West Coast Tin Belt of Malay Peninsula and island of Bangka contain wide diversity of primary ore types all closely related to granite contacts. In Kuala Lumpur Tinfield tin roughly equally divided between kaksa placers close to granite contact and mintjan placers up to 25 km away. Substantial part of primary tin mineralisation in East Coast Tin Belt and in Belitung is exogranitic and characterized by fine cassiterite*)

Teh, G.H. (1981)- The Tekka tin deposit, Perak, Peninsular Malaysia. *Bull. Geological Society Malaysia* 14, p. 101-118.

(online at: www.gsm.org.my/products/702001-101196-PDF.pdf)

(*Tekka deposit is hard-rock tin deposit in Kinta Valley. Cassiterite in mineralized veins (5mm- 1m thick) in granites and schists, associated with Triassic Main Range biotite granite. Early high T mineralization with cassiterite, columbite/tantalite and wolframite, followed by late stage low T minerals galena and stibnite*)

Teng, Y.H., M. Sone, R. Hirayama, M. Yoshida, T. Komatsu, S. Khamha & G. Cuny (2019)- First Cretaceous fish fauna from Malaysia. *J. Vertebrate Paleontology* 39, 1, e1573735, p.

(*First Cretaceous fish fossils from Malaysia, in non-marine sediments in interior of Pahang State. Associated with dinosaur and turtle remains. Over 100 fish teeth, representing 6 species of freshwater hybodont sharks and 3 species of actinopterygians. Assemblage strong affinities with previously mostly endemic E Cretaceous (Barremian- E Aptian) faunas of Sao Khua Fm (Khorat Group) of Thailand*)

Teoh, L.H. (1992)- Geology and mineral resources of the Sungai Tiang area, Kedah Darulman. Geological Survey of Malaysia, Map Report 5, p. 1-93.

(*Geology of area in Kedah, NW Malay Peninsula, with Paleozoic- Mesozoic section including folded possibly 800m thick Permo-Triassic Semanggol Fm*)

Thomas, H.D. & C.T. Scrutton (1969)- Palaeozoic corals from Perak, Malaya, Malaysia. *Overseas Geology and Mineral Resources (Inst. Geological Sciences/ British Geological Survey)*, London, 10, 2, p. 164-171.

(online at: <https://pubs.bgs.ac.uk/publications.html?pubID=B07235>)

(*E Paleozoic coral from West Malaya/ Sibumasu Block. In old Wen Yoon Yuen tin mine pit, near Batu Gajah town, Kinta Valley, NW Malay Peninsula, solitary corals identified as Siphonophyllia cf. gigantea and Zaphrentes sp., indicating E Carboniferous (Tournaisian-Visean) age. Also Late Ordovician coral Quepora sp. and M Silurian- E Devonian Heliolites barrandei, Favosites allani and Favosites sp. from two tin mines near Kanthan, Kinta*)

- Tjia, H.D. (1972)- Strike-slip faults in West Malaysia. Proc. 24th Session International Geological Congress, Montreal, Section 3, Tectonics, p. 255-262.
- Tjia, H.D. (1978)- Structural geology of Peninsular Malaysia. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 673-682.
- Tjia, H.D. (1986)- Geological transport directions in Peninsular Malaysia. In: G.H. Teh & S. Paramanathan (eds.). Proc. 5th Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 149-177.
(Fold asymmetry, isoclinal folds and low-angle reverse faults are indicators of structural transport direction. All domains of Peninsular Malaysia suggest E-ward transport in oldest rocks (Lower Paleozoic), followed by movement to S (U Paleozoic), then in general W-ward direction (Late Triassic- E Jurassic))
- Tjia, H.D. (1987)- Olistostrome in the Bentong area, Pahang. Warta Geologi 13, p. 105-111.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1987003.pdf>)
(Steeply E-dipping metasediments including olistostrome horizons with large blocks in Raub- Bentong suture zone. Associated with serpentinite bodies)
- Tjia, H.D. (1989)- The Bentong suture. In: B. Situmorang (ed.) Proc. 6th Regional Conference Geology Mineral Hydrocarbon Resources of SE Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 73-85.
(Bentong suture or Raub-Bentong Line in Peninsular Malaysia is N-S trending, 13 km wide zone of deformed rocks. Two main belts: in W pre-Silurian quartz-graphite schists, in East E Silurian- Permian clastic-chert unit with small occurrences of serpentinite, crystalline limestone (incl. Permian fusulinid Lst) and red clastics. Also few 100m wide zones of olistostrome. Probably Paleozoic accretionary prism. Earliest vergence E- SE (= W-ward subduction); later vergence in opposite direction (= generally viewed as Paleotethys suture))
- Tjia, H.D. (1989)- Tectonic history of the Bentong-Bengkalis suture. Geologi Indonesia (IAGI) 12, 1 (Prof. Dr. J.A. Katili 60 years Special Volume), p. 89-111.
- Tjia, H.D. (1996)- Tectonics of deformed and undeformed Jurassic-Cretaceous strata of Peninsular Malaysia. Bull. Geological Society Malaysia 39, p. 131-156.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1996014.pdf>)
(Jurassic-Cretaceous strata in Peninsular Malaysia occur as folded sequences (Tembeling Gp, Koh Fm, Bertangga Sst) but also as undeformed, slightly tilted strata (Gagau Gp, Ulu Endau Fm, Panti San))
- Tjia, H.D. (1999)- Geological setting of Peninsular Malaysia. In: Petronas (1999) The petroleum geology and resources of Malaysia, p. 141-169.
(Review of regional geology of Malay Peninsula. Part of Sundaland. Two main basement domains: Mergui in W, Indosinia in E, separated by Bentong-Bengkalis suture zone. Oldest dated rocks of Cambrian age, in NW domain. Straits of Malacca with 15 Oligocene-Miocene grabens/ half-grabens in 4 N-S trending belts. Etc.)
- Tjia, H.D. (1999)- Pre-Tertiary hydrocarbon potential. In: Petronas (1999) The petroleum geology and resources of Malaysia, p. 605-635.
(Review of Pretertiary stratigraphy and structure of Malaysia. Pre-Permian deposits low or no hydrocarbon prospectivity. Permian sediments marine, including common limestone. M Triassic common flysch deposits. End Triassic- Jurassic start of continental deposition. Locally thick U Jurassic- Lower Cretaceous Tembeling Gp (6800m) in intermontane basins. No known hydrocarbon seeps associated with Paleozoic-Mesozoic rocks. Triassic locally moderately high TOC, but generally overmature. Other formations low in organic matter. Potential for hydrocarbons in Pretertiary of Malacca Straits, etc., sourced from Tertiary rifts))
- Tjia, H.D. (2000)- Tectonics of deformed and undeformed Jurassic-Cretaceous strata of Peninsular Malaysia. In: Dynamic stratigraphy and tectonics of Peninsular Malaysia, Geological Society Malaysia, 3rd Seminar- The Mesozoic of Peninsular Malaysia, p. 1-29.

- Tjia, H.D. & S.S. Almashoor (1996)- The Bentong Suture in southwest Kelantan, Peninsular Malaysia. Bull. Geological Society Malaysia, 39, p. 195-211.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1996017.pdf>)
(Bentong Suture in SW Kelantan 18 km wide. W border is injection complex with Titiwangsa granitoids, E border consists of bedded chert. Seven imbricated tectonic units, each comprising schist, phyllite, olistostrome, mudstone and chert form suture zone. A single serpentinite body between two of tectonic units. Units stacked at moderate - vertical dips, with SW vergence. E border zone has younger, postdocking chaotic assemblage with common large Permian crystalline limestone clasts, probably also olistostrome. Interpreted as accretionary prism composed of suture rocks that originated in E-M Paleozoic marine or oceanic region that closed by E Triassic through NE-ward subduction of sliver of Gondwana plate in W with Cathaysian plate in E)
- Tjia, H.D. & Z. Harun (1985)- Regional structures of Peninsular Malaysia. Proc. 20th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Kuala Lumpur 1983, 2, Technical Reports, p. 231-236.
(online at: <https://repository.unescap.org/items/904fe6cc-d317-490d-8289-296e15f5d015>)
(Brief discussion of main structural lineaments in Malay Peninsula and Sumatra)
- Tjia, H.D. & Z. Harun (1985)- Regional structures of Peninsular Malaysia. Sains Malaysiana 14, p. 95-107.
(Same paper as above)
- Tjia, H.D. & Anizan Isahak (1990)- Permian glaciogenic deposits at Salak Tinggi, Selangor. Sains Malaysiana 19, 1, p. 43-64.
- Tjia, H.D. & S.A. Sharifah Mastura (2013)- Sea level changes in Peninsular Malaysia: a geological record. Penerbit Universiti Kebangsaan Malaysia (UKM), p. 1-150.
- Tjia, H.D. & M.M. Zain (2002)- Shock structures in Peninsular Malaysia: evidence from Kedah and Pahang. Geological Society Malaysia Annual Geological Conference 2002, Kota Bharu, Kelantan, p. 103-109.
(online at: www.gsm.org.my/products/702001-100736-PDF.pdf)
(Double Mahsuri Rings in S C Langkawi are impact structures. Each ring 2.4 km across, with depths of 45-107m and part of series of 4 structures, representing serial impacts of extraterrestrial projectiles arriving from SW. Age post Triassic-Jurassic granite, but could be of Neogene age)
- Tokuyama, A. (1961)- On some Triassic pelecypods from Pahang Province, Malaya. Transactions Proceedings Paleontological Society of Japan 9, 44, p. 175-181.
(online at: https://www.jstage.jst.go.jp/article/prpsj1951/1961/44/1961_44_175/_pdf/-char/en)
(M Triassic bivalves from two localities in Lower Myophoria sandstone in Pahang. Three Myophoria species, also Neoschizodus laevigatus)
- Tsegab, H. & W.S. Chow (2019)- Chemostratigraphy of Paleozoic carbonates in the Western Belt (Peninsular Malaysia): A case study on the Kinta Limestone. Intechopen Open access chapter, p. 1-23.
(online at: <https://www.intechopen.com/chapters/66289>)
(see also Kinta Limestones papers by H.T. Gebretsadik;= apparently the same author)
(Devonian-Carboniferous Kinta Limestone of western Malay Peninsula mainly carbonate mudstones, siltstones, shales, and minor cherty units. Fine-grained textures, lack of siliciclastic detritus, presence of bedded cherts, high organic C content and uncommon benthic fauna suggest deposition in Paleotethys slope environment with low energy and low oxygen content)
- Tsegab, H., W.S. Chow, A.Y. Gatovsky, A.W. Hunter, J.A. Talib & S. Kassa (2017)- Higher-resolution biostratigraphy for the Kinta Limestone and an implication for continuous sedimentation in the Paleo-Tethys, Western Belt of Peninsular Malaysia. Turkish J. Earth Sciences 26, p. 377-394.
(online at: <http://journals.tubitak.gov.tr/earth/issues/yer-17-26-5/yer-26-5-3-1612-29.pdf>)
(Kinta Limestone in C part of W Belt of Peninsular Malaysia (=Sibumasu terrane) extensively altered by diagenesis, making age determinations challenging. Three boreholes (total 360m) drilled at either end of Kinta

Valley. Conodonts incl. Pseudopolygnathus triangulus and Declinognathodus noduliferus, indicate Late Devonian (Famennian) to Late Carboniferous (Bashkirian) ages)

Tsegab, H., W.S. Chow & A.W. Hunter (2015)- Preservation of marine chemical signatures in Upper Devonian carbonates of Kinta Valley, Peninsular Malaysia: implications for chemostratigraphy. In: M. Awang et al. (eds.) Proc. Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2014), Singapore, Springer, p. 291-302.

Tsegab, H., W.S. Chow & J.A. Talib (2017)- Lithostratigraphy of Paleozoic carbonates in the Kinta Valley, Peninsular Malaysia: analogue for Paleozoic successions. In: M. Awang et al. (eds.) Proc. Int. Conf. Integrated Petroleum Engineering and Geosciences (ICIPEG2016), Kuala Lumpur 2016, Springer Verlag, p. 559-567.
(*W zone of Malay Peninsula (= Sibumasu terrane) with extensive Paleozoic carbonate sediments, incl. Kinta Limestone (Silurian-Permian)*)

Twidale, C.R. (2009)- Early geomorphological observations in Malaya: The contributions of J.B. Scrivenor (1876-1950). *Warta Geologi* 35, 2, p. 41-46.

(online at: <https://gsm.org.my/articles/702001-100404/>)

(*Discussion of early geological/geomorphological observations by English geologist John Brooke Scrivenor, who worked in Malaysia for 28 years, as the first Government Geologist in 1903 and later first Director Minerals and Geoscience Department (Geological Survey) of the Federated Malay States (Malaysia). With notable observations on weathering and the origin of karst inselbergs (tower karst)*)

Ulfa, Y., M.H. Hafizy & M. Farhan (2012)- Structural characteristics of the Semanggol Formation along the East-West Highway Route 67 Baling Area, Kedah, Malaysia. *Eksplorium* 33, 2, p. 83-96.

(online at: <http://jurnal.batan.go.id/index.php/eksplorium/article/view/2659/2447>)

(*Structural deformation in 6 outcrops in Permian-Triassic Semanggol Fm in NW Malay Peninsula. Regional strike NE-SW, with most dips to SE*)

Umor, M.R., A.A. Ghani, H. Mohamad, M.S. Leman, K. Zaw & A. Hussin (2011)- Re-evaluation of geochemical classification of the Western Belt, Central Belt and Eastern Belt granitoids, Malaysia Peninsular and their tectonic implications. Proc. Int. Conf. Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011), Khon Kaen, p. 22-27.

(online at: <http://home.kku.ac.th/geoindo2011/A1-1-116.pdf>)

(*Three granite belts in Peninsular Malaysia: W, C and E. W Belt mainly granites, mainly S-type, suggesting syncollision emplacement. C Belt granitoids mafic-intermediate and minor felsic rock, high-K calc-alkali to shoshonite, I-type and S-type granites in syn-collision setting. E Belt granitoids similar to C Belt granites but calc-alkali to high-K calc-alkali series, I-type granite affinity and classified as volcanic arc granite*)

Vachard, D. (1990)- Fusulinoids, smaller foraminifera and pseudo-algae from southeastern Kelantan (Malaysia) and their biostratigraphic and paleogeographic value. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 143-167.

(*Eight Carboniferous- Permian fusulinid biozones in SE Kelantan. M Carboniferous with Pseudostaffella, Fusulinella, Beedeina, Ozawainella, etc.; Late Carboniferous- earliest Permian (Asselian- Sakmarian) not represented (= plant fossil interval?). Upper Lower Permian with Darvasites. Basal U Permian (Lower Murghabian) with Neoschwagerina simplex and Verbeekina verbeeki. U Murgabian- Midian with Yabeina, Lepidolina. Uppermost Permian with Colaniella media and Palaeofusulina bella. Faunas similar to E Tethys assemblages of S China, Japan, Vietnam, Thailand, etc.)*

Van Bemmelen, R.W. (1940)- On the origin of some granites from Singapore. *De Ingenieur in Nederlandsch-Indie* (IV) 7, 2, p. IV.23- IV.35.

(online at: <https://www.stichtingblauwelijn.nl/assets/files/1940-02.pdf>)

(*Description of granites that form core of Singapore island (Bukit Timah quarry, Mandai quarry). Intrusive into clastic sediments with Triassic fossils. Mainly discussion on genesis of granites*)

- Van der Wal, J.L.N. (2015)- The structural evolution of the Bentong-Raub Zone and the Western Belt around Kuala Lumpur, Peninsular Malaysia. M.Sc. Thesis, University of Utrecht, p. 1-109.
(online at: <http://dspace.library.uu.nl/handle/1874/316232>)
(Four deformation phases in Bentong-Raub suture zone. D1: NE-SW shortening during accretionary wedge formation during N-ward subduction of PaleoTethys Ocean beneath Indochina, with greenschist facies metamorphism; D2: Deformation and burial-related sub-greenschist facies metamorphism of Triassic forearc basin; D3: Contact metamorphism in metasediments during intrusion of Triassic S-type Main Range Granites, followed by steep normal faulting; D4: strike-slip shearing in Paleogene, related to Eocene formation of offshore sedimentary basins due to Indian-Eurasian collision and subsequent CW rotation of SE Asia)
- Webby, B.D., D. Wyatt & C. Burrett (1985)- Ordovician stromatoporoids from the Langkawi Islands, Malaysia. *Alcheringa* 9, 2, p. 159-166.
(Four species of labechiid stromatoporoids from ~1100m thick Ordovician Lower Setul Lst of Langkawi Island, including *Labechia variabilis* and *Rosenella woyuensis*. Reported previously from M Ordovician of N China and New South Wales)
- Weir, J. (1925)- On some specimens of fossiliferous sandstone from Pahang, Malay Peninsula. *Geological Magazine* 62, 8, p. 347-350.
(On Upper Triassic Myophoria Sst of Newton (1900, 1925) from Kuala Lipis, Pahang and Singapore. Several *Myophoria* spp., also poorly preserved *Halobia*)
- Willbourn, E.S. (1917)- The Pahang Volcanic series. *Geological Magazine* (VI), 4, 10, p. 447-462.
(Part 1 of 2 on Late Carboniferous- Permian andesitic Pahang Series of Malay Peninsula. Mainly developed in Pahang Province, also in Singapore, Johore, Negri Sembilan and Perak. Composed of andesitic and rhyolitic lavas, tuffs and porphyric intrusives. Associated with serpentinite, but relations not clear.)
- Willbourn, E.S. (1917)- The Pahang Volcanic series. *Geological Magazine* (VI), 4, 11, p. 503-514.
(Continuation of Willbourn (1917) paper above. Descriptions of andesitic and rhyolitic tuffs and breccias of Pahang Series. Comparison with 'Permo-Carboniferous' volcanic rocks of Gumai Mts, S Sumatra shows differences. Majority of tuffs and lavas are interstratified with Raub shales, and fossil evidence proves that some of them are of Permian age, some Raub limestones possible Upper Carboniferous age)
- Willbourn, E.S. (1922)- An account of the geology and mining industries of South Selangor and Negri Sembilan. Geological Department Federated Malay States, Kuala Lumpur, 115p.
- Willbourn, E.S. (1925)- The volcanic rocks of the Malay Peninsula and a comparison with their equivalents in the surrounding regions. *Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kolonien, Geologische Serie 8 (Gedenkboek Verbeek, memorial volume)*, p. 601-616.
(online at: <https://books.google.com/books?id=Yy0RAAAIAAJ&pg>)
(In Verbeek Memorial Volume 1925. No maps. Includes chapter on comparison of Pahang volcanic series with Permo-Carboniferous volcanic rocks of Gumai Mts, S Sumatra, as described by Tobler 1912 (looks like the two are not very similar; JTvG))
- Willbourn, E.S. (1936)- A short account of the geology of those tin-deposits of Kinta that are mined by alluvial methods. *J. Engineering Assoc. Malaysia*. 4, p. 255-264.
- Winn, K., L.N.Y. Wong, K. Zaw & J. Thompson (2018)- The Ayer Chawan Facies, Jurong Formation, Singapore: age and observation of syndepositional pyroclastic sedimentation process with possible peperite formation. *Bull. Geological Society Malaysia*, 66, p. 25-31.
(online at: <https://gsm.org.my/products/702001-101759-PDF.pdf>)
(Ayer Chawan Facies volcano-sedimentological facies of Jurong Fm in Singapore. Ayer Chawan Facies on Jurong Island mainly dark mudstone interbedded with grey siltstone/sandstone. Intercalated pyroclastic rocks with zircons with U-Pb age of 240.6 ± 1.2 Ma (M Triassic). Evidence of peperitic textures/structures, suggesting pyroclastic rocks emplaced into sediments during deposition when still in wet condition)

Wong, R.H.F. (1999)- Petroleum resources, Peninsular Malaysia. In: Petronas (1999) The petroleum geology and resources of Malaysia, p. 253-272.

Wong, P.K., F. Hassan & T.E. Yancey (1973)- Newly recognized structural and stratigraphic features in the eastern part of the Langkawi Islands, West Malaysia. Geological Society Malaysia Newsletter 43, p. 5-10.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1973004.pdf>)

Wongwanich, T., D. Wyatt, B. Stait & C Burrett (1983)- The Ordovician system in southern Thailand and northern Malaysia. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 77-95.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_04.pdf)
(Ordovician sediments known from W and Peninsular Thailand, and in adjacent Langkawi Island off NW Malay Peninsula. Parts of (Shan-Tai/ Sibumasu Terrane. Oldest faunas of U Cambrian and E Ordovician ages)

Wyatt, D.J. (1983)- Lithostratigraphy and sedimentology of the Ordovician Lower Setul Limestone, Langkawi Islands, Malaysia. Thesis, University of Tasmania, p. 1-125.

Xin Hui, P., M. Ramkumar, R. Nagarajan, M.J. Mathew & T.F. Ng (2021)- Episodic dolomitization of Paleozoic limestones in the Kinta Valley, Malaysia: implications on porosity evolution and reservoir properties. Energy Geoscience 2, 4, p. 298-307.
(online at: <https://www.sciencedirect.com/science/article/pii/S266675922030072X>)
(Multiphase dolomitization in Paleozoic limestone in Kinta Valley negatively impacted porosity and permeability)

Xin Hui, P., M. Ramkumar, T.F. Ng, N.I. Taib, M.J. Mathew, B. Sautter, N.A. Siddiqui & M.C. Poppelreiter (2022)- Geochemical evolution of structure-bedding controlled hydrothermal dolomites of the Kinta Valley, Western Malaysia. Carbonates and Evaporites 37, 62, p. 1-30.
(online at: <https://link.springer.com/article/10.1007/s13146-022-00802-40>)
(Multiphase dolomitization in Paleozoic limestone in Kinta Valley, Western Belt of Malay Peninsula. Kinta Limestone is 700-m thick succession, deposited during Silurian-Permian. First dolomitization event could be associated with folding- faulting prevalent during Permo-Triassic Sibumasu-East Malaya collision)

Yaacub, S.N. & U. Said (2002)- Plant fossils from Bukit Belah, Batu Pahat, Johor. In: Geological Society Malaysia Annual Geological Conference 2002, Bull. Geological Society Malaysia, 45, p. 287-292.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2002044.pdf>)
(Late Jurassic-Early Cretaceous plant fossils from 'post-orogenic' fluvial deposits in outcrop at Bukit Belah, Batu Pahat, Johor, S Malay Peninsula. Include *Gleichenites* (*Gleichenoides*) *gagauensis*, *G. pantiensis*, *Ptilophyllum* cf. *pterophylloides* and *Otozamites gagauensis* (similar to 'Gagau' and Ulu Endau floras described by Kon'no 1967, 1968, Smiley 1970 and Kon'no and Asama 1975))

Yanagida, J. & P.C. Aw (1979)- Upper Carboniferous, Permian and Triassic brachiopods from Kelantan, Malaysia. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 20, p. 119-141.

Yanagida, J. & S. Sakagami (1971)- Lower Carboniferous brachiopods from Sungei Lembing district, NW of Kuantan, Malaysia with a brief note on the bryozoans in association with brachiopods. Memoirs Faculty of Science, Kyushu University, Ser. D (Geology), 21, p. 75-91. (also in *Geology and Palaeontology of SE Asia 11?*)
(Seven species of brachiopods from siltstones of Lower Carboniferous Calcareous Series of E Pahang. Assemblage strong affinity with M Visean fauna of Russian Central Asia and N America)

Yancey, T.E. (1972)- Devonian fossils from Pulau Rebak Besar, Langkawi Islands, West Malaysia. Geological Society Malaysia Newsletter 37, p. 10-12.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/ngsm1972005.pdf>)

(Red mudstones below Singa Fm tilloid-bearing sediments yield uppermost Devonian marine fossils (Meor & Lee (2004) interpreted beds of nearby NW Peninsular Malaysia as Late Devonian- earliest Carboniferous))

Yancey, T.E. (1975)- Evidence against Devonian unconformity and Middle Paleozoic age of Langkawi folding phase in Northwest Malaya. American Assoc. Petroleum Geol. (AAPG) Bull. 59, 6, p. 1015-1019.

(No Devonian unconformity in NW Peninsular Malaysia/ Langkawi Islands. Age of Langkawi folding phase probably post-Early Permian and pre-Early Triassic (This is on Sibumasu Blocks and coincides with collision with E Malaya block; JTVG))

Yancey, T.E. (1985)- Bivalvia of the H.S. Lee Formation (Permian) of Malaysia. Journal of Paleontology 59, 5, p. 1286-1297.

(Bivalves of upper 15m of H.S. Lee Fm section at H.S. Lee No. 8 tin mine, Kinta Valley, 35km S of Ipoh, Perak, Malaysia, most diverse Permian (Artinskian) mollusc-dominated biota in Tethyan province. Bivalves dominated by giant clams of family Alatoconchidae. Also highly diverse bellerophontid and other gastropods. With *Shikamaia perakensis*, *Saikraconcha*, *Prospondylus*, *Grammatodon obsoletiformis*, *Pernopecten*, etc. One new genus *Permartella* with three new species)

Yang, J.H., M.F. Zhou, R.Z. Hu, H. Zhong, A.E. Williams-Jones, L. Liu, X.C. Zhang, Y.Z. Fu & W. Mao (2020)- Granite-related tin metallogenic events and key controlling factors in Peninsular Malaysia, Southeast Asia: new insights from cassiterite U-Pb dating and zircon geochemistry. Economic Geology 115, 3, p. 581-601. (manuscript online at: <https://escholarship.mcgill.ca/downloads/2j62s946h>)

(U-Pb ages of cassiterite separates from Sintok and Rahman tin deposits in W belt (~219, 227 Ma), and Bandi, Setahum, Lembing, and Cherul tin deposits in E belt (~213, 271, 283 and 281Ma), suggesting tin mineralization in Peninsular Malaysia in two periods: 290-270 Ma (E Permian) and 230-210 Ma (Late Triassic; Norian). Tin-bearing granitic magmas in Peninsular Malaysia derived from reworking of Paleo- to Mesoproterozoic sedimentary rock-dominated crust in response to Paleo-Tethyan subduction and continental collision)

Yap, F.L. (1986)- Age determination on the Kuantan granite and dolerite dykes. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 415-422.

(Rb/Sr age of granite in Kuantan area (E coast Malay Peninsula) ~292 ±12 My (E Permian))

Yap, S.F. & U. Said (2002)- Palynological study on a rock sequence at Bandar Tenggara, Johore. GSM Annual Geological Conference 2002, Kota Bharu, Bull. Geological Society Malaysia 45, p. 185-189.

(online at: www.gsm.org.my/products/702001-100723-PDF.pdf)

(Outcrop of Tertiary sediments at Bandar Tenggara, Johore, ~45 km SE of Keluang, with plant fossils and rich palynomorph assemblage. Presence of *Verrucatosporites usmensis*, *Spinizonocolpites baculatus*, *Alnipollenites*, *Psilatricolporites operculatus*, etc., suggests Late Eocene *V. usmensis* zone. Fresh water algae *Pediastrum* sp., with *Striatricolpites catatumbus*, *Stenochlaena*, *Laevigatosporites* and *Deltoidosporas*, indicate freshwater swamp environment)

Yaro, U.Y. & I.A. Abir (2023)- Variation in thermal structure with crustal thickness for the crust beneath the Peninsular Malaysia. J. Asian Earth Sciences: X, 9, 100146, p. 1-13.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056023000117>)

(New regional thermal structure and crustal thickness models beneath Malay Peninsula and surrounding regions. Estimated crustal thickness (from gravity inversion?) ~ 28- 35 km, average ~31 km. Uplifted Curie depths (20- 25 km) and deeper Moho depths (30-34 km) observed over most of Peninsular Malaysia continent. NW Peninsular Malaysia and S Thailand deeper Curie (30-40 km), coincident with Sibumasu terrane. Consistent with deeper crustal thickness (30 – 35 km), West Sumatra block deepest Curie point (30- 46 km). West Sumatra block and NW Peninsular Malaysia low Bouguer anomalies and comparable crustal thickness, suggesting common ancient continental core)

Yeap, C.H. (1980)- A comparative study of Peninsular Malaysia granites with special reference to tin mineralisation. Ph.D. Thesis, University of Malaya, Kuala Lumpur, p. 1-395. (*Unpublished*)

Yeap, E.B. (1993)- Tin and gold mineralizations in Peninsula Malaysia and their relationships to the tectonic development. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 329-348.

(*Tin and gold mineralizations in Peninsular Malaysia several juxtaposed and overlapping belts. Tin deposits genetically related to Late Triassic S-type granites*)

Yeap, E.B. (2000)- The prospects for hardrock gold and tin deposits in Malaysia. In: G.H. Teh et al. (ed.) Geological Society Malaysia Annual Geological Conference 2000, Pulau Pinang, p. 325-332.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_46.pdf)

(*Tin and gold mineralization in Peninsular Malaysia in parallel belts, related to tectonic setting. Sarawak and Sabah hosts to gold deposits related to magmatism. Primary tin deposits in two belts (W and E) of Peninsular Malaysia in aplite, cassiterite-magnetite skarn, cassiterite pegmatites, etc. Gold mineralization dominated by Mesozoic mesothermal veins in folded and partly metamorphosed Paleozoic-Triassic rocks. Primary gold mineralization in 4 distinct N-S belts. Gold mineralization in Bau, Sarawak, epithermal Au-Ag-As-Sb-Pb-S vein type, associated with Miocene dacitic intrusives. Sabah, gold commercially produced from Mamut Cu-Au porphyry deposit, genetically related to Kinabalu granodiorite-diorite*)

Yong, B.T., A.A. Ghani, T.T. Khoo & S. Muda (2004)- Benom Complex: Evidence of magmatic origin. Geological Society Malaysia, Bulletin 48, p. 55-60.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100588-PDF.pdf)

(*Central Belt of Malay Peninsula with line of plutons that follow Bentong-Raub suture, emplaced into Triassic Semantan Fm sediments Most plutons granitic, but Benta and Benom complexes two main areas of intermediate gabbro/ syenite/ monzonite, previously regarded as migmatite complexes. Accidental xenoliths in Bentom complex suggest igneous origin (see also Meng et al.(2001), with Late Triassic zircon ages)*)

Yu, Y., X. Qian, A.A. Ghani, Y. Zhang & Y. Wang (2023)- Triassic felsic magmatism in SE Peninsular Malaysia: Petrogenesis and geodynamic implications for the Eastern Paleotethyan tectonic transition. Lithos 462-463, 107399, p. 1-14.

(*M-L Triassic volcanism and granitoids in SE Peninsular Malaya. New zircon ages constrain formation time at 238-235 Ma. (E Carnian). Rel. high SiO₂ contents, etc. Primary melt source was Proterozoic crustal rocks with juvenile middle-lower crustal component. Triassic volcanism in SE Peninsular Malaysia extends to N to synchronous volcanic rocks in Lancangjiang and Chiang Khong-Lampang-Tak volcanic zones. Volcanic rocks and granites formed in localized extensional setting in response to Paleotethyan slab breakoff. Initial collision of Sibumasu with East Malaya may have occurred at ~237 Ma*)

Yu, Y., X. Qian, K.A. Mustapha, T.C. Sheldrick, C.Gan, Y. Zhang & Y. Wang (2022)- Late Paleozoic–Early Mesozoic granitic rocks in Eastern Peninsular Malaysia: New insights for the subduction and evolution of the Paleo-Tethys. J. Asian Earth Sciences 239, 105427, p. 1-17.

(*New zircon U-Pb dating and Sr-Nd-Pb-Hf isotopic data for granitoids from East Malaya. Permian- M Triassic granitoids in Eastern Peninsular Malaysia three groups: (A) 289–270 Ma, I-type granites derived from meta-igneous rocks, (B) 285–272 Ma, S-type granites from metasedimentary rocks and (C) 254–244 Ma, mixed source of “ancient” meta-mafic rocks with juvenile mafic component. All formed in response to subduction of Paleotethyan Ocean. Possible transition from subduction to slab roll-back at ~270 Ma. Subduction-related granitoids may continue N to E Myanmar and SW China, and to S with W Borneo*)

Zahir, N.A.M., M.A. Beg & A.A. Kadir (2020)- Hydrothermal dolomitization on Devonian to Carboniferous carbonates in Kinta Valley, Perak, Malaysia: a petrographic study. Indonesian J. on Geoscience (IJOG) 7, 1, p. 25-39.

(online at: <http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/636/297>)

(*Thick Devonian- Carboniferous shallow marine Kinta Limestone platform in Perak, NW Malay Peninsula uplifted by granite intrusions in Triassic. Selectively dolomitized along N-S oriented deep-seated fault*)

Zakaria, E., N.T. Fatt, A.A.J. Hafiz, M. Sebastien & M. Charles (2015)- Characterization of galena and vein paragenesis in the Penjom gold mine, Malaysia: trace elements, lead isotope study and relationship to gold mineralization episodes. *Acta Geologica Sinica* 89, p. 1914-1925.

(Penjom Gold Mine is 30 km from Bentong-Raub Suture at W boundary of the Central Belt in Peninsular Malaysia. Gold mineralization hosted in vein system associated with pyrite, arsenopyrite, and minor galena. Two stages of galena formation)

Zamri, N.S., Y.J. Teoh, K.K. AbuBakr, M.H.A. Hassan, N.A. Ismail & N.M. Muztaza (2022)- Recognition of sea-level fluctuations in Late Silurian to Early Permian deposits, Perlis, Malaysia. *Arabian J. Geosciences* 15, 1501, p.

(51 third order sequences in Perlis section. Silurian Mempelam Lst to Carboniferous Chepor Mb characterized by progressive increase and decrease in accommodation space, indicating a rise and fall in long term sea level. Carboniferous Uppermost Kubang Pasu-Permian Chuping Lst sequence progressive decrease in accommodation space, indicating a longer-term fall in sea level)

Zhao, J., Q. Liu, K.W. Lee, V. Choa & C.I. Teh (1999)- Underground cavern development in the Jurong sedimentary rock formation. *Tunnelling and Underground Space Technology* 14, 4, p. 449-459.

(Late Triassic- E Jurassic Jurong Fm forms W and SW of Singapore Island. Intensely folded mudstone, sandstone, shale, conglomerate, phyllite, slate and limestone, with structural strike and faults generally NW-SE. Potential cavern development in Late Triassic limestones of Jurong Fm)

Zin, M.M., M.B.I. Basori, K. Sanematsu, T. Manaka, K. Zaw, C. Dietz, H. Jamil & A. Salam (2024)- Geology, mineralogy and sulphur isotope constraints of the Buffalo Reef gold deposit, Central Belt, Peninsular Malaysia: Implications for Ore Genesis. *Geological Journal* 60,4, p. 824-843.

(Buffalo Reef deposit is developed gold mine in N Pahang State, within Central Belt of Peninsular Malaysia. Gold deposit hosted by Permo-Triassic Gua Musang Fm clastics, volcanics and low-grade metamorphic rocks. Gold ore in quartz veins along N-S and NE-SW striking faults. Gold mineralisation here and in other gold deposits along Bentong-Raub Suture Zone in Central Belt is of orogenic type)

IX.3. Thailand

Relevance for Indonesia: The Thailand Sibumasu + Paleotethys suture(s) + Indochina terrane stratigraphies are useful analog for the less well studied Pretertiary of NE Sumatra and Sundaland

Achache, J. & V. Courtillot (1985)- A preliminary Upper Triassic paleomagnetic pole for the Khorat plateau (Thailand): consequences for the accretion of Indochina against Eurasia. *Earth Planetary Science Letters* 73, 1, p. 147-157.

(Paleomagnetic results from U Triassic (Norian) Huai Hin Lat Fm at base of Khorat Group in C Thailand suggest this unit remained at tropical northern latitudes since Late Triassic. Comparison with Eurasian poles reveals 1650 ± 850 km of SW-NE convergence and $15^\circ \pm 10^\circ$ of CCW rotation between 205-160 Ma (NB: results questioned by Opdyke and Chen and Courtillot 1989: results probably Cenozoic remagnetization))

Adachi, S., H. Igo, A. Ampornmaha & N. Nakornsri (1993)- Triassic coral buildups observed in the Chaiburi Formation near Phattalung, Peninsular Thailand. *Annual Report Institute of Geoscience, University of Tsukuba* 19, p. 27-31.

(Small coral buildups up to 10m thick in upper part Phanomwand Limestone Mb of Chaiburi Fm near Phattalung in S Thailand (on Sibumasu Terrane). Fauna dominated by sponges and Tubiphytes. With foram Ophthalmidium tori, suggesting Carnian age (Flügel, 2002))

Adventino & P. Chenrai (2022)- Petroleum source rock assessment using outcrop data and geochemical analysis in Phetchabun and Loei Province, Thailand. *Bull. Earth Sciences Thailand (BEST)* 13, 2, p. 65-77.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247286/168655>)

(Geochemistry study of mainly Carboniferous and Late Triassic sediments of Khorat Plateau. Late Triassic Huai Hin Lat Fm potential source rock; other formations are not. Mainly gas-prone)

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2006)- Lower Devonian tentaculite bed in the Satun area, southern peninsular Thailand. *J. Asian Earth Sciences* 26, p. 605-611.

(Lower Devonian (Emsian) tentaculite fauna including Nowakia acuaria in black shale in basal part of siliciclastic sequence N of Satun, southern peninsular Thailand. Similar E Devonian black tentaculites shale present from N Thailand to NW Malaysia (Langkawi Islands and Mahang-Baling))

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2006)- Ordovician-Silurian boundary graptolites of the Satun area, southern peninsular Thailand. *Paleontological Research (Palaeontological Society of Japan)* 10, 3, p. 207-214.

(online at: www.jstage.jst.go.jp/article/prpsj/10/3/207/_pdf)

(Black shale N of Satun, S Peninsular Thailand, lies upon Upper Ordovician limestone and rich in graptolites, including Normalograptus pseudovenustus, index species for interval around Ordovician-Silurian boundary)

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2006)- Ordovician conodonts from the Thong Pha Phum area, western Thailand. *J. Asian Earth Sciences* 26, p. 49-60.

(online at: <https://www.thaiscience.info/Article%20for%20ThaiScience/Article/61/10008297.pdf>)

(Ordovician conodont biostratigraphy of ~500m thick limestones in Tha Manao Fm in W Thailand with four E-M Ordovician conodont zones: Juanognathus variaviris, Walliserodus comptus, Juanognathus jaanussoni-Histiodella holodentata and Plectodina onychodonta Zone. Faunas are similar to those from Midcontinent Province, N China, E Australia, and Argentina)

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2006)- Lower and Middle Ordovician conodonts from the Thung Song and Thung Wa areas, southern peninsular Thailand. *Paleontological Research (Palaeontological Society of Japan)* 10, 3, p. 215-231.

(online at: https://www.jstage.jst.go.jp/article/prpsj/10/3/10_3_215/_pdf)

(15 species of E-M Ordovician (M Arenigian- E Caradocian) conodonts from Thung Song Gp in S Peninsular Thailand. Affinities with faunas in Australia, S China, Argentina and N America midcontinent)

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2007)- Ordovician conodonts from the Satun area, Southern Peninsular Thailand. *Journal of Paleontology* 81, p. 19-37.

(Well-preserved U Ordovician conodonts from micritic limestone of Thung Song Gp in Satun area of S peninsular Thailand near Malaysian border. Faunas have N Atlantic Realm affinities, some of these faunas also reported from S China. Conodont-bearing limestone deposited on continental margin of NE Gondwana)

Agematsu, S., K. Sashida, S. Salyapongse & A. Sardud (2008)- Early Ordovician conodonts from Tarutao Island, southern Peninsular Thailand. *Palaeontology* 51, 6, p. 1435-1453.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1475-4983.2008.00810.x/epdf>)

(E Ordovician conodont faunas from E Tremadocian - M Arenig Thung Song Gp limestone (1000m thick) on SE Tarutao Island, SW side of Peninsular Thailand. 14 known and 8 undescribed species. Three zones: Rossodus manitouensis, Utahconus tarutaoensis and Filodontus tenuis. Deposited on deeper shelf; S2 member limestone-shale shallow marine)

Agematsu, S., K. Sashida & A. Sardud (2008)- Reinterpretation of Early and Middle Ordovician conodonts from the Thong Pha Phum area, western Thailand, in the context of new material from western and northern Thailand. *Paleontological Research (Palaeontological Society of Japan)* 12, 2, p. 181-195.

(online at: https://bioone.org/journals/paleontological-research/volume-12/issue-2/1342-8144_2008_12_181_RO_Etc.)

(see also Agematsu et al. (2006). E and M Ordovician conodonts Thong Pha Phum and Kanchanaburi areas in W Thailand and Li area in N Thailand. Two zones, Triangulodus larapintinensis and Aurilobodus leptosomatus. Two regression events in latest E Ordovician and earliest M Ordovician)

Agematsu, S., K. Sashida & A. Sardud (2013)- A new Middle Ordovician conodont fauna from the Thong Pha Phum Area of Western Thailand. *Paleontological Research (Palaeontological Society of Japan)* 17, 2, p. 179-188.

(online at: <https://bioone.org/journals/paleontological-research/volume-17/issue-2/1342-8144-17.2.179/A-New-Middle-Ordovician-Conodont-Fauna-from-the-Thong-Pha/10.2517/1342-8144-17.2.179.full>)

(New M Ordovician conodonts from Thong Pha Phum area, central W Thailand. Nine species, incl. first report of Eoplacognathus suecicus, Pygodus lunnensis, Protopanderodus calceatus, Protopanderodus cooperi, and P. graei in Thailand, indicating cool-water fauna in W and in southern peninsular Thailand in M-L Ordovician)

Ahrendt, H., C. Chonglakmany, B.T. Hansen & D. Helmcke (1993)- Geochronological cross section through Northern Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 207-217.

(Isotopic age determinations in N Thailand, mainly S and SE of Chiang Mai. Zircons from crystalline basement W of Tak indicate maximum age of ~200 Ma for last amphibolite facies overprint instead of Precambrian. Tertiary K-Ar ages of ~30 Ma on mica from crystalline rocks interpreted as cooling ages, pointing to strong uplift in mid-Tertiary)

Ahrendt, H., B.T. Hansen, A. Lumjuan, A. Mickein & K. Wemmer (1997)- Tectonometamorphic evolution of NW Thailand deduced from U/Pb- Sm/Nd and K/Ar isotope investigations. In: P. Dheeradolok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97)*, Bangkok, Dept. Mineral Resources (DMR), p. 314-319.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(U-Pb zircon analyses of gneisses of crystalline basement of NW Thailand show age of high-grade metamorphic event is ~197-202 Ma, suggesting no Precambrian metamorphic events and gneisses are not original basement of Paleozoic and Mesozoic strata. Younger high-grade overprints. K/Ar cooling ages around U Cretaceous (79-66 Ma) in W and Late Oligocene- E Miocene (25-18 Ma) in E, suggesting two-stage uplift. Two granite groups: Triassic and Tertiary cooling ages)

Aihara, K., K. Takemoto, H. Zaman, H. Inokuchi, D. Miura, A. Surinkum, A. Paiyarom et al. (2007)- Internal deformation of the Shan-Thai block inferred from paleomagnetism of Jurassic sedimentary rocks in Northern Thailand. *J. Asian Earth Sciences* 30, p. 530-541.

(Clockwise rotation of ~20° in S and N Shan-Thai block due to collision of India. Larger local internal CW deformation in central part of Shan-Tai block)

Ainsworth, R.B., M. Sanlung & S.T.C. Duivenvoorden (1999)- Correlation techniques, perforation strategies, and recovery factors; an integrated 3-D reservoir modelling study, Sirikit field, Thailand. *American Assoc. Petroleum Geol. (AAPG) Bull.* 83, p. 1535-1551.

(Sirikit oil field of Phitsanulok basin producing since 1982. 130 wells, oil-in-place >800 MMBO. Miocene reservoirs mainly lacustrine mouth-bar and fluvial deposits. Discussion of lithostratigraphic vs. chronostratigraphic correlation techniques between adjacent wells)

Alderson, A., N.J.L. Bailey & A. Racey (1994)- Palynology and geochemistry of Mesozoic source rocks from southern Peninsula Thailand: implications for petroleum exploration. In: P. Angsuwathana et al. (eds.) *Proc. Int. Symposium Stratigraphic correlation of Southeast Asia*, Bangkok 1994, Dept. Mineral Resources (DMR) and IGCP 306, p. 276-281.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6953.pdf)

*(Oil-prone Mesozoic source rock in fluvial-coastal deposits in Peninsular Thailand SE of Phuket. Presence of palynomorphs *Callialisporites dampieri* and *Aequitriradites spinulosus* suggest Early Cretaceous (?Late Jurassic) age. In correlative deposits also crocodiles, turtles, *Estheria* and plant fossils (Asama et al. 1981). For additional palynology data see Lei Zuoqi (1993))*

Almeras, Y. (1988)- Jurassic brachiopods from the Kio-Mae-Sot area. *CCOP, Technical Bulletin* 20, p. 211-217.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(Descriptions of five rel. non-diagnostic E-M Jurassic rhynchonellids from Kio Tho, NW Thailand)

Altermann, W.W. (1986)- The Upper Palaeozoic pebbly mudstone facies of peninsular Thailand and western Malaysia- continental margin deposits of Palaeoeurasia. *Geologische Rundschau* 75, 2, p. 371-381.

(Questions the glacial origin of Carboniferous-Lower Permian 'pebbly mudstones' of Phuket Group/ Singha Fm of S Thailand/ NW Malaysia. See also comments by Stauffer & Lee 1986)

Altermann, W.W. (1989)- The Permo-Carboniferous facies development in Thailand: a plate-tectonic discussion. *Compte Rendu 11th Congres International du Stratigraphie et Geologie du Carbonifere*, Beijing 1987, 4, p. 119-126.

(online at: <https://epub.ub.uni-muenchen.de/5586/1/5586.pdf>)

(N-S trending pelagic basin separated Shan Thai and Indosinia cratons in Carboniferous- Permian. Deposition of ribbon cherts from pre-Asselian- Kubergandian. M Permian flysch sedimentation. Basin was E-vergent, isoclinally folded and overthrust. Parts of basin metamorphosed into greenschist facies. In E margin Kubergandian- Midian molasse deposited from new rising fold belt. Total width of basin <200 km. Folding affected marginal marine basin and was caused by W-directed subduction under volcanic arc. W of arc, pebbly mudstones deposited on trench slope or continental margin of Paleoeurasia. Deposition of mixtites continued through Carboniferous- Lower Permian and came to end with uplift of Shan-Thai Craton and onset of subduction under Petchabun marginal basin. Subduction W of area of pebbly mudstones and directed to E)

Altermann, W.W. (1989)- Facies development in the Permian Phetchabun Basin, Central Thailand. *Verlag Wissenschaft und Bildung*, Berlin, p. 1-234.

(online at: [https://epub.ub.uni-muenchen.de/5585/1/5585\(1\).pdf](https://epub.ub.uni-muenchen.de/5585/1/5585(1).pdf))

(Part I on N-S trending Permian Phetchabun Basin (E of Sukhothai, W of Loei) separates Shan Tai craton (Sibumasu) in W from Indochina craton in E. E-M Permian overall coarsening-upward cycle: Early Permian mainly pelagic deposits with ribbon cherts. M Permian flysch sedimentation, with molasse deposits in E margin. Tectonic interpretation is folded marginal marine basin, with folding caused by W-directed subduction (A-subduction) under volcanic arc. Part II on pebbly mudstones in Peninsular Thailand and W Malaysia)

Altermann, W.W. (1991)- New Permo-Carboniferous geochemical data from central Thailand: implication for a volcanic arc model. *Palaeogeogr. Palaeoclim. Palaeoecology* 87, p. 191-210.

(On implications for SE Asia geotectonic reconstructions of new data on Late Carboniferous- M Permian quartz- keratophytic to spilitic volcanics from C Thailand. Volcanic rocks associated with platform carbonates and deep basin sediments suggest Late Paleozoic volcanic arc and subduction zone in West)

Amonpantang, P. (2019)- Structural characterization of the Phitsanulok basin, onshore Thailand, and inverted pull-apart sandbox analog models. M.Sc. Thesis, University of Houston, p. 1-106.

(online at: <https://uh-ir.tdl.org/bitstreams/aa706160-f499-49e6-b49b-71e33be861cf/download>)

(See also summary paper below)

Amonpantang, P. & J. Wu (2021)- Structural characterization of the Phitsanulok basin, onshore Thailand, and regional tectonic implications. *Marine and Petroleum Geology* 130, 105110, p. 1-22.

(open manuscript online at: <https://www.sciencedirect.com/science/article/abs/pii/S0264817221002130>)

(Phitsanulok basin largest onshore rift basin in C Thailand and major hydrocarbon producer for >30 years. Formed in mid-Cenozoic and was episodically reactivated after E Miocene. Overlies Sukhothai Arc basement. N Phitsanulok basin predominantly extensional; S basin shows unconformities, folding, and reverse faults from stronger inversion.)

Ampaiwan, T., P. Churasiri & C. Kunwasi (2003)- Palynology of coal-bearing units in the Mae Ramat Basin, Tak Province, Northern Thailand: implications for the paleoclimate and the paleoenvironment. *Natural History J. Chulalongkorn University* 3, 2, p. 19-40.

(online at: <http://www.thaiscience.info/journals/Article/NHCU/10439719.pdf>)

(Palynology of lacustrine shale core from Mae Ramat Basin. Exact age of sequence cannot be assigned, but was deduced from paleoclimate and time ranges of fossils as E Miocene)

Ampaiwan, T., K.I. Hisada & P. Charusiri (2009)- Lower Permian glacially influenced deposits in Phuket and adjacent islands, Peninsular Thailand. *Island Arc* 18, 1, p. 52-68.

(online at: https://www.researchgate.net/publication/230029823_Lower_Permian_glacially_influenced_deposits_in_Phuket_and_adjacent_islands_peninsular_Thailand)

(Dropstones and dump structures from E Permian (Asselian- Lower Sakmarian) diamictite-bearing sequence at Phuket and adjacent islands suggests sediments originated as glaciomarine (Basal Ko Sire Fm, up to 400m thick) and debris-flow deposits (Ko He Fm; ~400m thick). Diamictite clasts 70% quartzite, remainder granite/gneiss, shale, carbonate, vein quartz and diamictite. Evidence of glacially influenced environment supports paleogeographic interpretation of Sibumasu block at NW Australian margin of Gondwana)

Ampornmaha, A. (1995)- Triassic carbonate rocks in the Phattalung area, Peninsular Thailand. *J. Southeast Asian Earth Sciences* 11, 3, p. 225-236.

(online at: https://www.academia.edu/58607433/Triassic_carbonate_rocks_in_the_Phaththalung_area_Peninsular_Thailand)

*(Carbonates near Phaththalung and others areas in Peninsular Thailand known as Permian Rat Buri Lst, but of Triassic age and here renamed Chaiburi Fm. Three members: (1) basal Dienerian- Smithian dolomite with conodonts *Neospathodus kummeli*, *N. waageni*, etc.; (2) bedded limestone with thin chert layers and nodules with latest Spathian- M Anisian *Neospathodus timorensis*, *N. kockeli* and *Neogondolella bulgarica*; (3) Carnian massive limestone with coral buildups)*

Anderson, K. (2017)- Pennsylvanian- Early Permian Pha Nok Khao platform margin evolution and paleoecology of carbonate buildups, Loei-Phetchabun foldbelt, NE Thailand. Ph.D. Thesis University of Western Australia, Perth, p. 1-271.

(online at: http://research-repository.uwa.edu.au/files/16863899/THESIS_DOCTOR_OF_PHILOSOPHY_ANDERSON_Kaylee_Dawn_2017_Part_1.pdf)

Andrianarimanana, M., A. Salam, C. Sutthirat & T. Manaka (2017)- Mineralogy and petrography of skarn in Khao Lek Area, Nong Bua District, Nakhon Sawan Province, Northern Thailand. *Bull. Earth Sciences Thailand (BEST)* 9, 1, p. 61-67.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247020/167848>)

(*Khao Lek skarn iron deposit in Nakhon Sawan Province, C Thailand, hosted in Permian Tak Fa Fm limestone (marble) and Late Permian-Early Triassic basalt- andesitic basalt volcanic rocks*)

Aranyakanon, P. (1955)- Diamond discovery in Phangnga and Phuket, South Thailand. Royal Department of Mines, Bangkok, Reports of Investigation 1, p. 35-36.

(*Diamonds present in tailings at dredgings at Phuket Tin Dredging and Kamunting Tin Dredging. Originate either from conglomerates of Phuket Series or pegmatite dikes in tin granites. No ultrabasic rocks nearby*)

Aranyakanon, P. (1961)- The cassiterite deposit of Haad Som Pan Ranong Province, Thailand. Ph.D. Thesis University of Durham 1960, Dept. Mineral Resources (DMR), Bangkok, p. 1-182.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1961/883.pdf)

Aranyakanon, P. (1969)- Tin deposits in Thailand. In: Second Technical Conference on Tin, Bangkok 1969, 1, p. 83-102.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1980/5551.pdf)

Aranyakanon, P., W. Jantaraniya, P. Vichit & P. Suthakorn (1976)- Tin exploration in the Adang-Rawee Archipelago area, Satun Province, southern Thailand. Dept. Mineral Resources, Economic Geology Special Issue 2, Bangkok, p. 143-161.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1980/5554.pdf)

(*Results of 1972-1974 survey for tin, off W coast of Satun, ~170km SE of Phuket. Most core holes did not reach likely tin placers*)

Aranyakanon, P. & C. Nilkuha (1955)- Radioactive minerals from Tin and Tungsten mines in Thailand. Royal Dept. of Mines, Bangkok, Report of Investigation 1, p. 41-47.

(*Monazite present at several localities in Thailand, but rel. small occurrences. No Uranium*)

Aranyakanon, P. & P. Vichit (1983)- The gem deposits of Thailand. Proc. Conference Geology and Mineral Resources of Thailand, Bangkok, p. 280-290.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1983/10601.pdf)

(*Main gems of Thailand are ruby and sapphire. Deposits common in N, NE, SE and W-C part of country, mostly in alluvial deposits associated with basalt flows*)

Arboit, F. (2016)- The tectonic evolution of Khao Khwang fold-thrust belt, Central Thailand: new insights in the Permian and Triassic evolution of the Indosinian orogeny in SE Asia. Ph.D. Thesis University of Adelaide, p. 1-222.

(online at: <https://digital.library.adelaide.edu.au/dspace/bitstream/2440/113358/2/02whole.pdf>)

(*Study of Khao Khwang fold-thrust belt at SW margin of Indochina Block in Saraburi region, in S portion of Loei volcanic belt, part of Permo-Triassic Indosinian orogen. Mainly collection of earlier publications*)

Arboit, F., K. Amrouch, A.S. Collins, R. King & C. Morley (2015)- Determination of the tectonic evolution from fractures, faults, and calcite twins on the southwestern margin of the Indochina Block. *Tectonics* 34, 8, p. 1576-1599.

(*Analyses of fractures, striated faults in Permian carbonates of Khao Khwang fold-thrust belt in C Thailand. Five tectonic stages; first three predate main Indosinian deformation event, later two stages after or during, the main folding (N-S compression) and Cenozoic E-W composite strike-slip/contractional stage, related to India-Asia collision*)

Arboit, F., K. Amrouch, C.K. Morley, A.S. Collins & R. King (2017)- Palaeostress magnitudes in the Khao Khwang fold-thrust belt, new insights into the tectonic evolution of the Indosinian orogeny in central Thailand. *Tectonophysics* 710-711, p. 266-276.

(Calcite twinning analysis in Khao Khwang fold-thrust belt in Saraburi Province, C Thailand, to quantify palaeostresses magnitudes since onset of Indosinian orogeny. Foldbelt located on SW margin of Indochina Block. M Permian structural regime likely dominated by foreland flexure or extension due to back-arc rifting. Thrusting/folding in KKFTB began in E Triassic. Possibly later reactivation coeval with phase of fold tightening in Late Triassic after Sibumasu-Indochina collision. Maximum depositional ages of syntectonic sediments in foredeep 251 ± 3 Ma, and foreland 205 ± 6 Ma)

Arboit, F., A.S. Collins, R. King, C.K. Morley & R. Hansberry (2014)- Structure of the Sibumasu-Indochina collision, central Thailand: a section through the Khao Khwang Fold and thrust belt. *J. Asian Earth Sciences* 95, p. 182-191.

(online at: www.academia.edu/18408958/Structure_of_the_Sibumasu_Indochina_collision_central_Thailand_A_s_Etc.)
(Triassic Indosinian orogeny in Thailand often interpreted without considering tectonic evolution of portion of Indochina Block margin formed by Khao Khwang Platform area of Saraburi Group, C Thailand. Area represents thin-skinned fold-thrust belt with several large thrusts dominantly ~N-propagating deformation in Triassic. Foldbelt represents significant kink in collision between Sibumasu and Indochina)

Arboit, F., A.S. Collins, C.K. Morley, R. King & K. Amrouch (2016)- Detrital zircon analysis of the southwest Indochina terrane, central Thailand: unravelling the Indosinian orogeny. *Geological Society of America (GSA) Bull.* 128, 5-6, p. 1024-1043.

(online at: www.academia.edu/21708455/Detrital_zircon_analysis_of_the_southwest_Indochina_terra_Etc.)
(Zircon age assemblages from Khao Khwang fold-thrust belt of C Thailand with common age peak at ~450 Ma (Late Ordovician). Samples also grains of 0.2-0.3, 0.4-0.6, 1.0-1.3, 1.7-1.8 and 2.2-2.7 Ga. Probable sediment sources Indochina basement and/or continental crust in terranes amalgamated to Indochina at that time. Detrital zircons as young as 205 ± 6 Ma show parts of Saraburi Gp no older than Late Triassic. Propose depositional model of Permian rift or passive margin setting that evolved into piggyback and foredeep basins during folding-thrusting in Triassic)

Arboit, F., A.S. Collins, C.K. Morley, F. Jourdan, R. King, J. Foden & K. Amrouch (2016)- Geochronological and geochemical study of mafic and intermediate dykes from the Khao Khwang fold-thrust belt: implications for petrogenesis and tectonic evolution. *Gondwana Research* 36, p. 111-128.

(Late Permian- Late Triassic dyke swarms in Khao Khwang fold-thrust belt at SW margin of Indochina Terrane in C Thailand. Three groups. Mafic dykes share geochemical characteristics with Chiang Khong volcanic suite in Sukhothai terrane and Loei volcanic belt in N Indochina and likely emplaced in similar orogenic setting. Group III rocks intruded from E Triassic (255 ± 6 Ma) to Late Triassic (207 ± 2 Ma), and probably sourced from more crustally contaminated magma)

Archbold, N.W. (1999)- Additional records of Permian brachiopods from near Rat Buri, Thailand. *Proc. Royal Society of Victoria, Melbourne*, 111, p. 71-86.

(Permian brachiopods from Ratburi Lst of NE Peninsular Thailand, which overlies Phuket Gp 'pebbly mudstones'. Referred to Ufimian (=Roadian) stage)

Arsairai, B. (2014)- Depositional environment and petroleum source rock potential of the Late Triassic Huai Hin Lat Formation, Northeastern Thailand. *Doct. Engin. Thesis, Sunaree University of Technology*, p. 1-310.

(online at: <http://sutir.sut.ac.th:8080/sutir/bitstream/123456789/5758/1/Fulltext.pdf>)
(Organic-rich shales of Late Triassic Huai Hin Lat Fm in Sap Phlu and Na Pho Song basins include excellent gas source rocks)

Arsairai, B., A. Wannakomol, Q. Feng & C. Chonglakmani (2016)- Paleoproductivity and paleoredox condition of the Huai Hin Lat Formation in northeastern Thailand. *J. of Earth Science (China)* 27, 3, p. 350-364.

(online at: <http://en.earth-science.net/PDF/20160612012847.pdf>)

(Lacustrine facies of Late Triassic Huai Hin Lat Fm at Khorat Plateau of NE Thailand believed to be one of main source rocks of gas. Organic matter mainly of AOM and acritarchs, with TOC of 2-7%. Mainly Type I and II kerogens with some Type III as indicated by phytoclasts, spores, and pollen)

Asama, K. (1966)- Permian plants from Phetchabun, Thailand and problems of floral migration from Gondwanaland. Bull. National Science Museum, Tokyo, 9, p. 171-211. *(in Japanese?)*
(Re-evaluation of Permian floras of Phetchabun (Indochina Plate), initially described and interpreted by Kon'no (1964) as Cathaysian with Gondwanan Glossopteris and Paleovittaria. Asama interpreted only Cathaysian flora, suggesting similarities to Jambi flora of SW Sumatra)

Asama, K. (1966)- Permian plants from Phetchabun, Thailand and problems of floral migration from Gondwanaland. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 197-244.
(Re-evaluation of Permian floras of Phetchabun, described by Kon'no (1964) as Cathaysian with Gondwanan elements Glossopteris and Paleovittaria. Asama interpreted only Cathaysian flora. Similarities to Jambi flora of SW Sumatra (6 genera (but no species?) in common, incl. Sphenophyllum, Alethopteris, Pecopteris, Taeniopteris, Cordaites. With discussion on Permo-Carboniferous floral provinces)

Asama, K. (1973)- Some younger Mesozoic plants from the Lom Sak Formation, Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 13, p. 39-46.
(Plant fossils from C Thailand identified as Sequoia ambigua and Pterophyllum sp., interpreted to be probably of Cretaceous age (but vertebrate fossils suggest Late Triassic age of rocks; Buffetaut et al., 1984))

Asama, K (1982)- *Araucarioxylon* from Khorat, Thailand. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press 23, p. 57-64.

Asama, K, J. Iwai, M. Veeraburus & A. Hongnusunthi (1968)- Permian plants from Loei, Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 4, p. 82-99.
(Typical Gigantopteris flora in continental facies U Permian of Loei area, NNE of Phetchabun, NE Thailand (= W margin Indochina terrane). 16 species of Sphenophyllum, Pecopteris, Bicoemphlectopteris, Gigantonuclea, Taeniopteris, etc. (but no Gigantopteris) (more locality information in Iwai et al. 1966))

Asama, K, N. Nakornsri, C. Hinthong & S. Sinsakul (1981)- Some younger Mesozoic plants from Trang, southern Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 35-47.
(Probably E Cretaceous-age plant fossils of Filicales, Bennettales and Coniferales groups from Peninsular Thailand, SE of Phuket)

Asnachinda, P. & S. Pitragool (1978)- Review of non-metallic mineral deposits of Thailand. In: P. Nutalya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 795-804.

Assavapatchara, S., P. Charusiri, T. Charoentitirat, V. Chutakositkanon, K. Hisada & K. Ueno (2006)- On the lithostratigraphy of Permian rocks in Thailand: implications for depositional environments and tectonic settings. J. Geological Society Thailand 1, p. 27-48.
(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/70.pdf>)
(Review of widely exposed, limestone-dominated Permian sections in Thailand. Deposited on margins of Sibumasu, Indochina and intervening Lampang- Chang Rai and Nakhon Thai blocks)

Assavapatchara, S. & L. Raksaskulwong (2010)- Geologic investigation at Paklay- Kenthao area, Lao PDR. In: P. Puncharoen (ed.) Proc. Thai-Lao Technical Conf. on Geology Mineral Resources, Bangkok, p. 197-217.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2010/25987.pdf)

(Correlation of Silurian-Cretaceous stratigraphy between Paklay- Kenthao area in Laos and Loei-Phitsunulok-Uttaradit region of N Thailand. No maps)

Assavarittiprom, V., B. Chaisilboon & S. Polachan (1995)- Review on petroleum exploration in Northeastern Thailand. Proc. Int. Conf. Geology Geotechnology and Mineral Resources of Indochina (GEO-INDO '95), Kon Khaen, p. 541-550.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1995/7459.pdf)

(First exploration well in Khorat Plateau drilled by Unocal in 1971 (dry). Esso drilled 13 wells in 1982- 1990, mainly dry holes, but 1981 gas discovery at Nam Phong (developed in late 1990's). Seven more wells drilled in 1991-1994, also mainly dry. Still remaining potential in Permian and Triassic sequences)

Atherton M.P., M.S Brotherton & C. Mahawat (1992)- Integrated chemistry, textures, phase relations and modelling of a composite granodioritic-monzonitic batholith, Tak, Thailand. J. Southeast Asian Earth Sciences 7, p. 89-112.

Bahae, W. (2017)- Structural evolution using section restoration, Phitsanulok Basin, Central Thailand. Bull. Earth Sciences Thailand (BEST) 9, 2, p. 114-124.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247070/167881>)

(Phitsanulok basin largest Cenozoic rift basin in onshore Thailand; with several sub-basins. Six major stages of structural evolution: (1) E-Oligocene? early extension; (2) Late-Oligocene major rifting; (3) E-Miocene low, late extension; (4) M-Miocene low extension, second pulse of high subsidence; (5) Late-Miocene gentle extension (late rift or early post-rift); (6) Pliocene- Recent stable post-rift stage. Inversion can be observed since Late-Oligocene. Most faulting dies out around base of Late-Miocene)

Baird, A. (1992)- The sedimentology and diagenesis of the Ratburi Limestone, northern peninsular Thailand. Ph.D. Thesis Royal Holloway and Bedford New College, University of London, p. 1-318. *(Unpublished)*

Baird, A. & D. Bosence (1993)- The sedimentological and diagenetic evolution of the Ratburi Limestone, Peninsular Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology, Mineral and Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 173-180.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7599.pdf)

(Ratburi Lst in Peninsular Thailand is warm-water carbonate deposit in platform setting, suggesting that after deposition of glacial pebbly mudstones in rift setting in earliest Permian, the Shan Thai (=Sibumasu) craton moved to lower latitudes by late M- early Late Permian. Platform topography and facies distribution controlled by extensional tectonics. Early dolomitisation, followed by karstification, in response to uplift of Late Permian Indosinian orogeny. Petroleum potential from long karst history (Late Permian- present day) and source potential of platform carbonate mudstone. E-dipping subduction of Indian Ocean Plate resulted in granite magmatism in peninsula during Cretaceous)

Baird, A., O. Dawson & D. Vachard (1993)- New data on biostratigraphy of the Permian Ratburi limestone from north Peninsular Thailand. In: T. Thanasuthipitak (ed.) Proc. Int. Symposium Biostratigraphy of mainland Southeast Asia: facies & paleontology (BIOSEA), Chiang Mai 1993, Chiang Mai University, 2, p. 243-260.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/6790.pdf)

(Ratburi Lst of Peninsular Thailand deposited on broad carbonate platform that covered Shan-Tai (Sibumasu) Terrane. With rel. low diversity fusulinid forams (Nankinella, Staffella, Eopolydiexodina afghanensis and rare Parafusulina, Pseudofusulina, Chusenella), typical hemigordiopsid small forams (Hemigordius reicheli, Hemigordiopsis renzi, Baisalina, Shanita amosi) and Sphairionia sikuoides, suggesting age range of late Murgabian- Midian (late M- early Late Permian))

Bal, A.A., H.M. Burgisser, D.K. Harris, M.A. Herber, S.M. Rigby, S. Thumprasertwong & F.J. Winkler (1992)- The Tertiary Phitsanulok lacustrine basin, Thailand. Proc. Conference Geological resources of Thailand: potential for future development, Dept. Mineral Resources (DMR), Bangkok 1992, p. 247-258.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6223.pdf)

(Phitsanulok basin N-S intra-cratonic rift formed by E-W extension related to India- Asia collision. Located in zone between Shan-Tai and Indochina cratonic plates. Early extension Late Oligocene- E Miocene, followed by later transpressional phase with basic volcanism. Basin center is Sukhothai depression, with 8 km of alluvial-lacustrine sediments)

Barber, A.J., M.F. Ridd & M.J. Crow (2011)- The origin, movement and assembly of the pre-Tertiary tectonic units of Thailand. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 507-537.

(Thailand forms part of core of SE Asia, which, together with rest of Sundaland, formed from continental fragments derived from break-up of N margin of Gondwana. Fragments separated from Gondwana by development of new oceanic crust, and moved N, leaving expanding oceans behind them. At same time oceanic crust lying to N subducted beneath S margin of Asia until, in Triassic, fragments collided and accreted to Asia. Collision zones between continental fragments marked by accretionary complexes, belts of serpentinized and highly disrupted oceanic mantle, basaltic crust and ocean-floor sediments forming ophiolites, together with thrust and imbricated continental margin sediments (melanges with blocks of igneous and sedimentary rocks in clay or serpentinous matrix)

Barr, S.M. & P. Charusiri (2011)- Volcanic rocks. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 415-439.

(Widely distributed volcanic rocks in Thailand, from five Late Paleozoic- Mesozoic belts in Sukhothai and Phetchabun foldbelts to more widely scattered Late Cenozoic basaltic volcanism. Radiometric dating of young basalts is difficult)

Barr, S.M. & M.A. Cooper (2013)- Late Cenozoic basalt and gabbro in the subsurface in the Phetchabun Basin, Thailand: implications for the Southeast Asian Volcanic Province. *J. Asian Earth Sciences* 76, p. 169-184.

(Fragments of basaltic and gabbroic rocks in cuttings from exploration wells in Na Sanun area, Phetchabun Basin, C Thailand, represent flows and sills in lacustrine and fluvial sediments of E-M-Miocene Wichian Buri Group. Basaltic flows ages of ~2, 16, 18 and 24 Ma, and within-plate tholeiitic-alkalic characteristics)

Barr, S.M. & D.E. James (1990)- Trace element characteristics of Upper Cenozoic basaltic rocks of Thailand, Kampuchea and Vietnam. *J. Southeast Asian Earth Sciences* 4, p. 233-242.

(U Cenozoic basaltic rocks of SE Asia classified as nephelinite, basanite, trachybasalt, alkali basalt, basaltic trachyandesite, etc. Classified as continental (within-plate) alkalic or tholeiitic volcanics)

Barr, S.M. & A.S. MacDonald (1978)- Geochemistry and petrogenesis of Late Cenozoic alkaline basalts of Thailand. *Bull. Geological Society Malaysia* 10, p. 25-52.

(online at: www.gsm.org.my/products/702001-101285-PDF.pdf)

(Pleistocene(?) basalts of Thailand small plugs, vents and flows. Part of large NW-SE trending alkaline basalt province through Thailand, Cambodia, Laos, Vietnam, increasing in volume to SE. Thai basalts mainly in two groups: basanitoid (formed by partial melting in mantle at high P, followed by rapid ascent; with gem-quality corundum and zircon) and hawaiitic. Also rare tholeiitic basalts. Possibly related to rifting of S China Sea and associated basins (unlikely?; JTvG))

Barr, S.M. & A.S. MacDonald (1987)- Nan River suture zone, northern Thailand. *Geology (GSA)* 15, p. 907-910.

(Nan River suture zone in N Central Thailand is belt of ophiolitic mafic- ultramafic rocks and Pha Som Gp metasedimentary rocks (epidote-crossite blueschists), probably pre-Permian in age. Nan River belt part of (Paleotethys) suture between Indosinian and Shan-Thai cratonic blocks)

Barr, S.M. & A.S. MacDonald (1991)- Toward a late Palaeozoic-early Mesozoic tectonic model for Thailand. *J. of Thai Geosciences Chiang Mai University* 1, p. 11-22.

(Sukhothai terrane, located between Shan-Thai and Indochina, accreted to Indochina in M Permian, while Shan-Thai followed in Late Triassic)

Barr, S.M., A.S. MacDonald, D.R. Dunning & W. Yaowanoiyothin (1993)- The Doi-Inthanon metamorphic core complex in NW Thailand: age and tectonic significance. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 117-125.

(Doi Inthanon complex in belt of high-grade gneissic rocks along W mountain ranges of Thailand. Dome-shaped orthogneissic core, mantled by mylonitic paragneisses, separated by detachment surfaces from cover of mainly E Paleozoic low-grade to unmetamorphosed sediments. Zircon from core orthogneiss suggests derivation from Late Triassic- E Jurassic granitic protolith, with high-grade metamorphism in Late Cretaceous. Development of complex between Late Cretaceous and Miocene, in response to major crustal thinning)

Barr, S.M., A.S. MacDonald, D.R. Dunning, P. Ounchanum & W. Yaowanoiyothin (2000)- Petrochemistry, U-Pb (zircon) age, and paleotectonic setting of the Lampang volcanic belt, northern Thailand. J. Geological Society, London, 157, 3, p. 553-563.

(online at: https://www.researchgate.net/publication/249547088_Petrochemistry_UPb_zircon_age_and_palaeotectonic_setting_of_the_Lampang_volcanic_belt_northern_Thailand)

(Two NE-trending belts of subaerial dacitic-rhyolitic flows and tuffs near Lampang, N Thailand. Rhyolite from Doi Luang belt yielded U-Pb zircon age of 240 Ma (M-Triassic). Lampang volcanic belt can be traced to N into Lincang-Jinghong volcanic belt in S China, and formed at M-Triassic convergent plate margin. Data constrain timing of final amalgamation between Indochina- Shan-Thai terranes to M Triassic or younger)

Barr, S.M., A.S. MacDonald, N.S. Haile & P.H. Reynolds (1976)- Paleomagnetism and age of the Lampang basalt (northern Thailand) and the age of the underlying pebble tools. J. Geological Society Thailand 2, 1, p. 1-10.

(online at: <http://library.dmr.go.th/Document/J-Index/1976/36.pdf>)

(Quaternary Lampang basalt flows in area of ~200 km² in NW Thailand. Overlie gravels with Early Paleolithic pebble tools. Reversed-to-normal magnetic polarity change recorded within basalt series, probably Matuyama-Brunhes boundary of 0.69 Ma (now assumed to be closer to 0.78 Ma; JTvG). Pebble tools must be older)

Barr, S.M., A.S. Macdonald, B.V. Miller, R. Reynolds, B.P. Rhodes & B. Yokart (2002)- New U- Pb and ⁴⁰Ar/³⁹Ar Ages from the Doi Inthanon and Doi Suthep metamorphic core complexes, Northwestern Thailand. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources (DMR), p. 284-294.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6405.pdf)

(Fission Track ages of extensional metamorphic core complexes in gneiss belt of NW Thailand (W of Chiang Mai) show mainly E Miocene (21-16 Ma) exhumation/ uplift/ cooling ages of Doi Inthanon complex, suggesting response to indentation of SE Asia by India. Zircon dates of ~200-212 Ma from gneiss regarded as igneous protolith ages))

Barr, S.M., A.S. Macdonald, P. Ounchanum & M.A. Hamilton (2006)- Age, tectonic setting and regional implications of the Chiang Khong volcanic suite, northern Thailand. J. Geological Society, London, 163, 6, p. 1037-1046.

(NE part of Tak-Chiang Khong volcanic belt in Sukhothai terrane of N Thailand mainly subaerial andesitic-rhyolitic tuffs, with Triassic U-Pb zircon age of 233 Ma (Carnian). Suite correlated with ~240 Ma Lampang volcanics to SW in Tak-Chiang Khong belt, and Lincang-Jinghong belt in Yunnan (W Simao block). Correlations support placement of Paleo-Tethys suture to W of Sukhothai terrane (see also Srichan et al. 2009))

Barr, S.M., A.S. Macdonald & W. Yaowanoiyothin (1985)- Occurrence of blueschist in the Nan River mafic-ultramafic belt, northern Thailand. Warta Geologi (Newsletter Geological Society Malaysia) 11, 2, p. 47-50.

(online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1985002.pdf>)

(Doi Phuk Sung area, Nan Province, N Thailand with crossite schists (blueschists), associated with metagabbro, hornblende, pyroxenite, garnet amphibolite, and serpentinite in sequence of SSW-dipping sheet-like units, which may have been repeated by thrusting)

Barr, S.M., C. Tantisukrit, W. Yaowanoyothin & A.S. Macdonald (1990)- Petrology and tectonic implications of Upper Palaeozoic volcanic rocks of the Chiang Mai belt, northern Thailand. *J. Southeast Asian Earth Sciences* 4, p. 37-47.

(*Chiang Mai volcanics in N-C Thailand small areas of basaltic volcanic rocks in Permo-Carboniferous sediment sequences. No apparent relationship to plate margin (subduction) environment*)

Bassoulet, J.P. (1988)- Preliminary note on some Jurassic microfossils (foraminifers, algae) from Thailand. In: H. Fontaine & V.Suteethorn (eds.) Late Paleozoic and Mesozoic fossils of West Thailand and their environments, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 20, p. 142-151.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(*Marine Jurassic rel. widespread in N, W and NW Thailand M Jurassic Kanchanaburi Lst platform facies already described by Kemper (1976), with new species of foraminifera Lucasella and Haurania. Other species present include Gutnicella kaempferi, G. parva, Mesoendothyra, Timidonella sarda and dasyclad alga Holosporella siamensis Von Pia*)

Bassoulet, J.P. (1994)- *Bosniella fontainei* nov. sp. (Foraminifere, Biokoviniidae) du Jurassique moyen de Thaïlande. *Geobios* 27, 4, p. 403-411.

(*'Bosniella fontainei* nov. sp. (Foraminifera, Biokoviniidae) from the Middle Jurassic of Thailand'. New small benthic foram species from M Jurassic carbonate platform facies in Kanchanaburi Province near Myanmar border in NW Thailand. Associated with bivalve *Parvamussium donaiense* and foram *Timidonella sarda* (age probably Late Toarcian- Aalenian; Fontaine et al. 2009))

Bastin, H., E. Braun, A. Hess, K.E. Koch, V. Stein, D. Stoppel & R. Wolfart (1970)- Silurian and Early Devonian biostratigraphy in northwestern Thailand. *Newsletters on Stratigraphy* 1, 2, p. 25-32.

(*Silurian and E Devonian graptolites from Paleotethys suture zone melange between Shan-Tai (=Sibumasu) and Indochina terranes*)

Baum, F. & K.E. Koch (1968)- Ein Beitrag zur stratigraphischen Neuordnung des Palaeozoikums in Süd-Thailand. *Geologisches Jahrbuch* 86, p. 879-884.

(*'A contribution to the stratigraphic revision of the Paleozoic of Thailand'. Incl. occurrences of E Devonian graptolites Monograptus spp.*)

Baum, F., E. von Braun, A. Hess, K.E. Koch, G. Kruse, H. Quarch & M. Siebenhuner (1970)- On the geology of northern Thailand. *Beihefte Geologisches Jahrbuch*, Heft 102, p. 1-23.

(online at: <https://edepot.wur.nl/487524>)

(*Review of 1966-1968 work on Geologic Map of N Thailand by German Geological Mission. Summary of Precambrian- ?Jurassic stratigraphy. Precambrian gneiss overlain by ~500m Cambrian quartzites, ~100m Ordovician limestone, 500m Silurian- Devonian shale, sand and limestones. Lower Carboniferous in flysch facies, U Carboniferous intermediate volcanic and igneous rocks, Permian clastics and several 100m thick reefal limestones, etc.*)

Beauvais, L. (1988)- Jurassic corals and coral-bearing limestones of Thailand and Burma. Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 20, p. 152-203.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(*Lower, Middle and Upper Jurassic limestones present in Thailand, but no true coral reef limestones; mainly of microbial origin. Corals from 4 levels, incl. Montlivaltia numismalis. Jurassic microfacies of Thailand and Sumatra similar but not identical. Incl. rare calcisponge Cladocoropsis mirabilis and algae Salpingoporella pygmaea at Pa La Tha, S of Umphang, Tak Province, W Thailand (Sibumasu Block)*)

Beauvais, L. (1988)- Revision of the corals from the Kamawkala Limestone (Burmo-Thai frontier) described in 1930 by J.W. Gregory. In: H. Fontaine & V.Suteethorn (eds.) Late Paleozoic and Mesozoic fossils of West Thailand and their environments, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 20, p. 204-210.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(Fossils from Kamawkala Lst in Thai- Myanmar border area previously interpreted as probable Triassic, but corals here re-identified as *Thalamocoenia*, *Stereocoenia*, *Stylosmilia*, etc. are M-L Jurassic taxa)

Beauvais, L. & H. Fontaine (1993)- *Montlivaltia numismalis* (D'Orbigny): a Middle Jurassic coral newly found in west Thailand. In: T. Thanasuthipitak (ed.) Proc. Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA), Chiang Mai 1993, 1, p. 63-70.

(*Scleractinian coral species Montlivaltia numismalis in black shale S of Mae Sot, W Thailand. Well known from Bathonian (M Jurassic) of Europe (also known from Timor, Seram, Bangka, etc. and usually assigned Late Triassic age?)*)

Beckinsale, R.D., S. Suensilpong, S. Nakapadungrat & J.N. Walsh (1979)- Geochronology and geochemistry of granite magmatism in Thailand in relation to a plate tectonic model. J. Geological Society, London, 136, p. 529-537.

(*Rb-Sr ages of granites in Thailand suggest phases at ~240 Ma (Lower Triassic), ~210 Ma (U Triassic), ~130 Ma (Lower Cretaceous) and ~90 Ma (U Cretaceous). K-Ar ages for mica separates commonly grossly discordant (up to 150 Ma younger than corresponding Rb-Sr whole rock age). Grouped into I-types or S-types, related respectively to subduction of oceanic lithosphere and continent-continent or continent-magmatic arc collisions. Major tin deposits of Thailand associated with Triassic and M Cretaceous S-type granites*)

Benammi, M., Y. Chaimanee, J.J. Jaeger, V. Suteethorn & S. Ducrocq (1999)- Paleontology and magnetostratigraphy of the Eocene Krabi basin (Southern Thailand). In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 545-553.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1999055.pdf>)

(*Eocene Krabi basin in Peninsular Thailand with 6 reptile genera and 31 mammal species. Nearly all vertebrates from lignite levels, indicating tropical climate. Mammal fauna can be related to Late Eocene and/or E Oligocene forms from Europe, N Africa and Asia. Proposed age for mammal fauna Late Eocene (~37-34 Ma). Paleomagnetic work suggests probable correlation for Krabi section with chron C13r (33.5-34.7 Ma)*)

Benammi, M., Y. Chaimanee, J.J. Jaeger, V. Suteethorn & S. Ducrocq (2001)- Eocene Krabi basin (southern Thailand): paleontology and magnetostratigraphy. Geological Society of America (GSA) Bull. 113, 2, p. 265-273.

(*Krabi section from Krabi basin ~105 m of siltstones, sandstones, claystones, lignites, and limestones. Mammalian biostratigraphy indicates Late Eocene age (but palynology suggests E-M Miocene age? Songtham & Watanasak 1999; JTvG), but correlation of magnetostratigraphy to Geomagnetic Polarity Time Scale suggests age of section between 31-34 Ma (E Oligocene)*)

Benammi, M., Y. Chaimanee, J. Urrutia-Fucugauchi & J.J. Jaeger (2004)- Magnetostratigraphic study of the continental sedimentary sequence of Chiang Muan Basin, northern Thailand: implication for the age of the first Miocene hominoids from Thailand. International Geology Review 46, p. 646-654.

(online at: https://www.researchgate.net/publication/232886555_Magnetostratigraphic_Study_of_the_Continental_Sedimentary_Sequence_of_the_Chiang_Muan_Basin_Northern_Thailand_Implications_Etc.)

(*Magnetostratigraphic study of Chiang Muan Basin series N Thailand that contains recently discovered M Miocene hominoid *Lufengpithecus chiangmuanensis*. Tentatively correlated with geomagnetic polarity scale, guided by biostratigraphic data. Proposed correlations suggest age of 13.5- 10 Ma for new hominoid fossil*)

Benammi, M., J. Urrutia-Fucugauchi, L.M. Alva-Valdivia, Y. Chaimanee, S. Triamwichanon & J.J. Jaeger (2002)- Magnetostratigraphy of the middle Miocene continental sedimentary sequences of the Mae Moh Basin in northern Thailand: evidence for counterclockwise block rotation. Earth Planetary Science Letters 204, p. 373-383.

(*Magnetostratigraphic study in Mae Moh basin, N Thailand, documents CCW vertical axis rotation of ~13° with respect to expected Miocene direction derived from Eurasian polar wander curve. Not consistent with*

previously reported paleomagnetic data and may be due to local tectonics. Polarity sequence of nine magnetozones correlated to chron C5ABn–C5An2n, between 13.5 and 12.1 Ma)

Bhongsuwan, T. & P. Ponathong (2002)- Magnetic characterization of the Thung-Yai Redbed of Nakhon Si Thammarat Province, Southern Thailand, and magnetic relationship with the Khorat Redbed. *Science Asia* 28, p. 277-290.

(online at: http://scienceasia.org/2002.28.n3/v28_277_290.pdf)

(Paleomag analysis of U Jurassic - Lower Cretaceous Thung-Yai redbeds. Paleopole position is at $Plat/Plon = 57.8^{\circ}N/184.6^{\circ}E$, which overlaps well with pole position derived from Khorat redbeds, indicating that S Thailand (Shan-Thai/ Sibumasu block) and Khorat Plateau (Indochina block) have not moved relative to each other since U Jurassic- Lower Cretaceous)

Blum, J.D., D.A. Papanastassiou, C. Koeberl & G.J.Wasserburg (1992)- Nd and Sr isotopic study of Australasian tektites: new constraints on the provenance and age of the target materials. *Geochimica Cosmochimica Acta* 56, 1, p. 483-492.

(Nd and Sr isotopic studies of Australites tektites suggest source material derived mainly from Proterozoic crustal terrane. Sr analyses of Muong Nong-type layered indochinite tektites from NE Thailand yield isochron age of ~170 Ma, possibly time of deposition of sedimentary target rocks. Compositional layering in Muong Nong-type tektites may reflect compositional variability of Jurassic sediments. Impact site may be in area of Jurassic sedimentary bedrock, near N Cambodia, S Laos or SE Thailand)

Boonchai, N., P.J. Grote & P. Jintasakul (2009)- Paleontological parks and museums and prominent fossil sites in Thailand and their importance in the conservation of fossils. In: J.H. Lipps & B.R.C. Granier (eds.) *Paleoparks and the protection and conservation of fossil sites worldwide*, Carnets de Geologie, Book 2009/03, Chapter 7, p. 75-95.

(online at: http://paleopolis.rediris.es/cg/CG2009_BOOK_03/CG2009_BOOK_03_Chapter07.pdf)

(Incl. Petrified Forest Park in Tak Province, NW Thailand. 22-69m long and 2m thick silicified *Koompassioxylon* tree trunks, ~800,000 years old)

Boonchai, N., M. Philippe, P.A. Carling & L. Meshkova (2017)- A preliminary investigation of fossil wood from the Lower Mekong Basin of Southeast Asia. *Global Geology* 20, 3, p. 2-14.

(online at: prints.soton.ac.uk/414196/1/Boonchai_et_al_2017.pdf)

(occurrences of Mesozoic fossil wood in Mekong River basin of Thailand, Laos and Cambodia. Includes *Agathoxylon*, *Pahudioxylon* and *Dicotyloxylon*)

Boonchai, N., S. Suteethorn, W. Sereprasirt, C. Suriyonghanphong, R. Amiot, G. Cuny et al. (2020)- *Xenoxylon*, a boreal fossil wood in the Mesozoic redbeds of Southeast Asia: potential for the stratigraphy of the Khorat group and the palinspatic reconstruction of Southeast Asia. *J. Asian Earth Sciences* 189, 104153, p.

(ms online at: <https://hal.archives-ouvertes.fr/hal-02991830/document>)

(First report of *Xenoxylon* silicified wood in NE Thailand, from redbeds of M-L Jurassic(?) Phu Kradung Fm (Khorat Gp) at Phu Por, Kalasin Province. Associated with common *Brachyoxylon serrae* logs. Originates from Indosinian terrane and correlates with other occurrences of genus in S China and Vietnam. Genus widely distributed in Late Triassic- Cretaceous of N Hemisphere, but rare at low latitudes)

Boonchaisuk, S., W. Siripunvaraporn & Y. Ogawa (2013)- Evidence for middle Triassic to Miocene dual subduction zones beneath the Shan-Thai terrane, western Thailand from magnetotelluric data. *Gondwana Research* 23, p. 1607-1616.

(Kanchanaburi province, W Thailand, on Shan-Thai terrane. Late Triassic W-ward subduction in E, where Lampang- Chiang Rai block subducted under Shan-Thai terrane. In E Tertiary W Burma terrane subducted under Shan-Thai. Two deep conductive zones interpreted as mafic/ultramafic rocks, tied to subducted slabs)

Boonsener, M. & K. Sonpirom (1997)- Correlation of Tertiary rocks in northeast Thailand In: P. Dheeradilok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97)*, Dept. Mineral Resources (DMR), Bangkok, 2, p. 656-661.

Boonsoong, A. (2007)- Petrography and geochemistry of the Chanthaburi-Trat basalt, Thailand. In: W. Tantiwanit (ed.) Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources (DMR), p. 242-250.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2007/12729.pdf)

(Late Cenozoic (24 -<0.5 Ma) basalts in mainland SE Asia (Vietnam, China, Thailand, Malaysia) interpreted to have erupted in continental rift environments. Chanthaburi-Trat basalts transitional between trachybasalts and basanites. Magma was generated in continental rift environment, in fertile mantle at ~35km depth).)

Boonsoong, A., Y. Panjasawatwong & K. Metparsopsan (2011)- Petrochemistry and tectonic setting of mafic volcanic rocks in the Chon Daen-Wang Pong area, Phetchabun, Thailand. Island Arc 20, 1, p. 107-124.

(Mafic volcanic rocks and hypabyssal rocks in Chon Dean-Wang Pong area possibly S extension of western Loei volcanic Sub-belt, NE Thailand. Possibly Permian-Triassic age and formed in volcanic arc setting)

Booth, J.E. (1998)- The Khorat Plateau of NE Thailand- exploration history and hydrocarbon potential. Proc. Offshore South East Asia Conference Exhibition (OSEA98), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 169-203.

(Khorat Basin at N edge Indochina Plate, with stacked Permo-Carboniferous, Triassic, Mesozoic and Tertiary basins. To date Permian platform carbonates only productive (gas) reservoir. Oldest well penetration is E Carboniferous (329 Ma) granite in Yang Talat 1. Etc.)

Booth, J. (2011)- The Nakhon Thai Ranges fold-belt in Northern Thailand- evolution of a Late Palaeozoic play from concept to drillable prospect. Proc. 4th Petroleum Forum: Approaching to the 21st Petroleum concession bidding round, Bangkok 2011, Department of Mineral Fuels, p. 90-112.

(online at: [www.dmf.go.th/cms/assets/1/The%204th%20\(DMF\)%20Petroleum%20Forum%20Proceeding.pdf](http://www.dmf.go.th/cms/assets/1/The%204th%20(DMF)%20Petroleum%20Forum%20Proceeding.pdf))

(Exploration blocks in N Thailand highlands between Tertiary Phetchabun- Wichan Buri and Phitsanulok basins, W side of Khorat Plateau. Potential gas play in fractured Permian carbonates)

Booth, J. (2011)- The Nakhon Thai Ranges fold-belt in northern Thailand- evolution of a Late Palaeozoic play from concept to drillable prospects. Proc. 2011 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, 22, p. 1-38. (Abstract + Presentation)

(Similar to Booth 2011, above)

Booth, J. & N. Sattayarak (2011)- Subsurface Carboniferous- Cretaceous geology of NE Thailand. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 185-222.

Boucot, A.J., L.R.M. Cocks & P.R. Racheboeuf (1999)- Early Devonian brachiopods from Satun Province, Southern Thailand. Journal of Paleontology 73, 5, p. 850-859.

(Twelve species of brachiopods from E Devonian (Emsian) Pa Samed Fm mudstones of S Thailand (= Shan Tai/ Sibumasu Block). Represent deeper-water benthic assemblages. Assemblages affinities to Old World Realm, but cannot be assigned to particular biogeographic region)

Brooks, J. (1987)- Development of the Sirikit oil field, Thailand. In: M.K. Horn (ed.) Trans. Fourth Circum Pacific Energy and Mineral Resources Conference, Singapore 1986, Circum-Pacific Council for Energy and Mineral Resources, p. 35-42.

(Sirikit field is 1981 Shell oil discovery in Miocene fluvial-lacustrine K and L sands of Phitsanulok intra-cratonic basin of C Thailand. Recoverable oil ~34-40 MBO. Crude oil waxy (pour point 35°C), but light (40° API) and no sulphur)

Brown, G.F., S. Buravas, J. Charaljavanaphet, N. Jalichandra, W.D. Johnston, V. Sresthaputra & G.C. Taylor (1951)- Geologic reconnaissance of the mineral deposits of Thailand. U.S. Geological Survey (USGS) Bull. 984, p. 1-183.

(online at: <http://pubs.usgs.gov/bul/0984/report.pdf>)

Bunjitradulya, S. (1978)- A review of the Lower Paleozoic rocks of Thailand. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, Asian Institute of Technology, p. 721-730.

(Many metamorphic rocks of Thailand assumed to be of E Paleozoic age, but may be incorrect. Lower Paleozoic sediments mainly along W side of Thailand (= Sibumasu Block). Incl. Late Cambrian sandstones, Ordovician limestones, Silurian graptolite shale, Devonian limestone, etc.)

Bunopas, S. (1976)- On the stratigraphic successions in Thailand- a preliminary summary. J. Geological Society Thailand 2, 1, p. 31-58.

(online at: <http://library.dmr.go.th/Document/J-Index/1976/38.pdf>)

(Review of Precambrian- Cenozoic successions and fossil content in Thailand)

Bunopas, S. (1981)- Paleogeographic history of western Thailand and adjacent parts of South-East Asia- a plate tectonics interpretation. Ph.D. Thesis Victoria University of Wellington, New Zealand, p. 1-810.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1981/29786_1.pdf)

(also at http://library.dmr.go.th/Document/DMR_Technical_Reports/1981/29786_2.pdf)

Bunopas, S. (1982)- Palaeogeographic history of Western Thailand and adjacent parts of Southeast Asia- a plate tectonics interpretation. Geol. Survey Paper No. 5. Dept. Mineral Resources, Bangkok, p. 1-810.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1982/4573.pdf)

(Reprint of Bunopas (1982) thesis. Milestone study of W Thailand paleogeography and tectonics)

Bunopas, S. (1983)- Paleozoic succession in Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 39-76.

(online at: https://www.gsm.org.my/wp-content/uploads/gsm_file_1/SCTM_03.pdf)

(Rel. complete sequence of Cambrian-Permian Paleozoic rocks, mainly in marine facies, outcrops outside Khorat Plateau, both in Shan- Thai and Indochina microcontinents)

Bunopas, S. (1990)- Tektites- their origin and the continental catastrophic destruction in NE Thailand and Indochina. Proc. 16th Conference Sciences and Technology of Thailand, Bangkok, p. 512-513.

(see also Bunopas, Wasson et al. 1999a,b)

Bunopas, S. (1992)- Regional stratigraphic correlation in Thailand. In: Nat. Conf. Geologic resources of Thailand potential for future development, Dept. Mineral Resources, Bangkok, p. 189-208.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6197.pdf)

(Review of new Paleozoic- Cenozoic stratigraphic nomenclature in 7 stratigraphic belts of Thailand: (1) Archeotectonics- Precambrian- Lower Paleozoic Shan-Thai and Indochina part of Australian Gondwana; (2) Paleotectonics; Shan Thai and possibly Indochina rifting in Paleozoic, >180° CW rotation as it moved from S to N Hemisphere and collided with. each other near end-Triassic; (3) Mesotectonics; latest Triassic- Jurassic post-orogenic stage, with early M Cretaceous CW rotation, causing folding along W mountains and downwarping of Khorat Plateau with evaporite deposition; (4) Neotectonics; Cenozoic extension))

Bunopas, S. (1994)- Regional stratigraphy, paleogeographic and tectonic events of Thailand and continental Southeast Asia. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources (DMR), p. 2-24.

(online at: <http://library.dmr.go.th/library/6936.pdf>)

(Four major tectonic events in geologic evolution of Thailand and parts of SE Asia)

Bunopas, S. (2021)- Australasian Pleistocene cometary impact and its effects in Thailand. Thai Geoscience J. 2, 1, p. 16-109.

(online at: <https://www.dmr.go.th/wp-content/uploads/2023/04/Thai-Geoscience-Journal-Vol.2-No.1.pdf>)

(Extensive review of tektites from the Australasian comet impact event in Indochina at ~788 ka, and its impact effects in Thailand (edited by K. Howard and C. Burrett after Dr. Sangad Bunopas passed away in 2020)

Bunopas, S., H. Fontaine, S. Salyapongse & D. Vachard (1983)- Permian paleogeography in Southeast Thailand evidenced by new discoveries. J. Geological Society Thailand 6, p. 17-21.

(online at: <http://library.dmr.go.th/library/J-Index/1983/85.pdf>)

(Complete sequence of Permian fossils now known from Thailand. New Permian limestone localities described from E Thailand near Cambodia border (incl. M Permian Ipciphyllum timoricum). In E Thailand limestones dominant, in W dominantly shale with rare limestones)

Bunopas, S., S. Khositantont & J.T. Wasson (1997)- Evidences of the Early Quaternary global disaster and destruction from extraterrestrial impacts of comet in NE Thailand and South Indochina within the Australasian tektites field: the last mass extinction. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 434-435. (Extended Abstract)

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_3/2540_1/8440.pdf)

(Extinction of many mammals and marsupials and formerly widespread Dipterocaryoxylon plant in S and E Asia, up to 10m thick structureless atmospheric sand and loess across Khorat Plateau, etc. all related to ~700,000 yr Pleistocene Australasian tektite field/ asteroid impact)

Bunopas, S. & P. Vella (1978)- Late Palaeozoic and Mesozoic structural evolution of northern Thailand, a plate tectonics model. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 133-140.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1978/7404.pdf)

(Probably first plate tectonic reconstruction of Thailand. Four N-S trending tectonic belts)

Bunopas, S. & P. Vella (1983)- Tectonic and geologic evolution of Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 307-322.

(online at: https://gsmpublic.files.wordpress.com/2014/10/sctm_18.pdf)

(Thailand consists of two microcontinents: Shan-Tai (=Sibumasu) and Sukhothai foldbelt in W and Indochina and eastern foldbelt in E. Both cratonic fragments derived from Australian Gondwana in Paleozoic, and sutured in M-L Triassic. Gulf of Thailand formed by Late Cretaceous- E Tertiary rifting- spreading)

Bunopas, S. & P. Vella (1983)- Opening of the Gulf of Thailand, rifting of continental Southeast Asia, and Late Cenozoic tectonics. J. Geological Society Thailand 6, 1, p. 1-12.

(online at: <http://library.dmr.go.th/Document/J-Index/1983/83.pdf0>)

(Gulf of Thailand floored by up to 7km of mainly fresh-water sediments, including beds of Oligocene age or older, with marine deposition from Pliocene onward. Extension E-W, at right angles to normal faults.)

Bunopas, S. & P. Vella (1992)- Geotectonics and geologic evolution of Thailand. In: Nat. Conf. Geologic resources of Thailand: potential for future development, Bangkok, p. 209-228.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6198.pdf)

(Review of Thailand tectonic history. Seven major stratigraphic belts in Thailand (5 on Shan Thai, 2 on Indochina Block. Paleomagnetic data suggest >180° CW rotation of Shan-Thai (= Sibumasu) between Carboniferous and Triassic, after rifting from Gondwana)

Bunopas, S., P. Vella, C. Burrett, H. Fontaine, S. Hada, P. Haines, S. Khositantont, P. Chintasakul, P. Chaodamrong, P. Charusiri & K.T. Howard (2007)- Australasian cometary impact, 0.8 Ma catastrophically buried alive Miocene, Pliocene faunas in Thailand and Central Australia, and tektite-bearing flood deposits in NE Thailand. New world's discovery extinction age in Thailand (Indochina) and Australia impact fields. In: W. Tantiwanit (ed.) Int. Conf. on Geology of Thailand: towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 30-43.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2007/12701.pdf)

(Review of Australasia Comet Impact event at ~0.8 Ma, which caused mass extinction, forest fires, floods, >12m thick 'catastrophically', etc., from SE Asia to Australia. Named 'Buntharik Event')

Bunopas, S., J.T. Wasson, P. Vella, H. Fontaine, S. Hada, C. Burrett, T. Suphajanya & S. Khositanont (1999)- Catastrophic loess, mass mortality and forest fires suggest that a Pleistocene cometary impact in Thailand caused the Australasian tektite field. J. Geological Society Thailand, 1999, 1, p. 1-17.

(online at: <http://library.dmr.go.th/Document/J-Index/1999/138.pdf>)

(Common fires, local extinction of trees and mammals and presence of thick catastrophic loess all tied to Australasian tektite impact event at ~0.77 Ma. Sandpits at Udon in NE Thailand, possibly 300-500km from possible impact site, with piles of burnt and petrified logs and trees pushed down abruptly. Associated with mammal fossils and buildup of >12m thick 'catastroloess' (airfall sands/ debris))

Bunopas, S., J.T. Wasson, P. Vella, H. Fontaine, S. Hada, C. Burrett, T. Suphajanya & S. Khositanont (1999)- Early Quaternary global terrestrial impact of a whole comet in the Australasian tektite field, newest apparent evidences discovery from Thailand and East Asia. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology, Mineral Energy Resources SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 533-575.

(online at: www.gsm.org.my/products/702001-100784-PDF.pdf)

(Additional evidence of ~0.77 Ma catastrophic comet impact event in Thailand and E Asia, linked to Pleistocene Australasian tektite field, and here named Buntharik Event. Multiple impact craters in 800 x 1140 km wide impact center from Hainan, Vietnam, NE Thailand to Cambodia)

Bunopas, S., J.T. Wasson, P. Vella, H. Fontaine, S. Hada, C. Burrett, T. Suphajanya & S. Khositanont (1999)- Ancient analogs of burial alive extinction of the mastodons in catastroloess in Thailand, and of the last dinosaurs (in eggs) in Gobi desert: further on tektites. In: Symposium Mineral, energy and water resources of Thailand: towards the year 2000, Bangkok, p. 168-177.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1999/6614.pdf)

(Quaternary sudden mass extinction of mastodons, stegodons and other mammals and reptiles, buried alive under catastroloess in sandpits of Khorat, NE Thailand. Associated with common burnt and abruptly felled trees and tied to Buntharik Impact Event, which generated widespread tektites. Caused E Quaternary extinction across >1/4 of globe. Probably multiple impact craters in NE Thailand- E Cambodia-SE Laos- Hainan)

Bunopas, S., N. Yaemniyoun & S. Khositanont (1999)- Catastroloess and its derivatives, the life time sustainable construction was originally high atmospheric settling in the Quaternary cometary impact in Thailand and Asia. Proc. Symposium Mineral, energy and water resources of Thailand: towards the year 2000, Bangkok 1999, p. 142-151.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1999/6611.pdf)

(Widespread yellow fine construction sands across NE Thailand are derivatives of Pleistocene catastrophic loess that originally formed 10-50m thick blanket across Thailand (not windblown sands). With microtektites, formed at ~0.770 Ma, and tied to comet impact. Covers tektite horizons, burnt petrified trees, burnt trees, ancient elephants, etc., and also E Quaternary tin placers)

Bunpitaksakul, T., K. Jankae & S. Pisutha-Arnond (2009)- Geological study of oil sand from Lower Mae Sot Formation, Fang Basin, Changwat Chiang Mai. Bull. Earth Sciences Thailand (BEST), 2, p. 90-92.

(Brief paper on geochemical and petrological characteristics of oil sand in (Miocene?) Mae Sot Fm in Fang Song intermontane basin, N Chiang Mai province. Oils sourced from lacustrine and floodplain environments)

Buravas, S.C. (1952)- Preliminary notes on the geology of Thailand. Thai Science Bulletin 7, p. 7-43

Buravas, S.C. (1957)- Age of the Mae Soon Oil Field of Fang Basin, Chiang Mai Province. Proc. Conference on the Geology of Thailand, 2, p. 61-65.

(Tertiary oil-bearing deposits of Fang Basin with freshwater molluscs Viviparus and Unio, and plant remains. Preliminary spores-pollen identifications suggest Oligocene age)

Burrett, C. (2021)- The man who made impact – The scientific work of Dr Sangad Bunopas. Thai Geoscience J. 2, 1, p. 1-15.

(online at: <https://ph03.tci-thaijo.org/index.php/TGJ/article/view/1779/1358>)

Burrett, C.F., S.P. Carey & T. Wongwanich (1986)- A Siluro-Devonian carbonate sequence in northern Thailand. *J. Southeast Asian Earth Sciences* 1, 4, p. 215-220.

(220m thick Silurian-M Devonian calcarenites-calcisiltites at Mae Ping, S of Chiang Mai, NW Thailand. Overlie tentaculitid shale. Most common and abundant fossils orthoconic nautiloids similar to Parakionoceras, also known from S Europe and Australia. Conodont fauna near base with Ozarkodina excavata, indicating Lower Silurian-M Devonian age)

Burrett, C., X. Fang, W. Li, H. Thassanapak & M. Udchachon (2024)- The first scyphocrinitid loboliths from Thailand. *Proc. Geologists Association, London*, 135, 1, p. 131-136.

(First plate loboliths (near-spherical buoys of pelagic, scyphocrinitid crinoids) from Thailand. Abundant near top of Siluro-Devonian limestone in Ban Tha Kradan, Kanchanaburi province, W Thailand. Associated conodonts include U Ludlow-Pridoli Zieglerodina remsheidensis. Confirm near-cosmopolitan occurrence of loboliths close to Siluro-Devonian boundary (also known from Sibumasu terrane in N Malay Peninsula, Myanmar and Baoshan)

Burrett, C., H. Thassanapak & M. Udchachon (2015)- Upper Devonian (Famennian) conodonts from radiolarian cherts, Loei Terrane, Loei Province, Northeast Thailand. *Research and Knowledge* 1, 2, p. 26-32.

(online at: <https://rk.msu.ac.th/wp-content/uploads/2016/02/rkv2-03-indd-5.compressed.pdf>)

(Conodonts from radiolarian cherts in Loei Terrane, NE Thailand (W margin Indochina block), include Palmatolepis triangularis, P. minuta ssp and polygnathids, indicating Famennian crepida Zone age. Cherts ~20 My younger than Givetian reef limestones and unlikely deposited in major ocean, but rather in deep marine basin close to volcanic arc)

Burrett, C., M. Udchachon, H. Thassanapak & A. Chitnarin (2015)- Conodonts, radiolarians and ostracodes in the Permian E-Lert Formation, Loei Fold Belt, Indochina Terrane, Thailand. *Geological Magazine* 152, 1, p. 106-142.

(Conodonts rare in Permian carbonates of Indochina block, but abundant conodonts and ostracodes in carbonate turbidites of E-M Permian E-Lert Fm, deposited on margins of interplatform Nam Duk Basin, W side of Khorat Plateau. Conodonts typically Tethyan, incl. Hindeodus, Mesogondolella, Sweetognathus, etc., and indicating late Kungurian-Roadian age. Overlying siliceous shales and chert with radiolaria of latest Kungurian- earliest Roadian age. Ostracodes 23 species)

Burri, P. (1989)- Hydrocarbon potential of Tertiary intermontane basins of Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) *Int. Symposium on Intermontane basins: geology and resources*, Chiang Mai, p. 3-12.

Burton, C.K. (1974)- Peninsular Thailand. In: A.M. Spencer (ed.) *Mesozoic-Cenozoic orogenic belts*, Geological Society, London, Special Publ. 4, p. 301-315.

(Older overview of Triassic-Jurassic Yunnan-Malayan orogeny of W Thailand in terms of geosynclinal theory)

Burton, C.K. (1974)- The Satun Group (Nai Tak Formation and Thong Song Limestone) of Peninsular Thailand. *Sains Malaysiana* 3, 1, p. 15-34.

Burton, C.K. (1986)- The Kanchanaburi supergroup of Peninsular and Western Thailand. In: G.H. Teh & S. Paramananthan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 311-361.

(online at: www.gsm.org.my/products/702001-101421-PDF.pdf)

(Extensive review of Paleozoic stratigraphy of W and Peninsular Thailand (= Sibumasu Terrane). Carboniferous- Lower Permian Phuket Group deposited as turbiditic series in opening graben, etc.)

Burton, C.K. & J.D. Bignell (1969)- Cretaceous-Tertiary events in Southeast Asia. *Geological Society of America (GSA) Bull.* 80, p. 681-688.

(Granites NE of Gulf of Thailand mainly Triassic or older age. Granites from Malay-Thai Peninsula reveal widespread Cretaceous-Tertiary activity)

Busse, A.G., B. Orberger, S. Pitragool, L. Zenker & G. Friedrich (1990)- Preliminary petrographic and geochemical investigations on mafics and ultramafics from the Phrae Nan chromite mining district in comparison to the Ban Pak Nai area: The Nan river suture zone, northern Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Proc. Int. Symposium Intermontane basins: geology and resources, Chiang Mai, p. 493-501.

C&C Reservoirs (2009)- Sirikit Field, Phitsanulok Basin, Thailand. 48p.

(online at: http://ccop.asia/uc/data/43/docs/Sirikit%20field_c&c%20reservoir.pdf)

(Sirikit Field in Phitsanulok half-graben basin, ~400 km N of Bangkok. Discovered in 1981, onstream in 1982. Largest onshore oil field in Thailand, with EUR 148 MMBO. Sweet light waxy oil (~39°API) in faulted N-S-trending anticline. Reservoirs mainly lacustrine-delta sandstones of Miocene Lan Krabu Fm)

Canham, A.C., M.A. Love, A. Racey & S. Polachan (1996)- Stratigraphy and reservoir potential of the Mesozoic Khorat Group, NE Thailand: Part 2: Diagenesis and reservoir quality. J. Petroleum Geology 19, 3, p. 321-338.
(Khorat Gp Cretaceous continental redbeds, unconformably over lithologically similar U Triassic Nam Phong Fm. Reservoir quality decreases with increasing age due to burial compaction and diagenesis. Maximum burial depth >7 km. Porosities from 11% (U Khorat Gp) to 4.9% (Nam Phong Fm). Ratio of secondary grain-dissolution porosity to primary porosity increases with age. Part 1 see Racey et al., 1996)

Carey, S.P., C.F. Burrett, P. Chaodumrong, T. Wongwanich & C. Chonglakmani (1995)- Triassic and Permian conodonts from the Lampang and Ngao Groups, northern Thailand. Courier Forschungsinstitut Senckenberg 182, p. 497-513.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1995/4991.pdf)

(Limestones of Triassic Lampang Gp and Permian-Triassic Ngao group (in NE margin of Shan-Tai terrane or Sukhothai terrane) with 3 conodont assemblages: (1) U Permian Neogondella bitteri, (2) Lower Triassic Neospathodus pakistanensis and (3) U Triassic (Norian) Epigondella triangularis))

Caridroit, M. (1993)- Permian radiolaria from NW Thailand. In: T. Thanasuthipitak (ed.) Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA), Chiang Mai 1993, 1, Chiang Mai University, p. 83-96.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7485.pdf)

(Permian and Triassic radiolaria from Chiang Dao region, NW Thailand, an area SW of Nan from which U Silurian- Triassic deep water radiolarian-bearing rocks are known, and where nappe sheets are indicated. With descriptions of Permian radiolaria (Folliculus, Albaillella, etc.))

Caridroit, M., D. Bohlke, A. Lamchuan, D. Helmcke & P. de Wever (1993)- A mixed radiolarian fauna (Permian/Triassic) from clastics of the Mae Sariang area, northwestern Thailand. In T. Thanasuthipitak (ed.) Proc. Int. Symposium on Biostratigraphy of Mainland Southeast Asia: facies and paleontology (BIOSEA), Chiang Mai, 2, p. 401-413.

(online at: www.mnhn.fr/mnhn/geo/PDW/Caridroit%20et%20al%201993.pdf)

(Sequence of red conglomerates/ sandstones/shales unconformably over highly deformed U Paleozoic beds W of Amphoe Mae Sariang not of M Triassic age but latest Triassic or younger. Pebbles include metamorphic quartz and reworked chert clasts with M-L Permian and M Triassic radiolarian assemblages)

Caridroit, M., H. Fontaine, V. Suteethorn & D. Vachard (1990)- New paleontological data on the Carboniferous and Permian of NW Thailand. In: Ten years of CCOP research on the Pre-Tertiary of East Asia, CCOP, Special Volume, p. 337-351.

(Microfaunas from 40 new localities of Visean- Late Permian limestones in NW Thailand)

Caridroit, M., D. Vachard & H. Fontaine (1992)- Datations par radiolaires (Carbonifere, Permien et Trias) en Thaïlande nord-occidentale. Mise en évidence de nappes de charriage et d'olistostromes. Comptes Rendus Academie Sciences, Paris, ser. II, 315, 4, p. 515-520.

('Radiolarian age datings (Carboniferous, Permian and Triassic) in NW Thailand; evidence of nappes and olisthostromes'. Paleozoic stratigraphy in NW Thailand described as single Ordovician- Permian marine succession, tectonized in Triassic time, but ages from radiolarite dating (Carboniferous- Triassic) demonstrate existence of separate sedimentary basin far from detrital sources and of Carboniferous- Triassic limestones. Present structural imbrication of radiolarites with limestones and detritic series interpreted in terms of tectonic nappes with considerable shortening, and olistostrome deposits)

Carter, A. & C.S. Bristow (2003)- Linking hinterland evolution and continental basin sedimentation by using detrital zircon thermochronology: a study of the Khorat Plateau Basin, eastern Thailand. *Basin Research* 15, p. 271-285.

(online at: http://searg.rhul.ac.uk/pubs/carter_bristow_2003%20Linking%20hinterland%20evolution.pdf)

(Khorat Plateau Basin, E Thailand, U-Pb and fission-track (FT) zircon data from Phu Kradung Fm age peaks at 141 ± 17 and 210 ± 24 Ma (FT) and 2456, 2001, 251 and 168 Ma (U-Pb). FT data record post-metamorphic cooling, U-Pb data record zircon growth events. U-Pb zircon ages consistent with Qinling Orogenic Belt as source for Khorat Basin sediments. Zircon FT cooling peaks between 114 ± 6 (Phra Wihan Fm) and 141 ± 17 Ma (Phu Kradung Fm), corresponding to Late Jurassic-E Cretaceous reactivation event, which affected Qinling Belt. Early Cretaceous erosion from collision between Lhasa Block and Eurasia)

Carter, A., C.S. Bristow & A. Hurford (1995)- Constraints on the thermal history and provenance of the Khorat Group in Thailand using Fission Track Analysis. *Proc. IGCP Symposium on Geology of SE Asia, Hanoi 1995, Journal of Geology, Hanoi, B, 1995, 5/6, p. 342-353.*

(Khorat Gp on Khorat Plateau up to 4000m thick redbed sequence of Cretaceous age. Zircon fission track data show two age peaks: major Late Triassic (~195 Ma), lesser ~109, 135, 158 Ma age peaks. Increase in zircon ages through Khorat Gp suggests progressive unroofing in foreland basin)

Cavosie, A.J., N.E. Timms, T.M. Erickson & C. Koeberl (2018)- New clues from Earth's most elusive impact crater: evidence of reidite in Australasian tektites from Thailand. *Geology (GSA)* 46, 3, p. 203-206.

(Former presence of reidite (high-P polymorph of zircon) detected in zircon grains in Muong Nong-type tektites from Thailand. Preserved microstructures and dissociation of zircon to ZrO₂ and SiO₂ require pressure of >30 GPa and $T > 1673^{\circ}\text{C}$, the most extreme conditions reported for Australasian tektites so far)

C&C Reservoirs (2009)- Sirikit Field, Phitsanulok Basin, Thailand. Field Evaluation Report, p. 1-47.

(online at: http://www.ccop.or.th/uc/data/43/docs/Sirikit%20field_c&c%20reservoir.pdf)

(Comprehensive description of Shell Sirikit oil field))

Chakrabarti A.K. (1976)- The oil shale deposits of Thailand. *Economic Geology* 71, 4, p. 812-813.

(Brief communication of Late Tertiary oil-shale deposits in several areas of Thailand. Most important deposit at Mae Sod in NW Thailand (20-25% oil by weight); others are Li (Lamphum Province), Ko Kha District (Lampang) and Krabi (S Peninsular region). Thickness up to 20'. With fish fossils of family Cyprinidae)

Chansom, K., P. Kanjanapayont, H.Y. Lee & M. Sone (2025)- Multiple phases of structural deformation in the evolution of the Klaeng fault zone, Eastern Thailand, constrained by zircon U-Pb ages and Hf isotopic compositions. *J. Asian Earth Sciences* 292, 106729, p. 1-19. *(online at: https://www.academia.edu/130493489/Multiple_phases_of_structural_deformation_in_the_evolution_of_the_Klaeng_fault_zone_Eastern_Thailand_constrained_by_zircon_U_Pb_ages_and_Hf_isotopic_compositions)*

(Eight sheared granites from Klaeng FZ with zircon U-Pb ages of 448 Ma (Late Ordovician), 219-217 Ma (Late Triassic), and 46.38 Ma (M Eocene)..E Thailand evolved through four phases of tectonic deformation: D1 folding during Triassic Indosinian orogeny; D2 Cretaceous collision of Burma block with SE Asia; D3 and reactivated D4 influenced by Cenozoic collision of India. Klaeng fault zone represents Palaeotethys suture in E Thailand)

Chantong, W. & J. Booth (2007)- Is the Kuchinarai Group of the Khorat Plateau a good source of hydrocarbons? In: W. Tantiwanit (ed.) *Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07)*, Bangkok, Dept. Mineral Resources, p. 132 *(Abstract only)*

(Late Triassic Kuchinarai Gp synrift clastics and volcanoclastics in half-grabens/ grabens that formed after Indosinian Orogeny I (age based on palynology from exploration wells). Most rift basins bounded by NW-SE and W-E faults to S. Graben fill three main sequences: (1) upper claystone- shale, (2) middle dark lacustrine shale with minor siltstone- sandstone, (3) lower basal conglomerates and volcanoclastics. Petroleum wells shows shales of M Kuchinarai Gp have 1.0-3.7% TOC and are potentially good oil-gas source)

Chantong, W., P. Srisuwon, C. Kaewkor, C. Praipipan & S. Ponsri (2013)- Distributions of the Permo-Carboniferous rocks in the Khorat Plateau Basin. Proc. 2nd Lao-Thai Technical Conference on geology and mineral resources, Vientiane, p. 73-80.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2013/36770.pdf)

(Permian carbonate major petroleum reservoir in Khorat Plateau. 47 wells drilled, two producing gas fields (Nam Phong and Sin Phu Horm) from reservoirs in Permo-Carboniferous carbonate platform, with thrust fault resulting in fracture development. Dong Mun Gas field in development, in carbonate reef with karst topography. 18 separate isolated carbonate platforms identified from seismic)

Chantraprasert, S. & S. Utitsan (2021)- Origin of synchronous extension and inversion in a rift basin: The Phitsanulok Basin, central Thailand. J. Asian Earth Sciences 213, 104774, p. 1-15.

(Phitsanulok Basin rift basin in C Thailand opened in Oligocene- E Miocene along N-S and NNW-SSE trending normal faults. In M Miocene N part of basin continued extension, while S part affected by compressive inversion. Extension resumed in Late Miocene-Pliocene, followed by post-rift subsidence in Quaternary. Strike-slip motions contributed to CCW rotation of continental block W of Phitsanulok Basin, creating synchronous extension and contraction)

Chaodumrong, P. (1992)- Stratigraphy, sedimentology and tectonic implications of the Lampang Group, central North Thailand. Ph.D. Thesis, University of Tasmania, p. 1-230.

(online at: http://eprints.utas.edu.au/18810/1/whole_ChaodumrongPol1992_thesis.pdf)

(Triassic Lampang Gp in Sukhothai foldbelt deposited on E side of Shan Thai terrane (= Sibumasu) in Lampang and Phrae forearc basins, above W-ward subduction of Indochina under Shan-Thai terrane. Collision in Late Triassic. Both sub-basins with similar deepening-upward megasequence, starting with fan-delta red beds, grading upward to ramp carbonates (with common oolites and oncolites) and submarine fan sediments with Halobia, etc. Volcaniclastics dominate most Lampang sandstones. Source areas changed from active magmatic arc in Hong Hoi and Pha Daeng Fms to combination magmatic arc and recycled orogen in Wang Chin Fm as result of interaction between ShanThai and W-ward subducting Indochina terrane)

Chaodumrong, P. (1994)- Sedimentology and tectonic implication of Triassic submarine fans, Lampang group, central north Thailand. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok, 1994, Dept Mineral Resources and IGCP 306, p. 208-225.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1994/6948.pdf)

(Triassic Lampang Gp in central N Thailand deposited in two adjacent subbasins in fore-arc basin of Shan-Thai (= Sibumasu) terrane). Mainly mud-rich submarine fans, with Daonella, Halobia, etc. Provenance change from active magmatic arc in Hong Hoi Fm to combined active arc- recycled orogen during Wang Chin Fm, probably due to interaction of Shan-Thai Plate and W-ward subducting Indochina terranes, with collision ending in Late Triassic)

Chaodumrong, P. (2007)- Stratigraphy and tectonic evolution of Thailand. In: W. Tantiwanit (ed.) Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 319-321. *(Extended Abstract)*

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2007/12740.pdf)

(Thailand consists of two major Gondwana derived, Shan-Thai to W and Indochina to E, amalgamated along Nan-Uttaradit suture in Late Triassic. Indochina terrane drifted away from Gondwana in Late Devonian, as suggested by radiolarian assemblages from chert in suture zone. Shan-Thai terrane was adjacent to NW Australian part of Gondwana until E Permian, based on stratigraphic and faunal affinities from Cambrian- E Permian. Discovery of Devonian- M Triassic deep sea thin-bedded chert and Cathaysian fauna in Carboniferous-Permian limestones in N Thailand, formerly mapped as part of Shan-Thai terrane)

Chaodumrong, P. (2010)- Revised lithostratigraphy of the Kaeng Krachen Group. Stratigraphy Report Geological Bureau, Royal Thai Department of Mineral Resources 1 (2553), p. 1-172.
(Report on E Permian clastics, Peninsular(?) Thailand)

Chaodumrong, P. (2012)- Stratigraphy and tectonic subdivisions of Thailand. Proc. 12th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA 2012), Bangkok, p. 111-114. (*Extended Abstract*)
(Three tectonostratigraphic Gondwana-derived terranes in Thailand, from E to W: (1) Indochina (with Loei-Phetchabun fold belt on W margin), (2) North Thailand (Sukhothai fold belt + Inthanon zone; with Cathaysian Late Carboniferous- Permian seamount limestones)) and (3) Shan-Thai (=Sibumasu))

Chaodumrong, P. (2013)- Lexicon of stratigraphic names of Thailand. Bureau of Geological Survey, Dept. Mineral Resources, Bangkok, p. 1-265.
(online at: https://www.academia.edu/4514086/Lexicon_of_Stratigraphic_Names_of_Thailand_2013)
(Listing of formal and informal stratigraphic formation names in Thailand from Precambrian-Cenozoic)

Chaodumrong, P. & C.F. Burrett (1992)- Revised stratigraphy of the Lampang Group and provenance of volcanoclastic sandstones. In: Technical Annual Meeting Volcanic and volcanoclastic rocks of Thailand, Chiang Mai University, p. 1-28.
(see also Chaodumrong & Burrett (1997))

Chaodumrong, P. & C.F. Burrett (1997)- Early Late Triassic continental colliding between Shan- Thai and Indochina terranes as indicated by occurrence of fan delta red beds of Pha Daeng Formation Central North Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA197), Bangkok, Dept. Mineral Resources, 1, p. 143-157.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7632.pdf)
(In Lampang basin of C N Thailand 200-700m thick early Late Triassic shallow marine 'red bed' fan delta deposits, sourced from active magmatic arc in extensional forearc basin on Shan-Thai (Sibumasu) terrane during collision with W-dipping Indochina terrane. With marine mudstone with M Carnian *ingularis* fauna. Paleocurrents mainly from W and S)

Chaodumrong, P. & C.F. Burrett (1997)- Stratigraphy of the Lampang Group in central north Thailand: new version. CCOP, Technical Bulletin 26, p. 65-80.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1997/4982.pdf)
(Triassic Lampang Gp in central N Thailand formed in two sub-basins, Lampang in W and Phrae in E. Lampang sub-basin formed in Early Triassic to early Late Triassic and contains *Daonella*, *Paratrachyceras*, *Costatoria* and *Claraia*. Phrae sub-basin formed from in Late Triassic and contains mainly *Halobia*)

Chaodumrong, P. & Y. Chaimanee (2002)- Tertiary sedimentary basins in Thailand. In: The Symposium on Geology of Thailand, Bangkok, p. 156-169.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6389.pdf)
(At least 70 named Tertiary intermontane and rift basins in Thailand, with many similarities. Tied to N-ward movement of India. Basins in S formed earlier than in N, in W earlier than E. Alluvial facies dominant in lower and upper parts, fluvio-lacustrine and swamp facies common in middle part)

Chaodumrong, P. & P. Rao (1992)- Depositional environments of Triassic carbonates, Lampang group, central north Thailand. In: C. Piencharoen (ed.) Proc. Nat. Conf. Geologic resources of Thailand: potential for future development, Bangkok, Dept Mineral Resources, p. 355-367.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1992/6235.pdf)
(Carbonate facies of Triassic Lampang Gp. Six carbonate units in mainly siliciclastic sequence. Carbonate ramp model with 14 microfacies types. Shallow ramp/shoal facies with common oncolites and some oolites)

Chaodumrong, P., Y. Ukakimapan, S. Snansieng, S. Janmaha, S. Praditdan & N. Sae Leow (1983)- A review of the Tertiary sedimentary rocks of Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of

Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 159-187.

(online at: https://gsm publ.files.wordpress.com/2014/10/sctm_09.pdf)

(In Thailand 61 small intermontane and larger basins, with mainly lacustrine and fluvial sediments)

Chaodumrong, P., X. Wang & S. Shen (2007)- Permian lithostratigraphy of the Shan-Tai terrane in Thailand: revision of the Kaeng Krachan and Ratburi Groups. In: W. Tantiwanit (ed.) Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 229-236. (Extended Abstract) (online at:

[http://library.dmr.go.th/elib/cgi-](http://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&sid=undefined&skin=u&usid=undefined&mmid=12140&bid=12727)

[bin/opac.exe.exe?op=mmvw&db=Main&sid=undefined&skin=u&usid=undefined&mmid=12140&bid=12727](http://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&sid=undefined&skin=u&usid=undefined&mmid=12140&bid=12727))
(Revision of Permian stratigraphy of Shan-Thai (= Sibumasu) terrane in Thailand, consisting of lower clastics of Asselian- Kungurian Kaeng Krachan Group and overlying Roadian- Wuchiapingian Ratburi Group carbonates (with fusulinids *Pseudofusilina* and *Eopolydiexodina* sp. and small foram *Shanita*). Similar Permian stratigraphy can be traced from Malaysia, through Peninsular Thailand, Myanmar, W Yunnan, to Lhasa)

Charoentitirat, T. (2002)- Permian fusulinodean biostratigraphy and carbonate development in the Indochina Block of Thailand with their paleogeographic implication. Doct. Thesis, University of Tsukuba, Japan, p. . (Unpublished)

Charoentitirat, T. (2002)- Late Middle Permian Fusulinoidean zonations from Changwat Sra Kaeo, East Thailand. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, p. 77-81.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6377.pdf)

(Common fusulinids in Khao Taa Ngog Fm in Sta Keao area of E Thailand. Two zones, *Colania douvillei* and *Lepidolina multiseptata*- *M. douvillei* zones)

Charoentitirat, T. (2005)- Development of Indochina carbonates during Late Paleozoic time based on fusulinoidean data. In: K. Ueno et al. (eds.) Proc. First Int. Symposium Geological anatomy of East and South Asia, paleogeography and paleoenvironment in Eastern Tethys (IGCP 516), Tsukuba, p. (Abstract?)

Charoentitirat, T. & S. Chantraprasert (2012)- Fusulinacean biostratigraphy from limestone blocks within Nan-Uttaradit suture, Thailand. Proc. First International Symposium of IGCP-589, Xi'an, China 2012, Acta Geologica Sinica 33, Suppl. 1, p. 74 (Abstract)

(online at: [http://igcp589.cags.ac.cn/pdf/33-Charoentitirat%20Thasinee\(news\).pdf](http://igcp589.cags.ac.cn/pdf/33-Charoentitirat%20Thasinee(news).pdf))

(Nan-Uttaradit Suture former back-arc basin between Sukhothai Zone and Indochina Block. Scattered Permian limestone blocks in intensely folded shales-tuffs in Nan area with Middle and early Late Permian fusulinid fauna (*Neoschwagerina*, *Pseudodoliolina*, *Colania*, *Lepidolina*, *Colaniella*). Earlier reports of late Early Permian fusulinids and M Triassic radiolaria show existence of Nan back-arc basin from late E Permian (Artinskian) to M Triassic. Fusulinids similar to Indochina Block)

Charoentitirat, T., K. Lousuwan, P. Ampaiwan, A.T. Nguyen, P.T.L. Phung, S. Thanudamrong, C.K. Morley & J. Warren (2012)- Relationships between fluid chemistry and the creation of fractured carbonate-hosted fields in Thailand (analogs for Phu Horm and Nang Nuan Fields). Proc. 12th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA 2012), Bangkok, p. 92 (Abstract only)

(Permian limestones in Saraburi and Chum Phae areas with isotope trends reflecting regional burial related to Indosinian orogeny and later catagenic fluid migration event, possibly tied to Paleogene transpression. Same catagenic fluids associated with reservoir-creating fracture system in nearby Phu Horm gas field)

Charoentitirat, T. & K. Ueno (1999)- Late Carboniferous- Early Permian fusulinacean fauna from Loei, Northeast Thailand. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 86-87 (ST5

book online at: [https://library.dmr.go.th/elib/cgi-](https://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374)
[bin/opac.exe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374](https://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374))

(Brief paper on Gzhelian-Asselian fusulinids in Loei area, NE Thailand)

Charusiri, P. (1989)- Lithophile metallogenetic epochs of Thailand: a geological and geochronological investigation. Ph.D. Thesis, Queen's University, Kingston, Canada, p. 1-809. *(Unpublished)*

Charusiri, P., A.H. Clark, E. Farrar, D. Archibald & B. Charusiri (1993)- Granite belts in Thailand: evidence from the $^{40}\text{Ar}/^{39}\text{Ar}$ geochronological and geological syntheses. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology, Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 127-136.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/16.pdf>)

(Three granitoid belts of Thailand formed in different geotectonic environments: (1) E Belt formed in M-U Triassic (245-210 Ma; no Permian ages; I-type granitoids formed by subduction under Shan-Thai and Indo-China microcontinents), (2) C Belt in Late Triassic- E Jurassic (220-180 Ma; S-type granitoids result of Shan-Thai/Indo-China microcontinental plate collision), and (3) W Belt in Late Cretaceous- M Tertiary (80-50 Ma; S-type granitoids result of Shan-Thai/ W Burma collision))

Charusiri, P., V. Daorerk & D. Archibald, K. Hisada & T. Ampaiwan (2002)- Geotectonic evolution of Thailand: a new synthesis. J. Geological Society Thailand 1, p. 1-20.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/45.pdf>)

(Thailand two major terranes, Shan Tai and Indochina, which amalgamated in Late Triassic. In M Paleozoic two smaller terranes between Shan-Tai and Indochina: 'Nakhon Thai' ocean floor to E and 'Lampang- Chiang Rai' volcanic arc to W. Late Triassic- E Jurassic thrusting of Shan-Tai over Lampang-Chiang Rai, E Lampang-Chiang Rai over Nakhon Thai, W Nakhon Thai over W Indochina, etc., followed by Jurassic-Cretaceous continental sedimentation over Lampang-Chiang Rai, Nakhon Thai and W and SW Indochina. M-L Miocene mantle-derived, gem-bearing basalts, possibly linked to late regional uplift. Etc.)

Charusiri, P., S. Imsamut, Z. Zhuang, T. Ampaiwan & X. Xu (2006)- Paleomagnetism of the earliest Cretaceous to early late Cretaceous sandstones, Khorat Group, Northeast Thailand: implications for tectonic plate movement of the Indochina block. Gondwana Research 9, p. 310-325.

(Paleomagnetic study of samples from earliest Cretaceous to early Late Cretaceous sandstones of Khorat Gp in Indochina block suggest paleolatitude similar to today. Major displacement of Indochina along Red River and associated faults by ~950 km with 16-17° CW rotation relative S China plate in earliest Cretaceous. Indochina plate rotated 20-25° CW since very Late Cretaceous-E Neogene, may be due to India-Asia collision)

Charusiri, P., S. Kosuwan & S. Imsamut (1997)- Tectonic evolution of Thailand: from Bunopas (1981)'s to a new scenario. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 414-420.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7645.pdf)

Charusiri, P., S. Kosuwan, A. Lumjuan & B. Wechbunthung (1999)- Review of active faults and seismicity in Thailand. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 653-665.

(online at: www.gsm.org.my/products/702001-100776-PDF.pdf)

(Thailand rel. low seismicity. Fault activities more or less linked to extrusion tectonics caused by India-Asia collision in mid-Tertiary. Five major fault zones: N, WNW, C Peninsular, S Peninsular, and ENE FZ)

Charusiri, P., W. Lunwongsa & P. Laochu (2003)- Geophysical investigations at Khao Nang Klu lead deposit, Ban Kli Ti, Kanchanaburi, Western Thailand: implications for tectonic structures ore localization and exploration. Science Asia 29, p. 265-277.

(online at: www.scienceasia.org/2003.29.n3/v29_265_277.pdf)

Charusiri, P., S. Pailoplee, S. Kosuwan, I. Takashima & B. Rhodes (2022)- Active fault and seismic zonation in Thailand: An empirical compilation. Bull. Earth Sciences Thailand (BEST) 14, 1, p. 11-34

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/248778/168874>)

(Recent fault activity in Thailand linked to extrusion tectonics caused by India-Asia collision in M-Tertiary time. Fault activity mainly related to basin flanks in N Thailand. Map with 17 major active fault zones and five seismically active belts)

Charusiri, P., W. Pongsapich, V. Daorerk & B. Charusiri (1992)- Anatomy of Chantaburi granites: geochronology, petrochemistry, tectonics and associated mineralization. In: C. Piencharoen (ed.) Proc. Nat. Conf. Geologic resources of Thailand: potential for future development, Bangkok, Dept. Min. Resources, p. 383-392.

(online at: www.geo.sc.chula.ac.th/eatgru/Thai/research/pdf/paper/11.pdf)

(Chantaburi granites I-type and intruded in U Paleozoic- Lower Triassic, emplaced at ~195-209 Ma (= ~Triassic-Jurassic boundary), overprinted by Paleogene thermal event. Nearby Early Eocene S-type intrusions)

Charusiri, P., W. Pongsapich, V. Daorerk & C. Khantaprab (1992)- Granitoid belts in Thailand: new evidence from ⁴⁰Ar/³⁹Ar geochronological and isotopic syntheses. J. Scientific Research Chula University 17, 2, p. 99-116.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/12.pdf>)

(New Ar/Ar ages show Eastern Granite Belt is Triassic, Central Belt Late Triassic- M Jurassic and Western Belt Late Cretaceous- M Tertiary)

Charusiri, P., W. Pongsapich & S. Vedchakanchana (1986)- Petrological & geochemical studies of granites of Kathu Plutons of Phuket Island, Southern Thailand. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 261-280.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986020.pdf>)

(C part of Phuket Island covered with Cretaceous- Tertiary granitic rocks of Kathu Plutons. Five types of granites. Tin deposits mainly in greisenized mica granites and pegmatites)

Charusiri, P. & S. Pum-Im (2009)- Cenozoic tectonic evolution of major sedimentary basins in Central, Northern, and the Gulf of Thailand. Bull. Earth Sciences Thailand (BEST 2009), 2, 1, p. 40-62.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246467/167543>)

(In Thailand all major N-S trending Cenozoic basins are pull-apart basins developed during Late Eocene- E Oligocene (55-35 Ma) rifting as result of 'extrusion tectonics' of SE Asian block along major NE-SW trending fault zones. Basins fill started with localized lacustrine and alluvial deposits in Oligocene, followed by fluvial-alluvial deposits in lower unit (<100-2500m thick), transgressive fluvial and marginal marine deposition (<500-1000m thick) in middle, and capped by overall regressive fluvial- alluvial deposits in upper unit)

Charusiri, P., T. Pungrassami & G. Sinclair (2006)- Classification of rare-earth element (REE) deposits in Thailand: a genetic model. J. Geological Society Thailand 1, p. 57-66.

(online at: <http://library.dmr.go.th/Document/J-Index/2005-2006/2848.pdf>)

(Rare Earth minerals in Thailand mainly monazite, and also xenotime and microlite. Primary REE deposits associated with tin granitoids of S-type affinity and mainly in Cretaceous- Tertiary Western Granitoid Belt. Alluvial placers near weathered granites may yield variable amounts of REE ores, mainly near granitoid terraces of western Gulf of Thailand, possibly also along Andaman Sea)

Charusiri, P., T. Rewbumroong, K. Rittidate & N. Srinak (2014)- Tectonic evolution of Cenozoic basins in Thailand with special emphasis on Mae Moh Basin, northern Thailand. In: Development of the Asian Tethyan Realm, Proc. 3rd Int. Symposium International Geosciences Program (IGCP) Project 589, Tehran 2014, p. 68-70. (Abstract)

(N-S trending Cenozoic basins of Thailand inferred to have developed in Late Eocene- E Oligocene as result of extrusion tectonics of SE Asian block, along major NE-SW trending fault zones. Most basins regarded as pull-apart basins. Deposition started with localized lacustrine and alluvial deposition in Oligocene, followed by fluvial and marginal marine deposits. Four main tectonic episodes: (1) pull-apart and transtensional rifting (55-30 Ma), marked at end by M Tertiary unconformity; (2) quiescent thermal subsidence event (30-15 Ma) involving widespread transpression and extensive delta progradation; (3) transpression wrenching event (15-7

Ma) due to on-going dextral shear along major NW-trending fault zones, with subsequent basin inversion and folding; end marked by late M Miocene unconformity; (4) post-rifting (7 Ma- Recent))

Charusiri, P., C. Sutthirat, C. Plathong & W. Pongsapich (2004)- Geology and petrochemistry of basaltic rocks at Khao Kradong, Burirum, NE Thailand: implications for rock wool potentials and tectonic setting. J. Scientific Research Chulalongkorn University 29, 2, p. 81-103.

(Khao Kradong in Burirum national park in NE Thailand is small basaltic volcanic cone in Cenozoic basaltic terrain of ~30 km². Age from whole-rock Ar/Ar dating 1 Ma. Rocks transitional from hawaiiite to alkali olivine basalt. Part of Cenozoic basalts of continental-rift origin of Laos-Cambodia- Vietnam)

Charusiri, P., C. Sutthirat & V. Daorerk (2009)- Introduction to Rare-Earth metal resources in Thailand. 6th Int. Conference Materials Engineering for Resources (ICMR) 2009, Akita, Keynote Session, A1-3, p. 73-78.

(online at: www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/93.pdf)

(Monazite and xenotime significant rare earth minerals occurring with tin-tungsten deposits in granites and pegmatites and in Quaternary fluvial and beach deposits. Ilmenite- series granites more rare earth minerals than magnetite - series granites. Weathering crust of granites-pegmatites of important economic significance. In S Thailand highest RE metal contents 0.092%. Important secondary provinces in Songkhla and Yala of S Thailand with up to 0.045% monazite and 0.196% xenotime)

Chen, Y. & V. Courtillot (1989)- Widespread Cenozoic(?) remagnetisation in Thailand and its implications for the India-Asia collision. Earth Planetary Science Letters 93, 1, 113-122.

(Paleomagnetic study of Devonian- Jurassic sites of Khorat plateau and reappraisal of published data from Triassic-Cretaceous show most of Indochina block suffered complete remagnetization after Triassic and possibly after Cretaceous, most likely during India- Eurasia collision. Paleodirections associated with remagnetization consistent with Thailand as part of Eurasia that suffered some 20° of CW rotation)

Cheneval, J., L. Ginsburg & C. Mourer-Chauvire (1984)- Discovery of an avifauna from the Miocene of Northern Thailand. Comptes Rendus Academie Sciences, Paris 299, Serie II, 19, p. 1369-1372.

Cheneval, J., L. Ginsburg & C. Mourer-Chauvire & B. Ratanasthien (1991)- The Miocene avifauna of the Li Mae Long locality, Thailand: systematics and paleoecology. J. Southeast Asian Earth Sciences 6, 2, p. 117-126.

(Miocene bird fossils from Li Mae Long includes anhinga, heron, lesser flamingo (Phoeniconaias siamensis n. sp.), etc. Probably in large swampy depression surrounded by humid forests, under warm climate)

Chen, Z.Y., W.J. Li, X. Fang, C. Li, C. Burrett, M. Udchachon & Y.D. Zhang (2024)- Ordovician conodonts from the Ban Tha Kradan area, western Thailand. Palaeoworld 33, 3, p. 546-558.

(online at: https://www.researchgate.net/publication/366207835_Ordovician_conodonts_from_the_Ban_Tha_Kradan_area_western_Thailand)

(Eleven Ordovician conodont species from W Thailand. Conodonts and macrofossils show Tha Manao Fm limestone of U Floian-Darriwilian age. Conformably overlying Pa Kae Fm Sandbian lower Katian (Sibumasu))

Chen, Z.Y., H. Thassanapak, W.J. Li, X.J. Wu, M. Udchachon, X. Fang & C. Burrett (2025)- First documentation of early Silurian conodonts from western Thailand and its geological implications. J. of Palaeogeography 14, 1, p. 157-171.

(online at: <https://www.sciencedirect.com/science/article/pii/S2095383624001172>)

(E Silurian conodonts from Kroeng Kravia section in W Thailand (Sibumasu) similar to that from Baoshan (Yunnan) and Langao of Shaanxi Province in W China and alsosimilar assemblages and paleoenvironments in Australia, Laurentia, and peri-Gondwana, suggesting good marine connections between these regions)

Chenrai, P. (2012)- Paleocurrent analysis of the Sao Khua Formation, Khorat Group, Nong Bua Lamphu region, NE Thailand. Arabian J. Science Engineering 37, 1, p. 115-120.

(online at: https://www.researchgate.net/publication/257803076_Paleocurrent_Analysis_of_the_Sao_Khua_Formation_Khorat_Group_Nong_Bua_Lamphu_region_NE_Thailand)

(Paleocurrent analysis in sandstones of E Cretaceous Sao Khua Fm redbeds of Khorat Plateau shows paleocurrent trend of sand channels dominantly NE; probably in braided channel environment)

Chinbunchorn, N., S. Praditjan & N. Sattayarak (1989)- Petroleum potential of Tertiary intermontane basins in Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) International Symposium Intermontane basins: geology and resources, Chiang Mai, p. 29-42.

Chinoroje, O. (1993)- Petrographic studies of Permian carbonates in Southern Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 161-171.

(Petrography of M-U Permian carbonates from Peninsular Thailand (Ratburi, Prachuab Khirikhan, Ko Ang Thong and Surat Thani-Phang Nga). Six facies in interior-platform setting. Bioclastic grains stromatolite, green algae, tabulate corals, solitary corals, crinoids, foraminifera (Shanita, Hemigordius), brachiopods, bryozoan, etc. Non-bioclastic grains ooids, peloids and intraclasts)

Chinoroje, O. & M.R. Cole (1995)- Permian carbonates in the Dao Ruang 1 exploration well- implications for petroleum potential, Northeast Thailand. Proc. Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (Geo-Indo '95), Khon Kaen University 1995, p. 563-576.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1995/7461.pdf)

(Texaco 1993 Doa Ruang 1 well in NE Thailand penetrated ~3000' of late E- early M Permian Ratburi Fm carbonates, overlying Permian? andesitic volcanics. With significant gas shows, but low, non-commercial flow rates due to poor reservoir quality. Potential massive dolomite reservoir not encountered)

Chitnarin, A., S. Crasquin, T. Charoentitrat, P. Tepnarong & N. Thanee (2012)- Ostracods (Crustacea) of the Early-Middle Permian from Central Thailand (Indochina block). Part I. Order Palaeocopida. Geodiversitas 34, 4, p. 801-835.

(online at: <http://sciencepress.mnhn.fr/sites/default/files/articles/pdf/g2012n4a5.pdf>)

(E-M Permian shallow marine ostracods from W margin of Indochina block, C Thailand. Samples from 12 limestone localities in Loei, Phetchabun and Nakhon Sawan-Lopburi contain 39 species of Palaeocopida, families Aparchitidae, Kloedenellidae, Knoxitidae, Paraparchitidae, Kirkbyidae, Amphissitidae, Youngiellidae, Hollinellidae, and Coelonellidae. Podocopida will be described in second paper. Eight new species)

Chitnarin, A., S. Crasquin, C. Chonglakmani, J. Broutin, P.J. Grote & N. Thanee (2008)- Middle Permian ostracods from Tak Fa Limestone, Phetchabun Province, Central Thailand. Geobios 41, 3, p. 341-353.

(First Permian ostracod fauna described from M Permian Tak Fa Lst of Khao Khwang carbonate platform in Phetchabun province, C Thailand. Shallow marine, nearshore assemblages. 15 species mainly endemic, except one, which shows paleobiogeographic links between C Thailand and S China)

Chitnarin, A., S. Crasquin, M.B. Forel & P. Tepnarong (2017)- Ostracods (Crustacea) of the Early-Middle Permian (Cisarulian-Guadalupian) from Central Thailand (Indochina Block): part II, Orders Podocopida, Platycopida and Myodocopida. Geodiversitas 39, 4, p. 651-690.

(Abundant E-M Permian (Cisarulian-Guadalupian) marine ostracods of Indochina block in C Thailand. Close palaeogeographic affinities with S China Block in Paleo-Tethys realm)

Chitnarin, A. & C. Ketwetsuriya (2021)- Middle Permian ostracod fauna from the Khao Khad Formation (Indochina Terrane), Central Thailand. Annales de Palaontologie 107, 4, 10521, p. 1-9.

(First Permian ostracods from Wordian (M Permian) Khao Khad Fm of Saraburi Limestone Group in C Thailand W margin of Indochina terrane). 18 species, typical Palaeo-Tethyan assemblage and similar to faunas from other E-M Permian limestones in C Thailand. Associated with rich fusulinids.

Chonglakmani, C. (1981)- The systematics and biostratigraphy of Triassic bivalves and ammonoids of Thailand. Ph.D. Thesis, University of Auckland, New Zealand, p. (Unpublished)

Chonglakmani, C. (1983)- The marine Mesozoic stratigraphy of Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 105-126.

(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_06.pdf)

(Marine Mesozoic rel. widespread in W Thailand (mainly non-marine in NE). Widespread marine Triassic deposits. Less common, but complete Jurassic sections in NW, NC and S Thailand)

Chonglakmani, C. (1985)- Report on work done along SEATAR Transect-1. Proc. 21st Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bandung 1984, 2, Technical Reports, p. 144-162.

(online at: <https://repository.unescap.org/items/69c82b4b-501e-4b22-84e9-e8571a408cba>)

Chonglakmani, C. (1999)- The Triassic system of Thailand: implication on geotectonic evolution of Southeast Asia. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 95-102. (also in Shallow Tethys 5 Conference, 1999)

(online at: www.gsm.org.my/products/702001-100830-PDF.pdf)

(Four main Triassic sedimentary facies: (1) Continental facies in retroarc foreland basins in NE Thailand amalgamated Indosinia- Sukhothai terranes; (2) Continental platform facies in 'Shan-Mergui' and Chiang Mai (Phrao Lst, Klaeng Lst) terranes; (3) Marine intra-arc facies in volcanoplutonic setting on W part of Sukhothai- Indochina terrane (shallow water siliciclastics- carbonates, turbidites and rhyolitic- andesitic volcanics; (4) Deep marine and oceanic facies (radiolarian chert, pelagic limestone, turbidite and basalts) in two zones representing two distinct Triassic sutures: (1) Chiangrai-Chanthaburi belt, extending S into Bentong-Raub suture of Malaysia, and (2) Mae Sariang-Kanchanaburi belt, extending S to W Malaysia and C Sumatra. Nan-Uttaradit-Sra Kao ophiolite belt previously considered as Late Triassic suture is Late Permian one. Major terrane accretions in Late Triassic by subduction to E in Late Carnian and M-L Norian)

Chonglakmani, C. (2001)- The Saraburi Group of North-Central Thailand: implication for geotectonic evolution. Gondwana Research 4, 4, p. 597-598. (Abstract only)

(Permian limestones of Thailand used to be grouped in Ratburi Limestone, named after province in W Thailand and formed in peri-Gondwanan Realm. Permian limestones from N and NE Thailand are different, formed on Indochina Plate/ Tethyan Realm and should be grouped in Ngao and Saraburi Groups)

Chonglakmani, C. (2002)- Current status of Triassic stratigraphy of Thailand and its implication for geotectonic evolution. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources (DMR), p. 1-3.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6367.pdf)

(Brief review of Triassic deposits in Thailand. Mainly marine, except in NE where only continental, with warm Dictyophylum- Chlathopteris flora. Shan-Tai block with rel. widespread carbonate. E part of Shan-Tai block Late Triassic marine with volcanics facies (equiv. of Semantan Fm in Malaysia Central Belt. Deep marine and oceanic facies in two belts: (1) between Chiang Mai (C Shan Tai) and Sukhothai (E Shan Tai) terranes; with Devonian- M Triassic cherts (=Inthanon suture?); (2) Mae Sariang Zone (farther W; extends S to Kanchaburi, to Semanggol Fm in Malaysia, into C Sumatra. Shan Tai here regarded as part of Indochina province?)

Chonglakmani, C. (2011)- Triassic. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 137-150.

Chonglakmani, C., T. Charoentitirat & M. Liengjarern (1995)- Permian carbonates of Loei area, Northeastern Thailand. Proc. Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (Geo-Indo '95), Khon Kaen University 1995, p. 577-587.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1995/7462.pdf)

(Late Carboniferous- M Permian carbonates in E part of Changwat Loei, NE Thailand. Dark grey massive limestone, ~280m thick, with abundant fusulinids (6 zones), corals algae, etc.)

- Chonglakmani, C., W.W. Duan & H. Fontaine (1990)- Note on the continental deposits of Peninsular Thailand with a description of some conchostracans. *Oil and Gas Geology* 11, 1, p. 31-37.
(*Conchostracans collected from continental sediments halfway between Trong and Krabi dominated by Pseudograptia spp. and probably of late M Jurassic age. Associated with plants, crocodile teeth, etc.*)
- Chonglakmani, C., Q. Feng, D. Meischner, R. Ingavat-Helmcke & D. Helmcke (2001)- Correlation of tectono-stratigraphic units in northern Thailand with those of western Yunnan (China). *J. China University of Geosciences* 12, 3, p. 207-213.
(online at: <http://sutir.sut.ac.th:8080/sutir/bitstream/123456789/506/1/bib132.pdf>)
(*N continuation of Lampang region of Thailand is in Simao region of Yunnan, with very similar Permian-Triassic developments*)
- Chonglakmani, C. & H. Fontaine (1993)- The Lam Narai- Phetchabun region: a platform of Early Carboniferous to Late Permian age. *Proc. Conference Development of geology for Thailand into the year 2000*, Chulalongkorn University, Bangkok 1990, p. 39-98.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1990/24715.pdf)
(*On Carboniferous- Permian carbonate platform S of Phetchabun, NE Thailand (= W passive margin of Indochina Block). Incl. late M Permian massive corals (Ipciphyllum, Wentzellioides), small forams (Dagmarita, Hemigordiopsis), fusulinids (Verbeekina verbeeki, Colania douvillei, Sumatrina, Neoschwagerina). No marine Triassic noted*)
- Chonglakmani, C., H. Fontaine & D. Vachard (1983)- A Carboniferous -Lower Permian(?) section in Chon Daen, Central Thailand. *Proc. Conference on Geology and Mineral Resources of Thailand*, Bangkok 1983, p. 16-20.
(online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=s&mmid=7247&bid=10592>)
(*Rel. thin Carboniferous limestone and clastic sediments at W end of Khorat Plateau. Incl. Michelinia coral*)
- Chonglakmani, C. & J.A. Grant-Mackie (1993)- Biostratigraphy and facies variation of the marine Triassic sequences in Thailand. In: T. Thanasuthipitak (ed.) *International Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA)*, Chiang Mai 1993, 1, Chiang Mai University, p. 97-123.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7482.pdf)
(*Relatively complete marine Triassic section in Thailand >3000m thick, in 3 sedimentary basins across W Thailand (Sibumasu terrane and Paleotethys suture zone?). Twelve faunal zones in Lampang-Phrae basin, mainly based on bivalve molluscs (Claraia, Costatoria, Daonella, Halobia, Trigonodus, Indopecten). Ammonoids relatively rare*)
- Chonglakmani, C. & D. Helmcke (1989)- The Triassic Lampang Group of northern Thailand: forearc basin deposits or sediment of intramontane basins. In: T. Thanasuthipitak & P. Ounchanum (eds.) *International Symposium on Intermontane basins: geology and resources*, Chiang Mai, p. 265-275.
(*Lampang Group, which overlies Late Triassic Lampang volcanic rocks, deposited in shallow intramontane basins, developed on continental crust in post-collisional setting*)
- Chonglakmani, C. & D. Helmcke (2001)- Geodynamic evolution of Loei and Phetchabun regions- does the discovery of detrital chromian spinels from the Nam Duk Formation (Permian, North-Central Thailand) provide new constraint? *Gondwana Research* 4, 3, p. 437-442.
(online at: <http://sutir.sut.ac.th:8080/jspui/bitstream/123456789/499/1/bib129.pdf>)
(*M-U Permian Nam Duk Fm sandstones of Phetchabun region contain chromian spinel and are affected by compressional deformation (unconformably overlain by U Triassic). Confirms erosion of compressional mountain belt and reflects M-U Permian closure of Nan-Uttaradit suture*)
- Chonglakmani, C. & N. Sattayarak (1978)- Stratigraphy of the Huai Hin Lat Formation (Upper Triassic) in northeastern Thailand. In: P. Nutalaya (ed.) *Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III)*, Bangkok, p. 739-774.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1978/7413.pdf)
(Huai Hin Lat Fm at W side of Khorat Plateau is <1300m thick basal unit of Mesozoic Khorat Group. Composed of grey-red fluvial-lacustrine sediments, unconformably over eroded Permian limestones or clastics. Basal unit rhyolite-andesite-tuff volcanics. Age mainly Norian possibly also late Carnian, based on plant fossils of *Dictyophyllum*- *Clathropteris* flora (Kon'no & Asama 1973), estheriids (Kobayashi 1973) and spores-pollen (Haile 1973))

Choowong, M. (2011)- Quaternary. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 335-350.

Chualaowanich, T., D. Saisuthichai, P. Sarapanhotewittaya, P. Charusiri, C.L. Sutthirat, T.Y. Lee. & M.W. Yeh (2008)- New ⁴⁰Ar/³⁹Ar ages of some Cenozoic basalts from the east and northeast of Thailand. Proc. Int. Symposia on Geoscience Resources and Environments of Asian Terranes, Bangkok, p. 225-229.

Chuvavroj, S. (1997)- Deformations in Khorat Plateau Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 321-325.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7642.pdf)
(Three deformation phases in Khorat Plateau, NE Thailand, from Landsat interpretation. Oldest N-S trending, tied to Late Cretaceous Shan Tai- Indochina collision; younger events NW-SE trending folds tied to E Tertiary India collision)

Chutakositkanon, V., P. Charusiri & K. Sashida (2000)- Lithostratigraphy of Permian marine sequences, Khao Pun area, Central Thailand: paleoenvironments and tectonic history. The Island Arc 9, p. 173-187.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/34.pdf>)
(Thick marine Permian section in Saraburi Province, C Thailand (W side of Indochina Block), Permian transgressive-regressive trend from E Permian limestone dominated shelf to M Permian pelagic-abyssal environment. Late Permian again shallow marine facies)

Chutakositkanon, V. & K. Hisada (2008)- Tectono-stratigraphy of the Sa Kaeo-Chanthaburi accretionary complex, Eastern Thailand: reconstruction of tectonic evolution of oceanic plate- Indochina collision. Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok, p. 330-338.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/101.pdf)
(Sa Kaeo suture in E Thailand formerly proposed to be collision zone between Sibumasu and Indochina blocks. Redefined as Sa Kaeo-Chanthaburi Accretionary Complex: melange with Late Paleozoic blocks of oceanic plate materials of basalts and overlying chert with seamount-type limestone, subducted/accreted to W edge of Indochina in latest Permian, covered by turbidite deposits in M Triassic)

Chutakositkanon, V., K. Hisada, P. Charusiri & S. Arai (1999)- Detrital chromian spinels from the Nam Duk Formation: a key to elucidate the tectonic evolution of central mainland Southeast Asia and the Loei suture zone in Thailand. Proc. Int. Symposium Shallow Tethys 5, Chiang Mai, p. 450-456.

Chutakositkanon, V., K.I. Hisada, P. Charusiri & S. Arai (2001)- Tectonic significance of detrital chromian spinels in the Permian Nam Duk Formation, central Thailand. Geosciences Journal 5, p. 89-96.

(Detrital chromian spinels in turbiditic sandstones of Permian Nam Duk Fm suggest mafic- ultramafic volcanics and peridotites of arc origin were exposed in region in Permian. Loei-Phetchabun-Ko Chang volcanic belt, possible candidate for source of detrital Cr-spinels. Associated limestone beds with *Pseudodoliolina pseudolepida* and *Verbeekina verbeeki* suggest late M Permian age for Nam Duk Fm)

Circosta, G. (2011)- Gold (and copper) exploration and mining potential of the Loei- Phetchabun Volcanic belt. Proc. Int. Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011), Khon Kaen, p. 1-2. (Abstract only)

(online at: <http://home.kku.ac.th/geoindo2011/A1-1-116.pdf>)

(Loei-Phetchabun Volcanic Belt is N-S trending Permo-Triassic magmatic-volcanic arc which trends from Laos through C Thailand and into W Cambodia and hosts several world-class Au and Cu-Au deposits)

Cobbing, E.J. (2011)- Granitic rocks. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 441-457.

Cobbing, J. (2004)- The gneissic granites of northern Thailand. In: V. Daorerk & M. Kimata (eds.) Int. Symposium on the geologic evolution of East and Southeast Asia: microcontinental accretion and formation of marginal sea, Chulalongkorn University, p. 28-31.

Cocks, L.R.M. & R.A. Fortey (1997)- A new *Hirnantia* fauna from Thailand and the biogeography of the latest Ordovician of South-East Asia. *Geobios* 30, Suppl. 1, p. 117-126.

(New occurrence of widespread latest Ashgillian Hirnantia brachiopod shelly fauna from Satun Province, S Thailand. Fauna similar to N Shan States, Myanmar and to S China, indicating that Sibumasu (Shan-Thai) palaeocontinent, on which Thailand and N Shan States were situated, in Ordovician and Silurian closer to S China than previously supposed. Incl. descriptions of trilobite Mucronaspis, brachiopods Hirnantia, etc.)

Coenraads, R.R., P. Vicht & F.L. Sutherland (1995)- An unusual sapphire-zircon-magnetite xenolith from the Chanthaburi Gem Province, Thailand. *Mineralogical Magazine* 59, p. 465-479.

(Sapphire, zircon and magnetite-bearing xenolith from Khao Wua, near Chanthaburi dated as ~2 Ma. This is within range of fission track ages for alluvial zircons (~2.57 Ma) from Chanthaburi-Trat gem fields and K/Ar ages of 0.44-3.0 Ma for alkali basaltic volcanism in Chanthaburi Province, with which Thailand's gemstones appear to be associated)

Cooper, M.A., R. Herbert & G.S. Hill (1989)- The structural evolution of Triassic intermontane basins in Northeastern Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Proc. International Symposium on Intermontane basins: geology and resources, Chiang Mai 1989, p. 231-242.

(Description of Khorat Plateau, NE Thailand, Late Triassic half-grabens filled with fluvial sediments. Basin and range type extension explained as collapse of thickened continental crust, 20 My after E Triassic 'Indosinian' collision of Shan Tai and Indochina plates. Overlain by sag-phase Jurassic- Cretaceous continental sediments of Khorat Gp. Basin system inverted during Late Cretaceous- E Tertiary compression caused by Kohistan Arc collision (=W Burma plate?). (Triassic grabens mainly on Indochina Block?; JTVG))

Coster, P., M. Benammi, Y. Chaimanee, C. Yamee O. Chavasseau, E.G. Emonet & J.J. Jaeger (2010)- A complete magnetic-polarity stratigraphy of the Miocene continental deposits of Mae Moh Basin, northern Thailand, and a reassessment of the age of hominoid-bearing localities in northern Thailand. *Geological Society of America (GSA) Bull.* 122, 7-8, p. 1180-1191.

(N Thailand has >40 Tertiary intermontane basins. Some contain hominoid fossils and rich Neogene mammal faunas. Magnetic-polarity stratigraphy used for age calibration in Mae Moh Basin, Lampang Province. 15 polarity zones recognized between 14-12 Ma. Correlation with nearby Chiang Muan basin suggest age of beds with large-bodied hominoid Khoratpithecus Chiangmuanensis is between 12.4- 12.2 Ma)

Cronier, C & R.A. Fortey (2006)- Morphology and ontogeny of an Early Devonian phacopid trilobite with reduced sight from Southern Thailand. *Journal of Paleontology* 80, 3, p. 529-536.

(Development of reduced-eyed phacopid species Plagiolaria poothaii Kobayashi and Hamada 1968, from E Devonian of Pa Samed Fm, Satun Province (Sibumasu terrane). Associated with dacryoconarid tentaculites. Plagiolaria part of specialized group of phacopids inhabiting muddy, dark, deep water environment)

Crosby, K.S. (2007)- Geology of the Udon Thani potash (sylvinite) deposits with an overview for development of a sustainable potassium resource for Thailand. *Proc. Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005)*, Khon Kaen, p. 283-299.

(Exploration program by Asia Pacific Resources Ltd. during 1990s delineated two sylvinite-type potash in Khorat Plateau, Udon S and Udon N. Significant resource of potash fertilizer)

- Crow, M.J. (2011)- Radiometric ages of Thailand rocks. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 593-614.
- Crow, M.J. & K. Zaw (2011)- Metalliferous minerals. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 459-492.
- Curiale, J.A. & M.R. Gibling (1994)- Productivity control on oil shale formation- Mae Sot Basin, Thailand. *Organic Geochemistry* 21, p. 67-89.
(*On Neogene oil shales from freshwater, lacustrine, intermontane Mae Sot Basin, W Thailand*)
- Dawson, O.T. (1978)- Depositional and diagenetic fabrics of Permian limestone from Saraburi, Central Thailand. In: P. Nutalya (ed.) *Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III)*, Bangkok, p. 47-60.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1978/7401.pdf)
(*Study of 1400m of Permian Ratburi Lst, N of Saraburi, C Thailand. Fusulinid faunas can be correlated with Misellina, Neoschwagerina zones of Tethyan Realm*)
- Dawson, O.T. (1978)- Notes on deformation fabrics of the Permian Limestone from Central Thailand. *J. Geological Society Thailand* 3, 1, p. 3-14.
(online at: <http://library.dmr.go.th/library/J-Index/1978/45.pdf>)
(*On deformation and pressure solution in anticlinal structures of folded Permian limestones in Saraburi area. Tests of staffellid and schwagerinid (Nankinella) fusulinid foraminifera more susceptible to stress and solution than neoschwagerinid (Neoschwagerina simplex) types*)
- Dawson, O. (1993)- Fusuline foraminiferal biostratigraphy and carbonate facies of the Permian Ratburi Limestone, Saraburi, central Thailand. *J. Micropalaeontology* 12, 1, p. 9-33.
(online at: <https://www.j-micropalaeontol.net/12/9/1993/jm-12-9-1993.pdf>)
(*Permian carbonates N of Saraburi, at S end of Phetchabun foldbelt in C Thailand. N-S trending carbonate platform with diverse E Permian (Sakmarian) to early Late Permian (Midian) fusulinid-algal assemblages. Archaeolithoporella and Tubiphytes form reef frameworks, similar to M Permian reefs of Austria and W Texas. Fusulinids of Arctic-Tethyan affinities in E Permian, of Tethyan affinity in M Permian. Tethyan verbeekiniids dominate in late M Permian, together with cosmopolitan species of Parufusulina and Schwagerina, and can be correlated with S Pamirs, Afghanistan, S China, Johore and W Sumatra. Associated dasycladacean floras assignable to E Circum-Pacific Realm. Eight fusuline assemblage zones*)
- Dawson, O., A. Baird & D. Bosence (1993)- No reef-rimmed margins to the Permian carbonate platforms of Thailand. In: B.K. Tan et al. (eds.) *Proc. 7th Conf. Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 181-186.
(*C Thailand E Permian platform, margins formed mainly by grainstones, with only small Archaeolithoporella-Tubiphytes- calcisponges boundstone biostromes. In Ratburi area of Peninsular Thailand, small M Permian Tubiphytes bioherms on platform interior ridges, not in shelf marginal position*)
- Dawson, O. & A. Racey (1993)- Fusuline- calcareous algal biofacies of the Permian Ratburi Limestone, Saraburi, Central Thailand. In: B.K. Tan et al. (eds.) *7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 49-65.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7589.pdf)
(*E-M Permian Ratburi Lst of C Thailand (= W margin of Indochina terrane) folded sequence of Sakmarian- E Midian supratidal to outer platform biofacies. Subdivided with abundant fusuline and calcareous algal biota. Ratburi Lst transgressive-regressive carbonate platform sequence. Fusulinid distribution depth-controlled, with 6 main assemblages. With fusulinid facies distribution model*)
- Dawson, O., A. Racey & J.E. Whittaker (1993)- The palaeoecological and palaeobiogeographical significance of *Shanita* (foraminifera) and associated foraminifera/ algae from the Permian of peninsular Thailand. In: T.

Thanasuthipitak (ed.) International Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA 1993), Chiang Mai 1993, 2, Chiang Mai University, p. 283-295.
(online at: [www.researchgate.net/profile/Andrew-Racey/publication/266149557_DAWSON_O_RACEY_Etc./](http://www.researchgate.net/profile/Andrew-Racey/publication/266149557_DAWSON_O_RACEY_Etc./links/5491106c0cf2747c168b100c/DAWSON-O-RACEY-Etc.pdf) Etc.)
(Late M Permian (Midian) pillared miliolid foram *Shanita amosi* known from Ratburi Lst of Peninsular Thailand and from platform carbonates in Tunisia, Turkey, Iran, E Burma. Associated with poor fusulinid assemblages (unlike high-diversity fusulinids in E Thailand. Appears to be restricted to W Tethys and Shan-Tai Block (Key marker genus for latest M-early Late Permian) of Sibumasu/ Cimmerian terranes; JTVG))

Dawson, O., A. Racey & J.E. Whittaker (1994)- Permian foraminifera from northeast and peninsular Thailand. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources and IGCP 306, p. 323-332.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6958.pdf)
(Permian carbonates of Peninsular Thailand originally deposited on Shan-Tai (Sibumasu) terrane. With mod. diverse foraminifera and algal assemblages mainly of M Permian (late Murgabian-Midian) age, locally ranging down into Sakmarian. Localities with *Shanita amosi* and common *Hemigordius* and *Hemigordiopsis* restricted to peninsular Thailand, where fusulinid assemblage of low diversity. NE Thailand (Indochina terrane) age-equivalent fusulinids are abundant and diverse Tethyan assemblages with *Colania douvillei*, *Lepidolina*, *Neoschwagerina*, *Verbeekina verbeeki*, etc.))

Deng, T., R. Hanta & P. Jintasakul (2008)- A new species of *Aceratherium* (Rhinocerotidae, Perissodactyla) from the late Miocene of Nakhon Ratchasima, northeastern Thailand. J. Vertebrate Paleontology 33, 3, p. 977-985.

(New skull and mandible of mid-sized rhinocerotid *Aceratherium* from Tha Chang sand pits in Nakhon Ratchasima Province, described as *A. porpani*. First discovery of *Aceratherium* in Thailand. Mixture of primitive and derived characters that differ from known species of *Aceratherium*. Probably latest Miocene)

Department of Mineral resources (2014)- Geology of Thailand. Department of Mineral Resources, Bangkok, Thailand, p. 1-508.
(online at: www.dmr.go.th/ewt_dl_link.php?nid=77457&filename=index EN)

Dew, R.E.C. (2014)- Stratigraphy of deformed Permian carbonate reefs in the Saraburi Province, Thailand. Honours Thesis University of Adelaide, p. 1-64.
(online at: <https://digital.library.adelaide.edu.au/dspace/bitstream/2440/110046/2/02wholeGeoHon.pdf>)
(*Khao Khwang Platform formed along S margin of continental fragment of Indochina Block and was deformed in E Triassic Indosinian Orogeny, creating Khao Khwang fold-thrust belt*)

Dew, R.E.C., A.S. Collins, S. Glorie, C.K. Morley, M.L. Blades, S. Nachtergaele, R. King, J. Foden et al. (2018)- Probing into Thailand's basement: New insights from U-Pb geochronology, Sr, Sm-Nd, Pb and Lu-Hf isotopic systems from granitoids. *Lithos* 320-321, p. 332-354.
(online at: https://zarmesh.com/wp-content/uploads/2019/06/Probing-into-Thailand-s-basement-New-insights-from-U-Pb-geochronol_2018_Lit.pdf)
(Review of Thailand main tectonic terranes (Sibumasu, Sukhothai magmatic arc and Indochina), collisional zones (with relics of Inthanon and Nan Sa Kaeo back arc basins), Syn-collisional granitoids in Sibumasu Terrane and Inthanon Zone formed during final stages of Permo-Triassic Indosinian Orogeny (closing of Paleotethys). Etc.))

Dew, R.E.C., A.S. Collins, R. King, F. Arboit, S. Glorie & C.K. Morley (2015)- Stratigraphy of deformed Permian carbonate reefs in the Saraburi Province, Thailand. Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 14-16. (*Extended Abstract*
(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>))
(*E-M Permian (Asselian-Capitanian) Khao Khwang carbonate platform with minor clastic sediments with well-bedded platform carbonates and massive reef complexes. After deposition platform deformed into Khao Khwang fold-thrust belt in Triassic-Lower Jurassic Indosinian Orogeny along S margin of Indochina Block*)

Dew, R.E.C., A.S. Collins, C.K. Morley, R.C. King, N.J. Evans & S. Glorie (2021)- Coupled detrital zircon U-Pb and Hf analysis of the Sibumasu Terrane: from Gondwana to northwest Thailand. *J. Asian Earth Sciences* 211, 104709, p. 1-20.

(U-Pb and Lu-Hf isotopic data from detrital zircons of Paleozoic-Mesozoic sediments from Sibumasu Terrane in NW Thailand. Consistent with other published data. Detrital ages change from (1) 'Gondwanan' older Paleozoic sedimentary sequences, with prominent age populations at 1200-900 Ma, 650-500 Ma and 2500-2460 Ma, to (2) latest Permian-Triassic sediments with Indosinian zircon sources (granitoids emplaced through amalgamation of Thailand). Changes reflect movement of Sibumasu Terrane from NW Australian margin of Gondwana to collision with terranes of present-day Asia)

Dew, R.E.C., R. King, A.S. Collins, C.K. Morley, F. Arboit & S. Glorie (2017)- Stratigraphy of deformed Permian carbonate reefs in Saraburi Province, Thailand. *J. Geological Society, London*, 175, 1, p. 163-175.

(Km-scale thrusts affect sedimentary of Khao Khwang Platform in C Thailand (W margin of Indochina Terrane). Platform three Permian carbonate-dominated units, intercalated with clastics. Paleogeography of area prior to Triassic Indosinian Orogeny poorly known. In Saraburi area several separate carbonate platforms dominated by four major M Permian facies, dated with foraminifera (incl. verbeekiniid and neoschwageriniid fusulinids) and algae)

Dheeradolok, P. & W. Kaewyana (1986)- On the Quaternary deposits of Thailand. *Proc. GEOSEA V*, 1, Bull. Geological Society Malaysia 19, p. 515-532.

(online at: www.gsm.org.my/products/702001-101242-PDF.pdf)

Diehl, P. & H. Kern (1981)- Geology, mineralogy, and geochemistry of some carbonate-hosted lead-zinc deposits in Kanchanaburi Province, western Thailand. *Economic Geology* 76, 8, p. 2128-2146.

(Pb-Zn deposits in W mountain chains of Kanchanaburi Province, W Thailand. Sulfide mineralization stratabound and related to reef-like algal crinoidal buildups in thick Ordovician limestone sequence. Mainly fine-grained galena-sphalerite-pyrite. Homogenization temperatures of fluid inclusions 107-174 °C. Origin of metal-bearing solutions is uncertain, possibly nearby igneous source)

Diemar, M.G. & V.A. Diemar (2000)- Geology of the Chatree epithermal gold deposits, Thailand. In: G. Weber (ed.) *Proc. PACRIM '99 Congress*, Bali 1999, Australasian Institute of Mining and Metallurgy (AusIMM), Publ. 4-99, p. 227-231.

Dill, H.G., R. Botz, F.W. Luppold & F. Henjes-Kunst (2005)- Hypogene and supergene alteration of the Late Palaeozoic Ratburi Limestone during the Mesozoic and Cenozoic (Thailand, Surat Thani Province). Implications for the concentration of mineral commodities and hydrocarbons. *Int. J. Earth Sciences (Geologische Rundschau)* 94, p. 24-46.

(Interdisciplinary study of Late Carboniferous-M Permian Ratburi Gp, Peninsular Thailand, with emphasis on multi-stage diagenesis of Ratburi Lst in Surat Thani Province)

Dill, H.G., F.W. Luppold, A. Techmer, P.I. Chaodumrong & S. Phoonphun (2004)- Lithology, micropaleontology and chemical composition of calcareous rocks of Paleozoic through Cenozoic age (Surat Thani Province, central Peninsular Thailand): implications concerning the environment of deposition and the economic potential of limestones. *J. Asian Earth Sciences* 23, 1, p. 63-89.

(On composition and diagenesis of Ordovician, Carboniferous, Permian, Triassic and Jurassic limestones of Central Peninsular Thailand)

Dill, H.G., F. Melcher & R. Botz (2008)- Meso- to epithermal W-bearing Sb vein-type deposits in calcareous rocks in western Thailand; with special reference to their metallogenetic position in SE Asia. *Ore Geology Reviews* 34, p. 242-262.

(Vein-type antimony deposits hosted by Late Paleozoic calcareous rocks widespread in Lampang-Phrae Province in NW Thailand and in Surat Thani Province in Peninsular Thailand. Stibnite mineralization in N Thailand may be related to Late Permian- Triassic magmatism near Sibumasu- Indochina suture)

DMR-CCOP-TCNU (2017)- Technical seminar on Biostratigraphy and karst morphology of Satun aspiring geopark, Bangkok, p. 1-27.

(online at: www.dmr.go.th/download/article/article_20170720115517.pdf)

(Geology of Satun Province- Tarutao Island in SW Thailand. Part of Shan-Thai (Sibumasu) Plate, with well-documented complete Cambrian- Permian marine sediment section. Tarutao Gp Late Cambrian- E Ordovician clastics with trilobites. Thung Song Gp Ordovician limestones with nautiloids, stromatolites and trilobites. Thong Pha Phum Gp Silurian- Carboniferous black shale, chert, sandstone and limestone with graptolites, trilobites, dacryoconarids (tentaculites), brachiopods. U Carboniferous- Lower Permian Kaeng Krachan Gp clastics with glacial dropstones, including unweathered granite pebbles)

Dopieralska, J., Z. Belka, P. Konigshof, G. Racki, N. Savage, P. Lutat & A. Sardud (2012)- Nd isotopic composition of Late Devonian seawater in western Thailand: geotectonic implications for the origin of the Sibumasu terrane. *Gondwana Research* 22, p. 1102-1109.

(Sm/Nd isotopic data from two U Devonian carbonates near Myanmar border. Conodonts from Thong Pha Phum, W Thailand, with high Sm/Nd ratios, suggesting passive margin continental setting and implying Sibumasu terrane was situated near Archean cratons of W Australia in Devonian, presumably near Carnarvon intracratonic basin. Conodonts from Mae Sariang succession in NW Thailand low and uniform Sm/Nd ratios resemble Variscan and present-day oceanic seawaters and point to pelagic setting within Paleotethys Ocean, suggesting Mae Sariang Paleozoic not part of Sibumasu terrane but part of Inthanon suture zone)

Drumm, A., H. Heggemann & D. Helmcke (1993)- Contribution to the sedimentology and sedimentary petrology of the non-marine Mesozoic sediments in northern Thailand (Phrae and Nan Provinces). In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology, (BIOSEA)*, Chiang Mai, University of Chiang Mai, 2, p. 299-318.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7486.pdf)

(On Permo-Triassic post-Variscan orogeny (latest M Permian) extensional basins in N and NE Thailand. Triassic Phrae-Nan paleo-graben starts with Norian siltstones- limestones, grading upward into Late Triassic-Jurassic continental deposits, with Rhaetian volcanics. Sediment source from E and NE)

Ducrocq, S. (1992)- Etude biochronologique des bassins continentaux Tertiaires du sud-est Asiatique. Thesis University Montpellier II, p. 1-354.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1992/283.pdf)

(*'Biochronologic study of the continental basins of SE Asia'. Diverse mammal-reptile faunas from ~500m thick continental Upper Eocene of Krabi Basin of Peninsular Thailand and faunas of Neogene basins from NW Thailand*)

Ducrocq, S., E. Buffetaut, H. Buffetaut-Tong, Y. Chaimanee, J.J. Jaeger, R. Lacassin & V. Suteethorn (1993)- Age and correlations of the Neogene continental basins from Thailand. *Proc. 7th Regional Conference Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, p. 14-15. (*Abstract only*)

Dunning, G.R., A.S. Macdonald & S.M. Barr (1995)- Zircon and monazite U-Pb dating of the Doi Inthanon core complex, northern Thailand: implications for extension within the Indosinian Orogen. *Tectonophysics* 251, p. 197-213.

(online at: www.academia.edu/2639634/Zircon_and_monazite_U_Pb_dating_of_the_Doi_Inthanon_Etc.)

(Doi Inthanon metamorphic core complex in NW Thai gneiss belt. Zircon dating of orthogneisses suggests derivation from Late Triassic-Early Jurassic granitic protoliths (~205 Ma). High-T metamorphism events in Late Cretaceous (84-72 Ma) and Late Oligocene (~27 Ma). Development of gneiss belt between Late Cretaceous- Early Miocene. Uplift and tectonic denudation chronologically overlap initiation of extensional basins to E and SE and imply genetic connection)

El Tabakh, M., B.C. Schreiber, C. Utha-Aroon, L. Coshell & J.K. Warren (1998)- Diagenetic origin of basal anhydrite in the Cretaceous Maha Sarakham salt: Khorat Plateau, NE Thailand. *Sedimentology* 45, p. 579-594.

(Development of 'Basal Anhydrite' of Cretaceous Maha Sarakham Saline Fm, Khorat Plateau, due to leaching or pressure dissolution of salt at contact between underlying active sandstone aquifer system and overlying massive halite-dominated evaporite sequence)

El Tabakh, M. & C. Utha-Aroon (1998)- Evolution of a Permian carbonate platform to siliciclastic basin: Indochina Plate, Thailand. *Sedimentary Geology* 121, p. 97-119.

(Extensive Permian carbonate platform developed in Thailand on margin of Indochina Plate and near deeper siliciclastic-dominated marine basin, which separated Indochina Plate in E from Shan Thai Plate in W. Sedimentation in both areas ended by late Permian/ E Triassic closure of Paleo-Tethys ocean. Tectonism controlled pattern of platform sedimentation and supplies of carbonate and clastic sediments into basin)

El Tabakh, M., C. Utha-Aroon & B.C. Schreiber (1999)- Sedimentology of the Cretaceous Maha Sarakham evaporites in the Khorat Plateau of northeastern Thailand. *Sedimentary Geology* 123, p. 31-62.

(Cretaceous- E Tertiary evaporites of Maha Sarakham Fm on Khorat Plateau of Thailand and Laos three members of evaporitic successions overlain by non-marine clastic red beds. Khorat and Sakon Nakhon basins periods of marine influx due to relative global sea-level rise but sporadically isolated from world ocean)

El Tabakh, M., C. Utha-Aroon, J.K. Warren & B.C. Schreiber (2003)- Origin of dolomites in the Cretaceous Maha Sarakham evaporites of the Khorat Plateau, northeast Thailand. *Sedimentary Geology* 157, p. 235-252.

(Khorat Plateau of NE Thailand and Laos area of widespread deposition of evaporites and siliciclastics (Maha Sarakham Fm) in Cretaceous. Three types of dolomites associated with this formation)

Elzner, A., T. Charoentitirat & S. Jitmahantakul (2023)- Stratigraphy and depositional environment of Permian clastic rocks in Ko Phi Phi Don, Krabi, Thailand with implications for reservoir quality. *Bull. Earth Sciences Thailand (BEST)* 15, 2, p. 36-51.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/253133/171845>)

(Outcrops of Permian Kaeng Krachan Gp off W Peninsular Thailand include sandstones-shales with dropstones and cool water brachiopods, indicating distal glaciomarine or deltaic depositional environment, linking syn-rift infill to separation of Sibumasu block from Gondwana in E Permian. Low sandstone porosity. Overlain by Ratburi Gp limestones)

Endo, R. (1969)- Fossil algae from the Khao Phlong Phrab District in Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 7, p. 33-85.

(Descriptions of calcareous algae from E-M Permian Rat Buri Lst between Lop Buri and Sara Buri, N Thailand. Fusulinids described earlier by Toriyama and Kanmera 1968. Mainly systematic descriptions of 64 species of 33 genera, incl. Velebitella, Mizzia velebitana, Permocalculus, Macroporella, Solenopora, Vermiporella, etc.)

Fanka, A., T. Tsunogae, V. Daorerk, Y. Tsutsumi, Y. Takamura & C. Sutthirat (2018)- Petrochemistry and zircon U-Pb geochronology of granitic rocks in the Wang Nam Khiao area, Nakhon Ratchasima, Thailand: implications for petrogenesis and tectonic setting. *J. Asian Earth Sciences* 157, p. 92-118.

(Wang Nam Khiao area, NE Thailand, with Carboniferous biotite granite (zircon U-Pb ages ~315-285 Ma), Late Permian hornblende granite (253 Ma) and Triassic biotite-hornblende granite (238 Ma). All part of Eastern Granite Belt and implying multiple episodes of arc-magmatism formed by Paleo-Tethys subduction beneath Indochina Terrane)

Fassihi, S., D. Vachard, A. Chitnarin, M. Sone & P. Heinz (2024)- A new Midian (late Middle Permian) foraminiferal assemblage from the Khao Khwang Platform of the western Indochina Block (Phetchabun Province, central Thailand). *TMS-CFFR Foraminifera Spring Meeting 2024, Cologne*, 1 p. *(Abstract only)*

(online at: www.researchgate.net/publication/372406169_A_new_species_of_Eoparafusulina_Fusulina_Etc.)

(Moderately diverse M Permian foram assemblage from U Saraburi limestone in Phu Phra That area, Phetchabun Province, C Thailand. Represents upper part of Carboniferous-Permian Khao Kwang Platform over W margin of Indochina Block. With fusulinids "Pseudofusulina" cambodgiensis, "P." padangensis, Rauserella staffi, Codonofusiella elongata, etc., but no Midian E Tethys fusulinids Lepidolina and Verbeekina)

Feng, Q.L., C. Chonglakmani, D. Helmcke & R. Ingavat-Helmcke (2004)- Long-lived Paleotethyan pelagic remnant inside Shan-Thai block: evidence from radiolarian biostratigraphy. *Science in China D*, 47, 12, p. 1113-1119.

(online at: www.scichina.com:8080/sciDe/fileup/PDF/04yd1113.pdf)

(E Carboniferous- M-L Triassic radiolarians from ribbon chert in Mae Hong Son-Mae Sariang area, W of Chiang Mai, NW Thailand, indicate pelagic basin in this region. Situated on 'Shan-Thai Block', which was not single block, but composed of Paleotethyan Ocean and two continental terranes affiliated to Gondwana and Cathaysian domains respectively)

Feng, Q.L., C. Chonglakmani, D. Helmcke, R. Ingavat-Helmcke & B. Liu (2002)- Middle Triassic radiolarian fauna from Lamphun, northern Thailand. In: N. Mantajit (ed.) *Proc. Symposium on Geology of Thailand, Bangkok 2002*, Dept. Mineral Resources, p. 108-116.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6381.pdf)

(Late Anisian radiolaria in thin-bedded siliceous rocks SSE of Chiang Mai. 12 species indicative of Triassicampe deweveri zone. Deep basin, probably part of Paleotethys)

Feng, Q.L., C. Chonglakmani, D. Helmcke, R. Ingavat-Helmcke & B. Liu (2005)- Correlation of Triassic stratigraphy between the Simao and Lampang-Phrae Basins: implications for the tectono-paleogeography of Southeast Asia. *J. Asian Earth Sciences* 24, 6, p. 777-785.

(Simao Basin (Yunnan, S China) and Lampang-Phrae Basin (N Thailand) similar Triassic stratigraphy and parts of same tectono-paleogeographic unit. Triassic Lampang Gp with thin-shelled bivalves in E Triassic (Claraia) and Late Triassic (Daonella indica, Halobia). Part of Sukhothai Terrane, E of main Changning-Menglian Paleotethys suture, and belongs to W margin of Cathaysian domain)

Feng, Q.L., D. Helmcke, C. Chonglakmani, R. Ingavat-Helmcke & B. Liu (2004)- Early Carboniferous radiolarians from North-West Thailand: palaeogeographical implications. *Palaeontology* 47, 2, p. 377-393.

(middle E Carboniferous radiolarians from bedded cherts S of Mae Hong Son, NW Thailand, in melange zone composed of Silurian to Triassic slices. Signify pelagic basin at W side of Shan-Tai Terrane, between Shan-Thai and Gondwana, suggesting Shan-Thai terrane already rifted from Gondwana in E Carboniferous, earlier than commonly assumed)

Feng, Q., K. Malila, N. Wonganan, C. Chonglakmani, D. Helmcke, R. Ingavat-Helmcke & M. Caridroit (2005)- Permian and Triassic radiolaria from Northwest Thailand: paleogeographical implications. *Revue de Micropaleontologie* 84, p. 237-255.

(Late Permian, late Ladinian and M Carnian radiolarians (51 species) from Mae Hong Son- Mae Sariang area, W of Chiang Mai, NW Thailand, represent part of Paleotethyan pelagic basin with E Carboniferous-early Late Triassic chert sedimentation. Main oceanic basin was within 'Shan-Thai Block' (= Sibumasu; JTvG), which was not single block, but composed of two continental terranes affiliated with Gondwana (Tengchong- Phuket) and Cathaysian (Simao- Lampang) domains, respectively, separated Paleotethyan Ocean, represented by remnant oceanic basins Changning-Menglian in SW China, Chiang Dao and Mae Yuan in NW Thailand)

Feng, Q.L., W.Q. Yang, S.Y. Shen, C. Chonglakmani & K. Malila (2008)- The Permian seamount stratigraphic sequence in Chiang Mai, North Thailand and its tectogeographic significance. *Science in China, Ser. D, Earth Sciences*, 51, 12, p. 1768-1775.

(online at: <http://engine.scichina.com/downloadPdf/9TokmWFpbobQDqBz9>)

(Widespread Permian carbonate outcrops in NW Thailand formerly considered as evidence for Late Paleozoic shallow Tethys, but are underlain by basalt comparable to oceanic island basalt in Three Rivers area, SW China. Permian carbonates in study area deposited on seamounts comparable to Late Paleozoic Paleotethys ocean of Changning-Menglian Belt in SW China. Seamounts in Chiang Mai-Fang area demonstrate oceanic basin in Late Paleozoic (Paleo-Tethys) between Shan Block of Myanmar and Lampang (= Suthothai) Block of Thailand, shows that in Late Paleozoic Shan and Thai blocks were two different microplates)

Feng, Q.L., Z. Zhang & M. Ye (2001)- Middle Triassic radiolarian fauna from Southwest Yunnan, China. *Micropaleontology* 47, 3, p. 173-204.

(Diverse Anisian radiolarian fauna in siliceous rocks with tuffs and mudstones in Paleo-Tethyan Changning-Menglian belt of SW Yunnan. 73 radiolarian species, 6 new (mainly Triassocampe spp.). Four zones: Triassocampe deweveri (late Anisian), T. coronata coronata (M Anisian), T. coronata inflata (M Anisian) and T. dimitricai (E Anisian). E Triassic radiolarian fauna in area low diversity, mainly Permian survivors)

Fenton, C.H., P. Charusiri, C. Hinthong, A. Lumjuan & B. Mangkonkarn (1997)- Late Quaternary faulting in northern Thailand. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution in Southeast Asia and the South Pacific*, Bangkok, 1, p. 436-452.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7646.pdf)

(N Thailand is intraplate Basin and Range province, with N-S trending grabens and half-grabens, developed in E-W oriented extensional stress regime initiated in Oligocene, with main phase of extension in Late Miocene- E Pliocene. Result of India- Eurasia collision and subsequent E-ward extrusion and rotation of S China and SE Asia along large strike-slip fault systems. Still some Quaternary activity on basin-bounding faults)

Ferrari, O.M. (2007)- Contribution to the geology of Thailand and implications for the geodynamic evolution of Southeast Asia. Doctoral Thesis, University of Lausanne, Lausanne, p. 1-179. *(Unpublished)*

(Study of Nan-Uttaradit suture and Chiang Mai Volcanic Belt. Proposes new location for Palaeotethys suture and new plate tectonic model of SE Asia, implying existence of new Orang Laut terranes (E Vietnam, W Sumatra, Kalimantan, Palawan, Taiwan) and redefined Shan-Thai terrane. Shan-Thai previously viewed as Cimmerian (when Nan-Uttaradit suture thought to be Paleotethys suture), but detached from Indochina with E Permian opening of Nan basin, which closed in M Triassic)

Ferrari, O.M., R. Martini, D. Vachard & G.M. Stampfli (2006)- Permian limestone blocks inside the Nan-Uttaradit Suture Zone (Northern Thailand): faunal affinities and palaeogeographic implications. *EGU Geophysical Research Abstracts* 8, 03423, 2p. *(Abstract only)*

(Nan ophiolite belt in E part of N Thailand separates Shan-Thai block from Indochina, and commonly interpreted as Paleotethys suture between Cimmerian domain and Indochina or closure of smaller basin at N Margin of Palaeotethys. Shan Thai may not be Cimmerian, but Indochina-derived. Oldest rocks in Nan belt Carboniferous-Permian Pha Som Metamorphic Complex, melange of blocks including three kinds of limestone blocks: M Permian grey limestone overlying ophiolite, U Permian bluish limestone as blocks inside schists and siliceous limestone as part of matrix. Closure of basin in two phases: (1) E-M Permian obduction induced greenschists metamorphism at 269 ± 12 Ma; (2) subduction between deposition of U Permian radiolarites and deposition of overlying Carnian-Norian molasse. True Paleotethys suture in region of Mae Hong Son)

Flint, S., D.J. Stewart, T. Hyde, C.A. Gevers, O.R.F. Dubrule & E.D. van Riessen (1988)- Aspects of reservoir geology and production behaviour of Sirikit Oil Field, Thailand: an integrated study using well and 3-D seismic data. *American Assoc. Petroleum Geol. (AAPG) Bull.* 72, p. 1254-1268.

(Onshore Thailand Sirikit oil field in intracratonic Phitsanulok half-graben basin that was subsequently deformed by sinistral strike-slip movement. 8 km thick Tertiary basin-fill includes fluvial-deltaic Lan Krabu Fm, which contains two main oil reservoirs (K, L sands). Formation intertongues with Chum Saeng Fm lacustrine claystones that form stratigraphic seals to both reservoirs)

Flint, S., D.J. Stewart & E.D. Van Riessen (1989)- Reservoir geology of the Sirikit oilfield, Thailand: lacustrine deltaic sedimentation in a Tertiary intermontane basin. In: M.K.G. Whateley & K.T. Pickering (eds.) *Deltas: sites and traps for fossil fuels*, Geological Society, London, Special Publ. 41, p. 223-235.

(Sirikit oilfield, ~400 km N of Bangkok, is fault-bounded structure in major half-graben basin. 8 km thick basin-fill succession includes alluvial fan-fluvial deposits overlain by fluvio-deltaic Lan Krabu Fm, which contains two main oil reservoirs)

Fontaine, H. (1988)- Permian corals of West Thailand. In: H. Fontaine & V.Suteethorn (eds.) *Late Paleozoic and Mesozoic fossils of West Thailand and their environments*, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 20, p. 112-127.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(Corals from W Thailand (Sibumasu Terrane) not abundant and mainly simple forms. Include *Tabulata* (mainly *Sinopora*, also *Pseudofavosites*, *Michelinia*), solitary rugosa (*Lophophyllidium*, *Amplexocarinia*, *Pavastephyllum*) and rare compound rugosa (*Paraipiciphyllum*, *Waagenophyllum*?))

Fontaine, H. (1990)- Some Devonian corals and stromatoporoids from Northeast Thailand. *Geologisches Jahrbuch* B73, p. 57-79.

(NE Thailand (Loei Province) E-M Devonian limestones two facies belts: (1) E belt of thin limestone lenses with brachiopods and massive tabulate corals (*Favosites*, *Helioles*, *Michelinia*) in marls, and (2) W belt with thicker limestones with rugose and tabulate corals (*Phillipsastraea*, *Endophyllum*, *Heliolites porosus*, *Favosites*, *Cladopora*, etc.) and stromatoporoids (*Chlathrodictyon*, *Actinostroma*, *Amphipora*). Most limestones probably Givetian age (*Heliolites* extinct at end M Devonian))

Fontaine, H. (1990)- Carboniferous corals from Northeast Thailand (northeast of Loei). *Geologisches Jahrbuch* B73, p. 81-89.

(NE of Loei in NE Thailand small outcrops of M Carboniferous (Visean- Bashkirian) limestones in two facies belts. Rel. poor coral assemblages of mainly solitary *Rugosa*, incl. *Multithecopora*, *Chaetetes*)

Fontaine, H. (1990)- Preliminary note on the Carboniferous corals of Thailand. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 281-284.

(Many Carboniferous localities in NE Thailand, some with corals of Eurasian affinity, incl. *Koninckophyllum*)

Fontaine, H. (1999)- Diverse Permian coral faunas are widely distributed in Thailand. *Permophiles* 33, p. 36-38.

(online at: <http://permian.stratigraphy.org/files/20121027151807120.pdf>)

(Summary of Permian coral distribution in Thailand, known from >100 localities, from Lower to Upper Permian. Two distinct provinces (1) E and C Thailand, with high diversity assemblages similar to Cambodia, Laos, Vietnam and S China, and (2) Peninsular Thailand, extending into NW Malay Peninsula with low diversity corals, absence of corals in Lower Permian and no *Ipciphyllum*, *Pseudohuangua*, etc.). U Permian declining coral faunas)

Fontaine, H., Y. Almeras, L. Beauvais, J.P. Bassoulet, E. Cariou et al. (1989)- Jurassic of West Thailand. *Proc. 24th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP)*, Bangkok 1987, 2, p. 137-146.

(Marine Jurassic known only from W Thailand (E Thailand continental with only minor marine ingressions). No marine Cretaceous in Thailand or E Burma. Red beds at Triassic-Jurassic boundary above Triassic *Halobia* shale, overlain by Toarcian- Aalenian with ammonites. Bathonian- Callovian not found. M Jurassic and Oxfordian coral limestones and mudstones present)

Fontaine, H. & S. Bunopas (1990)- The Carboniferous and the Permian in Thailand: a complex palaeogeography. In: 4th Int. Symposium on Pre-Jurassic East Asia, IGCP Project 224, 1, Osaka, p. 65-76.

Fontaine, H., C. Chonglakmani, S. Piyasin, B.A. Ibrahim & H.P. Khoo (1993)- Triassic limestones within and around the Gulf of Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 83-95.

(Presence of Early- Late Triassic limestones at Peninsular Thailand and NW Peninsular Malaysia, generally associated with Permian 'Ratburi Lst' and previously all included in Permian. Similar to 'Chuping Lst' and 'Kodang Lst' of NW Peninsular Malaysia. Post Triassic fracturing and karstification. Many contain *Aulatortus*, *Tubiphytes*, *Thaumatoporella parvovesiculifera*)

Fontaine, H. & S. Gafoer (1989)- The Carboniferous of Thailand: its fossils and sediments. *Proc. 24th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP)*, Bangkok 1987, 2, p. 125-129.

(Thailand Carboniferous 3 provinces: (1) Peninsular Thailand and Kanchanaburi: rare fossils and glacial? pebbly mudstones in upper part, (2) N and NW Thailand: more fossiliferous but poorly studied, and (3) E Thailand: fossiliferous limestones with fusulinids, corals, etc., throughout Carboniferous)

Fontaine, H., T.T. Hoang, S. Juangnam, S. Kavinat, S. Salyapongse, V. Suteethorn & D. Vachard (2009)- Paleontology and stratigraphy of the Northwest Thailand: paleogeographical implications. Department of Mineral Resources, Bangkok, p. 1-207.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=s&mmid=316&bid=22977>)

(Major review of Lower Carboniferous- M Permian in Pang Mapha-Ban District near Myanmar border, NW Thailand (= within Inthanon Paleotethys suture zone?; area located W of 'Paleotethys' Chiang Dao cherts; JTvG). Rel. complete Carboniferous section, including limestones with corals. Widespread E-M Permian limestones, incl. rare Asselian with fusulinids (rel. high diversity and warm climate faunas, incl. presence of Neoschwagerina and Verbeekina and absence of Shanita, different from Peninsular Thailand, suggesting this is not typical Sibumasu fauna, despite being just W possible Paleotethys radiolarian cherts of 'Chiang Dao/ Fang'. Is in Inthanon zone with Paleotethyan seamounts/ microcontinents? (Ueno et al. 2008); JTvG)

Fontaine, H., T.T. Hoang, S. Salyapongse, V. Suteethorn & D. Vachard (2007)- Permian limestones of Surat Thani Province, Peninsular Thailand. In: W. Tantiwanit (ed.) International Conference on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 221-228.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=s&mmid=12830&bid=12726>)

(Limestone widespread in Surat Thani Province of NE Peninsular Thailand, forming spectacular karst topography (= Ratburi Lst of Shan-Tai/ Sibumasu terrane; JTvG). Fossils rel. rare due to dolomitization/ recrystallization. Youngest well-dated Permian limestones of Surat Thani Province of Midian (M Permian) age. Some localities rich in Hemigordiopsis renzi, with smaller foraminifers (Sphairionia sikuoides, Geinitzina, Endothyra, Pachyphloia, Globivalvulina, Agathammina), rare Fusulinidae and solitary corals. Other samples rich in low-diversity Fusulinidae (Parafusulina spp., Yangchienia, Chusenella) with few, low diversity corals (mainly solitary Rugosa, rare massive). Peninsular Thailand oldest Permian limestone upper Lower Permian)

Fontaine, H., T.T. Hoang, S. Kavinat, V. Suteethorn & D. Vachard (2013)- Upper Permian (Late Changhsingian) marine strata in Nan Province, Northern Thailand. J. Asian Earth Sciences 76, p. 115-119.

(U Permian of NE Thailand (Loei Province) with land plants, and in Laos (Luang Prabang) with continental vertebrates (Dicynodon). M Permian represented only by marine sediments. W of these areas (Nan province) U Permian represented by marine sediments, with continental beds absent. Presence of marine U Permian with Colaniella and Palaeofusulina in N Thailand, locally extending to top U Permian and possibly Triassic)

Fontaine, H., T.T. Hoang, S. Kavinat, V. Suteethorn & D. Vachard (2013)- North Thailand 1-Very fossiliferous limestone belonging to the end of the Permian (Upper Changhsingian) in Wiang Sa Area; 2-Another Upper Permian limestone in Phrae Area. J. Science Technology Mahasarakham University (MSU) 31, 1, p. 51-62.

(online at: http://journal.msu.ac.th/2012/_index.php/SCI/article/view/285/293)

(Occurrence of Upper Permian limestone in outcrop in N Thailand, W of Wiang Sa (close to localities mentioned by Hahn and Siebenhuner 1982, Sakagami and Hatta 1982), with abundant Colaniella and some Palaeofusulina (= characteristic of latest Permian of Indochina terrane?; JTvG))

Fontaine, H., T.T. Hoang, S. Kavinat, V. Suteethorn & D. Vachard (2013)- Wide extension of Carboniferous limestone in Northwest Thailand with an interesting stratigraphy. J. Geological Society Thailand, Special Issue, p. 1-65.

(online at: www.gst.or.th/sites/default/files/GST-Limestone-E-book.pdf)

(Carboniferous limestones in NW Thailand, N of Chiang Dao, near Myanmar border, more widespread than previously thought (usually assigned to Permian). Descriptions of localities and diverse assemblages of smaller foraminifera, algae (incl. Permocalculus, Tubiphytes), fusulinids (Schellwienia, Fusulinella, Pseudostaffella,

Palaeofusulina, Profusulinella, etc.) and corals (mainly solitary Rugosa). Very different from Carboniferous of Peninsular Thailand)

Fontaine, H., Ibrahim B. Amnan & W. Tansathien (2002)- An overview of the Devonian of Malaysia and a comparison with the Devonian of Thailand. J. Geological Society Thailand 1, p. 21-33.

(online at: <http://library.dmr.go.th/library/J-Index/2002/135.pdf>)

(In Malaysia Devonian known only from Peninsular region, in 3 facies: (1) clastic facies widely distributed in W, extending into Peninsular and W Thailand; (2) limestone facies restricted to small area of Perak, but more widespread and more fossiliferous in NE Thailand; (3) radiolarian chert facies at few localities of Peninsular Malaysia and Thailand)

Fontaine, H. & N. Jungyusuk (1995)- Permian corals from Chom Bung area West of Bangkok: their paleogeographic significance. CCOP Newsletter 20, 3-4, p. 70-79.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=s&mmid=11294&bid=6639>)

(Corals from Permian Ratburi Limestone at Chom Bung, N Peninsular Thailand, 115 km WSW of Bangkok (= Sibumasu Terrane). Probably late M Permian (Murgabian-Midian). Common massive rugose corals (*Iranophyllum*, *Paraipocyphyllum* spp., etc.), associated with low-diversity fusulinid assemblage. Also common *Tubiphytes*. *Chombungia ratburina* n.gen, n.sp. of massive rugose coral))

Fontaine, H. & N. Jungyusuk (1997)- Growth bands in Permian corals of Peninsular Thailand. In: Int. Conf. Stratigraphy and tectonics evolution of SE Asia and the South Pacific, p. 83-87.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7624.pdf)

(Massive rugose coral *Paraipocyphyllum* from base of M Permian Ratburi/ Chuping Lst of Peninsular Thailand (= Sibumasu terrane, overlying pebbly mudstones) with growth bands, suggesting seasonal climate. Corals associated with M Permian foram assemblage with *Sphairionia*, *Hemigordius*, *Pseudofusulina*, *Nankinella*, *Langella*, etc. Absence of growth bands in mod. diverse M Permian coral assemblage from upper part of limestone (*Sinopora*, *Paraipocyphyllum*, *Chombungia*, etc.) at Khao Lan suggests warming climate)

Fontaine, H., S. Kavinate, T.T. Hoang & D. Vachard (2012)- Permian limestone of Peninsular and Western Thailand in Khao Yoi, Cha-am and Thong Pha Phum areas. Natural History Bull. Siam Society 58, p. 39-47.

(online at: <https://so04.tci-thaijo.org/index.php/nhbss/article/view/168675/121356>)

(Paleontological study of limestones in N Peninsular Thailand (Khao Yoi, Cha-am, Petchaburi Province) and W Thailand. Khao Yoi localities rich in large fusulines (*Eopolydiexodina megasphaerica*) indicating U Murgabian (M Permian) age. In Cha-am District M Permian corals (*Paraipocyphyllum*, *Sinopora asiatica*) and fusulinids (*Yangchienia iniqua*). In Thong Pha Phum, Kanchanaburi Province, W Thailand, fossils similar to above, with *Sinopora asiatica* and *Paraipocyphyllum*, also suggesting M Permian Shan-Thai fauna (=Sibumasu Block)

Fontaine, H., S. Lovachalasupaporn & B. Sektheera (1990)- Distribution of corals and coral reefs in the Permian of Thailand. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 271-280.

(Reprint of Fontaine et al. (1982) paper in CCOP Newsletter 9, 2. Thailand among richest countries in world in abundance of Permian corals. Coral-bearing Permian limestones common in Thailand, particularly Middle Permian of C Thailand, but not all represent reefs. Peninsular Thailand no reefs in E and Late Permian and only one possible locality in M Permian)

Fontaine, H., S. Lovachalasupaporn, N.D. Tien & D. Vachard (1990)- New data on the Lower Carboniferous in Thailand. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 297-306.

(Reprint of Fontaine et al. 1983, CCOP Newsletter, 10, 1/2, p. 13-18)

Fontaine, H., B. Mistiaen, W. Tantiwanit & T. Tong-Dzuy (1990)- Devonian fossils from Northeast Thailand: some new data from Tabulata and Stromatoporoidea. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 319-330.

(Devonian fossils from 5 areas in NE Thailand. Limestones commonly rich in tabulate and rugose corals (incl. *Heliolites*, *Thamnopora*, *Phillipsastraea*, *Favosites*, etc.) and *Stromatoporoidea* (*Amphipora*, *Clathrodictyon*))

Fontaine, H. & C. Poumot (1988)- The age of anthracite in Thailand. *J. Southeast Asian Earth Sciences* 2, 1, p. 41-42.

(Anthracite from N of Na Duang, Loei Province, NE Thailand. Overlying shale with *Lepidodendron*-like plant fossils and palynomorphs *Cirratiradites*, *Apiculatisporites* and *Cycadopites*, suggesting Permian age. May be equivalent of E Permian coals across Laos border, W of Vientiane, with Permian plants *Asterophyllites longifolius* and *Sigillaria brardi*)

Fontaine, H., C. Poumot & B. Songsirikul (1990)- Upper Palaeozoic formations of Northeast Thailand in Devonian and Lower Carboniferous. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 289-296.

(Reprint of Fontaine et al. 1981 in CCOP Newsletter, 8, 4, p., 1-7. Presence of M Devonian- Lower Carboniferous shales, sandstones, limestones, along Mekong River in Loei Province, NE Thailand)

Fontaine, H. & S. Salyapongse (1997)- Unexpected discovery of Early Carboniferous (Late Viséan-Serpukhovian) corals in East Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 48-52.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7620.pdf)

(First E Carboniferous coral fauna in limestones from E Thailand, with *Tabulata* (solitary *Kueichouphyllum* and compound *Siphonodendron*, *Solenodendron*), *Rugosa* and abundant *Heterocorallia* (*Hexaphyllia*). U Viséan warm water fauna. Probably related to Indochina Block)

Fontaine, H. & S. Salyapongse (1997)- Biostratigraphy of East Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference on Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 73-82.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&skin=s&mmid=12449&bid=7623>)

(Listing of 71 fossiliferous localities in E Thailand. Rel. complete Paleozoic section and possible Precambrian metamorphic rocks. Carboniferous rare. Permian mainly large bodies of limestone, a continuation of limestones in W Cambodia locally rich in fusulinids (*Yabeina*, *Lepidolina*). M-L Triassic coral limestones. Widespread Jurassic- Cretaceous continental sediments)

Fontaine, H. & S. Salyapongse (1999)- Oncolitic limestone is widespread in Klaeng area, East Thailand; distribution of this type of limestone in the Triassic of Southeast Asia. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Chiang Mai University, p. 282-286.

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)

(On likely Triassic -age (Scythian - Anisian) limestones with abundant 2-4mm oncolites but few other fossils in N and E Thailand Peninsular Malaysia, etc.(overlie latest Permian limestones with *Palaeofusulina*, *Colaniella*, *Dagmarita*, in Klaeng zone = continuation of Sukhothai zone? (Ridd et al. 2011))

Fontaine, H. & S. Salyapongse (2001)- A Murgabian to Lower Triassic sequence exposed from Khao Tham Yai to Khao Pa Khi, Northeast Thailand: a preliminary report. *J. Geological Society Thailand* 2001, 1, p. 43-47.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7487.pdf)

(>700m thick late M Permian- early Late Permian limestones in Nam Nao district, NE Thailand, overlain by 300m of Late Permian (Lopingian) clastics (= Indochina Plate). Lower part (Murgabian- lower Midian) with fusulinids *Colania douvillei*, *Sumatrana*, *Verbeekina verbeeki* and coral *Ipciphyllum*. Upper part (U Midian) with fusulinids *Lepidolina*, *Dunbarula*, *Sumatrana longissima*, *Kahlerina* and common *Mizzia* algae)

Fontaine, H., S. Salyapongse, Nguyen D. Tien & D. Vachard (2002)- Permian fossils recently collected from limestones of Nan area, North Thailand. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, p. 45-57.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6375.pdf)

(M Permian limestone around Nan, N Thailand, with rugose corals, smaller foraminifera and fusulinids (*Pseudodoliolina pseudolepida*, *Nankinella?*, *Parawedekindellina?*, *Parafusulina gigantea*, *schwagerinids*). Also Latest Permian with *Colaniella* and *Paleofusulina?* in area. Lower Permian (Asselian-Sakmarian) unknown in area. Of Cathaysian affinity, although Nan area is separated from Indochina block by Nan-Uttaradit suture.)

Fontaine, H., S. Salyapongse, Nguyen D. Tien & D. Vachard (2002)- The Permian of Khao Tham Yai area in Northeast Thailand. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, p. 58-76.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6376.pdf)

(>700m thick, thick-bedded, 45° E-dipping M Permian limestone of Tham Yai hill cave in Nam Nao district, ~360km NNE of Bangkok. Typical Tethyan/ Indochina Block assemblages of fusulinids (incl. *Lepidolina*, *Colania douvillei*, *Verbeekina verbeeki*, *Chusenella*, *Sumatrana*, etc.) and mainly massive rugose corals (*Ipciphyllum*, *Multimurinus*) (Lower Midian Horizon 3 comparable to Guguk Bulat fauna of Sumatra?)(see also Fontaine & Salyapongse 2001))

Fontaine, H., S. Salyapongse & V. Suteethorn (2003)- Glimpses into fossil assemblages of Thailand: coral perspectives. Natural History Bull. Siam Society 51, 1, p. 37-67.

(online at: https://thesiamsociety.org/wp-content/uploads/2020/04/NHBSS_051_1h_Fontaine_GlimpsesIntoFoss.pdf)

(Review paper of fossil corals of Thailand. Carboniferous, Permian and Triassic corals widespread; Devonian and Jurassic corals locally common; Ordovician and Silurian corals rare and poorly known. Includes Devonian limestone in NE Thailand area near Laos border (possibly Givetian- E Frasnian; affinities with Vietnam and S China) with rich coral faunas, incl. stromatoporoid *Chlathrodictyon* and tabulate coral *Heliolites porosus* (= same taxa as reported by Rutten 1940 from NE Kalimantan))

Fontaine, H., S. Salyapongse & V. Suteethorn (2005)- Fossil biodiversity in the limestones of Thailand: a cornucopia of information about the history of life. Natural History Bull. Siam Society 53, 1, p. 33-70.

(online at: https://thesiamsociety.org/nhbss_publications/vol-53-no-1-2005/)

(Review of fossils in Ordovician- Middle Jurassic (especially Permian) limestones exposed across Thailand)

Fontaine, H., S. Salyapongse, V. Suteethorn, P. Tian & D. Vachard (2005)- Sedimentary rocks of the Loei Region, Northeast Thailand: stratigraphy, paleontology, sedimentology. Dept. Mineral Resources, Bangkok, p. 1-165.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/2005/409.pdf)

(Extensive review of Loei region in NE Thailand, near Laos border. Includes Silurian with *Heliolites* spp. corals. M Devonian limestone with corals *Heliolites* spp. (incl. *H. porosus*) and *Favosites*, common stromatoporoids, and with basalts. Late Devonian- E Carboniferous (Famennian- Tournasian) siliceous shales and chert with radiolaria. Includes overview of Carboniferous of all of Thailand (p. 33-89). Permian of Loei area in marine facies in E-M Permian, in Late Permian in continental facies with *Gigantopteris* plant fossils and vertebrates (*Dicynodon*) in nearby Laos. Permian limestones now called Sariburi Lst, with diverse fossil assemblages, incl. common Tubiphytes. E Permian clastics with *Agathiceras ammonoid*. M Permian limestones with *Mizzia*, *Verbeekina*, etc.)

Fontaine, H., S. Salyapongse, V. Suteethorn & D. Vachard (2000)- Widespread occurrence of Triassic limestones Northwest of Uthai Tani in West Thailand. Natural History Bull. Siam Society 48, 1, p. 7-19.

(online at: <https://www.thaiscience.info/Journals/Article/NHB/10439381.pdf>)

(Two parallel N-S trending series of limestone hills associated with volcanic rocks in Nan region, NW of Uthai Thani near Laos border, NW Thailand, previously considered Silurian-Devonian and Permian in age, here assigned to Upper Triassic. Abundant coral. Foraminifera include locally common *Aulartortus*, suggesting likely Norian age)

Fontaine, H., S. Salyapongse, V. Tansuwan & D. Vachard (1997)- The Permian of East Thailand: biostratigraphy, corals, discussion about the division of the Permian system. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 109-127.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=s&mmid=8917&bid=7626>)

(Permian limestones common in E Thailand near Cambodian border: In E Roadian lst with *Cancellina* and *Neoschwagerina*; in W Capitanian with *Yabeina* and *Lepidolina* and abundant coral (incl. *Waagenophyllum*))

Fontaine, H., S. Salyapongse, C. Utha-aroon & D. Vachard (1997)- Age of limestones associated with gypsum deposits in northeast and central Thailand: a first report, CCOP Newsletter 21, 4, p. 6-10.

(Late Carboniferous limestones with gypsum-anhydrite interbeds in C Thailand (Indochina Block))

Fontaine, H., S. Salyapongse & D. Vachard (1999)- Occurrence of an Upper Permian (Dorashamian) limestone northeast of Klaeng, East Thailand. CCOP Newsletter 24, 2, p. 14-19.

Fontaine, H., S. Salyapongse & D. Vachard (1999)- The Carboniferous of East Thailand- new information from microfossils. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 461-465.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1999046.pdf>)

(E Carboniferous microfossils from 8 localities in area 70 km east of Chonburi, SE Thailand. In ~1000m thick shale-dominated series with limestone interbeds, highly folded with dips commonly >60°; strike ~N300W.)

Fontaine, H., S. Salyapongse & D. Vachard (1999)- Permian limestones from Chanthaburi to Sakaeo and Upper Carboniferous limestone of Khao Singto, East Thailand. CCOP Newsletter 24, 4, p. 13-17.

Fontaine, H., S. Salyapongse & D. Vachard (2000)- New Carboniferous fossils found in Ban Bo Nam area, Central Thailand. In: Proc. Symposium Mineral, energy and water resources of Thailand: towards the year 2000, Bangkok 1999, p. 201-211.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1999/6617.pdf)

(M-U Carboniferous fossils from black limestone lenses intercalated in basic-intermediate volcanoclastics E of Lam Narai, 250km NE of Bangkok, C Thailand. Rare fusulinds, incl. *Profusulinella*, *Staffella*, *Protriticites*, etc. Carboniferous volcanic section overlain by E-M Permian limestones (=W margin Indochina Block?; JTvG))

Fontaine, H., S. Salyapongse & D. Vachard (2001)- Widespread occurrence of Triassic limestones in the Nan region, northern Thailand and their constraints on age of the associated volcanoclastic rocks. J. Geological Society Thailand 1, p. 15-42.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=s&mmid=12235&bid=6927>)

Similar to Fontaine et al. (2000). Late Triassic (Carnian, some Norian) limestone outcrops in Nan province, NW Thailand, near Laos border. Rich in algae and Tubiphytes, locally also coral and oncolites. Common smaller foraminifera (mainly *Aulotortus*). Interbedded with rhyolite and rhyolitic tuffs, mainly ignimbrite tuffs (Khao Luang Tuff) (= probably part of Sukhothai Arc terrane; JTvG))

Fontaine, H., S. Salyapongse & D. Vachard (2002)- Paleozoic sediments west of the road from Chiang Khan to Loei and Wang Saphung. J. Geological Society Thailand 1, p. 47-61.

(online at: <http://library.dmr.go.th/Document/J-Index/2002/137.pdf>)

(Descriptions of various outcrops of clastics-dominated Carboniferous and limestone-dominated E-M Permian in Loei area, N-C Thailand (= W side of Indochina Block; JTvG))

Fontaine, H., N. Sattayarak & V. Suteethorn (1994)- Permian corals of Thailand. CCOP, Technical Bulletin 24, p. 1-108.

(Permian corals common and diverse assemblages in SE, Central and NE Thailand, with strong affinities to S China, Vietnam, Cambodia, E Malay Peninsula and Sumatra (Indochina- E Malaya terrane'; JTvG), but

unknown in Australia. Peninsular Thailand (= Shan-Thai/ Sibumasu terrane) only rare corals belonging to Tabulata (Sinopora) and solitary Rugosa and with low diversity fusulinids (but absent in E Permian). Peak coral diversity in Thailand in late M Permian (Murghabian= Wordian to Midian= Capitanian), with locally abundant Ipciphyllum, after which coral species diversity dropped 90%. C Thailand coral fauna very similar to Guguk Bulat locality of C Sumatra (p. 38). W Papua Permian faunas, without compound corals, most similar to faunas from Peninsular Thailand (p. 39))

Fontaine, H. & V. Suteethorn (1988)- Late Paleozoic and Mesozoic fossils of West Thailand and their environments. Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Technical Bulletin 20, p. 1-107.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(Descriptions of Devonian- Jurassic faunas of W Thailand (part of Shan-Thai/ Sibumasu Block). Incl. Toarcian-Aalenian limestones rich in forams, Toarcian limestones rich in Parvamussium donaiense, etc. Followed by 8 additional papers as Appendix 1-8)

Fontaine, H. & V. Suteethorn (1988)- Discovery of widespread Bashkirian limestone northeast of Loei. In: T. Silakul (ed.) Proc. Annual Technical Meeting Dept. Geological Sciences, Chiang Mai University, Special Publ. 8, p. 199-206.

Fontaine, H. & V. Suteethorn (1995)- Khao Tham Rusi Laat: Early Permian red limestone. CCOP Newsletter 20, 2, p. 13-18.

(Red limestone at Khao Tham Rusi Laat, W of Lam Narai- Phetchabun road, C Thailand with rel. diverse E Permian coral fauna, incl. solitary Rugosa (Pseudozaphrentoides, ?Caninophyllum), fasciculate Rugosa (Akagophyllum) and massive Rugosa (Chusenophyllum). Associated with few non- age diagnostic foraminifera)

Fontaine, H. & V. Suteethorn (2000)- Devonian and Lower Carboniferous corals found in Ban Na Klang Area, Loei Province, Northeast Thailand. J. Geological Society Thailand 2000, 1, p. 27-33.

(online at: <http://library.dmr.go.th/library/J-Index/2000/147.pdf>)

(Devonian diverse stromatoporoids and corals and Lower Carboniferous corals in limestones previously mapped as Permian)

Fontaine, H. & V. Suteethorn (2000)- Moscovian to Gshelian coral assemblages in northeastern Thailand: field-relationship between Carboniferous and Permian strata. J. Geological Society Thailand 2000, 1, p. 34-41.

(online at: <http://library.dmr.go.th/library/J-Index/2000/148.pdf>)

(New M-U Carboniferous (mainly Moscovian) coral limestone localities in Ban Na Duang area, Loei Province, NE Thailand. Overlain by Permian (Asselian) sandstones-limestones and M Permian fusulinid limestone)

Fontaine, H. & V. Suteethorn (2007)- Carboniferous corals of Pang Mapha District in northwest Thailand. Natural History Bull. Siam Society, Bangkok, 55, 2, p. 199-221.

(online at: http://www.siamese-heritage.org/nhbsspdf/vol051-060/NHBSS_055_2e_Fontaine_CarboniferousCor.pdf)

(Carboniferous limestone widespread in NW Thailand and spans whole Carboniferous. Corals common in Lower Carboniferous limestones, mainly Tabulata (Syringopora widespread) and diverse solitary Rugosa (Arachnolasma, Kueichouphyllum). Compound Rugosa locally present but rarely abundant (Solenodendron, Diphyphyllum). No massive Rugosa. M Carboniferous limestone with solitary Rugosa (Caninophyllum, Bothrophyllum) at few localities. Tabulata rare massive corals (Chaetetes) and fasciculate corals (Multithecopora). Few U Carboniferous limestone exposures as well. Paleogeographically, corals suggest some similarities with Eurasia, not Shan-Tai/Sibumasu))

Fontaine, H., V. Suteethorn & Y. Jongkanjanasontorn (1991)- Carboniferous corals of Thailand. CCOP, Technical Bulletin 22, p. 1-73.

(Carboniferous corals abundant in C and NE Thailand. In SE and NW only rare solitary Rugosa. Absent or only rare tiny corals without dissipiments in Peninsular Thailand (=Sibumasu terrane; JTvG). Most diverse

coral faunas in 'mid-Carboniferous' (Upper Visean- Lower Serpukhovian). *Rugosa* most common; *Tabulata* (*Syringopora*, *Chaetetes*) rel. rare))

Fontaine, H., V. Suteethorn & D. Vachard (1993)- Carboniferous and Permian limestones in Sop Pong area: unexpected lithology and fossils. In: T. Thanasuthipitak (ed.) Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA), Chiang Mai 1993, 1, Chiang Mai University, p. 319-336.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7487.pdf)

(On thick reefal E Carboniferous (Visean) to Late Permian Doi Chiang Dao Limestone in Inthanon Zone of NW Thailand, near Burma border. With diverse fusulinid foraminifera in Late Carboniferous (*Triticites*, *Schubertella*), E Permian (*Sphaeroschwagerina*, *Rugofusulina*) and M Permian (*Neoschwagerina*, *Verbeekina*, *Sumatrina*, *Afghanella*, primitive *Colaniella*). More affinities to Indochina than Sibumasu blocks. Also *Hemigordius*, *Mizzia*, *Permocalculus*, etc. (now considered to be Paleotethyan seamount carbonate))

Fontaine, H., V. Suteethorn & D. Vachard (1994)- The Carboniferous corals of Southeast Asia with new discoveries in Laos and Thailand. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources and IGCP 306, p. 25-42.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6937.pdf)

(Review of geographic and stratigraphic distribution of Carboniferous corals in SE Asia (generally rare). Sumatra only place in Indonesia with Carboniferous corals: Visean at Muara Gorge in C Sumatra, and Alas River in N Sumatra. W Sarawak lower Terbat Lst is of M-U Carboniferous age, very rare corals. No corals in Carboniferous of Peninsular Thailand or NW Peninsular Malaysia (Sibumasu))

Fontaine, H., V. Suteethorn & D. Vachard (1995)- The Carboniferous of northeast Thailand: a review with new data. J. Southeast Asian Earth Sciences 12, p. 1-17.

(All stages of Carboniferous represented in NE Thailand (Indochina Block), E of Loi. In parts of area overlain by Permian (mainly limestone). M-U Devonian limestone, shale and chert occur occasionally in C and N parts of area. U Tournaisian-Visean and U Carboniferous limestones rich in corals, algae, etc. Carboniferous of N Thailand affinities with S China, Japan, W Europe, but differs from Peninsular Thailand/ NW Malaysia, where, as in NW Australia, limestone is rare and fusulinids and compound corals are absent)

Fontaine, H., V. Suteethorn & D. Vachard (1998)- Khao Yoi, a Permian limestone hill of the Ratburi area, Peninsular Thailand. CCOP Newslett. 23, 3, p. 12-14.

(Midian-age Ratburi Lst at Khao Yoi with *Pseudoalgae* (*Tubiphytes*), algae (*Permocalculus*), foraminifera (*Dagmarita*, *Hemigordiopsis*, *Sphairionia*, transitional form between *Hemigordiopsis* and *Shanita*), corals (*Sinopora*, fasciculate *Waagenophyllidae*) (= late M Permian 'Sibumasu Fauna'; JTvG))

Fontaine, H. & W. Tantiwanit (1987)- Discovery of widespread and very fossiliferous Devonian beds in Northeast Thailand. CCOP Newsletter 12, 3, p. 25-26. (also in CCOP Technical Publ. 20, p. 315-317)

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1987/9619.pdf)
(Brief paper on probably M Devonian (Givetian) outcrops of NE Thailand (= Indochina Plate). Composed of shales with brachiopods, chert and thin-bedded limestone with stromatoporoids and corals (*Heliolites* spp., *Phillipsastraea*, *Favosites*, etc.))

Fontaine, H. & W. Tansthein (1987)- The coral *Koninckophyllum* in the Early Carboniferous of Thailand. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, p. 35-37.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6374.pdf)
(E Carboniferous rugose coral genus *Koninckophyllum* not common in Thailand. Second locality in C Thailand, in M Visean limestone 40 km SW of Phetchabun)

Fontaine, H. & D. Vachard (1981)- Decouvertes de microfaunes Scytho-anisiennes au sud-est de Bangkok: consequences paleogeographiques. Comptes Rendus somm. Societe Geologique France 2, p. 63-66.

('Discoveries of Scythian-Anisian microfaunas in the SE of Bangkok: paleogeographic consequences')

Foopathanakamol, A., B. Ratanasthien, H.I. Petersen, P. Wongpornchai & W. Utamo (2008)- Composition and petroleum potential of lake facies in the FA-MS-48-73 well, Mae Soon structure, Fang oilfield, northern Thailand. *J. Petroleum Geology* 31, 3, p 317-326.

(Fang Basin Cenozoic rift structure in N Thailand. Fang oilfield includes Mae Soon anticline with well FAMS-48-73, with multiple oil-filled sandstone reservoirs. Organic petrography, etc., shows Type II and III kerogen, consisting mainly of telalginite (Botryococcus-type), lamalginite, etc., suggesting freshwater lacustrine environment. Vitrinite Reflectance values ~0.38- 0.66% Ro, thermally immature for petroleum generation)

Forel, M.B. & A. Chitnarin (2023)- Marine ostracods from the Khao Pathawi Limestone (Late Triassic), central Thailand. *Revue de Micropaleontologie* 80, 100738, p. 1-10.

(First Late Triassic ostracos from Khao Pathawi Lst in Uthai Thani Province, C Thailand. 22 poorly preserved species. Likely Norian-Rhaetian age. Some of most typical Late Triassic taxa)

Fortey, R.A. (1989)- An Early Devonian trilobite fauna from Thailand. *Alcheringa* 13, 4, p. 257-267.

(Well-preserved, small Devonian trilobite fauna from limestones in Satun Province, S Thailand (Shan-Tai/ Sibumasu Block). Early Devonian age, probably Emsian. Includes Decoroproetus, Cornuproetus, Platyscutellum and two species of Reedops)

Fortey, R.A. (1997)- Late Ordovician trilobites from southern Thailand. *Palaeontology* 40, 2, p. 397-449.

(online at: http://cdn.palass.org/publications/palaeontology/volume_40/pdf/vol40_part2_pp397-449.pdf)

(Rich, well-preserved trilobite fauna from U Ordovician (Caradoc)limestone in Satun Province, S Thailand (= Shan Thai/ Sibumasu terrane). Outer shelf assemblage of 39 species, dominated by Ovalocephalus, nileids and remopleuridids. Identical to faunas described from Pagoda Lst of S China, suggesting proximity in Late Ordovician. Two new speciesd: Sculptaspis pulcherrima and Ovalocephalus plewesae)

Fujii, Y. & K. Moriyama (2011)- Petroleum exploration and development of fluvial sandstone reservoirs in the northern Phitsanulok Basin, onshore Thailand. *J. Japanese Association for Petroleum Technology* 76, 3, p. 219-232.

(online at: https://www.jstage.jst.go.jp/article/japt/76/3/76_219/_pdf/-char/en)

(In Japanese, with English Abstract. Tertiary Phitsanulok Basin known for Sirikit oil field, largest in onshore Thailand. Main reservoirs in basin E Miocene sandstones. Wells drilled in 1980s in N part of basin unsuccessful)

Fujikawa, M. & T. Ishibashi (1999)- Carboniferous and Permian ammonoids from North Thailand. *Memoirs Faculty of Science, Kyushu University, D*, 30, p. 91-110.

(online at: https://catalog.lib.kyushu-u.ac.jp/opac_download_md/1546575/30_03_p091.pdf)

(Nine species of U Permian and and 6 genera of ammonoids from Lampang and Loei areas, N Thailand (Prototoceras, Paratirolites, Pseudogastrioceras, Pseudotirolites, Tapashanites floriformis, T. changxingensis, Xenodiscus) and Carboniferous from Loei and Sop Pong (Lower Pennsylvanian; Pseudoparalegoceras sp., Gastrioceras, Paralegoceras, Pronorites, etc.)

Fujikawa, M., T. Ishibashi & N. Nakornsri (1999)- Middle Carboniferous cephalopods from Loei area, northern Thailand. In: Ninth Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur, Bull. Geological Society Malaysia 43, p. 467-475.

(online at: www.gsm.org.my/products/702001-100793-PDF.pdf)

(Abundant M Carboniferous cephalopods at 'Barite Mine', N Loei city, N Thailand. Five genera of ammonoids and 5 nautiloids: Branneroceras branneri, Diaboloceras involutum, Syngastrioceras, Neogastrioceras, Bisatoceras, Catastroboceras subsulcatifomae, Epidomatoceras doohylense, Gzheloceras, Temnocheilus and Epistroboceras, indicative of Namurian-Moscovian age. With brief overview of known Late Paleozoic ammonoid localities in Thailand)

Fujikawa, M., K. Ueno, A. Sardsud, W. Saengsrchan, Y. Kamata & K. Hisada (2005)- Early Permian ammonoids from the Kaeng Krachan Group of the Phatthalung-Hat Yai area, southern peninsular Thailand. *J. Asian Earth Sciences* 24, 6, p. 739-752

(Late E Permian (Kungurian/ Bolorian) small ammonoid fauna with Neocrinites, Agathiceras suessi, A. girtyi and Miklukhoceras from uppermost Kaeng Krachan Gp, ~15m below Ratburi Lst (with Monodiexidina in basal transition beds) on S Peninsular Thailand (= Sibumasu block) suggests these beds are of Kungurian/Bolorian age, slightly younger than previously considered. Environment of Sibumasu Block changed around this time from cool, clastic-dominant shelf to temperate- subtropical, carbonate platform. Ammonoid fauna much less diverse than probably coeval faunas of Timor)

Fukuchi, A., B. Ratanasthien, S. Tanaka, S. Nagaoka & S. Suzuki (2007)- Stratigraphy and sedimentary environment of late Middle-early Late Miocene Chiang Muan Formation, Phayao Province, Thailand. *Nature and Human Activities* 11, p. 1-15.

(online at: www.hitohaku.jp/publication/r-bulletin/Kiyoe_No11_1-1.pdf)

(Late M- early Late Miocene fluvial Chiang Muan Fm in Chiang Muan Basin of N Thailand ~300m thick and subdivided into five members, incl. two lignite members two mammalian fossil-bearing horizons)

Gabel, J. (1991)- Die marine Trias in Nordthailand: Sedimentation in expandierenden Halbgraben. Ph.D. Thesis, Universitat Göttingen, p. 1-99.

('The marine Trias in North Thailand: sedimentation in expanding half-grabens')

Gandi, N. (2021)- Sedimentology and stratigraphic architecture of syn-rift alluvial fan conglomerates in Namphae, Chiang Mai basin. *Bull. Earth Sciences Thailand (BEST)* 7, 1-2, p. 36-46.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246632/167655>)

(Outcrop study of alluvial fan depositional facies in footwall conglomerates in Nam Phae syn-rift within intra-cratonic Chiang Mai basin).

Gardiner, N.J., N.M.W. Roberts, C.K. Morley, M.P. Searle & M.J. Whitehouse (2016)- Did Oligocene crustal thickening precede basin development in northern Thailand? A geochronological reassessment of Doi Inthanon and Doi Suthep. *Lithos* 240-243, p. 69-83.

(Doi Inthanon and Doi Suthep metamorphic core complexes in N Thailand, exhumed through mobilization of low-angle detachment fault. Previous studies interpreted Late Triassic and Late Cretaceous metamorphic events, followed by ductile extension between Late Eocene- Late Oligocene (detachment at ~40 Ma, culminating in rapid unroofing in E Miocene. Zircon data from Doi Inthanon and Doi Suthep age ranges of 221-210 Ma, ~72 Ma, and 32-26 Ma. Monazite older ages. Data support view of Indosinian basement being reworked in Cretaceous, and indicate late Eocene- Oligocene tectonothermal event. Etc.)

Garson, M.S. & A.H.G. Mitchell (1970)- Transform faulting in the Thai Peninsula. *Nature* 228, 5266, p. 45-47.
(Angular feature in Phuket area of peninsular Thailand projecting into Andaman Sea is physiographic expression of two major transcurrent faults with total sinistral displacement of at least 200 km)

Garson, M.S., B. Young, A.H.G. Mitchell & B.A.R. Tait (1975)- The geology of the tin belt in Peninsular Thailand around Phuket, Phang Nga and Takua Pa. *Institute of Geological Sciences, Overseas Memoir* 1, Bangkok, p. 1-112.

(Report on 1968-1969 IGS fieldwork in area of western Peninsular Thailand. Paleozoic Phuket Group stratigraphy. Intruded by Mesozoic tin-bearing mica-granites and adamellite granites. Alluvial tin mined since 1956 (actually likely for 100s of years). With chapter on diamonds in dredgings for tin (first reported by Aryakanond, 1955), presumed first reworked into E Permian diamictite from kimberlite exposed on Gondwana, then into Quaternary valley-fills. Etc.)

Geard, A. (2008)- Geology of the Klaeng region (Southeast Thailand): lithology, structure and geochronology. B.Sc. Honours Thesis, University of Tasmania, Hobart, p. *(Unpublished)*

Gebert, H. (1988)- Geological setting and genesis of primary cassiterite and scheelite mineralization in the Nam Mae Lao Valley, Chiang Rai Province, Northern Thailand. In: C.S. Hutchison (ed.) *Geology of tin deposits in Asia and the Pacific, Selected papers from International Symposium Geology of tin deposits, Nanning, China, 1984*, Springer Verlag, Heidelberg, p. 629-648.

(online at <https://repository.unescap.org/items/f0e6c175-01e9-4218-9d43-94ae4ec4573e>)
(Cassiterite and scheelite deposits of Nam Mae Lao valley in N Thailand stratabound in Paleozoic host rocks)

George, A.D., S. Lazar & J. Booth (2012)- Mounds and boundstone facies in the Late Carboniferous- Early Permian Pha Nok Khao Formation-equivalent of the Loei Syncline, Loei-Phetchabun foldbelt: implications for reservoir quality. Int. Petroleum. Technical Conf. (IPTC), Bangkok 2012, 4, IPTC 15256, p. 3026-3031.
(Extended Abstract)

(Late Carboniferous- E-M Permian carbonate platforms major petroleum reservoirs in Khorat region of NE Thailand (Indochina Terrane). Carbonate platforms initiated on fault blocks formed during Late Carboniferous rifting. Outcrop analog study in N part of Loei-Phetchabun Foldbelt shows diverse platform-margin boundstones, incl. sandy shoal facies with Tubiphytes and phylloid algal mounds)

Getahun, B. & B. Ratanasthien (1993)- *Botryococcus* algae in oil source rocks, Fang Basin, northern Thailand. In: T. Thanasuthipitak (ed.) Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA), Chiang Mai 1993, 2, p. 337-346.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7488.pdf)

(Oligocene- E Miocene (pre-Florschuetzia) Mae Sot Fm in well IF 30 03S in intermontane Fang Basin, N Thailand, with basal lacustrine facies rich in *Botryococcus* algae and higher plant exinite. *Botryococcus*-rich layers occur between *Nypa*-rich palynological assemblages, suggesting brackish- deltaic influence)

Gibling, M.R. & B. Ratanasthien (1980)- Cenozoic basins of Thailand and their coal deposits: a preliminary report. Bull. Geological Society Malaysia 13, p. 27-42.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1980009.pdf>)

(Many N-S trending Cenozoic basins in Thailand, especially in N (43 named basins), in Chao Phraya basin and Gulf of Thailand. Tertiary in onshore basins generally <3000m thick, locally >4000m in Gulf of Thailand. Locally common coal (up to 35m thick seams) and lacustrine oil shales (up to 15m thick beds). Plant fossils suggest oldest rocks possibly Late Eocene in age)

Gibling, M.R., C. Tantisukrit, W. Uttamo, T. Thanasuthipitak & M. Haraluck (1985)- Oil shale sedimentology and geochemistry in Cenozoic Mae Sot Basin, Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 69, 5, p. 767-780.

(Intermontane Mae Sot basin, NW Thailand, with carbonate-rich oil shales. Laminated deposits with fish and plant fragments as main megafossils. Mappable oil shale sequences 10m thick, interstratified with marl-sandstone sequences 70m thick. Oil shales formed in perennial stratified lakes. Episodic deposition of oil shales reflects changes in lake level, probably due to climatic fluctuations on 24- 46 kyr scale)

Gibling, M.R., Y. Ukakimaphan & S. Srisuk (1985)- Oil shale and coal in intermontane basins of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 69, 5, p. 760-766.

(Mae Tip intermontane basin of NW Thailand contains Cenozoic oil shales in beds up to 1m thick, interbedded with coal and mudstone. Oil shales contain lamosite-type alginite. Beds laterally continuous for at least 1.5 km, but pass into mudstones toward basin margin. Oil shales originated when peat swamps were flooded by shallow lakes. Locally high geothermal gradients suggest potential for hydrocarbons)

Ginsburg, L. (1983)- The land vertebrates and plants of the Tertiary of Northern Thailand: stratigraphic and tectonic implication. In: Conf. Geology and Mineral Resources of Thailand, Bangkok, p. 198-201.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1983/10571.pdf)

(Tertiary lignites of N Thailand (Khon Khaen area) two groups: Li Gp and Mae Moh Gp. Both groups associated with mammal fossils and both appear to be of Late Miocene age)

Ginsburg, L. (1989)- The fossils mammals of Pong (Phayao) and the age of some intermontane basins of northern Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Proc. Int. Symposium Intermontane basins, Chiang Mai 1989, Chiang Mai University, p. 196-204.

Ginsburg, L., R. Ingavat & P. Tassy (1983)- *Siamogale thailandica*, un nouveau Mustelidae (Carnivora, Mammalia) neogene du Sud-Est asiatique. Bull. Societe Geologique France, 25, 6, p. 953-956.
(*New otter species from M-L Miocene of Mae Moh lignite mine, N Thailand*)

Ginsburg, L. & P. Mein (1987)- *Tarsius thailandica* nov. sp., first fossil Tarsiidae (Primate, Mammalia) of Asia. Comptes Rendus Academie Sciences, Paris, Serie 2, 304, 19, p. 1213-1215.

Ginsburg, L., P. Mein & P. Tassy (1991)- The Miocene of Li Basin, Changwat Lumphun, Thailand. In: Annual Techn. Meeting 1989 and IGCP-246, Chiang Mai University, p. 101-109.

Ginsburg, L. & P. Tassy (1985)- The fossil mammals and the age of the lignite beds in the intermontane basins of Northern Thailand: J. Geological Society Thailand. 8, 1-2, p. 13-27.

(online at: <http://library.dmr.go.th/Document/J-Index/1985/20.pdf>)

(*Lignite sequences in Tertiary intermontane basins of N Thailand traditionally divided in Eocene (Li Fm; based on study of poor flora by Endo (1963)) and Upper Miocene (Mae Moh Fm; based on mastodon molar identified as Stegolophodon by Von Koenigswald 1959. Also with fossil frogs, Siamogale (Thai otter)). New mammal discoveries suggest age in late part of M Miocene*)

Ginsburg, L. & Y. Ukkakimaphan (1983)- A new cervid from the South Asia Miocene and the age of the intermontane basins of North Thailand. Comptes Rendus Academie Sciences, Paris 297, Ser. 2, p. 297-300.

Glenister, B.F., W.M. Furnish, Z. Zhou & M. Polahan (1990)- Ammonoid cephalopods from the Lower Permian of Thailand. Journal of Paleontology 64, 3, p. 479-780.

(*Brief note on discovery of Lower Permian ammonoid fauna in 'Ratburi Lst' at Amphoe Muaglek, S-C Thailand, ~150 km NE of Bangkok. Four species identified: Miklukhoceras cf. M. pamiricum, Agathiceras mediterraneum, Perrinites cf. P. hilli, Prostacheoceras cf. P. oshense. Advanced perrinitid suggestive of Late Artinskian (Baigendzhinian). Ecologically, Thai ammonoids close to assemblages of SW China and Pamir, and minimal similarities to faunas of S China or Boreal biogeographic assemblages of W Australia. No figures*)

Glumglorit, S. & Akkhapun Wannakomol (2011)- Undiscovered hydrocarbon resources of Chonnabot Prospect, Northeast Thailand. Suranaree J. Science Technol. 18, 2, p. 89-97.

(online at: [http://ird.sut.ac.th/e-journal/document/contents/Journal18\(2\)/vol.%2018%20no.2%20part%201.pdf](http://ird.sut.ac.th/e-journal/document/contents/Journal18(2)/vol.%2018%20no.2%20part%201.pdf))

(*Assessment of undiscovered hydrocarbon resources in Permian carbonate prospect in NE Thailand. Probabilistic play analysis mean estimates 15 MMB Oil and 657 BCF of non-associated gas*)

Gocht, W. & E. Pluhar (1982)- Types of Phuket pegmatites with special reference to Ta-rich ores. In: A.M. Evans (ed.) Mineralization associated with acid magmatism, Wiley, New York, p. 91-99.

Gocht, W. & C. Strobel (1982)- Classification of tin-bearing pegmatites in Phuket, Thailand. In: T. Thanasuthipak (ed.) Proc. Annual Technical Meeting, Dept. Geol. Sciences, Chiang Mai University, Special Publ. 4, p. 143-153.

(*Kathu Valley on Phuket Island two types of tin-bearing pegmatites: Sn-Ta pegmatites (or albite-muscovite pegmatites) and Sn- Rare earth element (REE) pegmatites (or orthoclase-lepidolite pegmatites). Pegmatites intruded into Late Paleozoic (meta-) sediments of Phuket Group. Sn-Ta pegmatites in areas close to granite body; more complex Sn-REE pegmatites located further (2-4 km) from source granite*)

Grant, R.E. (1976)- Permian brachiopods from southern Thailand. Palaeont. Soc. Memoir 9 (Journal of Paleontology 50, 3, Supplement), p. 1-269.

(*Descriptions of 109 species/ 81 genera of silicified brachiopods from Permian 'Rat Buri Limestone' in 7 localities along S Peninsula of Thailand. Indicate late Artinskian (Baigendzhinian) age and many similarities with Bituani fauna of Timor. Paleogeographic setting of Thailand faunas interpreted to be near E end of Tethys Sea in fairly warm- shallow waters with access to cooler, Boreal regions (=Sibumasu Terrane; results questioned by Waterhouse (1981); characterized as Stereochia-Meekella fauna by Fang (1994) (JTvG))*)

Gregory, J.W. (1930)- Upper Triassic fossils from Burmo-Siamese frontier: the Thaungyin Trias and description of the corals. Records Geological Survey India 63, p. 155-166.

(Fossils collected by Cotter from Late Triassic (Norian-Rhaetian) reefal Kamawkale Limestone on N Thailand-Myanmar border between Tak and Kanchanaburi Provinces. Corals revised by Beauvais (1988) and identified as M-L Jurassic species)

Griffin, W.L., T.T. Win, T.T., R. Davies, P. Wathanakul, A. Andrew & I. Metcalfe (1998)- Diamonds from Myanmar and Thailand: characteristics and possible origin. International Kimberlite Conference (IKC), Cape Town, Extended Abstracts, p. 274-276.

(online at: <https://ikcabstracts.com/index.php/ikc/article/download/2707/2707/2693>)

Alluvial diamonds with no obvious sources ("headless placers") found in Myanmar, S Thailand (Phuket), Sumatra and Kalimantan. Their distribution within Sibumasu terrane, and close association with Carboniferous-Permian glacial-marine sediments, suggest diamonds derived from primary sources in NW Australia or within terrane itself, prior to E Permian separation of Sibumasu terrane from Gondwanaland margin (see also Griffin et al., 2001)

Griffin, W.L., T.T. Win, R. Davies, P. Wathanakul, A. Andrew, I. Metcalfe & P. Cartigny (2001)- Diamonds from Myanmar and Thailand: characteristics and possible origins. Economic Geology 96, p. 159-170.

(online at: <http://www.ipgp.fr/~cartigny/2001-EconGeol-Griffinetal.pdf>)

(No obvious primary sources for diamonds in modern alluvial deposits in Myanmar, W Thailand and Sumatra. Rounded and polished surfaces of most diamonds reflect resorption in corrosive magma. Abrasion and brown radiation damage spots suggest long surface transport. Distribution within Sibumasu terrane and close association with Carboniferous-Permian glacial-marine sediments suggest diamonds derived from primary sources in NW Australia or within Sibumasu terrane)

Grohe, C., L. de Bonis, Y. Chaimanee, O. Chavasseau, M. Rugbumrung, C. Yamee, K. Suraprasit, C. Gibert et al. (2020)- The Late Middle Miocene Mae Moh Basin of Northern Thailand: the richest Neogene assemblage of Carnivora from Southeast Asia and a paleobiogeographic analysis of Miocene Asian carnivorans. American Museum (Natural History) Novitates 2020, 3952, p. 1-57.

(online at: <https://digitallibrary.amnh.org/bitstream/handle/2246/7223/N3952.pdf?sequence=1&isAllowed=y>)

(Late M Miocene fossil-bearing lignite zones of Mae Moh Basin in N Thailand with rich vertebrate fauna, including several species of Carnivora)

Grote, P. (2007)- Studies of fruits and seeds from the Pleistocene of northeastern Thailand. Courier Forschungsinstitut Senckenberg, Frankfurt, 258, p. 171-181.

(Middle (or Early?) Pleistocene fluvial deposits in Nakhon Ratchasiam provence with plant remains (endocarp and dipterocarp fruits, seeds, leaves, wood, tubers, amber, pollen), suggestive of tropical mixed deciduous and dry evergreen forests. Also vertebrate fossils of fish, turtles, gavials, bovids, deer, Stegodon and hyena)

Grote, P.J. (2015)- Paleobiogeographic and paleoenvironmental changes in Thailand since the Miocene: evidence from plant fossils. Sunaree University of Technology, p. 1-54.

(online at: <http://sutir.sut.ac.th:8080/sutir/bitstream/123456789/5802/1/Fulltext.pdf>)

(Plant fossils from basins in Lamphun and Lampang and in Phetchaburi, C Thailand (all thought to be E Miocene or late Oligocene in age). N and C Thailand cooler during E Miocene. Climate became tropical during M Miocene)

Hada, S., S. Bunopas, K. Ishii & S. Yoshikura (1997)- Rift-drift history and the amalgamation of Shan-Thai and Indochina/ East Malaysia Blocks. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), 1, p. 273-286.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(Same paper as Hada et al. 1999)

Hada, S., S. Bunopas, K. Ishii & S. Yoshikura (1999)- Rift-drift history and the amalgamation of Shan-Thai and Indochina/East Malaysia Blocks. In: I. Metcalfe (ed.) Gondwana dispersion and Asian accretion (IGCP 321 Final Results Volume), Balkema, Rotterdam, p. 67-87.

(Nan-Chanthaburi suture zone in SE part of C Thailand, between Shan-Thai (=Sibumasu) in W and Indochina/E Malaya Blocks in E, regarded as main branch of Paleo-Tethys ocean. Two belts: in W imbricated bedded Chanthaburi chert-clastic sequence (former active margin of Shan-Thai terrane; cherts with M-L Triassic radiolaria), in E Thung Kabin serpentinite melange (incl. red cherts with E, M and L Permian radiolaria and blocks of E and M Permian fusulinid limestone). Both belts unconformably overlain by ?U Triassic greywacke-andestic tuffaceous sequence, then Khorat Gp redbeds. Collision age believed to be latest Triassic)

Hada, S., S. Khosithanont & H. Goto (2020)- A remarkable end-Permian boulder bed at Nam Nao in NE Thailand: its biostratigraphical and environmental significance. Thai Geoscience J. 1, 1, p. 1-16.

(online at: www.dmr.go.th/tgjdmr/download/TGJ/A%20remarkable%20end-Permian%20boulder%20bed%20of%20conglomeratic%20limestone.pdf)

(Boulder bed of fusulinids and conglomeratic limestones on top of Hua Na Kham Fm)

Hada, S., S. Khosithanont, H. Goto, H. Fontaine & S. Salyapongse (2015)- Evolution and extinction of Permian fusulinid fauna in the Khao Tham Yai Limestone in NE Thailand. J. Asian Earth Sciences 104, p. 175-184.

(Limestone unit within Khao Tham Yai Lst deposited in shelf setting on Indochina Block without clastic beds. Ranges in age from Wordian (middle M Permian) to Wuchiapingian (lower U Permian). Three fusulinid zones, in ascending order: Colania, Lepidolina (with abundant large fusulinids) and Codonofusiella. Boundary between Guadalupian (M Permian) and Lopingian (U Permian) defined by extinction of large Verbeekiniids and Schwageriniids to domination of small Schubertelliids (similar pattern evolution at Guadalupian-Lopingian boundary in shallow-water Tethyan shelf areas and mid-Panthalassa). Also common Mizzia algae)

Hagen, D. & E. Kemper (1976)- Geology of the Thong Pha Phum area (Kanchanaburi province, western Thailand). Geologisches Jahrbuch B21, p. 53-91.

(On Paleozoic-Jurassic 'Sibumasu' rocks in W Thailand, including Permian limestone with fusulinids ('Polydiexodina'; but not as rich as other parts of Thailand), Hemigordius, Tubiphytes, etc. M Jurassic limestone with Thaumtoporella parvovesiculifera algae and foram Lucasella kaempferi)

Hahn, L. (1976)- The stratigraphy and palaeogeography of the nonmarine Mesozoic deposits in northern Thailand. Geologisches Jahrbuch B21, p. 155-169.

(On 1750-2000m thick red, non-marine Upper Triassic (Norian) to M Jurassic clastics of N Thailand. With ms2 horizon (Rhaetian?) of abundant rhyolite, rhyodacite and andesite. Units can be correlated with continental red series of Khorat Plateau. Overlie U Triassic (Carnian) marine rocks with Juvavites, Halobia cf. comata, Paleocardita cf. buruca)

Hahn, L. (1982)- The Triassic in Thailand. Geologische Rundschau 71, 3, p. 1041-1056.

('Indosinian Orogeny' tectonics in Thailand between Permian and Jurassic. Strong orogenic movements in Norian. Two Triassic sedimentation cycles: Scythian- E Norian marine facies and Norian- Rhaetian/ Liassic terrestrial. Sediment facies and distribution of igneous rocks due to subduction of oceanic crust, starting in Carboniferous, and to collision of Eurasian and Indochina Plates in Norian)

Hahn, L. (1982)- Stratigraphy and marine ingressions of the Mesozoic Khorat Group in northeastern Thailand. Geologisches Jahrbuch B43, 35, p. 7-35.

(Jurassic-Cretaceous of Khorat Gp of NE Thailand deposited in predominantly fluvio-lacustrine environment. Climate was semi-arid to arid, with subtropical humid intervals. Several horizons in M-U Jurassic with bivalves and plesiosaur and ichthyosaurus teeth evidence of episodic marine transgressions)

Hahn, L., K.E. Koch & H. Wittekindt (1986)- Outline of the geology and the mineral potential of Thailand. Geologisches Jahrbuch B59, p. 3-49.

(Thailand three major tectonic units: Precambrian craton-like blocks Shan-Tai in West and Khorat Kontum Platform in East. In-between Yunnan-Malay mobile belt, N Thailand subdivided into Sukhothai foldbelt in W and Loei foldbelt in E Etc.)

Hahn, L. & M. Siebenhuner (1982)- Explanatory notes (paleontology) on the geological maps of Northern and Western Thailand 1:250,000 (Sheets Nan, Chiang Rai, Phayao, Chiang Dao, Chiang Mai, Li, Thong Pha Phum). Bundesanstalt für Geowissenschaften und Rohstoffe, Hannover, p. 1-76.

Haile N.S. (1973)- Note on Triassic fossil pollen from the Nam Pha Formation, Chulabhorn Nam Phrom Dam, Thailand. Newsletter Geological Society Thailand 6, 1, p. 15-16.

(Mostly Late Triassic Ovalipollis lunzensis, Cycadopites carpentieri and Alisporites sp.)

Haile, N.S. & D.H. Tarling (1973)- Note on the reversed magnetism of young Cainozoic basalts near Lampang, Northern Thailand. Proc. Conf. Geology of Thailand, Chiang Mai University Special Publ. 1, 2, p. 66-73.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1975/7390.pdf)

(Reverse magnetic polarity near base of Pleistocene Lampang basalts (see also Barr et al. 1976))

Haines, P.W., K.T. Howard, J.R. Ali, C.F. Burrett & S. Bunopas (2004)- Flood deposits penecontemporaneous with 0.8 Ma tektite fall in NE Thailand: impact-induced environmental effects? Earth Planetary Science Letters 225, 1-2, p. 19-28.

(Tektite-bearing flood deposits in NE Thailand penecontemporaneous with impact event of Pleistocene SE Asia-Australian tektite strewn field. Major flood events consistent with effects of regional deforestation, increased runoff and erosion, etc., expected in aftermath of major impact event)

Hamada, T. (1964)- Two Carboniferous brachiopods from Loei, Thailand. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 177-189.

(M Carboniferous brachiopods from Loei Province, N Central Thailand: Purdonella magna n.sp. and Brachythyridina strangwaysi. With review of Carboniferous fossil localities in other mainland SE Asia countries)

Hamada, T. (1964)- Some Middle Ordovician brachiopods from Satun, Southern Thailand. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 279-289.

(Black calcareous shale in Satun area of Peninsular Thailand contains M Ordovician shelly fauna, incl. 6 species of brachiopods: Cyrtotrochus spp., Rafinesquina, Opikina)

Hamada, T. (1968)- *Swaicoelia*, a new Ambocoeliid genus (Brachiopoda) from north Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 5, p. 1-12.

(Common but low-diversity ambocoeliid brachiopods assemblage in red mudstones SW of Fang, 108km N of Chiang Mai, N Thailand. Near outcrops with E Devonian graptolites. Age likely U Devonian. New genus and species Swaicoelia rotunda (part of Sibumasu/ Shan-Tai Terrane))

Hansawek, R., W. Pongsapich & S. Vedchakanchana. (1986)- Tin-tungsten mineralized granite at Mae Chedi area, Wiang Pa Pao District, Chiang Rai Province, Northern Thailand. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 423-471.

Hansberry, R.L., A.S. Collins, R.C. King, C.K. Morley, A.P. Gize, J. Warren, S.C. Loehr & P.A. Hall (2015)- Syn-deformation temperature and fossil fluid pathways along an exhumed detachment zone, Khao Khwang fold-thrust belt, Thailand. Tectonophysics 655, p. 73-87.

(Upper-level detachment zone in exhumed Khao Khwang fold-thrust belt of C Thailand, with illite crystallinity indicating deep diagenetic to low anchizonal conditions, and T of ~160-210 °C in shale detachment, interpreted as peak metamorphic conditions during Triassic Indosinian Orogeny. Positive association between organic carbon content in the shales and spacing and complexity of deformational structures)

- Hansberry, R.L., R. King, A.S. Collins & C.K. Morley (2014)- Complex structure of an upper-level shale detachment zone: Khao Khwang fold and thrust belt, Central Thailand. *J. Structural Geology* 67, p. 140-153.
(On newly identified upper-level detachment zone in shale unit in Khao Khwang fold- thrust Belt, C Thailand)
- Hansen, B.T. & K. Wemmer (2011)- Age and evolution of the basement rocks in Thailand. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 19-32.
- Hansen, B.T., K. Wemmer, M. Eckhardt, P. Putthapiban & S. Assavapatchara (2016)- Isotope dating of the potash and rock salt deposit at Bamnet Narong, NE Thailand. *Open Journal of Geology* 6, 8, p. 875-894
(online at: https://www.scirp.org/pdf/OJG_2016082216151192.pdf)
(Age determination of Cretaceous evaporites (halite, anhydrite) of Maha Sarakham Fm in samples from Bamnet Narong Asian Potash Mine, at W edge of Khorat Plateau/ Basin. Multiple isotopic approaches (K/Ar, K/Ca and Sr) suggest depositional age from ~93 Ma to <76 Ma (Cenomanian- Campanian), in agreement with Aptian- Albian ages from vertebrate fossils from underlying non-marine Khok Kruat Fm)
- Hansen, B.T., K. Wemmer, P. Putthapiban, I.C. Kleinhanns & F. Wilsky (2014)- Do U/Pb-SHRIMP dating and Pb stepwise leaching (PbSL) analyses confirm the lack of Precambrian Basement outcrops in Thailand? *Open Journal of Geology* 4, 10, p. 505-517.
(online at: <http://dx.doi.org/10.4236/ojg.2014.410037>)
(Zircon dating and Pb stepwise leaching experiments on garnets suggest absence of Precambrian outcrops in crystalline basement of Thailand. High grade metamorphism show Indosinian ages (225-200 Ma) for vast majority of outcrops in NW Thailand, and small group of ages of ~445 Ma (~Ordovician-Silurian boundary) in Lampang Province. Age of thermal imprint at ~60 Ma confirmed near Surat Thani, Peninsular Thailand)
- Hanta, R., B. Ratanasthien, Y. Kunimatsu, H. Saegusa, H. Nakaya & P. Chintasakul (2005)- Description of the Tha Chang *Merycopotamus* and its preserved condition. In: L. Wannakao et al. (eds.) *Proc. Int. Conf. Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005)*, Khon Kaen, p. 600-605.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2005/9383.pdf)
(Well-preserved anthracothere skull from sandpit in NE Thailand assigned to *Merycopotamus*. Related to Late Miocene *M. medioximus* from Pakistan)
- Hanta, R., B. Ratanasthien, Y. Kunimatsu, H. Saegusa, H. Nakaya & P. Jintasakul (2008)- A new species of Bothriodontinae, *Merycopotamus thachangensis* (Cetartiodactyla, Anthracotheriidae) from the Late Miocene of Nakhon Ratchasima, northeastern Thailand. *J. Vertebrate Paleontology* 28, 4, p. 1182-1188.
(online at: http://www.khoratgeopark.com/kgp/researchs/2008_Hanta%20et%20al.pdf)
(*Merycopotamus thachangensis* n.sp. (Cetartiodactyla, Anthracotheriidae) from sand pit in Tha Chang. Nearly complete cranium of first known *Merycopotamus* in Thailand. Mixture of derived and primitive features, most likely Late Miocene age, possibly late late Miocene)
- Hara, H., T. Charoentitirat, T. Tokiwa, T. Kurihara, K. Suzuki & A. Sardud (2023)- Record of the Indosinian orogeny from conglomerates and detrital zircon U-Pb ages of the western Indochina Block, central Thailand. *Gondwana Research* 128, p. 368-389.
(M Triassic - E Jurassic conglomerates and associated sediments that record Indosinian Orogeny, as exposed in W Indochina Block, C Thailand (W of Khorat Plateau). Detrital zircon ages suggest three Indosinian events: (I) limestone conglomerates, from collapse of Permian carbonate platform in Norian (Late Triassic), triggered by collision between Indochina- S China blocks; (II) Type-2 conglomerates, from uplift/collapse of Sukhothai Arc, Nan Back-arc Basin, Phetchabun Volcanic Belt, and Indochina basement, reflecting closure of Paleo-Tethys and start of collision between Sibumasu, Sukhothai Arc and Indochina in Rhaetian (latest Triassic); (III) Type-3 conglomerates:from post-Toarcian post-collision magmatism between Sibumasu- Indochina)
- Hara, H., Y. Kon, T. Usuki, Y.L. Ching, Y. Kamata, K. Hisada, K. Ueno, T. Charoentitira & P. Charusiri (2013)- U-Pb ages of detrital zircons within the Inthanon Zone of the Paleo-Tethyan subduction zone, northern Thailand: new constraints on accretionary age and arc activity. *J. Asian Earth Sciences* 74, p. 50-61.

(U-Pb dating of detrital zircons in lithic and basaltic sandstones from Inthanon Zone melange in N Thailand (W margin of Sukhothai Arc). Peak ages 3400-3200, 2600-2400, 1000-700, 600-400, and 300-250 Ma, similar to zircons in other circum-Paleo-Tethys subduction zones. Two types of sandstone: (1) with Late Carboniferous youngest zircon ages of ~300, 308 Ma, older than associated radiolarian chert blocks in same outcrop; (2) with youngest zircon ages of ~238 Ma, suggesting M Triassic maximum depositional age and peak magmatism in Sukhothai Arc. Youngest detrital zircons in Type 1 sandstones from Late Carboniferous- E Permian 'missing' arc, suggesting Sukhothai Arc was active during sedimentation. Significant M Triassic arc magmatism inferred from zircon age peaks in Type 2 sandstones and igneous rock record of Sukhothai Arc)

Hara, H., M. Kunii, K. Hisada, K. Ueno, Y. Kamata, W. Srichan, P. Charusiri, T. Charoentitirat et al. (2012)- Petrography and geochemistry of clastic rocks within the Inthanon zone, northern Thailand: implications for Paleo-Tethys subduction and convergence. *J. Asian Earth Sciences* 61, p. 2-15.

(Two types of clastic rocks in Paleo-Tethys convergence zone at Inthanon Zone, N Thailand: (1) lithic sst-shale in Permo-Triassic accretionary complex (35% from Sukhothai Zone volcanic rocks, 65% Indochina craton sst); and (2) Carboniferous quartzose sst- mudstone in Sibumasu Block (continental margin). Paleo-Tethys subduction caused continental island arc in Sukhothai Zone, with Late Permian-Triassic forearc basins and M- early Late Triassic volcanism and accretionary complex formation)

Hara, H., M. Kunii, Y. Miyake, K. Hisada, Y. Kamata, K. Ueno, Y. Kon, T. Kurihara, H. Ueda, S. Assavapatchara, A. Treerotchananon, T. Charoentitirat & P. Charusiri (2017)- Sandstone provenance and U-Pb ages of detrital zircons from Permian-Triassic forearc sediments within the Sukhothai Arc, northern Thailand: record of volcanic-arc evolution in response to Paleo-Tethys subduction. *J. Asian Earth Sciences* 146, p. 30-55.

(Provenance analysis and U-Pb dating of detrital zircons in Permian-Triassic forearc sediments from Sukhothai Arc in N Thailand clarify evolution of missing arc system associated with Paleo-Tethys subduction. Turbidite-dominated forearc sediments include Permian- Late Triassic formations. Initial Sukhothai Arc (Late Carboniferous- E Permian) developed as continental island arc. Magmatic quiescence in M- early Late Permian. Latest Permian- early Late Triassic Sukhothai Arc activity with E-M Triassic I-type granites, evolution of accretionary complex, and abundant supply of volcanic sediments to trench through forearc basin. Sukhothai Arc became quiescent as Paleo-Tethys closed after Late Triassic)

Hara, H., T. Kurihara, J. Kuroda, Y. Adachi, H. Kuritae, K. Wakita, K. Hisada, P. Charusiri, T. Charoentitirat & P. Chaodumrong (2010)- Geological and geochemical aspects of a Devonian siliceous succession in northern Thailand: implications for the opening of the Paleo-Tethys. *Palaeogeogr. Palaeoclim. Palaeoecology* 297, p. 452-464.

(Opening of Paleo-Tethys reconstructed, using radiolarian fossils and geochemistry of Devonian siliceous succession in Chiang Dao area of N Thailand. Rock types: black shale (Lower Devonian), siliceous shale (M Devonian), tuffaceous chert and tuff (M-U Devonian), and chert (U Devonian). Succession deposited in continental margin and pelagic environments between Sibumasu and Indochina-North China blocks. Initial Paleo-Tethys developed as small, closed anoxic-suboxic oceanic basin in E-M Devonian, close to continental margin. Opening of Paleo-Tethys started around M-U Devonian boundary, marked by voluminous volcanic activity. Ash and pumice in chert derived from continental source. After Late Devonian, Paleo-Tethys developed as deep, broad ocean in which pelagic chert was deposited)

Hara, H., J. Kuroda, T. Kurihara, K. Wakita & P. Chaodumrong (2008)- Depositional environment related to Paleo-Tethys opening during Devonian: new insights from Total Organic Carbon analysis of siliceous rocks in the Chiang Dao Area, Northern Thailand. *Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok, p. 339-340. *(Extended Abstract)*

(online at: www.geo.sc.chula.ac.th/Geology/English/News/Technique/GREAT_2008/PDF/102.pdf)

(Devonian siliceous rocks in Chiang Dao area, N Thailand, with basal organic black shale with E Devonian graptolites, brachiopods and conodonts. Upward decrease of TOC values indicates opening history of Paleo-Tethys during Devonian, with change from anoxic conditions in E-M Devonian to oxic siliceous rocks in Late Devonian. Late Devonian mud, organic matter and pumice tuff still derived from continental margin. After Carboniferous pelagic chert was distributed in deep ocean with development of Paleo-Tethys Ocean)

Hara, H., T. Tokiwa, T. Kurihara, T. Charoentitirat, A. Ngamnithiporn, K. Visetnat, K. Tominaga, Y. Kamata & K. Ueno (2018)- Permian-Triassic back-arc basin development in response to Paleo-Tethys subduction, Sa Kao-Chanthaburi area in Southeastern Thailand. *Gondwana Research* 64, p. 50-66.

(Sa Kao Back-arc Basin in SE Thailand developed behind Sukhothai Arc along W margin of Indochina Block during Permian-Triassic subduction of Paleo-Tethys. Two lithologic units: (1) Thung Kabin Melange, of back-arc basin basalts, chert, limestone and sandstone, along with melange; (2) Pong Nam Ron Fm thick clastic sediments, deposited over oceanic rocks of TKK melange. Detrital zircons youngest grain early Late Triassic, youngest cluster latest Permian- earliest Triassic, also Paleozoic and Proterozoic zircon ages. Tectonic evolution: (1) E Permian spreading, with basaltic magmatism, (2) subsidence during inactive period of Sukhothai Arc into M Triassic, with formation of Permian cherts- limestones and M Triassic cherts; (3) Triassic clastic sedimentation and eventual closing of basin. Clastics sourced from back-arc basin basalts, felsic volcanics of Sukhothai Arc and continental Indochina Block (Paleozoic and Proterozoic zircons))

Hara, H., T. Tokiwa, T. Kurihara, T. Charoentitirat & A. Sardud (2020)- Revisiting the tectonic evolution of the Triassic Palaeo-Tethys convergence zone in northern Thailand inferred from detrital zircon U-Pb ages. *Geological Magazine* 158, 5, p. 905-929.

(online at: https://www.researchgate.net/publication/344446207_Revisiting_the_tectonic_evolution_of_the_Triassic_Palaeo-Tethys_convergence_zone_in_northern_Thailand_inferred_from_detrital_zircon_U-Pb_ages)
(Detrital zircon U-Pb ages for sediments in and around Paleo-Tethyan convergence zone in N Thailand provide constraints for tectonic interpretations of Indochina, Sibumasu Block, Inthanon Zone accretionary complex and Nan back-arc basin during Triassic. In Indochina Block, most zircons sourced from collision zone between Indochina and S China blocks, and active continental margin in W Indochina Block. Sediments of Sibumasu Block from erosion of Archaean basement and from Grenville and Pan African orogenies, but no record of Permian-Triassic igneous activity. Accretionary complex provenances from Sukhothai Arc and Indochina and South China blocks (erosion related to the Indosinian I orogeny)

Hara, H., K. Wakita, K. Ueno, Y. Kamata, K. Hisada, P. Charusiri, T. Charoentitirat & P. Chaodumrong (2009)- Nature of accretion related to Paleo-Tethys subduction recorded in northern Thailand: constraints from melange kinematics and illite crystallinity. *Gondwana Research* 16, 2, p. 310-320.

(online at: https://www.academia.edu/download/43204407/Hara_et_al_GR20160229-12973-hx17lf.pdf)
(Reconstruction of accretion process of Paleo-Tethys subduction in N Thailand, showing orientation of Paleo-Tethys subduction zone was N80°E, indicating Paleo-Tethys subducted N-ward beneath Indochina Block from Permian- Triassic)

Harnpattanapanich, T. (2008)- Phitsanulok thrust and fold belt: geologic evidences from Kwai Noi Dam. *Proc. Int. Symposium Geoscience resources and environments of Asian Terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok, p. 73-83.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=13575&bid=18253>)

(On geology of area of newly-built dams foundations (~2006) in Phitsanulok area, NE Thailand. Located in frontal fold-thrust belt at edge of Khorat Group))

Haruo, S., B. Ratanasthien & H. Nakaya (1999)- A new Miocene mammalian locality, Mae Soi, and the occurrence of partial skeletons of rhinocerotids and gomophoteres from Northern Thailand. In: B. Ratanasthien & S.L. Rieb (eds.) *Proc. Int. Symposium Shallow Tethys (ST) 5*, Chiang Mai 1999, Chiang Mai University, p. 440- 449.

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)
(E or M Miocene mammal fossils from Mae Soi village in Chiang Mai province, N Thailand)

Hasegawa, H., S. Imsamut, P. Charusiri, R. Tada, Y. Horiuchi & K. Hisada (2010)- 'Thailand was a desert' during the mid-Cretaceous: equatorward shift of the subtropical high-pressure belt indicated by eolian deposits (Phu Thok Formation) in the Khorat Basin, northeastern Thailand. *Island Arc* 19, 4, p. 605-621.

(online at: http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper_2/106.pdf)

(Paleo-wind directions in M Cretaceous eolian sandstones of Phu Thok Fm (~126- 95 Ma; lateral equivalent of evaporite formations?) show Khorat Basin in NE trade wind belt. Subtropical high-pressure belt was N of area during initial deposition, immediately above basin during main phase of deposition, then shifted N again to N of basin during final deposition. Similar age eolian sandstone in Sichuan Basin, S China. Suggest development of low-latitude desert and equatorward shift of subtropical high-pressure belt in mid-Cretaceous)

Hashimoto, W, S. Buravas & S. Kudo (1968)- On the source rock of the Mae Fang oil field, North Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 68-77.

(Mae Fang oil field in Mio-Pliocene lacustrine sediments of Cenozoic Mae Fang intermontane basin in NW Thailand. Nearby dark Early Paleozoic graptolite shales, but no obvious source rocks)

Hayami, I. (1968)- Some non-marine bivalves from the Mesozoic Khorat Group of Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 100-107.

(Early paper on Cretaceous non-marine bivalves from Khorat Group)

Heggemann, H. (1993)- *Sedimentäre Entwicklung der Khorat-Gruppe (Ober-Trias bis Paläogene) in NE und N-Thailand*. Doct. Thesis, Gottinger Arbeiten Geologie Paläontologie 63, p. 1-146.

(online at: www.geomuseum.uni-goettingen.de/museum/publications/images/GAGP/pdf/GAGP_Nr%2063_Heggemann_Heiner.pdf)

('Sedimentary development of the Khorat Group (Upper Triassic to Paleogene) in NE and N Thailand'. Extensive descriptions of sedimentology of >4000m fluvial-dominated redbeds, with some lacustrine and brackish deposits, representing 'molasse facies' after Indosinian orogeny (Paleotethys closure). Includes Late Triassic half-grabens with acid-intermediate volcanic rocks, Jurassic redbeds indicate increasing aridity, Lower Cretaceous Maha Sarakham evaporites up to 890m thick)

Heggemann, H., D. Helmcke & K.W. Tietze (1994)- Sedimentary evolution of the Mesozoic Khorat Basin in Thailand. *Zentralblatt Mineralogie Geologie Paläontologie*, I, 1992, 11-12, p. 1267-1285.

(Khorat Basin of NE Thailand extends into Cambodia, Vietnam, Laos and SW China (Yunnan). After compressional deformation along Nan-Uttaradit suture (Phetchabun fold-thrust belt) Late Triassic extensional tectonics led to formation of half-grabens, followed by larger scale subsidence in Jurassic- Early Cretaceous. Up to 4000m of Latest Triassic- E Cretaceous fluvial-continental redbeds with lacustrine and brackish deposits)

Heggemann, H., R. Khoring & T.H. Schluter (1990)- Fossil plants and arthropods from the Phra Wihan Formation, presumably Middle Jurassic, of northern Thailand. *Alcheringa* 14, p. 311-316.

(Fossil plants, conchostracan crustaceans (Cyzicus sp.) and insects (Blattodea, Procercopina thailandica n.sp.) from lacustrine sediments of M Jurassic? age from Phra Wihan Fm in N Thailand)

Heggemann, H., K.W. Tietze & D. Helmcke (2003)- The river system of the Phra Wihan Formation, Thailand. In: *Festschrift Behr, Gottinger Arbeiten Geologie Paläontologie, Sonderband SB5*, p. 23-32.

(online at: www.geomuseum.uni-goettingen.de/museum/publications/images/GAGP/...)

(Fluvial sedimentology of quartzitic sandstones of ~700m thick E Cretaceous Pra Wihan Fm, in middle part of Khorat Gp, Khorat Basin. General evolution from bed-load (braided) streams to mixed-load (meandering), to suspended-load (meandering to anastomosing) rivers. Paleocurrent measurements suggest source rock areas to N and NE of Khorat Basin. Petrified tree fragments (Dadoxylon (Araucarioxylon)) in channel-lag deposits)

Heide, F. (1938)- Über Tektite von Siam. *Zentralblatt Mineralogie Geologie Paläontologie*, A, p. 359-360.

('About tektites from Thailand')

Heim, A. & H. Hirschi (1939)- A section of the mountain ranges of North-Western Siam. *Eclogae Geologicae Helveticae* 32, 1, p. 1-16.

(online at: <http://retro.seals.ch/cntmng?type=pdf&rid=egh-001:1939:32::279&subp=hires>)

(Description of 80km W-E traverse from Rameng to Mesod at Burma border, carried out in 1935. Includes description of Tertiary lacustrine oil shales in Mesod Basin. Rock types: Metamorphic rocks, ?Carboniferous)

shales-quartzite, ?Permo-Carboniferous recrystallized limestone, loose block of M Permian fusulinid limestone (identified by C. Dunbar in 1935 as Neoschwagerina cratulifera, Verbeekina verbeeki, Pseudofusulina douvillei and Sumatrina annae (similar to Sumatra M Permian assemblages; JTvG)). Triassic green shale- limestone with Daonella, etc. Evidence for longitudinal stretching)

Helmcke, D. (1984)- The orogenic evolution (Permo-Triassic) of central Thailand. implications on palaeogeographic models for mainland S.E. Asia. Memoires Societe Geologique France, N.S.147, p. 83-91.

Helmcke, D. (1985)- The Permo-Triassic 'Paleotethys' in mainland Southeast-Asia and adjacent parts of China. Geologische Rundschau 74, 2, p. 215-228.

(Seemingly outdated interpretation of position of Paleotethys suture in Tibet- SE Asia)

Helmcke, D. (1986)- On the geology of Petchabun Fold Belt (Central Thailand): implications for the geodynamic evolution of mainland SE Asia. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 79-85.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986007.pdf>)

(Petchabun fold-thrust belt in C Thailand with Permian succession indicative of Late Variscan (Permian) orogeny, not Late Triassic continent/continent-collision between Indosinia and Shan-Thai Cratons. Main orogenic event, accompanied by low grade metamorphism, already during Late Devonian- E r Carboniferous)

Helmcke, D. (1994)- Distribution of Permian and Triassic syn-orogenic sediments in Central Mainland SE-Asia. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, IGCP 306, Bangkok 1994, Dept. Mineral Resources (DMR), p. 123-128.

(Permian syn-orogenic sediments known from Phetchabun region, but N and S continuation unclear. Triassic syn-orogenic sediments described Lampang and Phrae regions, but not true flysch. True syn-orogenic sediments discovered in Mae Sariang region, NW Thailand)

Helmcke, D., C. Chonglakmani, Q. Feng & R. Ingavat-Helmcke (2002)- Contributions to the Paleozoic evolution of Northern Thailand. In: Geodynamic processes of Gondwanaland-derived terranes in East and Southeast Asia, their crustal evolution, emplacement and natural resources potential, Fourth Symposium ICGP Project 411, Phitsanulok 2002, p. 20-23.

Helmcke, D. & C. Kraikhong (1982)- On the geosynclinal and orogenic evolution of Central and Northeast Thailand. J. Geological Society Thailand 5, 1, p. 52-74.

(online at: <http://library.dmr.go.th/library/J-Index/1982/76.pdf>)

(Most parts of Petchabun, etc., foldbelts of C and E Thailand affected by E-M Triassic Indosinian orogeny. In Loei area, Petchabun Province, E Permian pelagic sediments overlain by M-L Permian flysch and molasse, suggesting also 'late Variscan' (Permian) orogeny in this area)

Helmcke, D. & H.G. Lindenberg (1983)- New data on the 'Indosinian' orogeny from Central Thailand. Geologische Rundschau 72, 1, p. 317-328.

(Petchabun foldbelt in C Thailand previously thought to be deformed by 'Indosinian' (Triassic) orogeny. New data show main orogenic event in Thailand is dated as Late Permian and Paleotethys closed on Thai territory during this event. Upper Triassic deformation in N Thailand intracontinental and of minor importance)

Hirschi, H. (1939)- Zur Petrographie von Nordwest-Siam (Gebiet westlich von Raheng). Schweizerische Mineralogische Petrographische Mitteilungen 19, 1, p. 200-221.

(online at: <https://www.e-periodica.ch/digbib/view?pid=smp-001:1939:19#210>)

('On the petrography of NW Thailand (area W of Raheng)'. Descriptions of igneous and metamorphic rocks collected during a 1935 survey with Swiss geologist Arnold Heim. No locality maps)

Hisada, K., S. Arai, K. Ueno, Y. Kamata, H. Hara, T. Charoentitirat, P. Charusiri & H. Chanthavongsa (2016)- Ultramafic rocks of Nan Suture Zone in northern Thailand and its northward extension in Laos. In:

- Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 65. (*Abstract*)
(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)
(*Nan Suture Zone was regarded as site of collision of Shan Thai (Sibumasu) and Indochina continents, but more recently accepted as oceanic materials in suture zone representing floor of marginal basin (Nan backarc basin) N extension of Nan SZ recently confirmed near Pakbeng, N Laos (serpentinites, metamorphics). Ultramafic rocks derived from supra-subduction zone*)
- Hisada, K., M. Sugiyama, K. Ueno, P. Charusiri & S. Arai (2004)- Missing ophiolitic rocks along the Mae Yuam Fault as the Gondwana-Tethys divide in north-west Thailand. *The Island Arc* 13, p. 119-127.
(*Thailand two continental blocks: Sibumasu and Indochina. Late Triassic Mae Sariang clastics in NW Thailand (Sibumasu) with chromian spinels sourced from ultramafic/ mafic rocks, suggest ophiolitic rocks were exposed nearby, but no known outcrops. Exposure of ophiolitic complex denotes suture zone and suggests Gondwana-Tethys divide is along Mae Yuam Fault zone*)
- Hite, R.J. (1973)- Evaporite deposits of the Khorat Plateau, northeastern Thailand. in A.H. Coogan (ed.) *Fourth Symposium on Salt*, Northern Ohio Geological Society, 1, p. 135-146.
- Hite, R.J. (1982)- Progress report on the potash deposits of the Khorat Plateau, Thailand. U.S. Geol. Survey, Open-File report 82-1096, p. 1-70.
(online at: <https://pubs.usgs.gov/of/1982/1096/report.pdf>)
(*Potash deposits mainly in Lower Salt Member of Cretaceous Maha Sarakham Fm of Khorat Plateau. Most surface anticlines on Khorat Plateau are very young formed as result of unloading of lower salt horizons by ~150m deep Pleistocene channel incision of overlying bedrock. Alluvial fills in paleo-stream channels potential for hosting uranium deposits*)
- Hite, R.J. & J. Japakasetr (1979)- Potash deposits of the Khorat Plateau: Thailand and Laos. *Economic Geology* 77, p. 448-458.
(*Khorat Basin of NE Thailand with extensive Cretaceous evaporites, commonly ~200-250m thick, locally much thicker. Four main salt-angydrate cycles. Potash deposits discovered in 1973 near Top Lower Salt, up to 82m thick and underlie more than half of Khorat Basin. Potassium minerals mainly carnalite, also sylvite*)
- Horiuchi, Y., P. Charusiri & K. Hisada (2012)- Identification of an anastomosing river system in the Early Cretaceous Khorat Basin, Northeastern Thailand, using stratigraphy and paleosols. *J. Asian Earth Sciences* 61, p. 62-77.
(*Phu Kradung and Phra Wiha Fms of E Cretaceous Khorat Group deposited in anastomosing river system, in semi-arid to sub-humid paleoclimate with wet-dry cycles (incl. calcretes)*)
- Howard, K.T. (2011)- Tektites. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The geology of Thailand*, Chapter 21, Geological Society, London, p. 573-591.
(*Review of 800 ka old tektites from large impact that formed Australasian strewn field in Thailand*)
- Hogbom, B. (1913)- Contributions to the geology and morphology of Siam. *Bull. Geological Institution University of Uppsala* 12, p. 56-128.
(online at: <https://paleoarchive.com/literature/Hogbom1913-GeologyMorphologySiam.pdf>)
(*Early observations on the geology of Thailand, made in 1912, along Korat Railway, etc.*)
- Howard, K.T., P.W. Haines, C.F. Burrett, J.R. Ali & S. Bunopas (2003)- Sedimentology of 0.8 Ma log-bearing flood deposits in northeast Thailand and mechanisms for pre-flood deforestation. *Proc. 8th Int. Congress on Pacific Neogene Stratigraphy*, Chiang Mai, p. 49-67.
- Hsu, S.C, K.N. Pang, M. Sone, P. Limtrakun, W. Srichan & H.Y. Lee (2025)- Magmatic and detrital zircon records of an Ordovician–Early Devonian arc in the western part of the Indochina block: A case of the Loei volcanic belt, Thailand. *J. Asian Earth Sciences* 291, 10667, p. 1-22.

(online at: https://www.academia.edu/130494319/Magmatic_and_detrital_zircon_records_of_an_Ordovician_Early_Devonian_arc_in_the_western_part_of_the_Indochina_block_A_case_of_the_Loei_volcanic_belt_Thailand)

(Silurian- E Devonian magmatism in Loei region, W Indochina Block, Thailand. Mainly felsic lava and volcanoclastics with zircon U-Pb dates between 434-424 Ma (Silurian). Magmatic ages broadly coincide with age peaks of detrital zircons from Loei and Phetchabun provinces. Likely convergent margin magmatism from Ordovician- Early Devonian)

Hummel, C.L. & P. Phawandon (1967)- Geology and mineral deposits of the Phuket Mining District, South Thailand. Reports Investigations Royal Thai Department of Mineral Resources No. 5, p. 1-74. (online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=3677&bid=5262>)

(USGS/DMR report) (Phuket mining district of western Peninsular Thailand part of N-trending geanticline with belts of Paleozoic folded and regionally metamorphosed sedimentary rocks, intruded by two syntectonic granite plutons, with numerous kinds of tin-and tungsten-bearing lode deposits. Two kinds of granitic rock. Tin most important commodity (mainly cassiterite in secondary, young river valley-fill deposits). Etc..)

Hunyek, V., C. Sutthirat & A. Fanka (2020)- Magma genesis and arc evolution at the Indochina Terrane subduction: petrological and geochemical constraints from the volcanic rocks in Wang Nam Khiao area, Nakhon Ratchasima, Thailand. *Frontiers in Earth Science* 8, 271, p. 1-18.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2020.00271/full>)

(Volcanic rocks and dikes in Wang Nam Khiao area, NE Thailand, comparable to continental arc magmatism along Loei Fold Belt as consequence of Late Permian Paleo-Tethys subduction under Indochina Terrane)

Igo, H. (1972)- Fusulinacean fossils from Thailand. Part VI. Fusulinacean fossils from North Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 10, p. 63-116.

(33 species of Carboniferous fusulinids from NE Thailand, incl. *Profusulinella* spp., *Hemifusulina*, *Protriticites*)

Igo, H. (1973)- Lower Carboniferous conodonts from Ko Yu, Songkla, Peninsular Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 29-42.

(Lower Carboniferous conodonts from siliceous shale of Khanchaburi series on island at SE side of Peninsular Thailand. With *Hindeodella*, *Gnathodus*, *Polygnathus*, etc.)

Igo, H. (1998)- Some Carboniferous rugose corals from northeast Thailand. *Bull. National Science Museum, Tokyo*, Ser. C 24, 3-4, p. 151-162.

(online at: <http://ci.nii.ac.jp/naid/110004313609/en>)

(U Carboniferous limestones exposed in Loei-Wang Saphung area, NE Thailand, with many rugose corals, most of them described by Fontaine et al. (1991) and strikingly similar to S China Block)

Igo, H., K. Ueno & K. Sashida (1993)- Lower Permian fusulinaceans from Ban Phia, Changwat Loei, northeastern Thailand. *Transactions Proceedings Paleontological Society of Japan* 169, p. 15-43.

(online at: www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NS169.pdf)

(Late E Permian (Yakhtasian) fusulinids in Saraburi limestone-sandstone of Loei foldbelt with *Pamirina*, *Schubertella*, *Darvasites*, *Pseudofusulina*, etc.)

Imai, A., K. Yonezu, K. Sanematsu, T. Ikuno, S. Ishida, K. Watanabe, V. Pisutha-Arnond, S. Nakapadungrat & J. Boosayasak (2013)- Rare Earth Elements in hydrothermally altered granitic rocks in the Ranong and Takua Pa Tin-Field, Southern Thailand. *Resource Geology* 63, 1, p. 84-98.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1751-3928.2012.00212.x/epdf>)

(EREE and HREE content in some altered granitic rocks associated with hydrothermal Sn mineralization in Takua Pa tin-field in W Belt of S Thailand higher original fresh granitic rocks.)

Imsamut, S. (2003)- Marine Paleozoic stratigraphy of the Betong- Than-To area, Yala Province, Peninsular Thailand. Dept. Mineral Resources, Bangkok, Technical Report BGS 25/2003, p. 1-49.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2003/10556.pdf)
(Folded 'Sibumasu' Paleozoic stratigraphy of N Peninsular Thailand: (1) Silurian Devonian Betong Fm clastics >100m thick with minor chert and limestones with Tentaculites, graptolites, trilobites, brachiopods, etc.; (2) 800m of E Carboniferous Yaha Fm shales and thin-bedded chert with radiolaria and conodonts; (3) 500m of Sri Paen Fm with bivalves, brachiopods and ribbon chert with Carboniferous radiolaria; (4) E Permian recrystallized crinoid limestones of Tham Krachaeng Fm with fusulinids. Intruded by Triassic biotite granites)

Imsamut, S. (2012)- Lithostratigraphy of the Khuan Klang Formation, Satun Province, Peninsular Thailand. 12th Regional Congress on Geology, Mineral and Energy Resources of SE Asia (GEOSEA 2012), p. 95-112.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2555/34880.pdf)
(E Carboniferous Khuan Klang Fm in S Thailand 200-250m thick clastics with Posidonomiya sp., trilobites, brachiopods, etc.)

Imsamut, S. & M.N. Abdul Rahman (2017)- Lithostratigraphic correlation between Langkawi Islands and Satun Aspiring Geopark. In: Technical Seminar on "Biostratigraphy and karst morphology of Satun Aspiring Geopark", DMR-CCOP-TNCU Technical Seminar Biostratigraphy and Karst Morphology of Satun Aspiring Geopark, DMR, Bangkok, p. 71-80.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=s&mmdid=4762&bid=40283>)

(Stratigraphic correlation of Cambrian-Permian stratigraphy between Langkawi Islands of NW Malaysia and Tarutao Islands and Satun Aspiring Geopark of SW Thailand (= 'Sibumasu'-type stratigraphy))

Imsamut, S., S. Bunopas, V. Daorerk, M. Pattarametha, S. Maranata, V. Thotosawam & P. Charusiri (1994)- Magnetostratigraphy of Phu Thok Mesozoic deposit NE Thailand: preliminary investigation. In: P. Angsuwathana et al. (eds.) Proc. International Symposium Stratigraphic correlation of Southeast Asia, IGCP 306, Bangkok 1994, Dept. Mineral Resources, p. 170-182.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1994/6947.pdf)

(Paleomagnetic succession of Phu Tok Fm redbeds of Khorat Gp with 7 normal and 7 reverse periods. Tied to Late Jurassic- E Cretaceous)

Imsamut, S., P. Charusiri, Z. Zhuang & V. Daorerk (1995)- Paleomagnetic result of Phu Thok red beds of NE Thailand: implication for Mesozoic tectonic history of SE Asia. Proc. International Conference Geology geotechnology and mineral resources of Indochina, Khon Koen, p. 73-78.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1995/7421.pdf)

(Paleomagnetic study of Phu Tok Fm continental red beds of Khorat Gp of Indochina Block in NE Thailand suggest Cretaceous age. paleolatitude of 20-30°N and CW rotation during M Cretaceous)

Imsamut, S., P. Charusiri & V. Daorerk (1993)- On the stratigraphy of Ban Rai area, Changwat Uthai Thani: implication for tectonic history. In: T. Thanasuthipitak (ed.) International Symposium Biostratigraphy of mainland Southeast Asia: facies and palaeontology (BIOSEA), Chiang Mai, 1, p. 187-201.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/14.pdf>)

(Paleozoic (meta-)sediments of W Thailand five Cambrian- Permian units (= Shan Thai/ Sibumasu passive margin series))

Indranadi, V., A. Hartono, A. Rifai, S. Koysamran & T. Charoentitirat (2024)- Paleozoic and Mesozoic outcrops in Krabi Area: new insights for the Pre-Tertiary petroleum system in the Western Basins, Gulf of Thailand. Proc. 48th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA24-G-169, p. 1060-1072.

(Medco field visit to Permian Ratburi Limestone in S Thailand, part of Sibumasu Terrane. Phi Phi islands karstified Permian fusulinid limestone, and oil stains in overlying Jurassic- Cretaceous non-marine- shallow marine Thung Yai sediments, suggesting working Pre-Tertiary petroleum system)

Ingavat, R. (1984)- On the correlation of the Permian foraminiferal faunas of the western, central and eastern provinces of Thailand. Memoires Societe Geologique France, N.S. 147, p. 93-100.

Ingavat-Helmcke, R. (1993)- Contribution to the Permian fusulinacean faunas of Peninsular Thailand. In: B.K. Tan et al. (eds.) Proc. 7th Conf. Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 67-75.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7590.pdf)

(Permian fusulinids and smaller forams (incl. *Shanita*, *Hemigordius*) from S Peninsular Thailand (=Sibumasu Block). Lower Permian (Asselian) from W coast cold water facies, along E coast near Chumphon warmer-water carbonates with fusulinids *Pseudoschwagerina* and *Eoparafusulina* (but may be younger taxa?; Ueno et al. 1996). M Permian fusulinids (*Schwagerina*, *Chusenella*, *Pseudodoliolina*, *Ozawainella*, etc.) many similarities with faunas of central N Thailand (Indochina Block). M Permian smaller benthic foram *Shanita* widespread in S Peninsular Thailand. Also occ. *Sphairionia sikuoides*)

Ingavat-Helmcke, R. (1993)- Review on fossils of Thailand. In: T. Thanasuthipitak (ed.) Proc. Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and correlation (BIOSEA), Chiang Mai 1993, 1, p. 1-22.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7483.pdf)

(Review of Cambrian-Tertiary biostratigraphy/ fossil occurrences in Thailand)

Ingavat-Helmcke, R. (1994)- Paleozoic paleontological evidence of Thailand. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources and IGCP 306, p. 43-54.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6938.pdf)

(Review of Paleozoic faunas reported from Thailand. Cambrian- Devonian faunas of Thailand close faunal affinities with Australia and S China. Carboniferous- Permian carbonate facies warm, shallow marine. Incl. *Pronorites* sp. from NW Thailand)

Ingavat, R. & R.C. Douglas (1981)- Fusuline fossils from Thailand, Part XIV. The fusulinid genus *Monodiexodina* from Northwest Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 23-34.

(First record of fusulinid *Monodiexodina* from basal Ratburi Limestone in W-most Thailand- Myanmar border area (genus generally regarded as typical of Kungurian of Sibumasu/ Cimmerian Terranes; JTvG)

Ingavat-Helmcke, R. & D. Helmcke (1986)- Permian Fusulinacean faunas of Thailand- event controlled evolution. In: Lecture Notes in Earth Sciences 8, Springer Verlag, p. 241-248.

(Evolution of Permian fusulinid faunas of Thailand controlled by 3 bioevents (1) upper Lower Permian disappearance of 'Arctic-Tethyan' elements, tied to closure of Urals and global regression; (2) M-U Permian boundary to lower U Permian (Midian) extinction of ~90% of fusulinids; (3) End of Permian extinction)

Ingavat-Helmcke, R. & D. Helmcke (1994)- Permian facies-realms in Thailand. In: P. Angsuwathana et al. (eds.) Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources, IGCP 306, p. 100-105.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6940.pdf)

(With schematic maps showing paleopositions of terranes, incl. evolution of 'Phuket Terrane' (=Sibumasu) from E Permian rifting off Gondwana to M Triassic collision with Eurasia)

Ingavat, R. & P. Janvier (1981)- Bradyodont (Chondrichthyes) teeth from the Permian and Carboniferous of Northern Thailand. *Geobios* 14, 5, p. 651-653.

(Psammodontid fish tooth fragment in a massive Visean limestone in Ban Pak Chom area of Thailand. Tooth referred to *Deltodus* sp., associated with teeth of 'Cladodus' type, in Lower Permian limestone at Ban Na Chareon (E of Loei)).

Ingavat, R. & J. Jumnonthai (1988)- Permian foraminifera at Wang Nua, Lampang. Geol. Survey Division, Dept. Mineral Resources, Palaeont. Report 3, p.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1985/5125.pdf)

(Interesting assemblages of Lower Permian foraminifera from 10m thick limestone at Wang Nua, 6 km NW of Amphoe Wang Nau, Lampang Province, NW Thailand: in middle part Pseudofusulina sp. Boultonia willsei and Sphairionia sikuoides, towards upper part Sphaeroschwagerina glomerosa, Paraschwagerina, Rugoschwagerina and Darvasites. Age of section Asselian- Sakmarian. Thin limestones in basal part of overlying clastics with Monodioxodina (Yahtashian= lower Artinskian?) (=Sibumasu assemblage?; JTvG))

Ingavat, R., S. Muanlek & C. Udomratn (1975)- On the discoveries of some Permian fusulinids and Ordovician cephalopods at Ban Rai, west Thailand. J. Geological Society Thailand 1, p. 81-89.

(online at: <http://library.dmr.go.th/library/J-Index/1975/34.pdf>)

(M Permian limestone hills ~200 km N of Bangkok, associated with thick Ordovician limestone with straight nautiloids, Silurian- Devonian shale, etc. (should be E Sibumasu Terrane). Kungurian- Kazanian fusulinids incl. Neoschwagerina, Sumatrina annae, Verbeekina verbeeki, Parafusulina gigantea, Ozawainella, etc.))

Ingavat, R., R. Toriyama & K. Pitakpaivan (1980)- Fusuline zonation and faunal characteristics of the Ratburi Limestone in Thailand and its equivalents in Malaysia. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 43-62.

(Carboniferous- Permian Ratburi Fm limestones of C Thailand contain 256 species of fusulinid foraminifera, grouped in 20 fusulinid zones. Most species of East Tethyan affinity or endemic to Thai-Malay province)

Inglethorpe, S.J.D. & J.M. Pearce (1999)- Mineralogy and petrography of diatomite from the Lampang Basin, Changwat Lampang, northern Thailand. British Geological Survey (BGS), Overseas Geology Series, Report WC/99/19, p. 1-29.

(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19793902.pdf>)

(Petrography and chemistry of Pliocene lacustrine diatomites in N Thailand. 'High quality' diatomite 75-80% SiO₂, 10-12% Al₂O₃ and <5% Fe₂O₃)

Inglethorpe, S.J.D., C. Utha-aroo & C. Chanyavanich (1998)- An inventory of the diatomite deposits of the Lampang Basin, Changwat Lampang, Northern Thailand. British Geological Survey (BGS), Overseas Geology Series, Report WC/98/33, p. 1-28.

(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19789751.pdf>)

(Result of DMR and British Geological Survey fieldwork in 1996 in N Thailand, to diatomite quarries in Lampang Neogene intermontane basin (one of 30 such basins in N Thailand). About 25m thick white Pliocene-age diatomite in Ko Kha Fm (Mao Moh Gp) with dominant Melosira granulata and rare Navicula, indicating post-Miocene freshwater lacustrine environment. Four diatom assemblages, based on species of Aulocoseira. Diatomite deposition possibly related to silica enrichment of lake water by volcanic ash-falls)

Intasopa, S.B. (1993)- Petrology and geochronology of the volcanic rocks of the Central Thailand volcanic belt. Ph.D. Thesis University of New Brunswick, Fredericton, p. 1-242.

Intasopa, S. & T. Dunn (1994)- Petrology and Sr-Nd isotopic systems of the basalts and rhyolites, Loei, Thailand. J. Southeast Asian Earth Sciences 9, p. 167-180.

(Loei volcanic province in N part of C Thailand Loei-Prachinburi Volcanic belt (W margin Indochina block). Devonian rhyolite, M Devonian- Lower Carboniferous basalt and Permo-Triassic andesite. Not part of contemporaneous volcanic arc. Two magmatic episodes: partial melting of continental crust at 374 Ma, ocean floor basalts at 361 Ma)

Intasopa, S., T. Dunn & R.S.J. Lambert (2011)- Geochemistry of Cenozoic basaltic and silicic magmas in the central portion of the Loei-Phetchabun volcanic belt, Lop Buri, Thailand. Canadian J. Earth Sciences 32, 4, p. 393-409.

(Cenozoic volcanic rocks in central Loei-Phetchabun volcanic belt in C Thailand. Composition ranging from basalt to high-silica rhyolite. Decrease in age from S to N: oldest rocks 55–57 Ma rhyolites; younger rhyolites that occur farther N (13–24 Ma). Depleted mantle source)

- Ishibashi, T. & C. Chonglakmani (1990)- Uppermost Permian ammonoids from northern Thailand. *J. Southeast Asian Earth Sciences* 4, 3, p. 163-170.
(*Uppermost Permian ammonoids (Pseudogastriceras aff. P. guangxiensis, Paratirolites nakornsrii n.sp. and Xenodiscus?) in Huai Thak Fm near Lampang, N Thailand, from shale bed ~50m below occurrence of Lower Triassic bivalve Claraia. Uppermost Permian Palaeofusulina and Colaniella fauna-bearing limestone bed present in same area*)
- Ishibashi, T., M. Fujikawa & N. Nakornsri (1997)- Biostratigraphy of Carboniferous and Permian ammonoids in Thailand. In: P. Dheeradolok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok, Dept. Mineral Resources, p. 403-411.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7621.pdf)
- Ishibashi, T., M. Fujikawa, S. Yoda & N. Nakornsri (1998)- Dorashamian biostratigraphy of the Doi Pha Phlung area, North Thailand. In: Strzelecki Int. Symposium, Permian of Eastern Tethys: biostratigraphy, palaeogeography and resources, *Proc. Royal Society of Victoria* 110, p. 221-226.
(*Late Permian diverse macrofauna in Huai Tak Fm shale N of Lampang, incl. foraminifera (Gallowayinella and Colaniella parva-Reichelina zones), ammonoids (Paratirolites nakornsrii, Tapashanites yaowalakae) in uppermost horizon of Doi Pha Phlung area. Also brachiopod Oldhamina (and Leptodus tenuis?) and rugose coral Waagenophyllum aff. virgalense*)
- Ishibashi, T., N. Nakornsri & K. Nagai (1994)- Permian- Triassic boundary and fauna at Doi Pha Phlung, northern Thailand. *Memoirs Faculty of Science, Kyushu University*, D, 28, p. 23-40.
(online at: https://api.lib.kyushu-u.ac.jp/opac_download_md/1543642/28_02_p023.pdf)
Paratirolites- Tapashanites ammonoid fauna associated with Palaeofusulina sinensis of latest Permian age from top of 1100m thick Permian Huak Thai Fm in N Thailand. Overlying basal Triassic with ammonite Opiceras sakuntula and bivalve Claraia spp.)
- Ishida, K., A. Nanba, F. Hirsch, T. Kozai & A. Meesook (2005)- Discovery of Early-Late Triassic microfaunas from the bedded-chert and 'Jurassic base-conglomerate' at Mae-Sot, NW Thailand: Preliminary report for the Shan-Thai Terrane and end-Triassic orogeny. *Natural Science Research, University of Tokushima*, 19, p. 31-40.
(online at: https://repo.lib.tokushima-u.ac.jp/files/public/11/117472/20220916135604923128/nsr_19_31.pdf)
(*Mae Sot -Umphang area in NW Thailand part of Shan-Thai Terrane (Sibumasu). With M and Late Triassic radiolaria in tuff rich bedded chert. Triassic cherts overlain by 'Basal Jurassic conglomerate' (with 'oceanic' chert clasts with M-L Triassic radiolaria and conodonts), overlain by Toarcian-Bajocian shelfal deposits*)
- Ishihara, S., H. Hirano & T. Moriyama (2009)- Constituent minerals and REE contents of the granite and Sn skarn ores from the Pin Yok mine, southern Thailand. *Bull. Geological Survey of Japan* 60, 11/12, p. 581-591.
(in Japanese; online at: https://www.gsj.jp/data/bulletin/60_11_04.pdf)
- Ishihara, S., T. Moriyama & H. Hirano (2008)- REE-rich granites of Ko Samui, Ko Phuket and Yod Nam mine in the Southern Thailand. *Proc. Int. Symposia on Geoscience resources and environments of Asian terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, p. 238-247.
(online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Etc.>)
(*REE-rich Permo-Triassic Ko Samui granites in S Thailand (N extension of Main Range granites of Malay Peninsula) and Cretaceous Ko Phuket and Yod Nam mine granites*)
- Ishihara, S., H. Sawata, K. Shibata, S. Terashima, S. Arrykul & K. Sato (1980)- Granites and Sn-W deposits of Peninsular Thailand. *Mining Geology, Special Issue* 8, p. 223-241.
- Iwai, J., K. Asama, M. Veeraburus & A. Hongnusunthi (1966)- Stratigraphy of the so-called Khorat Series and a note on the fossil plant-bearing Paleozoic strata in Thailand. In: T. Kobayashi (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 2, p. 179-196. (*also in Japanese J. Geology and Geography* 37, 1, p. 21-38)

(Rhaetian- Lower Cretaceous Khorat Series of Khorat Plateau, NE Thailand, >1000m thick, unconformably overlies U Permian (and older) beds with Cathaysian flora (Taeniopteris, Pecopteris, Cordaites, etc.) Five formations, mainly non-marine, very poor in fossils. Late Triassic or Liassic-age plants in basal clastics, incl. Chlathropteris cf. meniscoides, Neocalamites, Equisetites, etc. Lower Cretaceous(?) Ban No Yo Fm with fresh-water molluscs Nippononaia, Trigonioides, Plicatounio, etc.)

Iwai, J., A. Hongnusunthi, K. Asama, T. Kobayashi, E. Kon'no, N. Nakornsri, M. Veerebus & W. Yuyen (1975)- Non-marine Mesozoic formations and fossils in Thailand and Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 15, p. 191-218.

Iwai, J., S. Sakagami, N. Nakornsri & W. Yuen (1968)- Mesozoic stratigraphy of the northwestern part of the Khorat Plateau. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 151-165.

(Khorat Series Mesozoic stratigraphy along Second Friendship Highway E of Phitsanulok in NE Thailand. Mainly redbeds, gently folded, >1000m thick)

Iwakuni, M., T. Kato, H. Takiguchi, T. Nakaegawa & M. Satomura (2004)- Crustal deformation in Thailand and tectonics of Indochina Peninsula as seen from GPS observations. *Geophysical Research Letters* 31, L11612, p. 1-4.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1029/2004GL020347>)

(Three years of GPS observation in Thailand since March 1998 suggest that most of Indochina Peninsula is rigid and can be considered part of Sunda Block. No significant differential motion between Sunda block and South China block. Acute clockwise rotation E Himalayan syntax indicates left lateral shear in N Thailand, which may be partially accommodated by left lateral motion along Mae Chan fault. Etc.)

Jaeger, H., V. Nakinovda, V. Nahakapong, E. Braun, A. Hess, K.E. Koch & V. Stein (1968)- Graptolites of the Lower Devonian from Thailand (preliminary result). *Neues Jahrbuch Geologie Palaontologie, Monatshefte*, 12, p. 728-730.

(Initial report on earliest Devonian graptolites incl. Monograptus hercynicus and M. yukonensis from folded black shales between KM 105.5-106.1 of Chiangmai- Fang highway. Fauna resembles graptolite assemblage d from Malay Peninsula by Jones (1967). More detail in Jaeger et al. (1969))

Jaeger, H., V.S.R. Wolfart & D. Stoppel (1969)- Fauna (Graptolithen, Brachiopoden) der unterdevonischen Schwarzschiefer Nord-Thailands. *Neues Jahrbuch Geologie Palaontologie, Abhandlungen* 133, 2, p. 171-190.

('Fauna (graptolites, brachiopods) from the Lower Devonian black shale of North Thailand'. Five Monograptus species from near Fang, N Thailand. Monograptus hercynicus, M. aequabilis and M. yukonensis suggest E Devonian age, not Ordovician as previously reported by Kobayashi and Igo (1966). New brachiopod species name for Paterula nana (small disc-shaped brachiopod described as Orbiculoidea minutula by Kobayashi and Igo, 1966). Associated conodonts suggest M Siegenian- Lw Emsian age for black shales (=Sibumasu Terrane?))

James, R. & G.V. Cumming (2007)- Geology and mineralization of the Chatree epithermal Au-Ag Deposit, Phetchabun Province, Central Thailand. In: W. Tantiwanit (ed.) *Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHA1'07)*, Bangkok, Dept. Mineral Resources (DMR), p. 378-390.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2007/12753.pdf)

(Chatree mine low-intermediate sulphidation epithermal gold-silver deposit in C Thailand, largest hard-rock Au resource in Thailand. Au-Ag hosted in multiple hydrothermal veins and breccias in gently folded 350m thick E Triassic andesitic host rocks, representing continental arc at W side of Indochina Terrane (Sukhothai Arc). Mineralization dated as E Triassic (~251 Ma); host volcanic succession dated as 250 ± 6 Ma (= ~Permian-Triassic boundary). Granodiorite S of mine anomalous in copper and intruded in M Triassic (244 Ma))

Jankaew, K. (2017)- Black shale of Khorat Basin: its geochemical characteristics and implication in future exploration. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017)*, EAGE, Kuala Lumpur, 43548, p. 260-263. *(Extended Abstract)*

Japakasetr, T. & D.R. Workman (1981)- Evaporite deposits of northeast Thailand. In: M.T. Halbouty (ed.) Energy Resources of the Pacific Region, Hawaii, American Assoc. Petroleum Geol. (AAPG) Studies in Geology 12, p. 179-187.

(Khorat plateau of NE Thailand with 130,000 km² of gently folded Mesozoic continental- paralic deposits. Upper part of Cretaceous Khorat Gp with three thick evaporite sequences, separated by 10-50m thick claystones. Lowest evaporite sequence basal thin anhydrite layer overlain by 300+ m of massive halite then, over much basins, zone with potassium minerals (carnallite, also sylvite). Thickest lower evaporite 437m, with 0.7m anhydrite, 354m of halite, and 82m of halite+ carnallite. Middle evaporite generally thinner. Uppermost evaporite sequence averages ~22m of halite, with little anhydrite and no potassium minerals)

Javanaphet, C. (1969)- Geological map of Thailand; Scale 1: 1,000,000, with Explanation. Dept. Mineral Resources (DMR), Bangkok.

Jiang, H., K.D. Zhao & S.Y. Jiang (2023)- Early Permian passive-margin magmatism in the Sibumasu Block, northern Thailand: a product of the slab-pull force of the Paleo-Tethys Ocean? *Lithos* 458-459, 107367, p. 1-15.
(Small stock of E Permian hornblende gabbros ~75 km SE of Chiang Mai in Sibumasu Block, N Thailand, emplaced at ~290 Ma. Derived from lithospheric mantle modified by subducted sediments, formed in continental rift setting (slab-pull of Paleotethys Ocean induced continental rifting?))

Jiang, H., K.D. Zhao, S.Y. Jiang, W.Q. Li, K. Zaw & D. Zhang (2021)- Late Triassic post-collisional high-K two-mica granites in Peninsular Thailand, SE Asia: petrogenesis and Sn mineralization potential. *Lithos* 398-399, 106290, p. 1-17.

(Late Triassic (216 Ma) two-mica granites in Upper Peninsula of Thailand. Formed in post-collisional setting. Magmas derived from fluid-absent muscovite melting of metapelite. High Sn mineralization potential)

Jitmahantakul, S., P. Kaewsomwang, J. Sumpaonthong & R. Simpson (2024)- Inherited extensional faults and bed-parallel slip in Mae Moh Basin, Thailand with implication for basement fabrics. *J. Structural Geology* 179, 1, 105047, p.

(Faults in Mae Moh mine in central sub-basin of Mae Moh Basin in Sukhothai Zone, N Thailand suggest M Miocene E-W extension, followed by Late Miocene-Pliocene inversion)

Jitmahantakul, S., J. Phetheet & P. Kanjanapayont (2020)- 2D Sequential restoration and basin evolution of the Wichianburi Sub-basin, Phetchabun Basin, Central Thailand. *Frontiers in Earth Science* 8, 578218, p. 1-10.

(online at: www.frontiersin.org/articles/10.3389/feart.2020.578218/full)

(Productive Wichianburi sub-basin in S part of Phetchabun Basin, C Thailand, with NNW-SSE to NNE-SSW normal faults as result of multistage rifting since Late Oligocene)

Jungyusuk, N. & T. Sirinawin (1983)- Cenozoic basalts of Thailand. Proc. Conference Geology Mineral Resources of Thailand, Bangkok, p. 1-9.

Junhavat, S. & S. Piyasin (1978)- Triassic rocks of Thailand. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, Asian Institute of Technology, p. 735-738.

(Brief review of marine Triassic sediments (commonly grouped as Lampang Group) in 5 areas of Thailand)

Kaewpradit, J. (2018)- Tectono-stratigraphic evolution of the Ayutthaya Basin, Central Thailand. *Bull. Earth Sciences Thailand (BEST)* 10, 2, p. 83-97.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246748/167731>)

(Ayutthaya Basin major Late Oligocene and younger rift or transtensional basin in C Thailand, with up to 2500m sediment fill. Bounded to N by NW-SE trending Mae Ping strike-slip fault zone. Oil prospectivity poor)

Kamata, Y., H. Hara, K. Ueno, A. Sardud, T. Charoentitirat, P. Charusiri & K. Hisada (2012)- Middle and Late Permian radiolarians from allochthonous chert blocks in the Inthanon Zone, Northern Thailand: constraints for

the formation age of melange fabric related to Paleo-Tethys subduction. Proc. First Int. Symposium of IGCP-589, Xi'an, China 2012, Acta Geologica Sinica 33, Suppl. 1, p. 36-37. (*Extended Abstract*)
(online at: <http://igcp589.cags.ac.cn/pdf/18-Kamata%20et%20al%202.pdf>)
(*Inthanon Zone of N Thailand characterized by Paleo-Tethys pelagic sediments, including Carboniferous-Permian seamount-type carbonate associated with oceanic basaltic rocks and M Devonian-M Triassic radiolarian chert. Two chert blocks in accretionary prism with Late and Middle Permian radiolaria*)

Kamata, Y., M. Kato, K. Ueno, A. Miyahigashi, T. Charoentitirat & S. Apsom (2013)- Middle Triassic basalt-chert succession in the Chanthaburi area, Southeast Thailand. In: 2nd Int. Symposium Int. Geoscience Programme Project (IGCP) 589, Borocay, Philippines, p. 79-81. (*Abstract*)
(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)
(*Conformable basalt-chert succession of Noen Po Fm in SE Thailand in zone between Indochina and Sibumasu Terranes. With M Triassic age bedded chert, deposited directly on oceanic crust with MORB geochemical signature, suggesting formation in oceanic area remote from volcanic arc or continental domain (not part of Sukhothai Arc Domain)*)

Kamata, Y., M. Kato, K. Ueno, A. Miyahigashi, T. Charoentitirat & A. Sardud (2012)- Middle to Late Devonian radiolarians from Klaeng of Rayong Province, Southeast Thailand. Proc. First International Symposium of IGCP-589, Xi'an, China 2012, Acta Geoscientica Sinica 33, Suppl.1, p. 33-35. (*Extended Abstract*)
(online at: <http://igcp589.cags.ac.cn/pdf/17-Kamata%20et%20al%201.pdf>)
(*Tightly folded Silurian-Devonian bedded siliceous rocks in Kanchanaburi Fm SW of Klaeng with M-L Devonian radiolarians. Dark shales with quartz- mica sandstones, probably from felsic plutonic rocks. This shows environment not pelagic Paleo-Tethys ocean floor, but continental margin, probably Sibumasu block*)

Kamata, Y., M. Kato, K. Ueno, A. Miyahigashi, T. Charoentitirat & A. Sardud (2014)- Middle-Late Devonian radiolarians from Klaeng District, Rayong Province, southeastern Thailand: geotectonic significance of the Rayong area as a continental margin of the Sibumasu Block. J. Asian Earth Sciences 104, p. 197-204.
(*Fine clastics-siliceous succession at Laem Krabang Phet, ~20 km SW of Klaeng, SE Thailand with thin bedded chert intercalated with carbonaceous shale, tuffaceous shale, brown glassy tuff and quartz-rich sandstones. One chert horizon with poorly preserved M-L Devonian radiolarians, incl. Palaeoscenidium cladophorum, Stigmospaerostylus cf. pusilla and Entactiniidae. Succession coeval with Devonian part of Fang chert, N Thailand. Depositional environment of section deep water continental margin of E Sibumasu Block*)

Kamata, Y., A. Maezawa, H. Hara, K. Ueno, K. Hisada, A. Sardud, T. Charoentitirat & P. Charusiri (2012)- Basaltic activity preserved in an Upper Permian radiolarian chert from the Paleo-Tethys in the Inthanon Zone, northern Thailand. J. Asian Earth Sciences 61, p. 51-61.
(*Basaltic sandstone below and intercalated with U Permian radiolarian chert in Inthanon suture zone, NW Thailand (Wuchiapingian Follicucullus charveti- Albaillella yamakitai and E Changhsingian Neobaillella ornithoformis zones). Deposition in pelagic realm of Paleo-Tethys. Gravity currents of basaltic fragments in radiolarian chert and presence of fusulinid foraminifera tests indicate source from oceanic seamount*)

Kamata, Y., K. Sashida, K. Ueno, K. Hisada, N. Nakornsri & P. Charusiri (2002)- Triassic radiolarian faunas from the Mae Sariang area, northern Thailand and their paleogeographic significance. J. Asian Earth Sciences 20, 5, p. 491-506.
(online at: https://www.researchgate.net/publication/223578732_Triassic_radiolarian_faunas_from_the_Mae_Sariang_area_northern_Thailand_and_their_paleogeographic_significance)
(*Early to Late Triassic (Spathian-Carnian) radiolaria from bedded cherts of Mae Sariang Gp in NW Thailand. Similar fauna and rocks to E continental margin of Sibumasu Block. E (?) Carnian radiolarian assemblage from bedded chert shows closure of Paleotethys Ocean between Sibumasu- Indochina blocks after E Carnian*)

Kamata, Y., A. Shirouzu, K. Ueno, A. Sardud, T. Charoentitirat, P. Charusiri, T. Koike & K. Hisada (2014)- Late Permian and Early to Middle Triassic radiolarians from the Hat Yai area, southern peninsular Thailand: implications for the tectonic setting of the eastern margin of the Sibumasu continental block and closure timing

of the Paleo-Tethys. *Marine Micropaleontology* 110, p. 8-24. (manuscript online at: www.researchgate.net/publication/259128525_Late_Permian_and_Early_to_Middle_Triassic_radiol_Etc.)
(Hat Yai area, SE Peninsular Thailand with two kinds of radiolarian-bearing fine-grained sediments: (1) lower M- early Late Permian shale unit and (2) E-M Triassic upper chert unit, interpreted as continental slope sediments over Permian clastic-calcareous facies, rather than abyssal plain pelagic deep-water sediments. Closure of Paleo-Tethys between Sibumasu and Indochina terranes after M Triassic in peninsular Thailand)

Kamata, Y., K. Ueno, M. Fujikawa, H. Hara, K. Hisada, K. Uno, T. Charoentitirat & P. Charusiri (2005)- Siliceous sedimentary rocks distributed in the Loei area, northeastern Thailand, lithological description and geological ages. In: L. Wannakoe et al. (eds.) *Proc. Int. Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2005)*, Khon Kaen, p. 417-420.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2005/9358.pdf)
(Paleozoic cherts and siliceous shales from 'Loei-Petchabun flodbelt', also viewed as Loei suture zone that was Paleotethys suture at E margin of Indochina Block. With black cherts with Late Devonian- E Carboniferous radiolarians. Also thin-bedded Permian shales with radiolaria and calcareous microfossils, deposited closer to continental margin)

Kamata, Y., K. Ueno, H. Hara, M. Ichise, T. Charoentitirat, P. Charusiri, A. Sardud & K. Hisada (2009)- Classification of the Sibumasu and Paleo-Tethys tectonic division in Thailand using chert lithofacies. *Island Arc* 18, 1, p. 21-31.
(online at: https://www.researchgate.net/publication/230146977_Classification_of_the_Sibumasu_and_Paleo-Tethys_tectonic_division_in_Thailand_using_chert_lithofacies)
(Two chert types used for mapping Paleotethys suture in N Thailand- Malaysia: (1) Devonian- M Triassic pelagic chert (common radiolarians, no terrigenous material) as blocks in sheared matrix, originated in Paleo-Tethys; (2) Triassic hemipelagic chert (scattered radiolarian tests and calcareous organisms such as foraminifera), accumulated on E margin of Sibumasu Block. Cherts in two N-trending zones: W zone hemipelagic cherts and glaciomarine successions on Precambrian basement (Sibumasu), E zone pelagic chert and limestone (Paleo-Tethys). Boundary between zones is N-trending, E-dipping, low-angle thrust, resulting from collision of Sibumasu and Indochina blocks)

Kamata, Y., K. Ueno, A. Miyahigashi, H. Hara, K.I. Hisada, T. Charoentitirat & P. Charusiri (2016)- Geological significance of the discovery of Middle Triassic (Ladinian) radiolarians from the Hong Hoi Formation of the Lampang Group, Sukhothai Zone, northern Thailand. *Revue de Micropaleontologie* 59, 4, p. 347-358.
(Newly found Ladinian (M Triassic) radiolarians from Hong Hoi Fm of Lampang Group, Sukhothai Zone, N Thailand. Concords with age previously determined by molluscs. Radiolarian-bearing siliceous beds intercalated with volcanics-rich lithic sandstone -shale in lower part of lower Hong Hoi Fm. Probably deposited in forearc basin close to Sukhothai Arc, during time of intensive volcanic activity)

Kamata, Y., K. Ueno, W. Saengsrichan, A. Sardud, T. Charoentitirat, P. Charusiri & K. Hisada (2008)- Stratigraphy and geological ages of siliceous sedimentary rocks distributed in the Hat Yai Area, Southern Peninsular Thailand. *Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok, p. 349-352.
(online at: https://www.academia.edu/download/43204371/Stratigraphy_and_Geological_Ages_of_Sili20160229-15770-1t9kppx.pdf)
(Permian- Triassic Kaeng Krachan and Yaha Fms deep marine clastics of Peninsular Thailand, 20km W of Hat Yai, probably continental margin sequence at E side of Sibumasu Plate. Incl. dark shale with Late Permian radiolaria (*Follicucullus scholasticus*). M Triassic radiolarians in bedded chert (*Triassocampe coronata*, *T. deweveri*, *Pseudostylosphaera japonica*, *Eptingium*, etc.), suggesting closure of Paleo-Tethys after M Triassic in Peninsular Thailand (see also Kamata et al. 2014))

Kamvong, T. & K. Zaw (2005)- Geology and genesis of the Phu Lon copper-gold skarn deposit, northeast Thailand. In: L. Wannakao (ed.) *Proc. Int. Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2005)*, Khon Kaen, Thailand, p. 310-318.

Kamvong, T. & K. Zaw (2009)- The origin and evolution of skarn-forming fluids from the Phu Lon deposit, northern Loei Fold Belt, Thailand: evidence from fluid inclusion and sulfur isotope studies. *J. Asian Earth Sciences* 34, 5, p. 624-633.

(Phu Lon skarn Cu-Au deposit in Triassic N Loei Fold Belt along W margin of Indochina terrane. Hosted by Devonian volcano-sedimentary sequences intercalated with limestone and marble units. Intruded by diorite and quartz monzonite porphyries of calc-alkaline affinities; U-Pb dating of zircon from quartz monzonite phases indicates age of 244 ± 4 Ma (early M Triassic))

Kamvong, T., K. Zaw, S. Meffre, R. Maas, H. Stein, C.K. Lai (2014)- Adakites in the Truong Son and Loei fold belts, Thailand and Laos: genesis and implications for geodynamics and metallogeny. *Gondwana Research* 26, p. 165-184.

(Phu Kham adakites Truong Son Belt emplaced in Late Carboniferous (~306-304 Ma; during subduction of Ailaoshan-Song Ma plate). Puthap adakites in Loei Fold Belt of SE Thailand formed in M Triassic (~244-241 Ma; during main Paleotethys subduction))

Kanjanapayont, P. (2009)- Structural analysis and geochronology of the Khlong Marui Fault, Southern Thailand. Ph.D. Thesis Universitat Wien, p. 1-137.

(online at: http://othes.univie.ac.at/6871/1/2009-09-07_0648134.pdf)

(Khlong Marui Fault cuts ~150 km across Thai peninsula trending NNE-SSW from Gulf of Thailand to Andaman Sea. Three deformation phases. Two early dextral ductile deformation phases influenced by Late Cretaceous W Burma-Shan-Thai collision and/or subduction along Sunda Trench. Major exhumation period of ductile core in Eocene, influenced by early India-Asia collision)

Kanjanapayont, P. (2016)- Strike-slip ductile shear zones in Thailand. In: S. Mukherjee & K.F. Mulchrone (eds.) *Ductile shear zones: from micro- to macro-scales*, Chapter 15, Wiley Blackwell, p. 250-269.

Kanjanapayont, P. (2014)- Deformation style of the Mesozoic sedimentary rocks in southern Thailand. *J. Asian Earth Sciences* 92, p. 1-9.

(Mesozoic sedimentary rocks in S Thailand (Sibumasu terrane) include marine Triassic and non-marine Jurassic-Cretaceous, unconformably overlying Permian carbonate rocks with angular unconformity and unconformably overlain by Cenozoic sediments. Mesozoic folded into two huge N-S or NNE-SSW synclines)

Kanjanapayont, P., M.A. Edwards & B. Grasemann (2009)- The dextral strike-slip Khlong Marui Fault, southern Thailand. *Trabajos de Geologia, Universidad de Oviedo*, 29, p. 393-398.

(online at: www.geol.uniovi.es/TDG/Volumen29/TG29-72.PDF)

(Khlong Marui Fault is S-most of four major strike-slip faults in Thailand. NNE-SSW-trending dextral strike-slip fault zone from Gulf of Thailand to Andaman Sea. No clear age-constraints, but likely related to escape tectonics arising from India-Asia collision)

Kanjanapayont, P., B. Grasemann, M.A. Edwards & H. Fritz (2012)- Quantitative kinematic analysis within the Khlong Marui shear zone, southern Thailand. *J. Structural Geology* 35, p. 17-27.

(NNE trending Khlong Marui shear zone at least two deformation phases. Rocks metamorphosed at amphibolite and greenschist facies by first deformation. No clear age-constraints, but early dextral strike-slip displacement of KM shear zone related to W Burma and Shan-Thai collision and subduction along Sunda Trench in Late Cretaceous, while main exhumation influenced by early India-Asia collision)

Kanjanapayont, P., P. Kiedupattum, U. Klotzli, E. Klotzli & P. Charusiri (2013)- Deformation history and U-Pb zircon geochronology of the high grade metamorphic rocks within the Klaeng fault zone, eastern Thailand. *J. Asian Earth Sciences* 77, p. 224-233.

(online at: www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper_2/133.pdf)

(In SE Thailand Nong Yai Gneiss high-grade metamorphic assemblage extends ~30 km in NW-SE direction along Klaeng fault zone. Three episodes of deformation: D1 NW-SE-trending isoclinal folds; D2 NE-SW shortening during Triassic Indosinian orogeny, cross-cut by Late Cretaceous (~79 Ma) leucogranite (effects of

W Burma and Shan-Thai/Sibumasu collision or development of Andean margin). Sinistral ductile movement D3 coeval with Eocene peak metamorphism during early phases of India-Asia collision)

Kanjanapayont, P., U. Klotzli & N. Frank (2020)- Dating multiple generation of zircons from granites and gneiss from Thailand: Implication for the crustal evolution of the Sibumasu terrane. *J. Asian Earth Sciences* 190, 104148, p. 1-17.

(Widespread granitic rocks of Sibumasu terrane, emplaced during Sibumasu-Indochina collision in Triassic. U-Pb zircon dating of granites and gneiss from Thailand shows inherited zircons with older core ages, derived from Sibumasu basement. Two phases of magmatic zircon growth: (a) ~242-235Ma and (b) ~231-213 Ma, suggesting two-step magmatic evolution of Sibumasu terrane granites: (1) during M Triassic Indochina collision, and (2) Late Triassic late-collisional stage)

Kanjanapayont, P., U. Klotzli, M. Thoni, B. Grasemann & M.A. Edwards (2012)- Rb-Sr, Sm-Nd, and U-Pb geochronology of the rocks within the Khlong Marui shear zone, southern Thailand. *J. Asian Earth Sciences* 56, p. 263-275.

(Khlong Marui shear zone in S Thailand E Eocene dextral ductile deformation phase suggested by U-Pb ages of zircon rims; Late Eocene dextral transpression indicated by mica Rb-Sr ages. Rb-Sr, Sm-Nd and U-Pb dating correlation implies major exhumation period of ductile lens in Eocene. Tied to early India-Asia collision?)

Kanmera, K. & R. Toriyama (1968)- Fusulinacean fossils from Thailand, Part III. *Maklaya*, new generic designation for Neoschwagerinids of the group *Cancellina pamirica* LEVEN. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 31-46.

(On group of neoschwagerinid fusulinids from M Permian of Sara Buri/ Rat Buri Lst, C Thailand. Maklaya evolved from Misellina)

Karapunar, B., A. Nutze & C. Ketwetsuriya (2022)- A low-diversity *Peruvispira*-dominated gastropod assemblage from the Permian Ratburi Group of Central Thailand. *Alcheringa* 46, 2, p. 147-155.

(E-M Permian gastropods from Ratburi Group of Khao Mang Lat, Kanchanaburi Province, C Thailand. Dominated by new species, Peruvispira kanchanaburiensis, together with one Orthonychia sp. Exceptionally low-diversity community)

Kavinate, M., M. Udchachon & H. Fontaine (2019)- Stratigraphy and palaeontology of mid-Carboniferous sequences at Phu Bo Bit in Loei Province, Thailand. *Palaeobiodiversity of Southeast Asia* 1, *Annales de Paleontologie* 105, 3, p. 191-199.

(Phu Bo Bit section shale and limestone with diverse fauna of brachiopods, corals, bryozoans and crinoids, interpreted as shallow marine or shelf environments. Foraminifera and algae late Bashkirian- E Moscovian)

Kawakami, T., N. Nakano, F. Higashino, T. Hokada, Y. Osanai, M. Yuhara, P. Charusiri et al. (2014)- U-Pb zircon and CHIME monazite dating of granitoids and high-grade metamorphic rocks from the Eastern and Peninsular Thailand- a new report of Early Paleozoic granite. *Lithos* 200-201, p. 64-79.

(U-Pb zircon dating of igneous and metamorphic rocks in 4 areas of E, NW and Peninsular Thailand. E Thailand, SE of Bangkok (Sukhothai Arc): gneiss from Khao Chao area crystallization age 229 Ma (Carnian), metamorphic age 193 Ma (E Jurassic). Peninsular Thailand Khao Dat Fa granite 477 Ma (E Ordovician; second oldest granite pluton from Thailand, suggesting Sibumasu block basement formed during Pan-African Orogeny). Khao Pret granite 67.5 Ma. NW Thailand metamorphic rocks in Doi Inthanon area similar plutono-metamorphic history with Peninsular Thailand, suggesting all belong to Sibumasu block)

Kemper, E. (1976)- The foraminifera in the Jurassic limestone of West Thailand. *Geologisches Jahrbuch* B21, p. 129-153.

(Early to Late Jurassic limestones with 'Tethyan' larger foraminifera from few-100m thick limestones in Kanchanaburi Province, W Thailand: Orbitopsella (M Lias/ E Jurassic), Lucasella (E-M Dogger/ M Jurassic), Haurania (M Lias-M Dogger) and Kurnubia (Late Jurassic). Little or no locality information)

- Kemper, E., H.D. Maronde & D. Stoppel (1976)- Triassic and Jurassic limestone in the region northwest and west of Si Sawat (Kanchanaburi Province, Western Thailand. *Geologisches Jahrbuch* B21, p. 93-127.
(200-300m thick Triassic with Anisian and Norian (with *Boueina- Involutina*) limestone, overlain by red and violet clastics and limestone of Rhaetian- E Jurassic age (mainly non-marine; uplift event?). Overlain by 200-300m thick Jurassic (M Liassic- Malm) limestones with *Lucasella*, *Orbitopsella*, *Haurania*, etc. (U Triassic halimeditform alga *Boueina* redescribed by Flugel (1988) as *Boueina marondei* n.sp.))
- Kerrick, R. & R.D. Beckinsale (1988)- Oxygen and strontium evidence for the origin of granites in the tin belt of southeast Asia. *Canadian Inst. Mining Metallurgy, Special Volume* 39, p. 114-123.
- Ketmuangmoon, P., A. Chitnarin, M.B. Forel & P. Tepnarong (2018)- Diversity and paleoenvironmental significance of Middle Triassic ostracods (Crustacea) from northern Thailand: Pha Kan Formation (Anisian, Lampang Group). *Revue de Micropaleontologie* 61, 1, p. 3-22.
(online at: <https://www.sciencedirect.com/science/article/pii/S0035159817300727>)
(Pha Kan Fm of Lampang Gp S of Lampang city, N Thailand, with 29 species of ostracods (4 new), dominated by Bairdiidae. First report of M Triassic (Anisian) ostracods from Sukhothai terrane)
- Ketwetsuriya, C., A.G. Cook & A. Nutzel (2020)- Permian gastropods from the Ratburi Limestone, Khao Phrik, Central Thailand. *Palaeontologische Zeitschrift* 90, p. 53-77.
(New M Permian (Wordian) gastropod fauna from limestones of Ratburi Gp exposed at Khao Phrik, C Thailand, the first diverse Permian assemblage from Sibumasu terrane)
- Ketwetsuriya, C., I.M. Hausmann & A. Nutzel (2021)- Diversity patterns of Middle Permian gastropod assemblages from the Tak Fa Formation, Central Thailand. *Palaeobiodiversity and Palaeoenvironments* 101, p. 907-925.
(online at: <https://link.springer.com/article/10.1007/s12549-021-00482-3>)
(M Permian marine invertebrates from Central Thailand analysed, dominated by gastropods. Two gastropod assemblages analysed from Tak Fa Lst with fusulinids at Khao Noi hill, Nakhon Sawan province)
- Ketwetsuriya, C. & P. Kanjanapayont (2016)- Stratigraphic distribution of Permian gastropods from Tak Fa Formation in Southern Part of Nakhon Sawan Province, Thailand. *Bull.Earth Sciences Thailand (BEST)* 8, 1, 88-92.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246727/167712>)
(20 species of gastropods in M Permian Tak Fa Lst in southern Nakhon Sawan Province, C Thailand)
- Ketwetsuriya, C., B. Karapunar, T. Charoentitirat & A. Nutzel (2020)- Middle Permian (Roadian) gastropods from the Khao Khad Formation, Central Thailand: implications for palaeogeography of the Indochina Terrane. *Zootaxa* 4766, 1, p. 001-047.
(New, diverse Permian gastropod assemblage from Roadian (M Permian) fusulinid limestones in Khao Khad Fm in Lopburi Province, C Thailand, which is part of Indochina Terrane. Faunas similar to Late Permian gastropod faunas from China (Paleotethys), not with other formations in Thailand)
- Ketwetsuriya, C., M. Nose, T. Charoentitirat & A. Nutzel (2020)- Microbial-, fusulinid limestones with large gastropods and calcareous algae: an unusual facies from the Early Permian Khao Khad Formation of Central Thailand. *Facies* 66, 21, p. 1-21.
(online at: <https://link.springer.com/content/pdf/10.1007/s10347-020-00605-w.pdf>)
(E Permian (Kungurian) Khao Khad Fm of C Thailand mostly carbonates deposited on W margin of Indochina Terrane. Yields unusual microbial-fusulinid limestones with large gastropods (>6cm). Calcareous algae, intraclasts and thick microbial-cyanobacterial (*Girvanella* and *Archaeolithoporella*) coatings also present. Fusulinids *Pseudofusulina* and *Misellina termieri* indicate Bolorian age. Calcareous algae dominated by dasycladaceans followed by gymnocodiaceans and solenoporaceans).
- Ketwetsuriya, C., A. Nutzel & P. Kanjanapayont (2014)- A new Permian gastropod fauna from the Tak Fa Limestone, Nakhonsawan, Northern Thailand- a report of preliminary results. *Zitteliana* A 54, p. 137-146.

(New silicified M Permian gastropod fauna from Tak Fa Lst from shallow water carbonates rich in fusulinids in N Thailand. 22 gastropod species, one of richest Permian gastropod faunas from SE Asia. Presence of Bellerophontidae, Pleurotomarioidea, Meekospiridae and Goniasmatidae)

Ketwetsuriya, C., A. Nutzelt & P. Kanjanapayont (2016)- Permian gastropods from the Tak Fa Limestone, Nakhon Sawan, Northern Thailand. Bull. Geosciences 91, 3, p. 481-513.

(online at: http://www.geology.cz/bulletin/fulltext/1617_Ketwetsuriya_161125.pdf)

(Silicified M Permian (Wordian) gastropod fauna in Tak Fa Lst from N Thailand, at W margin of Indochina Terrane. Shallow marine carbonates rich in fusulinids, sponges and calcareous algae. Forty gastropod species, 12 new. New genus Takfaia. Gastropod fauna dominated by Late Paleozoic cosmopolitan genera with bellerophontoids and pleurotomariines most abundant)

Khamloet, P., V. Pisutha-Arnond & C. Sutthirat (2014)- Mineral inclusions in sapphire from the basalt-related deposit in Bo Phloi, Kanchanaburi, western Thailand; indication of their genesis. Russian Geology Geophysics 55, 9, p. 1087-1102.

(Bo Phloi gem field in Kanchanaburi Province, W Thailand, closely associated with Cenozoic basalts. Blue and yellow sapphire, black spinel, and minor zircon mined for >3 decades. Most sapphires crystallized from high-alkali felsic melt, probably in lower crust)

Khanmanee, J., Q. Feng, T. Zhao, X. Nie, J. Hu, Z. Gan, T. Makkhun, P. Sribuatong et al. (2025)- Late Carboniferous plagiogranites within serpentinite mélangé, northern Thailand: Implications for the tectonic evolution of the Nan-Uttaradit Suture. J. Asian Earth Sciences 294, 106800, p.

(Late Carboniferous oceanic subduction-type plagiogranites identified within Nan-Uttaradit Suture, N Thailand. Zircon U-Pb ages of ~320 Ma and ~302 Ma. Nan-Uttaradit Ocean was branch of Paleo-Tethys Ocean, not a back-arc basin of the Chiang Mai Paleo-Tethys Ocean.)

Khositanont, S. (1986)- A comparative study of a selection of granites from central Thailand. British Geological Survey (BGS), Overseas Geology Series, Report WC/MP/86/1, p. 1-51.

(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19798140.pdf>)

Khositanont, S., P. Ounchanum, Y. Panjasawatwong, T. Thanasuthipitak, Khin Zaw & S. Meffre (2007)- U-Pb zircon ages and geochemical characteristics of Lampang-Phrae granites; implications for plate tectonic interpretation. In: W. Tantiwanit (ed.) Int. Conference on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources (DMR), p. 367-372.

(Lampang-Phrae granites isolated plutons in N-S trending volcanic rocks in Sukhothai Fold Belt, N Thailand. Zircon ages of ~224 Ma and 228 Ma suggest formation in early Late Triassic (~Carnian). Granites of I type affinity and may have emplaced in transition of subduction-collision environments in Late Triassic)

Khositanont, S., Y. Panjasawatwong, P. Ounchanum, T. Thanasuthipitak, Khin Zaw & S. Meffre (2008)- Petrochemistry and zircon age determination of Loei-Phetchabun volcanic rocks. Proc. International Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516, 5th APSEG, Bangkok, p. 272-278.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=S&mmid=13572&bid=18293>)

(Loei-Phetchabun Fold Belt volcanic and plutonic rocks characteristics suggesting formation in ocean floor in Paleozoic and back arc environment in Late Permian- E Triassic. U-Pb zircon ages vary from Silurian-Devonian for Loei volcanoclastics to Middle Triassic)

Khositanont, S., K. Zaw, S. Meffre, Y. Panjasawatwong, P. Ounchanum & T. Thanasuthipitak (2013)- Geotectonic and geochronology of volcano-plutonic rocks in the Loei-Phetchabun fold belt. In: C. Senebottalath et al. (eds.) Proc. 2nd Lao-Tai Conference Geology and Mineral resources, Vientiane, p. 81-95.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2013/36771.pdf)

(Late Permian- E Triassic volcanic-plutonic rocks in Loei-Phetchabun Fold Belt three types: basic volcanics, intermediate volcanics and intermediate-acid plutonic rocks. Formed in mid oceanic and subduction-related volcanic arc environments. Jurassic red beds of Khorat Gp show Tethys sea closed before Jurassic)

Khummongkol, D. & A. Suwannathong (2007)- Aspect of oil shale in Thailand. In: W. Tantiwanit (ed.) Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources (DMR), p. 399-403.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2007/12755.pdf)

(Largest oil shale reserves in Thailand in M-U Miocene of Mae Sot Fm in Mae Sot Basin in NW Thailand. Measured reserves ~952 Mtons and oil yield is 183 million barrels)

Klompe, Th.H.F. (1962)- Igneous and structural features of Thailand. In: G.A.Macdonald & H. Kuno (eds.) The crust of the Pacific Basin, American Geophysical Union (AGU) Geophysical Monograph Series 6, p. 122-134.

(Thailand 3 groups of igneous rocks: (1) mafic-ultramafics in N Thailand, intrusive in Silurian- Lw Carboniferous; (2) U Triassic hornblende-biotite granite in E and younger two-mica tin-bearing granite in W Thailand, considered to be post-Triassic, possibly same as 145-155 Ma (Late Jurassic) ages of tin granites from Billiton and Singkep; (3) various U Tertiary- Pleistocene effusives and some dioritic intrusions. W Thailand conformable Paleozoic sequence, locally capped by Triassic deposits. Regularity of this sequence, age of granites and unconformable contact between folded beds and overlying Late Jurassic- E Cretaceous in adjacent areas (Malaya, Borneo, Sumatra) favor Late Jurassic phase of mountain building. To E, Khorat Plateau folded Paleozoic sequence unconformably overlain by near-horizontal Rhaetian-Liassic, suggesting Late Triassic (old Cimmerian) phase of diastrophism in E part of country. Gulf of Thailand result of faulting)

Klompe, Th.H.F. (1962)- Igneous and structural features of Thailand. *Geologie en Mijnbouw* 41, 6, p. 290-302. *(Same paper as above)*

Klotzli, U.S., B. Neugschwentner, J. Burda, P. Kanjanapayont, Q.L. Li, Y. Liu, P. Konecný & P. Charusiri (2024)- The Late Cambrian to Neogene evolution of the Khanom Core Complex (Peninsular Thailand). *Lithosphere* 2024, 2023_272, p. 1-20.

(online at: https://pubs.geoscienceworld.org/gsa/lithosphere/article-pdf/doi/10.2113/2024/lithosphere_2023_272/6192192/lithosphere_2023_272.pdf)

(Khanom Core Complex in Peninsular Thailand is part of crystalline basement of Sundaland, with first metamorphism of paragneiss precursors in Late Cambrian at latest. Tectonic formation of core complex in Eocene (<42 Ma), followed by exhumation and regional cooling below ~450°C and latest cooling to ~120°C in E Miocene (~20 Ma). Part of Sibumasu. Late Cretaceous-Neogene cooling pattern and exhumation history can be related to N-ward drift of India)

Knox, G.J. & L.L. Wakefield (1983)- An introduction to the geology of the Phitsanulok Basin. *Proc. Conf. Geology and Mineral Resources of Thailand*, Bangkok, Dept. Mineral Resources, p. 1-8.

(online at: www.researchgate.net/publication/293487275_An_Introduction_to_the_Geology_of_the_Phitsanulok_Basin)

(Thai Shell summary of Phitsanulok Basin and Sirikit oilfield, producing since 1983. N-S trending Tertiary basin, with Sirikit oilfield, producing from E Miocene fluvio-lacustrine Lan Krabu Fm. Oligocene- Recent sediment fill ~8 km, E-W extension ~15 km)

Kobayashi, F., R. Martini, R. Rettori, L. Zaninetti, B. Ratanasthien, H. Saegusa & H. Nakaya (2006)- Triassic foraminifers of the Lampang Group (Northern Thailand). *J. Asian Earth Sciences* 27, 3, p. 312-325.

(online at: <https://www.thaiscience.info/Article%20for%20ThaiScience/Article/61/10008276.pdf>)

(Four Triassic foraminiferal limestone localities in Lampang Gp of Sukhothai foldbelt, N Thailand, between Sibumasu (Shan-Thai) Terrane in W and Indochina in E. Characterized by: (1) Glomospirella lampangensis n. sp. (E Triassic ?), (2) Pilamina densa (Anisian), (3) endothyroid foraminifers- Diplotremina astrofimbriata (Ladinian) and (4) Aulotortus sinuosus (Carnian). Taxa of these associations common to S China and SE Asia, also Europe (unlike M- Late Permian provincial/ endemic foram assemblages)

- Kobayashi, T. (1957)- Upper Cambrian fossils from Peninsular Thailand. J. Faculty of Science, University of Tokyo, Section 2, 10, 3, p. 367-382.
(online at: http://umdb.um.u-tokyo.ac.jp/DKoseibu/pdf/Ref_0152_.pdf)
(*Oldest faunas of W Peninsular Thailand (= Sibumasu Terrane) are Late Cambrian trilobites from Phuket series from Tarutao island, incl. Coreanocephalus planulatus, Sankiella, Pagodia thaiensis, Mictosaukia buravasi, Thailandium solum, etc.*)
- Kobayashi, T. (1958)- Some Ordovician fossils from the Thailand- Malayan borderland. Japanese J. Geology and Geography 29, 4, p. 223-231.
(*Part of E Paleozoic stratigraphy of 'Sibumasu' terrane in NW Malay Peninsula- Peninsular Thailand*)
- Kobayashi, T. (1959)- On some Ordovician fossils from northern Malaya and her adjacence. J. Faculty of Science, University of Tokyo, 2, 11, 4, p. 387-407.
(online at: http://umdb.um.u-tokyo.ac.jp/DKoseibu/pdf/Ref_0159_.pdf)
(*Ordovician gastropods, nautiloids, graptolites, from thick Setul Fm of Langkawi isands and adjacent Perlis Malay Peninsula*)
- Kobayashi, T. (1961)- A new genus of the Phillipsidae from Thailand. Japanese J. Geology and Geography 32, 1, p. 1-4.
(*Includes Carboniferous trilobite Thaiaspis sethapuli n.gen., n.sp.*)
- Kobayashi, T. (1961)- On the occurrence of Ordovician nautiloids in northern Thailand and her adjacence. Japanese J. Geology and Geography 32, 1, p. 35-43.
- Kobayashi, T. (1963)- On the Cretaceous Ban Na Yo fauna of East Thailand with a note on the distribution of *Nippononaia*, *Trigonioides* and *Plicatounio*. Japanese J. Geology and Geography 34, p. 34-41.
(*Cretaceous fresh-water molluscs from Khorat Group; see also Kobayashi, 1964*)
- Kobayashi, T. (1964)- Geology of Thailand. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 1-16.
(*Early review of geology, stratigraphy of Thailand*)
- Kobayashi, T. (1964)- Paleontology of Thailand, 1916-62. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 17-30.
(*Early review of Cambrian- Quaternary paleontology of Thailand*)
- Kobayashi, T. (1964)- On the Cretaceous Ban Na Yo fauna of East Thailand, with a note on the distribution of *Nippononaia*, *Trigonioides* and *Plicatiunio*. In: T. Kobayashi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 31-41.
(*Same paper as Kobayashi 1963. Lower? Cretaceous fresh-water molluscs in middle or upper member of Khorat Series in extreme E of Khorat Plateau. Dominated by Nippononaia mekongensis n.sp., also Trigonioides, Plicatiunio and Paranodonta. Similar to faunas known from Laos*)
- Kobayashi, T. (1968)- The Cretaceous non-marine pelecypods from the Nam Phung Dam Site in the Northeastern part of the Khorat Plateau, Thailand, with a note on the Trigonioididae. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 4, p. 109-138.
(*Pelecypods from Nam Phung dam site in NE Khorat Plateau belong to characteristic Trigonioides-Plicatounio- Nipponaia fauna of non-marine Cretaceous of SE Asia (Laos, Yunnan, S Korea, Japan)*)
- Kobayashi, T. (1973)- A Norian conchostracan from the basal part of the Khorat Group in Central Thailand. Proc. of the Japan Academy 49, 10, p. 825-828.
(online at: https://www.jstage.jst.go.jp/article/pjab1945/49/10/49_10_825/_pdf)
(*Non-marine conchostracan (bivalve crustacean) Euestheria mansuyi from Late Triassic Nam Pha Fm, basal Khorat Group, Nam Phrom Dam, NW Khorat Plateau*)

Kobayashi, T. (1975)- Upper Triassic estheriids in Thailand and the conchostracan development in Asia in the Mesozoic era. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 57-90.

(Fresh-water estheriid crustaceans in Khorat Plateau area indicate Norian age. With Khoratestheria n.gen., Asmuussia symmetrica n.sp.)

Kobayashi, T. (1980)- Notes on the Mesozoic history of Thailand and adjacent territories. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 27-36.

(Review of 4 stages of 'Burmese-Malayan geosyncline' in Paleozoic-Mesozoic, with paleogeographic maps of distributions of Triassic, Jurassic and E Cretaceous fossil occurrences)

Kobayashi, T. (1983)- Geological history of Thailand, Malayan Peninsula and adjacent areas-I. *J. of Geography (Chigaku Zasshi)*. Tokyo, 92, 5, p. 303-320. *(In Japanese)*

(online at: https://www.jstage.jst.go.jp/article/jgeography1889/92/5/92_5_303/_pdf/-char/en)

(Brief review, focused on Paleozoic stratigraphy)

Kobayashi, T. (1983)- Geological history of Thailand, Malayan Peninsula and adjacent areas- II. *J. of Geography (Chigaku Zasshi)* 92, 6, p. 371-391. *(In Japanese)*

(online at: https://www.jstage.jst.go.jp/article/jgeography1889/92/6/92_6_371/_pdf/-char/en)

(Brief review, focused on Mesozoic- Cenozoic stratigraphy and tectonic history)

Kobayashi, T. (1984)- On the geological history of Thailand and West Malaysia. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 3-42.

(Stratigraphy-oriented review of Thailand-Malay Peninsula area)

Kobayashi, T. & T. Hamada (1964)- On the Middle Ordovician fossils from Satun, the Malaysian frontier of Thailand. In: T. Kobayashi (ed.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 269-278.

(Ordovician trilobites from black calcareous shale in Satun area, SW-most Peninsular Thailand: Basiliella satunensis n.sp., Lophospira sp., etc)

Kobayashi, T. & T. Hamada (1968)- A Devonian phacopid recently discovered by Mr. Charan Poothai in peninsular Thailand. In: T. Kobayashi (ed.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 22-28.

(Trilobite Plagiolaria in E-M Devonian Tentaculites Shale of Peninsular Thailand. Associated with Monograptus spp.)

Kobayashi, T. & H. Igo (1966)- On the occurrence of graptolite shales in North Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 2, p. 1-8.

(M Ordovician- Silurian graptolites in highly deformed black shale below 'Fang Chert' in N Chiang Mai Province (= Paleo-Tethys suture). With Monograptus, Dicranograptus. (Monograptus spp. assemblage re-assigned to E Devonian age by Jaeger et al. 1968 and Baum et al. (1970). Also presence of small round, disc-shaped brachiopod, described as Orbiculoidea minutula (re-described as Paterula nana by Jaeger et al. 1969))

Kobayashi, T. & S. Sakagami (1989)- A Permian trilobite from North Thailand. *Proc. of the Japan Academy, Series B*, 65, p. 67-69.

(online at: https://www.jstage.jst.go.jp/article/pjab1977/65/4/65_4_67/_pdf)

(M-U Permian Pseudophillipsia aff. ozawai from Ratburi limestone in Loei District, NW Thailand)

Kobayashi, T., F. Takai & I. Hayami (1963)- On some Mesozoic fossils from the Khorat Series of East Thailand and a note on the Khorat Series. *Japanese J. Geology and Geography* 34, p. 181-192.

Kobayashi, T., F. Takai & I. Hayami (1964)- On some Mesozoic fossils from the Khorat Series of East Thailand and a note on the Khorat Series. In: T. Kobayashi (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 119-133.

(Same paper as Kobayashi et al. (1963). *Generally poorly preserved fossils from several localities in Jurassic-Cretaceous Khorat series of NE Thailand, incl. Jurassic Ichthyosauria and pleisiosauria teeth, E Jurassic bivalves, silicified wood (Araucarioxylon)*)

Kobayashi, T. & A. Tokuyama (1959)- The Halobiidae from Thailand. *J. Faculty of Science, University Tokyo*, sect. 2, 12, 1, p. 27-30.

(online at: http://umdb.um.u-tokyo.ac.jp/DKoseibu/pdf/Ref_0211_.pdf)

(Late Triassic bivalves previously reported from Chiang Rai and Lampang areas. New faunas with *Daonella sumatrensis* Volz (originally described from N Sumatra) from Na Thawi at Thai-Malay border area. Also *Daonella* cf. *pichleri*, *Halobia* cf. *styriaca* Krumbeck (originally described from Timor) and *Halobia* cf. *comata* from E of Lampang. All species related to Carnian of Alpine-Himalayan region)

Koch, K.E. (1973)- Geology of the region Sri Sawat-Thong Pha Phum- Sangkhlaburi (Kanchanaburi Province/Thailand). *Bull. Geological Society Malaysia* 6, p. 177-185.

(online at: www.gsm.org.my/products/702001-101347-PDF.pdf)

(Review of area in NW-most Thailand near Myanmar border, mapped by German Geological Mission in 1968-1971. Stratigraphy ~3000m of Cambrian- Jurassic (meta-)sediments, part of geosynclinal tract which extends from Yunnan in N to W Malay Peninsula in S (= Sibumasu terrane; JTvG). Include Ordovician limestone, Siurian graptolite shale, basal Devonian Tentaculites- graptolite shale, Carboniferous flysch-type clastics with pebbly shale, Permian carbonate, Triassic conglomerates ('Triassic orogeny'), Jurassic limestone, etc.)

Kohpina, P. & S. Chiemchindaratana (1997)- Diamond recommended exploration and potential deposits in the Andaman Sea. In: A. Sardud et al. (eds.) *Diamond in Thailand*, Department of Mineral Resources Mineral Resources Development Division Document 3, p. 36-60.

(online at: <https://khao-lak-ausfluege.de/wp-content/uploads/2024/06/diamond-in-thailand.pdf? Etc.>)

(Diamonds rel. common in sand-gravel dredgings of offshore Quaternary tin placers, mainly in 3 areas of shallow waters off Phuket and Phang-nga, western Peninsular Thailand. Diamonds always found in layer below tin-concentrated layer. Most Thai diamonds 0.5- 1 carats, up to 8 carats. Primary source still unknown)

Komalarjun, P. & T. Sato (1964)- Aalenian (Jurassic) ammonites from Mae Sot, Northwestern Thailand. *Japan. In: T. Kobayashi (ed.) Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 237-251.

(Three ammonites from marly limestone localities of Mae Sot Basin, NW Thailand: *Tmetoceras dhanarajatai* n.sp., *T. regleyi*, *Erycites* and *Graphoceras concavum*. Generally accepted as index species for Aalenian of Mediterranean and Pacific provinces)

Konigshof, P., N.M. Savage, P. Lutat, A. Sardud, J. Dopieralska, Z. Belka & G. Racki (2012)- Late Devonian sedimentary record of the Paleotethys Ocean- The Mae Sariang section, northwestern Thailand. *J. Asian Earth Sciences* 52, p. 146-157.

(11 m thick condensed sequence of Late Devonian grey pelagic limestones in Mae Sariang section of NW Thailand, with hardgrounds and Fe/Mn crusts. Ranges from Late rhenana to praesulcata conodont biozones. Probably belongs to Inthanon Zone, comprising remnants of Paleotethys Ocean)

Konishi, K. (1953)- New *Boultonia* and other microfossils from North Thailand. *Transactions Proceedings Paleontological Society of Japan*, N.S., 12, p. 103-110.

(online at: https://www.jstage.jst.go.jp/article/prpsj1951/1953/12/1953_12_103/_pdf)

(Late Permian fusulinid forams from Burmo-Thai borderland, incl. *Boultonia truncata* n.sp., *Triticites*, *Rugofusulina*, *Schwagerina*, etc.)

Kon'no, E. (1963)- Some Permian plants from Thailand. *Contributions to the geology and palaeontology of Southeast Asia*, 5. *Japanese J. Geology and Geography* 34, p. 139-159.

(Same paper as Kno'no (1964). Includes record of Permian 'Gondwanan'? *Glossopteris* cf. *angustifolia* among mainly 'Cathaysian' *Alethopteris thailandica* n.sp., *Sphenophyllum*, *Cordaite*s, *Taeniopteris* from black shale at Khlong Wang Ang in Phetchabun province)

Kon'no, E. (1964)- Some Permian plants from Thailand. In: T. Kobayashi (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 89-111.

(Same paper as Kon'no (1963). *Eight species of Permian plants from Khlong Wang Ang, 50km SSW of Phetchabun, C Thailand. Incl. Bowmanites, Sphenophyllum, Alethopteris thailandica* n.sp., *Glossopteris* cf. *angustifolia*, *Palaeovittaria*, *Taeniopteris hallei* and *Poacordaite*s. Probable age Kungurian- Kazanian. Remarkable presence of Gondwanan *Glossopteris* in assemblage otherwise 'Cathaysian' (although without *Gigantopteroids*))

Kon'no, E. & K. Asama (1973)- Mesozoic plants from Khorat, Thailand. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 149-171.

(Description of Late Triassic (E Norian?) flora dominated by *Equisetites arenaceus*, also with *Chlathropteris meniscoides*, *Todites goeppertianus*, etc., in Huai Hin Lat Fm, which lies unconformably over Permian limestone in Khorat Plateau, NE Thailand. Flora similar to 'Tonkin flora' of N Vietnam and belongs to *Dictyophyllum*- *Clathropteris* flora of SW Pacific floral province)

Kosuwat, S. & P. Charusiri (1997)- Structure geology of the Khanom gneissic complex, Nakhon Si Thammarat Province, southern Thailand. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Dept. Mineral Resources, Bangkok, 2, p. 727-739.

Koysamran, S. & N. Comrie-Smith (2011)- Basin modeling of Block L26/50, Eastern Khorat Plateau, Northeast Thailand. *Proc. 4th Petroleum Forum: Approaching to the 21st Petroleum concession bidding round*, Bangkok 2011, Department of Mineral Fuels, p. 5-12.

(online at: [www.dmf.go.th/cms/assets/1/The%204th%20\(DMF\)%20Petroleum%20Forum%20Proceeding.pdf](http://www.dmf.go.th/cms/assets/1/The%204th%20(DMF)%20Petroleum%20Forum%20Proceeding.pdf))
(E Khorat Plateau experienced a number of tectonic events. First was in M Carboniferous, followed by Indosinian events I, II, and III. Permian Pha Nok Khao carbonate primary reservoir target. Late Jurassic-Cretaceous Khorat Group deposited during extended period of regional subsidence and represents overburden for petroleum system. Structuring during Indosinian orogenies and amplified by uplift in Late Cretaceous and Tertiary. Permian source rocks mature for gas in Triassic; Triassic source rocks mature in Cretaceous)

Kozai, T., F. Hirsch, K. Ishida & A. Meesook (2006)- Faunal affinity of Toarcian-Aalenian (Early Jurassic) bivalves from Mae Sot and Umphang (Tak Province), Northwestern Thailand. *Geosciences Journal* (Springer). 10, 3, p. 205-215.

(E-M Jurassic (Toarcian-Aalenian) beds in NW Thailand Mae Sot-Umphang areas overlie Permian-Triassic beds of Shan-Thai (=Sibumasu) terrane with brecciated conglomerate. Pliensbachian- Early Bajocian shallow marine strata in partly terrestrial Jurassic sequence. 35 bivalve species (incl. *Parvamussium donaiense*) mainly endemic and defining Toarcian-Aalenian SE Asian Province of Tethys. Associated corals of Tethyan affinity)

Kozai, T., L. Perelis-Grossowicz, A. Bartolini, C. Yamee, J. Sandoval, F. Hirsch, K. Ishida, T. Charoentitirat, A. Meesook & J. Guex (2011)- New palaeontological investigations in the Jurassic of western Thailand. *Gondwana Research* 19, 1, p. 37-46.

(online at: https://www.researchgate.net/publication/240439358_New_palaeontological_investigations_in_the_Jurassic_of_western_Thailand)

(Jurassic of Mae Sot and Umphang districts, W Thailand, provide age constraints for marine Jurassic inundation of Sundaland after Paleotethys closure. Basal conglomerate of Jurassic derived from pelagic Triassic substratum. Ammonites (*Tethyan Catulloceras perisphinctoides*, *Riccardiceras longalvum*, *Malladaites* spp., *Abbasites*, *Spinammatoceras schindewolfi*, etc.), bivalves, large benthic forams (*Timidonella sarda*) and algae (*Cladocoropsis mirabilis*) suggest Toarcian-Bajocian ages. Faunas partly endemic, with North Tethyan (Eurasian/ Sundaland) affinity. Bivalves mainly endemic fauna with pectinoid bivalve *Parvamussium donaiense* and *Bositra ornata* in Toarcian- Early Bajocian)

Kozar, M.G., G.F. Crandall & S.E. Hall (1992)- Integrated structural and stratigraphic study of the Khorat Basin, Rat Buri Limestone (Permian), Thailand. In: C. Piencharoen (ed.) Proc. National Conference Geologic resources of Thailand: potential for future development, Bangkok, Dept. Mineral Resources (DMR), p. 692-736.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1992/6259.pdf)

(Review of Khorat Basin Permian geology and results of 17 wells drilled by Esso between 1982-1984. Main discovery Nam Phong gas field (recoverable reserves ~300-500 BCF of H₂S bearing gas). Eight depositional sequences from Wolfcampian- E Guadalupian (~271-255 Ma). E Carboniferous Variscan compression and Late Carboniferous rifting (back-arc extension) followed by deposition of Permian Ratburi carbonate platform on high blocks. M Triassic Indosinian and E Tertiary compressional events. Complicated diagenetic history; early dolomitized low-energy carbonates better reservoirs than high-energy counterparts)

Krobicki, M., A. Meesook & W. Yathakum (2013)- Early Jurassic marine molasse-type conglomerates (Mae Sot area, northern Thailand) - its sedimentological features and geotectonic significance. In: C. Senebottalath et al. (eds.) Proc. 2nd Lao-Tai Conference Geology and Mineral resources, Vientiane, p. 70-71. (Abstract and Presentation)

(online at: www.dmr.go.th/download/lao_thai56/pdf_dat/Early%20Jurassic%20marine%20.pdf)

Kromkhun, K., G. Baines, P. Satarugsa & J. Foden (2013)- Petrochemistry of volcanic and plutonic rocks in Loei Province, Loei-Petchabun Fold Belt, Thailand. In: 2nd International Conference Geological and Environmental Sciences, IPCBEE 52, IACSIT Press, Singapore, p. 55-59.

(online at: www.ipcbee.com/vol52/011-ICGES2013-G041.pdf)

(Petrography and geochemistry of Permo-Triassic volcanic- plutonic rocks of Loei-Petchabun Fold Belt in Amphoe Wang Sa Phung and Maung areas (=arc at W margin Indochina Block). Intermediate igneous rocks with calc-alkaline affinities indicating magmatism at E-dipping continent- ocean subduction zone where Paleotethys ocean subducted beneath Indochina block. Subduction active from at least 244-230 Ma (Middle-early Late Triassic). Subduction-derived melts probably contaminated by overlying continental crust)

Kruse, P. (1989)- A Thai receptaculitalean. *Alcheringa* (Australasian J. Palaeontology) 13, 2, p. 141-144.

(Fragmentary silicified receptaculitalean fossil material from E-M Ordovician Tha Manao Fm at Khao Tham, W- C Thailand (= Sibumasu terrane). Described as ?*Fisherites* sp., possibly related to *Fischerites burmensis* from C Myanmar (Rietschel & Nitecki 1984). One of few SE Asian records of this order)

Kubo T., M. Shibata, W. Naksri, P. Jintasakul & Y. Azuma (2018)- The earliest record of Asian Eusuchia from the Lower Cretaceous Khok Kruat Formation of northeastern Thailand. *Cretaceous Research* 82. p. 21-28.

(New crocodyliform from Aptian Khok Kruat Fm draws back oldest record of Asian eusuchians (*Tadzhikosuchus*), by ~30 My years and is only Mesozoic eusuchian found in E and SE Asia)

Kummel, B. (1960)- Triassic ammonoids from Thailand. *Journal of Paleontology* 34, 4, p. 682-694.

(First Triassic ammonoids from N Thailand (Doi Chang, Mae Moh River), showing presence of Anisian (*Balatonites*, *Ptychites*, *Tropigymnites*, *Beyrichites*, *Sturia*) and Carnian (*Joannites*, *Cladiscites beyrichi*, *Trachyceras* (*Paratrachyceras*), *Lobites*). None of Triassic localities and faunas known to date from mainland SE Asia anywhere comparable to abundance and diversity of faunas known from Himalayas and Timor)

Kuroda, J., H. Hara, K. Ueno, T. Charoentitirat, T. Maruoka, T. Miyazaki, A. Miyahigashi & S. Lugli (2017)- Characterization of sulfate mineral deposits in central Thailand. *Island Arc* 26, 2, 12175, p.

(Layered anhydrite and massive gypsum in NE Nakhon Sawan, C Thailand, likely precipitated from Carboniferous sea water (~326 Ma). Intruded by andesitic dikes with M Triassic zircons (~240 Ma))

Lacassin, R., H. Maluski, P.H. Leloup, P. Tapponnier, C. Hinthong, K. Siribhakdi, S. Chuaviroj & A. Charoenravat (1997)- Tertiary diachronic extrusion and deformation of western Indochina: structural and ⁴⁰Ar/³⁹Ar evidence from NW Thailand. *J. of Geophysical Research* 102, B5, p. 10,013-10,037.

(Wang Chao and Three Pagodas fault zones cut W part of Indochina block. Evidence of left-lateral shear in Lansang gneisses. Ar dating shows deformation terminated at ~30.5 Ma. Faults offset N striking lower Mesozoic

metamorphic-magmatic belt of N Thailand, which rapidly cooled around 23 Ma. Extrusion of SW Indochina occurred in Late Eocene- E Oligocene, probably inducing rifting in Gulf of Thailand and in Malay and Mekong basins. In Oligo-Miocene, continuing penetration of India into Asia culminated with extrusion of all of Indochina along Ailao Shan- Red River fault)

Laoniyomthai, N., T. Charoenpun & F. Saifuddin (2012)- Shallow pays in Sirikit Main oilfield, Phitsanulok Basin, Onshore Thailand: their habitat and identification on 3D seismic data. Proc. International Petroleum Technical Conference (IPTC), Bangkok, IPTC 15144, p. 2758-2769.

(Several shallow oil-gas reservoirs above main regional seal in Sirikit Main Field)

Laurie, J.R. & C. Burrett (1992)- Biogeographic significance of Ordovician brachiopods from Thailand and Malaysia. Journal of Paleontology 66, 1, p. 16-23.

(Early Ordovician brachiopods Spanodonta floweri and Aporthophyla tianjingshanensis? from Peninsular Thailand and Langkawi Islands, NW Malaysia, confirm evidence for Ordovician juxtaposition of Shan-Thai terrane, N China terrane and W Australia)

Laveine, J.P., B. Ratanasthien & S. Sithirach (1993)- The Carboniferous flora of Northeastern Thailand: its paleogeographic importance. Comptes Rendus Academie Sciences, Paris 317, 2, p. 279-285.

(Carboniferous plant fossils from near Na Duang coal mine, Loei area, NE Thailand, with Stigmaria, Lepidodendron, etc.)

Laveine, J.P., B. Ratanasthien & S. Sithirach (2003)- The Carboniferous flora of Northeastern Thailand. Revue de Paleobiologie, Geneve, 22, 2, p. 761-797.

Laveine, J.P., B. Ratanasthien, S. Sithirach & D. Demarque (2009)- The Carboniferous flora of northeastern Thailand: additional documentation from the Na Duang-Na Klang basin. Revue de Paleobiologie, Geneve, 28, 2, p. 315-331.

(online at: www.ville-ge.ch/mhng/paleo/paleo-pdf/28-2/pal-28-2-02.pdf)

(New Carboniferous plant material from E Carboniferous (Visean) of Na Duang-Na Klang basin in NE Thailand includes Lepidodendron timsuwanii n.sp. Flora essentially of Euramerican aspect)

Laveine, J.P., D. Vachard, B. Ratanasthien & S. Sithirach (2003)- The Lower Carboniferous Na Duang marine band (Na Duang Coal Mine, Loei District, Northeastern Thailand). Revue de Paleobiologie, Geneve, 22, 2, p. 799-809.

Lawwongngam, K. (1990)- Geochemical characterization of crude oils from Sirikit Oilfield, Phitsanulok Basin. Thesis Chulalongkorn University, Bangkok, p. 1-220.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1990/4586.pdf)

(12 oils from Sirikit field of onshore Phisanulok Basin suggest all oils derived from mixture of bacterial, algal and higher plant material. Sterane contents relatively low and sterane ratios suggest oils relatively immature. Extensive strike-slip faults in basin may have led to rapid burial of sediments)

Lawwongngam, K. & R.P. Philp (1993)- Preliminary investigation of oil and source rock organic geochemistry from selected Tertiary basins of Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 433-448.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7612.pdf)

(Crude oils and extracts from source rocks from 6 basins of central plain and Gulf of Thailand suggest organic sources deposited in lacustrine environments. Organic matter mainly algae, with varying amounts of higher plant material. Variation in pristane/phytane ratios may imply differences in depositional oxicity. Separation between lacustrine environments indicated by differences in paleosalinity, e.g. hypersaline biomarker, gammacerane, which is restricted to offshore Gulf of Thailand)

Lawwongngam, K. & R.P. Philp (1993)- Preliminary investigation of oil and source rock organic geochemistry from selected Tertiary basins of Thailand. J. Southeast Asian Earth Sciences 8, p. 433-448.

(Same paper as above. Analyses of crude oils and extracts from source rocks from six Thailand Tertiary basins of Central plain and Gulf of Thailand regions)

Lawwongngam, K. & R.P. Philp (1993)- Geochemical characteristics of oils from the Sirikit Oilfield, Phitsanulok Basin, Thailand. *Chemical Geology* 93, p. 129-146.

(see also paper below)

Lawwongngam, K., R.P. Philp & S. Tantayanon (1990)- Geochemical characterization of crude oils from Sirikit Oilfield, Phitsanulok Basin. In: *Development geology for Thailand into the Year 2000*, Chulangkorn University, Bangkok, p. 377-407.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1990/24728.pdf)

(similar to Lawwongngam & Philp, 1993)

Lazar, S. (2012)- Sedimentology and depositional history of the Pha Nok Khao platform in the Loei-Phetchabun fold belt, Northeast Thailand. M.Sc. Thesis University of Western Australia, Pert, p. 1-188.

(online at: http://research-repository.uwa.edu.au/files/3245697/Lazar_Shachar_2012.pdf)

(U Carboniferous- Permian Pha Nok Khao platform outcrops in N Loei-Phetchabun foldbelt and is outcrop analogue for coeval gas fields in nearby Khorat plateau. Part of Indochina Terrane)

Lehmann, B., N. Jungyusuk, S. Khositantont, A. Hohndorf & Y. Kuroda (1994)- The tin-tungsten ore system of Pilok, Thailand. *J. Southeast Asian Earth Sciences* 10, p. 51-63.

(Tin-tungsten mineralization in Pilok mining area on apical parts of probably Late Cretaceous alkali feldspar aplite stocks (aplogranite), which intrude earlier K-feldspar megacrystic biotite granite)

Lehmann, B. & C. Mahawat (1989)- Metallogeny of tin in central Thailand: a genetic concept. *Geology (GSA)* 17, 5, p. 426-429.

(Tin mineralization in C Thailand associated with granitic rocks of Thai-Burmese Border Range (W group). Eastern group granites have no tin)

Lei, Z.Q. (1993)- The discovery and significance of the Late Jurassic sporopollen assemblage in Peninsular Thailand (Phrae and Nan Provinces). In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology, (BIOSEA)*, Chiang Mai, University of Chiang Mai, 2, p. 361-380

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7489.pdf)

(Abundant and diverse sporopollen assemblages from redbeds of SW Peninsular Thailand dominated by 21 species of Classopollis (86%) and Dicheiopollis (4.3%). Indicate arid climate and Late Jurassic age, similar to Late Jurassic of dry southern zone in China. Associated with 'Estheria' fauna of conchostracans Pseudograptia, Paleoleptestheria, etc. (Alderson et al. 1994 suggest more likely Early Cretaceous age))

Lek-uthai, T., C. Sangsuwan & B. Thongpenyai (1987)- A petroleum source rock potential in Chumphorn Basin. In: P. Thanasuthipitak (ed.) *Proc. Symposium Cenozoic basins Thailand: geology and resources*, Chiang Mai 1984, p. 43-66.

Li, W., Z. Chen, C. Burrett, X. Fang, C. Li, M. Udchachon, J. Chen & Y. Zhang (2023)- Coupled sedimentary and $\delta^{13}\text{C}$ records of western Thailand and South China from Middle to Late Ordovician: Sea-level and climate changes prior to the Hirnantian glaciation. *Palaeogeogr. Palaeoclim. Palaeoecology* 625, 111686, p. 1-18.

(Conodont biostratigraphy and carbon isotope chemostratigraphy of M-L Ordovician limestone successions in Kanchanaburi area of W Thailand and in South China (Sibumasu Terrane)).

Limtrakun P. (2003)- Origin and distribution of corundum from an intraplate alkali basaltic province in Thailand: evidence from field and inclusion studies. Ph.D. Thesis University of Tasmania, p. 1-276.

(online at: http://eprints.utas.edu.au/20552/7/whole_LimtrakunPhisit2003_thesis_ex_pub_mat.pdf)

(Sapphires from alluvial placer deposits in Denchai gem fields of Phrae Province, N Thailand, generally interpreted as derived from late Cenozoic Denchai basalts, with olivine, clinopyroxene and common mantle-derived xenoliths. New evidence suggests sapphires crystallised from melts formed in continental lithosphere)

Limtrakun, P., Y. Panjasawatwong & J. Khanmanee (2013)- Petrochemistry and origin of basalt breccia from Ban Sap Sawat area, Wichian Buri, Phetchabun, central Thailand. Songklanakarin J. Science Technology (SJST) 35, 4, p. 469-482.

(online at: <http://rdo.psu.ac.th/sjstweb/journal/35-4/35-4-13.pdf>)

(Miocene Wichian Buri basalts and basalt breccias in Loei-Phetchabun Volcanic Belt similar petrography and chemical compositions. Both formed from same continental within-plate, transitional tholeiitic magma)

Limtrakun, P., Khin Zaw, C.G. Ryan & T.P. Mernagh (2001)- Formation of the Denchai gem sapphires, northern Thailand: evidence from mineral chemistry and fluid/melt inclusion characteristics. Mineralogical Magazine 65, 6, p. 725-735.

(Denchai gem sapphire deposits in Phrae Province, N Thailand, closely associated with late Cenozoic high CO₂/high K alkaline basaltic rocks. Sapphires in alluvial placer deposits in paleo-channels at shallow depths)

Lin, Y.L., M.W. Yeh, T.Y. Lee, S.L. Chung, Y. Iizuka & P. Charusiri (2013)- First evidence of the Cambrian basement in Upper Peninsula of Thailand and its implication for crustal and tectonic evolution of the Sibumasu Terrane. Gondwana Research 24, p. 1031-1037.

(online at: www.academia.edu/72851738/First_evidence_of_the_Cambrian_basement_in_Upper_Penins_Etc.)

(First radiometric date of Cambrian crystalline basement of Sibumasu: zircon U/Pb age of Khao Tao orthogneiss in Thailand Upper Peninsula 501.5 ± 7.5 Ma (Late Cambrian). Chemical similarity and spatial continuity of Khao Tao orthogneiss with other pre-Neotethys marginal Eurasian and Sibumasu granitoids indicate similar magmatic arc regime along Gondwana India-Australia margin)

Linnen, R.L. (1998)- Depth of emplacement, fluid provenance and metallogeny in granitic terranes: a comparison of western Thailand with other tin belts. Mineralium Deposita 33, p. 461-476.

(Tin mineralization may occur at shallow and deep levels of emplacement, but greater tendency for cassiterite-bearing pegmatites to form at depth)

Linnen, R.L. & A.E. Williams-Jones (1994)- The evolution of pegmatite-hosted tin-tungsten mineralization at Nong Sua, Thailand: evidence from fluid inclusions and stable isotopes. Geochimica Cosmochimica Acta 58, 2, p. 735-747.

(Western granite belt in Thailand contains high proportion of pegmatite-hosted Sn-W deposits. Maximum pressure for emplacement of Nong Sua pegmatite 3.8 kbar corresponding to depth of <12-14 km)

Linnen, R.L. & A.E. Williams-Jones (1995)- Genesis of a magmatic metamorphic hydrothermal system: The Sn-W polymetallic deposits at Pilok, Thailand. Economic Geology 90, p. 1148-1166.

(Cassiterite, wolframite and base metal mineralization in Pilok area, 250km NW of Bangkok, W Thailand, are hosted by veins and stockworks in apical portion of Late Cretaceous leucocratic granite stocks (Ar-Ar ages 72-77 Ma), close to contacts with pelitic metasedimentary rocks)

Linnen, R.L., A.E. Williams-Jones & R.F. Martin (1992)- Evidence of magmatic cassiterite mineralization at the Nong Sua aplite-pegmatite complex, Thailand. Canadian Mineralogist 30, p. 739-761.

(online at: http://rruff.info/doclib/cm/vol30/CM30_739.pdf)

(Nong Sua intrusive complex in N Peninsular Thailand, 180 km S of Bangkok, is layered aplite-pegmatite with Sn-W mineralization. Muscovite from pegmatite with Ar/Ar age of 63.9± 0.6 Ma. Nearby biotite granite with biotite Ar/Ar age of 53.2 Ma. Cassiterite crystallized at ~95% crystallization, or prior to vapor saturation)

Liu, L., R.Z. Hu, Y.Z. Fu, J.H. Yang, M.F. Zhou, W. Mao, Y.W. Tang, A. Fanka & Z. Li (2024)- Cassiterite and zircon U-Pb ages and compositions from ore-bearing and barren granites in Thailand: Constraints on the formation of tin deposits in Southeast Asia. Ore Geology Reviews 174, 106282, p. 1-19.

(online at: <https://www.sciencedirect.com/science/article/pii/S0169136824004153>)

(U-Pb age dating of wolframite and cassiterite grains from nine Sn deposits in Thailand. Two stages. Triassic (224-210 Ma) in Central belt, with Cretaceous tin deposits (78-67 Ma) younger than those in Western belt (84-74 Ma). Ore-bearing granites span two periods (227-205 Ma- Norian and 85-69 Ma- Late Cretaceous), occur

in central and western belts. Barren granites have ages from 303–224 Ma. Metasediment-rich basement of the Sibumasu block distributing along the continental margin is likely the Sn-rich source)

Loffler, E. & J. Kubiniot (1996)- Landform development and bioturbation on the Khorat Plateau, Northeast Thailand. *Natural History Bull. Siam Society* 44, p. 199-216.

(online at: www.thaiscience.info/Article%20for%20ThaiScience/Article/61/10001833.pdf)

(Khorat Plateau erosional surface developed in two main phases: (1) E Tertiary formation of extensive plain, with deep weathering under humid tropical conditions (red Yasothon ferralsols and gravels of 'upper terrace'); (2) Pliocene or E Pleistocene relief rejuvenation after tectonic uplift, dissecting and stripping much of weathered mantle, with development of yellow sandy xanthic ferralsols on new land surfaces under more seasonal climate. Modifying factor in landform/ soil development is post-depositional bioturbation by termites, capable of reworking a few m of soil profile in several 1000 yrs, transporting fine material upward and causing coarse material like tektites to move down profile like a lag deposit)

Long, J.A. & C. Burrett (1989)- Fish from the Upper Devonian of the Shan-Thai terrane indicate proximity to East Gondwana and South China terranes. *Geology (GSA)* 17, 9, p. 811-813.

(Coronodontid shark tooth, new species of Phoeodus and occurrence of chondrichthyan Harpagodens in Late Famennian of Thailand, Australia, and S China suggests Late Devonian proximity of these terranes, in accord with recent paleomagnetic data)

Long, J.A. & C.F. Burrett (1989)- Early Devonian conodonts from the Kuan Tung Formation, Thailand: systematics and biogeographic considerations. *Records Australian Museum, Sydney*, 41, 2, p. 121-133.

(online at: http://australianmuseum.net.au/Uploads/Journals/17706/140_complete.pdf)

(Conodonts from limestone horizon in Kuan Tung Fm, Satun Province, S Thailand, show E Devonian (Emsian) age. Many conodont species cosmopolitan, some restricted to E Gondwana- ShanThai- S China Terranes)

Luddecke, S., C. Chonglakmani & D. Helmcke (1991)- Analysis of pebble associations from the marine Triassic of northern Thailand. *J. Thai Geoscience* 2, p. 91-101.

(Carnian-Norian age 'molasse' overlying Permian ophiolitic melange in N Thailand. Three types: (1) M Triassic Lampang/ Hong Hoi conglomerate mainly pebbles of M Triassic limestones and acid volcanic rocks (from nearby carbonate platform on Permo-Triassic volcanic arc or rift?); (2) U Triassic Rong Kwang conglomerate mainly siliciclastic sediments and low-grade metamorphic rocks; (3) Nam Pat conglomerate 38% volcanic, 26% metamorphic, 10% plutonic (from continental crust with Triassic volcanic arc?))

Lumjuan, A. (1993)- Permo-Carboniferous of northern Nakhon Si Thammarat. In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA)*, Chiang Mai 1993, 1, p. 219-224.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/6788.pdf)

(Carboniferous- Permian series in N part of Peninsular Thailand. ~500m+ of Carboniferous quartzitic sandstones and shales, overlain by ~200m of Late Carboniferous- earliest Permian pebbly mudstones (with granitic and other clasts) With Posidonomya. Capped by E-M Permian Ratburi Limestone)

Macdonald, A.S. & S.M. Barr (1978)- Tectonic significance of a Late Carboniferous volcanic arc in northern Thailand. In: P. Nutalaya (ed.) *Proc. Third Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA III)*, Bangkok, p. 151-156.

(Remnants of Late Carboniferous volcanic arc through central N Thailand, W of younger andesitic arcs and (Nan-Uttaradit) ultramafic belt. Mainly tholeiitic basalts, possibly from island arc environment. Associated with Late Carboniferous sediment, below base of Rat Buri Limestone. Distribution of volcanics and granites implies convergence along W-dipping subduction zone)

Macdonald, A.S. & S.M. Barr (1984)- The Nan River mafic-ultramafic belt, northern Thailand: geochemistry and tectonic significance. *Bull. Geological Society Malaysia* 17, p. 209-217.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1984010.pdf>)

(Nan River suture in N Thailand with mafic and ultramafic rocks (mainly metabasalt and metabasaltic andesite flows) and tuffs overlying metagabbro. Ultramafic rocks along SE side metahornblendite, metapyroxenite and serpentite lenses within garnet amphibolite. Mafic rocks resemble calc-alkali basalts formed in volcanic arc, rather than in oceanic environment. Should probably be termed volcanic arc suite with associated fault-emplaced ultramafic bodies. If belt marks suture between Shan-Thai and Indosinian cratonic blocks no significant obduction of intervening oceanic basin onto Shan-Thai block)

Macdonald, A.S., S.M. Barr, G.R. Dunning & W. Yaowanoyothin (1993)- The Doi Inthanon metamorphic core complex in NW Thailand: age and tectonic significance. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 117-125.

(Doi Inthanon complex in NW Thailand part of 400km belt of high-grade gneissic rocks along W mountain ranges of Thailand. Orthogneiss dome looks like Cordilleran-type metamorphic core complex, Zircon ages suggest gneiss derived from Late Triassic- E Triassic granitic protolith; high-grade metamorphism probably in Late Cretaceous. Large scale extension to form core complex sometime between Late Cretaceous and Miocene)

Macdonald, A.S., S.M. Barr, B.V. Miller, P.H. Reynolds, B.P. Rhodes & B. Yokart (2010)- P-T-t constraints on the development of the Doi Inthanon metamorphic core complex domain and implications for the evolution of the western gneiss belt, northern Thailand. J. Asian Earth Sciences 37, p. 82-104.

(Western gneiss belt in N Thailand exposed in Doi Inthanon metamorphic core complex (W of Chiang Mai basin), and in Mae Ping strike-slip fault domain W of Tak batholith. Doi Inthanon gneiss experienced: (1) high-grade, medium-P metamorphism in Late Triassic- E Jurassic (~210 Ma); (2) Late Cretaceous (84, 72 Ma) thermal overprint; (3) Late Eocene mylonite age (40 Ma) is early stage of development of core complex by low-angle extension; (4) Miocene (~26-15 Ma) late-stage development of core complex. Similarities with N Vietnam, Laos, Yunnan, and C Myanmar suggest regional response to indentation of SE Asia by India)

MacDonald, S. & D.A. MacDonald (1976)- Age of the Lampang basalt and underlying pebble tools. Dept. Geological Sciences, Chiang Mai, Special Publ. 2, Humans in Northeast Asia, p. 1-9.

(see also Barr et al. (1976): Early Paleolithic pebble tools below basalt older than 0.78 Ma))

Mahawat, C., M.P. Atherton & M.S. Brotherton (1990)- The Tak Batholith, Thailand: the evolution of contrasting granite types and implications for tectonic setting. J. Southeast Asian Earth Sciences 4, p. 11-27.

(Tak Batholith, W Central Thailand at boundary of E and C granitoid belts. Four zoned plutons, with youngest of Late Triassic age (210 Ma). Composition changes from granodioritic in oldest, through monzonitic and monzogranitic to syenogranitic in youngest. Changes in composition with time similar to increasing K volcanic series at active continental margin. Due to change from subduction to strike-slip and then uplift)

Makel, G., B. Ainsworth, S. Chuenbunchom, M. Harvey, S. Kaewla-lad & R. Pal (1997)- The Sirikit Field-improved structural interpretation and reservoir architecture and its impact on further field development. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 2, p. 541-542. *(Abstract only)*

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(Sirikit oil field discovered in 1981 and largest field in Oligocene- Miocene N-S trending extensional Phitsanulok Basin. Numerous lacustrine- deltaic- fluvial cycles)

Malila, K. (2005)- Provenance of the Nam Duk Formation and implications for the geodynamic evolution of the Phetchabun fold belt. Ph.D. Thesis Suranaree University of Technology, p. 1-162. *(Unpublished)*

(online at: http://sutir.sut.ac.th:8080/sutir/bitstream/123456789/313/1/Kitsana_fulltext.pdf)

(On provenance of Permian sediments in Nam Duk Carboniferous- Permian marginal basin, C Thailand. Basin opened in Carboniferous as marginal basin off Indochina, and closed in Late Permian? with ophiolite obduction and formation of Nan-Uttaradit suture)

Malila, K., C. Chonglakmani, Q. Feng & D. Helmcke (2008)- Provenance and tectonic setting of the Permian Nam Duk Formation, North-Central Thailand: implications for geodynamic evolution. Science Asia 34, p. 7-22.

(online at: www.scienceasia.org/2008.34.n1/v34_007_022.pdf)

(Permian Nam Duk Basin, Phetchabun Fold Belt, C Thailand, is remnant ocean basin and branch of Paleo-Tethys. Geochemistry of siliciclastics indicates E-M Permian 'pelagic sequence' transitional between oceanic and continental island arc and derived mainly from metabasic sources. Middle-late M Permian provenance signatures of 'flysch' and 'molasse' with indications of ultramafic-mafic igneous provenance and deposition in continental island arc environment. Apparently ocean closed in short period in M Permian)

Maneerat, W., S. Jitmahantakul & T. Charoentitirat (2022)- Devonian tentaculite of the Thong Pha Phum Group in Si Sawat District, Kanchanaburi Province. Bull. Earth Sciences Thailand (BEST) 14, 1, p. 35-49.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/248779/168875>)

(Abundant Devonian tentaculites in deep marine Thong Pha Phum Gp clastics and limestones of Sibumasu Terrane, in W Thailand. Rich in fossils such as graptolites, tentaculites, ostracods, brachiopods, nautiloids and trilobites. Tentaculites 7 species of Nowakia, Styliolina and Homoctenus, indicating Devonian age)

Mankhemthong, N., C.K. Morley & W. Srichan (2020)- Structure of the Mae On Depression, Chiang Mai province, based on gravity modelling and geological field observation: Implications for tectonic evolution of the Chiang Mai- Chiang Rai Suture Zone, Northern Thailand. J. Asian Earth Sciences 190, 104186, p.

(Volcanic exposures, part of melange complex of Sibumasu-Sukhothai Terrane collision during Permo-Triassic Indosinian Orogeny. Gravity anomaly highs correspond to dense volcanic block, ~750–900 m thick, overlain by carbonate and pelagic formations, interpreted as typical seamount ocean plate stratigraphy. Interpreted as klippe of Mae Tha Fm, derived from W margin of Sukhothai Terrane)

Mankhemthong, N., C.K. Morley, P. Takaew & B.P. Rhodes (2018)- Structure and evolution of the Ban Pong Basin, Chiang Mai Province, Thailand. J. Asian Earth Sciences 172, p. 208-220.

(Ban Pong Basin is small Neogene intermontane basin on W margin of Chiang Mai Basin in N Thailand. Formed in hanging wall of major Cenozoic low-angle normal fault ((Inthanon Detachment). Absence of classic half graben morphology probably related to inversion and erosion that modified extensional basin geometry and original thickness)

Manoonphol, P., Y. Thasod & B. Ratanasthien (2015)- The composition and the yield of oil shale from Na Hong Basin, Mae Chaem District, Chiang Mai Province. Proc. 5th GEOINDO 2015, Khon Kaen, PO-4, p. 1-6.

(Oil shales from small Tertiary Na Hong Basin, N Thailand, dominated by alginite. Also Botryococcus, Pila and Reinschia)

Mansyur, M., J.K. Warren, I. Cartwright & Yow Lam Cheong (2013)- Dolomitization and its relation to fracture porosity evolution: a case study in Permian Ratburi carbonate outcrop in the Sibumasu domain, Krabi, Southern Peninsular, Thailand. Proc. 37th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA13-G-016, p. 1-15.

(online at: https://www.researchgate.net/publication/323555006_Dolomitisation_And_Its_Relation_To_Fracture_Porosity_Evolution_A_Case_Study_In_Permian_Ratburi_Carbonate_Outcrop_In_The_Sib_Etc.)

(Production from Permian carbonates in Nang Nuan oil field, offshore S Thailand and Sin Phu Horm and Nam Pong gas fields in NE Thailand. Dolomitization, karstification and fracturing part of diagenetic evolution. Study of Ratburi Lst dolomite outcrop near Krabi in S Peninsular Thailand revealed three distinct dolomite textures, all formed during burial in response to rock-fluid interaction)

Mantajit, N. (1997)- Stratigraphy and tectonic evolution of Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), 1, p. 1-26.

(Review of Paleozoic- Cenozoic stratigraphy, tectonic evolution and mineral deposits of Thailand)

Mantajit, N. (1999)- Thailand and Tethys Sea. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Chiang Mai University, p. IX--XXVII.

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)

(Foreword of ST5 Conference and review of terranes and Devonian-Jurassic paleogeography/ faunas from Thailand)

Mantajit, N., W. Tantiwanit & L. Raksasakulwong (1979)- Stratigraphy of Phuket- Phang Nga area (Permian-Carboniferous). J. Geological Society Thailand (?),
(Carboniferous- E Permian clastics of Phuket Gp derived from western source)

Maranate, S. (1982)- Palaeomagnetism of the Khorat Group in Northeast Thailand. M.Sc. Thesis Victoria University, Wellington, p. 1-398.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1982/4505.pdf)

Maranate, S. (1984)- Magnetostratigraphic correlation for dating in the Khorat Group Northeast Thailand. Proc. Conf. Applications of Geology and the National Development, Bangkok, p. 293-296.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1984/7249.pdf)

Maranate, S. (1984)- Palaeomagnetism of the Khorat Group in Northeast Thailand. Geological Survey Paper 3, p. 1-71.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1982/5292.pdf)
(Paleomag data from 179 sites in M Triassic- M Cretaceous Khorat Gp (54% of sites rejected). Paleolatitude not significantly different from today (unlike nearby S China, whose Jurassic-Cretaceous paleolatitudes N of present-day?). Clockwise rotation of ~38° after mid-Cretaceous))

Maranate, S. & P. Vella (1986)- Palaeomagnetism of the Khorat Group, Mesozoic, northeast Thailand. J. Southeast Asian Earth Sciences 1, 1, p. 23-31.
(Late Triassic- Cretaceous Khorat Group up to 5000m of paralic-freshwater sediments, mainly red-beds. Paleomagnetic data suggest clockwise rotation ($37 \pm 7^\circ$) in last 100 My. Inclinations not much different from present day, indicating NE Thailand (and Indochina plate) at nearly same latitude since Late Triassic (NB: Van der Voo (1993) suspects widespread resetting of paleomagnetic data in Indochina- SE Asia mainland))

Matha, S., F. Saifuddin, A. Panthong, I.N. Nuada, S. Phaungphuak et al. (2012)- Stratigraphic traps in distal lacustrine delta, a case history from Greater Sirikit East Field, Phitsanulok Basin, Central Plain, Thailand. Int. Petroleum. Technical Conf. (IPTC), Bangkok, 1, IPTC 14491, p. 932-947.
(On stratigraphic traps in Greater Sirikit East oil- gas field in Phitsanulok Basin. Main reservoirs are fluvio-deltaic Lan Krabu Fm members of K, L and M that interfinger with lacustrine Chumsaeng Fm)

McCabe, R., M. Celaya, J. Cole, H.C. Han, T. Ohnstad, V. Pajitprapaporn & V. Thitipawarn (2012)- Extension tectonics: the Neogene opening of the north-south trending basins of central Thailand. J. of Geophysical Research: Solid Earth 93, B10, p. 11899-11910.
(Paleomagnetic work on late Neogene basalt flows from Thailand suggest differential rotation between W and C Thailand versus Khorat Plateau. Rotations record late Neogene phase of E-W extension of Chao Phraya-Phitsanulok Basin, Gulf of Thailand, and intermontane basins of W Thailand basins. Formation of basins and related basaltic volcanism developed in response to subduction of Indian plate under W Burma. Tectonics of region similar in style to Basin and Range region of W United States)

Meesook, A. (2000)- Cretaceous environments of northeastern Thailand. In: H. Okada, H. & N.J. Mateer (eds.) Cretaceous environments of Asia, Elsevier Science B 17, p. 207-223.
(In NE Thailand widespread non-marine Cretaceous rocks of Khorat Group. Semi-arid conditions in Early Cretaceous to arid paleoclimate in Late Cretaceous)

Meesook, A. (2011)- Cretaceous. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 169-184.

Meesook, A. & J.A. Grant-Mackie (1994)- Biostratigraphic correlation of marine Jurassic rocks within Thailand and Southeast Asia. Proc. Int. Symposium Stratigraphic Correlation Southeast Asia, Bangkok 1994, p. 160-169.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/4665.pdf)
(Jurassic sediments of Thailand widespread marine (in W) and non-marine (in NE) deposits. Marine Jurassic mainly Toarcian- E Bajocian. Regionally Thailand Jurassic similar to that of Vietnam and Myanmar)

Meesook, A. & J.A. Grant-Mackie (1996)- Marine Jurassic lithostratigraphy of Thailand. J. Southeast Asian Earth Sciences 14, p. 377-391.

(Marine Jurassic rocks well-exposed in NW Thailand-Myanmar border area (= W part of Shan-Tai/ Sibumasu block), less in other areas of Thailand. Generally underlain unconformably by Triassic and overlain by Quaternary. Sequences ~450-900m thick in NW, thinner in other areas, particularly in S. Marine Jurassic contains ammonites (Toarcian Dactylioceras, Aalenian Onychoceras, Leioceras, Graphoceras, etc.), bivalves (Parvamussium donaiense, Bositra) and foraminifera (Aalenian Timidonella sarda) and is largely Toarcian-Aalenian plus some Bajocian. Presence of Late Jurassic not confirmed)

Meesook, A. & J.A. Grant-Mackie (1997)- Faunal associations, paleoecology and paleoenvironments of the Thai marine Jurassic: a preliminary study. In: P. Dheeradilok et al. (eds.) Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok 1997, Dept. Mineral Resources, 1, p. 164-176.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7633.pdf)

(Paleoecological study of shelfal marine Toarcian- E Bajocian in W and S Thailand, mainly based on bivalves and ammonites. By M Bajocian all area changed from marine to non-marine facies. Thin-shelled 'paper Pecten' Bositra-dominated facies in Toarcian- Aalenian dark mudstones tied to anoxic conditions. Also Grammatodon, Parvamussium, etc. Belemnites absent in E-M Jurassic of Thailand/ SE Asia)

Meesook, A. & W. Saengsrirachan (2011)- Jurassic. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 151-168.

(Review of Jurassic stratigraphy of Thailand. Marine Jurassic limited to W sides of N, W and Peninsular Thailand (Sibumasu) and limited to Toarcian- E Bajocian ages only (locally with non-marine interbeds). Non-marine Jurassic facies only in deposits of NE Thailand (Khorat Basin))

Meesook, A., J.G. Sha, C. Yamee & W. Saengsrirachan (2009)- Faunal associations, paleoecology and paleoenvironment of marine Jurassic rocks in the Mae Sot, Phop Phra, and Umphang areas, western Thailand. In: Jurassic of China and environs: stratigraphy, basin history, and paleoenvironment, Science in China, D-Earth Science, 52, 12, p. 2001-2023.

(online at: <http://earth.scichina.com:8080/sciDe/EN/article/showArticleFile.do?attachType=PDF&id=415693>)

(E-M Jurassic (Toarcian-Aalenian) marine Jurassic clastics and oolitic limestones with mainly bivalves (Parvamussium, Trigonina, etc.), also ammonites, brachiopods and some coral (Montlivaltia numismalis), but no belemnites)

Meesook, A., V. Suteethorn, P. Chaodumrong, N. Teerarungsikul, A. Sardud & T. Wongprayoon (2002)- Mesozoic rocks of Thailand: a summary. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, p. 82-94.

Mein, P. & L. Ginsburg (1997)- Les mammiferes du gisement Miocene inferieur de Li Mae Long, Thaïlande: systematique, biostratigraphie et paleoenvironment. Geodiversitas, 19, 4, p. 783-844.

(The mammals from the Lower Miocene beds of Li Mae Long, Thailand: systematics, biostratigraphy and paleoenvironment'. Mammal fauna of Li Mae Long (Lamphun district, Thailand) 33 species, 5 Insectivora, 9 bats, 1 Scandentia, 2 primates, 8 rodents, 2 carnivores, 1 proboscidean, 1 perissodactyl and 4 artiodactyls). Age basal MN4; environment tropical forest near very shallow lake)

Metcalf, I., C.M. Henderson & K. Wakita (2017)- Lower Permian conodonts from Palaeo-Tethys Ocean Plate stratigraphy in the Chiang Mai-Chiang Rai Suture Zone, northern Thailand. Gondwana Research 44, p. 54-66.

(Lower Permian (lower Sakmarian) conodonts from section of Ocean Plate Stratigraphy, and from limestone block in Palaeo-Tethys suture zone S of Chiang Mai. Conodont species deep-water forms. Chiang Mai- Chiang Rai suture zone proposed for Palaeo-Tethys suture in N Thailand between Sibumasu and Sukhothai Arc terranes.

Inthanon Zone of N Thailand interpreted as fold-thrust belt W of suture, comprising Sibumasu Terrane continental margin rocks and remnant klippen of Chiang Mai- Chiang Rai suture zone rocks thrust as nappe W-ward during Triassic Sibumasu- Sukhothai Arc/Indochina Terrane collision)

Metcalf, I. & M. Sone (2008)- Biostratigraphy and palaeobiogeography of Lower Permian (lower Kungurian) conodonts from the Tak Fa Formation (Saraburi Limestone), Thailand. *Palaeogeogr. Palaeoclim. Palaeoecology* 257, p. 139-151.

(online at: https://www.academia.edu/4148904/Biostratigraphy_and_palaeobiogeography_of_Lower_Permian_lower_Kungurian_conodonts_from_the_Tak_Fa_Formation_Saraburi_Limestone_Thailand)

(E Permian (Kungurian) conodonts from Saraburi Lst in C Thailand (W margin of Indochina Terrane). Association with fusulinids and presence of *Sweetognathus* and *Pseudosweetognathus* indicate equatorial warm water faunas. *Pseudosweetognathus* appears restricted to Kungurian of S China and Indochina terranes)

Mickein, A. (1997)- U/Pb-, Rb/Sr- und K/Ar-Untersuchungen zur metamorphen Entwicklung und Altersstellung des 'Präkambriums' in NW-Thailand. *Gottinger Arbeiten Geol. Palaontologie* 73, p. 1-83.

(U/Pb-, Rb/Sr- und K/Ar-U investigations of the metamorphic development and age determination of the 'Precambrian' in NW Thailand')

Milsom, J. (2011)- Regional geophysics. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 493-506.

Minato, M. (1944)- An occurrence of *Wentzella subtimorica* in northern Tai. *Proc. Imperial Academy (Tokyo)* 20, 2, p. 104-106.

(online at: www.journalarchive.jst.go.jp)

(Mid-Permian Lonsdaleia-type colonial tabulate coral from Dong Hua To limestone in N Thailand. Species originally described by Huang (1932) from S China, and closely resembles *Wentzelella timorica* (Gerth 1921) from Basleo, Timor. *Pseudoschwagerina* fusulinids from nearby localities described by Toriyama (1944) (now called *Ipciphyllum laosense*; Ingavat-Helmcke, 1994))

Minezaki, T. & K.I. Hisada (2016)- The tectono-stratigraphy and the Upper Paleozoic petroleum systems of the Khorat Plateau Basin in onshore NE Thailand. In: *Development of the Asian Tethyan Realm: genesis, process and outcomes*, 5th Int. Symposium International Geoscience Program (IGCP) Project 589, Yangon, p. 7-11.

(Extended Abstract)

(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)

(Khorat Plateau and surrounding NE Thailand underlain by Permian carbonates, which host two commercial gas fields. Intense deformation of Carboniferous- Permian sections below Indosinian I Event, which may be caused by closure of back-arc basin between Sukhothai arc and Indochina terrane at end of Permian along Nan-Uttaradit suture, before (Triassic) collision between Sibumasu block and Indochina)

Minezaki, T., K.I. Hisada, H. Hara & Y. Kamata (2019)- Tectono-stratigraphy of Late Carboniferous to Triassic successions of the Khorat Plateau Basin, Indochina Block, northeastern Thailand: initiation of the Indosinian Orogeny by collision of the Indochina and South China blocks. *J. Asian Earth Sciences* 170, p. 208-224.

(Khorat Plateau Basin in NE Thailand covers much of Indochina Block. Mesozoic gently folded non-marine sediments unconformably over faulted U Paleozoic sequence (Indosinian I unconformity) with, in some areas ~2000m of erosion. Result of collision of Indochina and S China blocks during late Permian- M Triassic)

Mitchell, A.H.G., B. Young & W. Jantaranipaa (1970)- The Phuket Group, Peninsular Thailand: a Palaeozoic ?geosynclinal deposit. *Geological Magazine* 107, 5, p. 411-428.

(Phuket Group in Phuket- Takua Pa- Krabi region of Peninsular Thailand, two folded formations: (1) >3 km thick Ordovician (Cambrian? to Lower Permian deep marine, quartz-rich continental margin clastics (with common pebbly mudstones in lower formation with clasts of quartzite, vein quartz, limestone and biotite granite; probably also diamonds); (2) 100-200m thick shallow marine- deltaics of E Permian age, overlain by

Permian Ratburi Lst. Continental source lay to E (Burton, Ridd had proposed clastic source from West; JTVG). Phuket Group continues N into S Burma as Mergui Series. See also comment and reply by Ridd 1971)

Miyahigashi, A., K. Ueno & T. Charoentitirat (2009)- Late Permian (Lopingian) foraminifers from the Doi Chiang Dao Limestone in the Inthanon Zone of Northern Thailand. *Acta Geoscientica Sinica* 30, Suppl. 1, p. 40-43.

(online at: www.cagsbulletin.com/dqxben/ch/reader/create_pdf.aspx?file_no=2009S123)

(Late Permian foraminifers from massive Visean-latest Permian (earliest Triassic) Doi Chiang Dao Lst in Inthanon Zone of N Thailand, N of Chiang Mai. Considered to be Paleotethyan seamount carbonate, deposited on basalts, and surrounded by shales and bedded 'Fang Chert', which represent M Devonian- M Triassic deep-sea sediments. Three Late Permian fusulinid foram assemblages, which can be compared with Shifodong Fm of Paleo-Tethyan mid-oceanic carbonates in Changning-Menglian Belt of W Yunnan, SW China)

Miyahigashi, A., K. Ueno & T. Charoentitirat & Y. Kamata (2012)- Foraminiferal assemblage and depositional environment of the Doi Long Formation (Triassic Lampang Group), Northern Thailand. *Proc. First Int. Symposium of IGCP-589, Xi'an, China 2012, Acta Geoscientica Sinica* 33, Suppl. 1, p. 45-49.

(online at: <http://igcp589.cags.ac.cn/pdf/24-Miyahigashi.pdf>)

(Doi Long Fm Triassic limestone NE of Lampang in Sukhothai Zone of N Thailand, believed to be Permian-Triassic island arc system along margin of Indochina Block. Rich foraminiferal assemblage with abundant Aulotortus sinuosus, Alpinophragmium perforatum, Agathammina austroalpina, etc., suggesting Carnian age, consistent with age estimated by ammonoids. Also with Shamovella (formerly Tubiphytes). Lagoon, reef and shoal facies recognized)

Miyahigashi, A., K. Ueno & T. Charoentitirat & Y. Kamata (2014)- Foraminiferal fauna and depositional environment of the Lower Permian Kiu Lom Formation in the Sukhothai Zone, Northern Thailand. In: *Development of the Asian Tethyan Realm, Proc. 3rd Int. Symposium Int. Geosciences Program (IGCP) Project 589, Tehran 2014, p. 152-153. (Abstract)*

(Lampang area in N Thailand belongs to Sukhothai Zone island arc, developed along margin of Indochina Block during Permian-Triassic. E Permian Kiu Lom Fm ~500m thick volcanoclastics with bedded limestone rel. rich in fusulinid foraminifera (Darvasites, Chalaroschwagerina, Praeskinnerella, Levenella, etc.). Volcanism of Sukhothai Arc active from latest Carboniferous - late E Permian (Yakhtashian), ceased, followed by major arc volcanism in M Triassic)

Miyahigashi, A., K. Ueno & T. Charoentitirat, Y. Kamata & A. Sardud (2013)- Foraminiferal fauna and depositional environment of the Late Triassic Kang Pla Formation (Song Group), Northern Thailand. In: *2nd Int. Symposium Int. Geoscience Programme Project 589, Borocay, Philippines, p. 76-78. (Abstract)*

(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)

(Triassic clastics with subordinate limestones widely distributed in Lampang-Phrae area, N Thailand. Kang Pla Fm ~100-500m thick with foraminifera Aulotortus sinuosus, A. communis, A. tumidus, Pilammina gemerica, P. grandis, Diplotremina subangulata, Agathammina austroalpina, etc., suggesting Carnian age)

Miyahigashi, A., K. Ueno & T. Charoentitirat, Y. Sera, Y. Kamata & A. Sardud (2010)- Late Carboniferous-Early Permian foraminiferal assemblages from the Doi Chiang Dao Limestone in the Inthanon Zone, Northern Thailand. *6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516) Geological Anatomy of East and South Asia, Kuala Lumpur 2010, p. 94-97.*

(Late Carboniferous-E Permian foraminiferal fauna of Doi Chiang Dao Lst (Paleo-Tethyan mid-oceanic seamount with basaltic rocks at base), shows similarities to Cathaysian blocks (incl. Sukhothai Zone), suggesting mid-oceanic Paleo-Tethys domain where Doi Chiang Dao Lst formed was paleobiogeographically in tropical Tethyan region. Faunal diversity generally lower than in Cathaysian region)

Mongkolitip, P. (1986)- Metamorphic mineral assemblages of gneisses along Doi-Inthanon Highway, Northern Thailand. In: G.H. Teh & S. Paramananthan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia* 20, p. 473-485.

(online at: www.gsm.org.my/products/702001-101416-PDF.pdf)

(Precambrian?metamorphic rocks of Chiang Mai -Tak gneiss belt include mica-K-feldspar-sillimanite gneiss and biotite gneiss with intercalating marble and calc-silicate. Gneiss units separated by Carboniferous and M Triassic biotite-granite intrusions)

Moonpa, K. & K. Motanated (2018)- Basin classification and tectonic framework of the Nam Pat Group, Uttaradit Province, Thailand: implications for the Nan Suture Zone. *Heliyon* 4, 1, e00517, p. 1-24.

(online at: <https://www.sciencedirect.com/science/article/pii/S2405844017327214>)

(Late Triassic Nam Pat Gp of Nam Pat Basin in Nan-Uttaradit Suture Zone, NW Thailand. Clastics dominated by volcanic arc detritus. Paleocurrents to SE and derived from underlying E-M Triassic Pak Pat andesitic magmatic arc volcanics. Basin best interpreted as short-lived back-arc basin rather than forearc basin)

Moonpa, K. & K. Motanated (2021)- Carbonate microfacies and depositional model of Triassic Pha Kan and Doi Long Formations, Lampang Group, Sukhothai Zone, Northern Thailand. *Heliyon* 7, 10, e08130, p. 1-21.

(online at: <https://doi.org/10.1016/j.heliyon.2021.e08130>)

(Triassic carbonate successions of Pha Kan (E Triassic- Ladinian) and Doi Long (Carnian) Fms of Lampang Gp, from Sukhothai Zone (between Sibumasu and Indochina blocks), Lampang. Depositional environment carbonate platform with lagoon, small reefs, and bioclastic and oolitic shoals. System influenced by nearby volcanic arc. Lampang Group can be correlated with Lincang Massif of W Yunnan Province, and NW Laos)

Moonpa, K., W. Srichan, T. Charoentitirat & T. Intawong (2024)- Lower Permian limestone associated with ocean floor rocks in the Inthanon Zone of northern Thailand: new evidence for melange. *Geosciences Journal* 28, 1, p. 1-14.

(online at: https://www.researchgate.net/publication/377456380_Lower_Permian_limestone_associated_with_ocean_floor_rocks_in_the_Inthanon_Zone_of_northern_Thailand_new_evidence_for_melange)

(New outcrops of crinoidal limestone, chert, sandstone, mudstone and microgabbro in N Lamphun area of N Thailand. Located in Inthanon Zone where Paleo-Tethyan ocean plate stratigraphy is well known. Fusulinid foraminifera (schwagerinids, Parafusulina, Verbeekina, etc.) from limestone Sakmarian- Kungurian (Cisuralian;(E Permian), and interpreted as mid-oceanic carbonate build-ups on seamount, chaotically mixed with radiolarian chert, microgabbro, pelagic mudstone, and turbidites in melange during Paleo-Tethys closure)

Morley, C.K. (2009)- Geometry and evolution of low-angle normal faults (LANF) within a Cenozoic high-angle rift system, Thailand: implications for sedimentology and the mechanisms of LANT development. *Tectonics* 28, 5, TC5001, p. 1-30.

(At least 8 examples of large (5-35 km heave), low-angle normal faults (20-30° dip) in Cenozoic rift basins of Thailand, laterally passing into high-angle extensional fault systems. Low-angle dips appear to follow pre-existing low-angle fabrics developed during Late Paleozoic and E Paleogene episodes of folding-thrusting)

Morley, C.K. (2014)- The widespread occurrence of low-angle normal faults in a rift setting: review of examples from Thailand, and implications for their origin and evolution. *Earth-Science Reviews* 133, p. 18-42.

(Many low-angle (<35° dip), high-displacement (>1km) Cenozoic normal faults identified on seismic onshore and offshore Thailand. In areas like Mergui Basin dominant east-dips suggest pre-existing fabrics control on fault dip direction. Low angles may also be caused by reactivation of pre-existing basement fabric)

Morley, C.K. (2015)- Five anomalous structural aspects of rift basins in Thailand and their impact on petroleum systems. In: F.L. Richards et al. (eds.) *Industrial structural geology: principles, techniques and integration*, Geological Society, London, Special Publ. 421, p. 143-168.

(Late Eocene- Miocene intra-cratonic Thailand rift basins caused rifts evolved differently from other intra-cratonic rifts: (1) widespread low-angle normal faults; (2) basin inversion alternating with rifting; (3) diachronous initiation and cessation of rifting (general younging to N with time; also E to W shift in Gulf of Thailand); (4) rapid post-rift subsidence (6km in Pattani, 8 km in Malay Basin) and (5) extensive, low-displacement post-rift faults. Differences may be related to hot, weak continental lithosphere of Sundaland, rapid evolution of plate boundaries and stresses during Cenozoic, and history of subduction and accretion)

Morley, C.K. (2017)- The impact of multiple extension events, stress rotation and inherited fabrics on normal fault geometries and evolution in the Cenozoic rift basins of Thailand. In: C. Childs et al. (eds.) The geometry and growth of normal faults, Geological Society, London, Special Publ. 439, p. 413-445.

(Rift basins of Thailand with remarkable diversity of fault displacement patterns. Oblique extension, influence of pre-existing trends and stress rotation in multi-phase rifts more comprehensive explanation than strike-slip interpretation of previous studies)

Morley, C.K. (2025)- Stratigraphic, structural and tectonic contexts of Permo-Triassic igneous activity in the Khao Khwang fold and thrust belt, Central Thailand. J. Asian Earth Sciences 292, 106725, p.

(Khao Khwang fold-thrust belt at S end of 'Indosinian' Loei foldbelt rel. well understood due to widespread quarry activity: (1) Early Permian (arc) volcanic activity interbedded with E Permian deepwater Alum Shales, (2) Late Permian volcanic activity following deposition of E-L Permian Saraburi Gp. (3) Intrusion of sills and dykes prior to onset of deformation in E Triassic (pre-kinematic). (4) Intrusion of sills, dykes and plutons in M-L Triassic after main folding-(post-kinematic). Large volume of Late Triassic igneous activity. Phase of Permian-age N-directed subduction below KKFTB, when small ocean between N and S Indochina closed, which preceded latest Permian-Triassic E-wards subduction on W margin of united N and S Indochina.

Morley, C.K., P. Ampaiwan, S. Thanudamrong, N. Kuenphan & J. Warren (2013)- Development of the Khao Khwang fold and thrust belt: implications for the geodynamic setting of Thailand and Cambodia during the Indosinian Orogeny. J. Asian Earth Sciences 62, p. 705-719. (online at: www.academia.edu/7616662/Development_of_the_Khao_Khwang_Fold_and_Thrust_Belt_Implication_Etc.)

(Indosinian Orogeny in Thailand often viewed as developed between linear terranes, now ~N-S trending, and subsequently disrupted by NW-SE Cenozoic strike-slip faults, but may be more complex. Indochina Terrane probably series of continental blocks, separated by Permian rifting. In E Triassic early stage collision (S China-Cathaysian Terrane collision with Vietnam/Indochina) resulted in amalgamation of Indochina Terrane by closure along rifts. Rift basins thrust and inverted during early stages of Indosinian orogeny, with minor reactivation when Sibumasu collided with Sukhothai Zone- Indochina Terrane margin in Late Triassic)

Morley, C.K., F. Arboit, R. Hansberry, A. Collins, R. King, K. Amrouch & J. Warren (2015)- Style, timing, stratigraphic development and structural evolution of the Khao Khwang Fold and Thrust Belt. Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 52-53. (Abstract)

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(Triassic basins interpreted as syn-kinematic basins (piggy back or foreland) to episodes of thrusting from ~245- 205 Ma (M-L Triassic). Late Triassic deformation suggests later, more intense contraction history for Khao Khwang Foldbelt than adjacent Khorat Plateau area, with development of Norian- continental extensional basins unconformably overlain by Rhaetian. Detrital zircons with common age peak at ~450 Ma. Detrital zircon age spectra of siliciclastics of Saraburi Group resembles Permian-Triassic in Khorat Plateau, Vietnam and SE China, suggesting shared sediment source areas (Indosinian basement))

Morley, C.K. & S. Chantpraser (2025)- Multi-scale, diverse origin inherited fabrics in rifts: A discussion through the lens of Cenozoic rifting in Thailand and comparison with other rift basins. Earth-Science Reviews 265, 105131, p.

(Cenozoic Central Thailand Rift system 1500 km long N-S and was active from Late Eocene-Miocene, but timing is strongly diachronous. Represents rifting in hot, young continental crust in upper plate of major subduction zone system. Rift geometries influenced by inherited structural fabric: (1) Triassic-Early Jurassic Indosinian Orogeny, (2) Jurassic-Cretaceous Andean-type margin, 3) Eocene-Early Oligocene transpression and strike-slip deformation related to India-Eurasia collision)

Morley, C.K., P. Charusiri & I.M. Watkinson (2011)- Structural geology of Thailand during the Cenozoic. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, Chapter 11, p. 273-334.

(Comprehensive review of Cenozoic deformation of Thailand. Two dominant styles: (1) strike-slip faulting (mainly in W half of onshore Thailand and Andaman Sea; incl. Sagaing, Three Pagodas Fault) and extension. Folds-thrusts and inversion structures also present. Cenozoic rifts mainly N-S trending with E-dipping half-

graben boundaries and located predominantly in Sukhothai and Inthanon zones of Indosinian orogeny (mobile belts between stronger Sibumasu and Indochina blocks, reactivating E-dipping thrust faults?) Between Late Miocene and present tectonic setting changed from dominantly extension to increased strike-slip activity)

Morley, C.K., S. Gabdi & K. Seusutthiya (2007)- Fault superimposition and linkage resulting from stress changes during rifting: examples from 3D seismic data, Phitsanulok Basin, Thailand. *J. Structural Geology* 29, p. 646-663.

(Phitsanulok basin, Thailand, example of changing fault displacement patterns with time, associated with faults of different orientations. In N Phitsanulok basin three main phases associated with Late Oligocene-Recent fault development: (1) Late Oligocene- Late Miocene E-W extension, 'main rift' stage; (2) Late Miocene- Pliocene transtension to transpression(?), 'late rift' stage; (3) Pliocene- Recent minor faulting, E-W extension)

Morley, C.K., C. Haranya, W. Phoosongsee, S. Pongwapee, A. Kornawan & N. Wonganan (2004)- Activation of rift oblique and rift parallel pre-existing fabrics during extension and their effect on deformation style: examples from the rifts of Thailand. *J. Structural Geology* 26, p. 1803-1829.

(online at: <http://it.geol.science.cmu.ac.th/gs/staff/nutthawut/Webpage%20data/Structural%20Geology.pdf>)

(Tertiary rift basins of Thailand previously interpreted in terms of strike-slip faulting, but many trends oblique to N-S orientation of rift system appear to be inherited passive fabrics in pre-rift. Fabrics from Paleozoic and Mesozoic orogenies exerted influence on Tertiary strike-slip and normal faults)

Morley, C., Y. Ionnikoff, N. Pinyochon & K. Seusutthiya (2007)- Degradation of a footwall fault block with hanging-wall fault propagation in a continental-lacustrine setting: how a new structural model impacted field development plans, the Sirikit Field, Thailand. *American Assoc. Petroleum Geol. (AAPG) Bull.* 91, 11, p. 1637-1661.

(Sirikit oil-gas field large field (~800 MMBO IP) in Phitsanulok Basin in footwall of complex tilted fault block. Main reservoir horizons Lower Miocene fluvio-deltaic sands of Lan Krabu Fm, sourced and sealed by interbedded lacustrine shales. Stratigraphy on tilted block flank difficult to trace onto fault block crest, caused by features associated with degradation of footwall (low-angle detachment faulting, multiple episodes of erosion at tilted block crest, E-ward onlap onto eroded footwall surface)

Morley, C.K., S. Jitmahantakul, S. Pongwapee, H. Vattanasak (2022)- Multiphase deformation of an inverted Permian deepwater rift basin: The Nong Pong Formation, Khao Khwang Fold and Thrust belt, Thailand. *J. Asian Earth Sciences* 224, 104979, p. 1-25.

(Bathyal Permian Nong Pong Fm is crucial for understanding deformation in Triassic (Indosinian Orogeny) Khao Khwangfold-thrust Belt. Deposited in series of marine rift basins, with carbonates forming on intervening highs. Platform carbonates shortened by N-directed thrusts. Absence of proximal slope depo-belts, and juxtaposition of carbonate platform facies with deepwater deposits suggest thrusts (some initiated as inverted normal faults) on basin margins have displacements of 10-25 km. Nong Pong Fm deposited in basin up to 100 km wide, part of E-W trending seaway that bisected Indochina Terrane. Deformation of Nong Pong Fm demonstrates significant differences in structural style between ribbon continents and major continents)

Morley, C.K. & A. Racey (2011)- Tertiary stratigraphy. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 223-271.

Morley, C.K., N. Sangkumarni & T.B. Hoon (1998)- Structural evolution of Rift Basins in northern Thailand: new constraints from paleostress analysis. *Proc. Offshore South East Asia Conference (OSEA98)*, Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 79-81. *(Extended Abstract)*

(Tertiary rift basins of Thailand form N-S trending string of depressions from Gulf of Thailand in S to hill country in N. Southern basins larger, longer and deeper. Extension primarily in Oligocene and Miocene. Li basin data shows episodic compressional or strike-slip events through its evolution, inconsistent with simple pull-apart origin and suggesting strike-slip motions more complex than simple prevalent strike-slip models indicate. Thai basins may have evolved under two separate deformation mechanisms (escape tectonics from India collision and Indian Ocean subduction rollback) that may have alternated in importance with time)

Morley, C.K., N. Sangkumarni, T.B. Hoon, C. Chonglakmani & J. Lambiase (2000)- Structural evolution of the Li Basin, northern Thailand. *J. Geological Society, London*, 157, 2, p. 483-492.

(Oligo-Miocene sections of coal mines in Li Basin of N Thailand show basins formed under E-W extension. At least 5 episodes of mainly NNW-SSE to NE-SW oriented compression interrupted extensional development of basin, probably related to escape tectonics of Himalayan orogeny. Episodic nature of compression and extension inconsistent with either simple strike-slip related opening of basins or simple extension)

Morley, C.K., M. Smith, A. Carter, A.P. Charusiri & S. Chantraprasert (2007)- Evolution of deformation styles at a major restraining bend, constraints from cooling histories, Mae Ping fault zone, western Thailand. In: W.D. Cunningham & P. Mann (eds.) *Tectonics of strike-slip restraining and releasing Bends*, Geological Society, London, Special Publ. 290, p. 325-349.

(On ~150km-long, restraining bend in ~500km-long Mae Ping fault zone, a NW-SE trending fault zone across onshore Thailand and E Myanmar with >150 km sinistral motion during Cenozoic)

Morley, C.K. & N. Wongsanan (2000)- Normal fault displacement characteristics, with particular reference to synthetic transfer zones, Mae Moh Mine, Northern Thailand. *Basin Research* 12, 3/4, p. 307-327.

(Study of normal faults in M Miocene sediments of the Mae Moh mine, E of Lampang, N Thailand)

Morley, C.K., N. Wongsanan, N. Sankumarn, T.B Hoon, A. Alief & M. Simmons (2001)- Late Oligocene-Recent stress evolution in rift basins of Northern and Central Thailand: implications for escape tectonics. *Tectonophysics* 334, p. 115-150.

(Tertiary rift basins of Thailand generally evolved under E-W extension. Extension episodically interrupted by inversion events. Rift basins from N. Thailand and Laos into Gulf of Thailand different evolutions, but common trends: (1) widespread Oligocene- E Miocene extension; (2) In C and N Thailand also M Miocene extension, persisting into the Upper Miocene-Pliocene; (3) In S (W. Natuna, Penyu, Malay basins) extension ceased in earliest Miocene; (4) In N Gulf of Thailand extension ceased in M Miocene; (5) Thermal subsidence greatest (up to 4 km) in S (Malay, Pattani, W. Natuna, Penyu basins) and least in N Thailand; (6) Intense E-M Miocene inversion in S Gulf of Thailand; mild E-M Miocene inversion in N Gulf of Thailand. Most widespread inversion in N, in Plio-Pleistocene. Evolution more complex than can be explained by simple escape tectonic models)

Mouret, C. (1994)- Geological history of northeastern Thailand since the Carboniferous. Relations with Indochina and Carboniferous- Early Cenozoic evolution model. In: P. Angsuwathana et al. (eds.) *Proc. Int. Symposium Stratigraphic correlation of Southeast Asia*, Bangkok 1994, Dept. Mineral Resources (DMR) and IGCP 306, p. 132-158.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1994/6945.pdf)

(Phu Phan Range of NE Thailand result of strong E Cenozoic inversion. Khorat Plateau area major regional M Carboniferous unconformity ('Hercynian compression'). Post-collisional M-U Carboniferous half-grabens with clastic fill, followed by Permian carbonate-dominated deposition. M Triassic 'Indosinian I' and Latest Triassic/Rhaetian 'Indosinian II' thrusting events. Jurassic- Cretaceous Khorat Gp mainly fluvial redbeds, with thick evaporites in Albian- Cenomanian, followed by eolian sandstones. Around 65 Ma major uplift, erosion (folding/ inversion of pre-Rhaetian depocenters. Etc.))

Mouret, C., H. Heggemann, J. Goudain & S. Krisadasima (1993)- Geological history of the siliciclastic Mesozoic strata of the Khorat Group in the Phu Phan Range area, northeastern Thailand. In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and palaeontology (BIOSEA)*, Chiang Mai, 1, p. 23-49.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7484.pdf)

(On stratigraphy of Khorat Group of NE Thailand part of widespread Mesozoic non-marine deposits over E Thailand, Laos, Cambodia and Vietnam. Deposition starts in latest Triassic (Rhaetian) and continues with up to 5000m of redbeds before final uplift and erosion at 65 Ma (tied to plate collision in W, in Myanmar), resulting in erosion of up to 3500m of post M Jurassic sediments. Evaporitic conditions in Albian-Cenomanian. Paleocurrents mainly to WSW, possibly from Annamitic Mountain belt or farther NE)

Mukasa, S.B., G.M. Fischer & S.M. Barr (1996)- The character of the subcontinental mantle in Southeast Asia: evidence from isotopic and elemental compositions of extension-related Cenozoic basalts in Thailand. In: Earth processes: reading the isotopic code, American Geophysical Union (AGU) Geophysical Monograph 95, p. 233-252.

(Central Valley of Thailand and its flanks sites of basaltic volcanism due to extensional deformation since at least 10 Ma. Isotopic compositions of basalts most closely resemble post-spreading lavas in S China Sea Basin)

Mustoe, G., C. Aranyanark, N. Boonchai & P. Jintasakul (2022)- A new look at Cenozoic fossil wood from Thailand. *Geosciences (MDPI)*, 12, 291, p. 1-34.

(online at: <https://www.mdpi.com/2076-3263/12/8/291>)

(Thailand two notable 'petrified forest' regions, with different degrees of silicification: (1) Pleistocene (~800 ka) fluvial terrace deposits in Ban Tak region in NW Thailand highlands, with large silicified angiosperm tree trunks; (2) Khorat Plateau in NE Thailand with multiple Miocene- Pleistocene wood fossils (40 species; dominated by diverse variety of angiosperms (also with Cretaceous tree trunks. Little on geology)

Nachtergaele, S., S. Glorie, C. Morley, P. Charusiri, P. Kanjanapayont, P. Vermeesch, A. Carter, G. Van Ranst & J. de Grave (2020)- Cenozoic tectonic evolution of southeastern Thailand derived from low-temperature thermochronology. *J. Geological Society, London*, 177, 2, p. 395-411.

(online at: <https://jgs.lyellcollection.org/content/jgs/177/2/395.full.pdf>)

(Apatite thermal histories indicate late Eocene- Oligocene regional exhumation of exposed granitic and metamorphic basement rocks in SE Thailand. Exhumation contemporaneous with late Eocene- E Oligocene sinistral fault activity along Mae Ping and Three Pagodas Faults. Exhumation coeval with synrift phase of intracontinental offshore rift and half-graben development in E Gulf of Thailand. Exhumation ended in E Miocene, as result of changing plate-tectonic forces along plate boundaries of Sundaland)

Nakaoka, S., Y. Suganuma & B. Ratanasthien (2003)- Tectonics and paleomagnetism northern Thai Tertiary basins sediments. In: B. Ratanasthien et al. (eds.) *Pacific Neogene paleoenvironments and their evolution*, 8th Int. Congress on Pacific Neogene Stratigraphy, Chiang Mai, 2003, p.

Nakapadungrat, S. & D. Maneenai (1993)- The Phuket, Phangnga and Takua Pa tin-field, Thailand. In: B.K. Tan et al. (eds.) *7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 359-368.

(Tin fields on W side of Peninsular Thailand have been produced since late 1500's. Main production from alluvial placer deposits, but also from primary deposits, i.e. Cretaceous (78-98 Ma) S-type granites of W Tin Province of SE Asia. Three types of deposits: (1) pegmatites with minor cassiterite, (2) argillic dissemination and (3) quartz- cassiterite- wolframite vein swarms)

Nakapadungrat, S. & P. Putthapiban (1992)- Granites and associated mineralization in Thailand. In: C. Piencharoen (ed.) *Proc. Nat. Conf. Geologic resources of Thailand: potential for future development*, Bangkok, Dept. Mineral Resources (DMR), p. 153-171.

(online at: <http://library.dmr.go.th/library/6192.pdf>)

(Rb-Sr whole rock ages indicate 4 periods of granite magmatism in Thailand: ~240 Ma (M Triassic), ~200-220 Ma (Late Triassic), ~130 Ma (E Cretaceous) and ~75-90 Ma (Late Cretaceous). Ar-Ar ages generally broader ranges. Three belts: E (I-type, Triassic), C (S type, mainly Triassic) and W Belt (mixed I and S, Cretaceous)

Naksri, W., Y. Nishioka, J. Duangkrayom, G. Metais, N. Handa, P. Jintasakul, J.E. Martin et al. (2023)- A new Miocene and Pleistocene continental locality from Nakhon Ratchasima in Northeastern Thailand and its importance for vertebrate biogeography. *Annales de Paleontologie* 109, 4, 102659, p. 1-20.

*(New vertebrate fossils assemblages Sin Charoen sandpit in NE Thailand. In this province, vertebrate fossils have been yielded from the Miocene to the Pleistocene deposits. Upper section of sandpit similar to M Pleistocene fauna of Khok Sung as well as Early-Middle Pleistocene faunas of Java (e.g., Trinil; with *Gavialis cf. bengawanicus* and *Duboisia santeng*). Associated with abraded tektite. Large fluvial turtles and gharials indicates that past river system more developed than today and Khorat Plateau was at lower elevation. Lower section with rhinocerotids and advanced *Stegolophodon*, similar to Late Miocene fauna found elsewhere)*

Naksri, W., H. Tong, K. Lauprasert, P. Jintasakul, V. Suteethorn, C. Vidthayanon & J. Claude (2019)- Plio-Pleistocene giant tortoises from Tha Chang sandpits, Nakhon Ratchasima Province, Thailand. *Annales de Paleontologie* 105, 4, p. 257-267.

(Giant tortoises have been found from Plio-Pleistocene sediments of Tha Chang sandpits, assigned to genus Megalochelys. Strong similarities with large tortoises from India, Flores and Timor, and close morphologically to Megalochelys atlas)

Naviset, S., C.K. Morley, D.H. Naghadeh & J. Ghosh (2017)- Sill emplacement during rifting and inversion from three-dimensional seismic and well data, Phitsanulok Basin, Thailand. *Geosphere* 13, 6, p. 2017-2040.

(online at: https://gsw.silverchair-cdn.com/gsw/Content_public/Journal/geosphere/13/6/...)

(Cenozoic Phitsanulok rift basin with igneous intrusions and lava flows. Age of youngest sills ~10 Ma. Older sills inferred of M Miocene age. Well E-A01 drilled E Miocene synrift Lan Krabu Fm with 300m thick olivine dolerite sill, but without high amplitude seismic responses usually seen in intrusions)

Nichols, G. & W. Uttamo (2005)- Sedimentation in a humid, interior, extensional basin: the Cenozoic Li Basin, northern Thailand. *J. Geological Society, London*, 162, p. 333-347.

(Mid-Cenozoic extension created ~40 basins in N Thailand, related to major strike-slip faults, during time of relatively humid climate. Li Basin continental facies basin fill, with economic coal deposits. Fluvial channel and muddy overbank facies during periods of high clastic input; peat swamp and lacustrine facies when clastic input was lower. Trend towards drier conditions through Late Oligocene -Miocene)

Nie, X., Q. Feng, C. Chonglakmani, D. Monjai, H. Gao, K. Faramee , S. Chang, Y. Yu & J. Ren (2025)- Closure timing of the Nan-Uttaradit oceanic basin, Thailand: stratigraphic and magmatic constraints in the Phrae Sub-basin. *International Geology Review* 67, 16, p.

(Study of Phrae Sub-basin near Nan-Uttaradit suture zone in N Thailand. M Triassic radiolarian bedded cherts at indicate terrigenous cherts deposited in deep-sea extensional basin. Late Triassic corals indicate shallow-sea depositional environment. Propose existence of Triassic post-collisional extensional basin in N Thailand. (Paleo-Tethys Nan-Uttaradit oceanic basin had likely by end of Permian)

Nie, X., Q. Feng, J. Zi, Z. Gan, I. Metcalfe, C. Chonglakmani, D. Monjai, T. Zhao, J. Ren et al. (2024)- Detrital zircon U-Pb and Hf analyses of Silurian-Devonian sediments in the Sukhothai Terrane, northern Thailand: Implications for the middle Paleozoic arc belt. *J. Geological Society, London* 181, 1, p.

(Sukhothai Terrane in N Thailand with continental basement and Permo-Triassic magmatic arc related to subduction of main Paleo-Tethys Ocean. Youngest detrital zircon ages (433-403 Ma) of Donchai Gp metasediments suggest age between 433 Ma and 368 Ma. Sediments sourced from both continental basement and Silurian- E Devonian magmatic arc on W margin of Sukhothai Terrane)

Nieuwland, D.A. (1987)- The geology of the Sirikit oil field. In: P. Thanasuthipitak (ed.) *Proc. Symposium on Cenozoic basins Thailand: Geology and resources*, Chiang Mai 1984, p. 1-20.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=8475&bid=7346>)

(Sirikit oil field 1981 Shell oil discovery in large, complex strike-slip structure in E-M Miocene fluvial-lacustrine Lan Krabu Fm sediments of Phitsanulok Basin. Estimated EUR 35 MBO)

Nishioka, Y., R. Hanta & P. Jintasakul (2013)- Note on giraffe remains from the Miocene of continental Southeast Asia. *J. Science Technology Mahasarakham University (MSU)* 33, 4, p. 365-377.

(online at: http://research.msu.ac.th/msu_journal/upload/articles/article441_98487.pdf)

(Bramatherium remains from (Late) Miocene deposits at Tha Chang sand pit, NE Thailand, and from Irrawaddy sediments, C Myanmar)

Nishioka, Y., H. Nakaya, K. Suzuki, B. Ratanasthien, P. Jintasakul, R. Hanta & Y. Kanimatsu (2016)- Two large rodents from the Middle Miocene of Chiang Muan, northern Thailand. *Historical Biology* 28, 1-2, p.

(Two large rodents from M Miocene (13.0- 12.4 Ma) from Chiang Muan Coal Mine, N Thailand (1) beaver (Anchitheriomys); (2) indeterminate larger rodent)

Noosri, R. (2020)- Petroleum exploration in the mature Phitsanulok Basin, Thailand: success and failure analysis, and characterization of source rocks and crude oils. M.Sc. Thesis Colorado School of Mines, Golden, Colorado, p. 1-180.

(online at: https://repository.mines.edu/bitstream/handle/11124/176288/NOOSRI_mines_0052N_12020.pdf?sequence=1)
(Study of area of Sirikit Oil Field, in Phitsanulok Late Oligocene- E Miocene half-graben rift basin, which and produced for almost 40 years, by Shell Oil Co. Oil sources in lacustrine and terrestrial facies)

Nualkhao, P., R. Takahashi, A. Imai & P. Charusiri (2018)- Petrochemistry of granitoids along the Loei Fold Belt, Northeastern Thailand. Resource Geology 68, 4, p. 1-30.

(Petrochemical characteristics of Permo-Triassic granitoids from five regions along 800km long Loei Fold Belt in NE Thailand. Most formed in continental volcanic arc setting. Magmatism of Muang Loei occurred in M Jurassic and in Nakon Sawan- Lobburi in Late Triassic. Mineralizations along LFB in volcanic arc related to subduction of Paleo-Tethys)

Nulay, P. & R. Arjwech (2021)- A review of the lithostratigraphy of the Early Cretaceous Sao Khua Formation, Khorat Group in Northeastern Thailand. Open Journal of Geology.11, 9, p. 381-395.

(online at: <https://www.scirp.org/journal/paperinformation.aspx?paperid=111752>)

Nulay, P., C. Chonglakmani (2018)- Facies characteristics of the Late Cretaceous- Paleogene Phu Khat Formation in the Nakhon Thai region: Implication for environment of deposition. The 3th Thai-Lao Technical Conference on Geology and Mineral Resources, Bangkok 2015, p. 135-150.

(online at: www.researchgate.net/publication/327106441_Facies_characteristics_of_the_Late_Cretaceous)
(Late Cretaceous- E Paleogene in N Thailand ~500m thick non-marine series)

Nulay, P., C. Chonglakmani & Q. Feng (2015)- The provenances of the clastic Phu Khat Formation in the Nakhon Thai region constrained by the U-Pb detrital zircon age dating: Implications for geotectonics evolution. J. Geological Society Thailand 1, p. 37-45.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=S&mmid=18653&bid=37775>)
(see also Nulay (2016) paper below)

Nulay, P., C. Chonglakmani & Q. Feng (2016)- Petrography, geochemistry and U-Pb detrital zircon dating of the clastic Phu Khat Formation in the Nakhon Thai region, Thailand: implications for provenance and geotectonic setting. J. of Earth Science (China) 27, 3, p. 329-349.

(online at: <http://en.earth-science.net/PDF/20160612012417.pdf>)

(Late Cretaceous- E Tertiary Phu Khat Fm in Nakhon Thai region (between Nan-Uttaradit Suture/ Sukhothai Zone to W and Loei-Phetchabun Foldbelt/ Indochina Block to E) overlies Khorat Fm redbeds. Sandstone unsorted texture and common unstable volcanic lithic fragments (recycled sediments and felsic volcanic rocks from M-L Triassic arc to W). Unconformably overlies mature sandstone of Late Cretaceous Khao Ya Puk Fm (mainly recycled sediments))

Nulay, P., C. Chonglakmani & W. Paengkaew (2014)- Lithostratigraphy of the Phu Khat Formation in Nakhon Thai Region, Thailand: preliminary result. Dept. Mineral Resources (DMR), Annual Meeting 2014, Bangkok, p. 1-19.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2557/8590.pdf)

(Phu Khat Fm is uppermost (Cretaceous) red bed in Nakhon Thai region. Alluvial fan and braided fluvial deposits overlies unconformably aeolian sandstone of Khao Ya Puk Fm. Thickness ~490m. Age not older than Campanian age and not younger than Ypresian)

Nulay, P. & P. Intharajak (2019)- Lithostratigraphy of the Late Cretaceous Khao Ya Puk Formation in Nakhon Thai Region, Thailand: implication for depositional environment. Open Journal of Geology, 9, p. 711-713.

(online at: www.researchgate.net/publication/336019369_Lithostratigraphy_of_the_Late_Cretaceous_K_Etc.)

(Khao Ya Puk Fm in Nakhon Thai Region, Khorat Plateau, >400 m thick. It overlies top of anhydrite layer of upper rock salt Maha Sarakham Fm and is overlain unconformably by Phu Khat Formation. Interpreted as freshwater lake deposit in arid climate in Late Cretaceous)

Nutalaya, P., K.V. Campbell, A.S. MacDonald, P. Aranyakanon & P. Suthakorn (1979)- Review of the geology of Thai tin fields. In: C.H. Yeap (ed.) Proc. Int. Symposium Geology of tin deposits, Kuala Lumpur 1978, Bull. Geological Society Malaysia 11, p. 137-159.

(online at: www.gsm.org.my/products/702001-101228-PDF.pdf)

(Tin belt of SE Asia extends for 2900km from Myanmar through Thailand, Malaysia to Indonesian tin islands; 1800km portion of belt lies in Thailand. Tin occurrences spatially associated with granites. Main plutonic episode in Thailand Late Permian- Jurassic, with apparent peak in Upper Triassic. Ten main tin districts)

Nutalaya, P. & J.L. Rau (1987)- Structural framework of the Chao Phraya Basin, Thailand. In: P. Thanasuthipitak (ed.) Proc. Symposium Cenozoic basins Thailand: geology and resources, Chiang Mai 1984, p. 106-129.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1984/7351.pdf)

(Chao Phraya Cenozoic basin with basement-and-range like basement relief of ~2000m, resulting from mostly normal and some strike slip faulting)

Okuzawa, K., K. Hisada, H. Hara, P. Charusiri & S. Arai (2009)- Basaltic sandstone from the Loei Suture, Northeast Thailand. J. Geological Society Thailand 1, p. 1-10.

(online at: <http://library.dmr.go.th/library/J-Index/2009/2972.pdf>)

(Block of basaltic sandstone in outcrop of serpentized and sheared dunite within Devonian metamorphic rocks along Loei suture between Indochina and Nakhon Thai continental blocks in NE Thailand. Probably emplaced in or before E Permian)

O'Leary, H. & G.S. Hill (1989)- Tertiary basin development in the Southern Central Plains, Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Int. Symposium on Intermontane basins: geology and resources, Chiang Mai, p. 254-264.

Orberger, B., G. Friedrich & P. Suchit (1989)- Platinum-group-element distribution in ultramafic, chromite, magnetite, and pyrrhotite, Nan-Uttaradit ultramafic belt, Northern Thailand: preliminary results. In: T. Thanasuthipitak & P. Ounchanum (eds.) Int. Symposium on Intermontane basins: geology and resources, Chiang Mai, p. 483-492.

Orberger, B., J. Girardeau, J.C.C. Mercier, J.P. Lorand & S. Pitragool (1993)- Ophiolitic chromitite from Nan-Uttaradit, Northern Thailand: a result of boninitic-type melt and peridotite interaction. In: A. Fenoll Hach-Ali et al. (eds.) Current research in geology applied to ore deposits, University of Granada, p. 197-201.

Orberger, B., J.P. Lorand, J. Girardeau, J.C.C. Mercier & S. Pitragool (1995)- Petrogenesis of ultramafic rocks and associated chromitites in the Nan Uttaradit ophiolite, Northern Thailand. Lithos 35, p. 153-182.

(NE-SW trending Nan Uttaradit ophiolite belt 150km long, 10km wide. Ophiolitic rocks as tectonic slices within sediments: Carboniferous-Triassic in W, Siluro-Devonian in SE, Jurassic in E and NE. Geochemistry of volcanics suggests formation above subduction zone)

Osterle, J.E., U. Klotzli, Daniel F. Stockli, M. Palzer-Khomenko & P. Kanjanapayont (2019)- New age constraints on the Lan Sang gneiss complex, Thailand, and the timing of activity of the Mae Ping shear zone from in-situ and depth-profile zircon and monazite U-Th-Pb geochronology. J. Asian Earth Sciences 181, 103886, p. 1-21.

(Mae Ping shear zone one of four major strike-slip systems in Thailand. In NW Thailand, MPSZ exposes a ~5-km-wide core of intensely deformed high-grade metamorphic and minor undeformed magmatic rocks ('Lan Sang gneiss complex'). Zircon and monazite ages suggest granitic protolith of augen gneiss intruded metasedimentary basement of Sibumasu as early as ~235–220 Ma (Late Triassic). Zircon rim and monazite U- ages suggest

metamorphic recrystallization and overgrowth in Late Triassic-E Jurassic, E Cretaceous and Eocene (~45-35 Ma), contemporaneous with ductile deformation along MPSZ)

Owen, R.B. & C. Utha-Aroon (1999)- Diatomaceous sedimentation in the Tertiary Lampang Basin, Northern Thailand. *J. Paleolimnology* 22, 1, p. 81-95.

(Pliocene diatomite and diatomaceous clay in Pliocene Ko Kha Fm of Lampang Basin, N Thailand. Lacustrine deposits with freshwater diatom floras dominated by Aulacoseira granulata and other Aulacoseira spp. Pennate species present, but infrequent.)

Pagocho, F.V. (2014)- An isotopic and sedimentological study of deepwater carbonates Lobburi, Central Thailand. *Bull. Earth Sciences Thailand (BEST)* 7, p. 47-57.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246633/167658>)

(Sedimentological and geochemical isotope analysis of uplifted Permian basinal and platform margin limestones of Saraburi Gp in Lopburi-Pak Chong outcrop, C Thailand. With fusulinid limestone photomicrographs)

Palin, R.M., M.P. Searle, C.K. Morley, P. Charusiri, M.S.A. Horstwood & N.M.W. Roberts (2013)- Timing of metamorphism of the Lansang gneiss and implications for left-lateral motion along the Mae Ping (Wang Chao) strike-slip fault, Thailand. *J. Asian Earth Sciences*, 76, p. 120-136.

(Mae Ping fault in W Thailand, mainly left-lateral strike-slip motion. Previous studies suggested fault assisted extrusion of Sundaland in Late Eocene- E Oligocene, with offset of 120-150 km from displaced high-grade gneisses-granites of Chiang Mai-Lincang belt. Monazite from orthogneiss suggests two episodes of crystallization, core of ~123-114 Ma and rim of ~45-37 Ma, suggesting magmatic protolith emplacement for Lansang orthogneiss in E Cretaceous, with later metamorphism in Eocene)

Panjasawatwong, Y., S. Chantaramee, P. Limtrakun & K. Pirarai (1997)- Geochemistry and tectonic setting of eruption of Central Loei Volcanics in the Pak Chom Area, Loei, Northeast Thailand. In: P. Dheeradilok et al. (eds.) *Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok 1997, Dept. Mineral Resources, 1, p. 287-302.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7639.pdf)

(At least four pre-Jurassic volcanic belts in Thailand. Late Devonian C Loei volcanics part of Loei- Petchabun-Phai Sali volcanic belt, representing mid-ocean ridge basalts (MORB) and oceanic island arc lavas)

Panjasawatwong, Y., B. Phajuy & S. Hada (2003)- Tectonic setting of the Permo-Triassic Chiang Khong volcanic rocks, Northern Thailand based on petrochemical characteristics. *Gondwana Research* 6, 4, p. 743-755.

(Inferred Permo-Triassic Chiang Khong volcanic belt felsic to mafic volcanic rocks and pyroclastic equivalents. Mafic volcanic rocks interpreted to have formed in continental volcanic arc)

Panjasawatwong, Y. & W. Yaowanoyothin (1983)- Igneous rocks of Thailand: a review of plutonic rocks with intermediate-ultrabasic compositions and volcanic rocks. In: P. Nutalaya (ed.) *Proc. Workshop Stratigraphic correlation of Thailand and Malaysia*, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 233-243.

(online at: https://gsm publ.files.wordpress.com/2014/10/sctm_13.pdf)

Panjasawatwong, Y. & W. Yaowanoyothin (1993)- Petrochemical study of post-Triassic basalts from the Nan Suture, northern Thailand. *J. Southeast Asian Earth Sciences* 8, p. 147-158.

(Nan Suture metagabbros/ amphibolites and serpentinite melange represent Late Triassic collision suture between Shan-Thai and Indo-China cratons. With Carboniferous- Permo-Triassic ocean-island basalts, backarc basin and island-arc basalts and andesites, etc. Post-collisional, possibly Cenozoic, continental intraplate basalts form discontinuous narrow belt, disconformably above melange)

Panjasawatwong, Y., K. Zaw, S. Chantaramee, P. Limtrakun & K. Pirarai (2006)- Geochemistry and tectonic setting of the Central Loei volcanic rocks, Pak Chom area, Loei, northeastern Thailand. *J. Asian Earth Sciences* 26, p. 77-90.

(C Loei basalts and microgabbro are Late Devonian-E Carboniferous MOR Basalts and oceanic island-arc lavas, erupted on oceanic basement in same ocean basin as Chiang Rai- Chiang Mai volcanic belt)

Panthong, A. (2021)- Facies distribution and diagenetic evolution of a carbonate reservoir in Pha Nok Khao Formation, Sinphuhorm, Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 204-214.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246675/167677>)
(*Sinphuhorm field 1983 gas discovery on Khorat Plateau, NE Thailand (Indochina Block). Rapid lateral changes in reservoir quality of Permian carbonates of Pha Nok Khao Fm. Permian carbonate on high structure below Triassic 'Indosinian' unconformity*))

Patience, R.L., S.L. Rodrigues, A.L. Mann & I.J.F. Poplett (1993)- An integrated organic geochemical and palynofacies evolution of a series of lacustrine sediments from Thailand. Proc. 5th ASEAN Council ASCOPE 93 Conference, Bangkok, p. 75-84.

Perez-Huerta, A., C. Chonglakmani & A. Chitnarinc (2007)- Permian brachiopods from new localities in northeast Thailand: implications for paleobiogeographic analysis. J. Asian Earth Sciences 30, p. 504-517.
(online at: https://www.researchgate.net/publication/221942302_Permian_brachiopods_from_new_localities_in_northeast_Thailand_Implications_for_paleobiogeographic_analysis)
(*Small E-M Permian brachiopod faunas from Khao Khwang limestone, Nam Duk Basin and Khao Khwang Platform confirm Cathaysian affinities for brachiopods and fusulinids in NE Thailand. Fossils in Nam Duk Fm molasse facies, also show possible Gondwanan relationships with brachiopod taxa described in Australia*)

Petersen, H.I., A. Foopattanakamol & B. Ratanasthien (2006)- Petroleum potential, thermal maturity and the oil window of oil shales and coals in Cenozoic rift-basins, central and northern Thailand. J. Petroleum Geology 29, 4, p. 337-360.
(*C and N Thailand Oligocene- E Miocene rift basins with oil shales deposited in fresh-brackish lakes, with TOC up to 44%. With abundant lamalginite and algal-derived amorphous organic matter, liptodetrinite and telalginite (Botryococcus-type). Coals dominated by huminite and formed in freshwater mires. Exposed coals thermally immature. Steep Vitrinite Reflectance curves from oil basins reflect high geothermal gradients of ~62°C/km and ~92°C/km. Depth to top oil window for oil shales (VR ~0.70%) between ~1100-1800m depending on gradient. Kerogen composition and high T gradients result in narrow oil windows*)

Petersen, H.I. & A. Mathiesen (2007)- Determination of the temperature history for the U Thong oilfield area (Suphan Buri Basin, Central Thailand) using a realistic surface temperature. J. Petroleum Geology 30, 3, p. 289-296.
(*BP1-W2 well in oil-producing Suphan Buri Basin with likely geothermal gradient of ~42°C/km. Predicts that onset of oil generation at 107°C post-dated reservoir and trap formation in M-L Miocene times*)

Petersen, H.I., H.P. Nytoft, B. Ratanasthien & A. Foopattanakamol (2007)- Oils from Cenozoic rift-basins in central and northern Thailand: source and thermal maturity. J. Petroleum Geology 30, 1, p. 59-78.
(*Oil produced from Suphan Buri (U Thong, Sang Kajai fields), Phitsanulok (Sirikit field) and Fang Basin (Fang field) in C and N Thailand. Most Cenozoic rift-basins 2-4 km deep, but Phitsanulok Basin deepest, with up to 8km basin-fill. Sirikit oil most mature. Oils highly waxy, generated from freshwater lacustrine source rocks with common algal material. Presence of cadalene, tetracyclic C24 compounds, oleanane, lupane, bicadinane, etc., indicate contributions from higher land plants, either disseminated in lacustrine facies or from associated coal seams. Thermally immature oil shales (lacustrine mudstones) and coals exposed in many Thai basins*)

Petersen, H.I. & B. Ratanasthien (2011)- Coal facies in a Cenozoic paralic lignite bed, Krabi Basin, southern Thailand: changing peat-forming conditions related to relative sea-level controlled watertable variations. Int. J. Coal Geology 87, p. 2-12.
(*Cenozoic Krabi Basin in S part of Peninsular Thailand contains about 112 MTons proven coal reserves. Production from Bang Mark mine in S part of basin, where main lignite bed is 7-20m thick. Lignite low rank and dominated by huminite, indicating generally oxygen-deficient conditions in precursor mire. Lower part of*

lignite bed topogenous fresh water peat mire, subjected to periodic inundations and deposition of siliciclastics. Upper part of lignite bed represents slightly domed fresh water ombrogenous peat mire)

Pfeffer, K.H. (2013)- *Thailands vielfältige Landschaften: Geologie und Relief, Klima, Vegetation und Nutzung*. Borntraeger, Stuttgart. 194 p.

(‘Thailands varied landscapes: geology, climate, vegetation and uses’)

Phajuy, B., Y. Panjasawatwong & P. Osataporn (2005)- Preliminary geochemical study of volcanic rocks in the Pang Mayao area, Phrao, Chiang Mai, northern Thailand: tectonic setting of formation. *J. Asian Earth Sciences* 24, p. 765-776.

(Permian mafic volcanic rocks from Pang Mayao, Chiang Rai- Chiang Mai volcanic belt, are mid-ocean ridge and ocean-island basalts, possibly remnants of consumed Paleotethys Ocean)

Philippe, M., N. Boonchai, D.K. Ferguson, Hui Jia & W. Songtham (2013)- Giant trees from the Middle Pleistocene of Northern Thailand. *Quaternary Science Reviews* 65, 1, p. 1-4.

(Giant silicified trees in M Pleistocene gravel terraces of Ping River, 20 km N of Tak, N Thailand, with longest log 72.2m. Most trees belong to Koompassioxylon elegans. Part of >100m tall tropical- subtropical rainforest Lannathai pebble tools (presumably from Homo erectus) from coeval beds in same area. Overlying basalts K/Ar dated at 0.6± 0.2 and 0.8 ±0.2 Ma)

Phromsuwan, W., Y. Kamata, T. Charoentitirat, K. Ueno & A. Sardud (2025)- Permian radiolarian cherts and their geochemical characteristics in the Central Plain of Thailand: Implications for the geological affiliation and origin of the Permian chert. *Thai Geoscience J.* 6, 10, p. 26-50.

(Permian chert successions in C Thailand, interpreted as part of Sukhothai Zone (island arc formed by subduction of Paleo-Tethys Ocean under Indochina Block). Radiolaria suggest four E and M Permian chert sections. Believed to represent deposition in back-arc basin setting rather than vast Paleo-Tethys Ocean. Correlable with back-arc basin cherts from Sa Kaeo suture zone)

Pia, J. von (1930)- Upper Triassic fossils from the Burmo-Siamese frontier. A new dasycladacea, *Holosporella siamensis* nov. gen., nov. spec., with a description of the allied genus *Aciculella* Pia. *Records Geological Survey India* 63, p. 177-181.

Pinyo, K. (2010)- Petroleum system of the Chum Saeng Formation, Phitsanulok Basin, Thailand. M.Sc.Thesis, Colorado School of Mines, p. 1-123.

(online at: <http://digitool.library.colostate.edu/>.)

(Chum Saeng Fm of Phitsanulok Basin, C Thailand, E Miocene organic-rich lacustrine shale, 50-400m thick)

Pinyo, K. (2011)- Unconventional petroleum system evaluation of the Chum Saeng Formation, Phitsanulok Basin, Thailand. *Proc. Int. Conf. Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011)*, Khon Kaen, p. 267-280.

Pitakpaivan, K. (1959)- Preliminary study of fusulinid foraminifera from the Permo-Carboniferous of Thailand. Ph.D. Thesis, University of Cambridge, p. 1-188.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1959/4495.pdf)

Pitakpaivan, K. (1965)- Fusulines of the Rat Buri limestone of Thailand. *Memoirs Faculty of Science, Kyushu University, D (Geology)*, 17, 1, p. 3-69.

(Permian Rat Buri Limestone widespread across Thailand. With 25 species, 11 genera of fusulinid foraminifera, ranging in age from Sakmarian (Pseudoschwagerina assemblage) to Artinskian (Schwagerina and Neofusulinella) to Kungurian (Parafusulina) to Kazanian (Neoschwagerina). In many places Rat Buri Lst unconformably over intensely folded clastic series)

Pitakpaivan, K. (1965)- Occurrences of Triassic formation at Mae Moh. *Reports Investigations Dept. Mineral Resources (DMR)*, Bangkok, 1965-1, p. 47-57.

Pitakpaivan, K. (1966)- Fusulines of the Rat Buri limestone of Thailand. Bangkok (Thailand). In: T. Kobayasi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 63-129.
(Same paper as Pitakpaivan (1965) above)

Pitakpaivan, K. (1969)- Tin-bearing granite and tin-barren granite in Thailand. Proc. Second Technical Conference on Tin, 1, Tin Council, Bangkok, p. 284-298.

Pitakpaivan, K. & R. Ingavat (1980)- *Lepidolina multiseptata* Deprat in Thailand. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 37-42.
(First record of Permian fusulinid *Lepidolina multiseptata* from M or U Permian limestone blocks of border region between E Thailand- Cambodia (= part of E Malaya/ Indochina province). Associated with 11 other genera, incl. *Yabeina*, *Neoschwagerina*, *Verbeekina*, *Chusenella*, etc.)

Pitakpaivan, K., R. Ingavat & P. Pariwatvorn (1969)- Fossils of Thailand. vol. 1. Dept. Mineral Resources Thailand, Bangkok, Geol. Survey Memoir 3, 1, p. 1-67.
(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1969/4814.1_1.pdf)
(Listings of fossils known from Thailand: Cambrian trilobite-brachiopod shale off W Peninsular Thailand, Ordovician cephalopod limestone, Silurian Tentaculites and graptolite shale, no known Devonian fossils, Carboniferous- Permian (numerous localities with fusulinid limestones), Triassic, Jurassic- Cretaceous (rel. rare marine fossils), Tertiary (in isolated intermontane basins only). With descriptions and illustrations of Permian fusulinids and corals)

Pitakpaivan, K., R. Ingavat & P. Pariwatvorn (1969)- Fossils of Thailand, vol. 2. Dept. Mineral Resources Thailand, Bangkok, Geol. Survey Memoir 3, 2, p. 1-65.
(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1969/4814.1_2.pdf)
(Continuation 1 of fossils known from Thailand: descriptions and illustrations of brachiopods (incl. Permian *Leptodus tenuis*) and molluscs (*Daonella sumatrensis*, *Halobia*, etc.), incl. ammonoids of Permian (*Agathiceras*), Late Triassic-E Jurassic *Clathropteris*)

Pitakpaivan, K., R. Ingavat & P. Pariwatvorn (1969)- Fossils of Thailand, vol. 3. Dept. Mineral Resources Thailand, Bangkok, Geol. Survey Memoir 3, 3, p. 1-41.
(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1969/4814.1_3.pdf)
(Continuation 2 of fossils known from Thailand: descriptions and illustrations of Cambrian trilobites (*Pagodia*, *Thailandium*), Carboniferous trilobites (*Thaiaspis*, *Phillipsia*, *Proetus*), Ordovician-Silurian graptolites, Pliocene- Pleistocene vertebrates (*Stegolophodon*). Also plant fossils: Permian 'Cathaysian' *Pecopteris*, *Alethopteris*, *Sphenophyllum*, *Cordaitea* and *Taeniopteris* spp., Late Triassic-E Jurassic *Clathropteris*, Cretaceous *Araucarioxylon* from Khorat series, U Cretaceous- Paleogene *Sequoia*, *Taxodium*, etc.)

Pitfield, P.E.J. (1988)- South-East Asia Granite Project. Report on the geochemistry of the granites of Thailand. British Geological Survey, Overseas Geology Technical Report WC/88/6, p. 1-217. (Unpublished)
(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19793729.pdf>)
(Four N-S trending granite province across Thailand: Eastern (I-type), Main Range (S-type), N Thailand (S-type) and Western (Cretaceous S+I types of Peninsular Thailand-Burma))

Pitsanupong, K., U. Klotzli, P. Charusiri & E. Klotzli (2011)- LA-MC-ICP-MS U-Pb zircon geochronology of the Lan Sang and Nong Yai gneisses, Thailand. Proc. Int. Conf. Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011), Khon Kaen, p. 62-65.
(Gneisses of different U-Pb zircon ages in two different NW-SE sinistral strike slip faults: (1) Lan Sang gneiss (Mae Ping fault zone; associated with Shan-Thai - Indochina microcontinent collision?) in N Thailand with Triassic metamorphism and (2) Nong Yai Gneiss (Klaeng fault zone) in E Thailand in Cretaceous)

- Piyasin, S. (1971)- Marine Triassic sediments of Northern Thailand. Geological Society Thailand, Newsletter 4, p. 12-30.
- Piyasin, S. (1973)- Review of the Lampang group. Proc. Conf. Geology and mineral deposits of Thailand, 1, p. 101-107.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1975/7339.pdf)
(Marine lower-upper Triassic rocks of W Thailand united in Lampang Gp. Incl. M Triassic limestone, deeper marine deposits with *Daonella*, etc.)
- Piyasin, S. (1980)- Tentative correlation of the Lower Paleozoic stratigraphy of western part of southern Shan State, Burma, and Northwestern through Peninsular of Thailand. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 19-24.
(Lower Paleozoic sedimentary succession of all of W Thailand (= Sibumasu Block; JTVG) extends N-ward to Shan State of Burma. Upper Cambrian sediments with trilobites unconformable of Precambrian metamorphics. Ordovician rocks mainly limestones, with common straight nautiloids *Armenoceras* and *Ormoceras*. Basin subsidence in Silurian and Devonian, with graptolite shales (*Monograptus*, *Climacograptus*), thin limestones, bedded chert)
- Piyasin, S. (1981)- Reef limestone of Lower Permian at Ban Na Charoen, Northeastern Thailand. J. Geological Society Thailand 4, p. 13-22.
(online at: <http://library.dmr.go.th/library/J-Index/1981/64.pdf>)
- Piyasin, S. (1995)- The hydrocarbon potential of Khorat Plateau. Proc. Int. Conf. Geology Geotechnology and Mineral Resources of Indochina p. 551-562.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1995/7460.pdf)
- Polachan, S., W. Chantong, P. Srisuwon, P. Kaewkor & C. Praipiban (2010)- Petroleum potential of the Khorat Plateau, Thailand. Proc. Thai-Lao Technical Conf. Geology and mineral resources, Bangkok, p. 42-63.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2010/25973.pdf)
(Petroleum exploration of Khorat Plateau since 1962. 41 wells drilled, only two are gas discoveries, in Permian carbonate reservoirs (Nam Phong and Sin Phu Hom fields; Esso 1981,1982). Source rocks mainly Late Carboniferous rocks)
- Polachan, S., S. Praditjan, C. Tongtaow, S. Janmaha, K. Intarawijitr & C. Sangsuwan (1991)- Development of Cenozoic basins in Thailand. Marine and Petroleum Geology 8, p. 84-97.
(>60 Cenozoic onshore and offshore basins in Thailand, mainly N-S trending half grabens, initiated in Late Oligocene. N-S trending extensional faults, related to NW-SE dextral and NE-SW conjugate sinistral strike-slip faults, active since Oligocene and tied to CW rotation of SE Asia after India with S Asia collision. Four main basins (Mergui, Pattani, Malay, Phitsanulok), with up to 8 km of sediments. Mainly continental facies, except in Mergui Basin in Andaman Sea, where fill is mainly marine. Widespread perennial lake conditions onshore and in Western Graben Area of Gulf of Thailand. Change in tectonic and climatic conditions in M-L Miocene, resulting in cessation of lake conditions and development of regional unconformity)
- Polachan, S. & N. Sattayarak (1989)- Strike-slip tectonics and the development of Tertiary basins in Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Int. Symposium on intermontane basins, geology and resources, Chiang Mai, p. 243-253.
- Pollard, P.J., S. Nakapadungrat & R.G. Taylor (1995)- The Phuket Supersuite Southwest Thailand fractionated I-type granites associated with tin-tantalum mineralization. Economic Geology 90, 3, p. 586-602.
(Granites in Phuket-Ranong region of SW Thailand, some with extensive tin (-tantalum) mineralization, form part of Phuket Supersuite. Half of world tin production and significant part of tantalum production from mineralization related to granites which may have been derived from fractionation of I-type magmas)

Pongsapich, W., P. Charusiri & S. Vedchakanchana (1983)- Reviews of metamorphic rocks of Thailand. In: P. Notalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 244-252.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_14.pdf)

Pongsapich, W. & C. Mahawat (1977)- Some aspects of Tak Granites, northern Thailand. Geological Society Malaysia. Bull. Geological Society Malaysia 9, p. 175-186.
(online at: www.gsm.org.my/products/702001-101292-PDF.pdf)
(*N-S trending Tak Batholith near Changwat Tak in NW Thailand >4000 km², with 4 granitoid types. Minimum emplacement age Triassic.*)

Pongsapich, W., V. Pisutha-Arnond & P. Charusiri (1983)- Review of felsic plutonic rocks of Thailand. In: P. Notalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 213-232.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_12.pdf)
(*Granitic rocks in Thailand in three main parallel belts: Eastern (Triassic), Central (Triassic), and Western (Cretaceous)*)

Pongsapich, W., S. Vedchakanchana & P. Pongprayoon (1980)- Petrology of the Praburi-Hin Metamorphic Complex and geochemistry of gneisses in it. Bull. Geological Society Malaysia 12, p. 55-74.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1980005.pdf>)

Pongwapee, S., C. Morley & K. Won-in & (2019)- Impact of pre-existing fabrics and multi-phase oblique extension on Cenozoic fault patterns, Wichianburi sub-basin of the Phetchabun rift, Thailand. J. Structural Geology 118, p. 340-361.
(*Cenozoic fault patterns associated with rift development in Wichianburi subbasin wide range of controls, including influence by margin of a Permian basin, and NW-SE to NE-SW trending Triassic folds and faults. Regional change from E-W to NW-SE extension in M Miocene*)

Pongwapee, S., K. Won-in & C. Morley (2020)- Synrift magmatism in a Cenozoic rift basin, from 3D seismic data, Wichianburi Sub-basin, Phetchabun Basin, Thailand: part 1. Distribution and timing of intrusions and forced folds. J. Geological Society, London, 177, 1, p. 189-210.
(*Late Oligocene–Pliocene Wichianburi sub-basin of Phetchabun Rift three phases of development: Late Oligocene- E Miocene (~16 Ma), E-W extension on NNW–SSE- to N-S-striking faults; 16-3 Ma NE extension and 3 Ma- Present post-rift subsidence. Intrusive and extrusive igneous activity from 24-2 Ma. Oldest igneous activity (24-13 Ma) SW of Wichianburi Sub-basin, younging to N (11-9 Ma). Many domal folds related to magma emplacement, not tectonic inversion. Fold formation at ~16-15 and 12-11 Ma. Greatest intrusive activity and folding between 16 and 11 Ma. 16Ma date coincides with switch from E-W to NW-SE extension*)

Pongwapee, S., K. Won-in & C. Morley (2020)- Synrift magmatism in a Cenozoic rift basin from 3D seismic data, Wichianburi Sub-basin, Petchabun Basin, Thailand: part 2. How rift structure and stratigraphy modify intrusion. J. Geological Society, London, 177, 1, p. 211-230.

Praditjan, S. (1989)- Characteristics and controls of lacustrine deposits of some Tertiary basins in Thailand. In: T. Thanasuthipitak & P. Ounchanum (eds.) Int. Symposium on Intermontane basins: geology and resources, Chiang Mai 1989, p. 133-145.
(*Petrography and geochemistry of high-grade metamorphic gneiss complexes of NE Peninsular Thailand: Some of sedimentary, some of igneous origin*)

Praditjan, S. (1995)- Petroleum exploration in Northeastern Thailand: the revealed results and its potential. Proc. Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (Geo-Indo '95), Khon Kaen University 1995, p. 589-599.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1995/7463.pdf)

Praditnan, S., S. Jaroonsitha & Y. Gonedome (1999)- Petroleum systems of the petroliferous basins in Thailand. Proc. Symposium Mineral, Energy and Water resources of Thailand: towards the year 2000, Bangkok 1999, p. 557-563

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1999/6769.pdf)

(Tertiary basins of Thailand two major source systems: (1) Oligocene- E Miocene synrift lacustrine source (Phitsanulok, Fang, Suphan Buri, Songkhla and other small oil-bearing basins); (2) M Miocene fluvial gas-prone system (Pattani, North Malay). In depocenters of large Pattani and North Malay Basins of main generation in E Miocene, predating Miocene structural closures)

Prakash, U. (1979)- Fossil dicotyledonous woods from the Tertiary of Thailand. The Palaeobotanist 26, 1-3, p. 50-62.

(online at: <https://www.jpsonline.co.in/index.php/jop/article/view/1048/1035>)

(Fossil woods of *Pahudioxylon*, *Cynometroxylon*, *Millettioxylon*, *Anogeisoxylon* and *Dryoxylon siamensis* from NE Thailand. Exact age unknown, most likely Upper Tertiary)

Punpate, N., S. Pailoplee, I. Takshima & P. Charusiri (2005)- Ages of layered tektites and tektite-bearing sediments in Buntharik Area, Ubonratchathani, Northeast Thailand. Proc. International Conference Geology Geotechnology and Mineral Resources of Indochina (Geo-Indo), Khon Kaen, p. 517-523.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2005/9369.pdf)

(Layered tektites from 0.7-1m thick pebble bed in Unit 4 of alluvial deposits in E-most Khorat Plateau. Size 1-5 cm, with average thermoluminescence age of ~850 ka. Younger ages of surrounding sediments suggests probable reworking of tektites)

Punya, P., P. Charusiri & P. Putthapiban (2007)- Tectonic evolution of the Kampaengsaen Basin, Nakorn Pathom, Central Thailand from PTTEP seismic data. In: W. Tantiwanit (ed.) International Conference on Geology of Thailand: towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 331-337.

(Kampaengsaen basin onshore Tertiary sedimentary basins in C Thailand, ~70 km NW of Bangkok. With minor oil production since 1991. Half-graben with N-S trending bounding faults)

Putthapiban, P. (1984)- Geochemistry, geochronology and tin mineralization of Phuket granites, Phuket, Thailand. Ph.D. Thesis La Trobe University, Melbourne, Victoria, p. 1-435.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1984/4609.pdf)

Putthapiban, P. (1992)- The Cretaceous- Tertiary granite magmatism in the West coast of Peninsular Thailand and the Mergui Archipelago of Myanmar/ Burma. In: C. Piancharoen (ed.) Proc. Nat. Conf. on Geologic resources of Thailand: potential for future development, Bangkok, p. 75-88.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6182.pdf)

(Cretaceous granites along W coast of Peninsular Thailand and along Myanmar- Thai border. Rb/Sr and K-Ar ages vary from ~72- 51 Ma, fission track ages ~55, 43 Ma, possibly reflecting slow cooling after emplacement)

Putthapiban, P. (2002)- Geology and geochronology of the igneous rocks of Thailand. In: N. Mantajit (ed.) Proc. Symposium on the Geology of Thailand, Bangkok 2002, Dept. Mineral Resources, Bangkok, p. 261-283.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6404.pdf)

(Thai granites in 3 major belts, tending to W from Triassic to Late Cretaceous: (1) Eastern Belt (Triassic, I-type/magnetite series; rel. common gold), (2) Central Belt (Triassic, S-type, ilmenite series; with tin-tungsten) and (3) Western belt (Cretaceous; mainly S-, minor I-type; with tin-tungsten, REE minerals). Ultramafic suites (E Permian+) in 3 discontinuous strips, representing Paleo-Tethys suture, from N to S: (1) Pha Som (Nan-Uttaradit), (2) Sra Kaeo and (3) Narathiwat. Volcanic rocks, etc.)

Putthapiban, P. & C.M. Gray (1983)- Age and tin-tungsten mineralization of the Phuket granites, Thailand. Proc. Conference on Geology and Mineral resources of Thailand, Bangkok, p. 30-39.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1983/10576.pdf)

(Four different granite suites at Phuket, W side of Peninsular Thailand. Rb/Sr ages ~83-94 Ma (Late Cretaceous). Age of tin-tungsten mineralization rel. late, ~84 Ma)

Qian, X., Q.L. Feng, C. Chonglakmai & D. Monjai (2013)- Geochemical and geochronological constraints on the Chiang Khong volcanic rocks (northwestern Thailand) and its tectonic implications. *Frontiers of Earth Science* 7, p. 508-521.

(M Triassic volcanic rocks in Chiang Khong area at NW Thailand- Laos border genetically linked to tectonic evolution of Paleo-Tethyan Ocean. Mainly of andesitic to rhyolitic rocks. Andesitic samples of Doi Yao volcanic zone with zircon U-Pb ages of ~241 Ma and of arc volcanic affinity. Rhyolitic sample ~239 Ma and transitional arc-syn collisional chemistry. Most samples comparable to Lampang area in N Thailand and Jinghong area of SW Yunnan, indicating Chiang Rai arc-volcanic zone might link to Lancangjiang volcanic zone, SW China)

Qian, X., Q. Feng, Y. Wang, T. Zhao, J.W. Zi, M. Udchachon & Y. Wang (2017)- Late Triassic post-collisional granites related to Paleotethyan evolution in SE Thailand: geochronological and geochemical constraints. *Lithos* 286-287, p. 440-453.

(Chonburi, Rayong-Bang Lamung and Chanthaburi granite plutons in SE Thailand similar crystallization ages of 222-218 Ma (Norian, Late Triassic). Geochemically classified into S-type (Group 1; mainly from ancient greywackes) and I-type (Group 2; from juvenile mafic crust with input of meta-sediments) granites. Formed in post-collisional thickened crust after assemblage of Indochina and Sibumasu blocks. Linked to N with Late Triassic granitoids in NW Thailand (Sukhothai zone), to S with East Malay Peninsula granites)

Qian X., S. Ma, X. Lu, S. Wu, M. Udchachon, Y. Zhang & Y. Wang (2021)- Late Permian ultrapotassic rhyolites in SE Thailand: evidence for a Palaeotethyan continental rift basin. *J. Geological Society, London*, 179, 2, p.

(Volcanic rocks in Chanthaburi zone important in tectonic evolution of Paleotethyan Ocean in SE Thailand. Rhyolites from Ko Chang Island yield zircon ages of 258-254 Ma, confirming presence of Late Permian volcanic rocks in SE Thailand. Some have high K₂O contents, ultrapotassic rhyolites, probably formed in continental rift setting in response to rollback of subducted Palaeotethyan oceanic slab beneath Indochina Block. Possibly more Permian continental rift basins along E Palaeotethyan domain)

Qian, X., Y. Wang, Q. Feng, J.W. Zi, Y. Zhang & C. Chonglakmani (2016)- Petrogenesis and tectonic implication of the Late Triassic post-collisional volcanic rocks in Chiang Khong, NW Thailand. *Lithos* 248-251, p. 418-431.

('Post-collisional' Late Triassic Chiang Khong volcanics of ~220-229 Ma, younger than continental-arc and syn-collisional volcanic rocks (~238-242 Ma). Equivalent to volcanic rocks in Lancangjiang igneous zone in SW China and possibly related to upwelling of asthenospheric mantle shortly after slab detachment, which induced melting of metasomatized mantle wedge)

Qian, X., Y. Wang, Q. Feng, J.W. Zi, Y. Zhang & C. Chonglakmani (2017)- Zircon U-Pb geochronology, and elemental and Sr-Nd-Hf-O isotopic geochemistry of post-collisional rhyolite in the Chiang Khong area, NW Thailand and implications for the melting of juvenile crust. *Int. J. Earth Sciences* 106, 4, p. 1375-1389.

(Widespread Triassic volcanic rocks Chiang Khong-Lampang-Tak igneous zone in NW Thailand (part of Sukhothai Arc). Rhyolite with zircon U-Pb age of 230.7 ± 1.1 Ma. Rhyolites formed by partial melting of juvenile mafic lower crust in post-collisional setting. Deep crustal anatexis probably induced by upwelling asthenospheric mantle, shortly after slab detachment subsequent to closure of Paleo-Tethys)

Qian, X., Y. Wang, B. Srithai, Q. Feng, Y. Zhang, J.W. Zi & H. He (2017)- Geochronological and geochemical constraints on the intermediate-acid volcanic rocks along the Chiang Khong-Lampang-Tak igneous zone in NW Thailand and their tectonic implications. *Gondwana Research* 45, p. 87-99.

(Lampang-Den Chai area volcanic suite in NW Thailand intermediate- acid rocks with zircon U-Pb ages of ~240-242 Ma (M Triassic). Sequence dominated by calc-alkaline andesites, dacites and rhyolites. Formed in response to slab roll-back during transition from subduction to continental collision between Sibumasu and Indochina blocks. Constitute part of Chiang Khong- Lampang- Tak igneous zone, extending N to Lancangjiang igneous zone and S to Chanthaburi, Malaysia and Singapore areas)

Qian, X., H. Wei, Y. Wang & Q.L. Feng (2012)- Zircon U-Pb age and geological significance of arc-volcanic rocks in Chiang Khong, northern Thailand. *J. China University of Geosciences* 37, p. 195-203.

(Common Permian- Triassic volcanic rocks in Chiang Khong area of N Thailand. Zircon ages of basaltic andesite samples from Doi Yao zone 241 ± 6 Ma. Rhyolite from Doi Khun Ta Khuan zone 238 ± 9 Ma. M Triassic ages comparable to arc-volcanic rocks in Lampang area, N Thailand (Chiang Rai Arc) and Jinghong area, SW Yunnan (Lancangjiang arc). Also zircons of 1885- 1323 Ma, indicating Proterozoic-Mesoproterozoic basement)

Racey, A. (2009)- Mesozoic red bed sequences from SE Asia and the significance of the Khorat Group of NE Thailand. In: E. Buffetaut et al. (eds.) *Late Palaeozoic and Mesozoic continental ecosystems in SE Asia*. Geological Society, London, Special Publ. 315, p. 41-67.

(online at: https://www.researchgate.net/publication/266150421_RACEY_A_2009_Mesozoic_Red_Bed_Sequences_from_Southeast_Asia_and_the_significance_of_the_Khorat_Group_of_North_East_Thailand Etc.)

(Much of Khorat Gp of NE Thailand is Early Cretaceous age, rather than Late Triassic- E Cretaceous. Jurassic absent. Khorat Gp deposited in foreland basin, not thermal sag following Late Triassic rifting. Two 'Indosinian' orogenies recognized, one in Late Permian- Triassic (along Nan-Uttaradit suture/ Petchabun foldbelt/ Bentong-Raub suture), followed by Late Triassic rifting, followed by second tectonic event near end-Triassic)

Racey, A. (2011)- Petroleum geology. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, Chapter 13, p. 351-392.

(Major review of petroleum geology of Thailand by former BG geologist)

Racey, A. (2011)- Petroleum geology of Thailand- an overview. *Proc. 4th Petroleum Forum: Approaching to the 21st Petroleum concession bidding round, Bangkok 2011*, Department of Mineral Fuels, p. 61-63.

(online at: [www.dmf.go.th/cms/assets/1/The%204th%20\(DMF\)%20Petroleum%20Forum%20Proceeding.pdf](http://www.dmf.go.th/cms/assets/1/The%204th%20(DMF)%20Petroleum%20Forum%20Proceeding.pdf))

(Petroleum geology of Thailand four main areas (1) Gulf of Thailand, 13 basins, 4 with hydrocarbons (Pattani, Malay, Chumphon, Songkhla) in E-M Miocene fluvial sands, sourced from Oligocene lacustrine shales and E-M Miocene coals and lacustrine mudstones; (2) Onshore C- N Thailand Tertiary Basins: apart from Phitsanulok Basin small basins; (3) NE Thailand Khorat Plateau: principal exploration targets faulted Permian carbonates-sandstones and Late Triassic non-marine siliciclastics; (4) W Offshore Thailand Mergui Basin: no commercial discoveries yet, gas prone, stratigraphy similar to N Sumatra Basin but thicker Late Miocene-Pleistocene)

Racey, A., I.R. Duddy & M.A. Love (1997)- Apatite fission track analysis of Mesozoic red beds from northeastern Thailand and western Laos. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Dept. Mineral Resources (DMR), Bangkok, 1, p. 200-209.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(AFT analyses on Early Cretaceous fluvial sandstones from NE Thailand and SW Laos (incl. Khorat Plateau). Max. paleo-T before cooling $>120^\circ$ during burial. Cooling started at ~ 55 Ma for most samples, with possible final cooling to present outcrop between 35-25 Ma (Oligocene))

Racey, A. & J.G.S. Goodall (2009)- Palynology and stratigraphy of the Mesozoic Khorat Group of NE Thailand. In: E. Buffetaut et al. (eds.) *Late Palaeozoic and Mesozoic continental ecosystems in SE Asia*, Geological Society, London, Special Publ. 315, p. 67-81.

*(Most of NE Thailand Khorat Group redbeds of (Late Jurassic?-) Cretaceous age; Jurassic mostly absent. Khorat Gp overlies Late Triassic Nam Phong Fm and is unconformably overlain by continental evaporitic Maha Sarakham Fm, palynologically dated as M Albian-Cenomanian. Khorat Gp palynomorphs dominated by gymnosperm pollen *Corollina* (= *Classopollis*) spp. and *Dicheiropollis*, indicating warm, seasonally dry subtropical climate)*

Racey, A., J.G.S. Goodall, M.A. Love, S. Polachan & P.D. Jones (1994)- New age data for the Mesozoic Khorat Group of Northeast Thailand. In: P. Angsuwathana et al. (eds.) *Proc. Int. Symposium Stratigraphic correlation of Southeast Asia*, Bangkok 1994, Dept. Mineral Resources and IGCP 306, p. 245-252.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1994/6950.pdf)
(Age of much of Khorat Gp (Late Jurassic?-) Early Cretaceous, not Jurassic). Lowermost formation of Khorat Gp (Nam Phong Fm) dated as latest Norian- Rhaetian (*Ovalipoliis ovalis*))

Racey, A., P.J.C. Highton, T. Lekuthai, A. Alderson & S. Polachan (1997)- Mesozoic oils and source rocks from Peninsular Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Dept. Mineral Resources, Bangkok, 2, p. 511-524.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7651.pdf)

(Oil-gas source rocks of mainly of E Cretaceous age at several localities in S Peninsular Thailand. Variety of fluvial, lacustrine, restricted marine and open marine environments. TOC 0.22-30%, S₂ values 0.35-298 mg/g and HI 50-928 mg/g TOC. Tmax data indicate many samples are in oil window. Oil extracted from seep in E Cretaceous limestone near Phru Toei with biomarker profiles of lacustrine source. Absence of oleanane suggests oil from pre M Cretaceous source rock. Gulf of Thailand oils studied do contain oleanane)

Racey, A., M.A. Love, A.C. Canham, J.G.S. Goodall, S. Polachan & P.D. Jones (1996)- Stratigraphy and reservoir potential of the Mesozoic Khorat Group, NE Thailand: Part 1: Stratigraphy and sedimentary evolution. J. Petroleum Geology 19, 1, p. 5-39.

(Nam Phong Fm dated for first time as Late Norian- Rhaetian, while overlying Khorat Gp reassigned to Early Cretaceous (Berriasian- Aptian). Age of intervening Phu Kradung Fm probably Late Jurassic or E Cretaceous. Changes in provenance between Nam Phong and overlying Phu Kradung Fm suggest possible sedimentary hiatus. Paleocurrent data suggest main source from N and E. Part 2 of series see Canham et al. 1996)

Racey, A., A.B. Smith & O. Dawson (1994)- Permian echinoderms from Peninsular Thailand. In: P. Angsuwathana et al. (eds.) Proc. International Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, IGCP 306, Dept. Mineral Resources (DMR), Bangkok, p. 106-114.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1994/6941.pdf)

(Four species of crinoid (*Trimerocrinus*, *Parabursacrinus*, *Timorocidaris*, etc.) and one blastoid (*Deltoblastus permicus*) described for first time from Ratburi Lst of Peninsular Thailand. All taxa previously known mainly or only from E-M Permian of Basleo, Timor, suggesting Peninsular Thailand and Timor (Maubis Lst) were in same faunal province around Artinskian time. Associated with Tubiphytes and 'mid-Permian' foraminifera, including *Shanita amosi*, *Hemigordiopsis renzi*, *Hemigordius reicheli*, *Parafusulina* sp., etc.)

Racey, A., R.B. Stokes, P. Lovatt Smith & M.A. Love (1997)- Late Jurassic collision in northern Thailand and the significance of the Khorat Group. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), 1, p. 412-413. (Extended Abstract)

(Khorat Gp of NE Thailand commonly assumed to be of Late Triassic- E Cretaceous age, but here argued to include only Late Triassic and E Cretaceous sediments. Possibly reflects Late Jurassic collisional event (Sibumasu- Indochina collision)

Racki, G., P. Konigshof, Z. Belka, J. Dopieralska & A. Piszarska (2019)- Diverse depositional and geochemical signatures of the Frasnian-Famennian global event in western Thailand reveal Palaeotethyan vs. Western Australian geotectonic affinities. J. Asian Earth Sciences: X, 2, p. 1-20.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056019300064>)

(Two sections of Frasnian-Famennian (Devonian) boundary sections in W Thailand differ in depositional and geochemical characteristics, confirming different paleogeographic settings. Condensed Mae Sariang limestone succession (Inthanon Zone; Paleotethys) corresponds to event-chemostratigraphic pattern of F-F biocrisis, based primarily on German sections. Thong Pha Phum site (Sibumasu terane) with peculiar W Australian biogeochemical signature. Provenance in MS succession from continental margin, in TPP section from older, continental sedimentary-metasedimentary terrains)

Raksaskulwong, L. (2002)- Upper Paleozoic rocks of Thailand. Proc. Symposium on Geology of Thailand, Bangkok, p. 29-34.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6373.pdf)

(Brief review of Carboniferous- Permian stratigraphy of Thailand)

Ramingwong, T. (1978)- A review of the Khorat Group of Thailand. In: P. Nutalya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 763-774.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1978/7414.pdf)

(Review of Khorat Group of NE Thailand. Rel. undeformed Late Triassic- Cretaceous non-marine redbeds-dominated series, unconformably over Paleozoic rocks. With up to 610m of ?Upper Cretaceous evaporites)

Randon, C., N. Wongsanan, M. Caridroit, M.F. Perret-Minouse & J.M Degardin (2006)- Upper Devonian-Lower Carboniferous conodonts from Chiang Dao cherts, northern Thailand. Rivista Italiana Paleontologia Stratigrafia 112, 2, p. 191-206.

(online at: www.rivistaitalianadipaleontologia.it/doc/Randon_et_al_2006.pdf)

(U Devonian (Frasnian) -Lower Carboniferous conodonts from Paleotethys oceanic cherts in Chiang Dao chert (= 'Fang Chert'; Shan-Tai Block, N of Chiang Mai)

Ratanasthien, B. (1984)- Spore and pollen dating of some Tertiary coal and oil deposits in Northern Thailand. In: Conference Applications of geology at the National Development Chulalongkorn University, Bangkok 1984, p. 273-280.

(online at: <http://library.dmr.go.th/library/7247.pdf>)

Ratanasthien, B. (1990)- Neogene events recorded in coalfields in Northern Thailand. In: Development Geology for Thailand into the year 2000, Chulalongkorn University, Bangkok 1990, p. 462- 476.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=12660&bid=24732>)

Ratanasthien, B. (1997)- Algae types of oil source rocks in northern Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Dept. Mineral Resources, Bangkok, 2, p. 606-612

(Lacustrine oil shales in multiple Tertiary rift basins of NW Thailand dominated by Alginite B with disseminated Alginite A (Botryococcus braunii, Pila, Reinschia algae). Also Pediatrum)

Ratanasthien, B. (1999)- Association of oil source algae in some Tertiary basins, northern Thailand. J. Asian Earth Sciences 17, 1-2, p. 295-299.

(N Thailand Tertiary rift basins with coals and oil shales. In lower part Tertiary (especially in Fang oilfield), mainly alginite A (Botryococcus sp.) only type of algae, changing upward into association of Botryococcus braunii, Pila, thick-walled alginite B, and temperate palynomorphs (Late Oligocene?- E Miocene). In upper section alginite B dominant with Botryococcus-related taxa Pila, Reinschia and fresh-water-dwelling ferns)

Ratanasthien, B. (2002)- Problems of Neogene biostratigraphic correlation in Thailand and surrounding areas. Revista Mexicana Ciencias Geologicas 19, 3, p. 235-241.

(online at: [http://rmcg.unam.mx/19-3/\(10\)Ratanasthien.pdf](http://rmcg.unam.mx/19-3/(10)Ratanasthien.pdf))

(Main correlation tools in Thailand Neogene are vertebrate fossils and palynology. In N Thailand, vertebrate fossils, mammals, and palynological floras generally agree well. In S Thailand (Krabi Basin), work on small "M Eocene- E Oligocene" mammal fossils does not correlate well and contradicts results from palynology and microinvertebrate fossils)

Ratanasthien, B. (2005)- Evidences of tectonic evolution during Miocene. In: L. Wannakao et al. (eds.) Int. Conference Geology Geotechnology and Mineral Resources (GEOINDO 2005), Khon Khaen, p. 615-621.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2005/9386.pdf)

(Tertiary basins in Thailand and Myanmar record change from temperate flora in lower part to subtropical-tropical, implying SE-ward movement towards Equator)

Ratanasthien, B. (2011)- Coal deposits. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 393-414.

Ratanasthien, B., S. Chomproosi & T. Mahatthanachai (1997)- Deposition environment of Mae Moh Basin as indicated by coal petrography. In: P. Dheeradilok et al. (eds.) Proc. International Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA197), Dept. Mineral Resources, Bangkok, 2, p. 596-605.

(Mae Moh basin rel. small N-S trending Tertiary rift basin E of Lampang, with rel.common coal deposits (lignite- subbituminous) in fluvial-lacustrine ?Neogene section. Formed on Lampang Gp Permian-Triassic clastic and limestone basement. High sulfur content. Coal petrography)

Ratanasthien, B. & W. Kandharosa (1987)- Coal, oil-, oil shale-bearing formations in intermontane basins of Thailand. In: B. Situmorang (ed.) Proc. 6th Regional Conference Geology Mineral Hydrocarbon Resources of SE Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 363-369.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_2/1987/4669.pdf)

(Cenozoic intermontane and intercratonic basins of Thailand mainly filled with fluvial- lacustrine deposits. Most formations immature (Ro 0.2-0.7 %))

Ratanasthien, B., W. Kandharosa, S. Chompusri & S. Chartprasert (1999)- Liptinite in coal and oil source rocks in northern Thailand J. Asian Earth Sciences 17, 1-2, p. 301-306.

(N Thailand coal and oil shale deposits similar palynological associations to Borneo region. Oldest coal and oil shales (Late Oligocene- E Miocene age) dominated by Botryococcus sp. or related algae. Thick-walled lamaginites and spores and pollen of temperate affinity in some areas. Thin-walled lamaginite dominant in late M Miocene. Resinite, suberinite, and cutinite dominant in forest swamp coal deposits whereas alginite, cutinite and lycopodium spores dominant in lacustrine environments)

Ratanasthien, B., T. Kojima, T.Tokumitsu, A. Katoh & N.Uyemura (1992)- Relationship between elementary analysis, origin and diagenesis of Tertiary Thai coals. In: C. Piancharoen (ed.) Proc. Nat. Conference Geologic Resources of Thailand: potential for future development, Bangkok 1992, p 273-282.

Ratanasthien, B. & S. Promkotra (1994)- Coal seams correlation of Li coal deposits. In: P. Angsuwathana (ed.) Proc. International Symposium on Stratigraphic Correlation of Southeast Asia, Bangkok 1994, p. 282-290.

Ratanasthien, B., I. Takashima & O. Matsubaya (2008)- Paleogeography and climatic change recorded on Viviparidae carbon and oxygen isotope in Mae Moh Coal Mine, Northern Thailand. Bull. Geological Survey of Japan 59, 7/8, p. 328-338.

(online at: https://www.gsj.jp/data/bulletin/59_07_05.pdf)

(Coal mine in largest coal deposit in Thailand, in M Miocene of Mae Moh basin. With intercalations of up to 12m thick shell beds, composed of nearly 100% Bellemya fresh-water gastropod. C and O isotopes suggest more tropical climate in N Thailand in M Miocene)

Reed, F.R.C. (1920)- Carboniferous fossils from Siam. Geological Magazine 57, p. 113-120.

(Includes record of Posidonia becheri var. siamensis, Carboniferous ammonoids from Peninsular Thailand (Prolecanites, Glyphioceras, Pronorites aff. cyclolobus from Hat Yai area)

Reed, F.R.C. (1920)- Carboniferous fossils from Siam. Geological Magazine 57, p. 172-178.

(Continuation of paper above. Permo-Carboniferous fossis, incl. brachiopods Athyris, Spirifer, Productus, Chonetes and trilobite Phillipsia))

Remus, D., M. Webster & K. Keawkan (1993)- Rift architecture and sedimentology of the Phetchabun intermontane basin, central Thailand. J. Southeast Asian Earth Sciences 8, p. 421-432.

(Phetchabun Basin, onshore C Thailand is one of >30 Tertiary intermontane basins in Thailand. Composite of several N-S trending half and full graben, 1100-2500m deep, formed through transtensional dextral shear along Mae Ping fault zone. Oligocene syn-rift fluvial deposits and associated rift volcanics, followed by Oligocene-M-Miocene fluvial and lacustrine deposits. E and Late M Miocene intrusives reflect periods of igneous activity. M Miocene tectonic episode. Waxy oils and dry gas in thin bedded sandstones and igneous sills)

- Reynolds, N.A., T.W. Chisnali, K. Kaewsang, C. Keesaneyabutr & T. Taksavasu (2003)- The Padaeng supergene nonsulfide zinc deposit, Mae Sod, Thailand. *Economic Geology* 98, p. 773-785.
(Padaeng deposit near Mae Sod in NW Thailand first commercial supergene non-sulfide zinc deposit in world. Hosted by M Jurassic mixed carbonates-clastics. Formed when substantial body of sulfide ore was uplifted on margin of Mae Sod Tertiary intermontane basin, starting in M-L Miocene)
- Rhodes, B.P., J. Blum & T. Devine (2000)- Structural development of the mid-Tertiary Doi Suthep Metamorphic Complex and Western Chiang Mai Basin, Northern Thailand. *J. Asian Earth Sciences* 18, p. 97-108.
(Doi Suthep Metamorphic Complex near Chiang Mai part of 400km long N-S trending crystalline complex, likely metamorphosed, deformed, and intruded by granitoids during Permo-Triassic collision of Shan Thai terrane with Indosinian Craton. With mylonitic gneisses and major low-angle normal faults. Complex developed between Triassic- E Miocene, with detachment and uplift during Oligocene-Miocene. Stretching lineations trend N80°W)
- Rhodes, B.P., J. Blum, T. Devine & K. Ruangvataasirikul (1997)- Geology of the Doi Suthep metamorphic complex and adjacent Chiang Mai Basin. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution in Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok 1997, Dept. Mineral Resources, 1, p. 305-313.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7640.pdf)
(Doi Suthep metamorphic complex of amphibolite-grade gneisses and granitic rocks previously mapped as Precambrian, but now viewed as part of Cenozoic metamorphic core complex. Nearly uni-directional stretching lineations in complex with average N80°W trend. Zircon ages suggest likely Late Triassic granites as protoliths for orthogneiss (Dunnig et al. 1995). Peak metamorphism probably Late Cretaceous)
- Rhodes, B.P., P. Charusiri, S. Kosuwan & A. Lamjuan (2005)- Tertiary evolution of the Three Pagodas Fault, Western Thailand. In: L. Wannakao et al. (eds.) *Proc. Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005)*, Khon Kaen University, p. 498-505.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2005/9366.pdf)
(Three Pagodas Fault Zone developed as consequence of Indian-Asian collision. As NE syntaxis of India migrated N-ward, stresses rotated >100° clockwise)
- Rhodes, B.P., R. Conejo, T. Benchawan, S. Titus & R. Lawson (2005)- Palaeocurrents and provenance of the Mae Rim Formation, Northern Thailand: implications for tectonic evolution of the Chiang Mai basin. *J. Geological Society, London*, 162, p. 51-63.
(Chiang Mai basin is largest of series of Tertiary rift basins in N Thailand. Several phases of extension from Late Oligocene -Quaternary, with at least two periods of basin inversion. Paleocurrent and clast-composition data from Mae Rim Fm. alluvial fans and lacustrine deposits suggest provenance from W, from low-grade metasedimentary rocks of W Ranges metamorphic complex. Most of Mae Rim Fm accumulated during uplift of Western Ranges but before erosion had breached detachment fault)
- Rhodes, B.P., R. Perez, A. Lamjuan & S. Kosuwan (2002)- Kinematics of the Mae Kuang fault, northern Thailand Basin and Range Province. In: N. Mantajit (ed.) *Proc. Symposium on Geology of Thailand*, Bangkok 2002, Dept. Mineral Resources, p. 298-308.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6409.pdf)
(N-S trending basins characterize 'basin and range' province in N Thailand. One model for Tertiary deformation involves regional simple shear between set of sinistral faults. Newly discovered SW-NE trending Mae Kuang Fault may accommodate transfer of extension between two basins; not a throughgoing fault. Same paper as Rhodes et al. (2004) below)
- Rhodes, B.P., R. Perez, A. Lamjuan & S. Kosuwan (2004)- Kinematics and tectonic implications of the Mae Kuang Fault, northern Thailand. *J. Asian Earth Sciences* 24, p. 79-89.
(NE trending Mae Kuang strike-slip fault does not accommodate mid-Tertiary E-W extension in N Thailand. Fault probably initiated between 20- 5 Ma, simultaneous with slip inversion on Mae Ping and Red River Faults)

- Ridd, M.F. (1971)- The Phuket Group of Peninsular Thailand. *Geological Magazine* 108, 5, p. 445-446.
(Brief commentary on Mitchell et al. 1970 paper on Phuket Group. *Phuket Group of S Thailand stands out by great thickness and presence of pebbly mudstone. Source area was W of present-day Thailand. Numerous limestone clasts in Phuket Gp tilloids lithologically like Ordovician-Silurian Thung Song Lst*)
- Richter, B., M. Fuller, E. Schmidtke, U Tin Myint, U Tin Ngwe, U Mya Win & S. Bunopas (1993)- Paleomagnetic results from Thailand and Myanmar: implications for the interpretation of tectonic rotations in Southeast Asia. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 247-255.
(*Shan Hills of E Myanmar (Cretaceous Phuket-Mandalay foldbelt) and Khorat Plateau of Thailand rotated ~40° CW since Cretaceous*)
- Ridd, M.F. (2007)- A geological traverse across Peninsular Thailand. Geological Society Thailand, Bangkok, Special Issue 1, p.
- Ridd, M.F. (2008)- Khao Thalai red-beds, a Lower Triassic or older formation in Chanthaburi and Rayong Provinces, SE Thailand. *Proc. Int. Symposium Geoscience resources and environments of Asian terranes (GREAT 2008)*, Bangkok, p. 36-41.
(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/007.pdf)
(*Unfossiliferous red sandstone and conglomerate ('Khao Thalai Redbeds') on Gulf of Thailand coast SW of Chanthaburi, SE Thailand. Underlie limestone with Scythian-Anisian foraminifera, so redbeds are older than E-M Triassic*)
- Ridd, M.F. (2009)- The Phuket Terrane: a Late Palaeozoic rift at the margin of Sibumasu. *J. Asian Earth Sciences* 36, p. 238-251.
(*Kaeng Krachan Gp of Peninsular Thailand identified as infill of rift between Sibumasu and Gondwana, and given name Phuket Terrane. Rift-infill several km thick, with glacially-influenced diamictites similar to >3 km pre-M Permian rift-fill of Carnarvon Basin, W Australia. Khlong Marui Fault E boundary of rift, Three Pagodas Fault zone also rift margin. Rifting ceased in E Permian and passive margin formed as Mesotethys ocean widened. U Kaeng Krachan Gp and overlying Ratburi Lst part of post-rift*)
- Ridd, M.F. (2009)- Geological history of the Sibumasu Block in Peninsular Thailand: report of a Geologists' Association Field Meeting in 2007. *Proc. Geologists Association, London*, 120, p. 163-174.
(*Thailand two main terranes, both of Gondwana origin: Sibumasu in W, Indochina in E, which collided in Late Triassic. Cambrian-Miocene Sibumasu sediments crop out in Peninsular Thailand, as well as two N-S chains of granite plutons: Cretaceous-Paleogene age in W, Triassic further E*)
- Ridd, M.F. (2011)- Lower Palaeozoic. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 33-51.
- Ridd, M.F. (2012)- The role of strike-slip faults in the displacement of the Palaeotethys suture zone in Southeast Thailand. *J. Asian Earth Sciences* 51, p. 63-84.
(*Six N-S tectono-stratigraphic belts in SE Thailand: (1) W-most Belt part of Sibumasu Block, while E-most belt (5) is Permian accretionary complex on W flank of Indochina. Belt (3) volcanics and Carboniferous- Triassic sediments with distinctive faunas, interpreted to be volcanic arc; Belt (4) Triassic rocks of back-arc basin origin; Belt (6) is unconformable cover of Jurassic-Cretaceous red-beds. Triassic Indosinian Orogeny led to cratonization of SE Thailand by end-Triassic. Apparent absence of Devonian-Triassic Paleotethys Ocean (Inthanon Zone of N Thailand) in SE due to post-Indosinian sinistral strike-slip faulting*)
- Ridd, M.F. (2013)- A Middle Permian- Middle Triassic accretionary complex and a Late Triassic foredeep basin: forerunners of an Indosinian (Late Triassic) thrust complex in the Thailand- Malaysia border area. *J. Asian Earth Sciences* 76, p. 99-114.

(Semanggol Fm of NW Peninsular Malaysia is N-S belt of imbricately-thrust, deep-water, M Permian- Late Triassic sediments (radiolarian chert, sandstone, mudstone, conglomerate), and extends into Thailand. In M Permian Paleotethys began subducting beneath Indochina/ E Malaya, until end of M Triassic collision with Sibumasu. Crustal shortening continued into Late Triassic, forming foredeep basin in front of inactive subduction zone/ accretionary complex, depositing youngest part of Semanggol Fm)

Ridd, M. (2015)- A second Tethyan plate-boundary in southern Thailand: the medial Myanmar-Thai Peninsula suture. Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 62-68.

(Extended Abstract)

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(Sibumasu Block of Metcalfe (1984) and later papers subdivided into two blocks, 'Sibuma' and 'Irrawaddy', probably amalgamated in Early Cretaceous. Irrawaddy Block W of Medial Myanmar (Mitchell et al., 2012, 2015) and Thai Peninsula sutures contains (1) E part of W Burma Block, E of Sagaing Fault; (2) Karen-Tenasserim Unit with Phuket terrane; (3) N-S strip E of Khlong Marui Fault, and (4) NE Sumatra (Bohorok, Mentulu Fms). Similar boundary in SW Yunnan between Tengchong and Baoshan blocks, in Tibet between Lhasa and Qiangtang Blocks. Sumatran diamictites more closely resemble Phuket Gp than Singa Fm)

Ridd, M.F., A.J. Barber & M.J. Crow (2011)- Introduction to the geology of Thailand. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) The Geology of Thailand, Geological Society, London, p. 1-32.

Ridd, M.F., A.J. Barber & M.J. Crow (eds.) (2011)- The geology of Thailand. Geological Society, London, p. 1-614.

(Comprehensive overview of geology of Thailand, including tectonic evolution, stratigraphy, petroleum, coal, minerals, igneous rocks, etc.)

Ridd, M.F. & C.K. Morley (2011)- The Khao Yai Fault on the southern margin of the Khorat Plateau, and the pattern of faulting in Southeast Thailand. Proc. Geologists Association, London, 122, p. 143-156.

(Khao Yai fault ~E-W trending fault at SW margin of Khorat Plateau probably part of strike-slip duplex of bigger Mae Ping Fault belt. Part of Paleogene transpressional deformation that affected N part of Gulf of Thailand and surrounding land areas. Deformation from ~50-60 Ma, continuing in some places to ~30 Ma)

Ridd, M.F. & I. Watkinson (2013)- The Phuket- Slate Belt terrane: tectonic evolution and strike-slip emplacement of a major terrane on the Sundaland margin of Thailand and Myanmar. Proc. Geologists Association, London, 124, 6, p. 994-1010.

(online at: http://searg.rhul.ac.uk/pubs/ridd_watkinson_2013%20Phuket%20Thailand.pdf)

(Phuket-Slate Belt terrane can be traced for 1700 km in Peninsular and W Thailand (W side of Sibumasu continental terrane). Thick Carboniferous-Lower Permian series with diamictites, interpreted as glacio-marine rift-infill, deposited when Sibumasu block separated from Gondwana. It was emplaced in Late Cretaceous-Paleogene by dextral strike-slip along Khlong Marui/ Panlaung fault system. To S, bounding-fault postulated to extend to Sumatra where it aligns with restored proto-Indian Ocean location of India- Australia transform. Emplacement of Phuket-Slate Belt terrane was result of coupling with N-going India plate, resulting in up to 450 km of dextral shift on bounding fault system)

Rigby, S.M., A.A. Bal, H.M. Burgisser, D.K. Harris, M.A. Herber, S. Thumprasertwong & S. Winkler (1992)- The Phitsanulok lacustrine basin, onshore Thailand. AAPG International Conference, Sydney 1992, Search and Discovery Article 91015. *(Abstract only)*

(Phitsanulok basin is N-S trending intra-cratonic rift with up to 8 km of Tertiary sediments. Early rifting in Oligocene and E Miocene. Later compressional phase accompanied by basic volcanism. Lake Phitsanulok was 1000-4000 km² body of fresh water, with up to 400m of organic-rich claystones. Lake margins coarser deltaic deposits constitute main reservoirs of Sirikit oilfield. Sukhothai Depression main kitchen, first generating oil in M Miocene. Crudes are light (40° API) and waxy, with low sulfur and a high pour point)

Roberts, T.R. & J. Jumnonthai (1999)- Miocene fishes from Lake Phetchabun in North Central Thailand, with description of new taxa of Cyprinidae, Pangasiidae and Chandidae. *Natural History Bull. Siam Society* 47, 2, p. 153-189.

(online at: www.thaiscience.info/journals/Article/NHB/10439370.pdf)

(*Miocene lacustrine beds at 2-4m depth in Phetchabun intermontane basin at Ban Nong Pia, N-C Thailand with 11 species of teleosts or bony fishes*)

Robinson, K. (1984)- Assessment of undiscovered conventionally recoverable petroleum resources in Tertiary sedimentary basins of Thailand. U.S. Geological Survey (USGS), Open-File Report 84-330, p. 1-14.

(online at: <https://pubs.usgs.gov/of/1984/0330/report.pdf>)

Ronghe, S. & K. Surarat (2002)- Acoustic impedance interpretation for sand distribution adjacent to a rift boundary fault, Suphan Buri basin, Thailand. *American Assoc. Petroleum Geol. (AAPG) Bull.* 86, p. 1753-1771.

(*Suphan Buri basin N-S trending onshore Tertiary non-marine rift basin in Central Plain of Thailand, between two NW-SE trending strike-slip fault zones, Mae Ping and Three Pagodas fault zones. Seismic impedance used to image water-saturated sands in producing interval of half graben. Two styles of sand distribution: axial deposits comprising delta lobes and boundary fault-induced fan deltas and feeder canyons deposits*)

Rozalli, M., C.K. Morley & N. Mankhemthong (2025)- Indosinian structural geology and tectonics of northern Thailand: A discussion based on new field observations. *J. Asian Earth Sciences* 293, 106755, p.

(*Recent review of tectonic models for Triassic-Early Jurassic Paleo-Tethys Ocean closure between Sibumasu, Sukhothai Arc and Indochina terranes (Indosinian orogeny) in SE Asia. Mae Sariang Trough is rifted region within Sibumasu, not suture zone as previously suggested. Early deformation involved oblique Sukhothai Arc-Sibumasu collision, with variable shortening directions suggesting irregular shape of Sibumasu margin (not a simple E-W closure); post-collisional extensional collapse followed. Latest Triassic- E Jurassic deformation probably reflects collision of combined Sibumasu/Sukhothai terrane with Indochina. Etc..*)

Saegusa, H., B. Ratanasthien & H. Nakaya (2000)- A new Miocene mammalian locality, Mae Soi and the occurrence of partial skeletons of rhinocerotids and gomphotheres from northern Thailand. *Asian Paleoprimateology*, Kyoto, 1, p. 137-147.

(online at: https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/199736/1/aspp_01_137.pdf)

(*New E or M Miocene vertebrate fossil locality in Mae Soi, Chiang Mai Province, with nearly complete gomphothere (Archaeobelodon or Gomphotherium) (elephant-like proboscideans)*)

Saengsrirachan, W., T. Charoentitirat, A. Meesook, K. Hisada & P. Charusiri (2011)- Paleo-environments and tectonic setting of the Mesozoic Thung Yai Group in Peninsular Thailand, with a new record of *Parvamussium donaiense* Mansuy. *Gondwana Research* 19, 1, p. 47-60.

(online at: www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper_2/107.pdf)

(*300m thick late E Jurassic- E Cretaceous Thung Yai Gp along E margin of Shan Thai (=Sibumasu) block, unconformable between Triassic marine and Tertiary non-marine sediments. Dominantly brackish- non-marine clastics with few limestone beds. First record in peninsular S Thailand of pectinoid bivalve Parvamussium donaiense in Khlong Min Fm, representing Toarcian- Bajocian (E-M Jurassic) inundation after Late Triassic closure of Paleotethys (species common in NW Thailand, Vietnam, Tibet)*)

Saengsrirachan, W., J. Sha, A. Meesook & K. Hisada (2009)- Lithostratigraphy and petrography of marine Jurassic rocks in the Mae Sot area, Tak Province, western Thailand: implications for depositional environment and tectonics. *Geologiska Foreningens Forhandlingar (GFF)* 131, p. 83-103.

(online at: www.tandfonline.com/doi/pdf/10.1080/11035890902857895)

(*Marine Jurassic rocks from the Mae Sot area of W Thailand (near Myanmar border; part of Shan-Thai/ Sibumasu terrane): 200-832m thick, Toarcian- Bajocian age, shallow marine clastics with occasional carbonate platforms and reef flats. Three assemblages of ammonites: (1) late Toarcian (Pseudolioceras, Lytoceras and Onychoceras); (2) late Aalenian- E Bajocian (Erycites, Tmetoceras, Eumetoceras, Docidoceras); (3) M-L Oxfordian (Epimyrites, Phylloceras). Also bivalve Parvamussium donaiense*)

Saesaengseerung, D. (2009)- Devonian to Triassic radiolarian biostratigraphy and depositional environments of these radiolarian-bearing rocks in Thailand. Ph.D. Thesis University of Tsukuba, p. 1-220. (*Unpublished*)

Saesaengseerung, D., S. Agematsu, K. Sashida & A. Sardud (2009)- Discovery of Lower Permian radiolarian and conodont faunas from the bedded chert of the Chanthaburi area along the Sra Kao suture zone, Eastern Thailand. *Paleontological Research* (Palaeontological Society of Japan) 13, 2, p. 119-138.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2009/30936.pdf)

(Lower Permian (Asselian- Sakmarian) radiolarians and conodonts from bedded chert blocks in Thung Kabin melange of Chanthaburi area, SE Thailand (Sra Kao suture zone). Probably deposited in pelagic environment at low latitudes of S Hemisphere in Paleotethys or Paleotethyan back-arc basin)

Saesaengseerung, D. & A. Sardud (2013)- Summary of the Devonian to Triassic radiolarian faunas from northern and northeastern Thailand along the Laos-Thai Border. In: C. Senebottalath et al. (eds.) *Proc. 2nd Lao-Tai Conf. Geology and Mineral resources*, Vientiane, p. 247-252.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2013/36797.pdf)

(M Devonian- M Triassic 'Paleotethys' radiolaria along Laos-Thai border in pelagic and hemipelagic chert, and siliceous shales. Radiolaria assemblages: *Stigmatopora stylus variospina* (M Devonian- E Carboniferous), *Follicuculus scholasticus-Albaillella levis* (M-L Permian) and *Triassocampe deweveri* (M Triassic))

Saesaengseerung, D., K. Sashida & A. Sardud (2007)- Late Devonian to Early Carboniferous radiolarian fauna from the Pak Chom area, Loei Province, northeastern Thailand. *Paleontological Research* (Palaeontological Society of Japan) 11, 2, p. 109-121.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2007/30935.pdf)

(Famennian- Tournaisian radiolarian fauna in chert-clastic section along Khong River, Pak Chom area, NE Thailand, near Laos border. Deposited in pelagic- hemipelagic environment within E-most margin of Paleotethys Ocean/ Indochina Block in Late Devonian- E Carboniferous, probably on Nakhon Thai Block, subducted beneath Indochina Block. This suggests subduction and accretion of Nakhon Thai Block continued through E Carboniferous)

Saesaengseerung, D., K. Sashida & A. Sardud (2007)- Devonian to Triassic radiolarian faunas from Northern and Northeastern Thailand. In: W. Tantiwanit (ed.) *Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07)*, Bangkok, Dept. Mineral Resources, p. 54-71.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2007/12703.pdf)

(Radiolarian biostratigraphy of Devonian-Triassic deep marine sequences in N and NE Thailand. Twelve radiolarian zones proposed. Paleo-Tethys ocean probably existed between Shan-Thai (=Sibumasu) and Indochina terranes at least since E Devonian. Timing of collision between Shan-Thai and Indochina later than E? Carnian (early Late Triassic))

Saesaengseerung, D., K. Sashida & A. Sardud (2008)- Discovery of Middle Triassic radiolarian fauna from the Nan area along the Nan-Uttaradit suture zone, northern Thailand. *Paleontological Research* (Palaeontological Society of Japan) 12, 4, p. 397-409.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2009/30937.pdf)

(M Triassic radiolaria of Anisian *Triassocampe deweveri* fauna with *Cenosphaera igoi*, *Annulotrassocampe*, etc., in siliceous rocks at Nan area along Nan-Uttaradit suture zone, N Thailand. Deposited in pelagic environment in Nan-Uttaradit back-arc basin between Simao and Indochina blocks, suggesting this basin was connected with Paleo-Tethys and Panthalassa oceans and closed after M Triassic)

Saesaengseerung, D., K. Sashida & A. Sardud (2024)- Triassic radiolarian assemblages from the chert-clastic rock sequences in the Kanchanaburi area, western Thailand. *Thai Geoscience J.* 5, 7, p. 1-31.

(online at: <https://ph03.tci-thaijo.org/index.php/TGJ/article/view/2927/2382>)

(Early to early Late Triassic radiolarian assemblages in bedded chert- thin shale- thin sandstone sequences in Kanchanaburi area, W Thailand: *Parentactinia nakatsugawaensis*, *Eptingium nakasekoi*, *Triassocampe deweveri*, *Spine A2* and *Muelleritirtis cochleata*. Assemblages are known all across European Tethys, NW

Peninsular Malaysia, Thailand to Japan, suggesting Palaeo-Tethys Ocean and Panthalassa Ocean were connected by seaways at this time. Forty-five species. Hemipelagic environment at continental slope of E margin of Sibumasu Terrane, indicating that Paleotethys Ocean closed only after early Late Triassic (early Carnian))

Saesaengseerung, D., K. Sashida, A. Sardud & S. Salyapongse (2008)- Paleozoic and Mesozoic radiolarian faunas in Thailand. Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 186-188 (*Extended Abstract*)
(*Fourteen M Devonian- M Triassic radiolarian zones identified in pelagic- hemipelagic rocks of Thailand*)

Saesaengseerung, D., T. Kawinate & C. Pothichaiya (2015)- Discovery of Devonian to Carboniferous radiolarians from Central Thailand and its significance of these fauna in Thailand and Laos. Proc. 3rd Thai-Lao Technical Conference Geology and Mineral Resources, Bangkok 2015, p. 115-134.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2015/10914.pdf)
(*14 species of Late Devonian (Frasnian) to E Carboniferous (Tournasian) radiolaria in siliceous shale from E of Ban Rai, western C Thailand. With Trilonche spp., Stigmasphaerostylus spp., Albaillella paradoxa, etc. Deposited on passive continental margin of Sibumasu terrane, facing Paleo-Tethys ocean*)

Saifuddin, F., S. Phaungphuak, S. Matha, W. Ratawessanun & I Nengah Nuada (2012)- Recent step-out exploration in the Greater Sirikit East Area, Sirikit Oil Field, Onshore Thailand, a model for overlooked area. International Petroleum Technical Conference (IPTC), Bangkok 2012, IPTC 14465, p. 1-17.
(*Main Sirikit oil-gas field is faulted anticline in Oligocene-Miocene Phitsanulok Basin ~400km N of Bangkok is 1981 discovery and is surrounded by smaller fields Sirikit West, Thap Raet, Sirikit East and Nong Jig. New step-out exploration in Greater Sirikit East area, including some stratigraphic trap models (updip pinchouts)*)

Sakagami, S. (1966)- The Permian bryozoan fauna of Ko Muk, Peninsular Thailand, with the description of the Cyclostomata. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 255-272.
(*28 species of Permian (Artinskian) bryozoa from Ratburi Lst of Ko Muk island, W coast of Thailand, most of them new. Several species in common with Timor (Goniocladia timorensis, G. laxa, Fistulipora simillina, F wanneri, Penniretepora scalaris) and W Australia*)

Sakagami, S. (1966)- The cryptostomatous bryozoa from Ko Muk, Peninsular Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 2, p. 273-287.
(*Continuation of Sakagami (1966) paper above. Description of 14 species of Permian Cryptosomata, incl. Fenestella spp., Polypora, Penniretepora, etc.*)

Sakagami, S. (1968)- Permian Bryozoa from Khao Phrik, near Rat Buri, Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 4, p. 45-66.

Sakagami, S. (1968)- Permian Bryozoa from Khao Chong Krachok, Peninsular, Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 4, p. 67-81.

Sakagami, S. (1968)- Permian Bryozoa from Khao Ta Mong Rai, Peninsular Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 5, p. 47-67.
(*16 species of Permian (Artinskian or Sakmarian) bryozoans from N part of Peninsular Thailand. Incl. Fistulipora timorensis, Fenestella spp., Polypora spp. Associated with fusulinid forams*)

Sakagami, S. (1969)- Fusulinacean fossils from Thailand, Part IV. On some Permian Fusulinaceans from Peninsular Thailand. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 6, p. 256-275.
(*Permian fusulinids from 3 localities in Peninsular Thailand: Khao Prik with Ozawainella and Neofusulinella cf. lantenoisi (E Artinskian), Khao Chong Krachok with Pseudofusulina valida (Sakmarian?); Khoo Ta Mong Rai on coast with Triticites obai, Dunbarinella, Schwagerina mongraiensis and S. rouxi (Sakmarian?)*)

Sakagami, S. (1970)- On the Paleozoic bryozoa of Japan and Thai-Malayan districts. *Journal of Paleontology* 44, 4, p. 680-692.

Sakagami, S. (1971)- On the Palaeozoic bryozoa collected by Dr. C.K. Burton from Chumphon, peninsular Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 9, p. 135-146.

Sakagami, S. (1973)- Permian Bryozoa from Khao Raen, near Rat Buri, Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 12, p. 75-89.
(*Diverse Artinskian (E Permian) bryozoa from Ratburi Lst at Khao Raen near Rat Buri*)

Sakagami, S. (1975)- Permian Bryozoa from Khao Hin Kling, near Phetchabun, North-Central Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 33-43.

Sakagami, S. (1976)- Paleobiogeography of the Permian Bryozoa on the basis of the Thai-Malayan District. In: T. Kobayshi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 17, p. 155-172.

(*Geographic distributions of Permian bryozoa genera. Notmuch detail on SE Asia*)

Sakagami, S. (1999)- Permian bryozoans from some localities in the Khao Hin Kling area near Phetchabun, North-central Thailand. *Bull. Kitakyushi Museum Natural History* 18, p. 77-103.

(online at: www.kmnh.jp/publication/ronbun_pdf/18-77-E-Sakagami.pdf)

(*30 species of bryozoa in outcrops in Permian Tak Fa limestone of Ratburi Gp. Associated with fusulinids (schwagerinids, etc.). Some species in common with Timor. Faunas indicate typical S and C Tethys realms (see companion paper on brachiopods by Yanagida & Nakornsri (1999))*)

Sakagami, S. & A. Hatta (1982)- On the Upper Permian *Palaeofusulina-Colaniella* fauna from Khao Doi Pha Phlung, North Thailand. In: T. Kobayshi, R. Toriyama & W. Hashimoto (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 24, p. 1-14.

(*Latest Permian (late Changhsingian) foram-rich limestone of Palaeofusulina sinensis- Colaniella parva Zone from limestone 60km NE of Lampang. With Paleofusulina sinensis, Colaniella lepida, C. xikouensis, Pachyphloia langei, Paraglobivalvulina piyasini n.sp., Reichelina changhsingensis, etc.*)

Sakagami, S. & J. Twai (1974)- Permian fusulinaceans from the Pha Duk Chik limestone and in the limestone conglomerate in its environs, North Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 49-81.

Salam, A., W. Lunwongsa, L. Tangwattananukul, W. Sirisookprasert, A. Veeravinantanakul, K. Zaw & P. Charusiri (2014)- On the Chatree deposit in Central Thailand: its tectonism, ages, magmatism, structures, alteration and mineralization. In: I. Basuki & A.Z. Dahlius (eds.) *Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI)*, Palembang, p. 331-341.

(*Chatree epithermal Au-Ag deposit in C Thailand in Late Permian and E Triassic arc-related volcanic host rock units. Late Permian Suite 1 probably formed immediately after start of subduction and creation of new island arc. Less depleted E Triassic Suite 2 erupted during steady state subduction. Mineralization during switch between two mantle sources at Permo-Triassic boundary (~250 Ma). U-Pb zircon ages of emplacement of plutonic rocks at ~250-240 Ma and ~215-205 Ma. NNW-SSE normal faults response to E-W back arc extension prior to or during earliest Triassic. N-S trending reverse faults related to Triassic collision*)

Salam, A., K. Zaw, S. Meffre, J. McPhie & C.K. Lai (2014)- Geochemistry and geochronology of the Chatree epithermal gold-silver deposit: implications for the tectonic setting of the Loei Fold Belt, central Thailand. *Gondwana Research* 26, p. 198-217.

(Chatree Au deposit between Phichit and Phetchabun provinces, C Thailand, is largest epithermal Au deposit in mainland SE Asia. Hosted by Late Permian- E Triassic volcanics, which can be subdivided into 4 stratigraphic units and two volcanic suites. Late Permian Suite 1 formed immediately after onset of subduction and creation of new island arc. E Triassic Suite 2 units erupted during ongoing subduction. Chatree Au mineralization occurred during switch between mantle sources at Permo-Triassic boundary (~250 Ma))

Salyapongse, S. (1992)- Foliated contact metamorphic rock of the eastern Gulf of Thailand. Thai Geoscience 2, p. 35-42.

Salyapongse, S., H. Fontaine, P. Putthapiban & A. Lamjuan (1997)- Geology of the Eastern Thailand (Route No. 1)- Guidebook for excursion. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, p. 1-69.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1997/2520_1.pdf)

(Brief review of E Thailand geology and fieldtrip stops in Shan Tai and Indochina terranes)

Salyapongse, S., H. Fontaine & K. Sashida (2000)- Petrologic and paleontologic constraints of rock associations- pyroclastics, volcanoclastics and limestones in Nan, Phayao and Prae Provinces. Natural History Bull. Siam Society 48, p. 137-169.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2543/6923.pdf)

('Post-tectonic'? rhyolitic volcanics in NE corner of N Thailand (Nan, etc. provinces) near Laos border associated with Late Triassic limestones (volcanics formerly regarded as Jurassic-age (fossils see Fontaine, Salyapongse et al. 2000))

Salyapongse, S. & K. Sashida (2002)- Volcanic rock fragments in sandstone associated with Triassic chert beds at Nong Pru, Kanchanaburi province. Ref.?, p. 13-20.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2543/6935.pdf)

(Triassic volcanic sandstone with E Carboniferous chert pebbles, possibly sourced from Sukhothai volcanic belt)

Salyapongse, S. & K. Pitakpaivan (1999)- Older eolian evidences on the Khorat Plateau. J. Geological Society Thailand 1, p. 18-26

Salyapongse, S. & P. Putthapiban (1997)- A reconsideration of the Nan Suture. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 403-411.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7644.pdf)

(Nan suture with High P- low T eclogite- glaucophane schist- greenschist, as common in large orogenic belts, and indicative of subduction zone)

Saminpanya, S., J. Duangkrayom, P. Jintasakul & R. Hanta (2014)- Petrography, mineralogy and geochemistry of Cretaceous sediment samples from western Khorat Plateau, Thailand, and considerations on their provenance. J. Asian Earth Sciences 83, p. 13-34.

Saminpanya, S. & F.L. Sutherland (2014)- Different origins of Thai area sapphire and ruby, derived from mineral inclusions and co-existing minerals. European J. Mineralogy 23, 4, p. 683-694.

(Gem corundum from Thailand divided into sapphire and ruby suites. Rubies may have crystallized in high-P metamorphic rock of ultramafic/mafic composition. Sapphires may have crystallized in high-grade metamorphic rock or from highly alkaline magmas, at shallower depths than those hosting Thai rubies)

Sangsomphong, A., T. Thitimakorn & P. Charusiri (2015)- Interpretation of tectonic setting in the Phetchabun Volcanic Terrane, Northern Thailand: evidence from enhanced airborne geophysical data. J. Southeast Asian Earth Sciences 107, p. 12-25

(Aeromagnetic data used to interpret subsurface structures of Carboniferous-Triassic Phetchabun Volcanic Terrane, now largely covered by thick Cenozoic sediment deposits. Four distinct structural domains, N, E, C

and W. Elongate units interpreted to represent Late Carboniferous intrusive bodies. tied to E-ward subduction of Nakhonhai oceanic plate beneath Indochina continental plate, along Loei suture)

Sangsomphong, A., D. Tulyatid, T. Thitimakorn & P. Charusiri (2013)- Tectonic blocks and suture zones of eastern Thailand: evidence from enhanced airborne geophysical analysis. *Annals Geophysics* 56, 1, R0102, p. 1-12.

(online at: www.annalsofgeophysics.eu/index.php/annals/article/viewFile/5547/6201)

(Airborne geophysical data used to analyze tectonic structures of SE Thailand. Main regional structure trends NW-SE, with sinistral fault movements, result of E-W compression that generated strike-slip movement before Indian-Asian collision. Faults cross-cut by NE-SW sinistral fault and NW-SE dextral faults, which formed after Indian-Asian collision from transpression sinistral shear in NW-SE direction. Three geophysical domains: N (Indochina block), C (Nakhonhai block) and S (Lampang-Chaing Rai block) and lower Southern Subdomain with Shan Thai block)

Sanjit, P., N. Wonganan & Y. Thasod (2013)- Devonian radiolarian faunas in Pai Area, Mae Hong Son Province, Northern Thailand: paleogeographic implication. *J. Science Technology Mahasarakham University (MSU)* 33, 4, p. 393-402.

(online at: www.journal.msu.ac.th/upload/articles/article444_18057.pdf)

(High-diversity Devonian radiolarian fauna from N-S trending, vertically dipping dark-grey pelagic thin-bedded chert in Pai district in N Thailand (= Paleotethys Ocean floor sediment in Paleotethys suture zone). With 21 taxa/ 8 genera, identified as M-L Devonian (*Trilonche dihelicis*, *T. echinata*, *Stigmospaerostylus*, etc. and Late Devonian (*Trilonche palimbola*, *T. altasulcata*, *T. australis*, etc.))

Sardsud, A., T. Nuchanong & S. Potisat (1997)- Diamonds in Thailand. Department of Mineral Resources, Mineral Resources Development Division Document 3, p. 1-83.

(online at: <https://khao-lak-ausfluege.de/wp-content/uploads/2024/06/diamond-in-thailand.pdf>)

(Five papers. Diamonds known from Peninsular Thailand since 1955, from tin dredgings. Despite multiple investigations, origin still not clear; most likely source (Permian) pebbly greywacke of the Phuket Series)

Sasada, M., B. Ratanasthien & R. Soponpongpiat (1987)- New K-Ar ages from the Lampang basalt, Northern Thailand. *Bull. Geological Survey of Japan* 38, 1, p. 13-20.

(online at: https://www.gsj.jp/data/bull-gsj/38-01_04.pdf)

(Two samples of aphyric Lampang basalts from SW part of Mae Moh basin, NW Thailand. Chemically of basanite composition. Whole rock ages 0.8 ± 0.3 Ma and 0.6 ± 0.2 Ma. K-Ar ages may give lower limit of formation age because of argon loss due to hydration. Most flows of Lampang basalt normal polarity, except lower flow. Some flows overlie gravel with early Paleolithic pebble tools. One of the youngest igneous activity in mainland SE Asia)

Sashida, K., P. Hong, T. Ito, S. Salyapongse & P. Putthapiban (2023)- Late Triassic (late Early to early Middle Norian) and Late Triassic or Early Jurassic radiolarians from limestone in the Tha Sao Area, Kanchanaburi Province, Western Thailand: low-latitude fauna in the Eastern Tethys. *Paleontological Research (Palaeontological Society of Japan)* 28, 1, p. 37-67.

(online at: <https://bioone.org/journalArticle/Download?urlId=10.2517%2FPR220007>)

(Late Triassic radiolaria from two sections of limestone-dolomitic limestone in Tha Sao area, Kanchanaburi, W Thailand, previously assigned to Permian. 53 species/39 genera, representative of low latitude Tethyan fauna (in basin immediately before closing of (Pale-)Tethys Ocean between Sibumasu and Indochina blocks ?)

Sashida, K., P. Hong, P. Nimnate, T. Ito, K. Trakunweerayut, S. Salyapongse & P. Putthapiban (2023)- Late Paleozoic and Early Mesozoic radiolarians from chert conglomerates embedded in the Kaeng Raboet Formation (Upper Mesozoic continental red-bed), Kanchanaburi Province, western Thailand. *Revue de Micropaleontologie* 80, 100728, p. 1-19.

(Reworked E Carboniferous- M Norian (U Triassic) chert clasts with radiolaria in Late Jurassic- E Cretaceous continental redbeds at Wat Phu Toey, W Thailand (Sibumasu terrane). Probably eroded from Mae Sariang Zone (Inthanon Zone; Paleotethys suture))

Sashida, K. & H. Igo (1992)- Triassic radiolarians from a limestone exposed at Khao Chiak near Phattalung, southern Thailand. Transactions Proceedings Paleontological Society of Japan, N.S., 168, p. 1296-1310.
(online at: www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NSI68.pdf)
(Limestones around Phattalung regarded as S extension of Permian Ratburi Lst, but with Triassic (Anisian) radiolaria)

Sashida, K. & H. Igo (1999)- Occurrence and tectonic significance of Paleozoic and Mesozoic radiolaria in Thailand and Malaysia. In: I. Metcalfe (ed.) Gondwana dispersion and Asian accretion, IGCP 321 Final Results Volume, Balkema, Rotterdam, p. 175-196.
(Cherts and associated shales in various parts of Thailand and Peninsular Malaysia contain rich U Devonian- M Triassic radiolarian faunas, allowing subdivision in 13 zones (representing Paleo-Tethys Ocean sediments). Late Devonian- E Carboniferous 'Pak Chom Chert' on W margin of Indochina Block remnants of Paleotethys Ocean. Timing of collision of Shan-Thai with E Malaya is E Triassic and Shan-Tai with Indochina Late Triassic or later)

Sashida, K., H. Igo, S. Adachi, K. Ueno, Y. Kajiwarra, N. Nakornsri & A. Sardud (2000)- Late Permian to Middle Triassic radiolarian faunas from Northern Thailand. Journal of Paleontology 74, 5, p. 789-811.
(Wuchiapingian- Anisian radiolarians from Shan-Thai Block in thin chert- shale sequences exposed N of Chiang Mai, NW Thailand. 50 species, 35 genera. Radiolarians identical to faunas of Late Permian *Neobaillella ornithoformis* and *N. optima* zones and E Triassic *Parentactinia nakatsugawaensis* and *Triassocampe coronata* Assemblage Zones in chert sequences of Japan)

Sashida, K., H. Igo, S. Adachi, K. Ueno, N. Nakornsri & A. Sardud (1998)- Late Paleozoic radiolarian faunas from northern and northeastern Thailand. Science Reports Inst. Geoscience, University of Tsukuba, B, 19, p. 1-27.

Sashida, K., H. Igo, K. Hisada, N. Nakornsri & A. Ampornmaha (1993)- Occurrence of Paleozoic and Early Mesozoic radiolaria in Thailand (preliminary report). In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 97-108.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1993/7593.pdf)
(Devonian. E Carboniferous and Permian radiolaria found in 'Fang Chert' near Chiang Mai, NW Thailand (= Paleotethys ocean floor sediment). Late Devonian- E Carboniferous radiolaria also in tuffaceous shale/ chert in Loei area near Pak Chom (NE Thailand, Indochina Block). Well-preserved late E Triassic radiolarians in limestone near Phattalung, S Peninsular Thailand)

Sashida, K., H. Igo, K. Ueno, N. Nakornsri & A. Sardud (1998)- Late Paleozoic radiolarian faunas from northern and northeastern Thailand. Science Reports Inst. Geoscience, University of Tsukuba, B 19, p. 1-27.

Sashida, K., T. Ito, P. Hong, Y. Fukushima, S. Agematsu, S. Salyapongse & P. Putthapiban (2022)- Occurrence of Early Carboniferous radiolarians and Middle Triassic conodonts from Ban Rai, Southwestern Uthai Thani, Central Thailand and its geological significance. Paleontological Research (Palaeontological Society of Japan) 26, 4, p. 420-439.
(online at: <https://bioone.org/journals/paleontological-research/volume-26/issue-4/PR200056/Occurrence-of-Early-Carboniferous-Radiolarians-and-Middle-Triassic-Conodonts-from/10.2517/PR200056.full>)
(Bedded chert intercalated with sandstone and chert conglomerate, and 10m limestone block in Ban Rai area, with (1) E Carboniferous radiolarians (presumably deposited on upper continental rise of Sibumasu Terrane along Paleotethys Ocean) and (2) limestone with M Triassic (E Anisian) conodonts (deposited on continental shelf at margin of Sibumasu). Blocks probably mixed by submarine sliding at E margin of Sibumasu, after M Triassic)

Sashida, K., T. Ito, S. Salyapongse & P. Putthapiban (2021)- Additional occurrence report on early Carboniferous radiolarians from southern peninsular Thailand. Thai Geoscience J. 2, 2, p. 72-87.

(online at: <https://ph03.tci-thaijo.org/index.php/TGJ/article/view/1789/1368>)

(Radiolarians from Carboniferous black chert interbedded with sandstone and variegated siliceous shale in quarry near Ka Bang, Songkhla Province, S Peninsular Thailand. 13 species 7 genera indicate Tournaisian-Visean age. Also Tournaisian radiolarian fauna from black bedded chert in Saba Yoi Kabang area. May have been deposited in margin of Paleotethys Ocean)

Sashida, K., T. Ito, S. Salyapongse & P. Putthapiban (2021)- Permian and Triassic radiolarians from chert breccia in the Nong Prue area, western Thailand: its origin and depositional setting in the Paleotethys. *Palaeoworld* 31, 1, p. 103-115.

(online at: <https://www.sciencedirect.com/science/article/pii/S1871174X21000068>)

(Bedded chert- siliceous shale successions in Nong Prue area, NW of Kanchanaburi, W Thailand, previously regarded as Silurian-Devonian units, but yielded U Permian and L-M Triassic radiolarians. Chert breccia of sedimentary origin and deposited in Paleotethys, derived from siliceous rocks in distal margin to deep ocean basin of Sibumasu Terrane. Correlated with Semanggol Fm of Peninsular Malaysia and related rocks in Phatthalung and Hat Yai area of S Peninsular Thailand and Mae Sariang and Mae Sot areas of NW Thailand)

Sashida, K. & N. Nakornsri (1997)- Lower Permian radiolarian faunas from the Khanu Chert Formation distributed in the Sukhothai area, northern Central Thailand. In: P. Dheeradolok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok, Dept. Mineral Resources, 1, p. 101-108.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(Lower Permian Pseudoalbaillella spp. radiolarian assemblages from deformed phyllitic bedded Khanu Chert Fm of Sukhothai foldbelt (Paleotethys suture))

Sashida, K., N. Nakornsri, K. Ueno & A. Sardud (2000)- Carboniferous and Triassic radiolarian faunas from the Saba Yoi area, southernmost part of Peninsular Thailand and their paleogeographic significance. *Science Reports Institute of Geoscience, University of Tsukuba, B, Geological Sciences* 21, p. 71-99.

(see also Sashida et al. 2002)

Sashida, K. & S. Salyapongse (2002)- Permian radiolarian faunas from Thailand and their paleogeographic significance. *J. Asian Earth Sciences* 20, 6, p. 691-701.

(Eight Permian radiolarian zones in chert and fine-grained pelagic-hemipelagic rocks in Permian of Thailand, Deposited in deep pelagic environment of Paleotethys Ocean that existed between Late Devonian- M Triassic. N Thailand uppermost Permian- M Triassic deposited in pelagic basin, in E Thailand change in depositional environment from deep pelagic in Permian to shallow seas in Triassic)

Sashida, K., S. Salyapongse & P. Charusiri (2002)- Lower Carboniferous radiolarian fauna from the Saba Yoi-Kabang area, southernmost part of Peninsular Thailand. *Micropaleontology* 48, Suppl. 1, *Proc. INTERRAD* 9, p. 129-143.

(U Tournasian radiolaria from black chert in thick-bedded sandstone at Saba Yoi-Kabang, S Peninsular Thailand, near Malaysia border. 23 species of Albaillella indensis assemblage, also known from Pyrenees, SW China, Malay Peninsula and E Australia. Deposited in pelagic- hemipelagic environment in Paleotethys Ocean)

Sashida, K., S. Salyapongse & N. Nakornsri (2000)- Latest Permian radiolarian fauna from Klaeng, Eastern Thailand. *Micropaleontology* 46, 3, p. 245-263.

(Latest Permian radiolarian fauna from chert-clastic sequence at Khao Wang Chik, Klaeng, E Thailand (Shan-Tai Block). composed of Neoalbaillella, Albaillella, Entactinia, etc. and represent latest Permian Neoalbaillella optima Assemblage, also known from Japan, Russian Far East, Philippines, S and SW China, and N Thailand. Probably deposited in deep, pelagic environment of Paleotethys Ocean)

Sashida, K., A. Sardud, H. Igo, N. Nakornsri, S. Adachi & K. Ueno (1998)- Occurrence of Dienerian (Lower Triassic) radiolarians from the Phatthalung area of Peninsular Thailand and radiolarian biostratigraphy around the Permian/Triassic (P/T) boundary. *News of Osaka Micropaleontologists, Special Vol. 11*, p. 59-70.

- Sashida, K., K. Ueno, N. Nakornsri & A. Sardud (1999)- Lithofacies and biofacies of the Khlong Kon limestone, southern Peninsular Thailand. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Chiang Mai University, p. 228-241. (ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)
(M-L Triassic Khlong Kon limestone hills in southern Peninsular Thailand (Shan-Tai/ Sibumasu block) up to 240m high steep karst hills. Overlies siltstones with *Daonella*. Few fossils, including oncoidal-peloidal facies. Foraminifera include “*Endothyranella*” wirtzi, *Glomospira*, “*Endothyra*”, *Malayspirina fontainei* and *Duostominidae*). Possibly correlates to Bukit Chuping Bukit Koding, etc. limestones in Peninsular Malaysia)
- Sattayarak, N. (1983)- Review of the Mesozoic stratigraphy of Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 127-148.
(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_07.pdf)
(Thailand widespread non-marine Mesozoic redbeds, especially in NE (Khorat Plateau). More marine in W. Mainly of Triassic age (+ Jurassic- E Cretaceous?; JTVG))
- Sattayarak, N. (1992)- Petroleum exploration opportunities in Thailand. Proc. Nat. Conf. Geological Resources of Thailand: potential for future development, Bangkok 1992, Dept. Mineral Res., p. 668-675.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1992/6257.pdf)
(Thailand with 8 petroleum provinces. Established plays mainly in Oligo-Miocene faulted sands. Dry gas produced from Permian carbonates in NE. Several other potential plays)
- Sattayarak, N. (2005)- Petroleum potential of the northeast Thailand. In: L. Wannakao (ed.) Proc. Int. Conf. Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2005), Khon Kaen 2005, p. 21-30.
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2005/9311.pdf)
(Multiple Pre-Tertiary hydrocarbon play types in Khorat Basin area of NE Thailand. Main gas production from Permian carbonates (Nam Phong field))
- Sattayarak, N., B. Chaisilboon, S. Srikulwong, R. Charusirisawat et al. (1998)- Tectonic evolution and basin development of the Northeast Thailand. Seminar on Mesozoic redbeds in the northeastern Thailand, Dept. Mineral Resources, Bangkok, p. 1-20.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1997/270.pdf)
- Sattayarak, N., B. Chaisilboon, S. Srikulwong, R. Charusirisawat et al. (1999)- Tectonic evolution and basin development of Northeast Thailand. Proc. 35th Session Coord. Comm. Coastal Offshore Geoscience Programmes E and SE Asia (CCOP), Subic Bay 1998, 2, Technical Reports, p. 39-62.
(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1997/270.pdf)
- Sattayarak, N., S. Polachan & R. Charusirisawat (1991)- Cretaceous rock salt in the northeastern part of Thailand. In: 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, p. 36. (Abstract only)
- Sattayarak, N., S. Praditthan & C. Chonglakmani (1997)- Stratigraphy and depositional environment of the upper Palaeozoic and Mesozoic sediments in the central and northeastern parts of Thailand (Route No. 3). Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), p. 1-69.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1997/2520_3.pdf)
(Brief review of Paleozoic- Mesozoic stratigraphy of Thailand and fieldtrip stops)
- Sattayarak, N., S. Srigulwong & S. Pum-Im (1989)- Petroleum potential of the Triassic pre-Khorat intermontane basins in northeastern Thailand. In: T. Thansutipak & P. Ounchanum (eds.) Proc. Int. Conf. Intermontane basins: geology and resources, Chiang Mai University, p. 43-58.

Sattraburut, T. & B. Ratanasthien (2022)- Maceral association in coal-bearing formation of Mae Than coal mine in Lampang, Thailand - implication for depositional environment. *Environment and Natural Resources J.* 20, 1, p. 96-109.

(online at: <https://ph02.tci-thaijo.org/index.php/ennrj/article/download/245652/166487/864998>)

(Low-ranked coal mined in small Tertiary Mae Than intermontane basin in Lampang Province, N Thailand. Coals contain more huminite than liptinite macerals, while inertinite is negligible. Small to moderate amounts of mineral matter. Coals formed mainly in a freshwater forest swamp or mire in a warm temperate climate)

Savage, N. (2013)- Late Devonian conodonts from Northwestern Thailand. Trinity Press Co., Eugene, Oregon, p. 1-48.

(11m thick section near Mae Sariang, NW Thailand (Sibumasu terrane), yielded late Frasnian- Famennian conodont faunas. Faunas mostly cosmopolitan, but with several new species of Palmatolepis, Polygnathus, Pseudopolygnathus and Siphonodella. Outer-shelf, starved basin setting)

Savage, N.M., A. Sardud & W. Buggisch (2006)- Late Devonian conodonts and the global Frasnian-Famennian extinction event, Thong Pha Phum, western Thailand. *Palaeoworld* 15, 2, p. 171-184.

(Late Devonian Frasnian- Famennian conodonts in W Thailand mostly cosmopolitan species. Thailand section includes U Kellwasser Event recorded in Europe, N America, China, etc. Regional disappearance or extinction of conodont species at Frasnian-Famennian boundary followed by recovery during E Famennian)

Savage, N.M., A. Sardud & P. Lutat (2007)- Famennian (Upper Devonian) conodonts from Mae Sariang, Northwestern Thailand. In: W. Tantiwanit (ed.) *Int. Conf. on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07)*, Bangkok, Dept. Mineral Resources, p. 87-92.

(Late Famennian conodonts (Lower- Middle expansa Zones) from outcrop SW of Mae Sariang, NW Thailand (= Sibumasu Terrane). Species mostly cosmopolitan, with new species Polygnathus sariangensis)

Savage, N.M., A. Sardud & M. Orchard (2006)- Conodonts of Dienerian age (Early Triassic) from northern Thailand. In: V. Luer et al. (eds.) *InterRad 11 & Triassic Stratigraphy Symposium*, Wellington 2006, p. 120.

(Dienerian (Early Triassic) Neospathodus dieneri conodont fauna reported from limestone outcrop possibly belonging to Doi Chiang Dao Limestone (= Carboniferous- Permian Paleotethys seamount Lst)

Scheffers, A., D. Brill, D. Kelletat, H. Bruckner, S. Scheffers & K. Fox (2012)- Holocene sea levels along the Andaman Sea coast of Thailand. *The Holocene* 22, 10, p. 1169-1180.

(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.883.4261&rep=rep1&type=pdf>)

(Several sea-level curves for younger Holocene published for Malay-Thai Peninsula. General assumption is rapid rise to M Holocene maximum up to +5 m above present sea level, followed by regression. Paleo-sea level indicators at Andaman Sea coast document Holocene maximum of +2.6 m at 5700 yr BP)

Schenk, C.J., R.R. Charpentier, T.R. Klett, T.J. Mercier, M.E. Tennyson, J.K. Pitman & M.E. Brownfield (2014)- Geology and assessment of unconventional oil and gas resources of the Phitsanulok Basin, Thailand. U.S. Geological Survey (USGS) Open-File Report 2014-1133, 1 sheet.

(online at: <http://dx.doi.org/10.3133/ofr20141133>)

Schenk, C.J., R.R. Charpentier, T.R. Klett, T.J. Mercier, M.E. Tennyson, J.K. Pitman & M.E. Brownfield (2014)- Assessment of potential unconventional lacustrine shale-oil and shale-gas resources, Phitsanulok Basin, Thailand, 2014: U.S. Geological Survey (USGS) Fact Sheet 2014-3033, 2p.

(online at: <http://dx.doi.org/10.3133/fs20143033>)

Schenk, C.J., T.R. Klett, T.J. Mercier, T.M. Fynn, M.E. Tennyson et al. (2014)- Assessment of Continuous Gas Resources in the Khorat Plateau Province, Thailand and Laos, 2016. U.S. Geological Survey (USGS) Fact Sheet 2017-3023, p. 1-4.

(online at: <https://pubs.usgs.gov/fs/2017/3023/fs20173023.pdf>)

(Assessment of undiscovered volumes of shale-gas and tight-gas resources potentially retained within lacustrine shales of Triassic Kuchinarai Gp and Triassic- Lower Cretaceous tight-clastic reservoirs of Khorat Plateau Province of NE Thailand and W Laos: mean technically recoverable resources 2.3 TCF of continuous gas)

Searle, M.P. & C.K. Morley (2011)- Tectonics and thermal evolution of Thailand in the regional context of SE Asia. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The geology of Thailand*, Geological Society, London, Chapter 20, p. 539-571

(online at: www.researchgate.net/profile/M-Searle/publication/284600815_Tectonic_and_thermal_evolution_of_Thailand_in_the_regional_context_of_SE_Asia/links/59956544a6fdccaded254c95/)

(Review of tectonic elements, history and thermal events of Thailand)

Searle, M.P., M.J. Whitehouse, L.J. Robb, A.A. Ghani, C.S. Hutchison, M. Sone, S.W.P. Ng, M.H. Roselee, S.L. Chung & G.J.H. Oliver (2012)- Tectonic evolution of the Sibumasu-Indochina terrane collision zone in Thailand and Malaysia: constraints from new U-Pb zircon chronology of SE Asian tin granitoids. *J. Geological Society, London*, 169, p. 489-500.

(online at: https://umexpert.um.edu.my/file/publication/00004083_88503.pdf)

(Three principal granite provinces across SE Asia (1) West Thailand-Myanmar I-type granites with tin mineralization in greisen-type veins (zircon core ages Late Triassic ~212-214 Ma; thermal overprint rims of 81 and 85-75 Ma; (2) N Thailand- W Malaya Main Range S-type biotite granites with tin mineralization resulting from crustal thickening following Sibumasu-Indochina collision in M Triassic (zircon ages ~215- 210 Ma); (3) E Malaya province of Permian-Triassic I-type granites also yield zircon rim age of ~80 Ma, showing Cretaceous magmatism in common with province 1. Two E-dipping subduction zones required in Triassic, one along Bentong-Raub Paleo-Tethyan suture, and one W of the Phuket-Burma province 1 belt)

Senowbari-Daryan, B. & R. Ingavat-Helmcke (1993)- Upper Permian sponges from Phrae province (northern Thailand). In: T. Thanasuthipitak (ed.) *International Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA)*, Chiang Mai 1993, 2, Chiang Mai University, p. 439-451.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7494.pdf)

(Uppermost Permian in Phrae Province, ESE of Chiang Mai, N Thailand, is shale- sandstone- limestone sequence W of Nan-Uttaradit suture. Limestones with Paleofusulina and Colaniella parva and locally rich sponge faunas)

Senowbari-Daryan, B. & R. Ingavat-Helmcke (1994)- Sponge assemblage of some Upper Permian reef limestones from Phrae province (Northern Thailand). *Geologija* 36, p. 5-59.

(Fauna of uppermost Permian reefal limestones of Phrae province, N Thailand dominated by sponges incl. hexactinellida, sclerospongia, 'sphinctozoans', and 'inozoans'. Associated with Tubiphytes and Hemigordius, but no corals and fusulinid foraminifera. Locality is just W of 'Nan-Uttaradit' suture, which was probably not trace of Paleotethys, but closure of minor oceanic basin)

Senowbari-Daryan, B. & M.F. Ridd (2008)- Two new Triassic sphinctozoan sponge species from near Kantang, Trang Province, Southern Thailand. *Palaeontologische Zeitschrift* 82, 3, p. 254-261.

(Triassic black limestone from near Kantang, Trang Province, S Thailand, contains two new species of calcified sphinctozoan sponge, Amblysiphonella parva and Platythalamella minima)

Sepulchre, P., D. Jolly, S. Ducrocq, Y. Chaimanee, J.J. Jaeger & A. Raillard (2010)- Mid-Tertiary paleoenvironments in Thailand: pollen evidence. *Climates of the Past* 6, p. 461-473.

(online at: www.clim-past.net/6/461/2010/cp-6-461-2010.pdf)

(Pollen assemblages from Late Oligocene and M-L Miocene mammal sites. Palynoflora from Oligocene suggests warm temperate forests at 24-26 Ma. M Miocene assemblages thermophilous taxa. Change can be linked to climate reorganization that brought warmer and wetter conditions over SE Asia around 22 Ma)

Sethakul, N. (1987)- Pongnok oil field. In: P. Thanasuthipitak (ed.) *Proc. Symposium on Cenozoic basins Thailand: Geology and resources*, Chiang Mai University 1984, p. 21-42.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=8474&bid=7347>)

(Pongnok oil field in stratigraphic trap along E margin of intra-cratonic Fang Basin in non-marine Oligo-Miocene clastics. Twelve wells between 1978-1984)

Settakul, N. (1993)- Fang oil field: ramification for exploration in intermontane basins in Thailand. Proc. 5th ASEAN Council, ASCOPE 93, Bangkok 1993, p. 85-94.

(On oldest oilfield in Thailand. In non-marine Miocene deposits of small Fang intermontane half-graben basin, N Chiang Mai province)

Settakul, N. (2009)- Fang oilfield development. Walailak J. Science Technology (Thailand) 6, 1, p. 1-15.

(online at: <http://wjst.wu.ac.th/index.php/wjst/article/view/69/52>)

(Review of Fang oilfield, the oldest oil field in Thailand, in Fang intermontane basin, N Thailand, ~150 km N of Chiang Mai. Produced ~9 MMBO since 1960, from 240 wells. Seven sandstone reservoir zones, all in Maesod Fm. Oils high wax content (up to 18%))

Settakul, N. & V. Pimasarn (1991)- Source rock screening and oil/source correlation in the IF-30-01G and IF-30-02S wells, Fang Field, Thailand. In: P. Ounchanum & B. Ratanasthien (eds.) Proc. Annual Technical Meeting 1989, Geology Mineral Resources Thailand, Indochina and Myanmar, and IGCP-246, Pacific Neogene event in Southeast Asia, 1990, Chiang Mai University, Special Publ. 9, p. 111-140.

Sha, Jin-Geng & A. Meesook (2013)- Non-marine Cretaceous bivalve biostratigraphy of Thailand and Southern Lao PDR. In: C. Senebottalath et al. (eds.) Proc. 2nd Lao-Tai Conf. Geology and Mineral resources, Vientiane, p. 47-69.

(online at: www.dmr.go.th/download/English/LAO%20-THAI%20Conference%202012_Proceedings.pdf)

(Cretaceous sediments in Thailand and Lao PDR entirely non-marine facies: widespread in NE, SE and S Thailand and much of Laos. Generally, reddish brown to light grey sandstones, claystones and conglomerates, with salts and gypsum only in Maha Sarakham and Saysomboun Fms. Two assemblages of Aptian-Albian trigoniodid bivalves, in NE and Peninsular Thailand and in Savannakhet (Donghen) Basin of S Laos: T kobayashi- Plicatounio suzukii assemblage, and T. diversicostatus-Pseudohyria subovalis assemblage)

Shawe, D.R. (1984)- Geology and mineral deposits of Thailand. U.S. Geological Survey (USGS) Open-File Report 84-403, p. 1-190.

(online at: <https://pubs.usgs.gov/of/1984/0403/report.pdf>)

Shen, L.J. & N. Siritongkham (2020)- The characteristics, formation and exploration progress of the potash deposits on the Khorat Plateau, Thailand and Laos, Southeast Asia. China Geology 3, 1, p. 67-82.

(online at: <https://www.sciencedirect.com/science/article/pii/S2096519220300276>)

(Review of giant M-L Cretaceous potash deposits on Khorat Plateau of NE Thailand- S Laos)

Shen, S., Q. Feng, W. Yang, Z. Zhang & C. Chonglakmani (2010)- Study on the geochemical characteristics of ocean-ridge and oceanic-island volcanic rocks in the Nan-Uttaradit zone, northern Thailand. Chinese J. Geochemistry 29, 2, p. 175-181.

(Ophiolite melange in Nan-Uttaradit zone, N Thailand, formed in Late Devonian- Permian. Metamorphic tholeiites similar to ocean-ridge basalts, hawaiiites in Nan area similar to oceanic-island basalts. Basalts are all oceanic volcanic rocks and part of Paleo-Tethys oceanic crust)

Shen, S., Q. Feng, W. Yang, Z. Zhang & C. Chonglakmani (2010)- Geochemical characteristics of island-arc volcanic rocks in the Nan-Nam Pat-Phetchabun zone, northern Thailand. Chinese J. Geochemistry 29, 4, p. 337-342.

(Late Permian-Early Triassic volcanic rocks on E side of ocean-ridge/oceanic-island basalts in Nan-Uttaradit zone are basaltic-andesite island-arc volcanics. Ocean-ridge-island-arc pair indicates oceanic crust of Nan-Uttaradit zone once was of E-ward subduction)

Shen, S., Q. Feng, W. Yang, Z. Zhang & C. Chonglakmani (2010)- Study on the geochemical characteristics of arc-volcanic rocks in the Chiang Rai-Lampang belt of northern Thailand. *Chinese J. Geochemistry* 29, 3, p. 255-260.

(Late Permian- E Triassic continent margin arc volcanics on E side of oceanic basalts in Chiang Mai belt indicative of E-ward subduction of oceanic crust in Chiang Mai belt)

Shen, S., Q. Feng, Z. Zhang & C. Chonglakmani (2009)- Geochemical characteristics of the oceanic island-type volcanic rocks in the Chiang Mai zone, northern Thailand. *Chinese J. Geochemistry* 28, 3, p. 258-263.

(Oceanic island arc rocks in Chiang Mai zone, N Thailand, are usually covered by Lower Carboniferous-Permian shallow marine carbonates. Geochemistry typical of oceanic island basalts and alkali basalts, similar to equivalents in Deqin and Gengma (Changning-Menglian zone) of Yunnan Province, China)

Shergold, J., C. Burrett, T. Akerman & B. Stait (1988)- Late Cambrian trilobites from Tarutao Island Thailand. *New Mexico Bureau of Mines Mineral Resources Memoir* 44, p. 303-320.

(~850m thick Tarutao Fm of Tarutao Island off SW Peninsular Thailand shallow marine clastics with U Cambrian and basal Ordovician trilobites. Terminal Cambrian assemblage with Micragnostus, Prosaukia, Hoytaspsis, Lophosaukia, etc. Fauna resembles assemblage known from Vietnam)

Sherwood, N.R., A.C. Cook, M. Gibling & C. Tantisukrut (1984)- Petrology of a suite of sedimentary rocks associated with some coal-bearing basins in northwestern Thailand. *Int. J. Coal Geology* 4, 1, p. 45-71.

(Drilling and mapping, in Mae Sot Basin show thick sequences of oil shales, with abundant lamalginite. Trace amounts of telalginite, liptodetrinite, bitumen/resinite and huminite/inertinite also present. Vitrinite reflectance date from oil shales and associated coals indicate low level of maturity. Oil shales from other Thai basins petrographically similar to Mae Sot lamosites. All deposited in lacustrine environments)

Shi, G.R. & N.W. Archbold (1995)- Permian brachiopod faunal sequences of the Shan-Thai terrane: biostratigraphy, palaeobiogeographical affinities and plate tectonic/palaeoclimatic implications. *J. Southeast Asian Earth Sciences* 11, p. 177-187.

(Five Permian brachiopod assemblages known from Shan-Thai terrane in W Thailand, W Malay Peninsula and Myanmar: Late Asselian-Tastubian cool-water fauna, three 'transitional' faunas of Sterlitamakian, Baigendzhinian- E Kungurian and Kazanian-Midian ages, and Late Permian (Dorashamian) warm-water Cathaysian fauna. Shan-Thai belonged to Indoralian Province of Gondwanan Realm in Asselian-Tastubian and was incorporated into Cathaysian Province in latest Permian)

Shi, G.R., L. Raksaskulwong & H.J. Campbell (2002)- Early Permian brachiopods from northern and central peninsular Thailand. In: L.V. Hills et al. (eds.) *Carboniferous and Permian of the World*, Canadian Society of Petroleum Geologists, Memoir 19, p. 596-608.

Shi, G.R., S. Shen, S., H.J. Campbell & L. Raksaskulwong (2001)- A *Meekella*-dominated Early Permian brachiopod assemblage from central Peninsular Thailand. In: R.H. Weiss (ed.) *Contributions to Geology and Paleontology of Gondwana in honour of Helmut Wopfner*, Cologne, p. 441-451.

(Small Meekella-dominated brachiopod assemblage from upper Khao Phra Fm of uppermost Kaeng Krachan Gp in C Peninsular Thailand (Sibumasu Terrane). In cross-bedded quartz sst above diamictite. With Meekella bisculpta and Costatumulus. Most likely Late Artinskian or Kungurian age. Transitional between temperate Gondwanan and warm-water Cathaysian faunas)

Silaratana, T., B. Ratanasthien K. Takayasu, W.S. Fyfe, P. Asnachinda et al. (2004)- Sulfur isotopic implication of Middle Miocene marine incursion in Northern Thailand. *Science Asia* 30, p. 43-58.

(online at: www.scienceasia.org/2004.30.n1/v30_043_058.pdf)

(Sulfur isotopic study in M Miocene of Mae Moh and Chiang Muan coal fields in N Thailand suggest marine incursion occurred during deposition of the U2 coal)

Simpson, A., S. Glorie, C.K. Morley, N.M.W Roberts, J. Gillespie & J.K. Lee (2021)- In-situ calcite U-Pb geochronology of hydrothermal veins in Thailand: New constraints on Indosinian and Cenozoic deformation. *J. Asian Earth Sciences* 206, 104649, p. 1-16.

(U-Pb dating of calcite veins in C and W Thailand. Calcite U-Pb dates for Khao Khwang fold-thrust belt 221 ± 7 Ma and 216 ± 3 Ma, showing calcite precipitation during tectonic activity of Indosinian Orogeny- II (Late Triassic- E Jurassic). Three Pagodas FZ results complex, protracted history of Cenozoic brittle deformation at ~ 48 and ~ 23 Ma. Good agreement with published age constraints on deformation history of Thailand)

Simpson, R. & S. Jitmahantakul (2021)- Extensional fault systems in Mae Moh Basin, Lampang province, Thailand, based on 3D seismic data. *Bull. Earth Sciences Thailand (BEST)* 13, 2, p. 52-64.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247285>)

(Mae Moe Basin is major NE-SW trending failed Paleogene? rift basin on remnants of Triassic Sukhothai Arc of N Thailand. Miocene sediments of basin significantly displaced by syn-rift and post-rift deformation. 3D seismic data show WNW and N-S trending extensional fault systems)

Sinclair, G. (1997)- A study of the Pranburi Formation and Khao Tao Formation. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Bangkok, Dept. Mineral Resources, 1, p. 337-345.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7643.pdf)

(Metamorphic formations at E side of Upper Peninsula of Thailand near Khao Tao. Pranburi Fm paragneiss and schist, marble and quartzite originally shallow marine island arc sediments. Khao Tao Fm orthogneiss originally granite. Since peak metamorphism in Late Triassic uplifted by ~ 10 km. Several deformation episodes. N-S to NNE-SSW trending folds and schistosity. Tied to Sibumasu- Indochina collision)

Singharajwarapan, S. (1994)- Deformation and metamorphism of the Sukhothai Fold Belt, Northern Thailand, Ph.D. Thesis, University of Tasmania, Hobart, p. 1-385.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1994/566.pdf)

(Sukhothai foldbelt area E of Lampang in N Thailand, close to Nan Suture. Sirikit Dam area stratigraphy: (1) Permo-Carboniferous? Pha Som Metamorphic complex (intensely deformed melange with ultramafics and metasediments with M-U Permian radiolarian chert, W-dipping), structurally juxtaposed against (2) Permian-Triassic Pak Pat Volcanics (mainly basaltic andesite lavas, minor dacites, tuffs; 1500m thick?; geochemistry suggestive of rifting of intra-oceanic arc to form back arc basin), (3) unconformably overlain by Triassic Nam Pat Gp (with volcanics-rich basal conglomerates and turbiditic series with Halobia/ Daonella in upper part; > 3000 m?)) and (4) unconformably covered by Phra Wihan Fm non-marine sst redbeds with M Jurassic plants. Also brief study of Doi-Inthanon metamorphic complex W of Lampang)

Singharajwarapan, S. (1994)- Provenance and tectonic setting of deposition of metagreywackes in the Nan River Suture, Northern Thailand. In: G.H. Teh (ed.) *Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98)*, Kuala Lumpur 1998, *Bull. Geological Society Malaysia* 43, p. 113-129.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1999012.pdf>)

(Metagreywackes from Sirikit Dam area in N Thailand cover part of Nan River Suture between Shan-Thai terrane in W and Indochina in E. Belong to Pha Som Metamorphic Complex of Carboniferous-Permian pumpellyite-actinolite facies metasediments and tectonic slices of ophiolitic mafic-ultramafic rocks. Interpreted as accretionary complex on W dipping subduction zone. Metagreywacke derived from (1) quartz-rich continental island arc source, probably deposited in submarine fan setting and (2) quartz-poor oceanic island arc source. Suggests accretionary complex older than Late Triassic Shan-Thai- Indochina amalgamation)

Singharajwarapan, S. & R.F. Berry (1993)- Structural analysis of the accretionary complex in Sirikit Dam area, Uttaradit, Northern Thailand. In: B.K. Tan et al. (eds.) *7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 233-245.

(Complexly folded Late Carboniferous- Permian metagreywackes and phyllites with enclosed mafic-ultramafic rocks in Sirikit Dam area are part of 'Nan River Ophiolite Belt', interpreted as suture between Shan-Tai in W and Indochina terrane in E. Tight isoclinal folding, S2 slaty cleavage, stretching lineations and metamorphism related to E-directed (W-dipping) accretionary thrusting)

Singharajwarapan, S. & R. Berry (2000)- Tectonic implications of the Nan Suture Zone and its relationship to the Sukhothai Fold Belt, Northern Thailand. *J. Asian Earth Sciences* 18, 6, p. 663-673.

(online at: <https://www.semanticscholar.org/paper/Tectonic-implications-of-the-Nan-Suture-Zone-and-to-Singharajwarapan-Berry/47c148a189446d00122984e4640a59685beb1e6a>)

(Nan Suture and Sukhothai Fold Belt mark Shan-Thai -Indochina collision zone. Shan-Thai Terrane rifted from Gondwana in E Permian. As it drifted N, subduction complex developed along N margin. Nan serpentinitic melange is Late Permian accretionary complex with offscraped blocks from subducted Carboniferous and Permian oceanic crust. Deformational style supports W-dipping subduction zone. Late Permian-Late Triassic fore-arc basin sediments preserved in Sukhothai Fold Belt. Sequence folded and complexly thrust in Late Triassic as result of collision. Post-orogenic sediments prograded across suture in Jurassic)

Singsoupho, S., T. Bhongsuwan & S.A. Elming (2015)- Palaeocurrent direction estimated in Mesozoic redbeds of the Khorat Plateau, Lao PDR, Indochina Block using anisotropy of magnetic susceptibility. *J. Asian Earth Sciences* 106, p. 1-18.

(online at: https://www.academia.edu/114791040/Palaeocurrent_direction_estimated_in_Mesozoic_redbeds_of_the_Khorat_Plateau_Lao_PDR_Indochina_Block_using_anisotropy_of_magnetic_susceptibility)

(AMS interpretation of Jurassic-Cretaceous rocks of Khorat Basin suggests palaeocurrent directions in undeformed redbeds predominantly from NNE and NE (Laos, Vietnam, China))

Singtuen, M. & B. Phajuy (2016)- Geochemistry and tectonic significance of andesitic rocks in Tak Province, Thailand. *Proc. 52nd Annual Session Coord. Comm. Geoscience Programmes E and SE Asia (CCOP)*, Bangkok, p. 65-74.

(online at: www.ccop.or.th/download/as/52as2.pdf)

(Geochemistry of M-L Triassic mildly calc-alkalic andesite porphyry from Chiang Kong- Lampang- Tak volcanic belt of NW Thailand. Erupted in volcanic arc setting)

Singtuen V., B. Phajuy, A. Anumart, P. Charusiri, N. Chawthai & H. Heggemann (2023)- Geochemistry and provenance of Mesozoic sandstones in Khon Kaen Geopark: Implication for tectonics of the western Khorat Plateau of Thailand. *PLoS One* 18, 4, e0284974, p. 1-26.

(online at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC10132642/>))

(Khon Kaen Geopark known as area of dinosaur fossil diversity. Mesozoic sedimentary rocks of Late Jurassic- E Cretaceous Khorat Gp immature sedimentary rocks, mainly clast-supported pebbly sandstone and siltstone. Sources of sediments mostly quartzose sedimentary rocks and some felsic-intermediate igneous rocks)

Sinhabaedy, P. & Y. Ionnikoff (2008)- Integrating high resolution sequence stratigraphy, sedimentology and structuration in complexly faulted thin-bedded fluvio-lacustrine reservoirs, Sirikit oil fields, onshore Thailand. *Proc. International Symposium Geoscience resources and environments of Asian Terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 387-394.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=13548&bid=18314>)

(Sirikit oilfields in Phitsanulok basin, Thailand, started production in 1982 and reached peak production of 26,740 BOD in 2000. Over 400 wells. Field geology complex, particularly deltaic reservoir architecture)

Siriwattanakajorn, W. (2017)- Depositional environment of the Lan Krabu Formation in Sirikit oil field, Phitsanulok Basin, Thailand. *Bull. Earth Sciences Thailand (BEST)* 9, 2, p. 102-113.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247069/167880>)

(E Miocene Lan Krabu Fm is main reservoir in Sirikit oil field, Phitsanulok Basin, N Thailand. Depositional environments identified as freshwater lake, lacustrine/delta, alluvial plain with fluvial channels, and alluvial fan. With freshwater Viviparidae gastropods and freshwater bivalves. Clastic sediment supply mainly from E and NE, with freshwater lake facies developed to west, in basin center)

Sirot, S. (2020)- Fusulinacean biostratigraphy and carbonate petrography of Khao Khwang and Khao Khad formations, Saraburi province. M.Sc. Thesis, Chulalongkorn University, Thailand, p. 1-97.

(online at: <https://digital.car.chula.ac.th/cgi/viewcontent.cgi?article=1369&context=chulaetd>)

(*E-M Permian fusulinid foraminifera of Khao Khwang and Khao Khad Fms, Saraburi province (=fold-belt at W margin of Indochina block). Identified 15 genera/ 15 species incl. Robustoschwagerina, Yangchienia, Parafusulina loeyensis, P. gigantea, Laosella edoensis, Pseudofusulina, Chusenella chihshiaensis, C. shengi, Verbeekina verbeeki, Misellina, Pseudodoliolina, Neoschwagerina megasphaerica, Colania douvillei, Thailandina, Lepidolina shiraiwensis, Presumatrina ciryi, Sumatrina annae and S. cf. longissima. Age Early M Permian to Late M Permian (Murgabian-Midian)*)

Sirot, S. & T. Charoentitirat (2021)- Oldest fusulinid of Khao Khad Formation, Saraburi Province. Bull. Earth Sciences Thailand (BEST) 13, 1, p. 39-46

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247238>)

(*Limestones at Khao Makok, in Khao Khad Fm, Saraburi province, with common M Permian fusulinids. Oldest fusulinids of Khao Khad Fm are Robustoschwagerina with Parafusulina, suggesting E Permian age (Sakmarian-Yakhtashian)*)

Sitthithaworn, E. & P. Wasuwanich (1992)- Metallogenic map of Thailand. In: C. Piancharoen (ed.) Proc. Nat. Conf. Geologic Resources of Thailand-potential for future development, Dept. Mineral Resources (DMR), Bangkok, p. 1-15.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6199.pdf)

(*Thailand three metallogenic provinces, NE, Central (A, Cu, etc.) and West (Sn, Pb, Zn, etc.) representing continental and subduction system settings*)

Smith, M., S. Chantraprasert, C.K. Morley & I. Cartwright (2007)- Structural geometry and timing of deformation in the Chainat duplex, Thailand. In: W.D. Cunningham & P. Mann (eds.) Tectonics of strike-slip restraining and releasing bends, Geological Society, London, Special Publ. 290, p. 305-323.

(*Chainat N-S trending strike-slip duplex ~100 km long, developed along sinistral Mae Ping fault zone, which was active during Cenozoic. Probably began to develop towards end of main phase of escape tectonics in Thailand, i.e. around 33-30 Ma. E and Late Miocene inversions in adjacent rift basins suggests possible activity in duplex. Possible minor episodic dextral motions in Late Oligocene-Miocene and/or Pliocene-Recent*)

Sone, M. (2006)- Permian brachiopods from Peninsular Malaysia, Thailand, and Cambodia: implications for biogeography, palaeogeography, and the tectonic evolution of SE Asia. Doct. Thesis University of New England, Armidale, Australia, p. 1-364.

(online at: <https://rune.une.edu.au/web/handle/1959.11/6838>)

(*Doctoral Thesis under Prof. Ian Metcalfe. 26 M Permian and one Late Permian brachiopod taxa described, based on new specimens from Cambodia, mainland Thailand and Peninsular Malaysia. New marine biogeographic province (Indochina Province) proposed for E-M Permian biota of Indochina Terrane and adjacent microterranes (distinct from tropical Cathaysian Province). Permian latitudes of Indochinese Province estimated at ~10°S-20°S. Sukhothai-Eastmal Island-arc (with Late Permian-E Triassic marine succession that is absent from Indochina Terrane) proposed for Permian island arc developed off W Indochina Terrane. It comprises Lancang, Sukhothai, Chanthaburi, E Malaya and W Sumatra terranes*)

Sone, M. (2010)- A new species of the rare neritopsid gastropod *Magnicapitatus* from the Guadalupian (Middle Permian) of East Thailand (the Indochina Terrane). Alcheringa 34, 1, p. 1-6.

(*Neritopsid gastropod genus Magnicapitatus from fusulinoid-rich limestone of Khao Taa Ngog Fm (Capitanian, M Permian) at Khao Makha in E Thailand near Cambodia border, in Indochina Terrane*)

Sone, M., C. Chonglakmani & A. Chitnarin (2009)- Middle Permian productidine brachiopods from Central Thailand (the Indochina Terrane) with paleobiogeographic implications. Journal of Paleontology 83, 5, p. 804-810.

(*Assemblage of productid brachiopods Haydenella, Paraplicatifera and Compressoproductus from Wordian of U Saraburi Limestone Gp of C Thailand (= W margin of Indochina Terrane) suggests endemism for M Permian marine faunule of Indochina Terrane*)

Sone, M. & I. Metcalfe (2008)- Parallel Tethyan sutures and the Sukhothai Island-arc system in Thailand and beyond. Proc. International Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516, and 5th APSEG Bangkok, p. 132-134.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/039.pdf)

(Short version of paper below)

Sone, M. & I. Metcalfe (2008)- Parallel Tethyan sutures in mainland Southeast Asia: new insights for Palaeo-Tethys closure and implications for the Indosinian orogeny. Comptes Rendus Academie Sciences, Paris, Geoscience 340, 2, p. 166-179.

(online at: <https://comptes-rendus.academie-sciences.fr/geoscience/item/10.1016/j.crte.2007.09.008.pdf>)

(Two parallel tectonic sutures in Yunnan-Thailand region: (1) Changning-Menglian and Inthanon (= M Triassic closure of M Devonian- M Triassic Paleo-Tethys Ocean with collision of Sibumasu) and (2) Jinghong-Nan-Sra Kaeo (= Late Permian collapse of local Permian back-arc basin). Sukhothai Zone not part of Sibumasu Terrane, but part of Permian island-arc on W margin of Indochina Terrane)

Sone, M. & I. Metcalfe (2010)- Stratigraphic correlation between the Sukhothai island arc in Thailand and the East Malaya Terrane in Peninsular Malaysia. Proc. 6th Symposium International Geological Correlation Program (IGCP), Project 516, Geological Anatomy of East and South Asia, Kuala Lumpur, p. 55. (Abstract only)

(Permo-Triassic Sukhothai island arc system, situated between Indochina and Sibumasu continental terranes, extends S into East Malaya Terrane, with similar granitoids and Carboniferous- Triassic marine sediments. At W side Paleo-Tethys/ Raub-Bentong suture, at E side short-lived Permian back-arc basin. Late Permian marine shales with Cathaysian lytonid brachiopods succeeded by latest Permian limestones)

Sone, M., I. Metcalfe & P. Chaodumrong (2012)- The Chanthaburi terrane of southeastern Thailand: stratigraphic confirmation as a disrupted segment of the Sukhothai Arc. J. Asian Earth Sciences 61, p. 16-32.

(online at: www.academia.edu/12539980/The_Chanthaburi_terrane_of_southeastern_Thailand_Stratig_Etc.)

(Chanthaburi terrane interpreted as S segment of Permo-Triassic Sukhothai Arc. In SE Thailand, extending into Cambodia, between Indochina and Sibumasu continental blocks. Klaeng tectonic line is boundary between Chanthaburi Terrane- Sibumasu block. Late Permian- Triassic largely absent due to Indosinian I unconformity (W Indochina) or mainly carbonates (Sibumasu). Brachiopod, previously reported as *Leptodus*, re-identified as *Oldhamina*, previously known elsewhere in SE Asia, in Thailand confined to Sukhothai Arc. Marine stratigraphy of Sukhothai Arc Permian-Triassic carbonates and siliciclastics with common volcanic material. Marine conditions on Sukhothai Arc terminated by end-Triassic, later than in Indochina block (Late Permian) but earlier than Sibumasu block (Jurassic/ Cretaceous))

Songtham W., (2003)- Stratigraphic correlation of Tertiary basins in northern Thailand using algae, pollen and spores. Ph.D. Thesis, Chiang Mai University, Thailand, p. 1-280. (Unpublished)

Songtham, W., J. Duangkrayom & P. Jintasakul (2012)- An Australasian tektite from the Yasothon soil series, Noen Sa-nga, Chaiyaphum, Northeastern Thailand. Proc. First Int. Symposium of IGCP-589, Acta Geoscientica Sinica 33, Supplement 1, p. 59-64.

(Quarries N of Noen Sa-nga, Khorat Basin, NE Thailand, with lower fluvial gravel unit (with thin ferricrete layer at top) and upper bright reddish brown structureless sand unit with fining-upward basal portion (Yasothon soil series). Black glassy tektite (4x2 cm) found at contact between two units. Tektite deposition followed by larger-sized sediments and angular quartz fragments forming fining-upward sedimentary series. Finer sediments gradually settled down, forming Yasothon structureless sand deposit. Meteoritic impact event occurred at ~0.77 Ma)

Songtham, W., D.C. Mildenhall, P. Jintasakul & J. Duangkrayom (2011)- Evidence of sedimentary deposits generated by an Early Pleistocene meteor impact in Northeastern Thailand. In: Int. Conference Geology, Geotechnology and Mineral Resources of Indochina (GEOINDO 2011), Khon Kaen, p. 66-71.

(Yasothon soil horizon wide distribution in Khorat basin, NE Thailand. Probably 'loess', catastrophically generated by Pleistocene meteor impact in Buntharik, Ubon Ratchathani, at ~0.7-0.8 Ma, as dated by tektites

(*Bunopas 1990; part of Australasian strewnfield*). *Yasothon soils with 10-30 cm thick basal breccia, with sharp angular rock fragments (incl. tektites at base, fining upward into structureless silt -fine sand, interpreted as airfall deposit. Size of basal breccia coarser in E than in W, suggesting impact site in E, possibly circular raised ridge 13km across, W of Phanom Phrai)*

Songtham, W., D.C. Mildenhall & B. Ratanasthien (2012)- Petrified tree trunks from a gravel deposit, Ban Tak Petrified Forest Park, Ban Tak- Sam Ngao Basin, Tak Province, Northern Thailand. *J. Science Technology Mahasarakham University (MSU)*, p. 93-100.

(online at: www.thaiscience.info/journals/Article/JSMU/10887847.pdf)

(*Fossil tree stumps and up to 72.2m long trunks from fluvial and alluvial fan deposits in excavation pits at Ban Tak (Bantak) Petrified Forest Park identified as Koompassioxylon elegans and Pahudioxylon cf. sahnii. Ban Tak- Sam Ngao basin fluvial sediments on granite. Sediments deposited under tropical humid climate with deciduous forests. Tentative age E Pleistocene*)

Songtham, W., B. Ratanasthien & D.C. Mildenhall (2001)- Tropical palynofloras from Middle Miocene Chiang Muan basin, Phayao, Thailand. ?

(online at: www.thaiscience.info/Article%20for%20ThaiScience/Article/61/10012001.pdf)

(*Sporomorphs from M Miocene sediments of Chiang Muan basin include abundant Crassoretitritetes vanraadshoovenii, Dipterocarpaceae, Ilexpollenites, Botryococcus and rare Florschuetzia, representing tropical palynofloras derived from tropical monsoon forests, accumulated mainly in lacustrine environments (= M Miocene Thermal Maximum? JTVG)*)

Songtham, W., B. Ratanasthien & D.C. Mildenhall (2004)- New species of algae *Actinastrum* Lagerheim and *Closterium nitzsch* ex Ralfs from Middle Miocene sediments of Chiang Muan basin, Phayao, Thailand, with tropical pollen composition. *Science Asia* 30, p. 171-181.

(online at: www.scienceasia.org/2004.30.n2/v30_171_181.pdf)

(*Two new algal species of algae Actinastrum bansaense n. sp. and Closterium thailandicum from late M Miocene (~13.5 -10 Ma) lacustrine deposits associated with coals of Chiang Muan basin. Palynofloras from tropical monsoon forests (incl. Crassoretitritetes vanraadshoovenii fern spores, also Dipterocarpaceae, Lagerstroemia, Ilexpollenites, Myrtacidites and Combretaceae with rare Florschuetzia-type, Homonoia, Calophyllum, Striatritetes susannae, Botryococcus and Mimosaceae. Laevigatosporites haardtii fern spores in some horizons. Three acme zones; upper zone mainly with freshwater alga Actinastrum bansaense*)

Songtham, W., B. Ratanasthien, D.C. Mildenhall, S. Singharajwarapana & W. Kandharosa (2001)- Palynological zonation and their paleovegetations of Ban Pa Kha coal mine, Li basin, Changwat Lamphun. In: Geological Survey Division Annual Academic Meeting, Dept. Mineral Resources (DMR), Bangkok, p. 1-11.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2544/6144.pdf)

(*Palynology of Oligocene- E Miocene Li Basin sediments, N Thailand. Climate became warmer and wetter with time*)

Songtham, W., B. Ratanasthien, D.C. Mildenhall, S. Singharajwarapana & W. Kandharosa (2003)- Oligocene-Miocene climatic changes in Northern Thailand resulting from extrusion tectonics of Southeast Asian landmass. *Science Asia* 29, p. 221-233.

(online at: www.scienceasia.org/2003.29.n3/v29_221_233.pdf)

(*Tertiary basins of N Thailand two main palynological assemblages: warm temperate (Oligocene- E Miocene; with common conifers) and tropical (M Miocene, probably also E Miocene age). Climate in Thailand changed from temperate to tropical in Oligo-Miocene, possibly caused by S-SE-ward movement of SE Asian landmass by extrusion tectonics induced by India- Eurasia collision, beginning at ~40-50 Ma)*)

Songtham, W., B. Ratanasthien, M. Watanasak, D. Mildenhall, S. Singharajwarapan & W. Kandharosa (2005)- Tertiary basin evolution in northern Thailand: a palynological point of view. *Natural History Bull. Siam Society* 53, 1, p. 17-32.

(online at: https://thesiamsociety.org/wp-content/uploads/2020/04/NHBSS_053_1g_Songtham_TertiaryBasinEvol.pdf)

(Tertiary basins in NW Thailand developed in Oligocene- M Miocene, initially in warm-temperate climate, with mid-latitude forests. Early Miocene warming until completely tropical in late E Miocene, persisting until end of M Miocene)

Songtham, W., H. Ugai, S. Imsamut, S. Maranate, W. Tansathien, A. Meesook & W. Saengsrirachan (2005)- Middle Miocene molluscan assemblages in Mae Moh Basin, Lampang Province, Northern Thailand. *Science Asia* 31, p. 183-191.

(online at: www.scienceasia.org/2005.31.n2/v31_183_191.pdf)

(Fresh-water molluscs in M Miocene Mae Moh Gp of N Thailand (?Paludina, Melanoides, Bellamya, Margarya, Planorbidae, etc.))

Srichan, W. (2008)- Petrochemistry, geochronology and tectonic implication of the Chiang Khong-Lampang-Tak Volcanic belt, Northern Thailand. Ph.D. Thesis, University of Tasmania, p. 1-284. *(Unpublished)*

(Chiang Khong-Lampang-Tak volcanic belt part of Sukhothai Fold Belt in N Thailand, between Chiang Mai (Inthanon) and Nan-Sra-Kaeo sutures. Here suggested to form in post-collisional, extensional Basin and Range-type setting (crustal thickening due to late M Triassic collision between Shan-Thai and Indochina terranes, followed by rifting led to post-collisional magmatism). Zircons U-Pb ages mainly late M-early Late Triassic (220-230 Ma). Permian zircons in Late Triassic igneous rocks possibly inherited from Permian granites. Detrital zircons in belt's sediments indicate Late Devonian-E Carboniferous, Permian and Late Triassic rocks exposed in provenance areas. Thin-skinned, mainly E-directed fold-thrust deformation. Unconformably overlain by Latest Triassic- E Jurassic Khorat Gp molasse)

Srichan, W. (2011)- Petrology and geochronology of igneous rocks from Thoen District, Lampang Province, Northern Thailand. *Proc. International Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011)*, Khon Kaen, p. 54-57.

(Granites and andesitic mafic dykes from Thoen District, Lampang, in S part of Chiang Khong-Lampang-Tak volcanic belt (= C part of Sukhothai Fold Belt; 240-220 Ma). Mafic rocks evolved from basalt- andesite and have calc-alkalic composition, erupted in continental margin arc environment associated with subduction zone. U-Pb zircon ages of felsic igneous rocks 231 Ma (late M Triassic); dykes are younger)

Srichan, W. (2015)- Age dating of rocks in the Chiang Khong-Lampang-Tak Volcanic belt, northern Thailand. *Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015*, p. 77-78. *(Abstract only)*

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(U-Pb-Th zircon ages of igneous and sedimentary rocks in Chiang Khong-Lampang-Tak volcanic belt in middle part of Sukhothai Fold Belt. Most volcanic belt igneous rocks crystallized in late M- early Late Triassic (216-237 Ma) and show zircon age groups of ~220 Ma and ~230 Ma. Permian zircons (261-280 Ma) possibly inherited from Permian granites. Detrital zircons in sedimentary rocks in belt indicate Devonian-Carboniferous, Permian and Late Triassic rocks in provenance areas)

Srichan, W., A.J. Crawford & R.F. Berry (2009)- Geochemistry and geochronology of Late Triassic volcanic rocks in the Chiang Khong region, Northern Thailand. *Island Arc* 18, 32-51.

(Chiang Khong segment of Chiang Khong-Lampang-Tak Volcanic Belt (part of Sukhothai volcanic arc) in NW Thailand composed of three meridional sub-belts of mafic-felsic volcanic, volcanoclastic, and associated intrusive rocks. Associated sedimentary rocks mainly non-marine red beds. Late Triassic (223-220 Ma; Norian) zircon ages of lavas. E Sub-belt dominated by mafic lavas transitional between E-mid-oceanic ridge basalt and back-arc basin basalts. Dominance of felsic lavas and mainly non-marine associated sediments suggest post-collisional extensional setting)

Srinak, N., K. Hisada, Y. Kamata & P. Charusiri (2007)- Stratigraphy of the Mae Sariang Group of Northwestern Thailand: implication for paleoenvironments and tectonic setting. *Natural History J. Chulalongkorn University* 7, 2, p. 87-108.

(online at: www2.biology.sc.chula.ac.th/web%20of%20NHJCU%20PDF/7-2,%2087-108.pdf)

(M-L Triassic deep marine clastics of Mae Sariang Gp of NW Thailand in narrow N-S belt and ~900m thick, conformably over deformed Permian marine clastics and unconformably below subhorizontal Jurassic clastics. Conglomerate-lithic sandstone near base with Halobia and Daonella cf. sumatrensis bivalves, mainly mudstone and radiolarian chert in middle and with abundant Halobia and Posidonia bivalves near top of section. Interpreted as deposits of Permian-Triassic intra-cratonic basin (branch of Paleotethys?), within Shan-Tai Terrane, which closed in Late Triassic (Ishida et al. 2006 proposed this belt as main Paleotethys suture; JTVG))

Stait, B. & C. Burrett (1982)- Early Ordovician polyplacophoran *Chelodes whitehousei* from Tarutao Island, southern Thailand. *Alcheringa* 8, p. 112.

(Polyplacophoran Chelodes whitehousei Runnegar et al. 1979 from basal Thung Song Fm at NE Tarutao Island. Carbonates of E-M Ordovician Thung Song Fm form N-S belt through Peninsular Thailand)

Stait, B.A. & C.F. Burrett (1987)- Ordovician nautiloid faunas of Central and Southern Thailand. *Geological Magazine* 121, p. 115-124.

(Nautiloids from Ordovician shallow marine carbonates of W and Peninsular Thailand grouped into five assemblages Incl. Hardmanoceras chrysanthimum, Manchuroceras nakamense, Wutinoceras, Armenoceras chediforme, etc. All genera also occur in Australia and China)

Stait, B.A., C.F. Burrett & T. Wongwanich (1987)- Ordovician trilobites from the Tarutao Formation, Southern Thailand. *Neues Jahrbuch Geologie Palaontologie, Monatshefte* 1984, 1, p. 53-64.

(Ordovician (M-U Tremadocian) trilobites in upper 100m of Tarutao Fm clastics of Tarutao Island, N of Langkawi (= Sibumasu block) (see also Shergold et al. 1988, Late Cambrian trilobites from Tarutao))

Stait, B.A., D. Wyatt & C.F. Burrett (1987)- Ordovician nautiloid faunas of Langkawi Islands, Malaysia, and Tarutao Island, Thailand. *Neues Jahrbuch Geologie Palaontologie, Abhandlungen* 174, p. 373-391.

(E-M Ordovician limestones of Lower Setul Fm on NE Langkawi Island with 12 species of nautiloids, generically similar to Australia and North China)

Stephens, E.A., J.C. Javanaphat, J.H. Bateson & P. Sanevong (1966)- An investigation into the occurrence of diamonds and the regional geology of the Phuket-Phangnga area of Peninsula Thailand. *Inst. Geological Sciences/ British Geological Survey (BGS), Overseas Division, and Dept. Mineral Resources, Bangkok, Report WC/OG/66/6*, p. 1-32 + Figures.

(online at: <https://resources.bgs.ac.uk/PublicationPDFs/19800209.pdf>)

(Rounded diamonds of unknown source in alluvial deposits from tin- dredges in and near Phuket island and Phangnga, western Peninsular Thailand. No associated minerals of kimberlitic origin. Most likely source is the widely exposed turbiditic? pebbly greywacke and massive mudstones with scattered pebbles (up to 30 cm in diameter) of Phuket Series (= Carboniferous- E Permian glacial deposits?) (overlain by Permo-Carboniferous 'Rat Buri' Limestone with fusulinids). Also Cretaceous granites. Quality and quantity of diamonds not attractive for commercial exploitation)

Stokes, R.B. (1988)- Correlation of the Permian 'Phawa Limestone' of Thailand with the 'Kamawkala Limestone' of Burma. *J. Southeast Asian Earth Sciences* 2, p. 35-39.

(Phawa Dolomite Fm in area E of Mae Sot in western foldbelt of W Thailand contains rich Permian brachiopod fauna (with Leptodus, Waagenites speciosus, Uncinulus timorensis, etc., Artinskian-Kazanian?) and correlates with part of 'Kamawkala Limestone' at W rim of Mae Sot basin in Karen State of E Burma. This latter unit is re-named Htichara Dolomite Fm)

Stokes, R.B. (1988)- Structural control of Neogene sedimentation in the Mae Sot Basin (Thai-Burmese border: implications for oil shale reserves. *J. Petroleum Geology* 11, 3, p. 341-346.

Stokes, R.B. (2011)- The Late Cimmerian event in Western Thailand and Central Thailand and Central Lao PDR. *J. Geological Society Thailand* 1, p. 25-29.

(Folding and faulting of Jurassic marine strata in W Thailand interpreted as Jurassic-Cretaceous boundary event, pre-dating unconformable deposition of non-marine Cretaceous conglomerates with pebbles of Jurassic

limestone. Corresponds to widespread 'Late Cimmerian event' elsewhere in Asia, younger than M-L Triassic 'Indosinian Event')

Suensilpong, S., C.K. Burton, N. Mantajit & D.R. Workman (1978)- Geological evolution and igneous activity of Thailand and adjacent areas. Episodes 13, p. 12-18.

(online at: www.episodes.co.in/www/backissues/13/ARTICLES--12.pdf)

(Brief review of geologic history of Thailand from Precambrian- Recent))

Suensilpong, S., P. Putthapiban & N. Mantajit (1983)- Some aspects of tin granite and its relationship to tectonic setting. Geological Society of America (GSA) Memoir 159, p. 77-86.

(SE Asia granite belt in Thailand multiple phases of granite. Permian and Late Triassic-E Jurassic formed above W-dipping subduction zones. E Cretaceous (~125-130 Ma) and Late Cretaceous- E Tertiary (~80-50 Ma) granites involved E-dipping subduction (Indian Ocean- Eurasian plates convergence). Tin mineralization confined mostly to highly silicic parts of S-type granitoids, like Late Triassic- E Jurassic (~212-190 Ma))

Suganuma, Y., T. Hamada, S. Tanaka, M. Okada, H. Nakaya, Y. Kunitatsu, H. Saegusa, S. Nagaoka & B. Ratanasthien (2006)- Magnetostratigraphy of the Miocene Chiang Muan Formation, northern Thailand: Implication for revised chronology of the earliest Miocene hominoid in Southeast Asia. Palaeogeogr. Palaeoclim. Palaeoecology 239, p. 75-86.

(online at: <https://www.thaiscience.info/Article%20for%20ThaiScience/Article/61/10010961.pdf>)

(Paleomagnetic study constrains deposition of Miocene Chiang Muan Fm in N Thailand between ~13-9.8 Ma, and age of earliest large-bodied SE Asian hominoid between 12.4- 13.0 Ma)

Sugiyama, T. (1982)- Middle Permian corals from the Ratburi Limestone in the Khao Khao area, Sara Buri, Central Thailand. In: T. Kobayshi, R. Toriyama & W. Hashimoto (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 24, p. 15-29.

(M Permian corals from 360m thick Ratburi Lst in Khao Khao section (with fusulinids of Afganella-Neoschwagerina haydeni zones described by Toriyama and Kanmera 1979). Five coral localities with waagenophyllids Ipciphyllum saraburiense n.sp., Paraipciiphyllum, Pseudohuangia, Chihsiaphyllum kanmerai n.sp. and tabulate Tetraporinus)

Sugiyama, T. & R. Toriyama (1981)- Coral and fusuline faunas from the Kabin Buri Area, East Central Thailand. In: T. Kobayshi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 1-22.

(Description of new coral Koninckophyllum ingavatae n.sp., presumably of E Carboniferous age, 400km S of Loei (Visean))

Surakotra, N. (2011)- Diagenesis of laminated Loei-Wang Saphung gypsum- anhydrite deposits in the Northeastern Thailand. Proc. Int. Conf. Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011), Khon Kaen, p. 106-115.

(Presence of laminated gypsum-anhydrite asociated with Late Carboniferous carbonates in Loei-Wang Saphung area, NE Thailand)

Sutthirat, C., P. Charusiri, E. Farrar & A.H. Clark (1994)- New ⁴⁰Ar/³⁹Ar geochronology and characteristics of some Cenozoic basalts in Thailand. In: P. Angsuwathana et al. (eds.) Proc. International Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994, Dept. Mineral Resources (DMR), p. 306-321.

(online at: <http://www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/19.pdf>)

(Ar-Ar ages of Cenozoic basalts in Thailand suggest six main episodes: 22-24 Ma, 18-20 Ma, 8-14 Ma, 4-5.3 Ma, 1.6-3.6 Ma and <1.6 Ma). Believed to be result of continental rifting)

Sutthirat, C., S. Saminpanya, G.T.R. Droop, C.M.B. Henderson & D.A.C. Manning (2001)- Clinopyroxene-corundum assemblages from alkali basalt and alluvium, eastern Thailand: constraints on the origin of Thai rubies. Mineralogical Magazine 65, 2, p. 277-295.

(Thailand rubies mainly from alluvial deposits, but probably originated from Late Cenozoic basalts, probably crystallized in mafic garnet-clinopyroxenites or garnet-pyroxenites, in upper mantle)

Suwanich, P. (1983)- Potash and rock salt in Thailand. In: Conference Geology and Mineral Resources of Thailand, Bangkok, p. 244-252.

Suwanich, P. (2007)- Potash-evaporite deposits in Thailand. In: W. Tantiwanit (ed.) Int. Conference on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources, p. 252-262.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2007/12730.pdf)

(NE Thailand Khorat plateau/ basin with thick Cretaceous evaporites of Maha Sarakham Fm. Review of evaporite stratigraphy. Potash minerals carnallite, sylvite and tachyhydrite present above lower salt)

Suwanich, P. (2009)- Potassium Bromide (KBr) contents in the Maha Sarakham Formation, northeastern Thailand: indicator of origin and deformation of rock salt strata. J. Science Technology Mahasarakham University (MSU) 29, 3, p. 249-258.

Suwannathong, A. & D. Khummongkol (2007)- Oil shale resource in Mae Sot Basin, Thailand. In: 27th Oil Shale Symposium, Colorado School of Mines, p. 1-8.

(online at: www.ceri-mines.org/documents/27symposium/papers/mal1-4suwannathong.pdf)

(On E Miocene lacustrine oil shale in Mae Sot Basin, Tak Province, NW Thailand. Quality poor-medium)

Suwimonprecha, P., P. Cerny & G. Friedrich (1995)- Rare metal mineralization related to granites and pegmatites, Phuket, Thailand. Economic Geology 90, p. 603-615.

(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.857.7029&rep=rep1&type=pdf>)

(Rare metal mineralization on Phuket Island, SW Thailand, with deposits of Sn, Nb-Ta and W, related to Cretaceous granites of Khao Tosae Suite and pegmatite derivative)

Szczygielski, T., D. Drożdż, P. Chanthasit, S. Manitkoon & P. Ditbanjong (2025)- The Triassic turtle of Thailand- revision of '*Proganochelys*' *ruchae*. Plos One 20, 3, e0316338, p. 1-52.

(online at: <https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0316338>)

(True turtles (Testudinata) appeared in Norian (Late Triassic) and quickly attained worldwide distribution. One problematic species from Norian Huai Hin Lat Fm of Thailand, described by Broin (1984) as Proganochelys ruchae. Here placed in new genus, Thaichelys (probably from Khorat Plateau in NE Thailand; associated with common plant fossils Equisetites, Neocalamites and Clathropteris, suggesting Norian age)

Tada, T., R. Tada, P. Chansom, W. Songtham, P.A. Carling & E. Tajika (2020)- In situ occurrence of Muong Nong-type Australasian tektite fragments from the Quaternary deposits near Huai Om, northeastern Thailand. Progress in Earth and Planetary Science 7, 66, p. 1-15.

(online at: <https://progearthplanetsci.springeropen.com/articles/10.1186/s40645-020-00378-4>)

(Australasian tektites found in stratum called "laterite" layer, which is widely distributed in Indochina, but long-standing debate if tektites are in situ or transported on "laterite" paleo-erosional surface. Cluster of several angular and poorly sorted tektite fragments from "laterite" layer near Huai Om, NE Thailand, can be restored into one ellipsoidal Muong Nong-type tektite, suggesting this tektite fragmented on landing after ballistic trajectory and was not disturbed afterwards, demonstrating in-situ occurrence of tektites (similar observations by Fiske et al. 1996))

Taiyaqupt, M., P. Charusiri & W. Pongsapich (1984)- Geology and stratigraphy of Sri Racha area, Chonburi Province, Eastern Thailand. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology, Mineral and Energy Resources SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 59-71.

(Sri Racha area along coast SE of Bangkok, underlain by folded Carboniferous low grade metamorphics, thin Permian sediments including thin limestone similar to Ratburi Group with Tubiphytes and Pseudofusulina. Intruded by Triassic granites)

Takemoto, K., S. Sato, K. Chanthavichith, T. Inthavong, H. Inokuchi, M. Fujihara, H. Zaman et al. (2009)- Tectonic deformation of the Indochina Peninsula recorded in the Mesozoic palaeomagnetic results. *Geophysical J. International* 179, p. 97-111

(online at: <http://gji.oxfordjournals.org/content/179/1/97.full.pdf+html>)

(E Jurassic- E Cretaceous red sandstones sampled at three localities in Shan-Thai and Indochina blocks. Shan-Thai and Indochina blocks experienced ~10° CW rotation in early stage of India-Asia collision. After this, Shan-Thai Block underwent internal tectonic deformation, while Indochina Block behaved as rigid tectonic unit. Strength of continental lithosphere important role in deformation (continental roots beneath Indochina prevented internal deformation))

Tangwattananukul, L. (2015)- Characteristics of epithermal Au and porphyry Cu-Mo mineralizations of the Chatree deposit, central Thailand. Thesis, Akita University, Japan, p. 1-140.

(online at: https://air.repo.nii.ac.jp/?action=repository_uri&item_id=2547&file_id...2)

(Chatree Au-Ag deposit in Petchabun Province with two E Triassic mineralization styles in Carboniferous-sediments and Permian arc volcanics: (1) epithermal Au-Ag (~250 Ma; formed ~200m below paleosurface); (2) porphyry Cu-Mo (~244 Ma; formed ~1 km below paleosurface))

Tangwattananukul, L. & D. Ishiyama (2018)- Characteristics of Cu-Mo mineralization in the Chatree mining area, Central Thailand. *Resource Geology* 68, 1, p. 83-92.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/rge.12146/epdf>)

(Chatree mineral deposits within Eastern Granite Belt at W side of Indochina Block (Triassic- Jurassic Sukhothai arc/ foldbelt). Include Cu-Mo-bearing quartz veins in altered E Triassic (243±5 Ma) granodiorite porphyry and altered andesite lava, formed at T of 450°C and P of 250 bars. Associated Au mineralization at Chatree slightly older (250±0.8 Ma; latest Permian))

Tangwattananukul, L., D. Ishiyama & P. Charusiri, (2020)- Geochemical characteristics of gold mineralization of the Huai Kham On deposit, Sukhothai Fold Belt, Northern Thailand. *Resource Geology* 70, p. 362-377.

(Huai Kham On gold deposit in central Sukhothai Fold Belt, N Thailand. Sukhothai FB is accretionary complex formed by subduction and collision between Indochina and Sibumasu Terranes. Huai Kham On gold in volcanosedimentary rocks, limestone, and low-grade metamorphic rocks of Carboniferous- Triassic age)

Tangwattananukul, L., D. Ishiyama, O. Matsubaya, T. Mizuta, P. Charusiri, H. Sato & K. Sera (2014)- Characteristics of Triassic epithermal Au mineralization at the Q prospect, Chatree mining area, Central Thailand. *Resource Geology* 64, 2, p. 167-181.

(Chatree Au deposit in 600km Loei-Phetchabun-Nakhon Nayok volcanic belt between Shan-Thai and Indochina terranes, that extends from Laos in N through C and E Thailand into Cambodia. Gold-bearing quartz veins in late Permian- E Triassic andesitic breccia and Carboniferous-Permian volcanic sedimentary breccia. Gold-bearing quartz veins five stages; formed ~200 m below paleosurface)

Tangwattananukul, L., D. Rattanaphra, S. Nuchdang, W. Kingkam, K. Abe & P. Charusiri (2025)- Magmatic-hydrothermal evolution of the Late Permian-Early Triassic Southeast Asian metallogenic system: Insights from the Chatree epithermal gold deposit, Thailand. *J. Asian Earth Sciences* 294, 106804, p. 1-15.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912025003190>)

(Magmatism in the Loei metallogenic belt occurred in Late Permian-E Triassic (262-238 Ma). Chatree gold deposit two phases of gold precipitation recognized: one during main calc-alkaline volcanism period (±250 Ma, the other at ±210 Ma)

Tansathien, W., L. Raksaskulwong & A. Meesook (1997)- Stratigraphy, tectonic evolution and mineral deposits of Western Thailand (Route No. 2)- Guidebook for excursion. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97), Bangkok, Dept. Mineral Resources (DMR), p. 1-55.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1997/2520_2.pdf)

(Brief review of W Thailand geology and fieldtrip stops in ?Precambrian metamorphics, Paleozoic sediments and younger rocks)

Tantiwanit, W., L. Raksaskulwong & N. Mantajit (1983)- The Upper Palaeozoic pebbly rocks in southern Thailand. In: P. Nutalaya (ed.) Proc. Workshop Stratigraphic correlation of Thailand and Malaysia, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 96-104.

(online at: https://gsmpubl.files.wordpress.com/2014/10/sctm_05.pdf)

Widespread pebbly rocks/ diamictites in Carboniferous- E Permian marine Kaeng Krachan Fm in SW Thailand (Phuket, etc.). Can be correlated with Mergui Fm of Burma and Singa Fm of Malaysia (and Bohorok Fm of NE Sumatra; JTVG). May be ice-rafted deposits and tillites, some may be slump deposits. Thickness tilloid-bearing clastics >1200m?. Most common clasts quartzites/ quartz sandstones, also grey limestone, vein quartz, acid plutonic rocks (biotite-granite and trondhjemitic) and rare megacrysts of shale, mudstone, chert, biotite-gneiss and diorite. Conformably overlain by E Permian Ratburi Lst)

Tassy, P., P. Anupandhanant, L. Ginsburg, P. Mein, B. Ratanasthien & V. Suteethorn (1992)- A new *Stegolophodon* (Proboscidea, Mammalia) from the Early Miocene of Northern Thailand. *Geobios* 25, 4, p. 511-523.

(First complete molars of Stegolophodon from Thailand, from Mae Moh (M Miocene) and Na Sai (E Miocene); earliest known species of Stegolophodon)

Teraoka, Y., H. Sawata, T. Yoshida & T. Pungrassami (1982)- Lower Paleozoic Formations of the Tarutao Islands, Southern Thailand. Prince of Songkhla University, Geological Resources Project Publ. 6, p. 1-54.

(Igo 1984: oldest conodonts of SE Asia found here (E Ordovician) (see also Agematsu et al. 2008))

Thambunya, S., V. Pisutha-Arnond & C. Khantaprab (2007)- Depositional environments of Permian rocks of the Khao Khad Formation in Central Thailand. *Science Asia* 3, p. 371-381.

(online at: www.scienceasia.org/2007.33.n4/v33_371_381.pdf)

(Khao Khad Fm of Saraburi Group in C Thailand is sequences of limestone, dolomitic limestone and silty shale with nodular and banded cherts. Fifteen rock units distinguished. Deposited during major transgressive-regressive cycle in Lower- M Permian)

Thamniyom, P. (2021)- Depositional environment of the Basal Pratu Tao Formation Thap Raet Field, Phitsanulok Basin, Thailand. *Bull. Earth Sciences Thailand (BEST)* 5, 2, p. 102-107.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246590/167628>)

(Thap Raet Field in N part of Sirikit Field, Phitsanulok Basin in C Thailand, which formed as mid-Cenozoic rift basin as result of relative movement between Shan Thai and Indochina craton. Basin fill all non-marine)

Thanasuthipitak, T. (1978)- Geology of Uttaradit area and its implications on tectonic history of Thailand. Proc. 3rd Regional Conference. Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok 1978, p. 187-197.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main> Etc.))

(Suture zone in NW Thailand between Indochina- Sibumasu plate, with ophiolites, etc., reflecting W-dipping Permo-Carboniferous subduction/ continental collision zone)

Thanasuthipitak, T. (1978)- A review of igneous rocks of Thailand. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok, p. 775-782.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opac.exe.exe?op=mmvw&db=Main&sid=&skin=u&usid=&mmid=125&bid=7415>)

(Brief review of Late Carboniferous- Cretaceous granitic rocks of N, W and SE Thailand and Thai Peninsula, ultramafic-mafic rocks of NW Thailand and volcanics)

Thanasuthipitak, T. & T. Sirinawan (1986)- Petrochemistry of gem-bearing basalt in the Nong Bon area, Trat Province, Eastern Thailand. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology

Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 503-521.

(Gem deposits of Thailand (ruby, sapphire, zircon, garnet) associated with three belts of weathered Late Cenozoic basalt deposits)

Thanomsap, S. (1983)- Stratigraphic sequences and facies distributions in the Mae Sot Basin. In: Conf. Geology and Mineral Resources of Thailand, Bangkok, p. 367-376.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1983/10619.pdf)

(Late Tertiary Mae Sot intramontane basin in W Thailand with >2000m of fluvial-lacustrine sediments unconformably over Triassic-Jurassic limestones)

Thanomsap, S. & S. Sitahirun (1992)- The Mae Sot oil shale. In: C. Piencharoen (ed.) Proc. National Conference Geologic resources of Thailand: potential for future development, Bangkok, Dept. Mineral Resources (DMR), p. 676-691.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6258.pdf)

(On Miocene lacustrine oil shale in Mae Sot Basin, Tak Province, W Thailand. Oil shale beds 5- 100' thick. Generally low quality (average oil yield 5% by weight), minor quantities of higher quality (>10% oil). Explored since 1939, but no viable commercial development yet)

Thasod, Y., P. Jintasakul & B. Ratanasthien (2012)- Proboscidean fossil from the Tha Chang sand pits, Nakhon Ratchasima Province, Thailand. J. Science Technology Mahasarakham University (MSU), 31, p. 33-44.

(online at: https://www.khoratgeopark.com/kgp/researchs/2012_Thasod_283-293-1-PB.pdf)

(Eight genera of Proboscidean fossils in sand pits in Nakhon Ratchasima province, NE Thailand, of families Dienotheriidae (Prodeinotherium, Gomphotherium, Tetralophodon, Sinomastodon, Protanancus), Stegodontidae (Stegolophodon, Stegodon) and Elephantiidae (Elephas). Ages M Miocene- Pleistocene)

Thasod, Y., A. Jongboriboon, N. Boonchai, P.J. Grote, T. Nonsrirach, S. Manitkoon, P. Warapeang et al. (2024)- Mesozoic terrestrial biota west of the Chiang Mai suture (Mae Sot Basin, western Thailand). Annales de Paleontologie 110, 1, 102650, p. 1-14.

New Jurassic-Cretaceous fossil locality in Mae Sot Basin, W Thailand. With Ginglymodian fish scales and bones, wood (Brachyoxylon sp.) and leafy twigs (cf. Cupressinocladus sp.), and associated with Skolithos and Scoyenia ichnofacies, deposited in anoxic fluvial environment. First terrestrial Mesozoic biota reported from Shan-Thai terrane W of Chiang Mai suture. Likely age ~Late Jurassic- E Cretaceous)

Thassanapak, H., C. Chonglakmani, Q. Feng, J. Grant-Mackie & N. Thanee (2007)- Middle Triassic radiolarians from Den Chai Area, Northern Thailand. In: W. Tantiwanit (ed.) Int. Conference on Geology of Thailand: towards sustainable development and sufficiency economy (GEOTHAI'07), Bangkok, Dept. Mineral Resources (DMR), p. 180-186.

(Den Chai area at S edge of Cenozoic Phrae basin in NW Thailand with Lampang Gp marine Triassic, incl. Wang Chin Fm with Halobia, Paleocardita, Posidonia. M Triassic (Anisian-Ladinian) radiolarians extracted from maroon siliceous rocks, S of Den Chai, incl. Triassocampe deweveri, T. coronata, T. scalaris, Muelleritortis spp., etc. Interpreted as deposited offshore of extensional continental margin)

Thassanapak, H., Q.L. Feng, J. Grant-Mackie, C. Chonglakmani & N. Thanee (2011)- Middle Triassic radiolarian faunas from Chiang Dao, Northern Thailand. Palaeoworld 20, 2, p. 179-202.

(64 species of Late Anisian radiolarians from 9m thick thin-bedded chert sequence N of Chiang Dao indicates deep marine environment in NW Thailand (seaway between E and W Paleotethys). Beds probably from tectonic slice in Carboniferous- M Triassic sequence overlain by Triassic igneous rocks. Can be correlated with E zone of Changning-Menglian Belt in SW Yunnan, China)

Thassanapak, H., M. Udchachon & C. Burrett (2012)- Devonian conodont, radiolarian, and tentaculitid assemblages in the Indochina Terrane. Proc. First International Symposium of IGCP-589, Xi'an, China 2012, Acta Geologica Sinica 33, Supplement 1, p. 65-66 (Abstract)

(online at: <http://igcp589.cags.ac.cn/pdf/29-THASSANAPAK,%20UDCHACHON%20et%20al.pdf>)

(In E margin of Indochina Terrane along Troungson Foldbelt in C Laos, localities in Lak Xao and Sepon districts contain radiolarians (*Trilonche* spp.) and tentaculitids (*Homoctenus ultimus*, *Costulatostylionina vesca*), indicating Frasnian age. In W margin of Indochina Terrane Pak Chom in Loei, Thailand, Late Devonian radiolarian cherts)

Thassanapak, H., M. Udchachon, C. Burrett & Q. Feng (2017)- Geochemistry of radiolarian cherts from a Late Devonian continental margin basin, Loei fold belt, Indo-China terrane. *J. of Earth Science (China)* 28, 1, p. 29-50.

(online at: <http://en.earth-science.net/PDF/20170110101143.pdf>)

(>42 species of U Devonian (Frasnian-Famennian) radiolaria in cherts-siliceous shales in NE Thailand sector of Loei fold belt (Indochina terrane). Geochemistry suggests continental margin environment near volcanic arc, different from U Devonian cherts from N Thailand, Truong Son foldbelt (Laos) and S China. U Devonian deep marine sequences in Loei fold belt deposited in rifted continental margin basin, possibly back-arc basin, not in large oceanic basin)

Thassanapak, H., M. Udchachon, J. Chareonmit & C. Burrett (2020)- Early Permian radiolarians from Southern Thailand, the deglaciation of Gondwana and the age of the basal Ratburi Group. *Palaeoworld* 29, 3, p. 552-567.

(First radiolarian fauna obtained from Permian carbonates in Thailand of late Kungurian age and from basal beds of carbonate-mudstone-chert Phap Pha Fm of Ratburi Group. Several species of *Pseudoalbaillella*: *P. aidensis* and *P. elegans* together with *P. fusiformis*, *P. longtanensis*, *P. m. rhombothoracata*, etc., suggesting correlation to *P. longtanensis* Zone, equivalent to *P. ishigai* Zone, late Kungurian (= latest E Permian). Low generic diversity suggests restricted conditions, likely along cool deglaciating or deglaciating continental margin with abundant silica. Abundant chert in Phap Pha Fm part of widespread Permian Chert Event)

Thassanapak, H., M. Udchachon, C. Chonglakmani & Q. Feng (2011)- Geochemistry of Middle Triassic radiolarian cherts from northern Thailand: implication for depositional environment. *J. of Earth Science (China)* 22, 6, p. 688-703.

(M Triassic radiolarian cherts from N Thailand (Chiang Dao, Lamphun, Den Chai) of biogenic origin. Geochemistry suggests M Triassic radiolarian cherts deposited in deeper part of residual basin. Main Paleotethys which closed during Late Triassic should be located further to W)

Thassanapak, H., M. Udchachon, Q. Feng & C. Burrett (2017)- Middle Triassic radiolarians from cherts/siliceous shales in an extensional basin in the Sukhothai Fold Belt, Northern Thailand. *J. of Earth Science (China)* 28, 1, p. 9-28.

(online at: <http://en.earth-science.net/PDF/20170110100741.pdf>)

(>30 species of Late Ladinian radiolaria from red chert- siliceous shales in E of Sukhothai fold belt, incl. *Muelleritortis cochleata*, *M. expansa*, *Triassocampe deweveri*, *T. coronata*, *T. scalaris*, *Annulotriassocampe companilis*, *A. multisegmentatus*, *A. sulovensis*, *Pseudostylosphaera* spp., *Canoptum inornatus*, *C. levis*, *Corum kraineri*, *Spongoserula rarauana*, *Orbiculiforma karnica* and others. Assemblages correlated with Fang-Chiang Dao and Lumphun areas in N Thailand and Changning-Menglian belt of W Yunnan. Interpreted deposited in extensional continental margin in Sukhothai fold belt/ Lampang-Phrae Basin, not in Devonian-Permian back-arc basin of Nan suture)

Thienprasert, A. & M. Raksaskulwong (1984)- Heat flow in northern Thailand. *Tectonophysics* 103, p. 217-233.

(Heat flow in N Thailand highly variable. Four regions with high heat-flow, over 100 mW/m²: Fang oil fields, San Kamphaeng geothermal area, Mae Sot and W margin of Khorat plateau)

Thongboonruang, C. (2008)- Petroleum source rock potential of NE Thailand. *Proc. 2nd Petroleum Forum: Blooming era of Northeastern Thailand*, Bangkok 2008, Department of Mineral Fuels, p. 33-50.

Tien, Nguyen D. (1988)- Note on two "Incertae sedis" from the Permian of West Thailand. In: H. Fontaine & V. Suteethorn (eds.) *Late Paleozoic and Mesozoic fossils of West Thailand and their environments*, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Technical Bulletin 20, p. 109-111.

(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)

(Two organisms of uncertain affinity relatively common in Permian of W Thailand: (1) *Rectostipulina quatrata*, a small tube, square in section; also known from Turkey, Cyprus, Iran, Afghanistan, etc.; (2) *Sphairionia sikuoides* n.gen., n.sp., a small bubble that may be foraminifer or fossil of algal affinity; known from Cambodia, Thailand, Malay Peninsula (= also 'Sibumasu fossil' subsequently reported from Oman, etc.?; JTvG))

Tingay, M.R.P., C.K. Morley, R.R. Hillis & J. Meyer (2010)- Present-day stress orientation in Thailand's basins. *J. Structural Geology* 32, p. 235-248.

(Borehole breakouts in wells from 6 basins indicate N-S Smax in S Thailand and Gulf of Thailand, inconsistent with those predicted from India- Eurasia collision. Stresses from Sumatran-Andaman subduction zone may have resulted in significant deformation in offshore Thailand)

Tofke, T., A. Lumjuan & D. Helmcke (1993)- Triassic syn-orogenic siliciclastics from the area of Mae Sariang (northwestern Thailand). In: T. Thanasuthipitak (ed.) *Int. Symposium Biostratigraphy of mainland Southeast Asia: facies and paleontology (BIOSEA)*, Chiang Mai 1993, 1, Chiang Mai University, 2, p. 391-400.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1993/7490.pdf)

(In Mae Sariang area of NW Thailand, dissecting 'Shan-Tai craton' is zone of oceanic Permian and E-M Triassic radiolarian ribbon cherts overlain by M-L Triassic syn-orogenic siliciclastics with Ladinian- Carnian *Posidonia* and *Halobia*. Coarse grained beds with pebbles of chert, metamorphic and plutonic rocks)

Tongsuk, S. (2019)- Diagenetic evolution and isotopic characteristics of a clast breccia reservoir in Nang Nuan Field, Chumphon Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 11, 2, p. 111-121.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246777/167757>)

(Hydrothermal karstification in M Permian Ratburi Limestone, on basement high, plays significant role in formation of reservoir rock in offshore Nang Nuan oil field in N part of Chumphon Basin, western Gulf of Thailand. Ratburi Limestone typically 200-300m thick)

Tongtherm, K., J. Nabhitabhata, P. Srisuk, T. Nutadhira & D. Tonnayopas (2016)- New records of nautiloid and ammonoid cephalopod fossils in Peninsular Thailand. *Swiss J. of Palaeontology* 135, 1, p. 153-168.

(30 species of nautiloids and ammonoids identified from peninsular Thailand (+Shan-Thai/ Sibumasu). Ordovician nautiloids, Devonian-Carboniferous ammonoids, Triassic nautiloids (*Michelinoceras*, *Tienoceras* and *syringonautilid* nautiloids. Etc.))

Toriyama, R. (1944)- On some fusulinids from Northern Tai. *Japanese J. Geology and Geography* 19, p. 243-247.

(Mid-Permian *Pseudoschwagerina*-dominated fusulinid assemblage from N Thailand)

Toriyama, R. (1965)- Fusuline fossils from Thailand, Part I, Fusulines of the Rat Buri Limestone of Thailand. *Memoirs Faculty of Science, Kyushu University*, ser. D, 27, 1, p. 1-69.

Toriyama, R. (1967)- The Rat Buri Limestone of Thailand. *Journal of Geography (Chigaku Zasshi)* 76, 4, p. 13-20. (in Japanese with English abstract)

(online at: https://www.jstage.jst.go.jp/article/jgeography1889/76/4/76_4_191/pdf-char/en)

(Summary of known fossil localities of the Permian Rat Buri Limestone in Thailand. Not always limestone)

Toriyama, R. (1975)- Fusuline fossils from Thailand. Part IX. Permian fusulines from the Rat Buri Limestone in the Khao Phlong Phrab area, Sara Buri, Central Thailand. *Memoirs Faculty of Science, Kyushu University*, Ser. D, 23, p. 1-116.

(online at: https://catalog.lib.kyushu-u.ac.jp/opac_download_md/1544172/23_01_p001.pdf)

(Systematic descriptions and vertical distribution of 91 species/26 genera of fusulinid forams from 225m thick late Early- M Permian Ratburi Limestone section in C Thailand. Overall assemblage 'of Tethyan aspect', with *Verbeekina*, *Neoschwagerina*, also *Parafusulina*, rare *Monodioxodina* (but is on Sibumasu Plate?; JTvG). No locality maps, but described earlier in Toriyama, Kanmera et al. 1974; vol. 14 of this series. No figures?)

Toriyama, R. (1976)- Fusuline fossils from Thailand. Part IX. Permian fusulines from the Rat Buri Limestone in the Khao Phlong Phrab area, Sara Buri, Central Thailand. In: T. Kobayashi & W. Hashimoto (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 17, p. 1-116.

(Same paper as Toriyama 1975, *Mem. Faculty of Science Kyushu University*, above. *Systematic descriptions and vertical distribution of 91 species/26 genera of fusulinid forams from 225m thick late Early- M Permian Ratburi Limestone section in C Thailand*)

Toriyama, R. (1984)- Summary of the fusuline faunas in Thailand and Malaysia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 137-146.

(Brief review of localities with Carboniferous- Permian fusulinid forams in Ratburi Lst and equivalents in Thailand and Malaysia: 265 species belonging to 70 genera)

Toriyama, R., T. Hamada, H. Igo, R. Ingavat, K. Kanmera, T. Kobayashi, T. Koike et al. (1975)- The Carboniferous and Permian Systems in Thailand and Malaysia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 15, p. 39-76.

(Review of Carboniferous-Permian macro- and microfossils from Ratburi Gp limestones in Thailand, and Singa, etc. formations on Malay Peninsula. Correlations mainly based on fusulinid foraminifera)

Toriyama, R. & K. Kanmera (1968)- Fusulinacean fossils from Thailand, Part II: Two new Permian genera from Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 29-44.

(Two new fusulinid genera *Thailandina* and *Neothailandina* from rich fusulinid assemblages in 275m thick Rat Buri Limestone section at Phao Phlong Phrab, NE Thailand (names deemed invalid by Kobayashi et al. 2010). Section ranges from *Misellina* zone to lower part of *Neoschwagerina* zone (upper Lower- lower M Permian))

Toriyama, R. & K. Kanmera (1977)- Fusuline fossils from Thailand. Part X. The Permian fusulines from the Limestone Conglomerate Formation in the Khao Phlong Phrab area, Sara Buri, Central Thailand. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 18, p. 1-28.

Toriyama, R. & K. Kanmera (1979)- Fusuline fossils from Thailand. Part XII. Permian fusulines from the Rat Buri Limestone in the Khao Khao area, Sara Buri, Central Thailand. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 20, p. 23-93.

(Limestone quarries at Khao Khao hill, N of Saraburi, N Thailand, expose ~360m thick Permian Ratburi Limestone section. Abundant fusulinid foraminifera, 34 species, representing only part of Middle Permian, in four zones: *Afghanella megaspherica* to *Neoschwagerina haydeni*)

Toriyama, R., K. Kanmera & R. Ingavat (1969)- Fusulinacean fossils from Thailand. Part V. *Neofusulinella* from Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 7, p. 15-32.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1969/24353.pdf)

(E-M Permian fusulinids *Neofusulinella saraburiensis* n.sp., *N. praecursor* and *N. lantenoisi* from lower part of 'Ratburi Lst' in Khao Phlong Phrab section, Changwat Sara Buri, C. Thailand. Genus ranges from *Misellina* zone to *Neoschwagerina simplex* zone and is good indicator of upper Lower- lower Middle Permian. New species *Neofusulinella saraburiensis* n.sp.)

Toriyama, R., K. Kanmera, S. Kaewbaidhoam & A. Hongnushonthi (1974)- Biostratigraphic zonation of the Rat Buri Limestone in the Khao Phlong Phrab area, Sara Buri, Central Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 25-48.

(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1974/10.pdf)

(late Early-Middle Permian 'Ratburi Lst' at Khao Phlong Phrab Hill section, NE Thailand, ~250m thick and very rich in fusulinids (81 species, 26 genera). Subdivided into 7 zones (*Misellina* - *Maklaya*- *Neoschwagerina*- *Presumatrina* zones). High affinity of fauna with SE Pamir, S China and Japan)

Toriyama, R. & K. Pitakpaivan (1973)- Fusulinacean fossils from Thailand, Part VII: Middle Permian fusulines from Wat Kirinakratanaram, Central Thailand. In: T. Kobayshi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 12, p. 43-61.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1973/12082.pdf)

(lower M Permian fusulinids from Ratburi Lst near Kirinakratanaram Temple, Changwat Lop Buri, C Thailand. With *Neofusulina lantenoisi*, *Parafusulina gigantea*, *Verbeekina verbeeki*, *Sumatrana annae*, *Pseudodoliolina pseudolepida*, etc.)

Toriyama, R., K. Pitakpavan & R. Ingavat (1978)- The paleogeographic characteristics of fusuline faunas of the Rat Buri Group in Thailand and its equivalent in Malaysia. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III), Bangkok 1978, p. 128-132.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_3/2521-2530/9492.pdf)

(Permian 'Ratburi Lst' (s.l.) of Thailand with 238 species of fusulinids. Subdivided in 3 paleogeographic zones (1) Western zone with 41 species; in M Permian with *Verbeekina verbeeki*, *Sumatrana annae*, *Neoschwagerina*, etc.; U Permian fusulinids (*Paleofusulina*, *Colaniella*) only found in W; belt appears to extend into Malay Peninsula and N Kalimantan; (2) Central zone: little known fusulinids; (3) Eastern zone in Loei, etc., with 197 M Carboniferous- M Permian species. Fusuline faunas of Thailand and Malaysia close relationship to W Tethys in M-U Carboniferous. In Permian stronger affinity to E Tethys. No maps)

Toriyama, R. & T. Sugi (1959)- Permian fusulinids from Central Thailand. Memoirs Faculty of Science, Kyushu University, Series D, 9, 1, p. 17-32.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1959/12083.pdf)

(Fusulinids from 4 samples of Permian Rat Buri limestones and cherts in Sara Buri district of C Thailand. All referable to *Neoschwagerina* zone. With *Neoschwagerina* spp., *Parafusulina gigantea*, *Pseudofusulina crassa*, *Verbeekina* and *Sumatrana*)

Tukpho, T., C.A. Hauzenberger, D. Gallhofer, E. Skrzypek, S. Santitharangkun, M. Sirimongkonpun & A. Fanka (2025)- Subduction-related magmatism in the Indochina Terrane: Insights from Triassic volcanic rocks in Central Thailand. J. Asian Earth Sciences 279, 106459, p.

(Late Triassic calc-alkaline arc volcanic rocks in Saraburi–Lop Buri area, Loei Fold Belt, C Thailand. Related to subduction of Sukhotai terrane under west margin of Indochina Terrane and Loei foldbelt in continental arc setting during Late Triassic (~203-213 Ma))

Tulyatid, J. & J.D. Fairhead (1999)- Tectonic development of Central Thailand: new evidences from airborne geophysical data. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology, Mineral and Energy Resources SE Asia SE Asia (GEOSEA '98), Kuala Lumpur 1998, Geological Society Malaysia 43, p. 63-76

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100833-PDF.pdf)

(Review of Thailand structural geology and aeromagnetic maps of C Thailand)

Tumpeesuwan, S., Y. Sato & S. Nakhpadungrat (2010)- A new species of *Pseudohyria* (*Matsumotoina*) (Bivalvia: Trigonioidea) from the Early Cretaceous Sao Khua Formation, Khorat Group, Northeastern Thailand. Tropical Natural History 10, p. 93-106.

(online at: www.biology.sc.chula.ac.th/TNH/v10no1/8%20Tumpeesuwan%2093-106.pdf)

(New freshwater bivalve species, *P. (Matsumotoina) somanai* n. sp. from E Cretaceous Sao Khua Fm of NE Thailand. Interpreted as fluvial species, probably of Late Barremian age)

Uchida, E., S. Nagano, S. Niki, K. Yonezu, Y. Saitoh, K.C. Shin & T. Hirata (2022)- Geochemical and radiogenic isotopic signatures of granitic rocks in Chanthaburi and Chachoengsao provinces, southeastern Thailand: Implications for origin and evolution. J. Asian Earth Sciences: X, 100111, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056022000329>)

(Granitoids in Chanthaburi and Chachoengsao provinces in SE Thailand classified as I- to A-type granites, similar to granites in SW Cambodia Sukhothai Zone. Zircon ages 208-214 Ma (Late Norian, Late Triassic; Sibumasu- Indochina collision), except for Khao Cha Mao granite (55 Ma; related to India- Eurasia collision))

Udchachon, M., C. Burrett, H. Thassanapak, C. Chonglakmani, H. Campbell & Q. Feng (2014)- Depositional setting and paleoenvironment of an alatoconchid-bearing Middle Permian carbonate ramp sequence in the Indochina Terrane. *J. Asian Earth Sciences* 87, p. 37-55.

(M Permian carbonate sequence in S of Khao Khwang Platform, C Thailand (= tropical Tethyan shelf of Indochina Terrane). With common large alatoconchid bivalves. Nine main microfacies types. Platform evolved from rimmed platform in E Permian to ramp in M Permian. Abrupt negative shift in $\delta^{13}C$ in late Wordian and late Capitanian indicate significant changes in paleoenvironment, probably contemporaneous with Kamura event and related to global cooling and sea-level lowstand)

Udchachon, M., C. Chonglakmani, H. Campbell & N. Thanee (2007)- Late Middle Permian alatoconchid-bearing limestones from the south of the Khao Khwang platform, Central Thailand. In: W. Tantiwanit (ed.) *Proc. Int. Conf. Geology of Thailand: towards sustainable development and sufficiency economy*, Bangkok, p. 169-176.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2007/12718.pdf)

(Thick-shelled, alatoconchid tropical bivalves in M Permian Khao Khwang platform Permian limestones, exposed in Phetchabun fold-thrust belt along W edge of Khorat Plateau, C Thailand (W side of Indochina Block). Midian-age limestone with fusulinids (Colania, Lepidolina, Verbeekina, Neoschwagerina), and smaller forams (Hemigordius, Agathammina, Pachyphloia, Tuberitina, Tetrataxis) and algae (incl. Mizzia velebitana). Six main microfacies and facies model. Alatoconchids prefer soft substrate with peloidal wackestone texture of lagoon facies)

Udchachon, M., H. Thassanapak & C. Burrett (2017)- Palaeoenvironment and palaeogeography of Middle and Upper Devonian strata from the Loei fold belt, Indochina terrane (northeast Thailand). *Palaeobiodiversity and Palaeoenvironments* 97, 3, p. 497-516.

(Limestone-chert sections from Loei foldbelt, NE Thailand, yielded M-L Devonian (Givetian- Famennian) conodonts and Late Devonian radiolarian faunas. M Devonian siliciclastics interbedded with volcanoclastics and locally replaced by pillow basalts. Conformably overlain by argillaceous limestones and U Givetian reefal stromatoporoid-coral limestone. Drowning of bioherms and deposition of condensed continental margin oozes with radiolarians Trilonche spp and Famennian conodonts Palmatolepis spp. Transgressive M-U Devonian series broadly similar to sections in S China and in Germany. Continental margin series)

Udchachon, M., H. Thassanapak, C. Burrett, S. Chaidrusamee, M. Krobicki & P. Nulay (2024)- Microfacies and palaeoenvironments of late Cisuralian and Guadalupian (Early to Middle Permian) alatoconchid-bearing limestone in Loei fold belt, Indochina Terrane. *J. of Palaeogeography* 13, 3, p. 453-474.

(online at: <https://www.sciencedirect.com/science/article/pii/S2095383624000245>)

(First record of E Permian alatoconchid bivalves (giant clams) from Thailand, in N of Loei fold belt (Indochina Terrane, Paleotethys). With prolific Artinskian fusulines, dominated by Pseudofusulina sp., also Darvasites sp., Staffella spp., Nankinella, Neofusulinella, Schubertella., Pamirina darvasica, etc. Alatoconchids in life-position, suggesting autochthonous nature of deposits in intertidal environment. Also in central (Wordian) and S parts of fold belt (Capitanian, with Neoschwagerina sp., Yabeina sp., Lepidolina sp., Verbeekina verbeeki, etc.)

Udchachon, M., H. Thassanapak, C. Burrett & Q. Feng (2021)- The boundary between the Inthanon Zone (Palaeotropics) and the Gondwana-derived Sibumasu Terrane, northwest Thailand- evidence from Permo-Triassic limestones and cherts. *Palaeobiodiversity and Palaeoenvironments* 102, 2, p. 383-418.

(Widely accepted allochthon model proposes Inthanon Zone Devonian-Triassic radiolarites were pelagic and deposited on subducting ocean with seamounts with Visean- Permian tropical shallow-water carbonates. Alternative hypothesis places radiolarites of Inthanon Zone on continental margin and deposited in deeper small extensional basins with limited volcanism between long-lived, isolated carbonate platforms)

Udchachon, M., H. Thassanapak, Q. Feng & C. Chonglakmani (2011)- Geochemical constraints on the depositional environment of Upper Devonian radiolarian cherts from Loei, north-eastern Thailand. *Frontiers in Earth Science* 5, 2, p. 178-190.

(Late Devonian radiolarian chert sequences on Indochina terrane of NE Thailand exposed in narrow belt E of Loei province. Characterized by high silica content, high aluminum, low iron, etc. Results indicate cherts deposition in continental margin environment)

Ueno, K. (2022)- *Thailandina* and *Neothailandina* and their family *Thailandinidae* salvaged: a valid taxonomic group of peculiar Permian fusuline foraminifera. *Journal of Paleontology* 96, 2, p. 485-490.

(online at: <https://bioone.org/journals/journal-of-paleontology/volume-96/issue-2/jpa.2021.88/Thailandina-and-Neothailandina-and-their-family-Thailandinidae-salvaged--a/10.1017/jpa.2021.88.full>)

(Permian fusulinids Thailandina and Neothailandina reported by Toriyama and Kanmera (1968) from Khao Phlong Phrab of C Thailand. Associated with schwagerinid, verbeekinid neoschwagerinid fusulines. Deemed invalid genera by F. Kobayasi et al. (2010), but considered valid taxa by this author)

Ueno, K., M. Arita, S. Meno, A. Sardud & D. Saesaengseerung (2015)- An Early Permian fusuline fauna from southernmost Peninsular Thailand: discovery of Early Permian warming spikes in the peri-Gondwanan Sibumasu Block. *J. Asian Earth Sciences* 104, p. 185-196.

(Late E Permian fusuline fauna from Tarn To Fm of Yala area in S-most Peninsular Thailand (=E margin of Sibumasu Block, near base Ratburi Lst). Fauna consists of Pseudofusulina spp. and Praeskinnerella? sp., including forms resembling Tethyan and Panthalassan Pseudofusulina fusiformis and P. ex gr. krafftii. Likely Yakhtashian-Bolorian (=late Artinskian- E Kungurian) age. Similar Tethyan-affinity shallow marine fauna in Sibumasu in E Permian of Kinta Valley area in W Peninsular Malaysia. Yala fauna almost coeval with Monodioxodina fauna known elsewhere on Sibumasu Block. Interpreted as warming spikes during late Yakhtashian-Bolorian transgression)

Ueno, K. & T. Charoentitirat (2011)- Carboniferous and Permian. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The geology of Thailand*, Geological Society, London, p. 71-136.

(Extensive review of Carboniferous and Permian of Thailand. Stratigraphy and tectono-sedimentary development of five main domains: Indochina, Nan back-arc basin, Sukhothai Arc, Palaeotethyan (Inthanon Zone) and Sibumasu)

Ueno, K., T. Charoentitirat, Y. Sera, A. Miyahigashi, J. Suwanprasert et al. (2008)- The Doi Chiang Dao Limestone: Paleo-Tethyan mid-oceanic carbonates in the Inthanon Zone of North Thailand. *Proc. Int. Symposium Geoscience resources and environments of Asian Terranes (GREAT 2008)*, Bangkok 2008, p. 42-48.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/008.pdf)

(Doi Chiang Dao Lst in Inthanon zone of N Thailand >1000m thick continuous Carboniferous (Visean) to latest Permian (= 90 My) succession of mid-oceanic shallow marine carbonates without clastics, formed on seamount basalt base in Paleo-Tethys Ocean. Rich in fusulinids (23 Visean-Capitanian zones!), some corals, paleotropical Tethyan affinities. Comparable in origin to carbonate bodies in Central zone of Changning-Menglian Belt of SW China and Panthalassan seamount carbonates in accretionary complexes in Japan)

Ueno, K., M. Ejima, Y. Kamata, T. Charoentitirat & A. Sardud (2005)- Stratigraphy and sedimentary cycles of the Permian Kaeng Krachan Group of Phi Phi Island southern Thailand. *Proc. Int. Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2005)*, Khon Kaen, p. 555-557.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2005/9376.pdf)

(E Permian Kaeng Krachan Gp on Phi Phi Island off Krabi, S Peninsular Thailand, part of Sibumasu Block. Cyclic, ~350m thick quartz-rich marine clastics, including sparse dropstones, overlain by temperate-subtropical Ratburi Limestone. Formed in glaciation-influenced basin. No figures)

Ueno, K. & K. Hisada (2001)- The Nan-Uttaradit-Sa Kao Suture as a main Paleo-Tethyan suture in Thailand: is it real? *Gondwana Research* 4, p. 804-806. *(Extended Abstract)*

(In Thailand Nan-Uttaradit-Sa Kao Suture believed to be main Paleo-Tethyan suture between Cathaysian Indochina Block and Gondwana-derived Sibumasu Block of E Cimmerian continent, but is best interpreted as remnant of Nan back-arc basin. Paleotethys is represented by Chiang Rai tectonic line)

Ueno, K. & H. Igo (1993)- Upper Carboniferous foraminifers from Ban Na Din dam, Changwat Loei, Northeastern Thailand. Trans. Proc. Palaeontological Society Japan, N.S., 171, p. 213-228.
(online at: www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NS171.pdf)
(Limestone outcrops at Ban Na Din Dam, E of Loei, NE Thailand. Previously assigned to Lower Permian Nam Mahoran Fm, but with fusulinids *Triticites samaricus* and *Jigulites grandis* n.sp., indicating Gzhelian (latest Carboniferous) age. Also descriptions of smaller foraminifera)

Ueno, K. & H. Igo (1997)- Late Paleozoic foraminifers from the Chiang Dao area, Northern Thailand: geologic age, faunal affinity, and paleobiogeographic implications. In: 13th International Congress on the Carboniferous and Permian, Krakow 1995, Prace Panstwowego Instytutu Geologicznego (Studies of Polish Geological Institute) 157, p. 339-354.
(Permian fusulinid fauna from N Thailand of Tethyan affinity, similar to Indochina Block)

Ueno, K., A. Miyahigashi, Y. Kamata, M. Kato, T. Charoentitirat & S. Limruk (2010)- Triassic shallow-marine limestone in the Central Plain of Thailand: its foraminiferal age and geotectonic implications. In: C.P. Lee et al. (eds.) 6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 37-39. (Extended Abstract)
(Foraminiferal fauna limestone exposed in eastern Uthai Thani Province, Central Plain, previously interpreted as Permian age suggest (Late) Triassic age (common *Aulotortus* spp., with *Agathammina austroalpina*, *Ophthalmidium*, *Valvulina azzouzi*, *Endoteba*, *Tetrataxis inflata*, *Austrocolomia*, *Fronicularia woodwardi*, etc. Probably belongs to S extension of Sukhothai Zone)

Ueno, K., A. Miyahigashi, Y. Kamata, M. Kato, T. Charoentitirat & S. Limruk (2012)- Geotectonic implications of Permian and Triassic carbonate successions in the Central Plain of Thailand. J. Asian Earth Sciences 61, p. 33-50.
(Two Paleozoic-Mesozoic basement carbonate successions in Chao Phraya Central Plain of Thailand: (1) Triassic in E Uthai Thani Province, with rich foram fauna with *Aulotortus sinuosus*, *Tetrataxis inflata*, etc. suggesting Late Triassic, Norian/Rhaetian age. Formed carbonate platform and is comparable to Triassic Lampang-Phrae Basin in Sukhothai Zone of N Thailand; (2) Uthai Thani Lst to W: slightly metamorphosed, thick-bedded Permian succession. Tied to Ratburi Lst typical of Permian on Sibumasu Block. Three geotectonic domains in C Plain, from E to W: (1) Indochina Block (Cathaysialand), (2) Sukhothai Zone (Permian-Triassic island arc system), and (3) Sibumasu Block (Gondwanaland))

Ueno, K., K. Nagai, N. Nakornsri & T. Sugiyama (1994)- Middle Carboniferous foraminifers from Ban Sup, Changwat Loei, Northeastern Thailand. Science Reports Institute of Geoscience, University of Tsukuba, B (Geology) 15, p. 15-45.

Ueno, K., K. Nagai, N. Nakornsri & T. Sugiyama (1995)- Upper Carboniferous foraminifers from Phu Tham Maholan, southeast of Wang Saphung, Changwat Loei, Northeast Thailand. Science Reports Institute of Geoscience, University of Tsukuba, B (Geology) 16, p. 29-37.

Ueno, K., K. Nagai, N. Nakornsri & T. Sugiyama (1996)- A new Moscovian foraminiferal fauna from Huai Luang, east of Wang Saphung, Changwat Loei, Northeast Thailand. J. Southeast Asian Earth Sciences 14, p. 79-89.
(Small foraminiferal fauna with two species of *Fusulinella*)

Ueno, K. & S. Sakagami (1991)- Late Permian Fusulinacean fauna of Doi Pha Phlung, North Thailand. Trans. Proc. Paleontological Society Japan, N.S. 164, p. 928-943.
(online at: http://www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NS164.pdf)
(Eight species of Late Permian fusulinaceans from lower Huai Thak Fm in Doi Pha Phlung area, NE of Lampang. Fauna is characterized by abundant *Gallowayinella guidingensis*, similar Changxing Lst in S China, indicating an early Changxingian or E Dorashamian age)

- Ueno, K. & S. Sakagami (1993)- Middle Permian foraminifers from Ban Nam Suai Tha Sa-at, Changwat Loei, Northeast Thailand. Trans. Proc. Paleontological Society Japan 172, p. 277-291.
(online at: https://www.jstage.jst.go.jp/article/prpsj1951/1993/172/1993_172_277/_pdf/-char/en)
(*M Permian forams, incl. Verbeekina verbeeki, Pseudodoliolina pseudolepida and Praesumatrina neoschwagerinoides in small outcrop E of Loei. Age E Murgabian (late M Permian)*)
- Ueno, K., T. Sugiyama & K. Nagai (1996)- Discovery of Permian foraminifers and corals from the Ratburi Limestone of the Phatthalang area, southern Peninular Thailand. In: H. Noda & K. Sashida (eds.) Professor H. Igo Commemorative volume on Geology and Paleontology of Japan and Southeast Asia, Gakujyutsu Tosho Insatsu, Tokyo, p. 201-216.
- UN/ESCAP and DMR Thailand (2001)- Mineral resources of Thailand. Atlas of mineral resources of the ESCAP region 16, United Nations Publications, New York, p. 1-239. (*With mineral occurrences and geological maps*)
(Text online at: <https://repository.unescap.org/handle/20.500.12870/4860>)
(maps online at: <https://repository.unescap.org/bitstream/handle/20.500.12870/4860/ESCAP-2001-MN-Mineral-resources-Thailand.pdf-map.pdf?sequence=2&isAllowed=y>)
- Unwin, D.M. & D.M. Martill (2017)- Systematic reassessment of the first Jurassic pterosaur from Thailand. In: D.W.E. Hone et al. (eds.) New perspectives on pterosaur palaeobiology, Geological Society, London, Special Publ. 455, 1, p. 181-186.
(*Pterosaur humerus (PRC 64) from U Jurassic of Thailand reassigned to Rhamphorhynchidae*)
- Upton, D.R. (1999)- A regional fission track study of Thailand: implications for thermal history and denudation. Ph.D. Thesis Birkbeck, University of London, p. 1-392. (*Unpublished*)
- Upton, D., C.S. Bristow, A.J. Hurford & A. Carter (1997)- Tertiary tectonic denudation in northwestern Thailand: provisional results from apatite fission-track analysis. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 421-431.
(*Preliminary results of Apatite Fission-Track study in NW Thailand, consistent with gentle inversion in Late Cretaceous- E Tertiary prior to rapid cooling in N-S belt of gneissic and plutonic rocks in Late Oligocene- E Miocene. Cooling rates equate to 2.75- 3.5 km of section denuded in Late Oligocene over ~3 Myrs, most likely representing tectonic denudation possibly associated with unroofing of metamorphic core complex*)
- Utha-Aroon, C. (1993)- Continental origin of the Maha Sarakham evaporites Northeastern Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 193-203.
(*On Upper Cretaceous potash-bearing evaporites of Khorat Basin, NE Thailand*)
- Uttamo, W., C. Elders & G. Nichols (1999)- The Tertiary sedimentary basins of northern Thailand. Proc. Symposium Mineral, energy and water resources of Thailand: towards the year 2000, Bangkok, p. 71-92.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1999/6605.pdf)
(*>40 Tertiary intra-cratonic basins in N Thailand, mainly N-S trending, and with 500-3000m of sediment fill*)
- Uttamo, W., C. Elders & G. Nichols (2003)- Relationships between Cenozoic strike-slip faulting and basin opening in northern Thailand. In: F. Sorti et al. (eds.) Intraplate strike-slip deformation belts, Geological Society, London, Special Publ. 210, p. 89-108.
(*Cenozoic tectonics in N Thailand resulted from collision between Indian plate and Eurasia. Continued indentation of Indian plate into Eurasia caused polyphase extrusion of Sundaland and movement of major strike-slip faults. Regional E-W extension in Late Oligocene-Early Miocene. Thirty-six major faults and 42 intra-cratonic basins recognized in N Thailand from Landsat TM images, >70% related to strike-slip tectonics*)

Uyeno, T. (1969)- Miocene Cyprinid fishes from Mae Sot Basin, northwestern Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 7, p. 93-96.
(*Fresh-water fish fossils Puntius and Cyprinidae from Miocene grey papery oil shale in Mae Sot series near Amphur Mae Sot, NW Thailand*)

Vachard, D. (1988)- Some foraminifera and algae of the Upper Triassic of West Thailand. In: H. Fontaine & V. Suteethorn (eds.) *Late Paleozoic and Mesozoic fossils of West Thailand and their environments*, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 20, p. 135-141.
(online at: <https://ncloud.dotdream.co.th/index.php/s/BS3gLMwg67BfzdQ>)
(*Carnian-Norian Aulotortus assemblage of W Thailand characteristic of Tethyan province, and resembles Kodiang Lst of NW Malaysia and various outcrops of Sumatra*)

Vachard, D. (1990)- New data on foraminifera, algae and pseudo-algae of the Visean and Bashkirian (Lower-Middle Carboniferous) from Northeast Thailand. *Geologisches Jahrbuch B73*, p. 91-109.
(*Three Visean- Bashkirian assemblages from NE Thailand. Paleobiogeographic affinities with Australia and Vietnam. Diverse foraminifera with >40 species, incl. Staffeliidae and Profusulinella*)

Vachard, D., H. Fontaine & M. Caridroit (1992)- Foraminifera, algae and pseudo-algae from Carboniferous and Permian limestone of North-west Thailand. *Revue de Paleobiologie*, Geneve, 11, p. 137-147.

Vattanasak, H., C. Chonglakmani, Q. Feng & C.K. Morley (2020)- Chert geochemistry, depositional setting, stratigraphic and structural significance for the Permian Nong Pong Formation, Khao Khwang Fold and Thrust Belt, Saraburi, Thailand. *J. Asian Earth Sciences* 191, 104234, p.
(*Permian deepwater chert-shale-limestone-tuff of Nong Pong Fm of Saraburi Group within Triassic of Khao Khwang fold-thrust belt. Radiolarian fauna from cherts includes Follicucullus porrectus (probable late Guadalupian, late middle Permian; equivalent of nearby carbonate platform. Geochemical, structural and sedimentary facies analyses suggests NPF deposited in deep marine, normal fault-bounded basin on rifted, ribbon continent margin, where carbonate platforms grew on structural highs)*)

Vattanasak, H., C.K. Morley & S. Pongwapee (2024)- The hydrocarbon source potential of Permo-Triassic rocks of the Indochina Block adjacent to the Paleo-Tethys suture in Thailand. *J. Asian Earth Sciences* 259, 10591, p. 1-17.
(*Main Thailand petroleum systems in Cenozoic rift basins. Khorat Plateau area is separate gas province with Permian limestone reservoirs possibly sourced from Triassic lacustrine, and Permo-Carboniferous marine shales. Outcropping Permo-Triassic shales from W margin of Khorat Plateau and Khao Khwang fold-thrust belt generally little hydrocarbon potential due to dominance of post-mature? Type IV amorphous, vitrinite and intertinite macerals and <1 % TOC content*)

Veeraburus, M., N. Mantjit & S. Suensilpong (1981)- Outline of geology and ore deposits of Thailand. In: S. Ishihara & A. Sasaki (eds) *Metallogeny of Asia*, Proc. International Symposium on Metallogeny of Asia, Tsukuba-Tokyo 1980, Geological Survey of Japan, Report 261, p. 81-92.
(online at: <https://www.gsj.jp/data/rep-gsj/No261.pdf>)
(*Brief review of Thailand ore deposits. Tin and tungsten most important metallic minerals. Also natural gas, lignite, oil shale, potash and rock salt*)

Veeravinantanakul, A., P. Kanjanapayont, A. Sangsornpong, N. Hasebe & P. Charusiri (2018)- Structure of Phu Phan Range in the Khorat Plateau: Its Apatite Fission Track ages and geological syntheses. *Bull. Earth Sciences Thailand (BEST)* 10, 1, p. 8-16.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246736/167718>)
(*AFT analysis of Phu Phan area in NE Khorat Plateau of NE Thailand. Apatites from Late Jurassic- E Cretaceous sandstones suggest three events: (1) 78-60 Ma (NE-SE strike-slip fault movement in Khorat area; (2) 55-42 Ma:extensive exhumation; Khorat region became Khorat Plateau; (3) about 37 Ma; rel. minor*)

Veeravinantanakul, A., R. Takahashi, A. Agangi, T. Ohba, Y. Watanabe, M.A. Elburg, H. Ueckermann, P. Kanjanapayont & P. Charusiri (2021)- Zircon Hf-isotope constraints on the formation of metallic mineral deposits in Thailand. *Resource Geology* 71, 4, p. 436-469.

(Sibumasu-Indochina terranes collision created several kinds of mineral deposits in Thailand. Sukhothai Fold Belt with I- and S-type granitoid, with U-Pb zircon ages ~243-202 Ma (timing of subduction) to syn-collisional stage at ~243-237 Ma and post-collision during 230–202 Ma. Magma from partial melting of old continental crust and young oceanic crust, probably mixed with mantle-derived magma. Granitoids at W margin of Indochina Terrane (Loei Fold Belt) dominated by mantle-derived components and contributed to porphyry-related skarn copper-gold and iron and epithermal gold mineralization. Magmas in Sibumasu Terrane and Inthanon Zone originated from melting of old crustal materials and responsible for S-type granite-related tin-tungsten mineralization)

Vivatpinyo, J., P. Charusiri, C. Sutthirat (2014)- Volcanic rocks from Q-prospect, Chatree gold deposit, Phichit Province, North Central Thailand: indicators of ancient subduction. *Arabian J. Engineering* 39, p. 325-338.

(Area of Chatree gold deposit, W side of Khorat Plateau, N-C Thailand with subduction-related Loei-Phetchabun- Ko Chang volcanic arc sequence from basalt porphyry, basaltic tuff to rhyolite/rhyodacite tuff. Andesite dated as 250 ± 6 Ma, younger basaltic andesite dykes 244 ± 7 Ma)

Von Braun, E. & R. Jordan (1976)- The stratigraphy and palaeontology of the Mesozoic sequence in the Mae Sot area in western Thailand. *Geologisches Jahrbuch* B21, p. 5-51.

*(Mae Sot Basin in NW Thailand with reefal E-M Permian Ratburi Lst, Triassic redbeds overlain by marine shales and sandstone and Late Triassic Kamawka Limestone. Jurassic Mae Moei Gp marine with ammonites incl. *Lytoceras*, etc.)*

Von Braun, E., C. Besang, W. Eberle, W. Harre, H. Kreuzer et al. (1976)- Radiometric age determinations of granites in northern Thailand. *Geologisches Jahrbuch* B21, p. 171-204.

(In N Thailand three N-S belts of igneous rocks. Central complex oldest. E chain E Triassic (~232-236 Ma))

Von Koenigswald, G.H.R. (1959)- A mastodon and other fossil mammals from Thailand. Royal Department of Mines, Bangkok, Report of Investigation 2, p. 25-28.

Von Martini, H.J. (1957)- Ueber das Alter von Hauptfaltung und Granit in Thailand. *Geologisches Jahrbuch* 74 (Bentz Festschrift), p. 687-696.

('On the age of the main folding and granites in Thailand'. Alpinotype main folding in Thailand is old Cimmeridgian (Late Triassic))

Vozenin-Serra, C. & C. Prive-Gill (1989)- Bois Plio-Pleistocenes du gisement du Saropee, Plateau de Khorat, Est de la Thaïlande. *Review Palaeobotany Palynology* 60, 3-4, p. 225-254.

*('Plio-Pleistocene wood from the Saropee deposit, Khorat Plateau, East Thailand'. Alluvial deposits of Mue Nam Mum river at Saropee yielded ~60 wood specimens, attributed to *Araucarioxylon* sp., *Shoreoxylon thailandense* n.sp., *Careyoxylon pondicherriense*, *Terminalioxylon* spp., *Dipterocarioxylon*, etc. Plio-Pleistocene mixed deciduous forest assemblage, probably not far from river and ancient volcanoes (Bunopas et al. 1999: buried by 0.770 Ma Australasian tektite event?))*

Vozenin-Serra, C. & C. Prive-Gill (2001)- Bois plio-pleistocenes du gisement de Ban Tachang (=Sarapee), Est-Thaïlande. *Palaeontographica* B, 260, p. 201–212.

('Plio-Pleistocene wood from the Ban Tachang (= Sarapee) beds, East Thailand')

Vozenin-Serra, C., C. Prive-Gill & L. Ginsburg (1989)- Bois miocenes du gisement de Pong, nord-ouest de la Thaïlande. *Review Palaeobotany Palynology* 58, 2-4, p. 333-355.

('Miocene wood from the Pong deposit, NW Thailand')

Wang, Y., H. He, P.A. Cawood, B. Srithai, Q. Feng, W. Fan, Y. Zhang & X. Qian (2016)- Geochronological, elemental and Sr-Nd-Hf-O isotopic constraints on the petrogenesis of the Triassic post-collisional granitic rocks in NW Thailand and its Paleotethyan implications. *Lithos* 266-267, p. 264-286.

(Inthanon zone main suture zone of E Paleotethys Ocean in NW Thailand and links with Changning-Menglian suture zone in SW Yunnan. In NW Thailand switch from E-ward subduction of Paleotethys ocean plate to collision of Sibumasu with Indochina at ~237 Ma, with syn-collision at ~237-230 Ma and post-collision time at ~200-230 Ma. Late Triassic granites in Inthanon and Sukhothai zones of NW Thailand post-collisional magmatic products)

Wang, Y., H. He, Y. Zhang, B. Srithai, Q. Feng, P.A. Cawood & W. Fan (2017)- Origin of Permian OIB-like basalts in NW Thailand and implication on the Paleotethyan Ocean. *Lithos* 274-275, p. 93-105.

(manuscript online at: <https://research-repository.st-andrews.ac.uk/handle/10023/12399>)

(Basaltic rocks in NW Thailand part of SE Asian igneous zone that delineates extension of Paleotethys Ocean from SW China into NW Thailand. Chiang Mai basalts two groups of high-iron basalts, resembling OIB-like rocks. Origin in intra-oceanic seamount setting in Paleotethyan Ocean, continued at least till 283 Ma (E Permian). Inthanon/ Changning-Menglian zones define main Paleotethyan suture zone)

Ward, D.E. & D. Bunnag (1964)- Stratigraphy of the Mesozoic Khorat Group in northeastern Thailand. Department of Mineral Resources, Thailand, Report of Investigation 6, p. 1-95.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1964/1967.pdf)

(Review of Triassic- Cretaceous stratigraphy overlying Late Carboniferous- Permian Ratburi Lst)

Warren, J., C.K. Morley, T. Charoentitirat, I. Cartwright, P. Ampaiwan, P. Khositichaisri, M. Mirzaloo & J. Yingyuen (2014)- Structural and fluid evolution of Saraburi Group sedimentary carbonates, central Thailand: a tectonically driven fluid system. *Marine and Petroleum Geology* 55, p. 100-121.

(Isotopic study of calcite in deformed L-M Permian Saraburi Gp carbonates defines fluid-cement histories, tied to regional burial followed by orogenic overprint of Triassic Indosinian and telogenetic overprints driven by late Cenozoic uplift. Carbonates deposited along W margin of Indochina Block as isolated calcareous algal, sponge and fusulinid-rimmed platforms on highs bound by extensional faults. Likelihood of preserving primary and mesogenetic matrix porosity in Permian carbonates of C Thailand is low)

Warren, J., C.K. Morley, T. Charoentitirat, I. Cartwright, P. Ampaiwan, P. Khositichaisri, M. Mirzaloo, M. Nazrul, A. Panthong & J. Yingyuen (2016)- Poroperm evolution through different deformation stages: stable isotopes define fluid evolution in Permian and older carbonates in Thailand. AAPG Asia Pacific Geosciences Technology Workshop, Bangkok. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2016/51264warren/ndx_warren.pdf)

Wasson, J.T., K. Pitakpaivan, P. Putthapiban, S. Salyapongse, B. Thapthimthong & J.F. McHone (1995)- Field recovery of layered tektites in northeast Thailand: evidence of a large scale melted sheet. *J. of Geophysical Research* 100, E7, p. 14385-14389.

(Australasian tektites from 40×130 km region in NE Thailand all layered (Muong-Nong-type) tektites, with two exceptions near W edge of region, implying impact melt hot enough to flow if deposited on sloping surface. Absence of splash-form tektites indicates that layer still molten when reached ground. This requires that atmosphere remained hot (>2300°K) for few minutes. In-place tektites almost always associated with 10cm -1m thick layer of laterite, at bottom layer of loess-like sandy layer. Part of 1100-km-long area with layered tektites)

Waterhouse, J.B. (1981)- Age of the Rat Buri Limestone of southern Thailand. In: J.B. Waterhouse et al. (eds.) *The Permian stratigraphy and palaeontology of Southern Thailand*, Geological Survey Memoir 4, Dept. Mineral Resources, Bangkok, p. 1-42.

(Mainly critical evaluation of Grant (1976). Brachiopods from basal part of Rat Buri Limestone in S Thailand likely of Kungurian (late E Permian) age, not Baigendzinian (= Artinskian) as reported earlier, and in agreement with fusulinid data. Several specific links with Kungurian Bituani fauna of Timor. No stratigraphy)

Waterhouse, J.B. (1981)- Age of the brachiopod faunas from Kaeng Krachan Formation of southern Thailand. In: M.J. Hambrey & W.B. Harland (eds.) *Earth's pre-Pleistocene glacial record*, Cambridge University Press, p. 336. (Abstract only)

(Brachiopods above earliest Permian glacial pebbly mudstone in S Thailand 40 species, mainly new species of *Orthis*, *Chonetina*, *Neospirifer*, *Spirifer*, etc. Most common is new form of *Spinomartinia*. Probably of mid-Sakmarian age suggested by *Brachythyris* *rectangulus* and *Neospirifer* *sterlitamakensis*. Small fauna from pebbly mudstones at Ko Muk could be Asselian or Sakmarian age. Overlain by Rat Buri Lst with rich brachiopods of Kungurian age)

Waterhouse, J.B. (1982)- An Early Permian cool-water fauna from pebbly mudstones in south Thailand. *Geological Magazine* 119, 4, p. 337-354.

(E Permian (Asselian) small brachiopod fauna from above E Permian pebbly mudstones- sandstones of Phuket Gp at Ko Muk and Ko Phi Phi islands, Andaman Sea. With *Komukia*, *Cancrinelloides*, *Rhynchopora*, *Sulciplica*, etc. At one locality associated with solitary coral *Euryphyllum*. Most genera typical of temperate-high paleolatitudes, suggesting pebbly mudstones are cool water deposits, contemporaneous with Late Asselian Gondwana glacial deposits (=Sibumasu terrane'; JTvG))

Waterhouse, J.B. (1982)- New Carboniferous brachiopod genera from Huai Bun Nak, North-east Thailand. *Palaeontologische Zeitschrift* 56, 1-2, p. 39-52.

(Five new brachiopod genera and species are described from brown silty mudstone near Huai Bun Nak, NE Thailand)

Waterhouse, J.B. (1983)- A late Permian lytoniid fauna from Northwest Thailand. *Papers Dept. of Geology, University of Queensland*, 10, 3, p. 113-153.

(25 Lopingian (Late Permian) brachiopod species in marine shale in Huai Tak Fm of Lampang Province, NW Thailand. With common lytoniid brachiopod *Oldhamina squamosa* and new taxa *Lampangella lata*, *Transennatia pitakpaivani*, *Acosarina antesulcata*, etc.)

Waterhouse, J.B., K. Pitakpaivan & N. Mantajit (1981)- Early Permian brachiopods from Ko Yao Noi and near Krabi, southern Thailand. In: J.B. Waterhouse et al. (eds.) *The Permian stratigraphy and palaeontology of Southern Thailand*, Geol. Survey Memoir 4, Dept. Mineral Resources, Bangkok, p. 43-213.

(40 brachiopod species from SW Peninsular Thailand near Krabi and NE of Phuket, in U Kaeng Krachan Gp just below Rat Buri Lst and mostly above pebbly mudstones (= Sibumasu stratigraphy). Likely age Sakmarian (E Permian). Most common species *Spinomartinia prolifica*, also common *Retimarginifera*, *Brachythyris*, *Stenosisma*, *Stereochia*, etc. No obvious correlation with SE Asian faunas outside Thailand)

Waterhouse, J.B. & S. Piyasin (1970)- Mid-Permian brachiopods from Khao Phrik, Thailand. *Palaeontographica*, Abt. A, 135, 3-6, p. 83-197.

(40 species of silicified brachiopods from limestone at Khao Phrik, W of Bangkok, S Thailand. Incl. *Neospirifer*, *Marginifera*, *Hustedia*, *Leptodus* and *Waagenites speciosus* n.sp., close to *W. molengraaffi* (Broili) from Timor Bituni beds. Fauna lacks cool water elements. Some species in common with Basleo fauna of Timor)

Wathanakul, P., S. Nakapudungat, S. Sakkaravej & P. Lomthong (2001)- Diamonds from the eastern offshore of Phuket island, Thailand. 28th International Gemmological Conference, Madrid, p. 101-104.

Wathanakul, P., T.T. Win, R.M. Davis, S. Sakkaravej, A. Andrew & W.I. Griffin (1998)- Characteristics of diamonds, southern Thailand. In: Ninth Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur, p. 101-102. (Extended Abstract)

(Diamonds found in on- and offshore alluvial deposits in tin dredger samples in Takuapa-Phang Nga and Phuket areas, S Thailand. Source unknown. Area mainly covered with Carboniferous-Tertiary granites. Inclusions include graphite, sulfides, olivine, Cr-pyrope and chromite, indicating predominantly harzburgitic paragenesis)

- Watkinson, I. (2009)- The kinematic history of the Khlong Marui and Ranong Faults, Southern Thailand. Ph.D. Thesis Royal Holloway, University of London, p. 1-505. (*Unpublished*)
- Watkinson, I., C. Elders, G. Batt, F. Jourdan, R. Hall & N.J. McNaughton (2011)- The timing of strike-slip shear along the Ranong and Khlong Marui faults, Thailand. *J. of Geophysical Research: Solid Earth* 116, 9, B09403, p. 1-26.
(Ranong and Khlong Marui faults experienced major ductile dextral shear in M Eocene (48-40 Ma), which followed two phases of dextral shear along Ranong Fault: before Late Cretaceous (>81 Ma) and Late Paleocene- E Eocene (59-49 Ma). Many sheared rocks part of pre-kinematic crystalline basement, which partially melted and was intruded by Late Cretaceous (81-71 Ma) and E Eocene (48 Ma) tin granites. Late Eocene (<37 Ma) faults reactivation as curved sinistral branches of Mae Ping and Three Pagodas faults, accommodating lateral extrusion during India-Asia collision and Himalayan orogenesis)
- Watkinson, I., C. Elders & R. Hall (2008)- The kinematic history of the Khlong Marui and Ranong Faults, southern Thailand. *J. Structural Geology* 30, p. 1554-1571.
(Khlong Marui (KMF) and Ranong Fault (RF) NNE-trending strike-slip faults dissecting peninsular Thailand. Two phases of ductile dextral shear, separated by Campanian magmatism. Paleocene-Eocene post-kinematic granites date end of this phase. Brittle sinistral phase deforms granites, and exhumed ductile fault rocks. Faults formed near S margin of Late Cretaceous-Paleocene orogen, and may have been influenced by variations in rate of subduction. N-S compression prior to reactivation of subduction around southern Sundaland in Eocene caused widespread deformation in overriding plate, including sinistral transpression on KMF and RF)
- Wattananikorn, K., J.A. Beshir & A. Nochaiwong (1995)- Gravity interpretation of Chiang Mai Basin, northern Thailand: concentrating on Ban Thung Sieo area. *J. Southeast Asian Earth Sciences* 12, p. 53-64.
(Chiang Mai Tertiary basin five sub-basins. Depth to Cretaceous basement up to 2.3 km)
- Wathanapond, P., A. Fanka, K.N. Pang & S.L. Chung (2025)- Petrogenesis of REE-mineralized granitic plutons in central Thailand, Southeast Asian tin belt: New insights from geochemistry and zircon U–Pb geochronology. *J. Asian Earth Sciences* 277, 106368, p. 1-21
(online at: <https://www.sciencedirect.com/science/article/pii/S1367912024003638>)
(Geochemistry of Late Triassic- E Jurassic biotite granite and biotite-muscovite granite exposed in Uthai Thani province, C Thailand, in area of Paleozoic-Triassic rocks. Part of Inthanon Paleotethyan zone between Sibumasu and W part of Sukhothai-Indochina blocks). Zircon Pb/U suggest S-type biotite granite = Eastern Belt granite and of subduction granite in Sukhothai arc at ~222 Ma, while Central Belt I-type biotite-mucovite granite = younger collisional granite (194-209 Ma))
- Wernette, S.J., N.C. Hughes, P.M. Myrow & A. Sardud (2023)- Trilobites of Thailand's Cambrian- Ordovician Tarutao Group and their geological setting. *Papers in Palaeontology*, 2023, e1516, p. 1-100.
(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/spp2.1516>)
(Tuff-bearing M Cambrian- lowermost Ordovician beds on Ko Tarutao island (N of Langkawi), Satun province, S-most Peninsular Thailand (Sibumasu Terrane) with rich trilobite fauna. Fauna suggests close association with Australia, N China (Sino-Korea) and other continental fragments from Gondwana's northern equatorial sector)
- Wielchowsky, C.C. & J.D. Young (1985)- Regional facies variations in Permian rocks of the Petchabun fold and thrust belt. In: P. Thanavarachorn et al. (eds.) *Conference Geology and Mineral resource development of NE Thailand*, Khon Kaen University, Bangkok 1983, p. 41-55.
(Regional study of Lower-Middle Permian of Phetchabun fold-thrust belt of NE and C Thailand. Includes Carboniferous- M Permian Khao Kwang carbonate platform, in Late Paleozoic foldbelt at W margin of Indochina Plate?)
- Winkel, R., R. Ingavat & D. Helmcke (1983)- Facies and stratigraphy of the lower-lower Middle Permian strata of the Petchabun fold-belt in Central Thailand. In: P. Nutalaya (ed.) *Proc. Workshop Stratigraphic correlation of Thailand and Malaysia*, Haad Yai 1983, Geological Society Thailand and Geological Society Malaysia, p. 293-306.

(online at: https://gsm publ.files.wordpress.com/2014/10/sctm_17.pdf)

(Lower and lower Middle Permian Nam Duk Fm of Petchabun area mainly deep water limestones, cherts and shales, with acid tuff interbeds. Presence of displaced shallow marine fusulinids (*Sumatrina*, *Parafusulina*). Foram genus *Hemigordius* in most E-M Permian samples. Onset of overlying flysch and molasse deposits in late M Permian (Murgabian))

Withoeck, J. (2021)- Pin-pointing the Sibumasu-Indochina convergence zone (Northern Thailand): differential Meso-Cenozoic reactivation as constrained by low-temperature thermochronometry. Masters Dissertation, Ghent University, p. 1-70.

(online at: https://libstore.ugent.be/fulltxt/RUG01/003/008/236/RUG01-003008236_2021_0001_AC.pdf)

(Document uplift-exhumation of Loei Province during Oligocene and slightly earlier. Oldest exhumation in Thailand in Eocene, E of Chiang Mai Basin, with slow, gradual cooling during Eocene and Oligocene followed by stable conditions. Associated with exhumation of metamorphic core complexes during Eocene)

Wolfart, R. (1987)- Geology of Amphoe Sop Prap (Sheet 4844-1) and Amphoe Wang Chin (sheet 4944-4) (1:50,000), Thailand. *Geologisches Jahrbuch* 65, p. 3-52.

Wolfart, R. (2003)- Ordovician faunas (Trilobita, Ostracoda, Cystoidea, Crinoidea) from West Thailand. their significance for biostratigraphy and palaeobiogeography. *Geologisches Jahrbuch* B94, p. 1-265.

(Descriptions of Ordovician faunas from Khanchanaburi, Tong Pha Phum and Bo Noi regions and their meaning for biostratigraphy and paleogeography)

Wonganan, N. (2005)- Radiolaria and radiolarites of Northern Thailand- paleontology, tectonic and palaeogeographic implications. Ph.D. Thesis, Universite Sciences Technologies de Lille, Villeneuve d'Ascq, p. 1-577. (Unpublished)

Wonganan, N. (2012)- The youngest radiolarians from Mae Hong Son region, Northern Thailand; implication for the tectonic of Southeast Asia. *Proc. 13th Interrad Conference, Cadiz 2012, Radiolaria Newsletter* 28, p. 196-197. (Abstract only)

(Rich Triassic radiolaria in ~100m thick section of bedded siliceous rocks N of Mae La Noi, Mae Hong Son province, NW Thailand, representing Paleo-Tethys Ocean deposits. 55 species, including *Palaeosaturnalis triassicus*, *Vinassaspongos subsphaericus*, *Capnuhosphaera crassa*, etc., indicating U Ladinian- Carnian age. Top of section of E-M Norian age (*Capnuhosphaera crassa*, *Multimonilis*, etc). Chert in uppermost part of section with significant siliciclastics and carbonate minerals, indicating gradual change from deep oceanic environment to continental marginal realm. Therefore, Paleo-Tethys almost closed in middle Late Triassic)

Wonganan, N. & M. Caridroit (2005)- Middle and Upper Devonian radiolarian faunas from Chiang Dao area, Chiang Mai province, northern Thailand. *Micropaleontology* 51, 1, p. 39-58.

(Diverse Devonian radiolarians in ribbon-bedded chert in accretionary complex N of Chiang Dao, Chiang Mai, N Thailand, part of newly described (Paleotethys) suture zone. M Devonian- M Permian (and younger?) 'Chiang Dao chert series' is (imbricated?) oceanic sequence ~300m thick. Rich radiolarian assemblages with 43 species, *Entactinaria* dominant. Trilonche minax (lower Frasnian) assemblage from Australia recognized in area. Radiolarian cherts evidence for presence of wide paleo-ocean between Shan-Thai and Indochina continental terranes)

Wonganan, N. & M. Caridroit (2005)- Devonian radiolarians from Pai District, Mae Hong Son, northern Thailand. In: *Int. Conference Geology, geotechnology and general resources of Indochina (GEOINDO 2005)*, Khon Khaen 2005, p. 637-648.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2005/9389.pdf)

(Late Devonian radiolaria in highly folded cherts between Pai and Mae Hong Song, NW Thailand (Paleotethys oceanic deposit) (partly same localities as Sashida et al. 1998))

Wonganan, N. & M. Caridroit (2006)- Middle to Upper Permian radiolarian faunas from chert blocks in Pai area, northwestern Thailand. *Eclogae Geologicae Helvetiae* 99, Supplement 1, p. 133-139.

(online at: <https://sjg.springeropen.com/track/pdf/10.1007/s00015-006-0610-5.pdf>)

(Well-preserved Permian radiolarians in chert blocks in Mae Hong Son province, NW Thailand, recently mapped as Carboniferous. Twenty-four taxa, incl. *Follicucullus charveti*, believed to define Equatorial warm water province. In N Thailand Devonian- Triassic was zone of deep marine sedimentation, one of longest records of continuous deposition in oceanic setting)

Wonganan, N., M. Caridroit & C. Randon (2003)- The "Chiang Dao radiolarian chert" in the Chiang Dao area, Northern Thailand: a witness of a 150 My (at least ?) of oceanic deposit. In: 10th Meeting Int. Association of Radiolarian Paleontologists (Interrad X), Lausanne, Program and Abstracts, p. 116-117. (Abstract only)

(Big M Devonian- Permian chert body rich in radiolarians crops out for 2 km along N107 near Chiang Dao city. Also called 'Fang Chert'. Thickness ~300m, including ~50m volcanic bed. Overlies several m of black siliceous shale with graptolites (*Monograptus*) of early Lower Devonian age)

Wonganan, N., C. Randon & M. Caridroit (2009)- Mississippian (Early Carboniferous) radiolarian biostratigraphy of northern Thailand (Chiang Dao area). *Geobios* 40, 6, p. 875-888.

(Five E Carboniferous radiolarian assemblage zones recognized in ribbon-bedded radiolarites N of Chiang Dao, N Thailand. About 300m thick series of M Devonian- M-L Triassic distal oceanic deposits present in N Thailand, reflecting long-lived (150-200 My) Paleotethys oceanic realm between Indochina and Shan-Thai continental terranes)

Wongpornchai, P. (1997)- Origin of the formations in Nong Bua Basin, Central Thailand. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Dept. Mineral Resources, Bangkok, 1, p. 210-217.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)

(Nong Bua Cenozoic continental rift basin in central plains of Thailand. Asymmetric half-graben, formed during E-W extension. Fluvial-lacustrine fill)

Wongwanich, T. (1990)- Lithostratigraphy, sedimentology, and diagenesis of the Ordovician carbonates, Southern Thailand. Ph.D. Thesis, University of Tasmania, p. 1-215.

(online at: https://eprints.utas.edu.au/21931/1/whole_WongwanichThanis1991_thesis.pdf)

(Study of Ordovician Thung Song Gp in Satun Province. Age U Tremadoc- U Ashgill. Ramp setting, 1400m thick sequence of tropical limestones, dolomites and calcareous shale, with tidal flats, stromatolite reefs, lagoons, buildup-barrier reefs and deeper water facies. Long and complex diagenetic history. Overlies red siliciclastics and overlain by latest Ordovician- Silurian- Devonian black graptolitic shales and cherts with radiolarians)

Wongwanich, T. & A.J. Boucot (2011)- Devonian. In: M.F. Ridd, A.J. Barber & M.J. Crow (eds.) *The Geology of Thailand*, Geological Society, London, p. 53-70.

Wongwanich, T., A.J. Boucot, C.H.C. Brunton, M.R. House & P.R. Racheboeuf (2004)- Namurian fossils (brachiopods, goniatites) from Satun Province, southern Thailand. *Journal of Paleontology* 78, 6, p. 1072-1085.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2004/5533.pdf)

(Previously unknown M Carboniferous goniatite and brachiopod fauna from Pa Samed Fm clastics in Satun area, S Thailand (= Sibumasu terrane), which unconformably overlie E. Devonian (Emsian) dacryonarid-rich (= Tentaculites) black mudstones. Brachiopod fauna several new species and unlike any previously known from Asia)

Wongwanich, T. & C.F. Burrett (1983)- The Lower Palaeozoic of Thailand. *J. Geological Society Thailand* 6, 2, p. 21-29.

(online at: <http://library.dmr.go.th/Document/J-Index/1983/90.pdf>)

(Brief review of Lower Paleozoic in S and W Thailand. Close faunal affinities between trilobites and molluscs of Shan-Thai (Sibumasu) block and Australia suggest proximity to NW Australia in E Paleozoic)

Wongwanich, T., C.F. Burrett, P. Chaodumrong & W. Tansathien (1990)- Lower to Mid Palaeozoic stratigraphy of mainland Satun province, southern Thailand. *J. Southeast Asian Earth Sciences* 4, 1, p. 1-9. (online at:

- https://www.academia.edu/14933838/Lower_to_Mid_Palaeozoic_stratigraphy_of_mainland_Satun_province_southern_Thailand)
(A 727m thick sequence of L-M Mid Paleozoic in Satun province, S Peninsular Thailand (= Sibumasu Terrane) is succession of Ordovician- M Devonian deep water carbonates and clastics with trilobites, graptolites, tentaculites shale, etc., overlain by M-L Devonian shallower water carbonates and clastics)
- Wongwanich, T., W. Tansathien, S. Leevongcharoen, W. Paengkaew, P. Thiamwong, J. Chaeroenmit & W. Saengsrirachan W (2002)- The Lower Paleozoic rocks of Thailand. Proc. Symposium on geology of Thailand, Bangkok, p. 16-21.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6370.pdf)
- Woodruff, D.S. (2003)- Neogene marine transgressions, palaeogeography and biogeographic transitions on the Thai-Malay Peninsula. J. of Biogeography 30, p. 551-567.
(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.606.8853&rep=rep1&type=pdf>)
(Neogene marine transgressions flooded Thai-Malay Peninsula in two areas and created circumstances leading to present day phytogeographical and zoogeographical transitions between Sundaic and Indochinese subregions. Global eustatic sea level curve predicts 30-100 km wide seaways N and S of Nakhon in Thammarat Range in C Peninsula of S Thailand in E-M Miocene and E Pliocene, but not yet documented)
- Wu, C. & S. Ishihara (1994)- REE geochemistry of the Southern Thailand granites. J. Asian Earth Sciences 10, p. 81-94.
(REE study of Triassic- Cretaceous tin-bearing and tin-barren granitic plutons in S Peninsular Thailand. Three groups: low, variable and exceptionally high REE contents)
- Yakzan, A.M. & R.J. Morley (1997)- Palynology of Lower Miocene intermontane lacustrine sediments from the Nong Ya Plong Basin Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific, Dept. Mineral Resources, Bangkok, p. 259. *(Abstract only)*
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1997/7638.pdf)
(Palynology of 45m core from Sa Kae Ngam oilfield in Nong Ya Plong intermontane basin with E Miocene lacustrine shale and 6m bituminous coal. Shale with abundant Alnus. Upper mudstone with common pollen comparable to Florschuetzia and Lagerstroemia)
- Yamee, C., T. Charoentitirat & A. Meesook (2008)- Faunal aspects of marine Jurassic rocks in the Ban Mae Kut Luang Area, Mae Sot District, Tak Province, Thailand. Proc. Int. Symposia on Geoscience Resources and Environments of Asian Terranes (GREAT 2008), Bangkok, p. 177-180.
(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/061.pdf)
(Marine Jurassic of NE Thailand ~600m of clastics and oolitic limestone, with shallow marine faunas dominated by bivalves (incl. Bositra ornati, Camptonectes sp., Grammatodon sp., Parvamussium donaiense) and ammonoids, also rhynchonellid brachiopods, trace fossils and plant remains. Age Toarcian-Aalenian)
- Yan, Q., X. Shi, I. Metcalfe, S. Liu, T. Xu, N. Kornkanitnan, T. Sirichaiseth, L. Yuan, Y. Zhang & H. Zhang (2018)- Hainan mantle plume produced late Cenozoic basaltic rocks in Thailand, Southeast Asia. Nature Scientific Reports 8, 2640, p. 1-14.
(online at: <https://www.nature.com/articles/s41598-018-20712-7>)
(Late Cenozoic (0.4- 11 Ma) intraplate volcanism in SE Asia started shortly after end of seafloor spreading in S China Sea region. Major and trace element data and Sr-Nd-Pb-Hf isotope ratios of basaltic lavas from Khorat Plateau and volcanic centers in Paleozoic Sukhothai arc terrane in Thailand mainly trachybasalts and basaltic trachyandesites with oceanic island basalt/OIB-like characteristics. Post-spreading intraplate volcanism in SCS region induced by Hainan mantle plume which spread W-wards)
- Yanagida, J. (1964)- Permian brachiopods from Central Thailand. In: T. Kobayshi (ed.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 1, p. 143-176.

(Seven species of M-U Permian brachiopods from dark calcareous mudstone in Ratburi Lst, SW of Phetchabun, C Thailand, incl. *Tylopecta yangtzeensis*, *T. nangkinensis*, *Haydenella*, *Orthotichia*, etc. Faunal affinities closest to S China)

Yanagida, J. (1967)- Early Permian brachiopods from North-Central Thailand. In: T. Kobayshi & R. Toriyama (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 3, p. 46-97.

(First description of E Permian brachiopods from Thailand: assemblage of 29 species from Asselian? of Tham Nam Maholan, Ban Nong Hin, Changwat Loei, incl. *Reticulatia*, *Costiferina*, lyttonid *Oldhamina* aff. *decipiens*. Similar to 'Productus-Limestone' of Indochina, China, Urals, etc. Associated with fusulinids *Paraschwagerina* and *Triticites* sp.)

Yanagida, J. (1974)- Middle Carboniferous brachiopods from Loei, North Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 7-23.

Yanagida, J. (1976)- Palaeobiogeographical consideration on the Late Carboniferous and Early Permian brachiopods of Central North Thailand. In: T. Kobayshi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 173-189.

(Brachiopod faunas from Thum Nam Maholan Lst of N-C Thailand strong similarities to Lower Permian of Eurasian continent, but not to Australia- New Zealand. Etc.)

Yanagida, J. (1976)- Upper Carboniferous brachiopods from Wang Saphung, North Thailand. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 1-31.

Yanagida, J. (1976)- Palaeobiogeographical consideration on the Late Carboniferous and Early Permian brachiopods of Central North Thailand. In: T. Kobayashi & W. Hashimoto (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 17, p. 173-189.

(U Carboniferous and Lower Permian Brachiopod localities near Loei, N Thailand with similarities to N China, Europe, N America, etc.; few similarities with Australia)

Yanagida, J. (1980)- Carboniferous brachiopoda of the Thai-Malayan district and its significance in paleobiogeography. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 25-26.

(Brief review of Carboniferous brachiopod faunas in Thailand and Malay Peninsula. Moscovian brachiopods rel. warm-water assemblages, often associated with fusulinids, and no clear affinities with Australian faunas)

Yanagida, J. (1984)- Carboniferous and Permian brachiopods of Thailand and Malaysia with a brief note on the Mesozoic. In: T. Kobayshi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 187-194.

(Brief review of work on Carboniferous and Permian brachiopods in Thailand and Malaysia)

Yanagida, J. & N. Nakornsri (1999)- Permian brachiopods from the Khao Hin Kling Area near Phetchabun, North-central Thailand. *Bull. Kitakyushu Museum Natural History* 18, p. 105-136.

(online at: www.kmnh.jp/info/publication/date/18-105-E-Yanagida_Nakornsri.pdf)

(M- early Late Permian brachiopods from Tak Fa Fm black mudstone of Rat Buri Group ~50 km SW of Phetchabun, C Thailand (in Phetchabun foldbelt= W margin of Indochina Block). Fauna 21 species of 17 genera, close affinities to C and S Tethyan realms)

Yanagida, J. & Peck Chin Aw (1979)- Upper Carboniferous, Upper Permian and Triassic brachiopods from Kelantan, Malaysia. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 20, p. 119-141.

(Brachiopod assemblages from NE Malay Peninsula)

Yang, W., Q. Feng & S. Shen (2008)- Permian radiolarians, chert and basalt from the Nan Suture Zone, Northern Thailand. Proc. International Symposium Geoscience resources and environments of Asian terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 172-173. (*Abstract; full paper see below*)
(*Nan suture zone in N Thailand dominated by Carboniferous- Permian Pha Som Metamorphic Complex, with slices of volcanic rocks, schist, meta-greywacke, serpentinite and bedded chert, unconformably overlain by U Triassic and Jurassic red sandstones. Oceanic island basalt- purple radiolarian chert sequence with abundant radiolarians, incl. Follicucullus porrectus, suggesting latest M Permian- earliest Late Permian age*)

Yang, W., Q. Feng & S. Shen, K. Malila & C. Chonglakmani (2009)- Permian radiolarians, chert and basalt from the Nan Suture Zone, Northern Thailand. Earth Science (J. China University of Geosciences) 34, 5, p. 743-751.

(*Well-preserved sequences of radiolarian chert and basalt in Pha Som metamorphic complex in Nan suture zone, N Thailand. Bedded chert with Follicucullus porrectus (late M Permian- early Late Permian), deposited on continental margin, and Oceanic Island basalts suggest Nan suture zone was small marginal oceanic basin, which closed between Late Permian-Late Triassic*)

Yang, W., Q. Feng, S. Shen & C. Chonglakmani (2009)- Constraints of U-Pb zircon dating on the evolution of the Nan-Uttaradit suture zone in northern Thailand. Acta Geoscientica Sinica 30, Suppl. 1, p. 88-89.

(*Nan-Uttaradit suture zone in N Thailand narrow N-S ophiolite belt, interpreted as (1) Paleo-Tethys ocean remnants separating Shan-Thai (Sibumasu) and Indochina terranes or (2) boundary of Sukhothai (Simao) and Indochina terranes. Zircon dating of gabbro (~377 Ma; M Carboniferous) and tholeiite (~315 Ma; Late Carboniferous) from Carboniferous-Permian Pha Som Metamorphic Complex in suture zone suggest Late Devonian- early Late Carboniferous spreading of oceanic crust*)

Yang, W., X. Qian, Q. Feng, S. Shen & C. Chonglakmani (2016)- Zircon U-Pb geochronological evidence for the evolution of the Nan-Uttaradit suture in northern Thailand. J. of Earth Science (China) 27, 3, p. 378-390.

(*online at: <http://en.earth-science.net/PDF/20160612013541.pdf>*)

(*Nan-Uttaradit suture narrow N-S trending discontinuous ophiolite belt in N Thailand. Melange composed of gabbro, metabasalt, andesite and radiolarian chert. Gabbro and meta-basalt zircon U-Pb ages of ~311 and 316 Ma, suggesting Nan-Uttaradit Ocean existed in Late Carboniferous. Nan-Uttaradit Ocean probably Ailaoshan-extension Jinshajiang Ocean to N*)

Yang, Z. & J. Besse (1993)- Paleomagnetic study of Permian and Mesozoic sedimentary rocks from Northern Thailand supports the extrusion model for Indochina. Earth Planetary Science Letters 117, p. 525-552.

(*Paleomagnetic study of Jurassic- Cretaceous sediments on Khorat Plateau suggests 1500 ± 800 km of post-M Cretaceous left-lateral slip along Red River and Xian Shui He fault zones and $14 \pm 7^\circ$ CW rotation for Indochina block relative to S China block, in agreement with lateral extrusion model of Indochina during India-Asia collision. Additional data of Permian, U Triassic and Lw Jurassic suggest Indochina, Yunnan (S China), N China block and S China block probably in contact at least since Late Triassic*)

Yang, Z., J. Besse, V. Suteethorn, J.P. Bassoullet, H. Fontaine & E. Buffetaut (1995)- Lower-Middle Jurassic paleomagnetic data from the Mae Sot area (Thailand): paleogeographic evolution and deformation history of Southeastern Asia. Earth Planetary Science Letters 136, p. 325-341.

(*Paleomagnetic study of E-M Jurassic limestones and sandstones from Mae Sot area, W Thailand (part of Shan-Thai-Malay). Mae Sot paleolatitude show STM was close to or had already accreted with Simao or Khorat blocks in E-M Jurassic (in Late Triassic). Relative S-ward motion of $8 \pm 4^\circ$ of Indochina and CW rotations ($14-75^\circ$) relative to China*)

Yokart, B., S.M. Barr, A.E. Williams-Jones & A.S. Macdonald (2003)- Late-stage alteration and tin-tungsten mineralization in the Khuntan Batholith, northern Thailand. J. Asian Earth Sciences 21, p. 999-1018.

(*Khuntan Batholith of NW Thailand part of Late Triassic (~202, 212 Ma) E marginal belt of N Thailand Granite Province which formed in syn-collisional setting and may tie to Main Range of Malay Peninsula (= Sukhothai terrane of later authors?; JTvG). Most of batholith coarse biotite-muscovite granite, but SE part muscovite-tourmaline granite associated with Sn-W mineralization*)

Young, B. & W. Jantaranipa (1970)- The discovery of Upper Palaeozoic fossils in the "Phuket Series" of Peninsular Thailand. Proc. Geological Society, London 1662, p. 5-7.

Yumuang, S. (1997)- Post-depositional structural models of the potential potash layer in the Maha Sarakham Formation in Bamnet Narong area, Changwat Chaipum, northeastern Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Dept. Mineral Resources, Bangkok, 2, p. 663-668.

(Delineation of potash (carnallite) layer in Cretaceous evaporites of Khorat Basin, NE Thailand. Thickness 4.3-40m)

Yumuang, S., C. Khantaprab & M. Taiyaqupt (1986)- On the evaporite deposits in Bamnet Narong area, northeastern Thailand. In: G.H. Teh & S. Paramanathan (eds.) Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984, 2, Bull. Geological Society Malaysia 20, p. 249-267.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986b14.pdf>)

(Cretaceous evaporites of Khorat Basin with three main evaporite cycles of halite- anhydrite-clastics. Evaporite facies primary precipitates of marine evaporites in 'bar-basin')

Zaw, K., T. Rodmanee, S. Khositantont, T. Thanasuthipitak & S. Ruamkid (2007)- Geology and genesis of Phu Thap Fah gold skarn deposit, northeastern Thailand: implications for reduced gold skarn formation and mineral exploration. GEOTHAI'07 Int. Conference on Geology of Thailand, Bangkok, DMR, p. 93-95.

(Phu Thap Fah gold skarn deposit in Loei Province, NE Thailand, in Permian crystalline limestone and siltstone intruded by E Triassic granodiorite (~245 Ma) and Late Triassic andesitic dykes (~221 Ma). Gold occurs as electrum and gold-bismuth-telluride association. Most gold confined to massive pyrrhotite and pyrite)

Zeitoun, V., W. Chinnawut, L. Arnaud, C. Bochaton, K. Burdette, J. Thompson, J.B. Mallye, S. Frere et al. (2019)- Dating, stratigraphy and taphonomy of the Pleistocene site of Ban Fa Suai II (Northern Thailand): Contributions to the study of paleobiodiversity in Southeast Asia. Annales de Paleontologie 105, 4, p. 275-285.

(Studies Ban Fa Suai II site near Cave of the Monk in N Thailand show changes in taxonomic composition of fauna over time and argue against current data for paleo-ecological reconstructions)

Zhang, Y., Y. Wang, B. Srithai & B. Phajuy (2016)- Petrogenesis for the Chiang Dao Permian high-iron basalt and its implication on the Paleotethyan Ocean in NW Thailand. J. of Earth Science (China) 27, 3, p. 425-434.

(online at: <http://en.earth-science.net/PDF/20160612015946.pdf>)

(E Permian very high-iron basalts from Chiang Dao, NW Thailand, have geochemical affinity to Oceanic Intraplate Basalts (OIB). Probable evidence for Paleotethys seamount, and suggest Paleotethys Ocean was located between Shan-Thai terrane of Sibumasu and Sukhothai arc along Inthanon zone of Chiang Mai-Chiang Rai rather than Nan-Uttaradit zones)

Zhao T., X. Qian & Q. Feng (2016)- Geochemistry, zircon U-Pb age and Hf isotopic constraints on the petrogenesis of the Silurian rhyolites in the Loei fold belt and their tectonic implications. J. of Earth Science (China) 27, 3, p. 391-402.

(Silurian calc-alkaline rhyolites from Loei foldbelt with mean Pb-U age of 424±3 Ma typical arc-related rocks. Formed in volcanic arc, in contact with Truong Son fold belt during E Paleozoic. Simao Block may be contiguous with Indochina Block during Silurian)

Zhao T., X. Qin & Q. Feng (2015)- Zircon U-Pb-Hf isotopes and whole-rock geochemistry of the Late Triassic rhyolites from Lampang Zone, northern Thailand: implications for the closure of Paleo-Tethys. Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 102-106. *(Extended Abstract)*

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(Lampang rhyolites formed at ~225 Ma (Norian) in W Sukhothai terrane, after subduction in post-continental collision setting and represent closure of Paleo-Tethys Ocean in N Thailand. Youngest arc volcanics in same

*area ~242 Ma. Youngest oceanic pelagic sediments in Changning-Menglian and Inthanon Suture Zones with Triassic *deweveri* radiolarian assemblage, suggesting Paleo-Tethys ocean still open in M Triassic)*

Zhou, P. & S.B. Mukasa (1997)- Nd-Sr-Pb isotopic, and major- and trace-element geochemistry of Cenozoic lavas from the Khorat Plateau, Thailand: sources and petrogenesis. *Chemical Geology* 137, p. 175-193.
(Basaltic rocks from Khorat Plateau dated at 0.9 Ma, believed to be related to extension of continental SE Asia. Dominated by alkali-olivine basalt and hawaiite. Probably derived from melts similar in isotopic character to moderately depleted Indian Ocean MORB. This asthenospheric source likely prevalent beneath continental SE Asia)

Zhou, Z. & M. Liengjarern (2004)- Lower Permian perrinitid ammonoid faunas from Thailand. *Journal of Paleontology* 78, 2, p. 317-339.
(Artinskian Metaperrinites and Kungurian Perrinites faunas in Ratburi Group of N C Thailand and Saraburi Group of S C Thailand represent part of perrinitid belt of ancient Tethys ocean from Crimea in W to Pamir, Afghanistan, W China, C Thailand to Timor in E)

Zhou, Z. & M. Liengjarern (2007)- Early Permian verbeekinacean fusulinids associated with ammonoid *Perrinites* from Thailand. *Acta Micropalaeontologica Sinica* 24, 4, p. 346-358.
(Late E Permian (Kungurian) verbeekinaceans foraminifera associated with Perrinites ammonoid fauna from Saraburi Group in S C Thailand. They represent mixed association of faunas with different ecological attributions)

IX.4. Myanmar (Burma) - NE India- SW Yunnan (Sibumasu/ Baoshan and West Burma plates)

Relevance for Indonesia:

- includes parts of the Sibumasu terrane, analog to North Sumatra, etc.
- the mid-Cretaceous (Albian-Cenomanian) Wuntho-Popa Arc is part of extensive Transtethyan magmatic arc system, from Tibet to Sumatra (Woyla?) , possibly continuing into Java- SE Kalimantan and West Sulawesi (also Sumaba and Timor Banda Terrane?)

Abdullah, S., S. Misra & B. Ghosh (2018)- Melt-rock interaction and fractional crystallization in the Moho transition Zone: Evidence from the Cretaceous Naga Hills Ophiolite, North-East India. *Lithos* 322, p. 197-211.
(online at: https://www.academia.edu/37716788/Melt_rock_interaction_and_fractional_crystallization_in_the_Moho_transition_Zone_Evidence_from_the_cretaceous_Naga_Hills_Ophiolite_North_East_India)
(Study of magmatic exchanges between mantle and overlying oceanic crust in ancient Moho Transition Zone in Naga Hills Ophiolite in NE India- NW Myanmar)

Acharyya, S.K. (1986)- Tectono-stratigraphic history of Naga Hill Ophiolites. Geological Survey India, Memoir 119, p. 94-103.

Acharyya, S.K. (2007)- Collisional emplacement history of the Naga-Andaman ophiolites and the position of the eastern Indian suture. *J. Asian Earth Sciences* 29, p. 229-242.
(online at: https://www.academia.edu/32329632/Collisional_emplacement_history_of_the_Naga_Andaman_ophiolites_and_the_position_of_the_eastern_Indian_suture)

Acharyya, S. (2010)- Tectonic evolution of Indo-Burma Range with special reference to Naga-Manipur Hills. In: S. Ibotombi (ed.) *Indo-Myanmar Ranges in the tectonic framework of the Himalaya and Southeast Asia*, Proc. National Seminar 2008, Memoir Geological Society India, Bangalore, 75, p. 25-43.
(online at: https://www.academia.edu/32360628/Tectonic_evolution_of_Indo_Burma_Range_with_special_reference_to_Naga_Manipur_Hills)
(Dismembered ophiolites from Naga-Manipur Hills occur as rootless, low-dipping bodies overriding Eocene-Oligocene flyschoid sediments, deposited on moderately deep shelf. Ophiolites broadly follow trough of negative gravity anomaly. Contrary to general belief, Indo-Burma Range floored by crust of continental affinity called Indo-Burma-Andaman microcontinent. Eastern belt of steep-dipping late Mesozoic ultramafic rocks exposed intermittently along C Myanmar magmatic arc, and is characterized by gravity high. Etc.)

Acharyya, S. (2015)- Indo-Burma Range: a belt of accreted microcontinents, ophiolites and Mesozoic-Paleogene flyschoid sediments. *Int. J. Earth Sciences (Geologische Rundschau)* 104, 5, p. 1235-1251.
(N-S trending Indo-Burma Range W-verging series commonly interpreted as accretionary prism of oceanic material from subduction of Indian plate under Eurasian/Burmese plate. With two ophiolite suites with different accretion histories: (1) Naga Hills Lower Ophiolite (overthrusting from E; covered with Late Jurassic- Eocene (~150-55 Ma) pelagic sediments, accreted in E-M Eocene, overlain by M Eocene ophiolite-derived clastics); (2) Victoria Hills Upper Ophiolite (Mesozoic age, overthrusting continental metamorphic rocks, unconformably overlain by shallow marine U Albian - Cenomanian sediments). Ophiolites and cover rock overthrust by Proterozoic metamorphics from Burmese continent. Both ophiolite suites thrust W-ward over Eocene shelf sediments. Dismembered ophiolites and continental metamorphic rocks suggest thin-skinned tectonic detachment processes)

Acharyya, S.K, K.K. Ray & S. Sengupta (1990)- Tectonics of the ophiolite belt from Naga Hills and Andaman Islands, India. *Proc. Indian Academy of Sciences (Earth Planetary Sciences)* 99, 2, p. 187-199.
(online at: <https://www.ias.ac.in/public/Volumes/jess/099/02/0187-0199.pdf>)
(Ophiolitic rocks of Naga Hills-Andaman belt occur as rootless slices (nappes), thrust over gently dipping Paleogene flyschoid sediments (NE India margin?). Blueschists in ophiolite melange indicate involvement of subduction process. Subduction initiated prior to M Eocene (M Eocene cover sediments with ophiolite-derived clasts). Late Oligocene angular unconformity in region marks terminal collision between India and Sino-

Burmese blocks Slivers from Sino-Burmese block, accreted ophiolites and trench sediments from subduction zone were thrust W-ward as nappe and emplaced over down-going Indian plate. Naga ophiolite belt continues into Andaman islands and possibly into Sumatra and Java root zone (and possibly marked by gravity high))

Acharyya, S.K, D.K. Roy, N.D. Mitra, R.G. Coleman & I. Gass (1986)- Stratigraphy and paleontology of the Naga Hills ophiolite belt. In: Geology of Nagaland Ophiolite, Memoirs Geological Survey India 119, p. 64-74.

Agematsu, S. & K. Sashida (2009)- Ordovician sea-level change and paleogeography of the Sibumasu Terrane based on the conodont biostratigraphy. Paleontological Research (Palaeontological Society of Japan) 13, 4, p. 327-336.

(Ordovician conodont biostratigraphy of Sibumasu terrane in Thailand- Langkawi- N Malaysia. Faunal affinity of conodonts suggest Sibumasu was close to both Australia and N China, at that time located in low paleolatitudes)

Agematsu, S., K. Sashida & A. Sardrud (2008)- Early and Middle Paleozoic conodont paleobiogeography and paleoenvironments on the Sibumasu Block. Proc. Int. Symposium Geoscience resources and environments of Asian terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 1753-1760.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/060.pdf)

(Ordovician- E Devonian sea-level curve of Sibumasu Block in Thailand and NW Malaysia shows five regressions. Conodonts reflect tropical domain and closely related to Australia and N China in Tremadocian-Dapingian (E-M Ordovician), changing to middle- high-latitudes before Katian (Late Ordovician))

Aitchison, J.C., A. Ao, S. Bhowmik, G.L. Clarke, T.R. Ireland, S. Kachovich, K. Lokho, D. Stojanovic et al. (2019)- Tectonic evolution of the western margin of the Burma microplate based on new fossil and radiometric age constraints. Tectonics 38, 5, p. 1718-1741.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018TC005049>)

(New data from E Nagaland and Manipur, NE India. Naga Hills ophiolite, from suprasubduction zone (intra-oceanic island arc) in late Early Cretaceous (M Aptian). M Jurassic- E Cretaceous radiolaria in Tethyan ocean floor bedded chert sediments subducted beneath ophiolite. Timing of emplacement onto passive margin of E India constrained by Paleocene-Eocene radiolaria in sediments under ophiolite assemblage. Naga Metamorphics (thrust NW as nappe over ophiolite) of E Ordovician age, and sedimentary protolith most likely derived from S of W Australia and E Antarctica. Etc.)

Aitchison, J.C., G.L. Clarke, T.R. Ireland, K. Lokho, A. Ao, S.K. Bhowmik, T. Roeder et al. (2016)- New age constraints on the evolution of the Naga Hills: radiolarians and radiometric. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium International Geoscience Program (IGCP) Project 589, Yangon, p. 54. (Abstract only)

(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)

(Naga Hills in Indo-Myanmar Ranges dominated by Cenozoic sediments structurally overlying Indian passive-margin sequence. Near India-Myanmar border imbricate thrust stack also contains sheets of ophiolitic melange. Ophiolite disrupted and overlain by Eocene shallow marine sediments of Phokphur Fm. Further E high-grade metamorphic units thrust W-wards over ophiolite. Well-preserved Jurassic, Cretaceous and Paleocene radiolarians together with U/Pb data from ophiolitic and metamorphic units. New detrital zircon ages suggest derivation of some units from Sibumasu rather than Lhasa or Qiangtang terranes)

Ali, J.R., H.M.Z. Cheung, J.C. Aitchison & Y. Sun (2013)- Palaeomagnetic re-investigation of Early Permian rift basalts from the Baoshan Block, SW China: constraints on the site-of-origin of the Gondwana-derived eastern Cimmerian terranes. Geophysical J. International 193, 2, p. 650-663.

(online at: <https://academic.oup.com/gji/article-pdf/193/2/650/1772194/ggt012.pdf>)

(Paleomagnetic data from E Permian Woniusi Fm rift basalts of Baoshan block (SW China) suggest this part of E Cimmerian terrane detached from E Gondwana at ~42°S (34.2-51.2°S) (similar to Huang & Opdyke 1991 results on paleolatitude). Gondwana estoration: Baoshan fits against in narrow longitudinal belt close to NE Greater India and NW Australia; Sibumasu lay directly to E, off Australia; Qiangtang and Lhasa sat to W, off N Greater India- SE Arabia (see also Xu et al. 2015, who arrive at slightly lower paleolatitudes))

Ali, J.R., G.M. Thompson, M.F. Zhou & X. Song (2005)- Emeishan large igneous province, SW China. *Lithos* 79, p. 475-489.

(Emeishan large igneous province of SW China volcanic and upper-intrusive portion of province is relatively small. Most reliable age dates (zircon U-Pb SHRIMP) from intrusive body indicate generation at ~259 Ma, consistent with end-Guadalupian (end M Permian) age. Magnetostratigraphic data and field observations suggest bulk of volcanic sequence formed within 1-2 My. Geochemistry of volcanics and studies of underlying Maokou Fm suggests mantle plume generated province)

Ali, J., J. Fitton & C. Herzberg (2010)- Emeishan large igneous province (SW China) and the mantle-plume up-doming hypothesis. *J. Geological Society, London*, 167, p. 953-959.

(M Permian (~262 Ma) Emeishan Basalts of SW China commonly cited example of large igneous province that formed as result of mantle plume generating large regional-scale up-doming prior to volcanism. Support idea that ELIP was generated by plume that originated in mantle, but amount and lateral extent of uplift significantly less than predicted by conventional deep-mantle plume models. Large-scale doming may not be diagnostic feature of mantle plumes)

Allen, R., Y. Najman, A. Carter, D. Barfod, M.J. Bickle, H.J. Chapman, E. Garzanti, G. Vezzoli, S. Ando & R.R. Parrish (2008)- Provenance of the Tertiary sedimentary rocks of the Indo-Burman Ranges, Burma (Myanmar): Burman arc or Himalayan-derived? *J. Geological Society, London*, 165, p. 1045-1057.

(Indo-Burman Ranges in W Myanmar extend along Sunda Arc subduction zone and may be divided into W part of Neogene and E part of Paleogene sediments, separated by fault. Paleogene Indo-Burman Ranges contain significant arc-derived material from Burmese portion of Mesozoic-Tertiary arc to E. U-Pb dating on detrital zircons shows dominant zircon populations of (~55-150 Ma) in Paleocene; also Cambro-Ordovician and Precambrian age. Old populations possibly sourced from Himalaya or Burmese margin. Neogene Indo-Burman Ranges dominant derivation from Himalaya; minor arc-derived component may have been sourced from Trans-Himalaya, or recycled from arc-derived Paleogene Indo-Burman Ranges)

Amos, B.J. (1975)- Stratigraphy of some of the Upper Palaeozoic and Mesozoic carbonate rocks of the Eastern Highlands, Burma. *Newsletters on Stratigraphy* 4, p. 49-70.

(Stratigraphy of Permian- Triassic 'Plateau Limestone' from E Myanmar Highlands (Sibumasu/ Shan-Tai block). Permian with fusulinids Yangchienia, Verbeekina, Parafusulina, etc. Locally extensive diagenetic dolomitisation; incomplete dolomitisation in some areas. Permian. Triassic carbonates at least 2500m thick)

Anderson, M.M., A.J. Boucot & J.G. Johnson (1969)- Eifelian brachiopods from Padaukpin, northern Shan States, Burma. *Bull. British Museum (Natural History), Geology*, 18, 4, p. 107-163.

(online at: <http://ia600708.us.archive.org/4/items/bulletinofbritis18brit/bulletinofbritis18brit.pdf>)

(M Devonian articulate brachiopods from weathered 'Lower Plateau Limestone' in Padaukpin area, NE of Maymyo area, E of Mandalay, associated with colonies of tabulate corals and stromatoporoids. Brachiopod fauna 32 species, similar to West Yunnan faunas and with marked affinity with Eifelian of W Europe (stronger affinity with Europe than USSR))

Ao, A. & S.K. Bhowmik (2014)- Cold subduction of the Neotethys: the metamorphic record from finely banded lawsonite and epidote blueschists and associated metabasalts of the Nagaland Ophiolite Complex, India. *J. Metamorphic Geology* 32, p. 829-860.

(Thermal history of subducting Neotethys, using metabasalts from serpentinitic melange in segment of Nagaland Ophiolite Complex. Tectonically disturbed Cretaceous? metamorphic sequence, from W to E: (1) greenschist, (2) pumpellyite- diopside and (3) lawsonite/ glaucophane and epidote/glaucophane blueschist facies. Low T gradient of 8°C/km, corresponding to 40 km max. burial depth, suggest cold intra-oceanic subduction zone setting for Nagaland blueschists. Metamorphics suggest presence of intra-oceanic subduction systems within Neotethys also between Indian and Burmese plates)

Arboit, F., M. Min, D. Chew, A. Mitchell, K. Drost, E. Badenszki & J.S. Daly (2021)- Constraining the links between the Himalayan belt and the Central Myanmar basins during the Cenozoic: An integrated multi-proxy detrital geochronology and trace-element geochemistry study. *Geoscience Frontiers* 12, 2, p. 657-676.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987120301705>)

(15 Cenozoic samples from fore- and back-arc basins of C Myanmar Basin domain of W Burma terrane. Detrital age spectra span Miocene- Paleogene. Common age peaks at ca. 20, 40, 60, 90, 100 Ma, with ~80% of ages <140 Ma. Fore-arc basin was open to trench and fed by unroofing of nearby Wuntho Popa volcanic arc to E and possibly from Burmese basement and/or from Bengal Fan to W during Eocene. W Burma Terrane partitioned into pull-apart basins. Etc.).

Ariffin, M.M.M., Kyaw Linn Oo, M.H.B.A. Wahab, Nyunt Shwe & M Khairil (2017)- Lower Miocene carbonate play in the Pyay sub-basin, onshore Myanmar: Reservoir characterization for prospectivity de-risking. AAPG/EAGE/MGS 3rd Oil & Gas Myanmar Geosciences Conference, Yangon, p. 1-11. (Extended Abstract)

(Underexplored Lower Miocene carbonate play in Pyay sub-basin of C Myanmar, with Htantabin oil field (1979-1987))

Aung, A.K. (1995)- New Middle Devonian (Eifelian) rugose corals from Myanmar. *J. Southeast Asian Earth Sciences* 11, p. 23-32.

(Eight new species of M Devonian (Eifelian) rugose corals from Padaukpin and Pwepon areas in N Shan State, N Myanmar. Genera *Phacellophyllum*, *Peripaedium*, *Pterorrhiza*, *Dohmophyllum*, *Temnophyllum* and *Puanophyllum* reported for first time from Myanmar. Some Myanmar forms resemble species from Eifelian of SW China and E Australia)

Aung, A.K. (2010)- A short note on the discovery of Early Devonian tentaculite-bearing unit from Taunggyi-Taungchun range, Southern Shan State, Myanmar. *Warta Geologi* 36, 4, p. 175-178.

(online at: www.gsm.org.my/products/702001-100402-PDF.pdf)

(Short note on occurrences of E-M Devonian tentaculites in Myanmar. Similarities to *Nowakia acuaria* from Mahang Fm of NW Malay Peninsula (= part of 'Sibumasu' E Paleozoic stratigraphy; JTvG))

Aung, A.K. (2011)- A short note on the discovery of Early Devonian tentaculite-bearing unit from Taunggyi-Taungchun Range, southern Shan State, Myanmar. *Warta Geologi* (Newsletter Geological Society Malaysia) 36, 4, p. 175-178.

(online at: https://gsmpublic.files.wordpress.com/2014/09/warta-36_4.pdf)

(E-M Devonian limestone with tentaculites from Taunggyi area, SE of Mandalay, in S Shan State. ~10m thick, between Silurian Linwe Fm and Permian-Triassic 'Plateau Lst'. Resemble Mahang Fm and Lalang Mb of NW Peninsular Malaysia. Also correlatable with E Devonian Zebingyi Fm of Pyin Oo Lwin)

Aung, A.K. (2011)- Stratigraphy of the Devonian sediments in the northwestern part of the Shan Plateau, Myanmar. Proc. 24th Annual National Geoscience Conference (NGC2011), Johor Baru, B13, p. 59-60.

(Extended Abstract)

(online at: http://geology.um.edu.my/gsmpublic/NGC2011/NGC2011_Proceedings.pdf)

(Rel. complete and mainly shallow marine Devonian section E of Mandalay, C Myanmar)

Aung, A.K. (2012)- The Paleozoic stratigraphy of Shan Plateau, Myanmar- An updated version. *J. Myanmar Geoscience Society* 5, 1, p. 1-73.

Aung, A.K., R.T. Becker & K.K. Myint (2011)- First record of Frasnian (Upper Devonian) sediments and ammonoids from Myanmar. Subcomm. Devonian Stratigraphy (SDS) Newsletter 26, p. 49-53.

(First record of U Devonian sediments and ammonoids (goniatite *Beloceras* and *Tornoceras*) in Myogyi area, Sino-Burman Ranges, E Myanmar, so far unknown from all of SE Asia (= Precambrian- Mesozoic shelf series of 'Sibumasu Terrane'))

Aung, A.K. & L.R.M. Cocks (2017)- Cambrian-Devonian stratigraphy of the Shan Plateau, Myanmar (Burma). In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 14, p. 317-342.

(Sibumasu (Shan-Thai) Terrane of Shan Plateau with common limestone-dominated Cambrian - Devonian rocks, which, before Permian were part of N Gondwana margin. By M Cambrian (~510 Ma) Myanmar part of Sibumasu sector of Gondwana straddled equator and was close to NW Australian sector. Some acidic Cambrian volcanics, but passive margin setting from E Ordovician- end Carboniferous)

Aung, A.K. & K. Min (2011)- Stratigraphy of the Lower Devonian sediments in the northwestern Shan Plateau, Myanmar. Bull. Geological Society Malaysia 57, p. 55-67.

(online at: <http://geology.um.edu.my/gsmpublic/BGSM/bgsm57/bgsm2011008.pdf>)

(Lower Devonian sediments in NW Shan Plateau of C Myanmar with rich micro- and macrofauna, including graptolites (Monograptus atopus, M. helmckeii), trilobites (Cornuproetus), tentaculids (Nowakia acuaria), conodonts (Eognathodus sulcatus), rugose corals, etc. Can be correlated with neighboring regions in NW Malay Peninsula, Thailand and China (= part of Sibumasu stratigraphy; JTvG))

Aung, H.H. (2009)- Recognition of Paleo-Tethys Suture Zone in eastern Myanmar. Acta Geoscientica Sinica 30, Suppl.1, p. 1-3.

(Closure of Paleo-Tethys Ocean marked by collision between Shan Massif and Indochina plate in E Myanmar. Now complex zone of suturing and deformation along Than Lwin River, extending N to Yunnan (Changning-Menglian belt) and S into West Thailand (Inthanon Zone). Also large complex of Late Triassic granites)

Aung, H.H. (2015)- Delineation of western boundary of Paleo-Tethys suture zone in Myanmar. Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 1-3. (Abstract)

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(On western boundary fault of Paleo-Tethys suture zone in E Myanmar)

Aung, H.S., K. Yonezu, A. Imai, T. Tindell & K. Watanabe (2021)- Gold mineralization of the Thone Myae Song area, Sagaing Region, northern Myanmar. J. Asian Earth Sciences 214, 104749, p. 1-21.

(Several gold deposits in 'Central Magmatic-Volcanic Belt' of Myanmar, a N-S-trending, 1500km-long arc from Andaman Sea to N Myanmar, with Cretaceous granitoids intruded into folded andesites and pillow basalts. EE3 epithermal gold deposit part of hydrothermal vein gold mineralization in Thone Myae Song area in Kawlin-Wuntho block)

Aung, K.P. & Y. Isozaki (2020)- Permian calcareous algae of the Thitsipin Formation from Loikaw area, Kayah State, Myanmar. Banmaw University Research J. 11 (2), 456-463.

(Permian calcareous algae from E Myanmar Shan Plateau (Sibumasu Terrane))

Aung, K.P. & Y. Isozaki (2020)- Occurrence of Permian giant bivalve (Alatoconchidae) from Pindaya Range, Shan State (south), Myanmar. Banmaw University Research Journal 11, 1, p. 402-412.

(online at: https://researchmap.jp/read0183762/published_papers/35813949/attachment_file.pdf)

(Unique Permian Alatoconchidae bivalves in Guadalupian (M Permian) shallow marine limestone in Pindaya Range of S Shan Plateau, E Myanmar: giant body with wing-like flanges, etc. Form coquina beds and co-occur with rugose corals (Lophophyllidium, Ipcyphyllum, Thomasiphyllum) and bryozoans. Almost always associated with large fusulines (Verbeekiniidae) and/or rugose coral Waagenophyllidae of Tethyan affinity (but on Sibumasu Block))

Aung, K.P., K. Khin, T. Zaw, A. Moe (2024)- Carboniferous-Permian sequences of the western margin of Sibumasu Block: Implications for new lithostratigraphic correlation in the eastern Highlands of Myanmar. Geosystems and Geoenvironment 3, 1, 100240, p. 1-27.

(online at: <https://www.sciencedirect.com/science/article/pii/S2772883823000638>)

(Extensive review of Sibumasu stratigraphy in Eastern Highlands of Myanmar and adjacent regions. Characterized by Precambrian-Mesozoic formations, with Carboniferous-Permian sequences prominently present in Shan Scarp and Shan Plateau zones (typical of W margin of Sibumasu Block). Permian sequences

complicated by faults. Lower part of Permian lower siliciclastic units, upper part carbonates. Presence of diamictite unit (E Permian Mergui Gp; with diamonds) and associated units (Yinyaw and Thitsipin/Moulmein Fms) in complex zones of Shan Plateau and Shan Scarp)

Aung, K.P., K. Khin, T. Zaw, A. Moe (2025)- Biostratigraphic correlation of Carboniferous-Permian sequences of the western margin of the Sibumasu Block in the Eastern Highlands of Myanmar. *Earth History and Biodiversity* 5. 100030, p. 1-19.

(online at: <https://www.sciencedirect.com/science/article/pii/S2950475925000140>)

(*W margin of Sibumasu Block in E Myanmar with Carboniferous-Permian sequences with Mississippian Cimmerian-type fauna, Pennsylvanian missing. Kungurian admixtures of both Cathaysian and Gondwanan taxa, Cathaysian-affinity flora, and Guadalupian warm-water organisms, reflecting different paleolatitude settings within Cimmerian continents and drifting histories. E Permian glacio-marine deposits (Mergui Gp), Late E- early M Permian Cathaysian-affinity plants. M Permian 'Tethyan-affinity' fusulinid foraminifera (inc. Monodioxodina, also Shanita, Permocalculus, etc.)*)

Aung Khin & Kyaw Win (1968)- Geology and hydrocarbon prospects of the Burma Tertiary geosyncline. *Union of Burma J. of Science and Technology* 2, p. 53-81.

Aung, Lin T., Kyaw Zin Oo, K.M. Win, G.F. Moore, S.T. Tun & W. Naing (2020)- Active deformation of the Central Myanmar forearc basin: Insight from post-Pleistocene inversion of the Pyay Fault. *J. Asian Earth Sciences*: X, 4, 100037, p. 1-20.

(online at: www.sciencedirect.com/science/article/pii/S259005602030013X)

Aung Min Oo, Lv Xinbiao, K. Zaw, T. Htay, S. Binke & M.M.A. Adam (2020)- Ore geology, fluid inclusions, and (H-O-S-Pb) isotope geochemistry of the sediment-hosted antimony mineralization, Lyhamyar Sb deposit, Southern Shan Plateau, Eastern Myanmar: implications for ore genesis. *Minerals (MDPI)* 10, 4, 296, p. 1-25.

(online at: <https://www.mdpi.com/2075-163X/10/4/296/xml>)

(*Antimony deposits in Myanmar mainly in E part of Shan Plateau and Mogok-Mandalay-Mergui metallogenic Province in E Myanmar, usually near major fault systems. Large Lyhamyar Sb deposit in S Shan Plateau, in E Silurian Linwe Fm, as syntectonic quartz-stibnite veins, likely formed in Oligo-Miocene. Found in 2004*)

Aung, Mio Myint, L. Ding, U. Baral, F. Cai, B. Neupane, Me Me Aung, Aung Naing Thu et al. (2022)- Paleogeographic evolution of Southeast Asia: Geochemistry and geochronology of the Katha-Gangaw Range, Northern Myanmar. *Minerals (MDPI)* 12, 12, 1632, p. 1-27.

(online at: <https://www.mdpi.com/2075-163X/12/12/1632>)

(*Myanmar (Burma) plate is small tectonic plate in SE Asia, bounded by Indo-Burma outer wedge to W and Sagaing fault/ Shan-Thai Plateau/ Mogok Metamorphic Belt (Sibumasu block) to E. Mogok continental foreland region and Katha-Gangaw Range located in N-C section of Myanmar plate. a. Detrital zircon ages from S region of KGR peaks at 634 Ma, 525 Ma, 290 Ma and 248 Ma. All samples from N KGR >400 Ma. Etc.*)

Aung Moe & Kyi Khin (2023)- No oblique or hyper-oblique plate convergence along the Indo-Myanmar Ranges: insights from geological structures and tectonostratigraphy. *Proc. 6th Int. Conference on Substantial Scientific Collaboration Ocean and Earth Sciences Myanmar and China, Myeik 2023*, p. 1-16 + Presentation.

(online at: https://www.researchgate.net/publication/382975770_No_Oblique_or_Hyper-oblique_Plate_Convergence_Along_the_Indo-Myanmar_Ranges_Insights_from_Geological_Structures_and_Tecton_....Etc.)

(*Discussion of obliquity of convergence between Indian Plate and West Myanmar Block. Fold studies on Baronga Island and in Tripura State reveal upright anticlinal and synclinal folds within Miocene in foreland basin. Sunda Arc extends as megathrust through Bay of Bengal to Bengal Delta, indicating large-scale slip between subducting and overriding plates*)

Aung, P.S., C. Satirapod & C.O. Andrei (2016)- Sagaing Fault slip and deformation in Myanmar observed by continuous GPS measurements. *Geodesy and Geodynamics* 7, 1, p. 56-63.

(*GPS stations along dextral Sagaing Fault suggest E side of fault moves SE at ~32-40 mm/yr, whereas W side moves NE at ~31-35 mm/yr*)

Aung, S.N.L., S. He, E.M. Han, Y. Sampei, T. Dong & M.T.T. Aung (2021)- Organic geochemistry of crude oils from Oligocene reservoirs in the Salin sub-basin, Myanmar: Insights into source, maturity, and depositional environment. *J. Asian Earth Sciences* 220, 104905, p. 1-22.

(Oil samples from Oligocene reservoir rocks in onshore Myanmar Yenangyaung, Chauk and Letpando oilfields in Salin sub-basin medium to light oils. Three groups: (I) mainly originated from planktons/algal materials (lacustrine-marine); (II) from planktons/algal sources with minor terrestrial material (fluvial/deltaic-marine setting); (III) from mixed algal- terrestrial input (fluvial/deltaic-marine setting))

Aung Zaw Myint (2019)- Mineralogical and geochemical constraints on the genesis of granite related W-Sn-Mo mineralization in Padatgyaung- Myinmahti area, east of Nay Pyi Taw, central Myanmar. *J. Myanmar Academy Arts and Science* 17, 5, p. 1-18.

(online at: <https://maas.edu.mm/Research/Admin/pdf/Vol.XVII%20No.5%20Geol+Geog.pdf>)

(Padatgyaung-Myinmahti area is located 80km E from Nay Pyi Taw and lies at E margin of Shan Plateau. W - Sn-Mo mineralization spatially associated with E Eocene post-orogenic biotite granite and low-grade metasediments of Carboniferous- E Permian Mergui Group. Tin-tungsten production since 1930s)

Aung Zaw Myint, H. Li, A. Mitchell, D. Selby & T. Wagner (2021)- Geology, mineralogy, ore paragenesis, and molybdenite Re-Os geochronology of Sn-W (-Mo) mineralization in Padatgyaung and Dawei, Myanmar: Implications for timing of mineralization and tectonic setting. *J. Asian Earth Sciences* 212, 104725, p. 1-15.

(Sn-W (-Mo) deposits of Myanmar mostly in Western Granite Province. New molybdenite Re-Os dating of two regions: (1) in Padatgyaung ages of 64.2 and 60.5 Ma. Vein-type W-Mo mineralization formed after tin mineralized greisenization; (2) mineralization in Dawei region ~70-60 Ma. Discrete granite-related Sn-W mineralization at 75-60 Ma in W Granite Province, although overall age range of Sn-W mineralization in belt spans from 120 to ~40 Ma, emplaced during subduction and roll-back of Neo-Tethys oceanic crust)

Aung Zaw Myint, Khin Zaw, Ye Myint Swe, K. Yonezu, Yue Cai, T. Manaka & K. Watanabe (2017)- Geochemistry and geochronology of granites hosting the Mawchi Sn-W deposit, Myanmar: implications for tectonic setting and emplacement. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, Chapter 17, p. 385-400.

(Mawchi Mine in Myanmar is historic world-class Sn-W deposit in SE Asia tin province (world's largest tin-tungsten quartz vein system exploited before WW II). M Eocene (~43 Ma) Mawchi granite small pluton at W side of Shan Plateau with biotite granite and tourmaline granite, derived from melting of crustal rocks. Part of Cretaceous-Paleogene Western granite province (with nearby granites generally older: ~48-60 Ma)

Aung Zaw Myint, T. Wagner & K. Zaw (2022)- Telluride-bearing Au-Ag mineralization in the Singu-Tabaikkyin gold District, Mogok metamorphic Belt, Myanmar: New constraints on an intermediate-sulfidation epizonal orogenic ore system. *J. Asian Earth Sciences* 227, 105120, p.

Aung Zaw Myint, K. Yonezu, A.J. Boyce, D. Selby, A. Schersten, T. Tindell, K. Watanabe & Ye Myint Swe (2018)- Stable isotope and geochronological study of the Mawchi Sn-W deposit, Myanmar: implications for timing of mineralization and ore genesis. *Ore Geology Reviews* 95, p. 663-679.

(World-class Mawchi Sn-W mineralization in N-S trending steeply dipping quartz veins, hosted by Eocene granite and Carboniferous- E Permian metasediments. Three stages of ore formation; (1) tourmaline-cassiterite stage (2) main ore stage and (3) sulfide stage (with ⁴⁰Ar/³⁹Ar magmatic biotite age of ~41.5 Ma and zircon U-Pb age of 42.7 Ma. Sn-W mineralization synchronous with late Eocene granitic magmatism)

Ayyamperumal, R., R. Sooriamuthu, G. Gopalakrishnan, G. Biswa, R. Perumal, P. Gahlaut et al. (2021)- Micropalaeontological and geochemical evidence of the Late Jurassic radiolarians cherts of Naga Ophiolite Hill, Nagaland, Northeast-India. *Open Journal of Geology*, 2021, 11, p. 356-372.

(online at: https://www.scirp.org/pdf/ojg_2021081214102382.pdf)

(First recovery of Late Jurassic (Kimmeridgian- M Tithonian) pelagic radiolarian assemblages from red chert in Naga Hills Ophiolite complex in NE side of Indo-Burmese Ranges at Manipur, Nagaland (Indo-Burmese Range commonly viewed as extension of Andaman-Nicobar islands and Mentawai islands off W Sumatra.

Ophiolites in thrust slivers. Iron-rich chert deposited in deep marine environment, below Carbonate Compensation Depth)

Bannert, D. & D. Helmcke (1981)- The evolution of the Asian plate in Burma. In: Alfred Wegener Symposium, Berlin 1980, Geologische Rundschau 70, 2, p. 446-458.

(Post-Cretaceous evolution of Asian Plate in Burma strongly influenced by spreading of E Indian Ocean and N-ward movement of 'Greater India'. During end of Mesozoic E part of Burma emerged from ocean; W part formed shelf area with slowly W-wards migrating Indoburman geosyncline to W (U Cretaceous flysch). Emergence of Indoburman Ranges in Miocene, generating Outer Island Arc and forming Bay of Bengal. Approach of continental Indian crust led to thrusts in N part of Indoburman Ranges. Today subduction active only S of 18°N in E Bay of Bengal)

Bannert, D., A. Sang Lyen & T. Htay (2011)- The geology of the Indoburman Ranges in Myanmar. Geologisches Jahrbuch B, 101, p. 5-101.

(Indoburman Ranges are W-most unit in Myanmar and represent accretionary wedge formed by Late Mesozoic-Paleogene-Neogene marine sediments with transitions into molasse-type sediments. Four geological units. Most rocks Tertiary age, with widespread units of U Cretaceous, Albian and Cenomanian. Triassic (Carnian-Norian) flysch part of E Indoburman Ranges; Jurassic sediments absent. C Chin Hills of E Indoburman Ranges with U Cretaceous- Paleocene Kanpetlet Schists (metamorphosed Triassic flysch); Naga metamorphic rocks possibly similar, but age still undetermined. Common serpentinised ultrabasics, especially along continental splinter of W Burma Plate. Docking of W Burma Plate onto Eurasia margin at 83 Ma, followed by continent- continent collision of India Plate. During Late Himalayan collision, many young strike-slip faults developed, hampering reconstruction of original sedimentary regions. Tectonic contacts very steep)

Barber, A.J., K. Zaw & M.J. Crow (eds.) (2017)- Myanmar: geology, resources and tectonics. Geological Society, London, Memoir 48, p. 1-759.

(Major, modern review of geology of Myanmar by collective of expert authors)

Barber, A.J., K. Zaw & M.J. Crow (2017)- The pre-Cenozoic tectonic evolution of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 31, p. 687-712.

(Myanmar 7 N-S tectonic units, from W to E: (1) Indo-Myanmar Ranges (accretionary prism); (2) W Myanmar (Burma) Block (metamorphic basement overlain by Cenozoic C Myanmar Basins); (3) Mogok Metamorphic Belt (high-grade metamorphic core complex with Late Oligocene- E Miocene exhumation age, and granitoids); (4) Slate Belt (Mergui Gp with Late Carboniferous- Permian diamictites and intruded by Late Jurassic- E Cretaceous granodiorites); (5) Paunglaung Mawchi zone (isoclinally folded Shan Plateau margin rocks), (3,4,5 = Shan Scarps area) and (7) Shan Plateau (Paleozoic- Triassic stratigraphy, part of Sibumasu Terrane). Indochina Block does not extend into Myanmar. Mt Victoria/ West Burma Block identified in literature, but E margin of this block against Sibumasu, conventionally identified as Sagaing Fault, not clearly defined. Cenozoic development of Myanmar profoundly affected by N-ward movement of India and collision with Eurasia at ~50 Ma, resulting in ~70° rotation of whole country)

Barley, M.E., A.L. Pickard, K. Zaw, P. Rak & M.G. Doyle (2003)- Jurassic to Miocene magmatism and metamorphism in the Mogok metamorphic belt and the India-Eurasia collision in Myanmar. Tectonics 22, 3, p. 10-19.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2002TC001398>)

(Mogok metamorphic belt at W margin of Shan-Thai terrane. Deformed granitic orthogneisses contain M Jurassic (~170 Ma) zircons, partly recrystallized during ~43 Ma high-grade metamorphism. Syenite from Mandalay Hill also with Jurassic zircons with evidence of Eocene metamorphic recrystallization rimmed by thin zones of ~31 Ma magmatic zircon. Abundance of Jurassic zircons consistent with Andean-type margin at S Eurasia at that time. Mid-Cretaceous- E Eocene (120-50 Ma) I-type granitoids in MMB and W Myanmar confirm up to 200 km wide magmatic belt along Eurasian margin from Pakistan to Sumatra (K-Ar cooling ages 79-100 Ma; Allen et al. 2008))

- Basu, P., R. Verma, R. Paul & K. Viswanath (2010)- Deep waters of Rakhine Basin - a new frontier? Proc. 3rd Biennial Int. Conf. Petroleum Geophysics, Hyderabad 2010, P-160, p. 1-7.
(online at: <https://www.spgindia.org/2010/160.pdf>)
(Offshore Rakhine frontier basin in E part of Bay of Bengal, off Myanmar, with Shwe (2003) and Shwe Phyu and Mya subsequent gas discoveries, all three with biogenic gas in deep marine Lower Pliocene sandstones. Also postulated thermogenic petroleum system in Cretaceous sequence. Rakhine Basin merges with Andaman Nicobar-Sunda- Java foredeep basins system to South)
- Baxter, A.T., J.C. Aitchison, S.V. Zyabrev & J.R. Ali (2011)- Upper Jurassic radiolarians from the Naga Ophiolite, Nagaland, northeast India. Gondwana Research 20, p. 638-644.
(online at: https://www.academia.edu/105437314/Upper_Jurassic_radiolarians_from_the_Naga_Ophiolite_Nagaland_northeast_India?uc-sb-sw=35695449)
(Cherts from ophiolitic melange near Salumi, Nagaland, NE India, part of Naga- Andaman suture (Neotethys/Mesotethys oceanic material?) with U Jurassic (Kimmeridgian- lower Tithonian) radiolaria. Significantly older than fossils previously reported from this melange, but similar to radiometric ages from associated igneous units)
- Belousov, A., M. Belousova, Khin Zaw, M.J. Streck, I. Bindeman, S. Meffre & P. Vasconcelos (2018)- Holocene eruptions of Mt. Popa, Myanmar: volcanological evidence of the ongoing subduction of Indian Plate along Arakan Trench. J. Volcanology Geothermal Research 360, p. 126-138.
(In W of Myanmar geodetic and seismic data indicate ongoing highly oblique subduction of Indian Plate under Eurasian Plate, but volcanoes of Burma arc considered extinct. Youngest lava flows and pyroclasts of Mt. Popa (the best-preserved volcanic edifice in Myanmar) very young: produced several eruptions in E Holocene until ~8000 BP, with 1.3 km³ gravitational collapse of volcanic cone with deposition of 11-km-long debris avalanche, followed by 0.1 km³ of pyroclastic flow of calc-alkaline basaltic andesite composition)
- Bender, F. (1983)- Geology of Burma. Beitrage Regionalen Geologie der Erde 16, Borntraeger, Berlin, p. 1-293.
(Classic textbook on geology of Myanmar, with contributions by Bannert, Brinckmann, Gramann, Helmcke. Four main N-S trending physiographic/tectonic units: (1) Arakan coastal area, (2) Indo-Burman Ranges (E Tertiary flysch belt, with in E intercalated allochthonous U Cretaceous and older (U Triassic Halobia schist), W-vergent imbricate structures and some ophiolite; belt of ultrabasic rocks and Naga metamorphic complex along E side); (3) Chindwin- Irrawaddy Basin (Inner Burman) Basin (7 sub-basins?), mainly Miocene and younger age, with large thrust anticlines; continues into Andaman Sea and N and C Sumatra basins; (4) Sino-Burman Ranges (Eastern Highlands; mainly deformed Precambrian, Paleozoic and Mesozoic sediments (Sibumasu terrane) (incl. M Cretaceous with Orbitolina, Globotruncana limestone, latest Cretaceous with Siderolites, Lepidorbitoides (Asterorbis)). Etc.)
- Bender, F. (1994)- Myanmar (former Birma, Burma). In: H. Kulke (ed.) Regional petroleum geology of the world, I, Borntraeger, Berlin, p. 699-708.
(Brief review of oil-gas basins and fields of Myanmar; in German)
- Bertrand, G. (1999)- Tectonique Cenozoïque de l'Escarpe du Plateau Shan (Myanmar) - La collision oblique entre l'Inde et l'Asie en Birmanie. Ph.D. Thesis, Université Pierre et Marie Curie, Paris 6, p. 1-314.
(online at: https://www.researchgate.net/publication/269571777_Tectonique_Cenozoique_de_l'Escarpe_du_Plateau_Shan_Myanmar_-_La_Collision_Oblique_Entre_l'Inde_et_l'Asie_en_Birmanie)
(‘Cenozoic tectonics of the escarpment of the Shan Plateau (Myanmar), The oblique collision between India and Asia in Burma’. Two major phases of Cenozoic deformation in study area: (1) NNW-SSE ductile extension between 30 and 17 Ma along Mogek Metamorphic Belt and Shan scarp (= transtensional dextral shear zone related to N movement of India?). (2) brittle faulting along N-S (Sagaing) faults since M-U Miocene)
- Bertrand, G. & C. Rangin (2003)- Tectonics of the western margin of the Shan plateau (central Myanmar): implication for the India-Indochina oblique convergence since the Oligocene. J. Asian Earth Sciences 21, p. 1139-1157.

(online at: https://www.academia.edu/63733162/Tectonics_of_the_western_margin_of_the_Shan_plateau_central_Myanmar_implication_for_the_India_Indochina_oblique_convergence_since_the_Oligocene)

(On Neogene tectonics of Shan scarp area (C Myanmar) and relationship with India- Indochina oblique convergence. Two tectonic regimes: (1) NNW–SSE-trending extension, with ductile stretching in Mogok Metamorphic Belt, with N70E brittle normal faults; (2) M or U Miocene-Present right-lateral faults (N20W transpressive Shan scarp fault, N-S Sagaing fault). Transition from transtensional to transpressive stress regime in Miocene tied to end of spreading in S China Sea, opening of Andaman basin or end of subduction in Indo-Burma range)

Bertrand, G., C. Rangin, H. Maluski, Tin Aung Han, M. Thein, O. Myint, W. Maw & S. Lwin (1999)- Cenozoic metamorphism along the Shan Scarp (Myanmar): evidences for ductile shear along the Sagaing Fault or the northward migration of the Eastern Himalayan syntaxis? *Geophysical Research Letters* 26, 7, p. 915-918.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/1999GL900136>)

(Mogok metamorphic belt along N-S trending Shan scarp and Sagaing fault in E Myanmar regarded as Paleozoic-Precambrian, but Ar/Ar data suggests Oligocene- E Miocene metamorphism age (26-21 Ma). Metamorphism caused by NNW-SSE to N-S ductile extension, not directly related to Sagaing fault, but possibly related to N-ward migration of E Himalayan syntaxis, resulting from India-Asia oblique collision)

Bertrand, G., C. Rangin, H. Maluski, H. Bellon & Giac Scientific Party (2001)- Diachronous cooling along the Mogok Metamorphic belt (Shan scarp, Myanmar): the trace of the northward migration of the Indian syntaxis. *J. Asian Earth Sciences* 19, 5, p. 649-659.

(online at: <https://www.academia.edu/download/107428320/s1367-912028002900061-420231116-1-iadnw.pdf>)

(High grade Mogok metamorphic core complex in C Myanmar with Oligocene- M Miocene age of metamorphism. Ages younging from Gulf of Martaban in S to China-Myanmar border in N, confirming N-ward migration of tectonic event responsible for cooling, at velocity similar to India relative to Indochina velocity. Numerous ductile structures suggest NNW–SSE extension, representing local stretching of crustal material around eastern India syntaxis. Central part of Myanmar “recorded” N-ward passage of E Indian convergence with Indochina from Oligocene to M Miocene)

Bertrand, G., C. Rangin, R.C.Maury, H.M. Htun, H. Bellon & J.P. Guillaud (1998)- Les basaltes de Singu (Myanmar): Nouvelles contraintes sur le taux de décrochement recent de la faille de Sagaing. *Comptes Rendus Academie Sciences, Paris, IIA*, 327, 7, p. 479-484.

(online at: https://www.researchgate.net/publication/233648476_The_Singu_basalts_Myanmar_New_constraints_for_the_amount_of_recent_offset_on_the_Sagaing_Fault)

(‘The basalts of Singu volcano (Myanmar): new constraints on the recent strike-slip rate of the Sagaing fault’ Young (0.25-0.31 Ma) basalt flows offset by dextral Sagaing fault, suggesting movement of ~10-23 mm/year. This accomodates only 2/3 or less of India-Sundaland relative motion)

Betka, P.M., L. Seeber, S.N. Thomson, M.S. Steckler, R. Sincavage & C. Zoramthara (2018)- Slip-partitioning above a shallow, weak decollement beneath the Indo-Burman accretionary prism. *Earth Planetary Science Letters* 503, p. 17-28.

(open manuscript at: <https://www.sciencedirect.com/science/article/am/pii/S0012821X1830534X>)

(On the structure of the Indo-Burman Ranges, an ~375km wide accretionary prism that accommodates oblique convergence of ~13–20 km thick Ganges-Brahmaputra delta-fan system on Indian plate with Shan Plateau of Myanmar to E. Outer fold belt is detached along 3.1–3.4 km deep, weak decollement. Fold-belt has propagated rapidly W-ward by >15 km/Myr since ~8 Ma)

Bhattacharjee, C.G. (1991)- The ophiolites of northeast India- a subduction zone ophiolite complex of the Indo-Burman orogenic belt. *Tectonophysics* 191, p. 213-222.

(Ophiolites of NE India rootless blocks floating in matrix of U Cretaceous-Lower Tertiary Disang Gp. Ultramafics main component and interpreted as slices of oceanic crust and upper mantle obducted onto Indian continental margin. Associated blueschist indicative of subduction zone tectonics)

- Bhowmik, S.K. & A. Ao (2016)- Subduction initiation in the Neo-Tethys: constraints from counterclockwise P-T paths in amphibolite rocks of the Nagaland Ophiolite Complex, India. *J. Metamorphic Geology* 34, p. 17-44.
(online at: www.researchgate.net/publication/282790835_Subduction_initiation_in_the_Neo-Tethys_Constraints_from_counterclockwise_P-T_paths_in_amphibolite_rocks_of_the_Nagaland_Oph_Etc.)
(High-P metamorphic rocks formed at onset of oceanic subduction usually record single cycle of subduction-exhumation along CCW P-T paths. Fragment of M-L Jurassic Neo-Tethys in Nagaland Ophiolite Complex with two overprinting metamorphic cycles, but part of single tectonothermal event. M1 metamorphism first evidence for initiation of subduction of Neo-Tethys at E part of Indus-Tsangpo suture. Reburial and final exhumation during M2 explained by transport in large-scale convective circulation system in subduction channel)
- Bhowmik, S.K., A. Ao & M. Rajkakati (2022)- Tectonic framework of the high-pressure metamorphic rocks of the Nagaland Ophiolite Complex, North-east India, and its geodynamic significance: a review. *Geological Journal* 57, 2, p. 727-748.
(Review of High-P metamorphic rocks from Nagaland Ophiolite Complex, NE India. Structurally lowermost Mokie-Satuza-Thewati unit tied to development of Late Triassic- M Jurassic mature intra-oceanic subduction system within Neo-Tethys (and considered to be one of oldest units in Yarlung-Tsangpo Suture Zone). Structurally intermediate High-P Moya-Salumi sequence relate to second oceanic subduction beneath continental Naga Metamorphics. Present tectonic collage product of Eocene India-Myanmar plates collision)
- Bleek, A.W.G. (1907)- Die Jadeitlagerstätten in Upper Burma. *Zeitschrift für Praktische Geologie* 15, p. 341-365.
(online at: <https://books.google.com/books...>)
(*'The jadeite deposits of Upper Burma'*. Early, detailed description of geologic setting of jadeitites of Kachin Hills, NE Myanmar. Primary occurrence as bed or dike in serpentinite)
- Bleek, A.W.G. (1908)- Jadeite in the Kachin Hills, Upper Burma. *Records Geological Survey India* 36, 4, p. 254-285.
(online at: <https://babel.hathitrust.org/cgi/pt?id=uc1.31822009563370;view=1up;seq=172;size=125>)
(Jadeite found in three places in Kachin Hills of NE Myanmar: Tawmaw, Hweka and Mamon. Jadeite occurs as intrusive dike in serpentinite and in boulder conglomerates)
- Bojesen-Koefoed, J.A., M.B.W. Fyhn, L.H. Nielsen, H.P. Nytoft, I. Abatzis & U Nyan Tun (2017)- Petroleum composition in the Central Burma Depression, Myanmar- a preliminary assessment. AAPG/EAGE/MGS 3rd Oil & Gas Conference, Yangon 2017, p. 1-5. (*Extended Abstract*)
(C Burma Depression with up to 15km Albion- Recent sediments. Oils from Salin Basin from predominantly terrestrial source. Thermal maturity increasing from N to S across Salin Basin)
- Boonsawang, N. (2012)- Seismic sequence stratigraphy analysis in the Gulf of Moattama, Offshore Myanmar . *Bull. Earth Sciences Thailand (BEST)* 5, 2, p. 79-85
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246586/167623>)
(Gulf of Moattama is northernmost end of Andaman Sea and mainly composed of Miocene-Pleistocene deltaic offlap and slope sediments, derived from the interior basins of Myanmar. Eight sequence boundaries mapped. Best potential reservoirs in area should be in the lowstand deposits, within turbidite zones associated with sequences 3, 4 and 5 (Late Pliocene- E Pleistocene). Other potential reservoirs in incised valleys fills)
- Boonsawang, N., L. Intasorn, N. Sattayakhunnasakul, V. Chaisomboonpan, P. Siriyoote, P. Thamniyom et al. (2019)- Finding new play potential in Main Zawtika development area, Zawtika Project, Moattama Basin, offshore Myanmar. *Proc. AAPG Asia Pacific Region GTW, Back to the Future, Bangkok 2018 AAPG Search and Discovery Art.* 11155, 11p.
(online at: https://www.searchanddiscovery.com/documents/2019/11155boonsawang/ndx_boonsawang.pdf)
(Zawtika gas field off Myanmar reservoirs in Plio-Pleistocene deltaics. Unexplored potential in Plio-Pleistocene canyon fill trap and combination trap of deltaic sediments against canyon)

Bronnimann, P., J.E. Whittaker & L. Zaninetti (1975)- Triassic foraminiferal biostratigraphy of the Kyaukse-Longtawko area, Northern Shan States, Burma. *Rivista Italiana Paleontologia* 81, p. 1-30.
(Incl. new Late Triassic species *Duotaxis birmanica*)

Brunnschweiler, R.O. (1966)- On the geology of the Indoburman Ranges (Arakan Coast and Yoma, Chin Hills, Naga Hills). *J. Geological Society of Australia* 13, 1, p. 127-194.
(Mountains of W and NW Burma mainly thick accumulations of Paleo- Eocene (Arakan and Chin Hills) or Senonian-Eocene (Naga Hills) flysch. Some of highest mountains in Naga Hills are 'klippen' of metamorphics lying on flysch. Flysch ranges uplifted in Oligocene but along Arakan Coast also earlier orogenic phase (latest Cretaceous). Lowlands of Central and Lower Burma intramontane molasse-filled basin)

Brunnschweiler, R.O. (1970)- Contributions to the post-Silurian geology of Burma (Northern Shan States and Karen state). *J. Geological Society of Australia* 17, 1, p. 59-79.
(Review of U Paleozoic-Mesozoic stratigraphy of E Myanmar)

Brunnschweiler, R.O. (1974)- Indoburman Ranges- data for orogenic studies. In: A.M. Spencer (ed.) *Mesozoic-Cenozoic orogenic belts*, Geological Society, London, Special Publ. 4, p. 279-299.
(Early paper on Cenozoic Indo-Burman fold-thrust belt (accretionary prism of India/Bengal fan sediments subducting under West Burma Arc))

Buckman, S.S. (1918)- The brachiopods of the Namyau Beds, Northern Shan States, Burma. *Memoirs Geological Survey India (Palaeontologica Indica)* 3, Memoir 2 (1917), p. 1-299.
(online at: [google books](https://books.google.com/books))
(Jurassic brachiopods from Namyau Beds in northern Shan States of Myanmar, from limestone bands in lower part of several 1000' thick red sandstones-shales series, probably unconformably overlying Carboniferous limestone, etc. (= *Sibumasu Terrane*?). Mainly terebratulids and rhynchonellids. Many new genera/ species)

Burchfiel, B.C. & E Wang (2003)- Northwest-trending, middle Cenozoic, left-lateral faults in southern Yunnan, China, and their tectonic significance. *J. Structural Geology* 25, 5, p. 781-792.

Burton, C.K. (1967)- Graptolite and tentaculite correlations and palaeogeography of the Silurian and Devonian in the Yunnan- Malaya geosyncline. *Trans. Proc. Paleontological Society Japan*, N.S. 65, p. 27-46.
(online at: https://www.jstage.jst.go.jp/article/prpsj1951/1967/65/1967_65_27/_pdf/-char/ja)
(Silurian- M Devonian deeper marine graptolites and tentaculites found in black shales from W Yunnan (S China) - E Burma- W Thailand into NW Malay Peninsula (incl. Langkawi) (= *Sibumasu Block*))

Cai, F., L. Ding, W. Yao, A.K. Laskowski, Q. Xu, J. Zhang & K. Sein (2017)- Provenance and tectonic evolution of Lower Paleozoic-Upper Mesozoic strata from *Sibumasu terrane*, Myanmar. *Gondwana Research* 41, p. 325-336.
(online at: https://www.academia.edu/31388217/Provenance_and_tectonic_evolution_of_Lower_Paleozoic_Upper_Mesozoic_strata_from_Sibumasu_Terrane_Myanmar)
(Sandstone petrographic and U-Pb detrital zircon geochronologic data from Ordovician- Jurassic of *Sibumasu terrane* in Shan State. Ordovician-Silurian sandstones with 567-470 Ma and 982-917 Ma zircon peaks, sourced from E Gondwana continent. Carboniferous meta-sandstones with strong 1165-1070 Ma zircon age peak, likely derived from Albany-Fraser Province in SW Australia and Maud Province in Antarctic. U Triassic- Lower Jurassic Loi-an Gp clastics (overlying Permian- M Triassic Plateau Limestone Gp), with abundant Permian-Triassic detrital zircons (215 Ma/ Norian and older) from Sukhothai Arc in E. *Sibumasu terrane*, which was juxtaposed against NW Australia until E Permian time. Late Triassic change in provenance to Sukhothai Arc)

Cai, F., L. Ding, Q.H. Zhang, D.A. Orme, H.H. Wei, J.X. Li, J.E. Zhang, T. Zaw & K. Sein (2019)- Initiation and evolution of forearc basins in the Central Myanmar Depression. *Geological Society of America (GSA) Bull.* 132, p. 1066-1082.

(Chindwin and Minbu sub-basins developed as parts of forearc basin along W flank of W Myanmar Arc (in present coordinates). Forearc basin initiated in Albian time on continental West Burma plate due to formation of structural high along W margin of West Burma plate)

Cao, R.G. (1986)- Discovery of Late Carboniferous glacial-marine deposits in Western Yunnan. Geological Review 32, 3, p. 236-242. *(in Chinese, with English abstract)*

(U Carboniferous Dingjiazhai Fm in W Yunnan represented by glacio-marine strata. Lower part littoral diamictite, middle part glacio-marine strata with cold-water fauna of Stepanoviella and Eurydesma, upper part with fusulinids such as Triticites, of Late Carboniferous age. Similar to strata in India, Nepal, Bhutan, Tibet, Burma, Thailand, Malaysia and Australia. Baoshan and Tengchong areas belong to Gondwanaland (N.B.: age more likely E Permian; see Ueno et al. 2003))

Carter, P. (2015)- Exploration potential of the Rakhine Basin/Bengal Fan, Offshore Myanmar. Proc. 2015 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, 2.1, p. 1-27 *(Abstract + Presentation)*

(Myanmar large number of oil fields discovered, but most are small. Bulk of production from five fields: Yenangyaung, Chauk/Lanywa, Myanaung, Pyay and Mann. Onshore/offshore Cretaceous- Pliocene Rakhine Basin along W coast of Myanmar part of M Eocene- Recent accretionary prism in front of colliding India. N part of basin thick Pliocene- Recent Bengal Fan sediments, which extend from mouths of Brahmaputra and Ganges rivers to oceanic crust in Bay of Bengal. At least 10 onshore and 17 offshore exploration wells. Two proven petroleum systems: nearshore oil and offshore biogenic gas)

Catlos, E.J., E. Reyes, M. Brookfield & D.F. Stockli (2016)- Age and emplacement of the Permian-Jurassic Menghai batholith, Western Yunnan, China. International Geology Review 59, 8, p. 919-945.

(Menghai batholith in W Yunnan is S extension of ~370km long Lincang granite body that syntectonically intruded Paleotethys collision zone between Gondwanan Baoshan block and Laurasian Simao block. Crustal anatexis of Menghai granodiorites related to post-collisional lithosphere delamination and upwelling of hot asthenosphere, forming large-volume melts. Zircon ages from ~3234 to 172 Ma. Inherited zircons Carboniferous (~318 Ma) and older. Crystallization ages Permian- E Jurassic, with ages decreasing from center of batholith to E perimeter from ~227- 211 Ma to 212- 171 Ma respectively. Collision and closure of branch of Paleotethys here over ~100 Myr period (Permian (281 Ma) - Jurassic (172 Ma))

Chantraprasert, S. & T. Chotpitayasunon (2017)- Sedimentary thickness control on structural styles with implications for petroleum system evolution in Central Myanmar. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017), EAGE, Kuala Lumpur, 43000, p. 441-445. *(Extended Abstract)*

Chatterjee, N. & N.C. Ghose (2010)- Metamorphic evolution of the Naga Hills eclogite and blueschist, Northeast India: implications for early subduction of the Indian plate under the Burma microplate. J. Metamorphic Geology 28, p. 209-225.

(Tectonic slices of eclogite and blueschist in E Cretaceous-Eocene Naga Hills ophiolite belt. Part of accretionary wedge, reflecting E-ward subduction of Indian plate under Burma microplate prior to India-Eurasia collision. Glaucophane and epidote represent post-peak assemblage)

Chattopadhyay, B., P. Venkataramana, D.K. Roy, S. Bhattacharyya & S. Ghosh (1983)- Geology of Naga Hills ophiolites. Geological Survey India Record 112, p. 59-115.

Chen, B. & G. Xie (1994)- Evolution of the Tethys in Yunnan and Tibet. J. Southeast Asian Earth Sciences 9, 4, p. 349-354.

(Five ophiolite belts in Yunnan and Tibet, two represent Paleotethys and two Mesotethys oceans. Lancangjiang belt is suture between Gondwana and Eurasia (N limit of Glossopteris flora and cool-water faunas). Paleotethys closed in Late Permian, resulting in extension of W margin of Yangtze plate. Mesotethys opened after closure of Paleotethys and disappeared at end Mesozoic)

Chen, F., X.H. Li, X.L. Wang, Q.L. Li & W. Siebel (2007)- Zircon age and Nd-Hf isotopic composition of the Yunnan Tethyan belt, southwestern China. Int. J. Earth Sciences (Geologische Rundschau) 96, 6, p. 1179-1194.

(Baoshan block, SW China, is N part of Sibumasu microcontinent. Zircon ages and Nd-Hf isotopic composition of granites E Paleozoic (~470 Ma) and Latest Cretaceous- E Paleocene (Yanshanian; ~78-61 Ma). E Paleozoic granite with Archean- Mesoproterozoic inherited zircons, clustering around 1900-1800 and 1600-1400 Ma. Yanshanian magmatism related to closure of Neotethys ocean)

Chen, S., Y. Chen, Y. Li, Q. Zhang, M.M. Aung & K. Sein (2021)- Cenozoic ultrahigh-temperature metamorphism in pelitic granulites from the Mogok metamorphic belt, Myanmar. *Science China Earth Sciences* 64, 1, p. 1-20.

(online at: https://www.researchgate.net/publication/354066238_Cenozoic_ultrahigh-temperature_metamorphism_in_pelitic_granulites_from_the_Mogok_metamorphic_belt_Myanmar)

(Rel. young (~25 Ma) UHT granulites from Mogok metamorphic belt in Myanmar, possibly s possibly induced by continental rifting along thinned orogenic lithosphere)

Chen, Y., Q. Zhang, L. Chen, K. Shi & Kyaing Sein (2024)- Intra-oceanic subduction termination and reinitiation of the Eastern Neo-Tethys in Myanmar. *J. of Earth Science (China)* 35, p. 1053–1058.

(online at: <https://link.springer.com/article/10.1007/s12583-024-2009-5>)

(Myanmar is E prolongation of Himalayan orogenic system. Four tectonic belts: Indo-Burma Range, West Burma Block, Mogok metamorphic belt and Shan Plateau (= Sibumasu). Three N-S trending ophiolite belts, recording NeoTethyan subduction: (1) East OB (Myitkyina OB) formed in M Jurassic (176-166 Ma; suture zone along Sibumasu margin. West Burma Block was Cretaceous intra-Tethyan arc. (2) West OB (Nagaland-Manipur-Kalaymyo OB) along W boundary of West Burma Block with rocks formed in E Cretaceous (127-115 Ma; likely intra-oceanic suture zone in E Neo-Tethys; (3) COB (Indawgyi ophiolite belt) with Jurassic (~169 Ma) and E Cretaceous (~120 Ma) gabbroic crusts. High-P blueschists and eclogites occur in WOB and COB but absent in EOB. COB may have been connected with WOB before strike-slip movement of Sagaing fault, therefore only two E Neo-Tethys subduction-zone systems, EOB and WOB)

Chen, X., H. Xu, Q. Liu & S. Xiang (2023)- Eocene (~ 53 Ma) alkaline complex in the southern Lhasa subterrane, Tibet: implications for Neo-Tethyan slab breakoff. *J. Asian Earth Sciences* 254, 105733, p. 1-13.

(Eocene alkaline magmatism in Mayum alkaline complex of S Lhasa subterrane formed in extensional tectonic setting related to Neo-Tethyan oceanic slab breakoff at ca. 53 Ma)

Chen, X.C., C.H. Zhao, J.J. Zhu, X.S. Wang & T. Cui (2018)- He, Ar, and S isotopic constraints on the relationship between A-type granites and tin mineralization: a case study of tin deposits in the Tengchong-Lianghe tin belt, southwest China. *Ore Geology Reviews* 92, p. 416-429.

(online at: <https://www.sciencedirect.com/science/article/pii/S0169136817302007>)

(Tengchong-Lianghe tin belt in W Yunnan, SW China, important tin mineralization belt with two large tin deposits: Paleogene Lailishan and Late Cretaceous Xiaolonghe, associated with A-type granitoids)

Chhibber, H.L. (1934)- The geology of Burma. Macmillan, London, p. 1-538.

(online at: <https://archive.org/details/in.ernet.dli.2015.474848>)

(Classic textbook on geology of Burma (Myanmar))

Chhibber, H.L. (1934)- The mineral resources of Burma. Macmillan, London, p. 1-320.

(online at: <https://archive.org/details/in.ernet.dli.2015.234095>)

(Classic textbook on rich mineral resources of Burma (Myanmar))

Choowala, W., S. Chantraprasert & S. Jitmahantakul (2023)- Characterization of transpressional structure in Moattama Basin, Gulf of Moattama, Myanmar. *Bull. Earth Sciences Thailand (BEST)* 15, 2, p. 52-64.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/253136/171843>)

(In center of Moattama basin off Myanmar, synchronous normal faults and series of anticlines along N-S shear zone, possibly formed above deep-seated dextral strike-slip fault. Three anticlines analyzed show positive flower structures tied to dextral shear from continuation of onshore Sagaing Fault)

Chun Kit Lai (2012)- Tectonic evolution of the Ailaoshan fold belt in Southwestern Yunnan, China. Ph.D. Thesis, University of Tasmania, Hobart, p. 1-284. (*Unpublished*)
(online at: <http://eprints.utas.edu.au/15931/2/whole-lai-thesis-2012.pdf>)

Chungkham, P. & S.A. Jafar (1988)- Late Cretaceous (Santonian-Maastrichtian) integrated coccolith-globotruncanid biostratigraphy of pelagic limestones from the accretionary prism of Manipur, Northeastern India. *Micropaleontology* 44, 1, p. 69-83.
(*Exotic blocks of Late Cretaceous pelagic limestones in melange of Manipur/ Nagaland ophiolite belt in NE India, with Late Santonian- Late Maastrichtian low-latitude calcareous plankton. Initial rifting and birth of Indo-Myanmar (= part of Neotethys) ocean took place before latest Santonian and suturing initiated by latest Maastrichtian*)

Chung, Y.H., S.Y. Yang & J.W. Kim (2012)- Numerical simulation of deep biogenic gas play northeastern Bay of Bengal, offshore Northwest Myanmar. AAPG International Conference Exhib., Milan 2011, Search and Discovery Article 50562, p. 1-32. (*Abstract + Presentation*)
(*Three commercial biogenic methane gas discoveries in Late Pliocene deepwater turbidite sandstones reservoirs of Bengal Fan off NW Myanmar, 2900-3300m subsea. Modeling indicates M Miocene- Pliocene section thermally immature. Most biogenic gas generated from M Miocene and E Pliocene shale. Accumulation of commercial quantities of biogenic gas requires early formation of traps and seals. Miocene- Pliocene paleohydrates formed have played important role in gas accumulation, acting as seals in initial gas generation stage*)

Clegg, E.L.G. (1938)- The geology of part of the Minbu and Thayetmyo Districts, Burma. *Memoirs Geological Survey India* 72, 2, p. 132-307.

Clegg, E.L.G. (1941)- The Cretaceous and associated rocks of Burma. *Memoirs Geological Survey India* 74, p. 1-101.

Cliff, D. & P. Carter (2016)- Exploration of the Rakhine Basin, pushing out the barriers with new 3D. 2nd AAPG/EAGE/MGS Conf. Unlocking the complex geology of Myanmar, Yangon 2015, Search and Discovery Article 10848, p. 1-25. (*Abstract + Presentation*)
(online at: www.searchanddiscovery.com/documents/2016/10848cliff/ndx_cliff.pdf)

Cocks, L.R.M. & R.B. Zhan (1998)- Caradoc brachiopods from the Shan States, Burma (Myanmar). *Bull. British Museum (Natural History), Geology*, 54, 2, p. 109-130.
(*Late Ordovician brachiopod fauna from Naungkangyi Gp in Shan States (= Sibumasu Plate) with 37 species. Faunal affinities most comparable with S China, suggesting proximity during Ordovician*)

Colbert, E.H. (1938)- Fossil mammals from Burma in the American Museum of Natural History. *Bull. American Museum Natural History* 74, 6, p. 395-436.
(online at: (<https://digitallibrary.amnh.org/bitstream/handle/2246/372>)
(*Diverse collection of mammal fossils from (1) M-U Pleistocene terraces along Irrawaddy River in N Myanmar (most common in Terrace 3); (2) in underlying E Pleistocene Upper Irrawaddy Beds (U Irrawaddy fauna probably related to Upper Siwalik fauna of India and E Pleistocene faunas of Java (Tji Djoelang, Kali Glagah and Djetis); and (3) Mogok cave fauna (likely equivalent to M Pleistocene Trinil fauna of C Java)*)

Colbert, E.H. (1943)- Pleistocene vertebrates collected in Burma by the American Southeast Asia Expedition. *Transactions American Philosophical Soc., N.S.*, 32, p. 395-429.

Cong, F., F.Y. Wu, W.C. Li, J.G. Wang, F.Y. Hu, D.F. He, W.Q. Ji, Wei Lin, Kyaing Sein (2021)- Petrogenesis of the Main Range and Eastern Province granites in eastern Myanmar: new insights from zircon U-Pb ages and Sr-Nd isotopes. *Lithos* 382-383, 105895, p. 1-25.
(*Main Range and Eastern Provinces two major granite belts in SE Asia, from SE Tibetan Plateau to Myanmar, Thailand and Peninsular Malaysia. Interpreted as magmatic expression of Paleotethys closure in Permian-Triassic. Kyaing Tong granites age 207-216 Ma (Norian; post-collisional) implying N extent of Main Range,*

whereas Tachileik granites with ages 246-250 Ma (earliest Triassic) N extent of Eastern Province granite belt. Both granites I-type affinity; derived from melting of lower crustal amphibolite and assimilation of schist)

Connors, K., C. Jorand & L. Pryer (2017)- Influence of structural inheritance on the Moattama- East Andaman basins and the present day plate boundary. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, p. 1-27. (*Abstract + Presentation*)
(*Moattama Basin offshore Myanmar between Yadana-M8 High in W and Tanintharyi- Mergui Shelf to E, continuing S as oceanic (or highly extended continental) crust of E Andaman Basin. Basement of Yadana-M8 highs in N and Alcock and Sewell rises with E Miocene volcanic units (K-Ar age date of ~20 Ma), possibly continental crust intruded during arc magmatism (W Burma Terrane possible analogue.)*)

Cossey, S., D. Kim, S.Y. Yang & H.Y. Jung (2013)- The identification and implication of injectites in the Shwe gas field, offshore Northwestern Myanmar. AAPG Annual Convention Exhib., Pittsburgh 2013, Search and Discovery Article 20225, p. 1-26. (*Abstract + Presentation*)
(*online at: www.searchanddiscovery.com/documents/2013/20225cossey/ndx_cossey.pdf*)
(*Sand injectites identified in offshore Pliocene Shwe (biogenic) gas field in Myanmar (distal Bengal Fan, on oceanic crust). Injectites provide vertical and lateral continuity from basal proximal lobe sequence to overlying distal lobe sequence. Sills 5 cm- 2m thick in cored wells, with sharp bases and tops*))

Cowper Reed, F.R. (1927)- Palaeozoic and Mesozoic fossils from Yun-nan. Memoirs Geological Survey India, Palaeont. Indica N.S, X-1; 291
(*Classic work on Cambrian-Jurassic fossils from Yunnan, SW China (part of Sibumasu Terrane). With 75 new taxa*)

Cowper Reed, F.R.C. (1933)- Anthracolithic faunas of the Southern Shan States. Records Geological Survey India 67, p. 83-134.

Crow, M.J. & Khin Zaw (2017)- Geochronology in Myanmar (1964-2017). In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Appendix, p. 713-759.
(*Summary of published isotopic age data for Myanmar up to early 2017. K-Ar age data often ambiguous due to resetting by later tectonic and metasomatic events. Isotopes of Rb and Sr in magmatic minerals more stable. U-Pb isotopes of zircons from granitoids particularly useful, also as detrital zircons in sediments*)

Crow, M.J., Khin Zaw, Kyaw Thu, I. Belousov & K. Goemann (2023)- A review of new detrital zircon U-Pb ages from the Mogok area of Myanmar: Implications for the stratigraphy and early tectonic evolution of the Mogok Metamorphic Belt (MMB). Earth-Science Reviews 242, 104441, p. 1-24.
(*Mogok Metamorphic Belt (MMB) in Myanmar (which hosts world-class gemstone deposits) composed of low-to-high-metamorphic grade metasediments and igneous intrusions. Low-grade MMB metasediments Neoproterozoic- Cretaceous ages. New detrital zircon U-Pb stratigraphy of high-grade metasediments in Mogok area comparable to Neoproterozoic-Paleozoic on Shan Plateau. Youngest volcanic zircon age of ~515 Ma, near end of life of Cambrian volcanic arc, which was terminated by Indo-Australia accretionary orogenesis (510-450 Ma). Youngest volcanic zircon similar age and chemistry to zircons from Nyima centre in Lhasa Block, suggesting that during Cambrian, volcanic arcs in Lhasa and Sibumasu blocks were adjacent, so Lhasa block was not inboard of Sibumasu on W Australian Gondwana margin*)

Cruickshank, R.D. & K. Ko (2003)- Geology of an amber locality in the Hukawng Valley, northern Myanmar. J. Asian Earth Sciences 21, p. 441-455.
(*Occurrence of M Cretaceous amber ('burmite') rich in arthropod fossils in volcanics-rich clastics in Hukawng Valley of NE Myanmar. With Late Albian- E Cenomanian palynomorphs. Believed to be of M-U Albian age based on ammonite Mortonicerias. Also nearby U Albian Orbitolina limestone (see also Shi et al. 2012)*)

Curiale, J.A., P. Kyi, I.D. Collins, Aung Din, Kyaw Nyein, Maung Nyunt & C.J. Stuart (1994)- The Central Myanmar (Burma) oil family; composition and implications for source. Organic Geochemistry 22, 2, p. 237-255.

(Geochemistry of 31 Eocene-Miocene oils/seeps, Eocene coal and Eocene resin from C Myanmar basin system suggest deep Eocene resinous shale/coal source for oils. Least mature oils in oldest reservoirs with oldest (Eocene) reservoirs filling first and youngest (Miocene) reservoirs filling last. Surface seepage may be from subsurface traps filled to spillpoint)

Dalton, L.V. (1908)- Notes on the geology of Burma. Quarterly J. Geological Society, London, 64, p. 604-644.
(Geological observations in Irawadi Valley, with descriptions of Eocene and younger molluscs)

De Cotter, G.P. (1924)- The oil shales of Eastern Amherst, Burma, with a sketch of the geology of the neighbourhood. Records Geological Survey India 55, p. 273-313.
(online at: <https://archive.org/details/in.ernet.dli.2015.98037>)
(Late Tertiary (Miocene- Pliocene?) outcrops of ~100m thick lacustrine shale with numerous remains of teleostean fish, plant leaves and molluscs (Melaniidae, Viviparidae, Unionidae) in Mesod Basin at Birma- Thai border area. Some shale rich enough to ignite when heated)

De Cotter, G.P. (1938)- The geology of parts of the Minbu, Myingyan, Pakokku, and lower Chindwin districts. Memoir Geological Survey India 72, 1, p. 1-136.

De la Rue, W. & H. Muller (1857)- Chemical examination of Burmese naphtha, or Rangoon tar. Proc. Royal Society (London) 1857, 8, p. 221-228.
(online at: <http://rspl.royalsocietypublishing.org/content/8/221.full.pdf+html>)
(At several localities in Burmah tar is mined from 60' deep wells. Mostly composed of volatiles. Etc.)

De Terra, H. (1943)- The Pleistocene of Burma. In: Research on early man in Burma, Transactions American Philosophical Society, N.S. 32, 3, p. 271-340.
(Five Pleistocene terraces along Irrawaddy River, unconformably over tilted Pliocene- E Pleistocene 'Upper Irrawaddy Beds'. Contain 'Anyathian' Paleolithic stone tools)

Dew, R., C.K. Morley, Tin Aung Myint & A. Collins (2019)- Age and provenance of the Chaung Magyi Group, Yeywa Dome, Myanmar, based on U-Pb dating of detrital zircons. J. Asian Earth Sciences 184, 103967, p. 1-8.
(Chaung Magyi Gp metasediments of Yeywa Dome, N Shan Plateau, Myanmar (part of Sibumasu Terrane) of inferred Proterozoic age, unconformably under late Cambrian Pangyun Fm. Youngest detrital zircons in sandstones suggest age likely extends into late Cambrian (~500 Ma). Detrital zircon age distributions only slightly different from Cambrian of NW Thailand, with main ages between 1300 Ma and 820 Ma, with two major peaks at ~1080 Ma and 1022 Ma. Aso Cryogenian age peak at 647 Ma)

Dey, A., M.F. Hussain & M.N. Barman (2017)- Geochemical characteristics of mafic and ultramafic rocks from the Naga Hills Ophiolite, India: Implications for petrogenesis. Geoscience Frontiers 9, 2, p. 517-529.
(online at: www.sciencedirect.com/science/article/pii/S1674987117301020)
(Naga Hills Ophiolite in NE India one of fragments of Tethyan oceanic crust in Himalayan Orogenic system. Geochemistry of ophiolites suggest two groups)

Diener, C. (1911)- Anthracolithic fossils of the Shan States. Memoirs Geological Survey India (Palaeontologica Indica), N.S., 3, 4, p. 1-74.
('Carboniferous fossils from Myanmar'. Mainly on Permian brachiopods from Fusulina elongata limestone of Ke-Hsi Mansam in E Myanmar (incl. Spirifer, Spiriferella, Productus spp., Camarophoria purdoni, Oldhamina, Streptorhynchus, Dielasma, etc.). Also bryozoa (Fenestella, Polypora), corals (Amplexus, Zaphrentis, Lonsdaleia, etc.)

Ding, H., Q. Hou & Z. Zhang (2016)- Petrogenesis and tectonic significance of the Eocene adakite-like rocks in western Yunnan, southeastern Tibetan Plateau. Lithos 245, p. 161-173.
(Eocene magmatic rocks widespread in W Yunnan, SE Tibetan Plateau, linked with India-Asia collision. Eocene-Oligocene potassic-ultrapotassic magmatic suite widely distributed across E Qiangtang- Simao Block and W margin of Yangtze Plateau. Adakite-like rocks from E part of W Yunnan with zircon age of ~35 Ma and

derived from partial melting of late Paleozoic- Mesozoic mafic rocks formed as lower crust of continental magmatic arc during E-ward Paleotethys subduction. Eocene magmatic rocks in W Yunnan generated during removal of thickened continental lithosphere triggered by India and Asia collision)

Ding, L. T.K. Goswami, F.L. Cai, U. Baral, R.K. Sarmah & D. Bezbaruah (2022)- Detrital zircon U-Pb ages of Tertiary sequences (Palaeocene-Miocene): Inner Fold Belt and Belt of Schuppen, Indo-Myanmar Ranges, India. *Geological Journal* 57, 12, p. 5191-5206.

(U-Pb geochronology of sandstones from Indo-Burma Range (E India) shows Lower Disang Fm deposited in open marine environment during Late Cretaceous- M Eocene, from an Indian clastic source. During Eocene, shallow marine sediments from Himalayan and Trans-Himalaya source. After India-Asian collision, there was a remnant ocean, in which Barail and Surma groups were deposited. Etc.)

Du, Naizheng (1988)- Fossil wood from the late Tertiary of Burma. *Proc. Koninklijke Nederlandse Akademie van Wetenschappen B91*, 3, p. 213-236.

(Two pieces of fossil wood collected almost 100 years ago from Pliocene of Magwe and Yenangyaung oil fields described as new species Ebenoxylon burmense and Saracoxylon irrawaddiense)

Edwards, W.N. (1923)- On some Tertiary plants from South-East Burma. *Geological Magazine* 60, 4, p. 159-165.

(Collection of Tertiary plant fossils collected by Gregory near Tichara, NW of Myawadi in Myanmar- Thailand border region. Incl. Ficophyllum burmense, Dipterocarphyllum, Leguminosites, Dicotyledonous, etc.)

Edwards, A., R. Courel, N. Bianchi, A. Duffy, C. Jorand, G. Moltifiori, L. Ryan & S. O'Connor (2017)- Pore pressure modelling in data limited areas- a case study from a deepwater block, offshore Rakhine Basin, Myanmar. *Proc 79th EAGE Conference & Exhibition, Paris 2017*, p.

Enami, M., Zaw Win Ko, Aung Win & M.Tsuboi (2012)- Eclogite from the Kumon range, Myanmar: Petrology and tectonic implications. *Gondwana Research* 21, 2-3, p. 548-558.

(Eclogite from Kumon Range of Myanmar Western province, SE extension of Himalayan orogenic belt. Lower P/T limits of eclogite stage 1.2-1.3 GPa/ 530–615 °C. Possible widespread high-P metamorphics in ophiolite zone along SE extension of Indus-Yarlung Zangbo suture in Myanmar and Indochina.

UN/ESCAP (1996)- Geology and mineral resources of Myanmar. *Atlas of mineral resources of the ESCAP region*, 12, United Nations Publications, New York, p. 1-193.

(online at: <https://repository.unescap.org/handle/20.500.12870/4784>)

(Extensive review of geologic setting and mineral occurrences of Myanmar)

Evans, P. & C.A. Sansom (1941)- The geology of British oil fields; 3, The oil fields of Burma. *Geological Magazine* 78, 5, p. 321-350.

(Oilfields of Burma almost all in elongated N-S Tertiary basin, bordered on W by Arakan Yoma and on E by the ancient plateau of Shan Hills. Most oil from fields in single line of folding and in belt 50 miles long between latitudes 20° 20' and 21° 10'. Remainder in small fields between 19° 25' and 23° 45')

Fan, P. & K. Ko (1994)- Accreted terranes and mineral deposits of Myanmar. *J.Southeast Asian Earth Sciences* 10, p. 95-100.

(Three terranes in Myanmar: (1) Shan-W Malaysia-Sumatra in E (three subterrane: W Kachin continental fragment, E Kachin-Shan= Baoshan, and Karen-Tenasserim); (2) C Burma Basin, and (3) Arakan Yoma in W (W Ranges or Indo-Burman ranges subduction system, uplifted by collision of India plate in Eocene). Volcanic arc divides C Myanmar Basin terrane into forearc and back-arc basins; oil-bearing fields in forearc basin. In Arakan-Yoma terrane, chromium and nickel of Late Cretaceous- E Tertiary age in ultramafic belts)

Fan, W., Y. Wang, A. Zhang, F. Zhang, Y. Zhang (2010)- Permian arc-back-arc basin development along the Ailaoshan tectonic zone: geochemical, isotopic and geochronological evidence from the Mojiang volcanic rocks, Southwest China. *Lithos* 119, p. 553-568.

(Wusu and Yaxuanqiao basalts in S China with affinities to both MORB- and arc-like sources, together with other geological observations, support development of Permian arc-back-arc basin along Ailaoshan- Song Ma tectonic zone in response to N-ward subduction of Paleotethys main Ocean. Final closure of basin in uppermost Triassic due to diachronous amalgamation between Yangtze and Simao- Indochina Blocks)

Fang, N., Q. Feng, S. Zhang & X. Wang (1998)- Paleo-Tethys evolution recorded in the Changning-Menglian Belt, western Yunnan, China. *Comptes Rendus Academie Sciences, Paris, Earth Planetary Science*, 326, p. 275-282.

(Changning-Menglian Belt of W Yunnan 400km in N-S direction, 50-70km wide. Represents part of Paleotethys Ocean, with volcano-sedimentary record from E Devonian to M-L Triassic and several types of oceanic plateaus. Flanked by Lincang-Simao massif with Cathaysian flora-fauna in E and Gengma-Baoshan massifs with Permo-Carboniferous glacial deposits in W)

Fang, N. & Y. Niu (2003)- Late Palaeozoic ultramafic lavas in Yunnan, SW China, and their geodynamic significance. *Journal of Petrology* 44, 1, p. 141-157.

(online at: <https://academic.oup.com/petrology/article/44/1/141/1408585>)

(Ultramafic pillow lavas from Late Palaeozoic marine sequences in Yunnan have >26% MgO, olivine phenocrysts, clinopyroxenes with or without plagioclase in devitrified glassy matrix. Termed high-Mg picrites. Chemistry consistent with mantle plume origin. Chert interbeds with Carboniferous radiolaria)

Fang, W., R. van der Voo & Q. Liang (1989)- Devonian paleomagnetism of Yunnan Province across the Shan Thai-South China Suture. *Tectonics* 8, 5, p. 939-952.

(Contrasting paleolatitudes for Devonian sediments in E Yunnan (equatorial; part of Yangtze/S China Block) versus W Yunnan (paleolatitude of ~42°; part of Gondwanan Shan-Thai Block). Majority of samples overprinted by present-day field magnetization. Blocks separated by Red River and Lancang (Mekong) River fault zones, one of which inferred to be ancient suture)

Fang, W., R. van der Voo & Q. Liang (1990)- Ordovician paleomagnetism of Eastern Yunnan, China. *Geophysical Research Letters* 17, 7, p. 953-956.

(Ordovician formations of Yangtze Paraplatform (South China Block) show paleolatitude of 48°S, supporting Ordovician position of South China adjacent to Gondwana)

Fang, X., X. Ma, W. Li, Y. Zhang, Z. Zhou, T. Chen, Yong Lu & S Yu & J. Fa (2018)- Biostratigraphical constraints on the disconformity within the Upper Ordovician in the Baoshan and Mangshi regions, western Yunnan Province, China. *Lethaia*, 51, 2, p. 312-323.

(Ordovician- Silurian of Baoshan and Mangshi regions in W Yunnan regarded as parts of Sibumasu terrane. Significant disconformity in U Ordovician, possibly related to sea-level drop during Late Ordovician glaciations or, less likely regional tectonic uplift in N Sibumasu)

Fang, Z.J. & J.C.W. Cope (2008)- Affinities and palaeobiogeographical significance of some Ordovician bivalves from East Yunnan, China. *Alcheringa* 32, 3, p. 297-312.

(Restudy of four poorly known Ordovician bivalve genera from Lw Ordovician Hongshiya Fm of E Yunnan. Similarities between cycloconchids suggest proximity of E Yunnan and Australia, although no species in common. Eastern W Yunnan fauna lay at much higher paleolatitude than E Yunnan fauna)

Fareeduddin & Y. Dilek (2015)- Structure and petrology of the Nagaland-Manipur Hill ophiolitic melange zone, NE India: A fossil Tethyan subduction channel at the India- Burma plate boundary. *Episodes* 38, 4, p. 298-314.

(online at: www.episodes.org/index.php/epi/article/viewFile/82426/65474)

(Nagaland-Manipur Hill ophiolite belt in IndoMyanmar Ranges in NE India represents S extension of Neotethyan Yarlung-Zhangbo suture in S Tibet, and connects late Mesozoic collision front in N with modern trench-arc system in Andaman Sea region in S. Ophiolites occur as blocks or thrust sheets within melange and are associated with eclogitic and blueschist rock assemblages. Ophiolitic melange tectonically sandwiched between Triassic- E Cretaceous accretionary prism complex (Nimi Flysch, overlying Burma Plate) in E and Late Cretaceous-Miocene accretionary wedge (Disang Flysch; on India Plate) to W. Melange represents

subduction channel of fast subduction of Neotethys oceanic lithosphere beneath Asia- Sundaland. U Eocene-Miocene Pokhpur Fm unconformably over melange and accretionary prism metasediments constitute wedge-top or slope-basin sequence, rather than postcollisional molasse. Nagaland-Manipur Hill ophiolites represent accretionary-type ophiolite, mainly from downgoing plate, not Penrose-type complete ophiolite sequence)

Feng, Q. & D. Helmcke (2001)- Late Paleozoic compressional deformation in the Simao Region, Southern Yunnan, P.R. of China. *Newsletters on Stratigraphy* 39, 1, p. 21-31.

(In Yunxian anticline, 40 km NW of Simao, strongly deformed Carboniferous- Lower Permian sediments, deposited in deep basin, separated by angular unconformity from shallow marine strata of upper M Permian and U Permian age. Existence of Triassic island arc along Lancang Jiang must be questioned)

Fortey, R.A., S.J. Wernette & N.C. Hughes (2022)- Revision of F.R.C. Reed's Ordovician trilobite types from Myanmar (Burma) and western Yunnan Province, China. *Zootaxa* 5162, 4, p. 301-356.

(Sibumasu terrane M-U Ordovician trilobites from SE Asia, collected by Geological Survey of India, and described by F.R. Cowper Reed: from Shan States of Myanmar (1906) and from westernmost Yunnan, China (1917). 'Paleo-tropical-Gondwanan species')

Gaillot, J. & D. Vachard (2007)- The Khuff Formation (Middle East) and time-equivalents in Turkey and South China: biostratigraphy from Capitanian to Changhsingian times (Permian), new foraminiferal taxa, and palaeogeographical implications. *Coloquios de Paleontologia*, 57, p. 37-223.

(Middle- Late Permian foraminiferal biostratigraphy for 'Cimmerian Plates' of Middle East (can be applied to Sibumasu plates in SE Asia; JTvG). Paleobiogeographically significant M-L Permian foraminifera for Cimmerian/ Sibumasu blocks incl. W Thailand, Baoshan) include Shanita, 'Lysites', Hemigordiopsis renzi, Eopolydiexodina ex gr. persica. Indochina- S China plates (e.g. E Thailand) characterized by presence of Lepidolina, Paleofusulina, Colaniella)

Gaillot, J., D. Vachard, T. Galfetti & R. Martini (2009)- New latest Permian foraminifers from Laren (Guangxi Province, South China): palaeobiogeographic implications. *Geobios* 42, p. 141-168.

(Latest Permian limestones of Yangtze carbonate platform at Laren, S China, with rich small foram fauna. Paleogeographic distribution interpreted to be Neo-Tethyan, ranging from S Turkey to S China and Japan)

Gaillot, J., T. Galfetti, R. Martini & D. Vachard & (2007)- Latest Permian calcisponges of Laren, Guangxi Province, South China. In: E. Vennin et al. (eds.). *Facies from Palaeozoic reefs and bioaccumulations*, Mem. Museum National Histoire Naturelle 195, Paris, p. 321-324.

(Latest Permian Wujiaping Fm limestones of Paleozoic- M Triassic Yangtze carbonate platform at Laren with rare fusulinids (Nankinella cf. inflata, Reichelina simplex) and low diversity calcisponges)

Gao Lianda (1998)- On the discovery of a Gondwana affinity microflora from Baoshan, West Yunnan and its geologic significance. *Acta Geoscientica Sinica* 1998, 1, p.

(First record of palynomorphs from E Permian Dingjiazhai Fm in Baoshan, W Yunnan. 55 species. Miospore assemblages assigned to Parasaccites distinctus-Microbaculispora fentula zone, dominated by Gondwana microfloral elements (up to 80%, incl. Parasaccites distinctus, Brakarites rotatus, Potonieisporites spp., Microbaculispora, Interradispora, Horriditriteles, etc.). Asselian-Sakmarian in age)

Gardiner, N.J., C.J. Hawkesworth, L.J. Robb, M.J. Whitehouse, N.M.W. Roberts, C.L. Kirkland & N.J. Evans (2017)- Contrasting granite metallogeny through the zircon record: a case study from Myanmar. *Nature Scientific Reports* 7, 748, p. 1-9.

(online at: <https://www.nature.com/articles/s41598-017-00832-2>)

(Zircon isotope (U-Pb, Lu-Hf, O) and trace element data from paired Cu-Au (copper) and Sn-W (tin) magmatic belts in Myanmar reaffirm that tin belt magmas contain greater crustal contributions than copper arc rocks)

Gardiner, N.J., L.J. Robb, C.K. Morley, M.P. Searle, P.A. Cawood, M.J. Whitehouse, C.L. Kirkland, N.M.W. Roberts & Tin Aung Myint (2016)- The tectonic and metallogenic framework of Myanmar: a Tethyan mineral system. *Ore Geology Reviews* 79, p. 26-45.

(manuscript online at: https://nora.nerc.ac.uk/id/eprint/513738/1/OGR_Myanmar_Final_1.pdf)
 (Myanmar highly prospective but little explored minerals province, with deposits of tin, tungsten, copper, gold, zinc, lead, nickel, silver, jade and gemstones. Myanmar Mesozoic-Recent geological history dominated by orogenic events representing closing of Tethys Ocean. Genesis of much of Myanmar's mineral deposits in single, evolving, mineral system: subduction and suturing of Neo-Tethys. Nine metallogenic provinces: (1) Late Cretaceous- Eocene granites with Sn-W, (2) skarn Au-Ag linked to Kabaing Granite (~17 Ma); (3) porphyry Cu-Au (Eocene/ 40 Ma intrusion, (4) epithermal Au-Cu (latest Cretaceous or younger), (5) ultramafic-hosted nickel, jade, (6) orogenic Au, (7) sediment-hosted Pb-Zn in U Paleozoic carbonates of Shan Plateau, (8) gemstones (9) Sediment-hosted epithermal Au. Two sub-parallel magmatic belts: Wuntho-Popa Arc magmatism (mainly 80-110 Ma, also younger, with Cu-Au) and Mogok-Mandalay-Mergui Belt granitoids (~170 Ma, Late Cretaceous- Eocene with Sn-W mineralisation)

Gardiner, N.J., L.J. Robb & M.P. Searle (2014)- The metallogenic provinces of Myanmar. Applied Earth Science (Trans. Institute of Mining and Metallurgy-B), 123, 1, p. 25-38.

(online at: https://www.academia.edu/22859541/The_metallogenic_provinces_of_Myanmar)

(Myanmar contains important deposits of tin, tungsten, copper, gold, gemstones, zinc, lead, nickel and silver. Three world class deposits: Bawdwin (lead-zinc-silver), Monywa (copper) and Mawchi (tin-tungsten). Three principal metallogenic belts: (1) Late Cretaceous Wuntho-Popa Arc of subduction-related granites with associated porphyry-type copper-gold and epithermal gold; (2) Late Cretaceous and younger Mogok-Mandalay-Mergui Belt with Sn-W (tin-tungsten) associated with crustal melt granites; (3) Shan Plateau with massive sulphide-type lead-zinc deposits)

Gardiner, N.J., L.J. Robb & M.P. Searle, K. Htun & K. Zaw (2017)- The Bawdwin Mine, Myanmar: a review of its geological setting and genesis. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 30, p. 669-686.

(Bawdwin Mine Pb-Zn-(Cu-Ag-Ni) world-class mineral deposit in N Shan State, NE Myanmar, with near-continuous mining since 1412. E Paleozoic (Late Cambrian- E Ordovician) exhalative marine siliciclastic-felsic volcanogenic massive sulphide (VMS) deposit. Originally exploited as silver deposit, redeveloped in early 1900's as mainly lead-zinc producer (largest lead mine before WWII). Thermal overprint in Late Triassic, linked to Indosinian orogeny)

Gardiner, N.J., M.P. Searle, C.K. Morley, L.J. Robb, M.J. Whitehouse, N.M.W. Roberts, C.L. Kirkland & C.J. Spencer (2018)- The crustal architecture of Myanmar imaged through zircon U-Pb, Lu-Hf and O isotopes: tectonic and metallogenic implications. Gondwana Research 62, p. 27-60.

(manuscript online at: www.researchgate.net/publication/323637325_The_crustal_architecture_of_Myanmar_imaged_through_zircon_U-Pb_Lu-Hf_and_O_isotopes_Tectonic_and_metallogenic_implications)

Myanmar at least 4 major magmatic belts. Eastern and Main Range Provinces associated with Late Permian- E Triassic closure of Paleo-Tethys; Mogok- Mandalay- Mergui Belt and Wuntho- Popa Arc response to Eocene closure of Neo-Tethys. Mogok-Mandalay-Mergui Belt divided into Tin Province (~77-50 Ma magmatism) and Mogok Metamorphic Belt (complex magmatic- metamorphic history). Tagaung-Myitkyina Belt magmatic age of 172 Ma. New tectonic model for Myanmar: Baoshan and Greater Sibumasu likely assembled on or before Triassic, then sutured onto Indochina margin in Late Triassic. Tengchong Block within Myanmar southerly termination of Meso-Tethys suture immediately N of Mogok area. Tengchong Block sutured onto Greater Sibumasu before Late Cretaceous, after which Neo-Tethys subduction drove magmatism of Wuntho-Popa Arc)

Gardiner, N.J., M.P. Searle, C.K. Morley, M.P. Whitehouse, C.J. Spencer & L.J. Robb (2016)- The closure of Palaeo-Tethys in Eastern Myanmar and Northern Thailand: new insights from zircon U-Pb and Hf isotope data. Gondwana Research 39, p. 401-422.

(online at: [\(Main Range and E Province granite belts of SE Asia represent magmatic expression of closure of Paleo-Tethys in Late Paleozoic- E Mesozoic times. New U-Pb zircon age data from N Thailand and E Myanmar constrain closure in Myanmar to ~230 Ma. Age of 219-220 Ma from Kyaing Tong granite imply N extension of Main Range Province into E Myanmar \(E Triassic\). Tachileik granite in far E Myanmar 266 Ma, consistent with E Province ages. Hf data suggest Paleoproterozoic crust underlies both Main Range and E Province granites\)](http://www.academia.edu/22859518/The_closure_of_Palaeo_Tethys_in_Eastern_Myanmar_and_N_Etc.)

- Gardiner, N.J., M.P. Searle, L.J. Robb & C.K. Morley (2015)- Neo-Tethyan magmatism and metallogeny in Myanmar- an Andean analogue? *J. Asian Earth Sciences* 106, p. 197-215. (online at: www.academia.edu/22859517/Neo_Tethyan_magmatism_and_metallogeny_in_Myanmar_An_Andean_analogue)
(In Myanmar two (U Cretaceous- Paleogene) granite belts with significant metal deposits: (1) Late Cretaceous (mainly 80-110 Ma) Wuntho-Popa Arc with I-type granitoids with Cu-Au mineralization; (2) Mogok-Mandalay-Mergui Belt with S-type granites with Sn-W deposits. Represent subduction of Neo-Tethys below W side of Sibumasu Terrane (W Birma). Belts are parallel, reminiscent of metallogenic belts of C Andes)
- Gardiner, N.J., J.P. Sykes, A. Trench & L.J. Robb (2015)- Tin mining in Myanmar: production and potential. *Resources Policy* 46, 2, p. 219-233.
(online at: www.burmalibrary.org/docs22/Tin_Mining_in_Myanmar.pdf)
(In 2014, Myanmar became World's third biggest tin producer, after China and Indonesia. Likely contributed to drop in tin prices in 2015. Production increase from new Man Maw mining district in Wa State, E Myanmar, not far from traditional tin-producing areas in S)
- Garnier, V. (2003)- Les gisements de rubis associés aux marbres de l'Asie Centrale et du Sud-est: genèse et caractérisation isotopique. Ph.D. Thesis, Institut National Polytechnique de Lorraine, Nancy, p. 1-371.
(*The ruby-bearing beds associated with marbles on Central and SE Asia: genesis and isotopic characterization*)
- Garnier, V., G. Giuliani, D. Ohnenstetter, A.E. Fallick, J. Dubessy, D. Banks, Hoang Quang Vinh, T. Lhomme et al. (2008)- Marble-hosted ruby deposits from Central and Southeast Asia: Towards a new genetic model. *Ore Geology Reviews* 34, 1-2, p. 169-191.
(*Marble-hosted ruby deposits in C and SE Asia located in Himalayan foldbelt, from Afghanistan to Pakistan, Nepal, Vietnam and Myanmar (Mogok and Mong Hsu). Spatially related to granitoid intrusions in Paleozoic? platform carbonates that underwent high-grade metamorphism. Located in suture zones or shear zones that guided extrusion of Indochina block after collision in SE Asia. Age dating results mainly Miocene. Gem ruby formed at P~ 3 kbar and 620-670 °C, during thermal reduction of evaporite by organic matter, at high T-medium P metamorphism of platform carbonates during Tertiary India-Asia collision*)
- Garnier, V., H. Maluski, G. Giuliani, D. Ohnenstetter, D. Schwarz (2006)- Ar-Ar and U-Pb ages of marble-hosted ruby deposits from Central and Southeast Asia. *Canadian J. Earth Sciences* 43, 509-532.
(*Late Oligocene- Miocene ages of ruby-bearing metamorphic belts document extensional tectonics that were active from Afghanistan to Myanmar to Vietnam. Ruby-bearing marbles define high-quality gem belt linked to the high-T metamorphism in Himalayan fold belt during Tertiary collision of Indian plate with Asia*)
- Garson, M.S., B.J. Amos & A.H.G. Mitchell (1976)- The geology of the area around Nyaungga and Yengan, southern Shan states, Burma. Institute of Geological Sciences (IGS), London, Overseas Memoir 2, 2, p. 1-70.
- Garzanti, E., J.G. Wang, G. Vezzoli & M. Limonta (2016)- Tracing provenance and sediment fluxes in the Irrawaddy River basin (Myanmar). *Chemical Geology* 440, p. 73-90.
(*Feldspatho-quartzose sand in Irrawaddy headwaters derived from metamorphic and plutonic rocks of Mogok Belt and Lohit complex. Feldspatho-litho-quartzose Chindwin sand recycled from supracrustal, sedimentary and low-grade metasediments. Additional mafic- ultramafic detritus from ophiolites and blueschists exposed in Indo-Burman Ranges to Jade Mines and Myitkyina belts. Also volcanic detritus from Popa-Wuntho arc*)
- Ghose, N.C., O.P. Agrawal & N. Chatterjee (2010)- A geological and mineralogical study of eclogite and glaucophane schists in the Naga Hills Ophiolite, Northeast India. *Island Arc* 19, p. 336-356.
(*Low- to high-P metamorphic assemblages in metabasic rocks and metachert in U Cretaceous- Eocene ophiolite belt of Naga Hills, N Indo-Myanmar Ranges, in Indo-Eurasian collision zone. Metabasic rocks high-grade barroisite/ glaucophane epidote eclogite and glaucophane schist, also low-grade greenschist and prehnite-clinocllore schist, associated with lava flows and ultramafic cumulates at W thrust contact. Peak P-T conditions of ~20 kb/ 525°C. Retrogression/ uplift marked by replacement of barroisite and omphacite by glaucophane,*

followed by secondary actinolite, albite and chlorite. Mylonite in garnet lherzolite and 'mica fish' in glaucophane schist indicate ductile deformation in shear zone along which ophiolite was emplaced)

Ghose, N.C., O.P. Agrawal & R.N. Singh (1986)- Geochemistry of the ophiolite belt of Nagaland, N.E. India. In: N.C. Ghose & S. Varadarajan (eds.) Ophiolites and Indian plate margin, Sumna Publishers, Patna, p. 241-294.

Ghose, N.C., N. Chatterjee & Fareeduddin (2014)- A petrographic atlas of ophiolite: an example from the eastern India-Asia collision zone. Springer India, p. 1-232.

(Extensive review of Naga Hills ophiolite, with ultramafic rocks, plagiogranite, glaucophane schist, eclogite, chert, etc.)

Ghose, N.C., N. Chatterjee & Fareeduddin (2014)- Geology of the Naga Hills Ophiolite. In: N.C. Ghose et al. (eds.) A petrographic atlas of ophiolite: an example from the eastern India-Asia collision zone, Chapter 3, Springer India, p. 24-48.

(online at: https://www.researchgate.net/publication/312682046_Geology_of_the_Naga_Hills_Ophiolite)

(NE-SW-oriented Naga Hills in NE India and NW Myanmar constitute N part of Indo-Myanmar Ranges. With narrow arcuate zone of (dismembered) Naga Hills Ophiolite along middle of belt. Three tectono-stratigraphic units, from E to W: (1) tightly folded Nimi Fm accretionary wedge low-grade metasediments of Mesozoic? age, (2) Late Jurassic-Eocene NH Ophiolite ultramafics and basalts with pelagic Late Jurassic and Late Cretaceous cherts, and (3) Lower Disang Fm thick, folded Late Cretaceous-Eocene flysch-type sediments)

Ghose, N.C. & Fareeduddin (2011)- Textural fingerprints of magmatic, metamorphic and sedimentary rocks associated with the Naga Hills Ophiolite, northeast India. In: J. Ray et al. (eds.) Topics in igneous petrology, Springer, p. 321-354.

Ghosh, S., B. Chattopadhyay, D.K. Roy & P. Venkataramana (1984)- On the radiolarian bearing rocks of Naga Hills ophiolite. Geological Survey India Records 113, 4, p. 89-97.

(U Cretaceous- Lower Eocene age inferred for ophiolite rocks and associated cherts based on radiolarians (however: Baxter et al. (2011) also reported Late Jurassic radiolaria))

Gonguet, C., T. Kelly, F. Mohammad, U.K. Win & N. Hlaing (2017)- MOGE4 exploration block- Prome Embayment- Central Burma Depression - Learnings from new 2D seismic acquisition. AAPG/EAGE/MGS 3rd Oil & Gas Myanmar Geosciences Conf., Yangon, p. 1-7. *(Extended Abstract)*

Goossens, P.J. (1978)- The metallogenic provinces of Burma: their definitions, geologic relationships, and their extension into China, India, and Thailand. Proc. 3rd Regional Conference on Geology and Mineral Resources of SE Asia, Bangkok 1978, p. 431-492.

(Comprehensive review of metallic mineral occurrences in Myanmar. Geology still poorly known (similar paper by Gardiner et al. (2014))

Gough, A., R. Hall & M.K. BouDagher-Fadel (2020)- Mid-Cenozoic fluvio-deltaic to marine environments of the Salin Sub-basin, Central Myanmar. J. Asian Earth Sciences 190, 104143, p. 1-20.

(Salin sub-basin within N-S trending Central Basin in Myanmar. Oligocene Shwezetaw, Padaung and Okhmintaung Fms deposits of large broadly S-ward-flowing fluvial systems that interacted with deltaic and shallow marine environments in SW)

Gough, A., J. McNeil & R. Hall (2019)- Where did they come from, where did they go? Oligocene fluvio-deltaic sediments of the Salin Sub-Basin, Myanmar. Proc. 2019 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore 2019, p. 38. *(Abstract and Presentation)*

(Oligocene sediments in Salin Basin in C Myanmar probably intra-montane basin. Large contribution from nearby Myanmar magmatic arc suggested by common Late Cretaceous- Eocene zircons)

Gramann, F. (1974)- Some palaeontological data on the Triassic and Cretaceous of the western part of Burma (Arakan Islands, Arakan Yoma, western outcrops of Central Basin). *Newsletters on Stratigraphy* 3, 4, p. 277-290.

(Confirmation of presence of 'flysch-type' marine U Triassic (Carnian) deposits in Kyauktu-Sa area, at W side of Central Basin of Myanmar: dark shales with Daonella lommeli of Chin Hills, shales with Halobia cf. comata. Unconformably overlain by ~400m thick marine U Cretaceous, incl. Cenomanian limestones with Orbitolina, younger Cretaceous Globotruncana Limestones, thin Maastrichtian with Orbitoides and Siderolites)

Gramann, F., F. Lain & D. Stoppel (1972)- Paleontological evidence of Triassic age for limestones from the Southern Shan and Kayah States of Burma. *Geologisches Jahrbuch* B1, p. 1-33.

(Cephalopod limestone at top of 'Upper Plateau Limestone' of S Shan and Kachin States of Myanmar with ammonoids Paraceratites and Flexoptychites, suggesting Anisian (M Triassic), age, not Permo-Carboniferous. M Triassic age confirmed by conodont Gladiogondella tethydis. Underlain by >1000' of E-M Triassic dolomitic limestones and Permian fusulinid limestones)

Gregory, J.W. (1923)- The geological relations of the oil shales of Southern Burma. *Geological Magazine* 60, 4, p. 152-159.

(Tichara oil shales are lacustrine deposits in upper part of series of freshwater deposits of probably Pliocene age. Associated with fossil plant-bearing beds with Leguminosites, Phyllites, Ficophyllum, Dipterocarpophyllum and fresh water molluscs)

Grimaldi, D.A., M.S. Engel & P.C. Nascimbene (2002)- Fossiliferous Cretaceous amber from Myanmar (Burma): its rediscovery, biotic diversity, and paleontological significance. *American Museum (Natural History) Novitates* 3361, p. 1-71.

(online at: <http://digitallibrary.amnh.org/handle/2246/2914>)

(Amber from thin lignite seams in Kachin, N Myanmar, ('burmite') used in China for at least a millennium for carving decorative objects. Metasequoia (Coniferae) possible source of amber. Age probably Turonian-Cenomanian (90-100 Ma; see also Shi et al. 2012). Very rich in tropical plant and animal fossils. Newly excavated material in AMNH with 3100 organisms, incl. angiosperm flower and other plant material, mites, insects, flies, snails, etc., etc.)

Han, E.M., Y. Sampei & B. Roser (2014)- Upper Eocene coal and coaly shale in the Central Myanmar Basin: origin of organic matter and the effect of weathering. *Geochemical J.* 48, p. 259-275.

(online at: www.terrapub.co.jp/journals/GJ/pdf/4803/48030259.pdf)

(Extensive Late Eocene coals- coaly shales at W margin C Myanmar Basin. Organic matter mainly terrestrial herbaceous vegetation and aquatic plants, deposited in oxic to oxygen-poor peat swamps in estuarine/ fluvial-deltaic setting. Phase-I rich in gymnosperm biomarkers such as retene and 1,7-dimethylphenanthrene (type II-III kerogen); Phase-II increase in angiosperm proxies like oleanane (type III kerogen))

Haproff, P.J., M.L. Odum, A.V. Zuza, An Yin & D.F. Stockli (2020)- Structural and thermochronologic constraints on the Cenozoic tectonic development of the Northern Indo-Burma Ranges. *Tectonics* 39, 9, e2020TC006231, p. 1-38.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020TC006231>)

(Northern Indo-Burma Ranges exposes a SW-directed thrust belt E of NE India craton. Thermochronologic data indicate thrust-related cooling from ~36 Ma in NE to ~5.6 Ma in SW. Episodes of out-of-sequence thrusting. Restoration of thrust belt yields minimum horizontal shortening of ~280 km (~86%))

Harlow, G.E. & W. Bender (2013)- A study of ruby (corundum) compositions from the Mogok Belt, Myanmar: searching for chemical fingerprints. *American Mineralogist* 98, 7, p. 1120-1132.

(Mogok metamorphic belt of Myanmar famous for classic ruby (corundum: Al₂O₃) specimens. Model for formation of rubies hosted in marble from Himalayan arc is metamorphism of clays from evaporitic/organic-rich shale units. Mogok may involve igneous intrusions and formation of skarn)

Harrowfield, G. (2015)- Mass Transport Complexes of the Rakhine Basin, Myanmar- Deepwater examples from recent 3D seismic data. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore 2015, 2.3, p. 1-5.

(Mass Transport Complexes constitute significant volume of Miocene- Recent deep water deposits in Rakhine Basin, offshore Myanmar)

Harun, S.N.F., F. Zainetti & G.A. Cole (2014)- The petroleum system of the Central Burma Basin, onshore Myanmar. AAPG International Conference & Exhibition, Istanbul 2014, Search and Discovery Article 41439, p. 1-10. *(Extended Abstract)*

(online at: www.searchanddiscovery.com/documents/2014/41439harun/ndx_harun.pdf)

(Onshore C Burma Basin Tertiary- age hydrocarbon system with potential source rocks of Eocene through Miocene age. Producing reservoirs M Eocene- M Miocene sandstones. All accumulations of oil and gas in structural traps associated with NNW-SSE trending thrust anticlines)

He, Q., L. Xiao, B. Balta, R. Gao & J. Chen (2010)- Variety and complexity of the Late-Permian Emeishan basalts: reappraisal of plume-lithosphere interaction processes. Lithos 119, 1-2, p. 91-107.

(Compositional variations in Emeishan basalts generated by melting of heterogeneous mantle sources and interaction between Emeishan plume and lithosphere. High-Ti basalts products of deep melting plume head material, similar to oceanic island basalts, with little lithospheric overprint. Low-Ti basalts from shallower melting of plume head with either crustal contamination or by inherited subduction components in lithosphere)

Healey, M. (1908)- The fauna of the Napeng beds or the Rhaetic beds of Upper Burma. Palaeontologia Indica 2, 4, p. 1-88.

(Late Triassic (Rhaetic?) bivalves from N Shan States, Myanmar. Napeng Fm shale fauna dominated by bivalve molluscs, incl. Grammatodon lycettii, Pinna cf. blanfordi, Conocardium, Gervillia spp., Hoernesia filosa, Myophoria, Aequipecten, Modiola, Cardita, etc. (Assemblage similar to 'Padang Fauna' from W Sumatra (Krumbeck 1914))

Helmcke, D., R. Ingavat-Helmcke, Q. Feng, B. Wagner & K. Heppe (2001)- On geodynamic evolution of Simao region (Southwestern Yunnan, China) during Late Paleozoic and Triassic. J. China University of Geosciences 12, 3, p. 195-200.

(online at: www.geobiology.net.cn/chaen/photo/2012-11-10/20121110204048084808.pdf)

(Late Paleozoic compressional deformation along Lancangjiang, Yunnan, SW China, resulted in highly deformed Carboniferous quartz-phylite, unconformably overlain by Late Triassic red beds and rhyolites, probably representing Late Triassic rifting stage. In Yunxian anticline (NW of Simao) two angular unconformities: (1) deep marine Carboniferous- Lower Permian unconformably overlain by shallow marine upper M-U Permian sediments with fusulinids Yabeina, Verbeekina, Gigantopteris plants and brachiopod Leptodus tenuis. Angular unconformity same age as syn-orogenic sediments first described and dated from Phetchabun region in Thailand; (2) ~Early Triassic. (Simao Block generally regarded as 'Cathaysian' block in Late Paleozoic (W part of Indochina Block); JTvG))

Heppe, K. (2004)- Plate tectonic evolution and mineral resource potential of the Lancang River Zone, SW Yunnan, People's Republic of China. Doct. Thesis Georg August University, Gottingen, p. 1-105.

(online at: ediss.uni-goettingen.de/)

Heppe, K. (2006)- Plate tectonic evolution and mineral resource potential of the Lancang River zone, southwestern Yunnan, People's Republic of China. Geologisches Jahrbuch, Sonderhefte, D, 7, p. 1-159.

(Published version of 2004 thesis. Late Paleozoic- E Mesozoic geodynamic evolution of Lancang River Zone (Yangtze Platform, SW Yunnan))

Heppe, K., D. Helmcke & K. Wemmer (2007)- The Lancang River Zone of southwestern Yunnan, China: a questionable location for the active continental margin of Paleotethys. J. Asian Earth Sciences 30, 5-6, p. 706-720.

(No active continental margin accounts for subduction of Paleotethys main branch, proposed to be recorded either along Lancang River or Changning-Menglian Belt)

Hisada, K., K. Ueno, T. Sugiyama, K. Nagai and X.D. Wang (2001)- Confirmation of dropstones in the Dingjiazhai Formation of the Gondwana-derived Baoshan Block, West Yunnan. *Gondwana Research* 4, p. 630-631. *(Abstract)*

(Occurrence of cobble-sized dropstones in thin-bedded shale-siltstone in Dongshanpo section of Dingjiazhai Fm in Shidian area, 30km S of Baoshan, W Yunnan)

Hobson, G.V. (1941)- Report on a geological survey in part of Karenni and the Southern Shan States: Geological Survey India Memoir 74, 2, p. 103-155.

Hossain, M. S., M.S.H. Khan, K.R. Chowdhury & R. Abdullah (2019)- Synthesis of the tectonic and structural elements of the Bengal Basin and its surroundings. In: S. Mukherjee (ed.), *Tectonics & structural geology: Indian context*, Springer International Publishing, p. 135-218.

Hossain, M.S., W. Xiao, M.S.H. Khan, K.R. Chowdhury & S. Ao (2020)- Geodynamic model and tectono-structural framework of the Bengal Basin and its surroundings. *Journal of Maps* 16, 2, 445-458.

(online at: <https://www.tandfonline.com/doi/full/10.1080/17445647.2020.1770136>)

(On geodynamic evolution, and tectono-structural framework of Cretaceous - Recent Bengal Basin, NE India and Myanmar, one of largest collisional foreland basins in world, in collision zone between India in W and Burma plate in E. To the S it continues as Bengal Fan to Bay of Bengal)

Htay, Hla (2016)- Tectonic setting of ophiolite Belts in Myanmar. Proc. 2nd AAPG/EAGE/MGS Conference Innovation in geoscience: unlocking the complex geology of Myanmar, Yangon 2015, Search and Discovery Article 30452, p. 1-43. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2016/30452htay/ndx_htay.pdf)

(Myanmar region N-S trending major tectonic domains, from W to E: Rakhine foredeep, Indo-Burman Ranges outer arc or fore-arc, W Inner-Burma Tertiary inter-arc basin, Central volcanic arc, E Inner-Burman Tertiary back-arc basin, and Shan-Tenasserim massif ensialic, Sino-Burman Ranges. Ophiolitic rock associations in 3 parallel belts from W to E: W Ophiolite Belt (Naga Hill Line), Central and E Ophiolite Belt (Mandalay Line))

Htay, Hla, K. Zaw & T.T. Oo (2017)- The mafic-ultramafic (ophiolitic) rocks of Myanmar. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, Chapter 6, p. 117-141.

(Ophiolitic rock in three parallel N-S belts: (1) Western Ophiolitic Belt (Naga Hill Line; eastern hills of the Naga, Chin and Rakhine ranges; pre-Triassic ocean floor? (likely E Cretaceous oceanic crust and plagiogranites?); (2) Central Ophiolitic Belt; and (3) Eastern Ophiolitic Belt (Tagaung-Myitkina Belt M Jurassic ophiolite with Late Jurassic chert). Mandalay Line is combination of (2) and (3). All dismembered incomplete ophiolite bodies in fore-arc accretionary prism, emplaced in Late Cretaceous-Eocene. EOB associated with Cretaceous clastics, radiolarian chert and Orbitolina limestone, which probably overlaps Mesotethys suture)

Htun, K.T., Khin Zaw, I. Belousov, K. Yonezu, C. Makoundi, K. Watanabe & K. Goemann (2025)- U-Pb zircon and cassiterite geochronology of Sn-W bearing granitoids at the Tagu mining area in the Myeik region, Southern Myanmar: Insight into ore genesis and metallogenic implication. *Geosystems and Geoenvironment* 4, 3, 100416, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2772883825000664>)

(Tagu tin-tungsten deposit in S Myanmar hosted by both Cretaceous-Eocene granites and Carboniferous -E Permian metasedimentary rocks. Zircon U-Pb age of host granitic rocks 85.3 ± 1.5 Ma, cassiterite ages broadly similar (88, ~76 Ma). W-Sn mineralisation related to post-collisional magmatism from lower crustal melting after Late Cretaceous Neotethys(?) closure and collision between W Myanmar and Sibumasu Terranes)

Htun, Than, Aung Kyin & K. Zaw (2017)- Lead-zinc-silver deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 27, p. 589-623. (*>290 Pb-Zn-Ag deposits known in Myanmar, incl. large volcanic-hosted Namtu-Bawdwin mining complex. Eight types of host rocks with Pb-Zn-Ag mineralization. Pb-Zn-Ag belts at E Paleozoic active margin of N-C Shan Plateau (Sibumasu), hosted within Lower Paleozoic sediments and volcanics*)

Htun, Than, Than Htay & K. Zaw (2017)- Tin-tungsten deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 28, p. 625-647. (*Sn-W deposits associated with Late Cretaceous-Paleogene Central and Late Triassic- E Jurassic Eastern granitoid belts of Myanmar. Commercial exploitation of tin and tungsten in Myeik (Mergui) district of Myanmar. Surge in tin production in Myanmar since 2013 from Man Maw Mining District*)

Htut, Than (2017)- Myanmar petroleum systems, including the offshore area. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 11, p. 219-260. (*Oil exploration and production in Myanmar date back to 13th century, a time of manual excavation from hand-dug wells in Yenangyaung District. Export of crude oil began in 1853. After British annexation of U Burma Burmah Oil Company (BOC) established and started drilling at Yenangyaung in 1887, followed Yenangyat in 1893 and Chauk (Singu) in 1902. In 1918 oil production of Yenangyaung Field was >5.8 MMbbl/ year and, in 1941, Chauk's production peaked at >4 MMbbl. U Triassic- Miocene stratigraphy of Salin sub-basin of C Myanmar Basin includes Paleocene with Distichoplax, U Eocene with Biplanispira, Asterocyclina, etc.)*)

Htut, T.Y., K. Qin, G. Li, K. Sein & N.J. Evans (2020)- Eocene arc magmatism and related Cu-Au (Mo) mineralization in the Shangalon-Kyungalon district, Wuntho-Popa Arc, northern Myanmar. Ore Geology Reviews 125, 103678, p. 1-16. (proof online at: [www.academia.edu/108062767/Eocene_arc_magmatism_and_related_Cu_Au_Mo_mineralization Etc.](http://www.academia.edu/108062767/Eocene_arc_magmatism_and_related_Cu_Au_Mo_mineralization_Etc)) (*Shangalon-Kyungalon Cu-Au (Mo) ore district on SE margin of M Cretaceous Kanzachaung batholith in Wuntho-Popa Arc. Porphyry and epithermal Cu-Au mineralization associated with Late-Eocene diorites-granodiorites-gabbros with Zr ages ~37-38 Ma. Late-Eocene magmas formed from mantle source metasomatized by subducted sediments during Neo-Tethyan subduction beneath W Burma terrane*)

Htwe, K.K., K.M. Win, S. Aung & T.N. Win (2017)- Structural trap formation and petroleum accumulation in the northern part of Central Myanmar Basin: Kyaukkwet/ Letpanto Field. AAPG/EAGE/MGS 3rd Oil & Gas Conf., Yangon 2017, p. 1-5. (Extended Abstract)

Hu, F., F.W. Wu, J.G. Wang, M.N. Ducea, J.B. Chapman, K. Zaw, W. Lin, K. Sein & S. Meffre (2022)- Newly discovered Early Carboniferous and Late Permian magmatic rocks in eastern Myanmar: implications for the tectonic evolution of the eastern Paleo-Tethys. J. Asian Earth Sciences 227, 105093, p. 1-22. (open manuscript online at: <https://www.sciencedirect.com/science/article/abs/pii/S1367912022000165>) (*New zircon U-Pb and other data for magmatic rocks from Sukhothai arc in E Myanmar. Rocks include 360-355 Ma basaltic rocks and trondhjemitic dikes, and 257-254 Ma volcanics and gabbroic cumulates. E Myanmar, Central Tibet, SW Yunnan and SE Asia similar 3-staged magmatic history, forming ~4000 km long magmatic belt: (I) magmatic events related to subduction of E Paleo-Tethys Ocean in E Carboniferous, with Late Carboniferous back-arc basin opening and arc magmatism since Permian; (II) igneous rocks formed during final amalgamation between Indochina- Sibumasu Blocks in Late Permian- M Triassic; (III) post-collisional magmatism across suture zone in Late Triassic*)

Huang, H. & X. Jin (2016)- Permian oolitic carbonates from the Baoshan Block, China: ooid features, stratigraphic distribution and paleogeographic indications. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 15-16. (Abstract only) (online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>) (*In Baoshan (W Yunnan) and Peninsular Thailand (Sibumasu) block onset of (mid-latitude) oolitic carbonates in late M Permian (Wordian- Capitanian) (see also Huang et al. 2017)*)

Huang, H., X. Jin, F. Li & Y. Shen (2017)- Permian oolitic carbonates from the Baoshan Block in western Yunnan, China, and their paleoclimatic and paleogeographic significance. *Int. J. Earth Sciences* 106, 4, p. 1341-1358.

(M-L Permian ooids in Hewanjie Fm (N Baoshan) and Shazipo Fm (S Baoshan Block). Diachronous onset of Permian ooids among Gondwana-derived Cimmerian blocks: (1) mostly Sakmarian in C Taurides- C Pamir-Karakorum Block versus (2) Wordian-Capitanian in Baoshan Block, Peninsular Thailand and S Qiangtang (these also with Asselian- Sakmarian glaciomarine diamictite). Baoshan Block at higher paleolatitude during Asselian- Sakmarian than blocks with Sakmarian ooids. Marine ooids virtually absent near equator, so Baoshan Block interpreted to drift to warm-water southern mid-latitudes during Wordian- Capitanian)

Huang, H., X. Jin & Y. Shi (2008)- Middle Permian fusulinids from Southern Baoshan Block, Western Yunnan, China. *Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008)*, Bangkok 2008, p. 169. *(Abstract only)*

(online at: www.geo.sc.chula.ac.th/Geology/English/News/Technique/GREAT_2008/PDF/056.pdf)

(41 M Permian fusulinid species of 9 genera from lower Shazipo Fm in of SE Baoshan Block, W Yunnan, China (= Cimmerian/Sibumasu Block). Three biozones in ascending order (1) Verbeekina inflata Range Zone (9 species of Schwagerina, Roadian-Wordian in age, with Verbeekina inflata, V. grabaui, Pseudodoliolina pulchra and P. chinghaiensis, (2) Eopolydioxodina Abundance Zone (high diversity, commn Eopolydioxodina, Roadian-Wordian and (3) Sumatrana annae Range Zone (5 species of Sumatrana, incl. Sumatrana longissima and S. annae (Wordian- E Capitanian))

Huang, H., X. Jin & Y. Shi (2015)- A *Verbeekina* assemblage (Permian fusulinid) from the Baoshan Block in western Yunnan, China. *Journal of Paleontology* 89, 2, p. 269-280.

(online at: www.researchgate.net/publication/276139200_A_Verbeekina_assemblage_Permian_fusulinid_from_the_Baoshan_Block_in_western_Yunnan_China)

(Newly discovered M Permian (~Capitanian) Verbeekina assemblage from Xiaoxinzhai Section in Baoshan Block. Fusulinid assemblage of 11 species/ 6 genera, incl. Verbeekina verbeeki, Pseudodoliolina pseudolepida, Sumatrana annae, Yangchenia, Xiaoxinzhaiella, and ?Rugosochusenella. Two unusual attributes: dominance of Verbeekina and relatively low diversity compared with coeval fusulinids from paleo-tropical S China, indicating Baoshan Block probably in subtropical setting in M Permian (N.B.: several of these species were first described from W Sumatra?; JTvG))

Huang, H., X. Jin & Y. Shi (2015)- Mid-Permian fusulinids of the Bawei Section in southern Baoshan Block of western Yunnan, China with a discussion on paleogeographic implications. *Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589*, Bangkok 2015, p. 28-30. *(Extended Abstract)*

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(Permian fusulinids and carbonates of Baoshan Block in W Yunnan show dramatic switch from cool, Gondwana-affinity to warm, Tethyan affinity. M Permian carbonates in some areas have diverse verbeekinids and neoschwagerinids and rare staffellids (and ooid grainstones), others no verbeekinids/ neoschwagerinids but abundant staffellids (and dolomitic peloidal/skeletal wackestone-packstones). This reflects local sedimentary factors (open vs. restricted platform), not large-scale paleolatitude changes)

Huang, H., X. Jin & Y. Shi (2015)- Permian fusulinid *Rugososchwagerina* (*Xiaoxinzhaiella*) from the Shan Plateau, Myanmar: systematics and paleogeography. *J. Foraminiferal Research* 50, 1, p. 11-24.

(E Myanmar part of the Cimmerian Continent with Gondwana provenance. Fusulinids from Shan Plateau include Rugososchwagerina (subgenus Xiaoxinzhaiella) and Chusenella of Murgabian age (M Permian), associated with Shanita. Rugososchwagerina (s.l.) characteristic for M Permian Cimmerian region. R. (Xiaoxinzhaiella) endemic index foram signifying Cimmerian affinity)

Huang, H., X. Jin & Y. Shi (2020)- Permian fusulinid *Rugososchwagerina* (*Xiaoxinzhaiella*) from the Shan Plateau, Myanmar: systematics and paleogeography. *J. Foraminiferal Research* 50, 1, p. 11-24.

(online at: www.researchgate.net/publication/339368645_Permian_Fusulinid_Rugososchwagerina_Xiaoxinzhaiella_from_the_Shan_Plateau_Myanmar_Systematics_and_Paleogeography)

(*E Myanmar part of Cimmerian Continent, of Gondwana origin. Shan Plateau fusulinids poorly known, and include Rugososchwagerina (Xiaoxinzhaiella) subrotunda sp. nov. and Chusenella quasidouvillei of Murgabian age (M Permian). Known occurrences of R. (Xiaoxinzhaiella) confined to blocks of former Cimmerian Continent during Permian and even more widespread than Rugososchwagerina (s.s.)*)

Huang, H., X. Jin, Y. Shi, H. Wang, J. Zheng & P. Zong (2020)- Fusulinid-bearing oolites from the Tengchong Block in western Yunnan, SW China: Early Permian warming signal in the eastern peri-Gondwana. *J. Asian Earth Sciences* 193, 104307, p. 1-11.

(*Oolites with E Permian (Sakmarian-Artinskian) Eoparafusulina fusulinids from Cimmerian Tengchong Block, W Yunnan. Monotonous late Sakmarian-Artinskian fusulinid assemblage of Eoparafusulina tschernyschewi group, which are widespread among Cimmerian blocks in peri-Gondwana, characterized by low diversity and dominance of cosmopolitan taxa. Probably reflect short-term warming pulse during demise of late Paleozoic glaciation in Gondwana*)

Huang, H., X. Jin, Y. Shi & X. Yang (2009)- Middle Permian Western Tethyan fusulinids from southern Baoshan Block, Western Yunnan, China. *Journal of Paleontology* 83, 6, p. 880-896.

(online at: https://www.researchgate.net/publication/240776397_Middle_Permian_Western_Tethyan_Fusulinids_from_Southern_Baoshan_Block_Western_Yunnan_China)

(*New fusulinid collections from SE Baoshan Block in SW China necessitate paleobiogeographic re-evaluation of M Permian fusulinids in region. 32 species/9 genera, 3 Murgabian- Midian biozones (Schwagerina yunnanensis Range Zone, Eopolydiexodina Abundance Zone, and Sumatrana annae Range Zone). Assemblages belong to W Tethyan Province: presence of 'W Tethyan' genera Eopolydiexodina (but also 'Tethyan' Verbeekina, Sumatrana and Pseudodoliolina) and low diversity suggests rel. high latitudinal region within Tethyan Realm (N.B.: This 'Cimmerian' Baoshan Block includes 'Sumatran' species Verbeekina, Sumatrana annae Volz 1904, Schwagerina padangensis Lange 1925, Pseudodoliolina, etc.; JTvG)*)

Huang, H., X. Jin, Y. Shi, J. Zheng & Z. Yan (2023)- New fusulinid assemblages from the Changning-Menglian Belt in western Yunnan, China and their paleogeographic implications. *J. Asian Earth Sciences* 256, 105807, p. 1-15.

(*Changning-Menglian Belt in W Yunnan, China, is suture zone of Paleotethys Ocean. Contains limestones with abundant fusulinid foraminifera of possible Paleotethys seamount origin. New sampling of Late Carboniferous-Artinskian (E Permian) limestones in Mangyang show two fusulinid zones: Triticites abundance zone (Late Carbonif.) and Sphaeroschwagerina sphaerica range zone (Asselian); in Anxincao S. sphaerica RZ, Eoparafusulina interval zone and Chalaroschwagerina solita RZ. Fusulinids of distinct Cathaysian affinity (Triticites, Sphaeroschwagerina, Eoparafusulina). Coeval fusulinids in peri-Gondwana region (Baoshan Block) rel. impoverished and dominated by Eoparafusulina/ Pseudofusulina. However, E Permian fusulinids from here lower diversity than Cathaysian S China Previously, Monodiexodina reported here, but questionable)*)

Huang, H., Y. Shi & X. Jin (2015)- Permian fusulinid biostratigraphy of the Baoshan Block in western Yunnan, China with constraints on paleogeography and paleoclimate. *J. Asian Earth Sciences* 104, p. 127-144.

(online at: www.academia.edu/10355345/Huang2015_Permian_fusulinid_biostratigraphy_of_the_Baos_Etc.)
(*Gondwana-derived Baoshan Block in W Yunnan, China, yields poor Sakmarian-Yakhtashian fusulinids with Eoparafusulina and Pseudofusulina, signifying temperate-water conditions. M Permian fusulinids more diversified warm-water assemblages (Schwagerina, Eopolydiexodina, Sumatrana and Verbeekina; also small foram Shanita in Midian). Baoshan block in Murgabian-Midian probably located between equatorial region to N and majority of Sibumasu areas lacking Verbeekinids and Neoschwagerinids with temperate water to S*)

Huang, H., Y.K. Shi & X.C. Jin (2016)- Permian (Guadalupian) fusulinids of Bawei Section in Baoshan Block, western Yunnan, China: biostratigraphy, facies distribution and paleogeographic discussion. *Palaeoworld* 26, 1, p. 95-114.

(online at: www.sciencedirect.com/science/article/pii/S1871174X16300026?via%3Dihub)

(*Bawei Section in Shazipo Fm of S Baoshan Block (part of Sibumasu) in W Yunnan, with 31 species of M Permian fusulinids, in two late Murgabian- Midian assemblages: (1) Yangchienia-Nankinella and (2) overlying Chusenella-Rugosofusulina. Overlain by Shanita-bearing limestone. Dominance of staffellids and paucity of*

neoschwagerinids and verbeekinids differs from coeval fusulinids in Nansan-Hewai area in S Baoshan Block with common neoschwagerinids and verbeekinids. Interpreted as due to different depositional environments. (Nansan-Hewai area high-energy open platform))

Huang, H., X. Yang & X. Jin (2005)- The *Shanita* fauna (Permian foraminifera) from Baoshan area, western Yunnan Province, China. *Acta Palaeontologica Sinica* 44, 4, p. 545-555. (original in Chinese. English version in *Frontiers of Biology in China* 2, 1, p. 114-124 (2007))

(online at: <http://article.geobiology.cn/>)

(Permian *Shanita* foram fauna good marker of N peri-Gondwana tectonic blocks. *Shanita* fauna from Baoshan area in W Yunnan characteristic genera *Shanita* and *Hemigordiopsis* with 8 species and 10 genera of other non-fusulinid foraminifera. Age probably late Maokouan- Wuchiapingian. Fauna comparable to *Shanita* faunas from Burma, Thailand and Tibet, but lower diversity and absence of fusulinids)

Huang, K. & N.D. Opdyke (1991)- Paleomagnetic results from the Upper Carboniferous of the Shan-Thai-Malay block of western Yunnan, China. *Tectonophysics* 192, p. 333-344.

(Upper Carboniferous basaltic *Woniusi* Fm from near Baoshan (= now viewed as E Permian age basalts; part of Shan-Thai-Malay microplate). Paleomagnetic inclinations similar to Devonian rocks from area, indicating paleolatitude of ~41.9° S for Baoshan in Devonian-E Permian time)

Huang, K. & N.D. Opdyke (1993)- Paleomagnetic results from Cretaceous and Jurassic rocks of South and Southwest Yunnan: evidence for large clockwise rotations in the Indochina and Shan-Thai-Malay terranes. *Earth Planetary Science Letters* 117, p. 507-524.

(Paleomag studies of Jurassic-Cretaceous redbeds from S and SW Yunnan, China, indicate Xiaguan area on Red River fault, has not rotated relative to stable Eurasia since at least Late Cretaceous. Jinggu-Mengla area 200-400 km farther S rotated CW by 46-65°. Comparison with Mesozoic paleomagnetic data from C Yunnan, N Thailand and NW Borneo suggests Red River fault not demarcation between unrotated and significantly rotated regions, and that Sundaland did not respond to India-Asia collision as single coherent unit)

Huber, H. & C. Burri (1933)- Grundzuge der Geologie von Burma mit besonderer Berücksichtigung des jungen Vulkanismus. *Zeitschrift für Vulkanologie* 15, 1, p. 153-179.

(*Fundamentals of the geology of Burma with special overview of young volcanism*)

Hughes, R.W., O. Galibert, G. Bosshart, F. Ward, Thet Oo, M. Smith, Tay Thye Sun & G.E. Harlow (2000)- Burmese jade: the inscrutable gem. *Gems & Gemology* 36, 1, p. 2-26.

(N Myanmar remains primary source of top-grade jadeite. Primary jadeite in dikes, secondary jadeite in serpentinite boulder conglomerates)

Hui Ying Loke, Lee Cheang Hao Timothy, Htay Nyunt, Tin Nyunt Thet, Sellou Linda & Thye Sun Tay (2025)- Diamonds from Than Lwin River near Mong Hsu, Myanmar. *Proc. 38th Int. Gemmological Conference, Athens 2025*, p. 154- 158.

(online at: <https://www.igc-gemmology.org/wp-content/uploads/2025/11/IGC2025.pdf>)

(Small alluvial diamonds from Mong Hsu, Myanmar. Origin rocks unknown. With map of other diamond occurrences across Myanmar)

Hurukawa, N., Pa Pa Tun & B. Shibazaki (2012)- Detailed geometry of the subducting Indian Plate beneath the Burma Plate and subcrustal seismicity in the Burma Plate derived from joint hypocenter relocation. *Earth Planets and Space* 64, p. 333-343.

(online at: <https://www.terrapub.co.jp/journals/EPS/pdf/2012/6404/64040333.pdf>)

(Geometry of subducting Indian Plate under Burma Plate from relocated subduction earthquakes at depths of 30-140 km. Strikes of contours oriented ~N-S, and show 'S' shape in map view)

Iijima, M., M. Takai, Y. Nishioka, T.-Htike, Z.M. Maung-Thein, N. Egi, N. Kusuhashi, T. Tsubamoto et al. (2020)- Taxonomic overview of Neogene crocodylians in Myanmar. *J. Vertebrate Paleontology* 40, 6, p.

(Review of Late Miocene- Pliocene crocodylian fossils from Neogene Irrawaddy Fm of C Myanmar. Late Miocene Tebingan site, SE of Magway, yielded Gavialis (one of oldest records of genus?) and Crocodylus. U Pliocene of Gwebin area, SW of Bagan, produced Crocodylus cf. palaeindicus)

Imchen, W., G.T. Thong & T. Pongen (2014)- Provenance, tectonic setting and age of the sediments of the Upper Disang Formation in the Phek District, Nagaland. J. Asian Earth Sciences 88, p. 11-27.

(Shales and turbidites from Late Eocene U Disang Fm, Nagaland (NE India- Myanmar border area) derived from felsic and mafic and minor metamorphic sources. Felsic components most likely from granite/ gneiss of Karbi Anglong complex to W. However, bulk of sediments from nearby, fast-rising Naga Ophiolite, which probably emerged above sea level in M Eocene. Sediments from W transported by turbidity currents into E-deepening basin. Sediments from nearby East rapidly dumped on seafloor. Deposition took place in W-migrating accretionary-prism complex at convergence of Indian and Burma plates. Towards end of Eocene basin closed completely, with destruction of Neotethyan Ocean (Lokho et al. (2023) suggest M Miocene))

Intasorn, L. (2021)- High-resolution mapping of Plio-Pleistocene reservoir depositional facies in Zawtika gas field, Gulf of Moattama, using stratal-slicing techniques and attribute analysis. Bull. Earth Sciences Thailand (BEST), 12, 2, p. 13-24.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246790/167764>)

(Offshore Myanmar M9 Block in Gulf of Moattama with Zawtika gas field, producing mainly biogenic gas from structural closure of stacked Pliocene-Pleistocene tidally-influenced deltaic sandstone reservoirs)

Ito, T., X. Qian & Q.L. Feng (2016)- Geochemistry of Triassic siliceous rocks of the Muyinhe Formation in the Changning-Menglian belt of Southwest China. J. of Earth Science (China) 27, 3, p. 403-411.

(online at: <http://en.earth-science.net/PDF/20160612014127.pdf>)

(Triassic siliceous rocks of Muyinhe Fm in Changning-Menglian belt (Paleotethys suture). Triassic radiolaria Triassocampe, Pseudostylosphaera, Eptingium and Paroertlispongia observed on etched surfaces. Geochemistry suggests unlikely to be oceanic pelagic deposits; possibly represent closure stage of Paleotethys)

Iyer, L.A.N. (1953)- The geology and gemstones of the Mogok stone tract, Burma. Memoirs Geological Survey India, 82, p. 1-100.

(Mogok stone tract in upper Myanmar known for ruby gemstones for centuries. Rocks intensely folded, ENE and NE striking with dips to SE and SSE. Mogok gneiss associated with common crystalline limestone. Granite, syenite intrusions, etc. Ruby and spinel generally derived from crystalline limestone, sapphire from pegmatite)

Jaeger, H. (1983)- Unterdevonische Graptolithen aus Burma. Geologisches Jahrbuch 126, 2, p. 245-257.

(online at: www.landesmuseum.at/pdf_frei_remote/JbGeolReichsanst_126_0245-0257.pdf)

('Lower Devonian graptolites from Burma'. Two monograptids M. atopus and M. thomasi helmckei n.subsp., described from northern Shan states, indicative of mid-Early Devonian age)

Jerram, D.A., M. Widdowson, P.B. Wignall, Y. Sun, X. Lai, D.P.G. Bond & T.H. Torsvik (2016)- Submarine palaeoenvironments during Emeishan flood basalt volcanism, SW China; implications for plume-lithosphere interaction during the Capitanian, Middle Permian ("end Guadalupian") extinction event. Palaeogeogr. Palaeoclim. Palaeoecology 441, 1, p. 65-73.

(M Permian platform carbonate deposition terminated by rapid subsidence, with onset of late M Permian Emeishan volcanism during deepening (with widespread losses amongst fusulinacean foraminifera and calcareous algae). Lower two thirds of 4-5 km thick lava pile erupted at or below sea level, with terrestrial lava flows only in later stages. Late Permian of SW China at time of Emeishan was extended area of thinned lithosphere with epeiric seas, sustained through onset of LIP emplacement. Geochemical support of plume origin for Emeishan volcanism, but LIP emplacement not associated with regional pre-eruption uplift)

Jian, P., D. Liu, A. Kroner, Q. Zhang, Y. Wang, X. Sun & W. Zhang (2009)- Devonian to Permian plate tectonic cycle of the Paleo-Tethys Orogen in southwest China (I): Geochemistry of ophiolites, arc/back-arc assemblages and within-plate igneous rocks. Lithos 113, p. 748-766.

(Study of Paleo-Tethys ophiolites, incl. Ailaoshan ophiolite (NMORB-type; ~387-374 Ma= Late Devonian), Jinshajiang ophiolite (EMORB-type; 346-341 Ma= M Carboniferous) and Changning-Menglian ophiolite (~270-264 Ma= M Permian; marks main Paleo-Tethys suture between Gondwana-derived Sibumasu terrane and Yangtze-derived Simao terrane and formed at supra-subduction zone))

Jian, P., D. Liu, A. Kroner, Q. Zhang, Y. Wang, X. Sun & W. Zhang (2009)- Devonian to Permian plate tectonic cycle of the Paleo-Tethys Orogen in southwest China (II): Insights from zircon ages of ophiolites, arc/back-arc assemblages and within-plate igneous rocks and generation of the Emeishan CFB province. *Lithos* 113, p. 767-784.

(Ophiolites in SW China are remnants of Paleo-Tethys ocean, which was divided by Simao terrane into two tracts (1) main ocean in W (Changning-Menglian ophiolite with metagabbro crystallization age of 267 Ma= M-L Permian) and (2) oceanic branch in E (Ailaoshan- Jinshajiang ophiolites with sea-floor spreading ages from zircons ~383, 376, 343 Ma = Late Devonian- E Carboniferous). With reconstruction of Devonian-Permian plate tectonic cycle: Simao Block rifted off Yangtze margin in Carboniferous, etc.)

Jiang, H., S.Y. Jiang, W.Q. Li & K. Zhao (2019)- Timing and source of the Hermyingyi W-Sn deposit in southern Myanmar, SE Asia: evidence from molybdenite Re-Os age and sulfur isotopic composition. *J. of Earth Science (China)* 30, 1, p. 70-79.

(online at: <http://en.earth-science.net/article/doi/10.1007/s12583-018-0860-y>)

(Hermyingyi W-Sn deposit in S Myanmar typical quartz-vein type W-Sn deposit, mainly hosted by Hermyingyi monzogranite which intruded into Carboniferous metasedimentary rocks of Mergui Series. Molybdenite Re-Os ages suggest granitic magmatism and associated W-Sn mineralization during Late Cretaceous (70-68 Ma))

Jiang, H., W.Q. Li, S.Y. Jiang, H. Wang & X.P. Wei (2017)- Geochronological, geochemical and Sr-Nd-Hf isotopic constraints on the petrogenesis of Late Cretaceous A-type granites from the Sibumasu Block, Southern Myanmar, SE Asia, *Lithos* 268-271, p. 32-47.

(Late Cretaceous-Paleogene granitoids widespread in Sibumasu block in Myanmar, and associated with tin-tungsten mineralization. Dating of zircon grains from two granites yield ages of 69-70 Ma (Late Cretaceous). Belong to high-K calc-alkaline series and A-type granite affinity. Derived from partial melting of Paleoproterozoic continental crust dominated by meta-igneous rocks. Formation of granites linked to back-arc extension, induced by rollback of flat Neo-Tethyan subducting slab at ~70 Ma)

Jin, X. (2002)- Permo-Carboniferous sequences of Gondwana affinity in Southwest China and their paleogeographic implications. *J. Asian Earth Sciences* 20, p. 633-646.

(Descriptions of stratigraphy of Gondwana-affinity Permo-Carboniferous sequences in Himalayas, Lhasa Block, S Qiangtang Block in Tibet, and Tengchong and Baoshan blocks in Yunnan, SW China. Sequences characterized by presence of glacio-marine deposits and Gondwana-affinity biota)

Jin, X., H. Huang, Y. Shi & L. Zhan (2011)- Lithologic boundaries in Permian post- glacial sediments of the Gondwana-affinity regions of China: typical sections, age range and correlation. *Acta Geologica Sinica* 85, p. 373-386.

(online

at:

https://www.academia.edu/10355348/Lithologic_Boundaries_in_Permian_Post_glacial_Sediments_of_Etc.)

(SW China Gondwana-affinity Permo-Carboniferous deposits in N Himalayas, Lhasa, S Qiangtang, Baoshan and Tengchong Blocks. Diamictite- pebbly mudstone- dark mudstone and shale interpreted as glacial-deglacial- post-glacial marine environments. Change from post-glacial clastics to carbonate environment in Baoshan, Tengchong and Lhasa Blocks in E Artinskian. Carbonate environment in Baoshan Block with Woniusi Basalts. In N Himalayas limestones began in Late Permian)

Jonell, T.N., L. Giosan, P.D. Clift, A. Carter, L. Bretschneider, E.C. Hathorne, M. Barbarano et al. (2022)- No modern Irrawaddy River until the late Miocene-Pliocene. *Earth Planetary Science Letters* 584, 117516, p. 1-14.

(online at: <https://www.sciencedirect.com/science/article/pii/S0012821X22001522>)

(Provence studies of Miocene-Recent Irrawaddy river deposits suggest modern-day petrographic signatures only after Late Miocene- Pliocene, after ≤10 Ma basin inversion)

Kamenetsky, V.S., S.L. Chung, M.B. Kamenetsky & D.V. Kuzmin (2012)- Picrites from the Emeishan Large Igneous Province, SW China: a compositional continuum in primitive magmas and their respective mantle sources. *Journal of Petrology* 53, 10, p. 2095-2113.

(online at: <https://watermark.silverchair.com/egs045.pdf>)

(Late Permian Emeishian flood picrite lavas represent low- and high-Ti end-members of continental flood basalt magmatism. Diverse spectrum of basaltic magma. Peridotite and garnet pyroxenite mantle source for low- and high-Ti end-members, and more likely from subcontinental lithospheric mantle than from deep mantle 'plume')

Keller, P. C. (1983)- The rubies of Burma: a review of the Mogok stone tract. *Gems & Gemology* 19, 4, p. 209-219.

(online at: <https://www.gia.edu/doc/The-Rubies-of-Burma-A-Review-of-the-Mogok-Stone-Tract.pdf>)

(Mogok Stone Tract of Upper Burma (Myanmar) well known for fine rubies. Mining district located ~700 km N of Rangoon. Rubies found mainly in alluvial deposits, weathering out of crystalline limestone or marble in high-grade metamorphic complex ('Mogok Gneiss'), intruded by granitoids. Mainly native mining; British firm Burma Ruby Mines Ltd worked area from late 1800s-early 1930s)

Kelly, T. & C. Gonguet (2017)- Insights in the development of the Central Tertiary basins onshore & offshore Myanmar. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore*, p. 1-8. *(Extended Abstract)*

(Review of geology and hydrocarbons in offshore Myanmar M8 Block, S of Yadana field)

Khin, A., Aung Tin V., Aung Soe & Khin Khan (1970)- A study on the gravity indication of the Shan scarp fault. *J. Science and Techn. (Burma)*, 3, 1, p. 431-443.

Khin, A. & K. Win (1968)- Geology and hydrocarbon prospects of the Burma Tertiary geosyncline. *Union of Burma J. of Science and Technology* 2, 1, p. 53-81.

Khin, A. & K. Win (1969)- Preliminary studies of the paleogeography of Burma during the Cenozoic: *Union of Burma J. of Science and Technology* 3, 2, p. 53-73.

Khin, J.A. (1991)- Hydrocarbon-producing formations of Salin, Irrawaddy, and Martaban Basins, Myanmar (Burma). *Proc. Soc. Petroleum Engineers (SPE) Asia-Pacific Conf., Perth 1991*, p. 245-258.

(Almost all producing oil - gas fields in Myanmar in Salin, Irrawaddy and Martaban basins, in Mio-Pliocene reservoirs)

Khin, K. (1999)- Oil seepages trapped in Miocene forced regressive siliciclastic sequences, Baronga Islands, Yakhine, Myanmar. *Seminar, Dept. Earth and Planetary Sciences, Kyushu University, Japan*, p. 1-14.

(online at: www.academia.edu/93192552/Oil_Seepages_Trapped_in_Miocene_Forced_Regressive_Silic_Etc.)
(Oil seeps in E-M Miocene regressive part of deep marine clastics on Baronga Island, Bay of Bengal, in Arakan Ranges foldbelt W of Indo-Burma Ranges)

Khin, K., K.P. Aung, Y. Isozaki, Aung Moe & Than Zaw (2025)- Stratigraphy of Alatoconchidae (Permian giant bivalve) -bearing Guadalupian shallow marine carbonates in East Myanmar and its geological and paleoenvironmental implications.

(preprint online at: <https://ssrn.com/abstract=5371094> or <http://dx.doi.org/10.2139/ssrn.5371094>)

Khin, K., Aung Moe & Myo Myint (2020)- Geology, structure and lithostratigraphic framework of the Rakhine Coastal Ranges in western Myanmar: Implications for the collision of the India Plate and West Myanmar Block. *J. Asian Earth Sciences* 196, 104332, p. 1-19.

(online at: https://www.academia.edu/49017347/Geology_structure_and_lithostratigraphic_framework_of_the_Rakhine_CoastalRanges_in_western_Myanmar_Implications_for_the_collision_of_the_India_Plate_Etc.)

(On Eocene collision between India and West Myanmar (Burma) Block. Basement of the Indian Plate below Indo-Myanmar Ranges still moving N relative to rest of Asia. Syn- and post-deformation history of Mio-Pliocene siliciclastics of Rakhine Coastal Ranges in W Myanmar; oblique subduction and collision history)

Khin, K., Aung Moe & Kyi Pyar Aung (2022)- Tectono-structural framework of the Indo-Myanmar Ranges: implications for the structural development on the geology of the Rakhine Coastal Region, Myanmar. *Geosystems and Geoenvironment* 1, 3, 100079, p. 1-30.

(online at: <https://www.sciencedirect.com/science/article/pii/S2772883822000565>)

(Indo-Myanmar Ranges known as accretionary prism between India Plate and Myanmar Block. Six-stage deformation process)

Khin, K., Aung Moe, Kyi Pyar Aung & Than Zaw (2023)- Structural and tectonic evolution between Indo-Myanmar Ranges and Central Myanmar Basin: insights from the Kabaw Fault. *Geosystems and Geoenvironment* 2, 2, 100176, p. 1-19.

(online at: <https://www.sciencedirect.com/science/article/pii/S2772883822001510>)

(On N-S Kabaw Fault zone between Indo-Myanmar Ranges accretionary prism and C Myanmar Basin)

Khin, K., Aung Moe, Kyi Pyar Aung & Than Zaw (2025)- Triassic subduction initiation and Cretaceous forced collision along the West Myanmar Block. *Evolving Earth* 3, 100086, p. 1-17.

(online at: <https://www.sciencedirect.com/science/article/pii/S2950117225000305>)

(W Myanmar Block (correlated with West Sumatra Block) is oceanic plateau formed through intra-oceanic subduction at passive margin of Sibumasu Block (but with Halobia-bearing M-L Triassic flysch-type deposits in accretionary prism of Indo-Myanmar Ranges?). Cretaceous forced collision indicated by Mawgyi volcanics in Popa-Monywa-Wuntho magmatic arc. Etc.)

Khin, K., Aung Moe, Myo Myint & Kyi Pyar Aung (2021)- Dextral transpressional shearing and strike-slip partitioning developments in the Central Myanmar Basin during the collision between the India Plate and West Myanmar Block. *J. Asian Earth Sciences*: X, 5, 100055, p. 1-32.

(online at: www.sciencedirect.com/science/article/pii/S2590056021000128)

(C Myanmar Basin (CMB) between two major strike-slip faults: Sagaing Fault to E and Kabaw Fault to W. Basin developed by transpression basin during oblique convergence subduction, as well as collision of India Plate to W Myanmar Block, in Late Miocene- Pleistocene. Pre-existing ophiolite zone split up by Sagaing Fault. CMB moved NW about 450km by 45–50°convergent angle of India Plate collision to Eurasia. Etc.)

Khin, K. & T. Sakai (2012)- Neogene sedimentary fringe, West of Indo-Burma Ranges, in Western Myanmar: some evidences for Late Cenozoic synorogenic sedimentation in Himalaya-Bengal System. AAPG Int. Conv. Exhibition, Singapore 2012, Search and Discovery Article 50771, p. 1-48. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2012/50771khin/ndx_khin.pdf)

(On Late Cenozoic clastics Arakan Basin, W Myanmar, in frontal part of Himalayan orogenic belt)

Khin, K., T. Sakai & K. Zaw (2014)- Neogene syn-tectonic sedimentation in the eastern margin of Arakan-Bengal basins, and its implications on for the Indian-Asian collision in western Myanmar. *Gondwana Research* 26, p. 89-111.

(online at: www.academia.edu/26852415/Neogene_syn_tectonic_sedimentation_in_the_eastern_margin Etc.)

Khin, K., T. Sakai & K. Zaw (2017)- Arakan Coastal Ranges in western Myanmar, geology and provenance of Neogene siliciclastic sequences: implications for the tectonic evolution of the Himalaya-Bengal System. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 5, p. 81-116.

(Mainly analysis of ~2000m thick Miocene clastics of W Arakan Basin. Overall shallowing-upward series. E Mioceen sandstones quartz-rich. Overall upward increase in feldspar and high-metamorphic lithics, reflecting Himalayan uplift and orogenic unroofing)

Khin, K. & K. Zaw & L.T. Aung (2017)- Geological and tectonic evolution of the Indo-Myanmar Ranges (IMR) in the Myanmar region. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 4, p. 65-79. (online at:

[www.academia.edu/49781877/Chapter_4_Geological_and_tectonic_evolution_of_the_Indo_Myanmar_Ranges_Etc.](http://www.academia.edu/49781877/Chapter_4_Geological_and_tectonic_evolution_of_the_Indo_Myanmar_Ranges_Etc))
(Indo-Myanmar Ranges (= Indo-Burman Ranges or Western Ranges) along W margin of Myanmar microplate extend from E Himalayas S-wards along E side of Bay of Bengal to Andaman Sea. Comprise Naga Hills in N, Chin Hills in middle and Rakhine (Arakan) Yoma in S. Considered to have formed as accretionary wedge due to E-ward subduction under Myanmar from ?E Cretaceous- Recent. Rocks Late Triassic-Eocene flysch-type metasediments, three belts of Triassic-Jurassic ophiolitic rocks in E (W-ward obduction in Late Oligocene?). Ophiolitic sequence overlain by Eocene-Miocene flysch with Cretaceous-Eocene limestone olistoliths (derived from neighboring carbonate platform?))

Kim, D., S.Y. Yang & J. Kim (2012)- Geological modeling with seismic inversion for deepwater turbidite fields offshore Northwestern Myanmar. AAPG International Conference Exh., Italy 2011, Search and Discovery Article 40877, p. 1-26. (Abstract + Presentation)

(online at: www.searchanddiscovery.com/documents/2012/40877kim/ndx_kim.pdf)

(Geologic modeling of Daewoo Shwe, Shwe Phyu and Mya gas fields in Bay of Bengal, off W Myanmar. Reservoirs Late Pliocene deepwater channelized and basin floor fan lobe deposits)

Khogenkumar, S., A. K. Singh, S. Kumar, N. Lakhan, M. Chaubey, S. Imtisunep, A. Dutt & G. Oinam (2020)- Subduction versus non-subduction origin of the Nagaland- Manipur Ophiolites along the Indo-Myanmar Orogenic Belt, northeast India: Fact and fallacy. Geological Journal 56, 2, p. 1-22.

(part online at: www.researchgate.net/publication/345222747_Subduction_versus_non-subduction_origin_of_the_Nagaland-Manipur_Ophiolites_along_the_Indo-Myanmar_Orogenic_Belt_northeast_India)

(Nagaland-Manipur Ophiolites in NE India formed in mid-Tertiary collisional belt between India and Myanmar Plates. Mafic rocks originated in both subduction and non-subduction settings)

Khogenkumar, S., A.K. Singh, R.K.B. Singh, P.P. Khanna, N.I. Singh & W.I. Singh (2016)- Coexistence of MORB and OIB-type mafic volcanics in the Manipur Ophiolite Complex, Indo-Myanmar Orogenic Belt, northeast India: Implication for heterogeneous mantle source at the spreading zone. J. Asian Earth Sciences 116, p. 42-58.

(online at: https://www.researchgate.net/profile/S-Khogenkumar/publication/284137547_Coexistence_of_MORB_and_OIB-type_mafic_volcanics_in_the_Manipur_Ophiolite_Complex_Indo-Myanmar_Orogenic_Etc)

(Coexistence of two groups of tholeiitic mid-ocean ridge basalt (MORB) and alkaline ocean island basalt (OIB) mafic volcanics (seamount?) from Manipur Ophiolite Complex in Indo-Myanmar Orogenic Belt)

Kingson, O., R. Bhutani, J.K. Dash, S. Sebastian & S. Balakrishnan (2017)- Resolving the conundrum in origin of the Manipur Ophiolite Complex, Indo-Myanmar range: constraints from Nd isotopic ratios and elemental concentrations in serpentinized peridotite. Chemical Geology 460, p. 117-129.

(REE abundances and Nd isotopic ratios in serpentinized peridotite from Manipur Ophiolite Complex (MOC), Indo-Myanmar Range. Variation of La/Yb consistent with progressive addition of subduction-derived fluid to depleted mantle source. MOC buoyant fore-arc-mantle-wedge system along with subducted slab that was obducted during terminal stage of subduction of Neotethys below Burmese plate)

Kingson, O., Y. Liu, R. Bhutani & M. Widdowson (2023)- Relicts of Neo-Tethyan mantle wedge in the Indo-Burma Range, India: Record of carbonate metasomatism and Neo-Tethyan mantle evolution. Results in Earth Sciences 1, 1-19.

(Geochemistry study of Nagaland and Manipur ophiolites which are part of same Neo-Tethyan mantle wedge belt in Indo-Burma Range, India. Dual geochemical signatures observed in peridotites are due to patchy metasomatism of mantle wedge)

Kondo, K., C. Mu, T. Yamamoto, H. Zaman, D. Miura, M. Yokoyama, H.S. Ahn & Y. Otofujii (2012)- Oroclinal origin of the Simao Arc in the Shan-Thai Block inferred from the Cretaceous palaeomagnetic data. *Geophysical J. International* 190, 1, p. 201-216.

(online at: <https://academic.oup.com/gji/article/190/1/201/596342>)

(Paleomagnetic data suggest present-day arc-like geometry curvature of Simao Basin formed by oroclinal bending, starting after E Pliocene (4 Ma) and continuing until now. Ascribed to SW-ward movement of crustal material across Ailao Shan-Red River Fault. Requires decoupling between upper and middle-lower crusts)

Krishnan, M.S. & K. Jacob (1957)- Burma/Birmanie. *Lexique Stratigraphic Int.* 3, Asie, 8b, p. 283-328.

(Old stratigraphic lexicon for Burma/ Myanmar)

Kundu, B. & V.K. Gahalaut (2012)- Earthquake occurrence processes in the Indo-Burmese wedge and Sagaing fault region. *Tectonophysics* 524-525, p. 135-146.

(Under Indo-Burmese accretionary wedge, majority of earthquakes in depths of 30-60 km and define gently E-dipping surface that coincides with Indian slab. Dip of the slab steepens to E and earthquakes occur down to 150 km, though slab can be traced down to 660 km discontinuity. Similar to subduction zone, but focal mechanisms suggest intra-slab type on steep plane within Indian plate. Sense of motion implies N-ward relative motion with respect to Sunda plate.)

Kyaw, L. Oo, Zaw Khin, S. Meffre, D. Myitta, Wa Aung & C.K. Lai (2015)- Provenance of the Eocene sandstones in the southern Chindwin Basin, Myanmar: implications for the unroofing history of the Cretaceous-Eocene magmatic arc. *J. Asian Earth Sciences* 107, p. 172-194.

(Thick Eocene continental clastics in S Chindwin Basin, N Myanmar, with sandstones rich in volcanoclastic material and subordinate metamorphic lithic fragments. Detrital zircon ages of 101-43 Ma. Paleocurrent directions of late M Eocene Pondaung sst show Cretaceous- Eocene Andean-type andesitic volcanic arc to NE, possibly related to Neo-Tethys seafloor subduction under W Burma Block (= late M Eocene volcanoclastic deposition in fore-arc basin of C Myanmar Basin))

Kyaw Thu & Khin Zaw (2017)- Gem deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics. Geological Society, London, Memoir 48, Chapter 23, p. 497-529.

(Myanmar contains world-class gem deposits, incl. ruby from Mogok Stone Tract in Mandalay district, Mong Hsu ruby deposit in Shan State and jadeite from Kachin State. Both primary hard-rock deposits and secondary eroded/transported deposits)

Kyaw Thu Htun, K. Yonezu, Aung Zaw Myint, T. Tindell & K. Watanabe (2019)- Ore mineralogy and fluid inclusion studies of the Tagu Sn-W deposit, Myeik, Southern Myanmar. *Minerals (MDPI)* 9, 11, 654, p. 1-25.

(online at: <https://www.mdpi.com/2075-163X/9/11/654>)

(Most of the granite-related Sn-W deposits in Myanmar located in Late Cretaceous- Eocene (75-50 Ma) Western Granitoid Province of Myanmar-Thailand, emplaced into Late Paleozoic meta-sedimentary rocks of Slate Belt Tagu biotite granite in S Myanmar S-type peraluminous granite, formed in syn-collisional setting, derived from lower continental crust)

Kyaw, Toe Aung (2017)- Antimony deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 29, p. 649-668.

(Antimony deposits mainly in E Myanmar, in Shan Plateau and Mogok- Mandalay- Mergui metallogenic provinces)

Lamont, T.N. M.P. Searle, B.R. Hacker, Kyi Htun, K.M. Htun, C.K. Morley, D.J. Waters & R.W. White (2021)- Late Eocene-Oligocene granulite facies garnet-sillimanite migmatites from the Mogok Metamorphic belt, Myanmar, and implications for timing of slip along the Sagaing Fault. *Lithos* 386-387, 106027, p.

(manuscript online at: www.researchgate.net/publication/349050261_Late_Eocene-Oligocene_granulite_Etc.)

(Mogok Metamorphic Belt in Myanmar is a polymetamorphic, mainly M Eocene- E Oligocene granulite and E Miocene upper amphibolite facies terrane, consisting mainly of marbles and calc-silicates with spinel, ruby and

sapphire (protoliths probably M-L Permian massive limestones that overlie Carboniferous- E Permian glacial diamictites of Mergui Group. Mogok metamorphics cut by Sagaing Fault (400km dextral offset since ~20 Ma))

La Touche, T.H.D. (1913)- Geology of the northern Shan States. Memoirs Geological Survey India 39, 2, p. 1-380.

Latt, T.T., T. Nakazawa, X. Wang & K. Ueno (2009)- Carboniferous foraminifers from the lower part of Paleo-Tethyan seamount-type carbonates in the Changning-Menglian Belt, western Yunnan, Southwest China. Acta Geoscientica Sinica 30, Suppl. 1, p. 35-36.

(online at: www.cagsbulletin.com/dqxbcn/ch/reader/download_pdf.aspx?file_no...)

(Changning-Menglian Belt in W Yunnan is well-known as closed remnant of Paleo-Tethys Ocean. Thick E Carboniferous-Late Permian carbonate successions formed as Paleo-Tethyan seamount-capping atoll. Lower 400m of carbonate all Carboniferous, with >28 foraminiferal genera, including Eostaffella, Endothyra and 11 fusulinid genera)

Latt, T.T., Z. Win & K. Ueno (2008)- Permian fusuline fauna from the Plateau Limestone of the Lebyin Area, Eastern Myanmar: biochronologic and paleobiogeographic assessments. Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), Bangkok 2008, p. 170-171. (Extended Abstract)

(M Permian Plateau Lst of E Myanmar Shan Plateau is part of Sibumasu/ Shan-Thai terrane. Thickness 700m, lower part with shaly interbeds, middle part bioclastic limestones, upper part mainly oolitic limestone. In middle part E Midian fusulinid assemblages with Yangchienia, Pseudofusulina, Neoschwagerina, Sumatrina, Verbeekina, etc. Presence of neoschwagerinids and verbeekinids previously believed to be typical of paleo-equatorial Cathaysian domain, but here present in late M Permian of Sibumasu Block (but still lower diversity))

Latt, T.T., Z. Win & K. Ueno (2010)- Middle Permian Cimmerian fusuline succession of the Plateau Limestone in the Linwe area, Eastern Myanmar In: C.P. Lee et al. (eds.) 6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 40-41 (Abstract)

(Permian Plateau Limestone in Linwe section, E Myanmar, on Sibumasu Block. ~570m thick and unconformable on Silurian Linwe Fm. Three fusuline assemblages in m-u parts: (1) Late Murgabian, with Cimmerian genus Rugososchwagerina; (2) (3) Midian assemblages with more Tethys-type genera such as Afghanella, Verbeekina, and Pseudodoliolina. Fauna lacks Tethyan advanced neoschwagerinids (Yabeina, Lepidolina) and of lower diversity than Indochina and S China faunas)

Le Dain, A.Y., P. Tapponnier & P. Molnar (1984)- Active faulting and tectonics of Burma and surrounding regions. J. of Geophysical Research 89, B1, p. 453-472.

(Slab of oceanic lithosphere was recently subducted to E under Indoburman Ranges. Sagaing fault probably accomodates most of right-lateral strike-slip of India past Indochina, but also internal deformation in Burma, Thailand. Large parts of Burma-Thailand may have rotated clockwise)

Lee, H.Y., S.L. Chung, H.M. Yang (2016)- Late Cenozoic volcanism in central Myanmar: geochemical characteristics and geodynamic significance. Lithos 245, p. 174-190.

(Late Cenozoic volcanism in C Myanmar basin around Sagaing fault. Volcanics from Monywa, Mt. Popa and Singu areas erupted in two stages: M Miocene (mainly intermediate compositions) and Quaternary (mainly basalts). Magma generation related to India- Asia collision, causing Miocene plate reorganization from oblique subduction to dextral movement, and rollback of subducted Indian oceanic lithosphere in Quaternary)

Lenz, H. & P. Mueller (1981)- Rb/Sr determinations (total rock) of rocks of the Bawdwin Volcanic formation/northern Shan State, Burma. Geologisches Jahrbuch D, 43, p. 47-52.

Lepper, G.W. (1933)- An outline of the geology of the oil-bearing regions of the Chindwin-Irrawaddy Valley of Burma and of Assam-Arakan. Proc. 1st World Petroleum Congress, London 1933, 1, p. 1-11.

Li, D., Z. Luo, Y. Chen, J. Liu & Y. Jin (2014)- Deciphering the origin of the Tengchong block, west Yunnan: evidence from detrital zircon U-Pb ages and Hf isotopes of Carboniferous strata. *Tectonophysics* 614, p. 66-77.
(U-Pb and Hf isotope analyses on detrital zircons from Carboniferous in Tengchong block yield Neoproterozoic (~2.5 Ga), Mesoproterozoic (1.7-1.4 Ga), Grenvillian (~0.95 Ga) and Pan-African (0.65-0.5 Ga) age groups. Oldest Hf model ages indicate source magma included reworked Eoarchean (3.8-3.7 Ga) crustal material. Resemblance with Tethyan Himalayan, W Qiangtang and Indochina suggests Tengchong block was located along Indian margin of Gondwana in E Paleozoic)

Li, G., Q. Wang, Y. Huang, F. Chen & P. Dong (2015)- Discovery of Hadean- Mesoarchean crustal materials in the northern Sibumasu block and its significance for Gondwana reconstruction. *Precambrian Research* 271, p. 118-137.

(online at: www.cugb.edu.cn/uploadCms/file/20600/papers_upload/20161013165713736776.pdf)

(First occurrence in SE Asia of Hadean-Mesoarchean crustal materials in N Sibumasu block, SW China (Baoshan Block). Inherited zircons in E Paleozoic S-type granitoids (~470- 450 Ma; Ordovician) as old as Mesoarchean (~3.1 Ga). Model ages for source crust ~4.39 Ga, ~3.62 Ga and ~3.12 Ga. Hadean-Mesoarchean crustal materials similar age distribution as crusts of Pilbara and Yilgarn Cratons, W Australia)

Li, H., Aung Zaw Myint, K. Yonezu, K. Watanabe, T.J. Algee & J.H. Wu (2018)- Geochemistry and U-Pb geochronology of the Wagone and Hermyingyi A-type granites, southern Myanmar: implications for tectonic setting, magma evolution and Sn-W mineralization. *Ore Geology Reviews* 95, p. 575-592.

(Sn-W-associated granites common in Dawei region of SE Asian tin belt. High-K calc-alkaline Type A2 granites. U-Pb dating of magmatic and hydrothermal zircons from two granites yielded ages of 61-60 Ma (Paleocene) magmatic-mineralization event. Granites crustal origin, produced by partial melting of felsic clay-rich source in back-arc extensional setting (Jiang et al. (2019) conclude Hermyingyi, etc., magmatism and associated W-Sn mineralization in S Myanmar took place during Late Cretaceous (70–68 Ma))

Li, J.X., W.M. Fan, L.Y. Zhang, L. Ding, Y.H. Yue, F.L. Cai, Q.U. Yuan & K. Sein (2020)- Biotite geochemistry deciphers magma evolution of Sn-bearing granite, southern Myanmar. *Ore Geology Reviews* 121, 103565, p.

(Geochemical and O-H isotopic compositions of biotite from Late Cretaceous-Eocene granitic intrusions in W Sibumasu terrane in S Myanmar help decipher fluid exsolution, evolution of magmatic volatiles, granitic magma differentiation, etc.)

Li, J.X., W.M. Fan, L.Y. Zhang, N.J. Evans, J.L. Sun, L. Ding et al. (2019)- Geochronology, geochemistry and Sr-Nd-Hf isotopic compositions of Late Cretaceous- Eocene granites in southern Myanmar: petrogenetic, tectonic and metallogenic implications. *Ore Geology Reviews* 112, 103031, p. 1-16.

Granites associated with tin-tungsten mineralization in S Myanmar with Late Cretaceous- Eocene zircon ages (~84-48 Ma). Likely S-ward extension of coeval magmatic belt in Tengchong terrane. From fractionated I-type magmas and derived from Sibusima crust during subduction of Neo-Tethyan oceanic lithosphere)

Li, J.X., L.Y. Zhang, W.M. Fan, L. Ding, Y.L. Sun, T.P. Peng, G.M. Li & K. Sein (2018)- Mesozoic-Cenozoic tectonic evolution and metallogeny in Myanmar: Evidence from zircon/cassiterite U-Pb and molybdenite Re-Os geochronology. *Ore Geology Reviews* 102, p. 829-845.

(Age dating of metal deposits in Myanmar: Dapingba Mo-W in N Myanmar (Tengchong terrane; E Cretaceous: ~119- ~114 Ma); cassiterite U-Pb ages of ~60 Ma for Bawapin and Kalonta Sn-W deposits in S Myanmar (W Sibumasu terrane); Shangalon porphyry Cu-Au deposit in W Burma terrane Eocene (~39 Ma). Two periods of E Cretaceous (~120–114 Ma) and Late Cretaceous (~75–70 Ma) felsic melts and related Mo-Sn-W deposits from Tengchong and W Sibumasu terranes likely formed in continental arc during subduction of Meso- and Neo-Tethys oceans respectively. Paleocene-Eocene (~60–50 Ma) Sn-W deposits and granites in W Sibumasu possibly formed during roll-back of Neo-Tethys oceanic slab. After ~50 Ma India-Asia collision, Eocene (~41–39 Ma) porphyry Cu-Au (W Burma) and Sn-W deposits (W Sibumasu) likely formed during Neo-Tethys slab tear and break-off in collisional setting. Miocene (~19-14 Ma) epithermal Cu in W Burma terrane possibly formed in arc setting during oblique subduction of Indian oceanic lithosphere)

Li, J.X., W.M. Fan, L.Y. Zhang, T.P. Peng, Y.L. Sun, L. Ding, F.L. Cai & K. Sein (2020)- Prolonged Neo-Tethyan magmatic arc in Myanmar: evidence from geochemistry and Sr-Nd-Hf isotopes of Cretaceous mafic-felsic intrusions in the Banmauk-Kawlin area. *Int. J. Earth Sciences* 109, p. 649-668.

(Common Cretaceous intrusions in W Burma terrane. New data from Banmauk-Kawlin area in N Myanmar. Zircon dating indicate emplacement in Cretaceous (~110-90 Ma). Belt is E-extension of coeval Gangdese magmatic belt in S Lhasa terrane (Tibet). May have formed in magmatic arc setting during subduction of Neo-Tethys oceanic lithosphere, suggesting prolonged Neo-Tethyan magmatic arc from S Tibet to SE Asia)

Li, J., H. Zhong, W.G. Zhu, Z.J. Bai & W.J. Hu (2017)- Elemental and Sr-Nd isotopic geochemistry of Permian Emeishan flood basalts in Zhaotong, Yunnan Province, SW China. *Int. J. Earth Sciences* 106, 2, p. 617-630.

(Elemental and isotopic data for basalts from intermediate zone of ~260 Ma Emeishan large igneous province suggest garnet-dominated peridotite mantle plume source. High-Ti basalts in inner zone variable compositions, indicating heterogeneous mantle source, possibly with subcontinental lithospheric mantle)

Li, M.H., M.D. Yan, Z.R. Wang, X.M. Liu, X.M. Fang & J. Li (2015)- The origins of the Mengye potash deposit in the Lanping-Simao Basin, Yunnan Province, Western China. *Ore Geology Reviews* 69, p. 174-186.

(Lanping-Simao Basin is Mesozoic-eneozoic continental margin rift basin in W China, formed during opening and closing of Tethys Ocean. Mengye potash deposit either Paleocene or Cretaceous. Salt layers typical continental lithological features)

Li, R., L. Mei, G. Zhu, R. Zhao, X. Xu, H. Zhao, P. Zhang, Y. Yin & Y. Ma (2013)- Late Mesozoic to Cenozoic tectonic events in volcanic arc, West Burma Block: evidences from U-Pb zircon dating and apatite fission track data of granitoids. *J. of Earth Science (China)* 24, 4, p. 553-568.

(Pb/U ages of S-type volcanic arc in N of W Burma Block average 102 Ma, similar to ~94 Ma in N and 105 Ma in S, indicating continuous development of volcanic arc in N of W Burma Block and subsequent late E Cretaceous granitic intrusion. AFT ages suggesting rapid uplift and cooling from Late Oligocene- E Miocene (29-20 Ma) and slow uplift since E Pliocene (~4.2 Ma))

Liang, Y., S. Chung, D. Liu, Y. Xu, F.Y. Wu, J. Yang, Y. Wang & C. Lo (2008)- Detrital zircon evidence from Burma for reorganization of the eastern Himalayan river system. *American Journal of Science* 308, 4, p. 618-638.

Licht, A., I. Cojan, L. Caner, Aung Naing Soe, J.J. Jaeger & C. France-Lanord (2013)- Role of permeability barriers in alluvial hydromorphic palaeosols: the Eocene Pondaung Formation, Myanmar. *Sedimentology* 61, 2, p. 362-382.

Licht, A., G. Dupont-Nivet, Z. Win, H.H. Swe, M. Kaythi, P. Roperch, T. Ugrai, V. Littell, D. Park, J. Westerweel et al. (2019)- Paleogene evolution of the Burmese forearc basin and implications for the history of India-Asia convergence. *Geological Society of America (GSA) Bull.* 131, 5-6, p. 730-748.

(manuscript online at: https://insu.hal.science/insu-01901808/file/Licht_etal_GSA_2019.pdf)

(Burmese margin was Andean-type subduction margin until late M Eocene, with forearc basin open to trench and fed by erosion of volcanic arc to E. Modern hyper-oblique margin of C Myanmar formed at 39-37 Ma. Forearc basin quickly partitioned into pull-apart basins, bounded to W by emergent accretionary prism, and to E by synchronously exhumed basement with high-grade metamorphics (onset of strike-slip deformation, with formation of paleo-sliver plate). Results validate conservative geodynamic models of close-to-modern pre-collisional paleogeometry for Indochina with any post-collisional rotation achieved by late M Eocene)

Licht, A., C. France-Lanord, L. Reisberg, C. Fontaine, A. Naing Soe & J.J. Jaeger (2013)- A palaeo Tibet-Myanmar connection? Reconstructing the Late Eocene drainage system of central Myanmar using a multi-proxy approach. *J. Geological Society, London*, 170, 6, p. 929-939.

(paper reprinted in Licht (2013) thesis)

(Collision of India with Asia caused fundamental changes to Asian drainage patterns. Provenance of study of Paleogene fluvio-clastic sedimentary indicate primarily magmatic arc source (Wuntho-Popo Arc), with

secondary source of recycled, metamorphosed basement material. Rel. proximal source area on E Asian margin, no evidence to support Paleo Tsangpo- Irrawaddy River in Late Eocene)

Licht, A., L. Reisberg, C. France-Lanord, A.N. Soe & J.J. Jaeger (2016)- Cenozoic evolution of the central Myanmar drainage system: insights from sediment provenance in the Minbu sub-basin. *Basin Research* 28, 2, p. 237-251.

(online at: www.geo.arizona.edu/sites/www.geo.arizona.edu/files/pictures/licht%20et%20al%202015%20BRE.pdf)

(C Myanmar Basin several Tertiary sub-basins that remained filled since India-Asia collision. No dramatic provenance shift in M Eocene-Pleistocene sediments from Minbu sub-Basin, but gradual decrease of volcanic input and increase in supply from Burmese basement in Eo- Oligocene, reflecting unroofing of Wuntho-Popa volcanic arc along flank of Sino-Burman Ranges. C Myanmar drainage remained restricted to Sino-Burman Ranges since India-Asia collision)

Licht, A., M. van Cappelle, H.A. Abels, J. Ladant, J. Trabucho-Alexandre, C. France-Lanord, Y. Donnadiou et al. (2014)- Asian monsoons in a late Eocene greenhouse world. *Nature* 513, p. 501-506.

(Data from Eocene of Myanmar suggestive of monsoon-like climate patterns during Late Eocene greenhouse conditions (55-34 Ma))

Licht, A., Zaw Win, J. Westerweel, N Cogn, C.K. Morley, S. Chantpraser, F. Poblete, T. Ugrai, B. Nelson, Day Wa Aung & G. Dupont-Nivet (2020)- Magmatic history of central Myanmar and implications for the evolution of the Burma Terrane. *Gondwana Research* 87, p. 303-319.

(proof online at: <https://insu.hal.science/insu-02915966/file/licht-2020.pdf>)

(Burma Terrane microplate at E edge of the Tibetan-Himalayan orogen remains poorly understood. Basement metamorphic and igneous rocks forming Wuntho-Popa Arc. WPA in Wuntho Ranges two subduction-related magmatic events: 108-90 Ma and 46-32 Ma. Apatite FT data suggest arc exhumation in 39-22 Ma. Structural data indicate at least two phases of deformation, in Cretaceous and late Paleogene. Correlating the WPA remains ambiguous, but most likely Transtethyan arc origin for WPA)

Lim, H.G. & C. Lee (2024)- Reservoir connectivity in deep-water turbidite deposits over geological and production time scales: an integrated study of the Shwe field, Bay of Bengal. *J. Petroleum Exploration Production Technology* 14, p. 3349–3366.

(online at: <https://link.springer.com/article/10.1007/s13202-024-01876-7>)

(Producing Shwe gas field 2004-2006 discovery in Rakhine Basin, NE Bay of Bengal, offshore Myanmar. Reservoir Late Pliocene deepwater turbiditic reservoir sands, part of Bengal Fan. Complex compartmentalized reservoirs with multiple lobes, sand injectites, etc.)

Lin, N.H., Y. Guo, S.N. Wai, L.S. Tamehe, Z. Wu, N.M. Naing & J. Zhang (2019)- Sedimentology and geochemistry of Middle Eocene-Lower Oligocene sandstones from the western Salin Sub-Basin, the Central Myanmar Basin: implications for provenance, source area weathering, paleo-oxidation and paleo-tectonic setting. *J. Asian Earth Sciences* 173, p. 314-335.

(M Eocene-Lower Oligocene sandstones from W Salin fore-arc sub-basin of C Myanmar Basin derived from three provenances: W Myanmar Arc; Myanmar terrane basement and W Indo-Myanmar (Burman) Ranges)

Lin, T.H., S.L. Chung, A. Kumar, F.Y. Wu, H.Y. Chiu & I.J. Lin (2013)- Linking a prolonged Neo-Tethyan magmatic arc in South Asia: zircon U-Pb and Hf isotopic constraints from the Lohit Batholith, NE India. *Terra Nova* 25, 6, p. 453-458.

(Neo-Tethyan subduction before India-Asia collision resulted in Andean-type convergent margin in S Asia, with extensive arc magmatism. Gangdese Batholith in Lhasa terrane of S Tibet lasted from E Jurassic- Eocene. E-ward continuation of Neo-Tethyan magmatic arc truncated by E Himalayan syntaxis. Lohit Batholith in NE India is E-ward extension of Gangdese Batholith, and can be correlated S-ward to Wuntho-Popa arc in W Myanmar (zircon U-Pb ages of five granitoids ~148-96 Ma (mainly 110-96 Ma; 148 Ma= gabbro))

Lin, T.H., S.L. Chung, J.T. Tang & T. Oo (2017)- The delimitation between the mature and juvenile crustal provinces in SE Asia: Insights from detrital zircon U-Pb and Hf isotopic data for the Salween drainage, Myanmar. *J. Asian Earth Sciences* 145, B, p. 641-651.

Lin, T.H., A.H.G. Mitchell, S.L. Chung, X.B. Tan, J.T. Tang T. Oo & F.Y. Wu (2019)- Two parallel magmatic belts with contrasting isotopic characteristics from southern Tibet to Myanmar: zircon U-Pb and Hf isotopic constraints. *J. Geological Society, London*, 176, 3, p. 574-587.

(Before India-Asia collision, Neotethyan subduction created Andean-type convergent margin along S margin of Asia. Two parallel Mesozoic-Paleogene magmatic belts from S Tibet to Myanmar (1) from Gangdese Batholith in S Lhasa to Lohit Batholith, Sodon Pluton and Popa-Loimye Arc in W Burma Block (I-type granitoids); (2) from C Lhasa plutonic belt to Bomi-Chayu Batholith, Dianxi Batholith and Shan Scarps Batholith in C Myanmar (dominated by S-type granites with involvement of older continental crust). Indicates distinct tectonic settings of genesis and diverse nature of crust forming exotic continental ribbons amalgamated to Asia)

Liu, B.P., Q.L. Feng, N.Q. Fang et al. (1993)- Tectonic evolution of Paleo-Tethys poly-island-ocean in Changning-Menglian and Lancangjiang Belts, Southwestern Yunnan, China. *J. Chinese University Geoscience* 18, 5, p. 529-539. *(in Chinese)*

Liu, C.Z., S.L. Chung, F.Y. Wu, C. Zhang, Y. Xu, J.G. Wang, Y. Chen & S. Guo (2016)- Tethyan suturing in Southeast Asia: zircon U-Pb and Hf-O isotopic constraints from Myanmar ophiolites. *Geology (GSA)* 44, 4, p. 311-314.

(online at: <http://www.igg.cas.cn/xwzx/yjcg/201603/W020160331602933732421.pdf>)

(Two ophiolite belts in Myanmar: (1) Western Belt (E of Indo-Birman Range) Kalaymyo ophiolite with E Cretaceous zircons (av. ~127 Ma), coeval with Neotethys ophiolites of Yarlung-Tsangpo suture; (2) Eastern Belt Myitkyina ophiolite (between Sibumasu- W Burma plates) formed in M Jurassic (~173 Ma) and is S continuation of Mesotethys Bangong-Nujiang suture in Tibetan Plateau. Boundary between Sibumasu and W Burma blocks is Jurassic suture rather than transcurrent shear zone)

Liu, C.Z., C. Zhang, Y. Xu, J.G. Wang, Y. Chen, S. Guo, F.Y. Wu & K. Sein (2016)- Petrology and geochemistry of mantle peridotites from the Kalaymyo and Myitkyina ophiolites (Myanmar): implications for tectonic settings. *Lithos* 264, 1610, p. 495-508.

(Two ophiolite belts in Myanmar: (1) Kalaymyo ophiolite from W Belt at E margin of the Indo-Burma Range formed in E Cretaceous; (2) Myitkyina ophiolite from Eastern Belt formed in M Jurassic. Formed in different tectonic settings)

Liu, J., J. Deng, Q. Wang, G. Li, C. Li & E.M. Ripley (2022)- Coexistence of Carboniferous oceanic island basalts with Permian supra-subduction zone ophiolites in the Changning–Menglian accretionary wedge: Implication for tectonic reconstruction. *Geological Journal* 58, 8, p. 3008-3025.

(Two different-age basalt formations in Changning–Menglian accretionary wedge, SW China, Carboniferous typical oceanic island basalt and Permian (281 Ma) SSZ-type ophiolites. All remnants of accreted Palaeo-Tethys oceanic crust)

Liu, T., (2022)- Petrology and geochemistry of ultramafic rocks in the Mogok belt, Myanmar: cumulates from high-pressure crystallization of hydrous arc melts. *Geological Journal* 57, 2, p. 886-905.

(Mogok ultramafic rocks are cumulates generated by high-P crystallization of hydrous arc melts, probably during subduction of Tethyan oceanic slab)

Lokho, K., J.C. Aitchison, A. Kumar, R. Zhou, M. Prakasam & D.S.N. Raju (2023)- Middle Miocene final demise of remnants of an eastern Neotethyan seaway, Naga Hills, Indo-Myanmar Range. *Marine Micropaleontology* 181, 102243, p. 1-19.

(Early M Miocene (N8-N9; 16-14 Ma) planktonic foraminifera in Upper Bhuban Fm in foothills of Naga Schuppen Belt of Indo-Myanmar Range represent final remnants of Neotethyan seaway between India and E Eurasia (in western and Tibetan Himalayas similar seaways had already disappeared earlier, documenting

progressive disappearance of formerly widespread Neotethys marine seaway from W to E, from Late Eocene in Himalayan Belt to M Miocene in NE India/Myanmar)

Lokho, K., J.C. Aitchison, K. Whiso, D. Lhoupenyi, R. Zhou & D.S.N. Raju (2020)- Eocene foraminifers of the Naga Hills of Manipur, Indo-Myanmar Range (IMR): Implications on age and basin evolution. *J. Asian Earth Sciences* 191, 104259, p. 1-13.

(Disang Gp oldest Cenozoic clastic sedimentary rocks that crop out in much of the Naga Hills. Upper Disang Fm with upper M Eocene- Late Eocene planktonic foraminiferal zones E14-16)

Lokho, K., B.P. Singh & A. Bhandari (2019)- A synoptic review of Eocene-Miocene faunal records of the Indo-Burma Range (IBR), NE India and coeval northwestern Himalaya: paleoenvironmental and tectonic inferences. *J. Palaeontological Society India* 64, 1, p. 39-48.

(online at: https://palaeontologicalsociety.in/vol64_June/4.%20Lokho%20et%20al.pdf)

(Indo-Burma Range contains Cretaceous-Eocene pelagic sediments, overlain by Eocene-Oligocene flysch and Late Miocene-Pleistocene molasse. Disang Gp of Naga Hills includes Eocene Nummulites pengaronensis, Pellatispira and Discocyclina, overlain by Late Eocene-Miocene deeper marine fauna (in NW Himalayas foreland/collision zone, marine faunas already end in Late Eocene?))

Loveman, M.H. (1919)- A connecting link between the geology of the Northern Shan States and Yunnan. *The Journal of Geology* 27, 3, p. 204-211.

(online at: <https://www.jstor.org/stable/pdf/30056590.pdf>)

(Paleozoic-Mesozoic stratigraphy of North Shan States (Myanmar), as described by La Touche (1913), continues N into Yunnan, S China (now known as Sibumasu/‘Cimmerian’ terrane)

Loydell, D.K. & K.P. Aung (2017)- The “Panghkawko graptolite bed” (Llandovery, Silurian), Myanmar and the location of the Sibumasu (or Sibuma) terrane in the Silurian. *Palaeogeogr. Palaeoclim. Palaeoecology* 469, p. 1-17.

(manuscript online at: https://pure.port.ac.uk/ws/portalfiles/portal/5518870/The_Panghkawko_graptolite_bed.pdf)

(Panghkawko graptolite bed from Loilem area, Shan States, E Myanmar (‘Sibumasu terrane’), with several M-U Llandoveryan graptolite zones. Graptolites suggest non-equatorial paleo-location for Sibumasu between Gondwana and South China)

Luan, X., M.S. Islam, X. Wei, Y. Lu, G. Fan, Suang Khan Pau & Soe Moe Lwin (2021)- Hydrocarbon accumulation in an active accretionary prism, a case study in the deepwater Rakhine Basin, Myanmar offshore. *J. Asian Earth Sciences* 221, 104941, p. 1-14.

(Deep-water biogenic gas accumulations where Pliocene turbidite channels pass across anticlinal structures, deepwater Bay of Bengal)

Luo, W., Z.C. Zhang, M. Santosh, T. Hou, H. Huang, J. Zhu, X. Wang & X. Fu (2014)- Petrology and geochemistry of Permian mafic-ultramafic intrusions in the Emeishan large igneous province, SW China: insight into the ore potential. *Ore Geology Reviews* 56, p. 258-275.

Lwin, S.M., M.M. Aung & N.P. Oo (2017)- Paleoenvironmental analysis of benthic foraminifera and radiolarians in Middle Eocene Tabyin Formation, Mindon-Taing Da Area, Magway Region, Myanmar. AAPG/EAGE/MGS 3rd Oil & Gas Conf., Yangon 2017, Search and Discovery Article 51427, p. 1-45. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2017/51427lwin/ndx_lwin.pdf)

(Deep marine M Eocene benthic and planktonic foraminifera and radiolaria from folded sediments near eastern foothills of Rakhine Yoma, C Myanmar Basin)

Mallick, R., E.O. Lindsey, L. Feng, J. Hubbard, P. Banerjee & E.M. Hill (2019)- Active convergence of the India-Burma-Sunda plates revealed by a new continuous GPS network. *J. of Geophysical Research: Solid Earth* 124, 3, p. 3155-3171.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018JB016480>)

(New GPS velocities around Rakhine (Arakan) -Bangladesh shallow megathrust, along which Indian and W Burma plates collide, suggesting three major faults studied likely fully coupled; modern shortening rate across Burma Plate is 12-24 mm/year, and total dextral shear rate is 25-32 mm/year)

Maneerat, P. & R. Burgmann (2022)- Geomorphic expressions of active tectonics across the Indo-Burma Range. *J. Asian Earth Sciences* 223, 105008, p. 1-14.
(online at: <https://www.sciencedirect.com/science/article/pii/S1367912021003461>)

Mann, S., M. Lim, Q. van de Laarschot, M. Keym, A. Jones & R. Nesbit (2017)- Hydrate observations in the deepwater Rakhine Basin, Myanmar. *Proc. Third AAPG/EAGE/MGS Myanmar Oil and Gas Conf.*, Yangon 2017, 1p. *(Abstract only)*
(Bottom Simulating Reflector (BSR) in deepwater Rakhine Basin off Myanmar indicates Gas Hydrate Stability Zone (HSZ) and potential extensive gas hydrate system, likely indicative of extensive microbial gas system)

Mao, W., H. Zhong, J.H. Yang, Y.W. Tang, L. Liu, Y.Z. Fu, X.C. Zhang, K. Sein, S.M. Aung et al. (2020)- Combined zircon, molybdenite, and cassiterite geochronology and cassiterite geochemistry of the Kuntabin tungsten deposit in Myanmar. *Economic Geology* 115, 3, p. 581-601. (online at: www.researchgate.net/publication/339835651_Combined_Zircon_Molybdenite_and_Cassiterite_Geochronology_and_Geochemistry_of_the_Kuntabin_Tungsten_Deposit_in_Myanmar)
(Kuntabin Sn-W deposit in S Myanmar characterized by abundant greisen-type and quartz vein-type cassiterite and wolframite mineralization. Zircon U-Pb dating of two-mica granite 90.1 Ma, cassiterite U-Pb dating 88.1 ± 2 Ma, molybdenite Re-Os age 87.7 Ma and isochron age of ~ 88.7Ma. Turonian-Coniacian ages record earliest magmatism and Sn-W mineralization in Sibumasu and Tengchong terranes. Paleoproterozoic Sibumasu crust activated during Neo-Tethys subduction-related magmatism to form mainly crust derived melts)

Mao, W., H. Zhong, J.H. Yang, L. Liu, Y.Z. Fu, X.C. Zhang, Y. Tang, J. Li, L. Zhang, K. Sein et al. (2022)- Geochronology of Sn mineralization in Myanmar: metallogenic implications. *Economic Geology* 117, 6, p. 1387-1403.
(Dating of 6 primary and 2 placer Sn deposits in Myanmar suggests three episodes of Sn mineralization in W tin belt of SE Asia, tied to closure of multiple Tethys oceans: (1) Late Triassic (~218 Ma), after closure of Paleo-Tethys; (2) E Cretaceous (~124-107 Ma) during subduction of Meso-Tethys, and (3) Late Cretaceous-Eocene (~90-42 Ma), related to Neo-Tethys subduction. Global data suggest durations of regional Sn mineralization typically ~5-30 My, whereas Neo-Tethys subduction -related Sn mineralization lasted up to ~50 My. Sn mineralization ceased in Late Eocene after subduction ceased)

Maung, Kyi (1970)- Biostratigraphy of the Central Burma with special reference to the depositional conditions during late Oligocene and early Miocene. *Union of Burma J. of Science and Technology*. 3, p. 75-90.

Maung, M., T. Htike, T. Tsubamoto, H. Suzuki, C. Sein, N. Egi, Z. Win et al. (2005)- Stratigraphy of the primate-bearing beds of the Eocene Pondaung Formation at Paukaung area, Myanmar. *Anthropological Science* 113, p. 11-15.
(online at: https://www.jstage.jst.go.jp/article/ase/113/1/113_1_11/_pdf/-char/ja)
(‘Upper Member’ of ~500m thick fluvio-deltaic, late M Eocene (Bartonian) Pondaung Fm at Paukaung area in C Myanmar known for vertebrate fossils (incl. primates) since 1920's. Formation underlain by M Eocene Tabyin Fm with Nummulites and overlain by Late Eocene Yaw Fm with Nummulites and Discocyliina. Primate fossil localities Pk1, Pk2, Pk3, and Pk5 all nearly at same stratigraphic level, with age of ~37.2 Ma)

Maung Thein (1973)- A preliminary synthesis of the geological evolution of Burma with reference to the tectonic development of Southeast Asia: In: B.K. Tan (ed.) *Proc. Regional Conference on the Geology of SE Asia*, Kuala Lumpur 1972, *Bull. Geological Society Malaysia* 6, p. 87-116.
(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1973008.pdf>)
(Early review of geology of Myanmar)

Maung Thein (2014)- Geological map of Myanmar, scale 1: 2,250,000, with Explanatory brochure. Myanmar Geosciences Society.

Maung Thein (2015)- The Pre-Tertiary carbonate rocks exposed at the NE margin of the Central Myanmar Basin and their developmental history. J. Myanmar Geosciences Soc. 6, p. 1-22.

Maung Thein & B.T. Haq (1970)- The Pre-Paleozoic and Paleozoic stratigraphy of Burma, a brief review. Union of Burma J. of Science and Technology 2, p. 275-289.

Maung Thein & Soe Win (1970)- The metamorphic petrology, structures and mineral resources of the Shantaung-u-Thandawmywet Range, Kyaukse District. Union of Burma J. of Science and Technology 3, p. 487-514.

Maurin, T., F. Masson, C. Rangin, U Than Min & P. Collard (2010)- First global positioning system results in northern Myanmar: constant and localized slip rate along the Sagaing fault. *Geology (GSA)* 38, 7, p. 591-594.
(GPS data measured in 2005 and 2008 in N Myanmar at N tip of Sagaing fault show slip rate of 18 mm/yr, localized along single active narrow fault trace (<20 km wide). Same rate in C Myanmar. Modeled locking depth varies from 20 km in C Myanmar to 5 km in N)

Maurin, T. & C. Rangin (2009)- Structure and kinematics of the Indo-Burmese Wedge: Recent and fast growth of the outer wedge. *Tectonics* 28, 2, TC2010, p. 1-21.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2008TC002276/epdf>)

(N Sunda subduction zone offshore Burma, and associated Indo-Burmese Wedge mark active E boundary of Burma Platelet between India and Sunda Plates. Indo-Burmese Wedge underwent right-lateral shearing in innermost part (E) and E-W shortening in outermost part (W). In outer wedge thick-skinned deformation overprints thin-skinned deformation. Seismic lines show outer wedge deformation not older than 2 Ma)

McNeil, J.D., A. Gough, R. Hall, N.K. Lunsdorf, M. Weber & S. Feil (2021)- A multi-proxy provenance study of Eocene to Oligocene sandstones in the Salin Sub-basin, Myanmar. *J. Asian Earth Sciences* 216, 104825, p. 1-17.

(manuscript online at: <http://oro.open.ac.uk/76384/1/1-s2.0-S1367912021001632-main.pdf>)

(Salin Sub-basin up to 15,000 m of Cenozoic sediments. Eocene- Oligocene heavy mineral assemblages are diverse and immature, from igneous metamorphic lithologies, with some recycling of older sediments. Metamorphic basement in N Myanmar identified as source. Detrital zircons mainly Cretaceous-Palaeogene ages, possibly indicating input from Mogok Metamorphic Belt. Persistent Paleoproterozoic and Triassic signal in Shwezetaung and Padaung Fms suggests provenance in Pane Chuang Fm of Indo-Myanmar Ranges, showing that by E-M Oligocene ranges were topographically prominent enough to be source)

Metcalfe, I. (2014)- Phanerozoic tectonic and palaeogeographical evolution of East and Southeast Asia: Myanmar in context. AAPG/MGS Conf. Tectonic evolution of Myanmar and its basin development with special references to its petroleum occurrences, p. 6-18.

(E part of Myanmar (E of Sagaing Fault and Mogok Metamorphic Belt) part of Gondwana-derived Sibumasu. W part of Myanmar possibly underlain by continental fragment called West Burma Block, overlain by Cretaceous and Cenozoic sediments. Jurassic-Cretaceous intra-oceanic arc (Mawgyi Arc) and associated ophiolites and accretionary complex rocks (termed Naga- Andaman suture) emplaced to W as Mawgyi Nappe in M-L Cretaceous)

Metcalfe, I. & K.P. Aung (2014)- Late Tournaisian conodonts from the Taungnyo Group near Loi Kaw, Myanmar (Burma): implications for Shan Plateau stratigraphy and evolution of the Gondwana-derived Sibumasu Terrane. *Gondwana Research* 26, p. 1159-172.

(First record of Carboniferous (Tournaisian) conodonts in Taungnyo Gp of Shan Plateau (Sibumasu Terrane) of Myanmar (*Scaliognathus anchoralis* and *Gnathodus typicus*- *Protognathodus cordiformis* zones). Biogeographic links support NW Australian Gondwana margin position for Sibumasu in Late Paleozoic)

- Min, M., L. Ratschbacher, E. Enkelmann, L. Franz, R. Jonckheere & M. Tichomirowa (2017)- Magmatism, metamorphism, deformation, and exhumation in Southern, Central and Eastern Myanmar. AAPG/EAGE/MGS 3rd Oil & Gas Conf., Yangon 2017, p. 1-5. (*Extended Abstract*)
(*Zircon dating shows basement of Myanmar contains Proterozoic and E Paleozoic zircons. Igneous event of ~490 Ma ties basement to Gondwana. Shan Plateau of E Myanmar lacks Cenozoic-Cretaceous magmatism; Triassic event links it to Qiangtang block of C Tibet. Jurassic- E Cretaceous magmatism ties Mogok metamorphic belt to Gangdese belt of Tibet (Lhasa block) and Neotethys subduction. Both belts also share Late Cretaceous- Paleocene magmatism. Late Eocene- Oligocene high-grade metamorphism dominates Mogok belt; rapid cooling started at ~17 Ma and terminated before 10 Ma*)
- Min, M., L. Ratschbacher, L. Franz, B.R. Hacker E. Enkelmann, E.Y. Toreno, B. Hartel, B. Schurr et al. (2022)- India (Tethyan Himalaya Series) in Central Myanmar: implications for the evolution of the Eastern Himalayan syntaxis and the Sagaing transform-fault system. *Geophysical Research Letters*, 49, e2022GL099140, p. 1-10.
(online at: https://edoc.unibas.ch/91964/1/20221223122603_63a5904b4f90c.pdf)
(*Katha Range of C Myanmar with Cambro-Ordovician Indian-continental margin rocks of Tethyan Himalaya Series, ~700 km from easternmost outcrop in S-Tibet, and ~450 km from Himalayan rocks in E Himalayan syntaxis. Record high-P metamorphism in subduction-early collision tectonic setting, from ~65 Ma, peak at ~45 Ma, and exhumation/cooling until ~30 Ma. When Burma microplate (= part of intra-Tethyan Incertus arc) accreted to SE-Asia, its E boundary (S continuation of Indus-Yarlung suture), was reactivated as Sagaing fault (SF), which propagated N-ward into Indian rocks. Restoring SF fault system defines a continental collision-oceanic subduction transition junction, where IYS bifurcates into SF at E dge of Burma microplate and Jurassic ophiolite-jadeite belts that include Incertus-arc suture*)
- Mishra, O. P. (2022)- Lithospheric heterogeneities of northeast India and Indo-Burma region: Geodynamic implications. *Geosystems and Geoenvironment* 1, 100042, p. 1-13
(online at: <https://www.sciencedirect.com/science/article/pii/S2772883822000218>)
(*P-wave tomographic imaging of lithospheric structure for NE India- Indo-Burma region*)
- Mitchell, A.H.G. (1989)- The Shan Plateau and Western Burma: Mesozoic-Cenozoic plate boundaries and correlation with Tibet. In: A.M.C. Sengor (ed.) *Tectonic evolution of the Tethyan region*, Kluwer, Dordrecht, p. 567-583.
(*Four suture zones in Myanmar. E Burma- Chiang Rai- medial Malaya suture resulted from closure of ocean I (=Paleotethys) in E Triassic. Ocean II, N of Lhasa block, closed in end-Jurassic, but suture buried in Burma. Mount Victoria Land block (= W Burma block of Hutchison, 1989) rifted from Gondwanaland in Jurassic and collided with Burma after NE-ward subduction of ocean III in E Cretaceous. Contains metamorphic rocks overlain by Triassic turbidites, overthrust by ophiolite nappe (may correlate to W Sumatra block; Barber (2005)). Shan Plateau in E Myanmar with thick Precambrian- Mesozoic succession similar to W and SW Thailand (= Sibumasu; JTvG). With U Carboniferous- Lower Permian diamictites only in W part*)
- Mitchell, A.H.G. (1992)- Late Permian-Mesozoic events and the Mergui Group nappe in Myanmar and Thailand. *J. Southeast Asian Earth Sciences* 7, 2, p. 165-178.
(*Continental Shan-Thai Block (= Sibumasu) accreted to Indochina block to E by closure of two Tethyan ocean basins, terminating in Late Norian collision with generation of anatectic granites. Lower Permian Mergui Gp diamictites and associated rocks not part of Shan-Thai until Late Triassic-E Jurassic, when they were emplaced as nappe from present W, perhaps part of E Mesozoic arc system. Subsequent emplacement of ophiolite and overlying E-facing mafic magmatic arc onto W margin of Shan-Thai-Mergui Group block in E Cretaceous was followed by polarity reversal and development of W-facing M Cretaceous- Recent Myanmar arc*)
- Mitchell, A.H.G. (1993)- Cretaceous- Cenozoic tectonic events in the western Myanmar (Burma) - Assam region. *J. Geological Society, London*, 150, p. 1089-1102.
(*Correlation of Late Mesozoic ophiolitic rocks suggests that in Late E Cretaceous a NE-facing mafic arc was emplaced onto SE Borneo, W Sumatra, Mogok belt of W Myanmar and farther W, all then on SW margin of Asia. Reversal in tectonic polarity and E-ward subduction generated Late Cretaceous magmatic arc in W Myanmar and Sumatra. Magmatism, interrupted in latest Cretaceous, probably resumed in W Myanmar-Tibet*)

and Sumatra arc segments in E Paleogene, again interrupted in M Eocene when E-vergent ophiolite nappe overrode Indo-Burman Ranges, deforming Lw Eocene turbidites derived from magmatic arc to E. Following renewed N and E-ward subduction of ocean floor in latest Eocene, India collided with N Myanmar and Tibet. 450km of post-E Miocene dextral displacement on Sagaing Fault and related spreading in Andaman Sea)

Mitchell, A.H.G. (2011)- Very high-grade orogenic quartz-gold vein deposits in the Permo-Carboniferous Slate belt, Central Myanmar: indications of a regional gold province? Proc. 24th Annual Geol. Conv. Geological Society Philippines (GEOCON 2011), Geology working for a resilient society, p. 57-58. (Abstract only) (online at: <http://rwg-tag.bravehost.com/Conferences/geocon/abstracts/D2%200845-0900%20Mitchell%202.pdf>)

(Gold mineralization in argillites- quartzites, overlain by U Carboniferous-Lower Permian pebbly diamictites, interpreted as glacial deposits from Gondwana. Veins are orogenic or mesothermal, probably generated by metamorphic dehydration at depths of >15 km. Textures suggest gold formation in brittle-ductile transition zone at >4km, possibly related to Late Jurassic collision in suture along E margin of Slate belt, which continues S for >2800 km nearly to Borneo)

Mitchell, A.H.G. (2017)- Geological belts, plate boundaries and mineral deposits in Myanmar. Elsevier, p. 1-509.

(Comprehensive overview of geology, mineral potential and plate tectonics of Myanmar. Several of the structural belts of Myanmar continue into SW China and NW Thailand. With chapters on petroleum occurrences in C Burma Depression by M.F. Ridd and offshore petroleum geology by A. Racey)

Mitchell, A.H.G., C.A. AUSA, L. Deiparine, T. Hlaing, N. Htay & A. Khine (2004)- The Modi Taung-Nankwe gold district, Slate belt, central Myanmar: mesothermal veins in a Mesozoic orogen. J. Asian Earth Sciences 23, 3, p. 321-341.

(Quartz-gold veins of Modi Taung-Nankwe gold district, C Myanmar, hosted by mudstones of late Paleozoic Slate belt. Mineralization in E Jurassic following collision of Myanmar (on passive W margin of Shan-Thai continental block) with oceanic arc on overriding plate to W. Collision generated thrusting, metamorphism of Plateau rocks thrust W beneath Slate belt to form Mogok Metamorphics. Reversal in orogenic polarity initiated late Jurassic E-ward subduction of oceanic crust beneath Myanmar and generation of magmatic arc. Young radiometric ages on Mogok Metamorphic belt imply renewed Tertiary uplift or intrusion of Tertiary granites)

Mitchell, A., S.L. Chung, T. Oo, T.H. Lin & C.H. Hung (2012)- Zircon U-Pb ages in Myanmar: magmatic-metamorphic events and the closure of a neo-Tethys ocean? J. Asian Earth Sciences 56, p. 1-23.

(Main metamorphic event in Mogok Metamorphic belt (MMB) in Myanmar pre-dated India-Asia collision. MMB and Slate belt interpreted as part of W Myanmar (W Burma) block, separated in Jurassic from Shan Plateau to E by SW continuation of Bangong-Nujiang-Luxi 'Neo-Tethys I' ocean. Intrusive and metamorphic events in and near MMB related to W-ward subduction of this ocean and end-Jurassic collision of Plateau with overriding W Myanmar-Slate belt block; to orogenic polarity reversal and E Cretaceous W-ward translation of Plateau sequence over suture zone; and to E-ward subduction of ancestral Indian Ocean or 'Neo-Tethys II' beneath Myanmar with generation of Wuntho-Popa arc beginning before Late Cretaceous)

Mitchell, A., T. Hlaing & N. Htay (2002)- Mesozoic orogenies along the Mandalay-Yangon margin of the Shan Plateau. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources (DMR), p. 137-149.

(Mapping of Carboniferous Mergui Gp to Shan Plateau succession to E provides evidence of two Mesozoic orogenies: E Jurassic E-vergent orogeny resulted in a nappe stack and Lower Cretaceous?)

Mitchell, A.H.G., T. Hlaing & N. Htay (2010)- The Chin Hills segment of the Indo-Burman Ranges: not a simple accretionary wedge. In: S. Ibotombi (ed.) Indo-Myanmar Ranges in the tectonic framework of the Himalaya and Southeast Asia, Proc. National Seminar 2008, Memoir Geological Society India, Bangalore, 75, p. 3-24.

(Indo-Burman Ranges in NE India- W Myanmar border region not simple subduction-related accretionary prism, but composed of two belts, separated by E-dipping thrust. In E Belt ophiolites and cherts were emplaced

during (Late?) Jurassic orogeny over Triassic Pane Chaung Gp quartzose sandstone turbidites/flysch (originally deposited at Gondwana margin?). W Belt Late Cretaceous pelagic sediments (part of Burma/ Myanmar Plate of Indian Ocean floor?) that underwent end-Cretaceous deformation and are overlain by Paleogene clastics. Etc.)

Mitchell, A.H.G. & M.T. Htay (2013)- The magmatic arc and the slate belt: copper-gold and tin-tungsten and gold metallotects in Myanmar. Proc. Symposium East Asia: Geology, exploration technologies and mines, Bali 2013, Bull. Australian Institute of Geoscientists (AIG) 57, p. 66-67. (Extended Abstract)
(online at: <https://www.aig.org.au/library/publications/aig-bulletins/>)
(Cretaceous Popa-Loimye magmatic arc and Slate belt each host distinctive types of mineralisation and include two of Myanmar's four world- class mineral deposits (Monywa, Mawchi). Slate belt in Myanmar continues SSE for 2000km to Bangka Island in Indonesia. It consists largely of Carboniferous- E Permian mudstones or argillites and quartzites, with thick diamictite beds implying glaciation in Gondwana. Within Slate belt orogenic quartz- gold veins discovered in 1999)

Mitchell, A.H.G., M.T. Htay, C. AUSA, L. Deiparine, A. Khine & S. Po (1999)- Geological settings of gold districts in Myanmar. Proc. PACRIM 99 Int. Congress, 1999, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, p. 1-8.
(Historically, most lode gold production from latest Cretaceous mesothermal veins and derived placers)

Mitchell, A.H.G., M.T. Htay & Kyaw Min Htun (2015)- The medial Myanmar suture zone and the Western Myanmar- Mogok foreland. J. Myanmar Geosciences Soc. 6, 1, p. 73-88.
(online at: https://www.researchgate.net/publication/285475178_The_medial_Myanmar_suture_zone_and_the_western_Myanmar-Mogok_foreland)
(Discussion of 'Medial Myanmar suture zone' at W margin of Sibumasu Block, reflecting ~Late Jurassic collision between Shan-Tai/Sibumasu (already part of Asia) and West Myanmar-Mogok continental block (foreland) to West (closing of Mesotethys by E-dipping subduction under Sibumasu). Mogok foreland with Triassic flysch, with Late Jurassic overthrusting of ophiolite-basalt, etc. Followed in E Cretaceous by E-ward subduction of proto-Indian Ocean/ Neotethys, generating 105-90 Ma I-type granites in Popa-Loimye arc. Mid-Cretaceous Orbitolina limestones unconformably over various older rocks. Late Cretaceous- E Eocene S-type tin granites. Initiation to ~400km dextral movement along Sagaing Fault in M Miocene))

Mitchell, A.H.G., M.T. Htay & Kyaw Min Htun (2018)- The Popa-Loimye arc, its mineralisation and arc reversal. In: GeoMyanmar 2018, Third Int. Congress Geology, Resources, Geo-hazards of Myanmar and Surrounding Regions, Yangon 2018, Myanmar Geosciences Society, Abstracts, 6 p
(online at: [https://www.researchgate.net/profile/Naing-Than/publication/362992041_Abtract-Volume-GeoMyanmar-2018/links/6309ab9cacd814437fdc8265/Abstract-Volume-GeoMyanmar_Etc.\)](https://www.researchgate.net/profile/Naing-Than/publication/362992041_Abtract-Volume-GeoMyanmar-2018/links/6309ab9cacd814437fdc8265/Abstract-Volume-GeoMyanmar_Etc.)
(Popa-Loimye Arc (three extinct stratovolcanoes), is N continuation of Sunda arc in Sumatra and is defined by magmatic rocks of Cretaceous- Quaternary age. Deep E-ward-dipping seismic zone beneath W Myanmar indicates PL Arc faced W (subduction to E) during recent subduction. During emplacement of Kanzachauung Batholith (110- 90 Ma), PL Arc was E- facing island arc on West Burma block, beneath which Meso-Tethys ocean subducted W. By ~40-50 Ma tectonic polarity had reversed, initiating E-ward subduction of Neo-Tethys)

Mitchell, A.H.G., M.T. Htay & Kyaw Min Htun (2021)- Middle Jurassic arc reversal, Victoria-Katha Block and Sibumasu Terrane collision, jadeite formation and Western Tin Belt generation, Myanmar. Geological Magazine 158, 8, p. 1487-1503.
(online at: [https://www.researchgate.net/publication/350666361_Middle_Jurassic_arc_reversal_Victoria-Katha_Etc.\)](https://www.researchgate.net/publication/350666361_Middle_Jurassic_arc_reversal_Victoria-Katha_Etc.)

(Myanmar is N-ward continuation of Sunda arc and Shan Plateau. New tectonic interpretation of ophiolite-flysch belts, jadeite and tin deposits W of Salween. Before post-E Oligocene dextral displacement of 450km along Sagaing Fault. Permian emplacement of Mogok Metamorphic Group onto Slate Belt to form Sibumasu. In E Jurassic Neo-Tethys ophiolite nappe obducted over turbidites on passive W margin of Sibumasu. Following reversal in tectonic polarity, remaining Neo-Tethys subducted E-wards generating 113-128 Ma Mondaung Arc. During ocean closure Victoria-Katha Block (with U Triassic Pane Chaung flysch cover along

its N/E margin) subducted beneath Sibumasu. Subduction of Indian Ocean since Albian generated Popa-Loimye Arc. Extensional faulting led to uplift of Indo-Burman Ranges and formation of W Tin Belt granites)

Mitchell, A.H.G., M.T. Htay, Kyaw Min Htun, M.N. Win, T. Oo & T. Hlaing (2007)- Rock relationships in the Mogok metamorphic belt, Tatkon to Mandalay, central Myanmar. *J. Asian Earth Sciences* 29, p. 891-910.
(Mogok metamorphic belt >1450 km long, up to 40 km wide, along W margin of Shan Plateau in C Myanmar and continuing N to E Himalayas. At least two metamorphic events, one before and one after intrusion of Late Jurassic- E Cretaceous calc-alkaline rocks)

Mitchell, A.H.G., Kyaw Min Htun, M.T. Htay & N. Htay (2022)- Magmatic arcs and nappes in Myanmar related to Neo-Tethys closure and Indian Ocean subduction. *Thai Geoscience J. (TGJ)* 3, 4, p. 36-62.
(online at: <https://www.dmr.go.th/wp-content/uploads/2023/04/Thai-Geoscience-Journal-Vol.3-No.4.pdf>)
(Modern review of tectonic history of W Myanmar and W-most Thailand. Proposed restorations of ca 450 km of post-Eocene dextral displacement on Sagaing Fault. In E Jurassic Neo-Tethys was bordered by two subduction zones, one under Sibumasu on Asian plate, and one under narrow continental Victoria-Katha Block (VKB; = W Burma Block). With Neotethys closures in E Cretaceous (before Orbitolina Limestone on VKB), ophiolitic nappes obducted over-Asian and VK margins (translating Triassic, etc. continental margins flysch landwards). Final Neotethys closure (Sibumasu- VKB collision) at ~90 Ma, with thrusting of VKB onto Asia and ending Popa-Loimye arc on VKB. After collision, onset of Indian Ocean subduction under VKB)

Mitchell, A.H.G., W. Myint, K. Lynn, M.T. Htay, Maw Oo & T. Zaw (2011)- Geology of the high sulfidation copper deposits, Monywa Mine, Myanmar. *Resource Geology* 61, 1, p. 1-29.
(Monywa copper district near Chindwin River, 50 km², in N-ward continuation of Sunda-Andaman magmatic arc through W Myanmar. Ore hosted by M Miocene andesite or dacite porphyry intrusions and early M Miocene sandstone and overlying volcanoclastics)

Mon, C.T., X. Gong, Y. Wen, M. Jiang, Q.F. Chen, M. Zhang, G. Hou, M. Thant, K. Sein & Y. He (2020)- Insight into major active faults in Central Myanmar and the related geodynamic sources. *Geophysical Research Letters* 47, 8, e2019GL086236, p. 1-8.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019GL086236>)
(Seismic observation network in onshore Myanmar identified two NW-SE trending fault zones accommodating dextral strike-slip earthquakes beneath Central Basin. Also recognize nearly N-S trending seismic zone in overlying Indo-Burma Ranges (IBR) crust near Kabaw Fault)

Moore, G.F., L.T. Aung, R. Fukuchi, J.C. Sample, E. Hellebrand, A. Kop, Win Naing, Win Min Than & Tin Naing Tun. (2019)- Tectonic, diapiric and sedimentary chaotic rocks of the Rakhine Coast, Western Myanmar. *Gondwana Research* 74, p. 126-143.
(open manuscript online at: <https://www.sciencedirect.com/science/article/abs/pii/S1342937X19301108>)
(W margin of Myanmar is N extension of active Sunda subduction zone. Coastal regions and islands with exposures of 'melange' chaotic rock terranes. Tectonic shear zones contain fragments of Cretaceous ophiolites (peridotites and radiolarian cherts), in contact with thrust packets of Eocene turbidite units. Ophiolitic and turbiditic thrust slices exhumed and currently intruded by active mud volcanoes, bringing fragments of units up from depth to surface, forming diapiric melange with fragments of <50 cm that do not exhibit shear fabrics)

Morishita, T., Hnin Min Soe, Hla Htay, Than Htut Lwin, .M. Guotana, A. Tamura, T. Mizukami & K. Zaw (2023)- Origin and evolution of ultramafic rocks along the Sagaing Fault, Myanmar. *Structural Geology* 34, p. 122–132, (2023)
(Active Sagaing fault in Myanmar defines boundary between Indian and Eurasian Plates and causes seismic damage in Myanmar. Small bodies of serpentinite occur along fault)

Morley, C.K. (2017)- Syn-kinematic sedimentation at a releasing splay in the northern Minwun Ranges, Sagaing Fault zone, Myanmar: significance for fault timing and displacement. *Basin Research* 29, S1, p. 684-700.

(Sagaing Fault zone largest active fault in SE Asia, with displacement rate of ~1.8 cm/yr established from GPS data. Newly identified syn-kinematic extensional basin related to displacement on Sagaing Fault in N Minwun Ranges may help constrain timing and displacement along N part of Sagaing Fault)

Morley, C.K. & F. Arboit (2019)- Dating the onset of motion on the Sagaing fault: evidence from detrital zircon and titanite U-Pb geochronology from the North Minwun Basin, Myanmar. *Geology (GSA)* 47, 6, p. 581-585.
(Recently identified syn-kinematic basin at releasing bend in one of fault strands in N Myanmar dated using maximum depositional ages from detrital zircons and titanites, giving Oligocene age (28-27 Ma). This dates onset of motion on fault zone and favors high-displacement models (>400 km))

Morley, C.K., S. Chantpraser, K. Chenoll, P. Sootlek & S. Jitmahantakul (2022)- Interaction of thin-skinned detached faults and basement-involved strike-slip faults on a transform margin: the Moattama Basin, Myanmar. In: M. Nemchok et al. (eds.) *Tectonic development, thermal history and hydrocarbon habitat models of transform margins: their differences from rifted margins*, Geological Society, London, Special Publ. 524, p. 165-190.

(Sagaing Fault one of world's most active strike-slip faults, defines plate boundary on eastern West Burma Block margin, from Andaman spreading center to E Himalayas. In of N Andaman Sea the SF traverses Late Miocene-Recent Moattama Basin. Seismic data show highly unusual fault patterns, that overall resemble a giant (>33,000 km²) horsetail structure, with interaction of thin- and thick-skinned styles)

Morley, C.K., S. Chantpraser, J. Kongchum & K. Chenoll (2021)- The West Burma Terrane, a review of recent paleo-latitude data, its geological implications and constraints. *Earth-Science Reviews* 220, 103722, p. 1-16.

(Recent paleomagnetic data from W Burma Terrane indicates rapid N-wards translation (>2000 km) of terrane, at velocity of Indian Plate, from near-equatorial position in Late Eocene until present. WBT now mainly covered by Paleogene-Recent Central Basin. WBT probably first coupled with NE India, then both collided with SE Asia in latest Eocene or Oligocene (but weak evidence for loss of oceanic crust between Burma Terrane and Sibumasu during Paleocene-Eocene convergence)

Morley, C.K., T.T. Naing, M. Searle & S.A. Robinson (2020)- Structural and tectonic development of the Indo-Burma ranges. *Earth-Science Reviews* 200, B12, 102992, p. 1-43.

*(manuscript online at: <https://ora.ox.ac.uk/objects/uuid:43f6068b-5a75-464e-a31c-7a22f32ed233/files/> Etc.)
(Indo-Burma Ranges with evidence for (1) early accretionary history (Jurassic Jade belt metamorphism; (2) E Cretaceous ophiolites; (3) highly deformed Triassic turbidites. Possibly reflecting (1) collision of microcontinent (Mt. Victoria Land), overlapped by Aptian-Cenomanian limestones, or (2) an accretionary-type ophiolite on W margin of West Burma Terrane. Complex pre-Eocene deformation replaced in Late Eocene-E Oligocene by molasse deposition, marking closure of Neo-Tethys between India and the IBR/WBT, and onset of major dextral translation (>2000 km, 40 Ma-Recent), between India/IBR/WBT region and Sundaland. Late Miocene-Recent major transpressional deformation. Etc.)*

Mukhopadhyay, M. & S. Dasgupta (1988)- Deep structure and tectonics of the Burmese Arc: constraints from earthquakes and gravity data. *Tectonophysics* 149, p. 299-322.

(Active subduction of Indian plate beneath Burmese arc along E-dipping Benioff zone to depth of ~180 km)

Myint, Aung Zaw., T. Wagner & T. Fusswinkel (2022)- Calcite trace element geochemistry of Au deposits in the Singu-Tabeikkyin Gold District, Myanmar: implications for the sources of ore-forming fluids. *Ore Geology Reviews* 145, 104892, p. 1-17.

*(online at: <https://www.sciencedirect.com/science/article/pii/S0169136822002001>)
(Large Singu-Tabeikkyin gold district in Mogoke metamorphic belt of E Myanmar (metamorphism ~20-40 Ma?). Gold mineralization in quartz lodes, hosted by metamorphic sequence of marbles, calc-silicate rocks, gneisses, and migmatites. Ore fluids primarily associated with Miocene magmatism)*

Myint, Aung Zaw., T. Wagner & K. Zaw (2022)- Telluride-bearing Au-Ag mineralization in the Singu-Tabeikkyin gold District, Mogok metamorphic Belt, Myanmar: New constraints on an intermediate-sulfidation epizonal orogenic ore system. *J. Asian Earth Sciences* 227, 105120, p.

(On Singu-Tabeikkyin gold district (previously known as Shante) in Mogok Metamorphic Belt in Myanmar, hosted by Lower Paleozoic-Mesozoic marbles, gneisses, migmatites and calc-silicate rocks metamorphosed at greenschist to granulite facies conditions. Gold formed as two generations, the second stage is associated with major telluride assemblages)

Myint, L. (2016)- A synthesis of Myanmar petroleum geology and potential. Second AAPG/EAGE/MGS Conf. Innovation in Geoscience: unlocking the complex geology of Myanmar, Yangon 2015, Search and Discovery Article 30453, p. 1-30. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2016/30453myint/ndx_myint.pdf)

(Myanmar with numerous surface oil seeps and one of oldest known oil producing countries in world. In Indian- Eurasian Plates collision zone, with three types of plate boundaries: (1) convergent plate boundary (subduction) between Indian Oceanic and continental Burma Plate; (2) continent-continent boundary between Burma Plate- Eurasia plate in N; (3) transform boundary in E between Eurasia, Sunda and Burma plates)

Myint, L. (2017)- Speculative Pre-Tertiary petroleum systems and play types of Myanmar. AAPG/EAGE/ MGS 3rd Oil & Gas Conf., Yangon 2017, Search and Discovery Article 30516, p. 1-25. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2017/30516myint/ndx_myint.pdf)

(Oil and gas in Myanmar currently limited to Tertiary petroleum systems, with bionic gas in Plio-Pleistocene reservoirs, thermogenic oil and gas in Eocene- Miocene reservoirs. Potential pre-Tertiary hydrocarbon plays in sizable Pre-Tertiary basins of Eastern Highlands)

Myint Lwin Thein (1970)- On the occurrences of *Daonella* facies from the upper Chindwin area, western Burma. *Burma J. Science and Technology* 3, 2, p. 277-282.

Myint L. Thein (1973)- The Lower Paleozoic stratigraphy of Western part of the southern Shan States, Burma. *Bull. Geological Society Malaysia* 6, p. 143-163.

(online at: www.gsm.org.my/products/702001-101349-PDF.pdf)

(Cambrian- Silurian stratigraphy of area SE of Mandalay, S Shan State, E Myanmar. Incl. basal Silurian Orthoceras Beds, Silurian graptolite shales (Monograptus, Climacograptus) and Tentaculites beds))

Myint Thein (1991)- On the lateral displacement of the Sagaing Fault. *Georeports*, Yangon University, p. 23-34.

Myint Thein (2015)- The Pre-Tertiary carbonate rocks exposed at the NE margin of the Central Myanmar Basin and their development history. *J. Myanmar Geosciences Soc.* 6, p. 1-22.

(Barber et al. 2017:) Permian limestone slivers in Sagaing fault zone and associated with ophiolites of C Ophiolite belt interpreted as displaced from W margin of Shan Plateau (but with 'Cathaysian' fusulinids??))

Myint Thein (2017)- Current tectonic activity along the Sagaing Fault, Myanmar indicated by alluvial fans. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics. Geological Society, London, Memoir 48, Chapter 20, p. 443-452.

(Young alluvial fans and fanglomerates along Sagaing fault zone commonly displaced laterally relative to source areas. Sediments on E side of fault mainly (tilted) Upper Irrawaddy series fluvial-alluvial sediments, locally with rich Lower Pleistocene vertebrate faunas equivalent of Djetis fauna of C Java. Younger fans mainly on W side of fault))

Myint Thein & M. Maung (2017)- The Eastern (Back-arc) Basin of Central Myanmar: Basement rocks, lithostratigraphic units, palaeocurrents, provenance and developmental history. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics. Geological Society, London, Memoir 48, Chapter 8, p. 169-183.

(On eastern part of Central Myanmar Basin on W Myanmar Block. Lower Eocene- Pliocene sediments unconformably over U Paleozoic carbonates/ Mesozoic ophiolitic sediments in E, and igneous rocks of Wuntho Salingyi Mesozoic arc in W. Sediment source from N)

Myint Myat Phyoo, H.A.O. Wang, M. Guillong, A. Berger, L. Franz, W.A. Balmer & M.S. Krzemnicki (2020)- U-Pb Dating of zircon and zirconolite inclusions in marble-hosted gem-quality ruby and spinel from Mogok, Myanmar. *Minerals* (MDPI) 10, 2, 195, p. 1-18.

(online at: <https://www.mdpi.com/2075-163X/10/2/195>)

(Mogok area in Myanmar long known as source of finest ruby and spinel gemstones in world. U-Pb dating of cores and rims of zircon grains revealed ages from ~200 Ma in core to ~17 Ma in rim. Youngest U-Pb ages from zircon rims of inclusions in gem-quality ruby and spinel of Mogok area 22.3 Ma and 22.9 Ma. In ruby-spinel-bearing marble from Bawlongyi, youngest zircon age 17.1 Ma. Results in accordance with previous geochronological data from the Mogok Metamorphic Belt (MMB). Gem-quality ruby and spinel from Mogok formed during granulite-facies regional metamorphic event in Late Oligocene- E Miocene)

Naing Maw Than, Kyi Khin & Myint Thein (2017)- Cretaceous geology of Myanmar and Cenozoic geology in the Central Myanmar Basin. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, Chapter 7, p. 143-167.

(Review of stratigraphy of Cretaceous sediments in different tectonic belts of Myanmar. Thick Lower Cretaceous- Cenozoic succession in Myanmar Central Basin)

Naing, T.T. (2019)- Age, depositional history and tectonics of the Indo-Burman Ranges. Ph.D. Thesis University of Oxford, p. 1-404. (online at:

[https://ora.ox.ac.uk/objects/uuid:eade5a52-5bc8-4b8b-bc69-](https://ora.ox.ac.uk/objects/uuid:eade5a52-5bc8-4b8b-bc69-5afc3d0d37a8/download_file?safe_filename=DPhil_Thesis.pdf&type_of_work=Thesis)

[5afc3d0d37a8/download_file?safe_filename=DPhil_Thesis.pdf&type_of_work=Thesis](https://ora.ox.ac.uk/objects/uuid:eade5a52-5bc8-4b8b-bc69-5afc3d0d37a8/download_file?safe_filename=DPhil_Thesis.pdf&type_of_work=Thesis))

(Indo-Burman Ranges (IBR) mountain belt, with (1) W belt of folded-thrusted Cenozoic sediments, (2) Central zone of highly deformed Triassic turbidites (Pane Chaung Fm) and low-grade metamorphic rocks and (3) in E major Neotethyan suture zone. New age control reinforces hypothesis that Kalemio-Nagaland suture and Indus- Yarlung Tsangpo suture represent single suture zone, separating Indian plate to W (IBR) and Asian plate to E (Central Basin and Wuntho-Popa Arc). Triassic turbidites deposited on NE India (Gondwana) margin, not Asian (Sibumasu) plate. Wide Neotethyan ocean separated IBR from Wuntho-Popa Arc and Shan Plateau)

Naing, T.T., D.A. Bussien, W.H. Winkler, M. Nold & A. von Quadt (2014)- Provenance study on Eocene-Miocene sandstones of the Rakhine Coastal Belt, Indo-Burman Ranges of Myanmar: geodynamic implications. In: R.A. Scott et al. (eds.) *Sediment provenance studies in hydrocarbon exploration and production*. Geological Society, London, Special Publ. 386, p. 195-216. (online at:

www.academia.edu/28302133/Provenance_study_on_Eocene_Miocene_sandstones_of_the_Rakhine...Etc.)

(Indo-Burman Ranges accretionary wedge, resulting from subduction of Indian plate beneath Asian plate. Rakhine Coastal Belt thick stack of Cretaceous to Neogene turbiditic sediments and local thrust sheets of oceanic mafics and pelagic sediments. Eocene-Miocene sandstones provenance mainly from: (1) Late Cretaceous- Oligocene igneous rocks and (2) recycled orogenic terrane sources comprising ophiolitic rocks, from Burman margin and arc)

Naing, T.T., S.A. Robinson, M.P. Searle, C.K. Morley, I. Millar, O.R. Green, P.R. Bown, T. Danelian, M.R. Petrizzo & G.M. Henderson (2023)- Age, depositional history and tectonics of the Indo-Myanmar Ranges, Myanmar. *J. Geological Society*, London, 180, jgs2022-091, p. 1-27.

(online at: <https://pubs.geoscienceworld.org/jgs/article-pdf/doi/10.1144/jgs2022-091/5810711/jgs2022-091.pdf>)

(Indo-Myanmar Ranges enigmatic mountain belt in W Myanmar extending from N continuation of Sunda-Andaman arc into E Himalayan syntaxis. Part of accretionary fore-arc basin-arc complex that includes C Myanmar Basin and Wuntho-Popa Arc to E. New data suggest: (1) U Triassic Pane Chaung Fm originally deposited adjacent to NE India/ Gondwana continental margin during Late Triassic, and (2) U Cretaceous-Paleogene rocks of IMR mainly derived from Wuntho-Popa Arc and Inner Belt, with subordinate input from older crustal source. Kalemio-Nagaland ophiolite of E Cretaceous age similar to ages of ophiolites in Indus Yarlung-Tsangpo suture zone, S Tibet and Nagaland, suggesting part of same Neo-Tethyan ocean floor)

Najman, Y., E.R. Sobel, I. Millar, X. Luan, S. Zapata, E. Garzanti, M. Parra, G. Vezzoli, P. Zhang et al. (2022)- The timing of collision between Asia and the West Burma Terrane, and the development of the Indo-Burman Ranges. *Tectonics* 41, 7, e2021TC007057, p. 1-22.

online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1029/2021TC007057>

(Timing of collision of West Burma Terrane with both India and Asia is debated. Material eroded from Asia first recorded in C Myanmar Basin of W Burma Terrane after Late Eocene; E Oligocene minimum time of docking of continental fragments. Two periods of exhumation of accretionary prism of Indo-Burman Ranges: E-M Eocene and at Oligo-Miocene boundary, possibly associated with collision of West Burma Terrane and India)

Najman, Y., E.R. Sobel, I. Millar, D.F. Stockli, G. Govin, F. Lisker, E. Garzanti, M. Limonta et al. (2020)- The exhumation of the Indo-Burman Ranges, Myanmar. *Earth Planetary Science Letters* 530, 115948, p. 1-14.

(online at: http://alexcooley.co.uk/papers/2019_yani_ibr.pdf)

(W Myanmar Indo-Burman Ranges major period of exhumation around Oligo-Miocene boundary; possibly also at or before Late Eocene. Eocene rocks derived from Myanmar arc to E. By Miocene, provenance of C Myanmar Basin deposited by a through-flowing Irrawaddy River, with detritus from its Mogok Metamorphic Belt and Cretaceous-Paleogene granites to N. IBR already uplifted by this time)

Nakazawa, T., K. Ueno & X. Wang (2009)- Sedimentary facies of Carboniferous- Permian mid-oceanic carbonates in the Changning-Menglian Belt, West Yunnan, Southwest China: origin and depositional process. *Island Arc* 18, 1, p. 94-107.

(Huge E Carboniferous- Late Permian (Visean-Lopingian) carbonate bodies on basaltic basement in Changning-Menglian Belt, W Yunnan. No terrigenous siliciclastic material. Formed on isolated, subsiding mid-oceanic island probably of hotspot origin. Shallow-water carbonate platform and relatively deep-water carbonate slope facies developed contemporaneously)

Nandy, D.R. (1986)- Geology and tectonics of Arakan Yoma; a reappraisal. In: G.H. Teh & S. Paramananthan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 2, *Bull. Geological Society Malaysia* 20, p. 137-148.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986b08.pdf>)

(Brief review of Arakan-Yoma zone of Indo-Burman Orogen, W Myanmar)

Ng, Y.N., G.H. Shi & M. Santosh (2016)- Titanite-bearing omphacite from the Jade Tract, Myanmar: Interpretation from mineral and trace element compositions. *J. Asian Earth Sciences* 117, p. 1-12.

Ni, J.F., M. Guzman-Speziale, M. Bevis, M., W.E. Holt, T.C. Wallace & W.R. Seager (1989)- Accretionary tectonics of Burma and the three-dimensional geometry of the Burma subduction zone. *Geology (GSA)* 17, 1, p. 68-71.

(Geometry of Burma Wadati-Benioff zone determined from earthquake hypocenters. Dip varies from ~50° in N near E Himalayan syntaxis to ~30° in Bay of Bengal area)

Ni, Y., T. Chen, C. Cai, G. Li, Y. Duan & J. Wang (1982)- The Silurian rocks in Western Yunnan. *Acta Palaeontologica Sinica* 21, p. 119-132.

Nie, X., Q. Feng, I. Metcalfe, A.T. Baxter & G. Liu (2016)- Discovery of a Late Devonian magmatic arc in the southern Lancangjiang zone, western Yunnan: geochemical and zircon U-Pb geochronological constraints on the evolution of Tethyan ocean basins in SW China. *J. Asian Earth Sciences* 118, p. 32-50.

(Geochemistry and U-Pb zircon ages of Nanguang Fm volcanogenic sediments from S Lancangjiang zone in W Yunnan (= W margin of Simao/ Indochina plate) suggest as yet unidentified Late Devonian (~380-360 Ma) subduction-related magmatic arc. Either continuation of Late Ordovician- Silurian 'Proto-Tethyan' subduction or initial stage of Paleo-Tethyan Lincang Arc, i.e. subduction of Changning-Menglian ocean beneath Simao/ Indochina Block in Late Devonian)

- Niko, S. & M. Sone (2014)- Actinocerid cephalopods from the Ordovician of Myanmar, and their paleobiogeographic implications for Northern Gondwana. *Paleontological Research* 18, 2, p. 94-103.
(online at: https://umexpert.um.edu.my/file/publication/00011532_97674.pdf)
(*Actinocerid cephalopod fauna from shallow marine limestones in W Shan Plateau, Myanmar (=Sibumasu Block), with Ordosoceras, Armenoceras, Paratunkoceras and Wutinoceras moeseini. Strong link with N China during E-M Ordovician time; Sibumasu affinity to coeval Australian fauna less definable*)
- Niko, S. & M. Sone (2015)- Gondwanan nautiloid cephalopods from the Ordovician of Myanmar. *Paleontological Research (Palaeontological Society of Japan)* 19, 4, p. 288-293.
(online at: https://umexpert.um.edu.my/file/publication/00011532_112196.pdf)
(*Two late M Ordovician nautiloids from Wunbye Fm in Shan Plateau of Myanmar (= Sibumasu Block): orthocerid Sibumasuoceras langkawiense (Kobayashi) and discosorid Tasmanoceras sp. Sibumasuoceras known only from Malaysia and Myanmar of Sibumasu Block. Tasmanoceras previously known only in Tasmania, implying Ordovician marine biotic linkage between Sibumasu and Tasmania*)
- Ningthoujam, P.S., C.S. Dubey, S. Guillot, A.S. Fagion & D.P. Shukla (2012)- Origin and serpentinization of ultramafic rocks of Manipur Ophiolite complex in the Indo-Myanmar subduction zone, Northeast India. *J. Asian Earth Sciences* 50, p. 128-140.
(*Manipur-Nagaland ophiolite belt in Indo-Myanmar Ranges formed by collision between India and Myanmar continental plates. Dismembered ophiolite sequence of U Cretaceous- Lower Eocene age overlain by E-M Eocene oceanic pelagics, probably created at slow-spreading ridge, rather than supra-subduction-zone setting. Obducted and incorporated into Indo-Myanmar suture zone. Indo-Myanmar Ranges mainly composed of Late Cretaceous-Paleogene marine sediments, unconformably overlying U Triassic flysch-type sediments and associated ophiolite rocks*)
- Niu, X., F. Liu, J. Yang, Y. Dilek, Z. Xu, G. Feng, F. Xiong & K. Sein (2017)- Kalaymyo peridotite massif in the Indo-Myanmar Ranges (Western Myanmar): Its mineralogy and petrology. *Acta Geologica Sinica (English Ed.)* 91, Suppl. 1, p. 24-25 (*Abstract*)
(*Ophiolites in Indo-Myanmar Ranges are S continuation of Neotethyan ophiolites along Yarlung Zangbo Suture Zone in S Tibet farther NW. Kalaymyo and other ophiolites in Indo-Myanmar Ranges represent mid-ocean ridge (MOR)-type Tethyan oceanic lithosphere derived from downgoing plate and accreted into a W migrating subduction-accretion system along E margin of India.*)
- Niu, X., F. Liu, J. Yang, Y. Dilek, Z. Xu & K. Sein, K. (2017)- Mineralogy, geochemistry, and melt evolution of the Kalaymyo peridotite massif in the Indo-Myanmar Ranges (western Myanmar), and tectonic implications. *Lithosphere (GSA)* 10, 1, p. 79-94.
(online at: <https://pubs.geoscienceworld.org/gsa/lithosphere/article/10/1/79/207450/Mineralogy-geochemistry-and-melt-evolution-of-the>)
(*Kalaymyo peridotite massif in central part of Indo-Myanmar Ranges (W Myanmar) and other ophiolites in Indo-Myanmar Ranges represent mid-oceanic ridge-type Tethyan oceanic lithosphere derived from downgoing plate and accreted into W-ward-migrating subduction-accretion system along E margin of India*)
- Noetling, F. (1896)- *Über das Vorkommen von Jadeit in Ober-Birma*. *Neues Jahrbuch Mineralogie Geologie Paläontologie*, 1896, 1, p. 1-17.
(online at: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015068271041;view=1up;seq=45>)
(*'On the occurrence of jadeite in Upper Burma'*)
- Noetling, F. (1889)- Report on the oil fields of Twingoung and Beme, Burma. *Records Geological Survey India* 22, 2, p. 75-136.
(online at: <http://pahar.in/wpfb-file/1889-records-of-geological-survey-of-india-vol-22-pdf/>)
- Noetling, F. (1893)- Note on the occurrence of jadeite in Upper Burma. *Records Geological Survey India* 26, p. 26-31.
(online at: <http://pahar.in/wpfb-file/1893-records-of-geological-survey-of-india-vol-26-pdf/>)

(Brief report of first visit of western geologist to jade mines in NE Myanmar)

Noetling, F. (1895)- On some marine fossils of the Miocene beds of Burma. *Memoirs Geological Survey India* 27, p. 1-45.

(online at: <https://olivirv.myspecies.info/sites/olivirv.myspecies.info/files/Marine%20fossils%20from%20Miocene%20of%20-%20Noetling%2C%20F.%20%28Fritz%29.pdf>)

(69 species of Miocene molluscs from Yenangyat and Minbu areas, collected during survey of oil-bearing tracts in Upper Burma)

Noetling, F. (1897)- The occurrence of petroleum in Burma and its technical exploration. *Memoirs Geological Survey India*, 27, 2, p. 47-272.

(online at: <https://books.googleusercontent.com/books/...>)

(Oilfields, mud volcanoes, etc. See also Pascoe 1912)

Noetling, F. (1900)- The Miocene of Burma. *Verhandelingen Koninklijke Akademie van Wetenschappen, Amsterdam* (2), 7, 2, p. 1-131.

(online at: <https://books.googleusercontent.com/books/...>)

Noetling, F. (1901)- Fauna of the Miocene beds of Burma. *Palaeontologia India*, N.S. 1, 3, p. 1-378.

(online at:)

(Pioneering work on Burmese Tertiary molluscs, based on material collected by Noetling and Theobald from Singu and Kama areas. Many species in common with Indonesia. See also revisions by Vredenburg 1921, Shuto 1984)

Nyunt, M. & S. Lwin (1997)- Tectonic setting and hydrocarbon occurrence in the Central Myanmar Tertiary belt. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum systems of SE Asia and Australasia Conf., Indonesian Petroleum Association (IPA), Jakarta 1997*, p. 319-333.

(Onshore C Myanmar Tertiary Basin is 1300km long, 200km wide depression, which originated in Eocene as array of pull-apart rift segments along oceanic-cratonic transform zone between Indian and SE Asian lithospheric plates (influenced by oblique subduction of Indian oceanic crust beneath SE Asian craton and dextral slip along intra cratonic Sagaing transform fault). Proven reservoirs mainly Oligo-Miocene sandstones. Oils derived from Tertiary land plant material)

Nyunt, Than (1976)- Current status of stratigraphic correlation in Burma. In: *Proc. Regional Special Working Group meetings, 1973 and 1975, vols. III and V, UN-ESCAP Mineral Resources Development Series 42, B12*, p. 123-128.

(online at: <https://repository.unescap.org/server/api/core/bitstreams/b3b316b9-f95c-4a60-8926-4153bb464b44/content>)

(Useful correlation tables for Paleozoic- Recent formations, onshore Myanmar))

Nyunt, Thet Tin, Aung Jyaw Moe, Kyaw Zaya & S.P. Sone (2023)- Some critical mineral and element occurrences and potential in Myanmar. *Thai Geoscience J.* 4, 5, p. 11-32.

(online at: <https://ph03.tci-thaijo.org/index.php/TGJ/article/view/1803/1382>)

(Review of mineral belts in Myanmar. Critical minerals of Myanmar are rich in copper, lead, zinc, tin, and tungsten, fairly rich in antimony, nickel, and iron, and poor in chromite, manganese, platinum group minerals (PGMs), radioactive minerals, rare earth elements (REEs), bauxite, mercury, lithium, and uranium. Etc.)

Nyunt, Thet Tin, H.J. Massonne & Tay Thye Sun (2017)- Jadeitite and other high-pressure metamorphic rocks from the Jade Mines Belt, Tawmaw area, Kachin State, northern Myanmar. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, Chapter 13, p. 295-315.

(World's largest jadeite (NaAlSi₂O₆) deposit, with highest-quality jade, in Pharkant-Tawmaw Jade Mines Belt in N part of C Myanmar basin. N-S trending belt. Jadeitite in serpentinite melange, probably formed in subduction zone environment. Associated with albitites, chlorite schists, garnet-mica schists, graphite schists, glaucophane and epidote schists and amphibolite. Timing of jadeite formation still controversial: original

oceanic crust may have formed in M Jurassic (163 Ma zircon age), ~146 Ma (Late Jurassic) zircons may reflect age of subduction and high-P metamorphism. Rapid exhumation required for jadeite preservation)

Omura, I. (1942)- Oil fields in Burma. J. Mining Institute of Japan 58, 685, p. 300-303. (in Japanese)
(online at: https://www.jstage.jst.go.jp/article/shigentosoizai1885/58/685/58_685_300/_pdf/-char/en)
(Brief review of oil fields and seeps onshore Myanmar)

Oo, T., T. Hlaing & N. Htay (2002)- Permian of Myanmar. J. Asian Earth Sciences 20, 6, p. 683-689.
(Permian 'Plateau Limestone' with minor basal clastics widespread on Shan Plateau in E and S Myanmar. Thitshipin Lst three fusulinid biozones (1) *Pseudoschwagerina* (early E Permian, also with *Pseudofusulina*, *Pseudofusulinella*), (2) *Parafusulina* (late E Permian, with *P. cf. kattaensis*), (3) *Neoschwagerina- Verbeekina* (early Late Permian; with *Yangchienia*, *Schubertella*, *Tetrataxis* and *Polydixodina*). Overlying Nwabangyi Lst of *Paleofusulina- Codonofusiella* zone (Late Permian, also with *Hemigordius renzi*, *Shanita amosi*, etc.) Unconformable over Devonian silicicarbonates in Shan State, and Carboniferous meta-siliciclastics in other areas and suggest Permian limestones were deposited after emplacement of Mergui Terrane onto S margin of Shan-Thai Block, when Shan-Thai Block was in S hemisphere)

Oo, Z.M., Khin Zaw, I. Belousov, P. Putthapiban & C. Makoundi (2023)- Tectonic and metallogenic implications of W-Sn related granitoid rocks in the Kawthaung-Bankachon area, southernmost part of Myanmar: Constraints from petrology, geochemistry, and U-Pb zircon geochronology. Geosystems and Geoenvironment 2, 4, 100188, p. 1-15.
(online at: <https://www.sciencedirect.com/science/article/pii/S2772883823000110>)
(Granitoids in border region of Myanmar and Thailand in Sibumasu (Shan-Thai) Terrane, part of S-most Central Cretaceous-Eocene granitoid belt of SE Asia. All granitoids High-K calc-alkaline, S-type, and post-orogenic/post-collisional. Radiometric ages of ~79.0 Ma (biotite granites), 79.6 Ma (muscovite-biotite granite), and 49.5 Ma for biotite granite from Yadanabon W-Sn deposit. Magmatism and W-Sn mineralization attributable to collision between W Myanmar and Sibumasu Terranes)

Ovung, T.N., B. Ghosh & J. Ray (2021)- Petrogenesis of neo-Tethyan ophiolites from the Indo-Myanmar Ranges: a review. International Geology Review 63, 12, p. 1437-1449.
(online at: https://www.researchgate.net/publication/342192650_Petrogenesis_of_neo-Tethyan_ophiolites_from_the_Indo-Myanmar_ranges_a_review)
(Geochemical study of peridotites and volcanic rocks from Indo-Myanmar Ranges ophiolites (Nagaland, Manipur, W Myanmar ophiolites; all remnants of closed Neotethys Ocean))

Ovung, T.N., J. Ray, X. Teng, B. Ghosh, M. Paul, P. Ganguly, S. Sengupta & S. Das (2017)- Mineralogy of the Manipur Ophiolite Belt, North East India: implications for mid-oceanic ridge and supra-subduction zone origin. Current Science 112, 10, p. 2122-2129.
(online at: www.currentscience.ac.in/Volumes/112/10/2122.pdf)
(In Indo-Myanmar Ranges ophiolitic rocks in two parallel belts along E margin of Indian plate: (1) E belt through C Myanmar, Sumatra and Java; (2) W belt through Nagaland, Manipur, W Myanmar and Andaman islands. Wide compositional gap in Cr and Mg content of spinel in mantle peridotites of W Belt Manipur Ophiolite Belt implies upper mantle melting in different tectonic settings: (1) mid-oceanic ridge (MOR) origin for high-Al spinel peridotites and (2) supra-subduction zone origin for high-Cr spinel peridotites)

Pal, T., A. Bhattacharya, G. Nagendran, N. Yanthan, R. Singh & N. Raghuramani (2014)- Petrogenesis of chromites from the Manipur ophiolite belt, NE India: evidence for a supra-subduction zone setting prior to Indo-Myanmar collision. Mineralogy and Petrology 108, 5, p. 713-726.
(Manipur ophiolite belt in W Ophiolite Belt of Indo-Myanmar Ranges consists of serpentinitised peridotite, dykes, volcanic rocks and pelagic sediments. Compositions of magmatic chromites suggest ophiolite formed in supra-subduction zone setting)

Panda, D., B. Kundu, V.K. Gahalaut & C. Rangin (2018)- Crustal deformation, spatial distribution of earthquakes and along strike segmentation of the Sagaing Fault, Myanmar. *J. Asian Earth Sciences* 166, p. 89-94.

(~1200 km long, N-S Sagaing fault is plate boundary fault between Burma and Sunda plate, accommodates ~50-55% of dextral motion of India-Sunda plate motion. Along strike segmentation)

Panda, D., B. Kundu, V.K. Gahalaut & C. Rangin (2020)- India-Sunda plate motion, crustal deformation, and seismic hazard in the Indo-Burmese Arc. *Tectonics* 39, 8, e2019TC006034, p. 1-8.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019TC006034>)

(GPS observations constrain today's India-Sunda relative motion at ~37 mm/year, oriented along N11°E. Motion partitioned among three active units: Sagaing Fault (~18 mm/year), Churachandpur-Mao Fault (~17 mm/year), and blind megathrust (~7 mm/year))

Pascoe, E.H. (1912)- The oil fields of Burma. *Memoirs Geological Survey India, Calcutta*, 40, 1, p. 1-269.

(online at: <https://books.google.com/books?id=uYo9AQAAIAAJ&pg=PA262&lpg=PA262&dq=Noetl+etc>)

(Petroleum localities in Burma (now Myanmar) almost all in Irrawaddy and Chindwin basins, in rel. narrow tract E of Arakan-Yoma Range British records of large indigenous oil industry at Yenangyaung date back to late 1700s. After British annexation of Upper Burma in 1886, Burmah Oil Co started operations at Yenangyaung and Yenangyat in 1887. Singu (Chauk) oilfield discovered in 1896. Oil in anticlinal structures and reservoirs in Oligo-Miocene 'Pegu Beds'. Much of geology pioneered by Fritz Noetling of the India Geological Survey. Etc.)

Pascoe, E.H. (1965)- Manual of the geology of India and Burma, 3rd Edition, 3 vols. Government of India Press, Calcutta, p. 1-2363.

Paumard, V., S. Lang, H.W. Posamentier & M.E.J. Wilson (2020)- On the value of seismic stratigraphy and seismic geomorphology- Comments on “development patterns of an isolated oligo-mesophotic carbonate buildup, early Miocene, Yadana field, offshore Myanmar” by Teillet et al. (2020). *Marine and Petroleum Geology* 122, 104689, p. 1-5.

(Suggest that interpretations of Teillet et al., 2020b on seismic reflectors at Yadana carbonate platform/ gas field are not adequately supported by data)

Paumard, V., E. Zuckmeyer, R. Boichard, S.J. Jorry, J. Bourget, J. Borgomano, T. Maurin & J.N. Ferry (2017)- Evolution of Late Oligocene - Early Miocene attached and isolated carbonate platforms in a volcanic ridge context (Maldives type), Yadana field, offshore Myanmar. *Marine and Petroleum Geology* 81, p. 361-387.

(Stratigraphic evolution of Late Oligocene- E Miocene (Aquitania) carbonate platforms of Yadana High, offshore Myanmar (N of Andaman spreading zone). Seven seismic sequences in three stages: (1) Chattian development of aggrading attached and isolated platforms; (2) platform emersion at Oligo- Miocene transition; (3) Aquitania drowning of small buildup and km-scale backstepping on large platforms (3DF and Yadana). Aquitania onset of renewed volcanic activity, followed by development of ~300-850m thick Burdigalian fringing carbonate reefs at ~6 Ma. Platforms developed on volcanic hotspot ridge in Indian Ocean, not on volcanic arc)

Peng, T., Y. Wang, G. Zhao, W. Fan & B. Peng (2008)- Arc-like volcanic rocks from the southern Lancangjiang zone, SW China: geochronological and geochemical constraints on their petrogenesis and tectonic implications. *Lithos* 102, p. 358-373.

(Triassic volcanic rocks in C part of San-Jiang orogenic belt, SW China, mainly in E segment of Lancangjiang zone. Interpreted as products of subduction during closure of Paleo-Tethys. Mainly andesites with minor basaltic andesites. Andesite zircon age of 248.5±6.3 Ma (E Triassic), and similar to typical subduction-related arc volcanic rocks. Associated with M-Triassic (~230 Ma) syn-collision granites, andesites in S Lancangjiang zone viewed as E Triassic continental margin volcanic arc rocks, suggesting Paleo-Tethyan Ocean not closed until M Triassic continent- continent or continent- arc collision)

Peng, T., S.A. Wilde, Y. Wang, W. Fan & B. Peng (2013)- Mid-Triassic felsic igneous rocks from the southern Lancangjiang Zone, SW China: petrogenesis and implications for the evolution of Paleo-Tethys. *Lithos* 168-169, p. 15-32.

(SW Lancangjiang magmatic belt in SW China mainly composed of Lincang batholith and Mesozoic volcanic belt with abundant rhyolites. Zircon U-Pb results define emplacement ages for large Lincang batholith at ~230 Ma and ~220 Ma (just E of Changning-Mengliang suture zone). M-Triassic magmatism was generated in post-collisional tectonic setting, possibly tied to slab breakoff, resulting in post-collisional extension and asthenospheric upwelling that induced melting of middle-lower crust to produce felsic magma. This post-collisional magmatism indicates continent-continent/arc collision between Gondwana-derived Sibumasu and Indochina blocks was completed by early M Triassic)

Phyo, A.P., Huan Li, Xiao-Jun Hu, M. Ghaderi, Aung Zaw Myint & M. Faisal (2025)- Geology, geochemistry, and zircon U-Pb geochronology of the Nanthila and Pedet granites in the Myeik Sn-W district, Tanintharyi region, southern Myanmar. *Ore Geology Reviews* 178, 106488, p. 1-19.

(online at: <https://www.sciencedirect.com/science/article/pii/S0169136825000484>)

(Eocene Nanthila and Pedet granites in Western Granitoid Province of S-most Myanmar, in area with common W-Sn mineralized granitoids. Study area mainly Carboniferous-Permian Mergui Group and E Tertiary granitic rocks. Magmatic zircons from six granitoid samples yielded ages of ~ 50.8- 51.5 Ma (E Eocene))

Phyo, M.M., L. Franz, R.L. Romer, C. de Capitani, W.A. Balmer & M. S. Krzemnick (2023)- Petrology, geothermobarometry and geochemistry of granulite facies wall rocks and hosting gneiss of gemstone deposits from the Mogok area (Myanmar). *J. Asian Earth Sciences*: X, 100132, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056022000536>)

(Mogok Metamorphic Belt of Myanmar formed during Paleogene collision between W Burma and Shan-Thai blocks (W margin of Shan-Thai Block =Sibumasu) and mainly composed of M-H-grade marble, calc-silicate rocks, gneiss, quartzite, peridotite, etc., with ruby, spinel, sapphire, etc. in marble, formed in Oligocene- E Miocene. Three types of high-grade quartz-garnet gneiss (granulite facies PT- of ~775 °C at ~7.5 kbar). Shoshonitic and high-K mafic dykes occur intruded into marble. Spinel and ruby formed not only by metasomatism around alkaline intrusions, but also by granulite facies regional metamorphism)

Phyo, M.M., H.A.O. Wang, M. Guillong, A. Berger, L. Franz, W.A. Balmer & M.S. Krzemnicki (2020)- U-Pb dating of zircon and zirconolite inclusions in marble-hosted gem-quality ruby and spinel from Mogok, Myanmar. *Minerals (MDPI)* 10, 2, p. 1-18.

(online at: <https://www.mdpi.com/2075-163X/10/2/195>)

(Dating of zircon inclusions in Mogok Metamorphic Belt ruby and spinel gemstones gave youngest ages at rims ~22.5 Ma (E Miocene). U-Pb age of rims of zircon grains in biotite-garnet gneiss Late Oligocene age (~26 Ma). Cores of zircons with ages up to Precambrian)

Pilgrim, G.E. (1925)- The Perissodactyla of the Eocene of Burma. *Palaeontologia Indica*, N.S., 8, p. 1-28.

(One of early discoveries of M Eocene mammals in Myanmar: a rhinocerotoid hoofed mammal)

Pilgrim, G.E. (1928)- The Artiodactyla of the Eocene of Burma. *Paleontologia Indica* 13, p. 1-39.

Pilgrim G.E. & P. de Cotter (1916)- Some newly discovered Eocene mammals from Burma. *Records Geological Survey India*, 47, p. 42-77.

Pivnik, D.A., J. Nahm, R.S. Tucker, G.O. Smith, K. Nyein, M. Nyunt & P.H. Maung (1998)- Polyphase deformation in a fore-arc/back-arc basin, Salin subbasin, Myanmar (Burma). *American Assoc. Petroleum Geol. (AAPG) Bull.* 82, 10, p. 1837-1856.

(Salin subbasin of Myanmar is Neogene fore-arc/back-arc basin couplet, between oblique subduction zone to W and right-lateral strike-slip fault to E. NNW-directed extensional basin in Miocene, followed by ENE-directed Plio-Pleistocene transpressional deformation. In S Miocene thickens over 20°N and Yedwet uplifts, suggesting NNW striking faults that bound them represent Plio-Pleistocene inversion of Miocene normal faults)

Qi, M., H. Xiang, Z.Q. Zhong, H.N. Qiu, H. Wang, X.L. Sun & B. Xu (2013)- $^{40}\text{Ar}/^{39}\text{Ar}$ geochronology constraints on the formation age of Myanmar jadeitite. *Lithos* 162-163, p. 107-114.

(First direct $^{40}\text{Ar}/^{39}\text{Ar}$ dating of Myanmar jadeite from yielded plateau age of 123.9 ± 3.4 Ma, sodic-calcic amphibole associated with jadeite plateau age of 134.8 ± 1.4 Ma, and sodic amphibole of late amphibole rock plateau age of 92.7 ± 1.2 Ma. Indicate jadeitite formed during E Cretaceous (135 Ma) from high-P metasomatism, then experienced late Cretaceous (93 Ma) HP metasomatism)

Qiu, Z.L., F.Y. Wu, S.F. Yang, M. Zhu, J.F. Sun & P. Jang (2008)- Age and genesis of the Myanmar jadeite: constraints from U-Pb ages and Hf isotopes of zircon inclusions. *Chinese Science Bull.* 54, 4, p. 658-668.

(online at: www.researchgate.net/publication/226866800_Age_and_genesis_of_the_Myanmar_jadeite Etc.)

(Myanmar jadeite in collisional belt between India and Eurasian plates. Zircon inclusions in jadeite gem sample yield U-Pb age of 158 ± 2 Ma, indicating age of formation in Late Jurassic)

Racey, A. (2017)- Petroleum exploration offshore Myanmar: history and future potential. *Proc. SE Asia Petroleum Exploration Soc (SEAPEX) Exploration Conference 2017, Singapore, Session 1*, p. 1-4. *(Extended Abstract)*

(Brief review of hydrocarbon exploration offshore Myanmar since 1969. Currently four producing gas fields (Zawtika, Shwe/Shwe Phyu/Mya, Yadana, Yetagun) with Aung Sinkha field under development)

Racey, A. (2017)- Exploration history and petroleum geology of offshore Myanmar. In: A.H.G. Mitchell, *Geological belts, plate boundaries and mineral deposits in Myanmar*, Elsevier, Chapter 12, p. 391-431.

Racey, A. & M.F. Ridd (2015)- Petroleum geology of Myanmar. *Geological Society, London, Memoir* 45, p. 1-118.

(Review of onshore and offshore petroleum geology of Myanmar and adjoining basins, in 11 chapters by Racey & Ridd and Ridd & Racey)

Racey, A. & M.F. Ridd (2015)- Myanmar offshore petroleum overview. In: A. Racey & M.F. Ridd (eds.) *Petroleum geology of Myanmar*, Chapter 6, Geological Society, London, Memoir 45, p. 57-62.

(Myanmar offshore petroleum exploration since 1972, with main regions Rakhine (=Ganges-Brahmaputra delta), Moattama and Tanintharyi (=Ayeyarwaddy Delta). Mainly gas fields, with main discoveries Zawtika (2.05 Tcf), Shwe/ShwePhyu/Mya (4.09 Tcf biogenic gas in distal Bengal Fan), Yadana (2.89 Tcf in E Miocene carbonates in forearc basin setting) and Yetagun (1.5 Tcf, 41 MMb condensate, thermogenic)

Racey, A. & M.F. Ridd (2015)- Petroleum geology of the Moattama region, Myanmar. In: A. Racey & M.F. Ridd (eds.) *Petroleum geology of Myanmar*, Chapter 6, Geological Society, London, Memoir 45, p. 63-81.

(Offshore Moattama Region dominated by Martaban Basin, between Yadana- M8 highs in W and Tanintharyi Shelf in E. Late Oligocene- E Miocene carbonate platform of Yadana- M8 highs (with Yadana and smaller gas fields) overlies volcanic arc basement, and is overlain by thin U Miocene- Recent clastics from ancestral Ayeyarwady River. In C part of Martaban Basin area thick Miocene clastics from ancestral Ayeyarwady and Thanlwin Rivers (with Zawtika biogenic gas field))

Racey, A. & M.F. Ridd (2015)- Petroleum geology of the Tanintharyi region, Myanmar. In: A. Racey & M.F. Ridd (eds.) *Petroleum geology of Myanmar*, Chapter 8, Geological Society, London, Memoir 45, p. 83-91.

Racey, A. & M.F. Ridd (2015)- Petroleum geology of the Rakhine region, Myanmar. In: A. Racey & M.F. Ridd (eds.) *Petroleum geology of Myanmar*, Chapter 9, Geological Society, London, Memoir 45, p. 93-108.

(Rakhine Basin off NW Myanmar (with Shwe gas field) also extends onshore under Rakhine coastal lowlands (with small oil fields). Rakhine Coastal Lowlands represents S-ward extension of hydrocarbon-bearing regions of Assam and E Bangladesh. Structurally complex onshore and offshore shelf area separated from poorly structured deepwater area by dextral trench-parallel shear fault system which represents boundary between India Plate in W and Burma Platelet in E)

Rajkakati, M., S.K. Bhowmik, A. Ao, T.R. Ireland, J. Avila, G.L. Clarke, A. Bhandari & J.C. Aitchison (2019)- Thermal history of Early Jurassic eclogite facies metamorphism in the Nagaland Ophiolite Complex, NE India: New insights into pre-Cretaceous subduction channel tectonics within the Neo-Tethys. *Lithos* 346–347, 105166, p.

(Eclogite from fossil accretionary complex in Nagaland, at N end of Indo-Myanmar Ranges, provides oldest evidence for Neo-Tethyan subduction along eastern part of Yarlung-Tsangpo suture zone. Represents a ~ 205–172 Ma (mainly E Jurassic) subduction burial-exhumation cycle in eastern Neo-Tethys)

Rangin, C. (2017)- Active and recent tectonics of the Burma Platelet in Myanmar. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, p. 53–64.

(Burma Platelet covers W part of Myanmar, between Indian Plate/ Bengal Basin in W and Sunda Plate in E. Boundaries are active Sagaing dextral strike-slip fault in E, and debatable Bengal Basin subduction zone in W. Non-rigid sliver plate with several right-lateral shear zones accommodated N-ward India/Sunda dextral wrench movement, with hyper-oblique convergence since E Cenozoic)

Rangin, C., T. Maurin & F. Masson (2013)- Combined effects of Eurasia/Sunda oblique convergence and East Tibetan crustal flow on the active tectonics of Burma. *J. Asian Earth Sciences* 76, p. 185–194. (online at: https://www.academia.edu/63733152/Combined_effects_of_Eurasia_Sunda_oblique_convergence_and_East_Tibetan_crustal_flow_on_the_active_tectonics_of_Burma)

(Deformation of India/ Sunda plate result of partitioned oblique convergence. Sub-meridian dextral strike slip faulting accommodates India/Sunda motion in buffer zone (Burma platelet). This wide dextral strike slip shear zone is complicated by side effect of Tibet plateau collapse. Apparent E-W shortening component of hyper-oblique subduction is only effect of regional gravitational forces related to Tibet plateau collapse whereas N-S strike slip faulting accommodates India/Sunda motion)

Ridd, M.F. (2015)- East flank of the Sibumasu block in NW Thailand and Myanmar and its possible northward continuation into Yunnan: a review and suggested tectono-stratigraphic interpretation. *J. Asian Earth Sciences* 104, 5 160–174.

(E flank of Sibumasu block was passive continental margin, marked in NW Thailand by absence of M Permian-Triassic platform carbonates, widespread across Sibumasu further W. Instead, hemipelagic cherts, mudstones and sandstones including turbidites. Devonian-Triassic accretionary wedge in front of Sukhothai volcanic arc thrust W-wards across E flank of Sibumasu in M-L Triassic, then became source of terrigenous clastic rocks in foredeep basin in W. Boundary with Sibumasu Permo-Triassic carbonate platform further W is Mae Ping-Nam Teng Fault system. N-wards in Myanmar and Yunnan Sibumasu Permo-Triassic carbonate shelf continues as Shan Plateau and Baoshan Block. E flank is represented by Changning-Menglian Belt, and Paleotethys 'cryptic suture' in Thailand possibly joins with Lancangjiang Suture)

Ridd, M.F. (2016)- Should Sibumasu be renamed Sibuma? The case for a discrete Gondwana-derived block embracing western Myanmar, upper Peninsular Thailand and NE Sumatra. *J. Geological Society, London*, 173, 2, p. 249–264.

(Luxi-Nujiang suture extends from Yunnan into Myanmar and continues into Thailand and Malacca Strait. It separates Gondwana-derived Sibumasu Block into two terranes: (1) Irrawaddy Block in W, with thick Lower Permian, glacial diamictite-bearing sediments (= 'Phuket Slate Belt' of Thailand/ Tengchong Block of Yunnan/ Lhasa Terrane in Tibet? and much of Bohorok facies of Sumatra); (2) Sibuma Block in E, with local, rel. thin, Lower Permian marine ice-rafted deposits (= Shan-Tai Plateau of E Myanmar/ Baoshan Block of Yunnan/ Qiantang Terrane of Tibet?). NE Sumatra diamictite-bearing E Permian probably also part of Irrawaddy Block. Late Cretaceous-Paleogene dextral India-Australia oceanic transform propagated onshore as strike-slip fault, which disrupted Irrawaddy Block)

Ridd, M.F. (2017)- Central Burma Depression and its petroleum occurrences. In: A.H.G. Mitchell, *Geological belts, plate boundaries and mineral deposits in Myanmar*, Elsevier, Chapter 12, p. 325–349.

(Synopsis of Ridd & Racey (2015) papers. All Myanmar onshore oil-gas fields are in 1200km long Central Burma Depression. Possibly oldest oil production/ mining in world. N-S trending basin with up to 15,000m of U Cretaceous- Pleistocene sediments. Most productive fields Yenangyaung, Chauk and Yenangyat)

Ridd, M.F. (2017)- Karen-Tenasserim Unit. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 16, p. 365-384.

(Fault-bounded, N-S trending Karen-Tenasserim Unit of Bender (1983) W of Shan Plateau in southern Central Myanmar is direct continuation of 'Phuket -Slate Belt Terrane' of Ridd (2009) in Peninsular Thailand (and Tengchong Block to N?). With metamorphic rocks (incorrectly called Mogok Metamorphics), overlain by thick U Paleozoic Mergui Gp with intervals of ?Carboniferous- E Permian glacial diamictites and Permian 'Moulmein Limestone' (= Rathburi Lst of Peninsular Thailand; at Myeik/Mergui archipelago of S Myanmar with Lonsdaleia, Schwagerina, Productus sumatrensis, etc.). Also with common granitoid intrusions. Often viewed as W part of Sibumasu Block, but interpreted as separate 'Phuket Terrane' or 'Irrawaddy block' (Mitchell 2012, 2015, Ridd 2016) (but no ophiolites found yet between them)

Ridd, M.F., M. J. Crow & C.K. Morley (2019)- The role of strike-slip faulting in the history of the Hukawng Block and the Jade Mines Uplift, Myanmar. Proc. Geologists Association, London, 130, 2, p. 126-141.

(Hukawng Basin bounded on E by splays of still-active Sagaing Fault. Restoring Myanmar's blocks to their positions before widely-accepted c.400 km dextral strike-slip fault displacement, places Hukawng Block alongside Tengchong Block and Cretaceous–Paleogene Medial-Myanmar Shear Zone aligns with NW-SE Jade Mines Belt. Jadeitite formed there under HP/LT conditions in Mesozoic subduction zone)

Ridd, M.F. & A. Racey (2015)- Introduction to the petroleum geology of Myanmar. In: A. Racey & M.F. Ridd (eds.) Petroleum geology of Myanmar, Chapter 1, Geological Society, London, Memoir 45, p. 1-6.

(Oil and gas produced in Myanmar from Cenozoic sediments in 1200 km-long Central Burma Depression and in Andaman Sea offshore)

Ridd, M.F. & A. Racey (2015)- Regional tectonic setting of Myanmar's petroleum basins. In: A. Racey & M.F. Ridd (eds.) Petroleum geology of Myanmar, Chapter 2, Geological Society, London, Memoir 45, p. 7-12.

(Petroleum-bearing parts of Myanmar in west of country, with geology dominated by oblique collision between continental Sunda (Sibumasu and (W) Burma Plate) Plate in E and N-moving India Plate in W. Sagaing Fault separates W Burma Platelet from Sunda Plate to E. W Burma probably continuation of Woyla terranes of Sumatra, which collided with W side of Sibumasu in Late Jurassic- E Cretaceous)

Ridd, M.F. & A. Racey (2015)- Onshore petroleum geology of Myanmar: Central Burma Depression. In: A. Racey & M.F. Ridd (eds.) Petroleum geology of Myanmar, Chapter 4, Geological Society, London, Memoir 45, p. 21-50.

(All of Myanmar's commercial onshore oil- gas fields in Cenozoic of C Burma Depression. Seven sub-basins. Southern region contains all currently producing fields)

Ridd, M.F. & A. Racey (2015)- Frontier onshore petroleum basins of Myanmar. In: A. Racey & M.F. Ridd (eds.) Petroleum geology of Myanmar, Chapter 5, Geological Society, London, Memoir 45, p. 51-55.

Rietschel, S. & M.H. Nitecki (1984)- Ordovician receptaculid algae from Burma. Palaeontology 27, 2, p. 415-420.

(online at: http://cdn.palass.org/publications/palaeontology/volume_27/pdf/vol27_part2_pp415-420.pdf)

(Fischerites burmensis n.sp. from M Ordovician Wunbye Fm in W part of S Shan State (first receptaculid described from SE Asia) (second is from W Thailand?; Kruse 1989))

Roeder, T. (2015)- Using detrital zircon geochronology to unravel the history of the Naga Hills Ophiolite. M.Sc. Thesis, University of Sydney, p. 1-76.

(online at: <https://ses.library.usyd.edu.au/handle/2123/13535>)

(Naga Hills with dismembered Neotethyan ophiolite suite, assigned Late Jurassic age based on radiolaria from red cherts above ophiolite (Baxter et al., 2011). Naga Hills Ophiolite unconformably overlain by India-derived Phokphur Fm polymict conglomerates (incl. ophiolite debris), with detrital zircon peak ages Jurassic (190-200), Permo-Triassic (200-300 Ma), Cambrian, Mesoproterozoic (~1000-1200 Ma) and Archean (~2700- 2750

Ma), suggestive of SW Australian provenance. Youngest zircon ages 90 Ma (=maximum age of Naga ophiolite emplacement)

Rong, J.Y., K.P. Aung, R.B. Zhan, B. Huang, D.A.T. Harper, Di Chen, H.H. Zhou & X.L. Zhang (2020))- The latest Ordovician *Hirnantia* brachiopod fauna of Myanmar: significance of new data from the Mandalay Region. *Palaeoworld* 29, 1, p. 1-30.

(manuscript online at: <https://durham-repository.worktribe.com/OutputFile/1322582>)

(New, diverse, latest Ordovician *Hirnantia* brachiopod fauna from graptolite-bearing Hwe Mawng Purple Shale Mb of Naungkangyi Group, on Shan Plateau, E of Mandalay. *Hirnantia* fauna is global cool-water fauna, but in SE Asia limited to Sibumasu Terrane and adjacent S China Block. High diversity *Hirnantia* fauna in Myanmar represents ecological differentiation within benthos of Sibumasu Terrane. Also close affinities with S China and Lhasa paleoplates during late M- Late Ordovician, suggesting proximity)

Qiu, Z.L., F.Y. Wu, S.F. Yang, M. Zhu, J.F. Sun & P. Yang (2009)- Age and genesis of the Myanmar jadeite: constraints from U-Pb ages and Hf isotopes of zircon inclusions. *Chinese Science Bull.* 54, 4, p. 658-668.

(U-Pb ages of zircons in Myanmar jadeite from collisional belt between India- Eurasia plates 158 ± 2 Ma (Late Jurassic). Jadeite formation not genetically related to collision of India- Eurasia continental plates)

Rao, R.B.S.T.R. (1930)- The geology of the Mergui District. Geological Survey India Memoir 55, p. 1-62.

(Early description of Carboniferous- Permian Mergui series of S Myanmar, with probable diamictites, overlain by Permian Moulmein Limestone with *Schwagerina*, *Lonsdaleia salinaria*, *Productus sumatrensis*, etc.)

Sahni, M.R. (1937)- Discovery of *Orbitolina*-bearing rocks in Burma, with a description of *Orbitolina birmanica* sp. nov. *Records Geological Survey India* 71, 4, p. 360-375.

(New Lower Cretaceous larger foram species from 'Upper Burma' (Myanmar), now accepted as *Mesorbitolina birmanica*. Many specimens of single species in limestones near Yanbo, Mamtha Chaung and Ku Taung)

Sahni, M.R. (1940)- The Jurassic brachiopoda of the Nayau beds of the Northern Shan States, Burma. *Palaeontologica Indica*, N.S., 30, Mem. 1, p. 1-39.

Saing, U.C. (2003)- Evolution of Neogene Basins in Myanmar. In: B. Ratanasthien et al. (eds.) *Pacific Neogene paleoenvironments and their evolution*, 8th Int. Congress on Pacific Neogene Stratigraphy, Chiang Mai, 2003, p.

San, K.K., N.C. Fraser, D. Foffa, O. Rieppel & S.L. Brusatte (2019)- The first Triassic vertebrate fossils from Myanmar: Pachypleurosaurs in a marine limestone. *Acta Palaeontologica Polonica* 64, 2, p. 357-362.

(online at: <https://www.app.pan.pl/archive/published/app64/app005942019.pdf>)

(Discovery of two skeletons of unidentified pachypleurosaurs in N Shan States, the first Triassic marine vertebrate fossils from Myanmar. May be among oldest pachypleurosaurs globally. From formation previously mapped as Nwabangyi Dolomite Fm and correlated with Thigaungtaung Lst (E-M Triassic) of S Shan State)

San, K.K., S.M. Thant, K.N. Shantar & S.M. Naw (2018)- A new occurrence of the Middle Devonian unit in the Lashio area, Northern Shan State. *J. Myanmar Academy Arts and Science* 16, 5, p. 19-38.

(online at: [http://www.maas.edu.mm/Research/Admin/pdf/2.%20Khaing%20Khaing%20San\(19-38\).pdf](http://www.maas.edu.mm/Research/Admin/pdf/2.%20Khaing%20Khaing%20San(19-38).pdf))

(New occurrence of M Devonian limestone recognized in lower Maymyo Fm in Lashio area, E Highlands, N Shan State. Interbedded with shale-siltstone with abundant tabulate and rugose corals and gastropods, typical of M Devonian (Eifelian) in Myanmar (Padaukpin coral reef of La Touche, 1913), Europe, USSR, Asia and Australia)

San, K.K., S.M. Thant & Z. Swe (2021)- Study of the stratigraphy of the marine reptile fossil bearing limestone unit in Lashio area, Northern Shan State. *J. Myanmar Academy Arts and Science* 19, 5A, p. 239-248.

(online at: [https://maas.edu.mm/Research/Admin/pdf/22.%20Dr%20Khaing%20Khaing%20San%20\(239-248\).pdf](https://maas.edu.mm/Research/Admin/pdf/22.%20Dr%20Khaing%20Khaing%20San%20(239-248).pdf))

(Triassic outcrops W of Lashio in N Shan State previously mapped by Bronnimann et al (1975) as Late Permian- M Triassic Nwabangyi Dolomite Fm, containing marine reptile-bearing limestone horizon (Pachypleurosaurs). Four main facies (formerly Plateau Limestone of La Touche (1913), etc.))

Sano, T., K. Tani, S. Yoneda, H. Min, T. Htike, Z.M.M. Thein, O. Ishizuka, N. Kusuhashi et al. (2022)- Petrogenesis of isotopically enriched Quaternary magma with adakitic affinity associated with subduction of old lithosphere beneath central Myanmar. *Nature Scientific Reports* 12, 3137, p. 1-11.

(online at: <https://www.nature.com/articles/s41598-022-07097-4>)

(Three Quaternary volcanoes in C Myanmar (Popa, Monywa and Singu; continuation of Andaman arc). Popa Plateau (0.8-0.6 Ma) with high-K rocks and stratovolcano (<0.33 Ma) of medium-K rocks of adakitic affinity. Tied to old subduction zone setting, not related to slab melting)

Sarkar, A., A.K. Datta, B.C. Poddar, B.K. Bhattacharyya, V.K. Kollapuri & R. Sanwal (1996)- Geochronological studies of Mesozoic igneous rocks from eastern India. *J. Southeast Asian Earth Sciences* 13, p. 77-81.

(Variety of Mesozoic basaltic and alkaline igneous rocks on E margin of Indian shield. Igneous rock suites from Meghalaya-Nagaland region with K-Ar ages of 149-107 Ma (Late Jurassic-E Cretaceous). Mantle upwelling in extensional tectonic regime related to fragmentation of Indian plate from Australia-Antarctica in E Cretaceous main trigger for magmatic activity. Includes latest Jurassic age of 148 ± 4 Ma for basalts of Nagaland Ophiolite Complex)

Satyabala, S.P. (2003)- Oblique plate convergence in the Indo-Burma (Myanmar) subduction region. *Pure and Applied Geophysics* 160, 9, p. 1611-1650.

(online at: https://www.researchgate.net/publication/225546885_Oblique_Plate_Convergence_in_the_Indo-Burma_Myanmar_Subduction_Region)

(Indo-Burma (Myanmar) subduction boundary highly oblique to direction Indian plate motion relative to Eurasian plate. Area includes Wadati-Benioff zone of earthquakes, magmatic arc, fold-thrust belts. Also oblique subduction features-like arc-parallel strike-slip fault (Sagaing Fault) and buttress (Mishmi block) that resists the motion of fore-arc sliver. Study of earthquakes consistent with model of M Miocene- Recent E-ward subduction, volcanic activity and transcurrent movement)

Searle, D.L. & B.T. Haq (1964)- The Mogok belt of Burma and its relationship to the Himalayan orogeny. In: G. Kohli et al. (eds.) *Himalayan and Alpine orogeny*, Proc. 22nd International Geological Congress, New Delhi 1964, 11, p. 132-161.

Searle, M.P. (2006)- Role of the Red River shear zone, Yunnan and Vietnam, in the continental extrusion of SE Asia. *J. Geological Society, London*, 163, p. 1025-1036.

(1000km long Ailao Shan-Red River fault zone from SE Tibet to Gulf of Tonkin and S China Sea. Left-lateral strike-slip shearing along Red River shear zone started after 21 Ma, not 35 Ma as previously thought, and fault was purely crustal structure. None of geological features used to propose 500-1000 km offsets are robust, and total offset remains unknown (but see also Tang et al. 2012; JTVG))

Searle, M.P., J.M. Garber, B.R. Hacker, Kyi Htun, N.J. Gardiner, D.J. Waters & L.J. Robb (2020)- Timing of syenite-charnockite magmatism and ruby and sapphire metamorphism in the Mogok Valley Region, Myanmar. *Tectonics* 39, 3, e2019TC005998, p. 1-21.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019TC005998>)

(Mogok metamorphic belt (MMB) extends for >1,000 km along C Burma from Andaman Sea to the Et Himalayan syntaxis and represents exhumed lower and middle crustal metamorphic rocks of Sibumasu plate. In the Mogok valley region marbles with world class ruby and sapphire gemstones. Marbles intruded by charnockite-syenite sheet-like intrusions that have skarns around margins, with U-Pb zircon ages Jurassic (170-168 Ma), latest Cretaceous- E Paleocene (68-63 Ma), and late Eocene-Oligocene (44-21 Ma). Metamorphism between ~45 and 24 Ma, all related to India-Sibumasu collision)

Searle, M.P., C.K. Morley, D.J. Waters, N.J. Gardiner, U Kyi Htun., T.T. Nu & L.J. Robb (2017)- Tectonic and metamorphic evolution of the Mogok Metamorphic and Jade Mines Belts and ophiolitic terranes of Burma (Myanmar). In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 12, p. 261-293.

(Mogok High-T Metamorphic terrane along W margin of Sibumasu/ Shan Plateau in Myanmar (Burma) thought to be S-ward continuation of Lhasa block of S Tibet. S of Burma MMB may extend into tin granite province of Mergui coast and S to Phuket. MMB has little in common with Western granite belt of peninsula Malaysia, dominated by Triassic tin-bearing biotite granites. Includes Jade Mines Belt (ophiolitic mantle rocks subjected to high-P metamorphism). Peak metamorphism time ~M-L Eocene (~43-33 Ma), rapid exhumation in late E Miocene (~16-22 Ma))

Searle, M.P., S.R. Noble, J.M. Cottle, D.J. Waters, A.H.G. Mitchell, Tin Hlaing & M.S.A. Horstwood (2007)- Tectonic evolution of the Mogok metamorphic belt, Burma (Myanmar) constrained by U-Th-Pb dating of metamorphic and magmatic rocks. *Tectonics* 26, 3, p. 1-24.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2006TC002083/epdf>)

(Mogok belt of high-grade metamorphic rocks of Birma extends >1500 km along W margin of Shan-Thai block. Previous geochronology suggested long-lasting Jurassic- E Cretaceous subduction-related event with emplacement of granodiorites and orthogneisses (171-120 Ma) and poorly constrained Tertiary metamorphic event. New U-Pb isotope data suggest two Tertiary metamorphic events affecting MMB: (1) Paleocene ~59 Ma and (2) Late Eocene- Oligocene (at least from 37 (47?) to 29 Ma))

Searle, M.P., R.M. Palin, N.J. Gardiner, Kyi Htun & J. Wade (2023)- The Burmese jade mines belt: origins of jadeitites, serpentinites and ophiolitic peridotites and gabbros. *J. Geological Society, London* 180, 4, jgs2023-004, p. 1-15.

(online at: <https://pubs.geoscienceworld.org/jgs/article-pdf/doi/10.1144/jgs2023-004/6205744/jgs2023-004.pdf>)

(Ophiolitic peridotites in Burma (Myanmar) along three major tectonic zones: (1) western ophiolite along E side of Indo-Burman Ranges, the Kalemyo-Nagaland suture (~mid-Cretaceous), (2) central Jade Mines belt with (3) possibly offset, related eastern Tagaung-Myitkyina belt (~mid-Jurassic; at E side of West Burma Plate). All belts with harzburgite-lherzolite-dunite peridotites, but only Hpakan-Taw Maw region in Jade Mines belt in N Shan State hosts jadeitites (associated with serpentinitised peridotites, affected by widespread metasomatism))

Sein, C. (2020)- A new *Stegolophodon* (Proboscidea, Mammalia) from the Irrawaddy Formation of Myanmar. *Open Journal of Geology* 10, p. 863-873.

(online at: https://www.scirp.org/pdf/ojg_2020081015304371.pdf)

(New fossil teeth of Stegolophodon (Proboscidea, Mammalia) from terrestrial Irrawaddy Fm in Kyauksaungsan and Tebingan areas, Magway Region, C Myanmar. New species Stegolophodon iravaticus shares characters of advanced Stegolophodon and primitive Stegodon)

Sein, C., J. van der Made & G.E. Rossner (2009)- New material of *Propotamochoerus* (Suidae, Mammalia) from the Irrawaddy Formation, Myanmar. *Neues Jahrbuch Geologie Palaontologie, Abhandlungen* 251, 1, p. 17-31.

(New records of Late Miocene Propotamochoerus from Lower Irrawaddy Fm at Tebingan in Myanmar (P. "hysudricus", P. wui). Presence in Myanmar indicates faunal affinities between India, SE Asia and S China)

Sengupta, S., S.K. Acharyya, H.J. van den Hul & B. Chattopadhyay (1989)- Geochemistry of volcanic rocks from the Naga Hills Ophiolites, northeast India and their inferred tectonic setting. *J. Geological Society, London*, 146, p. 491-498.

(Highly disrupted and deformed slices of ophiolitic rocks occur in linear belt in Nagaland and Manipur, known as the Naga Hills Ophiolites. Principal rock types dunite, harzburgite, lherzolite, wehrlite, pyroxenite and mafic volcanics. Volcanics low-Ti and high-Ti groups, probably not cogenetic. Low-Ti group overlapping Mid-Ocean Ridge Basalt and island arc-like characteristics, and possibly suggest back-arc basin setting. High-Ti group similarities with within-plate basalts erupted at off-axis seamounts)

Sengupta, S., K.K. Ray, S.K. Acharyya & J.B. de Smeth (1990)- Nature of ophiolite occurrences along the eastern margin of the Indian Plate and their tectonic significance. *Geology (GSA)* 18, p. 439-442.

(U Mesozoic- Lower Eocene ophiolitic rocks in two parallel belts along E margin of Indian plate: (1) E belt: C Burma, Sumatra and Java, with gravity highs from steeply dipping mafic rocks, and denotes line of subduction prior to M Eocene (root zone of Cretaceous-Paleocene oceanic crust?) (2) W belt: Nagaland, Manipur, W Burma, and Andaman, flanked to E by negative gravity anomaly zone, with rootless subhorizontal ophiolites overlying Eocene-Oligocene flysch of Indo-Burmese Range (W-propagating ophiolite nappes from E belt during late Oligocene terminal collision of Indian and Eurasian continental blocks) (but associated with M Eocene ophiolite-derived clastics?). Late Oligocene unconformity in entire region Ophiolite occurrences in Andaman and Mentawai islands belong to W belt; generally linked with active subduction W of island arc, but subduction began only in Late Miocene and could not have produced ophiolites emplaced much earlier)

Sevastjanova, I., R. Hall, M. Rittner, S.M.T.L. Paw, T.T. Naing, D.H. Alderton & G. Comfort (2015)- Myanmar and Asia united, Australia left behind long ago. *Gondwana Research* 32, p. 24-40.

(online at: http://searg.rhul.ac.uk/pubs/sevastjanova_etal_2016%20West%20Burma.pdf)

(New data from heavy minerals and detrital zircon ages of Late Triassic Halobia-bearing Pane Chaung Fm turbidite sandstones of Chin Hills in E Indo-Burman Ranges of W Myanmar. Intercalated with ultramafic rocks. Sandstones derived from mix of metamorphic, sedimentary and contemporaneous volcanic rocks. Pre-Devonian ages of 'West Burma Plate' Triassic sands closely resemble Sibumasu and W Australia (incl. >2.6 Ga Archean zircons), but differ from Indochina. Significant Permian-Triassic zircon populations (peaks at ~240 and 260 Ma) in W Burma, but not present in NW Australia. This points to proximity of W Burma to SE Asia (tin granites, etc.) in Triassic. W Burma block is therefore not elusive Argo block, as suggested in some models)

Sevastjanova, I., L. Wilson, P. Markwick, C. Davies, A. Quallington & M. Harland (2016)- A source-to-sink study in Myanmar: implications for exploration. AAPG Geoscience Techn. Workshop Characterization of Asian hydrocarbon reservoirs, Bangkok, Search and Discovery Article 30454, p. 1-6. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2016/30454sevastjanova/ndx_sevastjanova.pdf)

(Detrital zircon U-Pb age data from Rakhine Basin shows Precambrian zircons more abundant in present-day river sands compared to Eocene-Miocene. This implies provenance change and increased sediment reworking between Miocene- Present, consistent with suggested rapid uplift of Indo-Burman ranges since Late Miocene)

Shellnutt, J.G. (2014)- The Emeishan large igneous province: a synthesis. *Geoscience Frontiers* 5, 3, p. 369-394.

(online at: www.sciencedirect.com/science/article/pii/S1674987113001072)

(Late Permian Emeishan large igneous province in SW China covers W margin of Yangtze Block (S China Block) and E Tibetan Plateau, with displaced units in N Vietnam (Song Da zone). Contains base metal deposits and is contemporaneous with late Capitanian (~260 Ma) mass extinction. Mainly flood basalts, but also ultramafic and silicic volcanic rocks. Three nearly concentric zones with thicker crust from inner to outer zone. Age of the ELIP constrained to interval of 3 Myrs or less. Uncertainty whether magmas derived from subcontinental lithospheric mantle or asthenosphere/ mantle plume sources or both. ELIP likely derived from short-lived, plume-like upwelling of mantle-derived magmas)

Shellnutt, J.G. (2015)- Igneous Rock associations 16. The Late Permian Emeishan Large Igneous Province. *Geoscience Canada* 42, p. 169-180.

(online at: <https://journals.lib.unb.ca/index.php/GC/article/download/21548/26356>)

(Review of Late Permian Emeishan large igneous province (ELIP) covers W margin of Yangtze Block and Tibetan plateau of SW China, with displaced correlative units in N Vietnam (Song Da zone). Contemporaneous with Late Capitanian mass extinction (260 Ma) erupted in <3 Myrs. Mainly flood basalts, but also also picritic and silicic volcanic rocks. Considered to be mantle plume-derived, albeit with some crustal contamination)

Shellnutt, J.G., S.W. Denyszyn & R. Mundil (2012)- Precise age determination of mafic and felsic intrusive rocks from the Permian Emeishan large igneous province; SW China. *Gondwana Research* 22, 1, p. 118-126.

(New zircon CA-TIMS U-Pb from intrusive rocks of Panxi region (Inner Zone) of M-L Permian ELIP yielded ages between >257 Ma and ~260 Ma, consistent with estimates from magneto-biostratigraphic data)

Shellnutt, J.G. & B.M. Jahn (2011)- Origin of Late Permian Emeishan basaltic rocks from the Panxi region (SW China): implications for the Ti-classification and spatial-compositional distribution of the Emeishan flood basalts. *J. Volcanology Geothermal Research* 199, p. 85-95.

Shellnutt, J.G., T. Usuki, A.K. Kennedy & H.Y. Chiu (2015)- A lower crust origin of some flood basalts of the Emeishan large igneous province, SW China. *J. Asian Earth Sciences* 109, p. 74-85.
(Neoproterozoic (i.e. ~750-850 Ma) zircons in Late Permian Emeishan basalts indicates either assimilation of older material during emplacement or rocks could be derived from mafic Neoproterozoic precursor, like Neoproterozoic Kangdian basalts)

Shellnutt, J.G. & K.L. Wang (2014)- An ultramafic primary magma for a low Si, high Ti-Fe gabbro in the Panxi region of the Emeishan large igneous province, SW China. *J. Asian Earth Sciences* 79, A, p. 329-344.
(Kelang gabbro (256± 3 Ma) in contact with syenite of Late Permian (~260 Ma) Baima igneous complex of Emeishan Large Igneous Province. Gabbro may be uppermost portion of large mafic-ultramafic intrusion unrelated to Baima igneous complex)

Shen, S., Q. Feng, Q. Wei, Z. Zhang & H. Zhang (2006)- A study on the geochemical characteristics of Upper Permian continental marginal arc volcanic rocks in the northern segment of South Lancangjiang Belt. *Chinese J. Geochemistry* 25, 3, p. 216-222.
(Geochemical characteristics of U Permian continental marginal arc volcanics from Xiaodingxi and Zangli on the E side of Yunxian-Lincang granite. Dominated by basalt-andesite-dacite. Lancangjiang Belt, together with ocean-ridge and ocean-island volcanic rocks and ophiolites in Changning-Menglian Belt, indicate Lancangjiang oceanic crust (Paleotethys) subducted E-wards)

Shen, S., Q. Feng, Q. Wei & Z. Zhang (2007)- Newly developed evidence for the original Tethysan island-arc volcanic rocks in the southern segment of the South Lancangjiang Belt. *Chinese J. Geochemistry* 26, 1, p. 91-97.
(Pre-Ordovician metamorphic volcanic rocks in Huimin-Manlai region of Yunnan Province represent Tethysan island-arc volcanic rocks)

Shen, S.Z., G.R. Shi & Z.J. Fang (2002)- Permian brachiopods from the Baoshan and Simao Blocks in Western Yunnan, China. *J. Asian Earth Sciences* 20, 6, p. 665-682.
(Four Permian brachiopod assemblages from W Yunnan, SW China. Faunas from Baoshan Block dominated by species characteristic of Cathaysian Province with some links with Peri-Gondwanan faunas. Simao Block characterised exclusively by taxa of Cathaysian Province)

Shen, S.Z., G.R. Shi & K. Zhu (2000)- Early Permian brachiopods of Gondwana affinity from the Dingjiazhai Formation of the Baoshan block, western Yunnan, China. *Rivista Italiana Paleontologia Stratigrafia* 106, 3, p. 263-282.
(online at: <https://riviste.unimi.it/index.php/RIPS/article/download/6146/6108>)
(28 species and 3 assemblages of E Permian brachiopods in 100-340m thick Dingjiazhai Fm of Baoshan block. In ascending order: (A) Bandoproductus qingshwigouensis- Marginifera semigrariosa (lower member with glacial dropstones; Asselian), (B) Punctocyrtella australis- Punctospirifer afghanus (latest Asselian- E Sakmarian) and (C) Callytharrella dongsbanpoensis (Late Sakmarian-Artinskian; correlative with Late Sakmarian Spinomartinia prolifica assemblage of S Thailand). Uppermost Dingjiazhai Fm with fusulinids Eoparafusulina spp., Schwagerina spp and Triticites. Strong Gondwanan affinity)

Shi, G.H., W. Cui, S. Cao, N. Jiang, P. Jian, D. Liu, L. Miao & B. Chu (2008)- Ion microprobe zircon U-Pb age and geochemistry of the Myanmar jadeitite. *J. Geological Society, London*, 165, p. 221-234.
(Myanmar jadeitite from W part of Sagaing fault belt with three groups of zircons: (1) ~163 Ma, indicating M Jurassic igneous (oceanic crust formation) or hydrothermal (serpentinization) event; (2) ~146.5 Ma, with

jadeite inclusions, suggesting Late Jurassic age of formation of Myanmar jadeitites, and subduction of E Indian oceanic plate; (3) 122 Ma, representing later unknown thermal event)

Shi, G.H., D.A. Grimaldi, G.E. Harlow, J. Wang, J. Wang, M. Yang, W. Lei, Q. Li & X. Li (2012)- Age constraint on Burmese amber based on U-Pb dating of zircons. *Cretaceous Research* 37, p. 155-163.

(online at: www.cugb.edu.cn/uploadCms/file/20600/20170113080954938661.pdf)

(Commercially exploited Cretaceous amber (burmite) from clastic rocks rich in volcanics in Hukawng Valley, N Myanmar, with diverse biota. Earlier age estimates Albian- Cenomanian based on palynology and insects. Zircons from amber two age groups: (1) 102-108 Ma; (2) 98.8 Ma (E Cenomanian; viewed as maximum age for burmite). Ages also indicate volcanic activity at ~98.8 Ma in area)

Shi, G.H., G.E. Harlow, J. Wang, E. Ng, X. Wang, S. Cao & W. Cui (2012)- Mineralogy of jadeitite and related rocks from Myanmar: a review with new data. *European J. Mineralogy* 24, 2, p. 345-370.

(online at: https://www.academia.edu/93342228/Mineralogy_of_jadeitite_and_related_rocks_from_Myanmar_a_review_with_new_data)

(Jadeitite composed almost entirely of jadeite and related pyroxene. Found in subduction channel serpentinite melange associated with High P/ low T metamorphosed rocks, but generally more rare than eclogite or blueschist. Late Jurassic jadeitite from Myanmar Jade Mine Tract at W side of Sagaing Fault diverse mineralogy, with >30 minerals: jadeite, omphacite, kosmochlor, etc. Primary jadeitite veins in serpentinite with albitite and/or amphibolite boundaries. Two or more stages of jadeitization. Late-stage zeolites, pectolite, hyalophane, etc. formed at lower P and T. Jadeite-forming fluids rich in Na, Al, Ba, Sr and Ca. Most rocks in serpentinite melanges subject to infiltration and potential replacement by jadeitite or reaction with jadeitite)

Shi, G.H., N. Jiang, Y. Liu, X. Wang, Z.Y. Zhang & Y.J. Xu (2009)- Zircon Hf isotope signature of the depleted mantle in the Myanmar jadeitite: implications for Mesozoic intra-oceanic subduction between the Eastern Indian Plate and the Burmese Platelet. *Lithos* 112, p. 342-350

(Lu-Hf isotope signatures of zircons in jadeitite from N Myanmar. Indo-Burma Range interpreted as Eastern subduction zone where oceanic crust of E Indian plate was overridden by Burmese platelet. Jadeite formed in serpentinite, marking subduction zone. Three zircon groups: ~163, 146 and 122 Ma. Zircon in jadeitite can be used to constrain age of serpentinitization/rodingitization, and age of formation of ultramafic rock within ophiolites. Results suggest presence of Mesozoic intra-oceanic subduction in Indo-Burman Range)

Shi, G.H., W. Lei, H. He, Y.N. Ng, Y. Liu, Y.X. Liu, Y. Yuan, Z. Kang & G. Xie (2014)- Superimposed tectono-metamorphic episodes of Jurassic and Eocene age in the jadeite uplift, Myanmar, as revealed by ⁴⁰Ar/³⁹Ar dating. *Gondwana Research* 26, 2, p. 464-474.

(Jade Mine Tract HP ophiolites/ serpentinite melange of Myanmar between Indo-Burma Range and Tagaung-Myiikyina Belt with two contrasting Ar-Ar ages: (1) Late Jurassic (152.4 Ma of glaucophane from blueschist) and (2) M Eocene (~45 Ma) of phengitic muscovites from quartz schists. Late Jurassic Jadeite Uplift possibly related to Woyla intra-oceanic arc subduction zone)

Shi, G.R., Z.Q. Chen & L.P. Zhan (2005)- Early Carboniferous brachiopod faunas from the Baoshan Block, west Yunnan, southwest China. *Alcheringa* 29, 1, p. 31-85.

(38 brachiopod species from Yudong Fm in W Yunnan. Associated coral and conodont faunas suggest late Tournaisian (E Carboniferous) age, possibility extending into early Viséan)

Shi, G.R., Z.J. Fang & N.W. Archbold (1996)- An Early Permian brachiopod fauna of Gondwana affinity from the Baoshan block, western Yunnan, China. *Alcheringa* 20, 81-101.

*(E Permian brachiopod fauna from U Dingjiazhai Fm, 30km S of Baoshan, W Yunnan. Dominated by *Stenosisma*. and *Elivina yunnanensis* n.sp. Strong links with faunas from Bisnain assemblage of Timor and Callytharra Fm of W Australia. Late Sakmarian age suggested)*

Shi, G.R. & S.Z. Shen (2001)- A biogeographically mixed, middle Permian brachiopod fauna from the Baoshan Block, Western Yunnan, China. *Palaeontology* 44, p. 237-258.

(Baoshan Block (= part of Sibumasu complex; JTvG) M Permian brachiopod assemblage with *Cryptospirifer* in from lower Shazipo Fm. Associated with fusulinids *Nankinella*, *Polydixodina* spp. and *Schwagerina*. Overlying U Shazipo Fm 500-700m carbonate contains *Shanita*- *Hemigordiopsis* foram assemblage. Paleogeographical distribution of *Cryptospirifer* overlaps with slightly younger (Capitanian-Wuchiapingian) *Shanita*-*Hemigordius* (*Hemigordiopsis*) foram fauna, also endemic or largely confined to M Permian transitional faunas of Cimmerian region (Baoshan Block))

Shi, G.U., P. Tropper, W. Cui, J. Tan & C. Wang (2005)- Methane (CH₄) -bearing fluid inclusions in the Myanmar jadeitite. *Geochemical J.* 39, 6, p. 503-516.

(Fluid inclusions in high-pressure jadeitites from famous jadeite tract of N Myanmar mostly H₂O (87-94%) and methane (CH₄). Stable isotope ratios of CH₄ indicative of abiogenic thermal maturation, probably from subducted organic carbon in paleosubduction zone. CH₄ may be stable to at least upper 20 km of subduction zone where jadeitite veins formed under low T/ high-P conditions)

Shi, Y. (2010)- Early Permian fusulinids from West Yunnan and their chronological puzzle. In: C.P. Lee et al. (eds.) 6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 42-43. (Abstract only)

(E Permian (Artinskian) fusulinids described recently from W Yunnan Sibumasu/ Cimmerian terranes: *Eoparafusulina*-*Pseudofusulina* faunas from Baoshan; *Eoparafusulina*-*Monodixodina* fauna from Tengchong)

Shi, Y., J.L. Anderson, Z. Wu, Z. Yang, L. Li & J. Ding (2016)- Age and origin of Early Paleozoic and Mesozoic granitoids in Western Yunnan Province, China: geochemistry, SHRIMP zircon ages, and Hf-in-zircon isotopic compositions. *Journal of Geology* 124, 5, p. 617-630.

(E Paleozoic magmatism in Baoshan block (granitoids with zircon Pb/U ages of ~481, 493 Ma and indications of crustal melting/reworking. Tengchong block Late Triassic S-type granites with zircons of 216-226 Ma, probably in post-collisional tectonic setting. Late Early Cretaceous (118 Ma) S-type granite; emplacement may be related to closure of Neotethys ocean)

Shi, Y., H. Huang & X. Jin (2017)- Depauperate fusulinid faunas of the Tengchong Block in western Yunnan, China, and their paleogeographic and paleoenvironmental indications. *Journal of Paleontology* 91, 1, p. 12-24.

(online at: <https://www.cambridge.org/core/journals/journal-of-paleontology/article/depauperate-fusul...>)

(M Permian fusulinids from Shanmutang area, Tengchong Block, W Yunnan, China (= part of Sibumasu) dominated by *Chusenella*, *Nankinella* and *Schwagerina*. In Shuangheyan area mainly *Chusenella* and *Schwagerina* spp. Both dated as Roadian-Capitanian (M Permian). Low diversity through E-M Permian and paucity of M Permian neoschwagerinids and verbeekinids in block confirm Gondwana-affinity and relatively low temperature of seawater. Depauperate assemblages of limited number of species with abundant individuals (E Permian fusulinids in block only three genera, *Eoparafusulina*, *Pseudofusulina* and *Monodixodina*))

Shi, Y., H. Huang, X. Jin & X. Yang (2011)- Early Permian fusulinids from the Baoshan Block, Western Yunnan, China and their paleobiogeographic significance. *Journal of Paleontology* 85, 3, p. 489-501.

(Sakmarian-Artinskian fusulinids from N and S Baoshan and W Yunnan, dominated by *Pseudofusulina* and *Eoparafusulina* spp. and similar to those from C Pamir, S Afghanistan, E-C Iran, C Oman, E Hindu Kush and N Karakorum)

Shi, Y. & X. Jin (2015)- Is the West Burma block Gondwana- or Cathaysia-derived?- A Permian paleobiogeographic and regional geological reappraisal. *Proc. 4th Int. Symposium International Geosciences Program (IGCP) Project 589, Bangkok 2015*, p. 97-99. (Extended Abstract)

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(W Burma block (also called Mount Victoria Land), generally considered as small block of Gondwanan origin, but Barber and Crow (2009) suggested it could be extension of 'Cathaysian' West Sumatra block based on similarities of fusulinid faunas. West Burma with two fusulinid assemblages: (1) *Pseudofusulina postkrafftii* and (2) *Rugososchwagerina* sp. and *Parafusulina*, which occur in Cathaysian region, but also in Gondwana-derived blocks Baoshan, Tengchong, etc.)

- Shi, Y., X. Jin, H. Huang & X. Yang (2008)- Permian fusulinids from the Tengchong Block, Western Yunnan, China. *Journal of Paleontology* 82, p. 118-127.
(Permian fusulinid faunas from N Tengchong Block, SW China. Lower Dadongchang Fm dominated by *Eoparafusulina*, possibly Sakmarian age. Dadongchang Fm mainly *Chusenella* and *Monodioxodina*, indicating Wordian-Capitanian age. Similar to fusulinid assemblages from Baoshan and Sibumasu Blocks (both low diversity without Cathaysian-Tethyan *Pseudoschwagerinidae*, *Verbeekinidae*, *Neoschwagerinidae*))
- Shoup, R.C., A.J. Filipov & M. Hiner (2017)- Geological interpretation of the reservoir and pay distribution of the G3.2 and G5.2 series of the Shwe Field, Myanmar. AAPG/EAGE/MGS 3rd Oil & Gas Conf., Yangon 2017, Search and Discovery Article 20401, p. 1-33.
(online at: www.searchanddiscovery.com/documents/2017/20401shoup/ndx_shoup.pdf)
(Offshore Myanmar Shwe, Shwe Phyu, and Mya gas fields discovered between 2004-2006 in Blocks A1 and A3. in Pliocene deepwater channel sandstones, sourced from NW. Gas biogenic in origin. Recoverable reserves for Shwe Field 2.9- 4.7 TCF, Shwe Phyu 0.4- 0.9 TCF and Mya 1.3- 2.2 TCF)
- Singh, A.K. (2013)- Petrology and geochemistry of abyssal peridotites from the Manipur Ophiolite Complex, Indo-Myanmar orogenic belt, Northeast India: implication for melt generation in mid-oceanic ridge environment. *J. Asian Earth Sciences* 66, p. 258-276.
(Manipur Ophiolite Complex in Indo-Myanmar Orogenic Belt accretionary prism is segment of Cenozoic Tethyan Ophiolite Belt of Alpine-Himalayan orogenic system. Peridotites of mid-oceanic ridge character (low Cr spinels. (U Cretaceous- M Eocene?) dismembered ophiolite and oceanic pelagic sediments now thrust slices at highest tectonic levels of IM Range, overlying U Cretaceous- U Eocene flysch above E-dipping thrust contact. Overthrust from E by continental metamorphic rocks of mica-schists, quartzite and granitic gneiss)
- Singh, A.K. & A. Ao (2024)- Origin, evolution, and emplacement of the Nagaland-Manipur ophiolites, Indo-Myanmar orogenic belt, Northeast India. *Proc. Indian National Science Academy* 91, p. 672-686.
(Nagaland-Manipur Ophiolites characterize Neo-Tethyan ophiolites in Indo-Myanmar Orogenic Belt, which lie along SE extension of Indus-Tsangpo suture zone. NMO represents both mantle and crustal sections. Geochemical affinities to Mid-ocean ridge basalt and Ocean island basalt, formed at pre-subduction and subduction events. Metamorphic records establish intra-oceanic subduction with Neo-Tethys, starting from subduction infancy (warmer subduction channel with hornblende eclogite facies) to more mature-colder stage of subduction (lawsonite/epidote blueschist), culminating in final collision of India plate and Myanmar microplate)
- Singh, A.K., S.L. Chung, R.K. Bikramaditya & H.Y. Lee (2017)- New U-Pb ages of plagiogranites from the Nagaland-Manipur ophiolites, Indo-Myanmar orogenic belt., NE India. *J. Geological Society, London*, 174, 1, p. 170-179.
(E Cretaceous U-Pb zircon ages of plagiogranites from Nagaland-Manipur Ophiolites in Indo-Myanmar orogenic belt (between 116.4 ± 2.2 and 118.8 ± 1.2 Ma; Aptian). Ophiolite overlain by Late Cretaceous pelagic limestones- to Eocene flysch. Ages coeval and geochemically comparable with Neo-Tethyan ophiolites in Indus-Yarlung-Tsangpo Suture to NW. To S ophiolite belt continues to Andaman-Nicobar island arc and Mentawai Islands of outer Indonesian island arc)
- Singh, A.K., S.L. Chung & I.D. Somerville (2022)- Petrogenesis of mantle peridotites in Neo-Tethyan ophiolites from the Eastern Himalaya and Indo-Myanmar Orogenic belt in the geo-tectonic framework of Southeast Asia. *Geological Journal* 57, p. 4886-4919.
(Neo-Tethyan ophiolites of Tuting-Tidding Suture Zone in E Himalaya (Tidding and Mayodia Ophiolite Complexes) and Indo-Myanmar Orogenic Belt (Nagaland and Manipur Ophiolite Complexes) which lie along the southern extension of Indus-Tsangpo Suture Zone formed during subduction tectonics)
- Singh, A.K., L.D. Devi, N.I. Singh, K.S.V. Subramanyam, R.K.B. Singh & M. Satyanarayanan (2013)- Platinum-group elements and gold distributions in peridotites and associated podiform chromitites of the Manipur Ophiolitic Complex, Indo-Myanmar Orogenic Belt, Northeast India. *Chemie der Erde* 73, 2, p. 147-161.

(Platinum group of elements and gold in peridotites and associated podiform chromitites of Neotethyan Manipur Ophiolitic Complex of Indo-Myanmar Orogenic Belt, NE India. PGE content in MOC peridotites 22-79 ppb, slightly higher than primitive mantle peridotites and mantle peridotites in ophiolites)

Singh, A.K., R. Nayak, S. Khogenkumar, K.S.V. Subramanyam, S.S. Thakur, R.K.B. Singh & M. Satyanarayanan (2016)- Genesis and tectonic implications of cumulate pyroxenites and tectonite peridotites from the Nagaland-Manipur ophiolites, Northeast India: constraints from mineralogical and geochemical characteristics. *Geological Journal* 52, 3, p. 415-436.

(Ultramafic sequence of Nagaland- Manipur Ophiolite generated at mid-oceanic ridge tectonic setting, close to E boundary of Indian passive margin, then thrust over continental margin of Indian Plate to W during collision with Myanmar Plate)

Singh, A.K., N.I. Singh, L.D. Devi & R.K.B. Singh (2012)- Geochemistry of mid-ocean ridge mafic intrusives from the Manipur Ophiolitic Complex, Indo-Myanmar Orogenic Belt, NE India. *J. Geological Society India* 80, 2, p. 231-240.

Singh, A.K., V.C. Tewari, A.N. Sial, P.P. Khanna & N.I. Singh (2016)- Rare earth elements and stable isotope geochemistry of carbonates from the melange zone of Manipur ophiolitic Complex, Indo-Myanmar orogenic belt, Northeast India. *Carbonates and Evaporites* 31, 2, p. 139-151.

(Carbonates in Neotethyan melange zone of Manipur Ophiolitic complex (= NE India-Myanmar plates collision zone/ accretionary prism). Melange with Late Cretaceous (Santonian- Maastrichtian) pelagic limestones that originally formed cover of ophiolitic oceanic crust, also Eocene flysch and younger molasse)

Sloan, R.A., J.R. Elliott, M.P. Searle & C.K. Morley (2017)- Active tectonics of Myanmar and the Andaman Sea. In: A.J. Barber et al. (eds.) *Myanmar: geology, resources and tectonics*, Geological Society, London, Memoir 48, p. 19-52.

(online at: <http://mem.lyellcollection.org/content/memoirs/48/1/19.full.pdf>)

(Active tectonics of Myanmar controlled by combination of: (1) continuing N-wards penetration of India into Asia; (2) active shear along right-lateral Sagaing strike-slip fault, and region to W; (3) active E-dipping Burma Seismic Zone indicating subduction of downgoing plate to >150 km; (4) CW rotation around E Himalayan Syntaxis and series of arcuate strike-slip faults in N Shan Plateau; and (5) active extensional and strike-slip tectonics in back-arc Andaman Sea)

Smith, S. (1941)- Some Permian corals from the Plateau Limestone of the Southern Shan States, Burma. *Palaeontologia Indica*. N.S., 30, 2, p. 1-21.

(Permian corals from Plateau Limestone of E Myanmar (= Sibumasu Block). With rel. common solitary rugose ncl. Lophophyllidium orientale, Pavastephyllum), also Protomichelinia, Wentzelella cf timorica Gerth (= Paraipicyllum?; Fontaine 1988). (= part of 'Cyathaxonia faunas' from Sibumasu Terrane of Wang et al. 2013)

Socquet, A., B. Goffe, M. Pubellier & C. Rangin (2002)- Le metamorphisme Tardi-Cretace a Eocene des zones internes de la chaine Indo-Birmane (Myanmar occidental): implications geodynamiques. *Comptes Rendus Geoscience* 334, 8, p. 573-580.

(online at: [https://comptes-rendus.academie-sciences.fr/geoscience/item/10.1016/S1631-0713\(02\)01796-0.pdf](https://comptes-rendus.academie-sciences.fr/geoscience/item/10.1016/S1631-0713(02)01796-0.pdf))

('Late Cretaceous to Eocene metamorphism of the internal zone of the Indo-Burma range (western Myanmar): geodynamic implications'. Metamorphism of Triassic schists in internal zone of Indo-Burma range ((Kamptetlet schists in metamorphic dome associated with Nagaland ophiolite). During prograde metamorphism, geothermal gradient evolves from 'normal' crust (30 °C/km) to thickened crust (18 °C/km). Peak conditions ~8 kbar and 450 °C. Thickening (25-30 km) probably between Late Cretaceous and Eocene, in front of obduction. Retrograde path implies slow exhumation, along shear zone)

Socquet, A. & M. Pubellier (2005)- Cenozoic deformation in western Yunnan (China-Myanmar border). *J. Asian Earth Sciences* 24, p. 495-515.

(online at: https://www.researchgate.net/publication/253165883_Cenozoic_to_active_deformation_in_Western_Yunnan_Myanmar_China_border)

(On Tertiary clockwise rotation of crustal blocks of E Himalayas around NE edge of India)

Soe A.N., Myitta, S.T. Tun, A.K. Aung, T. Thein, B. Marandat, S. Ducrocq & J.J. Jaeger (2002)- Sedimentary facies of the late Middle Eocene Pondaung Formation (central Myanmar) and the palaeoenvironments of its anthropoid primates. *Comptes Rendus Palevol* 1, 3, p. 153-160.

(Primate-bearing Pondaung Fm in NW part of C Myanmar mainly composed of cyclic sequences of sandstones and variegated clays, deposited in fluvio-deltaic environment. Anthropoid primate remains in swale-fill sediments, sometimes in carbonate nodules of pedogenetic origin and in small crevasse channel deposits of U Pondaung Fm)

Soe Min, I.M. Watkinson, Soe Thura Tun, Win Naing & Tin Lwin Swe (2017)- The Kyaukkyan Fault, Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics. Geological Society, London, Memoir 48, Chapter 21, p. 453-471.

(Kyaukkyan Fault active N-S dextral strike-slip structure across W Shan Plateau, parallel to and ~100-150 km E of central Sagaing Fault. Probable Late Oligocene- M Miocene onset of dextral shear)

Soibam, I., M.C. Khuman & S.S. Subhamenon (2015)- Ophiolitic rocks of the Indo-Myanmar Ranges, NE India: relicts of an inverted and tectonically imbricated hyper-extended continental margin basin? In: G.M. Gibson et al. (eds.) Sedimentary basins and crustal processes at continental margins: from modern hyper-extended margins to deformed ancient analogues, Geological Society, London, Special Publ. 413, p. 301-331.

(online at: www.academia.edu/42349896/Ophiolitic_rocks_of_the_Indo_Myanmar_Ranges_NE_India_Etc)
(Indo-Myanmar Ranges structural and tectonic features best explained by dextral shear and oblique subduction of Indian Plate below Myanmar Plate. U Cretaceous- Lower Eocene ophiolitic rocks Alpine-type harzburgite and lherzolite enriched in trace and rare earth elements, also diabase dykes, pillow basalts. Formation and unroofing probably by mantle exhumation in hyperextended continental margin setting. Paleomagnetic data suggest no latitudinal change since formation)

Socquet, A. (2003)- Accommodation du mouvement relatif entre l'Inde et la Sonde depuis la Faille de Sagaing jusqu'à la Syntaxe Est Himalayenne. Doct. Thesis Université Paris-Sud (Paris XI), p. 1-195.

(online at: <https://theses.hal.science/tel-00006110v1/file/tel-00006110.pdf>)

(‘Accommodation of relative movement between India and Sunda, from the Sagaing Fault to the East Himalaya syntax’. Arakan-Yunnan-Myanmar tectonics, incorporating, geology, earthquakes, GPS motions, etc.)

Socquet, A., C. Vigny, N. Chamot-Rooke, W. Simons, C. Rangin & B. Ambrosius (2006)- India and Sunda plates motion and deformation along their boundary in Myanmar determined by GPS. *J. of Geophysical Research* 111, B05406, p. 1-11.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2005JB003877/epdf>)

(New GPS India-Eurasia motion slower than previous determinations and predict India-Sunda relative motion of 35 mm/yr oriented N10° at latitude of Myanmar. Sagaing Fault only accommodates 18 mm/yr of right-lateral strike slip. Two models of how and where remaining deformation may occur)

Soe, T.T. & I.M. Watkinson (2017)- The Sagaing Fault. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 19, p. 413-441.

(ms online at: https://pure.royalholloway.ac.uk/ws/portalfiles/portal/29857365/Soe_Thura_Tun_and_Watkinson_accepted.pdf)

(Sagaing Fault in Myanmar one of world's longest and most active strike-slip faults in World. N-S trending. Accommodates more than half of right-lateral motion between Sundaland and India. Etc.)

Stamp, L.D. (1922)- An outline of the Tertiary geology of Burma. *Geological Magazine* 59, 11, p. 481-501.

(Main physical geographic belts of Myanmar: (1) Shan Plateau, in E: N-S trending belt of highly folded Paleozoic and E Mesozoic rocks; continuous with plateau of Yunnan; main folding post-E Jurassic and pre-late

Tertiary; (2) Central Tertiary Belt; (3) Arakan Yoma foldbelt in W. With detailed discussion of Tertiary stratigraphy and paleogeography)

Stamp, L.D. (1927)- Conditions governing the occurrence of oil in Burma. J. Institution of Petroleum Technologists, London, 13, p. 21-70.

(online at: <https://babel.hathitrust.org/cgi/pt?id=mdp.39015064479754&seq=55>)

(Summary of historic oil fields of onshore Myanmar, with production figures sine ~1917-1925. Similar to paper below)

Stamp, L.D. (1927)- The geology of the oil fields of Burma. American Assoc. Petroleum Geol. (AAPG) Bull. 11, 6, p. 557-579.

(Oil fields of Burma in long N-S line in Tertiary synclinal trough in central part of country, bounded in E by Shan Plateau and in W by Arakan Yoma/ Naga Hills, originally marine gulf, filled in by clastics of Chindwin and Irrawaddy Rivers. Oil-bearing reservoirs mainly deltaic. Main fields from N to S: Indaw, Yenangyat-Singu, Yenangyaung, Minbu, Padaukpin and Yenanna. Largest producer Yenangyaung (3,000,000,000 gallons since 1900). Singu has largest reserves. Discovery of important new fields unlikely)

Stamp, L.D. (1934)- Natural gas fields of Burma. American Assoc. Petroleum Geol. (AAPG) Bull. 18, 3, p. 315-326.

Steckler, M.S., S.H. Akhter & L. Seeber (2008)- Collision of the Ganges–Brahmaputra Delta with the Burma Arc: Implications for earthquake hazard. Earth Planetary Science Letters 273, 3–4, p. 367-378.

(online at: <https://www.academia.edu/download/1565172/Steckler2008BanglaTectonics.pdf>)

(Ganges-Brahmaputra Delta and fan (GBD; sediments from Himalayan collision, prograded 400km S since Eocene) is largest depositional system in the world). Has now has entered subduction zone of the continental Burma Arc)

Steckler, M.S., D.R. Mondal, S.H. Akhter, L. Seeber, L. Feng, J. Gale, E.M. Hill & M. Howe (2016)- Locked and loading megathrust linked to active subduction beneath the Indo-Burman Ranges. Nature Geoscience 9, p. 615-618.

(online at: <https://academiccommons.columbia.edu/doi/10.7916/D83J3KSZ>)

(GPS measurements of plate motions in Bangladesh, combined with measurements from Myanmar and NE India show 13-17 mm/yr of plate convergence on active, shallowly dipping and locked megathrust fault. Results suggest subduction in region still active, despite highly oblique plate motion (potential earthquake hazard))

Stojanovic, D., J.C. Aitchison, S. Kachovich, K. Lokho & T.R. Ireland (2016)- New age constraints for the Manipur ophiolitic melange: insights into Tethyan ophiolites of the Indo-Myanmar Range. American Geophysical Union (AGU), Fall General Assembly 2016, Abstract id. T11A-2595, 1p. (Abstract only)

(Manipur Ophiolite Complex disrupted belt of ophiolitic melange along border ranges between Myanmar and NE Indian states Manipur and Nagaland. Ranges formed through collision of Indian plate and displaced elements of Sibumasu terrane that have been sinistrally displaced >450 km along Asian margin by Sagaing fault (Neotethys suture). Well-preserved Lower Cretaceous radiolarian assemblages in green ribbon chert blocks (= minimum age of underlying ophiolitic ocean floor))

Sun, Y., X. Lai, P.B. Wignall, M. Widdowson, J.R. Ali, H. Jiang, W. Wang, C. Yan, D.P.G. Bond & S. Vedrine (2010)- Dating the onset and nature of the Middle Permian Emeishan large igneous province eruptions in SW China using conodont biostratigraphy and its bearing on mantle plume uplift models. Lithos 119, p. 20-33.

(M Permian Emeishan large igneous province of SW China. Conodont ages show eruptions began in M Capitanian Jinogondolella altudaensis Zone (~263 Ma) and increased in J. xuanhanensis Zone (~262 Ma). Postulated km-scale plume-related domal uplift prior to Emeishan eruptions not supported by data; rather more complex interaction between plume and lithosphere with minor localized uplift and subsidence is inferred)

Suzuki, H., La Ja, M. Maung, Aung Kyaw Thin & K. Kuwahara (2020)- The first report on Early Cretaceous Radiolaria from Myanmar. Paleontological Research (Palaeontological Society of Japan) 24, 2, p. 103-112.

(manuscript online at: https://www.academia.edu/112447372/The_First_Report_on_Early_Cretaceous_Radiolaria_from_Myanmar)

(First report on Cretaceous radiolarians from Tagaung Taung area, C Myanmar, from contorted bedded chert at W edge of Shan-Tennasserim Massif. Radiolaria mainly 'Tan Sin Hok species', indicating E Cretaceous age (Hauterivian-Barremian) age. Associated with beds with foraminifera Orbitolina kurdica, O. cf. concava, Oligostegina sp. and Dictyoconus, assumed to be of Albian-Cenomanian age)

Suzuki, H., M. Maung, Zaw Win, T. Tsubamoto, M. Maung, N. Egi, M. Takai & N. Shigehara (2006) Stratigraphic positions of the Eocene vertebrate localities in the Paukkaung area (Pondaung Formation, Central Myanmar). Asian Paleoprimatology, Kyoto, 4, p. 67-74.

(online at: https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/199770/1/aspp_04_067.pdf)

(Detailed survey of ~275m thick Upper Member of Eocene Pondaung Fm W of Paukkaung, to clarify stratigraphic relationship among the localities of fossil vertebrates. Most localities (Pk1, Pk2, Pk3, Pk4, Pk5 and Pk8) in single claystone (Ayoedawpon Taung Claystone), which overlies widely traceable Ayoedawpon Taung Sst. Localities Pk9 and Pk12 below and above this claystone)

Suzuki, H., M. Maung, N.S. Aung & N. Shigehara (2006)- Lithostratigraphy of the Pondaung Formation (Eocene) between Tabyin and Kyauktakha to the west of Pauk, Central Myanmar. Asian Paleoprimatology, Kyoto, 4, p. 75-97.

(online at: https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/199769/1/aspp_04_075.pdf)

(Pondaung Fm along Tabyin-Kyauktakha route composed of sandstone, siltstone and claystone with minor coal, acidic tuff and pebbly sandstone. Thickness~1170m. Upper Member mainly sandstone that, unlike in areas of Pale and Myaing, did not preserve fossil vertebrates)

Swe, Y.M., C.C. Aye & K. Zaw (2017)- Gold deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 25, p. 557-572.

(>300 gold occurrences in Myanmar, in 6 main associations: porphyry and epithermal deposits in Late Cretaceous- Paleogene Central Magmatic Arc; orogenic gold; skarn, sediment-hosted, Slate Belt-hosted and quartz veins in ophiolite-greenschist units)

Swe, Z.N., A.A. Khan. Myo Min & K.P. Aung (2019)- Permian exposed in the Hopang area, Wa Self-Administered Division, Northern Shan State, Myanmar. J. Myanmar Academy Arts and Science 17, 5, p. 67-79.

(online at: <https://maas.edu.mm/Research/Admin/pdf/Vol.XVII%20No.5%20Geol+Geog.pdf>)

(Plateau Limestone in northern Shan State, E Myanmar. Hopang limestone in Permian of study area with fusulinid horizons with common Cancellina spp and Pseudofusulina, Parafusulina, Nankinella and Toriyamaia. Dominance of Cancellina and absence of Misellina and Neoschwagerina indicate Late Kungurian age (late Early Permian) (assemblage not reported before from Shan State = part of Sibumasu Block))

Tainsh, H.R. (1950)- Tertiary geology and principal oil fields of Burma. American Assoc. Petroleum Geol. (AAPG) Bull. 34, p. 823-855.

(Review of Tertiary geology of Myanmar. Gravity minimum of Arakan Yoma runs through Andaman Islands to join gravity low of Vening Meinesz, SW of Sumatra along Mentawai Islands. Gravity maximum associated with Burma volcanic line can be traced to volcanoes of Narcondam and Barren Island in Andaman area may correspond to high of volcanic belt of Sumatra. Major oil fields near Irrawaddy River in C part of Upper Burma. Principal oil fields described are Chauk- Lanywa and Yenangaung anticlinal structures)

Tanaka, K., C. Mu, K. Sato, K. Takemoto, D. Miura, Y. Liu, H. Zaman et al. (2008)- Tectonic deformation around the eastern Himalayan syntaxis: constraints from the Cretaceous palaeomagnetic data of the Shan-Thai Block. Geophysical J. International 175, p. 713-728.

(E-M Cretaceous red sandstones sampled at four localities in Lanpin-Simao fold belt of Shan-Thai Block. Shan-Thai Block ~20° CW rotation in early stage of India-Asia collision, followed by S-ward displacement along Red River Fault before 32 Ma, then subjected to N-S compressive stresses from 32-27 Ma, shaping structure of Chongshan- Lancang- Chiang Mai Belt. Some local CW rotation in Pliocene-Quaternary in central Shan-Thai)

Tapponnier, P., R. Lacassin, P.H. Leloup, U. Schairer, Zhong D., Liu X., Ji S., Zhang L. & Zhong J. (1990)- The Ailao Shan/Red River metamorphic belt: Tertiary left-lateral shear between Indochina and South China. *Nature* 343, p. 431-437.

(Ductile shear in Ailao Shan/Diancang Shan metamorphic belt along Red River in Yunnan, S. China, with >500 km of mylonites with horizontal lineations on steep, NW-striking foliation planes, and left-lateral kinematic indicators. U-Pb radiometric ages of ~23 Myr imply strike-slip movement in earliest Miocene. Collision of India with Asia displaced Indochina at least 500km SE relative to S China)

Tarrass, I., P. Dattilo, P. Bourguignon, S. Van De Beuque & J.P. Thiriet (2017)- Turbidite systems of the East Andaman Basin (Myanmar): impacts on exploration. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference. 2017, Singapore, 2p. (Abstract)*

(Andaman Sea series of pull-apart basins formed in right lateral strike slip regime in back-arc setting. Volcanic basement overlain by Eocene and younger carbonate and clastic sequences. Oligocene- E Miocene shelf clastics sourced from E, with carbonate platforms and reefs mainly on W volcanic highs. Huge siliciclastic succession related to Irrawaddy Delta from U Miocene-present. Large slope channels, extending in abyssal plain)

Teillet, T., F. Fournier, J. Borgomano & Fei Hong (2020)- Origin of seismic reflections in a carbonate gas field, Lower Miocene, offshore Myanmar. *Marine and Petroleum Geology* 113, 104110, p. 1-22.

(manuscript online at: <https://hal.science/hal-03164591/document>)

(Yadana gas field in Andaman Sea in Late Oligocene- E Miocene Burma Limestone reservoir. Seismic reflection horizons may follow boundaries between different diagenetic units (see also discussion by Paumard et al. 2021))

Teillet, T., F. Fournier, F. Gisquet, L.F. Montaggioni, J. Borgomano, Q. Villeneuve & Fei Hong (2019)- Diagenetic history and porosity evolution of an Early Miocene carbonate buildup (Upper Burman Limestone), Yadana gas field, offshore Myanmar. *Marine and Petroleum Geology* 109, p. 589-606.

(online

at:

https://www.researchgate.net/publication/334087663_Diagenetic_history_and_porosity_evolution_of_an_Early_Miocene_carbonate_buildup_Upper_Burman_Limestone_Yadana_gas_field_offshore_Myanmar)

(Diagenetic history of Upper Burman Limestone reservoir in Oligo-Miocene offshore Yadana platform major carbonate gas reservoir in Andaman Sea, off Myanmar (& Tcf gas). High porosity (av. 28%) mainly as microporosity, moldic and vuggy porosity. Long-term depositional hiatus (M-L Miocene) at top of reservoir related to platform drowning and non-deposition in deep marine setting. Microporosity development and sparry calcite cementation mainly occurred in marine to marine shallow burial environments. Major decrease in porosity (10%) below gas-water contact suggests porosity evolution after hydrocarbon emplacement).

Teillet, T., F. Fournier, L.F. Montaggioni, M. BouDagher-Fadel, J. Borgomano, J.C. Braga, Q. Villeneuve & Fei Hong (2020)- Development patterns of an isolated oligo-mesophotic carbonate buildup, early Miocene, Yadana field, offshore Myanmar. *Marine and Petroleum Geology* 111, p. 440-460.

(manuscript online at: https://discovery.ucl.ac.uk/id/eprint/10114014/1/Teillet_Yadana_development_patterns_300518_v1.pdf)

(Development history of 160m of upper part of Oligocene- E Miocene Yadana buildup in N Andaman Sea. Three types of carbonate factories: (1) scleractinian, (2) echinodermal and (3) large benthic foraminiferal- coralline algal. Carbonate accumulation on Yadana platform controlled by light, nutrients and hydrodynamic conditions)

Thiangtham, C. (2019)- Diagenetic controls on reservoir quality in the Miocene carbonate reservoir interval, offshore Myanmar. *Bull. Earth Sciences Thailand (BEST)* 11, 2, p. 13-24.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246766/167748>)

(PTTEP study of M Miocene carbonates, deposited atop volcanics or volcanoclastic sediments, offshore Myanmar. More carbonate cement precipitation than in Late Oligocene- E Miocene platform carbonate of Yadana gas field 90 km to N)

Thong, G.T., W. Imchen & T. Walling (2022)- Geochemical evidences on the origin and paleo-oceanic depositional setting of the Naga Hills Ophiolite cherts, North East India. *Geological Journal* 57, 8, p. 3114-3134.

(Jurassic-Cretaceous Tethyan oceanic chert of Naga Hills Ophiolite tectonically juxtaposed with mafics and ultramafics during M Eocene along Indo-Myanmar Ranges (SE extension of Indus-Yarlung-Tsangpo Suture))

Thornton, S.E. (2015)- The history of oil exploration in the Union of Myanmar. AAPG/SEG Int. Conf. Exhib., Melbourne 2015, Search and Discovery Article 10807, p. 1-34. (*Abstract + Presentation*)
(online at: https://www.searchanddiscovery.com/documents/2015/10807thornton/ndx_thornton.pdf)
(*After centuries of indigenous oil mining in hand-dug wells in C Burma Basin (oil exported to India since 1855). First 'western' cable-tool oil well drilled in 1887 by Burmah Oil Co. (parent company of Anglo-Persian company, which became British Petroleum/ BP in 1954). By 1915 there were >4000 wells in Yenengyaung field. Foreign oil companies in Myanmar since 1988 (Unocal, etc.) discovered large offshore gas fields*)

Thornton, S.E. (2016)- Regional tectonics, structure and history of petroleum exploration in the Union of Myanmar (nee Burma). Houston Geological Society Bull., December 2016, p. 23-29.
(*Brief review of presentation; see also more extensive summary Thornton (2015)*)

Thu, K. & K. Zaw (2017)- Gem deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, p. 497-529.

Thu, Y.K., M. Enami, T. Kato & M. Tsuboi (2017)- Granulite facies paragneisses from the middle segment of the Mogok metamorphic belt, central Myanmar. J. Mineralogical and Petrological Sciences 112, 1, p. 1-19.
(online at: https://www.jstage.jst.go.jp/article/jmps/112/1/112_160526/_pdf/-char/en)
(*Metamorphic conditions in 1500km long Mogok metamorphic belt at W margin of Shan-Thai (Sibumasu) Block vary from lower amphibolite to granulite facies. Metamorphic grade increases from E to W, perpendicular to N-S extensional direction of Mogok belt. Granulite facies rocks widespread in middle segment of Mogok belt. Main metamorphic event Paleogene and younger*)

Tin Aung Myint, Than Than Nu & Min Aung (2014)- Precious and base metal mineralization in Kwinthonze-Nweyon area, Singu and Thabeikkyin Townships, Mandalay Region, Myanmar. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI), Palembang, p. 343-354.
(*Gold-silver and base metal mineralization in Kwinthonze-Nweyon area in Mogok Metamorphic Belt*)

Tun, Soe Thura & I.M. Watkinson (2017)- The Sagaing Fault, Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 19, p. 413-441.
(*N-S trending and relatively straight Sagaing Fault across Myanmar 1500 km long active strike-slip fault that accommodates more than half of right-lateral motion between Sundaland and India, within diffuse plate boundary along E margin of India, which occupies much of Myanmar. Ridge-subduction transform linking major thrust systems in N (E Himalaya) to Andaman Sea spreading center S. N-ward younging strike-slip segments. Little evidence for pre-M Miocene movement, but more diffuse dextral slip possibly accommodated 300-700 km of offset since Eo-Oligocene*)

Udchachon, M., P. Charusiri, H. Thassanapak & C. Burrett (2018)- A new section of Lower Palaeozoic rocks in Kayin State (Southeast Myanmar). Proc. Geologists Association, London, 129, 2, p. 215-226.
(*Lower Paleozoic rocks mapped in Kayin State (= Sibuma Block). Three new formations with thickness >900 m, Lower siliciclastics overlain by predominantly carbonate with M Ordovician conodonts. Older formations probable correlate to S Shan State of Myanmar and Lower Ordovician siliciclastics of W Thailand. Folds in Lower Paleozoic rocks overturned to NE; deformation in one major phase between Tournaisian- E Permian*)

Uddin, A., W.E. Hames & K.M. Zahid (2010)- Laser $^{40}\text{Ar}/^{39}\text{Ar}$ age constraints on Miocene sequences from the Bengal basin: implications for Middle Miocene denudation of the eastern Himalayas. J. of Geophysical Research: Solid Earth 115, 7, B07416, p. 1-9.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2009JB006401>)
(*Orogenic sedimentation began in Bengal basin by E Miocene. Laser $^{40}\text{Ar}/^{39}\text{Ar}$ age determinations of detrital muscovite grains from E-M Miocene Bhuvan Fm show ages from ~12 Ma- 516 Ma, suggesting derivation from combination of sources. Modes of ~16, 18, 26 and 40 Ma most consistent with unroofing of Higher Himalayas*)

since E Miocene. Detrital ages of ~16 and 22 Ma most prominent in highest levels, consistent with M Miocene unroofing of crystalline rocks of E Himalayas)

Uddin, A., P. Kumar & J.N. Sarma (2007)- Early orogenic history of the eastern Himalayas: compositional studies of Paleogene sandstones from Assam, northeast India. *International Geology Review* 49, p. 798-810.
(Disang Fm deep marine flysch-type sequence of cherts, carbonaceous mudstones and fine-grained sandstones of Late Eocene age in front of obducted Naga ophiolites= foreland basin fill?)

Uddin, A. & N. Lundberg (1998)- Unroofing history of the eastern Himalaya and the Indo-Burman ranges; heavy-mineral study of Cenozoic sediments from the Bengal Basin, Bangladesh. *Journal of Sedimentary Research* 68, 3, p. 465-472.

(U Eocene- Neogene fill of Bengal basin provides unroofing history of E Himalaya and Indo-Burman ranges. Quartzose sandstones of Eocene-Oligocene Fms only 0.2% heavy minerals, most likely sourced from Indian craton immediately to W. E Miocene sandstones of Surma Gp contain more heavy-minerals, indicating mostly metamorphic source rocks. U Miocene U Surma Gp also abundant blue-green amphibole, orthopyroxene, and sparse chromite, suggesting deeper exhumation, of high P metamorphic and ophiolitic rocks)

Uddin, A. & N. Lundberg (1998)- Cenozoic history of the Himalayan-Bengal system: sand composition in the Bengal Basin, Bangladesh. *Geological Society of America (GSA) Bull.* 110, 4, p. 497-511.

Uddin, A. & N. Lundberg (2004)- Miocene sedimentation and subsidence during continent-continent collision, Bengal basin, Bangladesh. *Sedimentary Geology* 164, 1-2, p. 131-146.

(Bengal basin complex foreland basin S of eastern Himalayas, with dramatic variability in Neogene sediment thickness. Basin originally formed as trailing margin SE of Indian continent, complicated by convergence with S Asia to N and oblique convergence with Burma to E)

Ueno, K., Y. Mizuno, X. Wang & S. Mei (2003)- Artinskian conodonts from the Dingjiazhai Formation of the Baoshan Block, West Yunnan, Southwest China. *Journal of Paleontology*. 76, 4, p. 741-750.

(E Permian conodonts from U Dingjiazhai Fm diamictite-bearing unit, in Gondwana-derived Baoshan Block. Conodont fauna in limestones in upper part of formation consists of *Sweetognathus* spp. *Mesogondolella*, etc., dated as M Artinskian. Dingjiazhai Fm overlain by basaltic volcanics related to rift volcanism during separation of Baoshan Block from Gondwanaland. Faunas including brachiopods and fusulinids from limestones interpreted as middle latitudinal, non-tropical, and Gondwana-influenced assemblage developed at N margin of Gondwanaland just after deglaciation (Ueno 2000))

Ueno, K., Myint Thein & A.J. Barber (2016)- Permian fusuline fauna from the Minwun Range, Central Myanmar. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 6. (Abstract only)

(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)

(Fault-bounded blocks of Permian limestones in Sagaing Fault Zone (associated with ophiolites of C Ophiolite Belt?) at Minwun Range with Permian fusulinids containing abundant *Chalaroschwagerina*, together with *Pseudofusulina kraftii*, *Levenella*, *Pamirina*, *Schubertella*, *Toriyamaia*, *Minojapanella*, and *Pseudoreichelina*. Age late Yakhtashian (late E Permian) age and Tethyan/ Cathaysian paleobiogeographic affinity)

Ueno, K. & S. Tsutsumi (2009)- Lopingian (Late Permian) foraminiferal faunal succession of a Paleo-Tethyan mid-oceanic carbonate buildup: Shifodong Formation in the Changning-Menglian Belt, West Yunnan, SW China. *Island Arc* 18, 1, p. 69-93.

(Late Permian foraminiferal succession in Changning-Menglian Belt (closed remnants of Paleo-Tethys Ocean). Shifodong Fm is uppermost unit in thick Carboniferous-Permian carbonate section on oceanic seamount basalts. Sixteen fusuline taxa, 3 zones: *Codonofusiella kwangsiana*, *Palaeofusulina minima* and *Palaeofusulina sinensis* Zones. Foram fauna in Paleo-Tethyan shallow-marine environment high faunal diversity, comparable to circum-Tethyan shelves like S China, and more diversified than coeval mid-oceanic Panthalassan faunas like Kamura Lst in Jurassic accretionary complex of SW Japan)

Ueno, K., Y. Wang & X. Wang (2003)- Fusulinoidean faunal succession of a Paleo-Tethyan oceanic seamount in the Changning-Menglian Belt, West Yunnan, Southwest China: an overview. *Island Arc* 12, 2, p. 145-161.
(*Fusulinids from Paleo-Tethyan seamount-type carbonates of Changning-Menglian Belt, SW China (= main Paleo-Tethys suture in E Asia). Basalts and overlying carbonates ~1100m thick with 17 late E Carboniferous-M Permian fusulinid zones. Tropical Tethyan-type succession, although diversity lower than those of Paleo-Tethyan shelves, such as S China, Indochina, and C Asia*)

U Aung Khin & U Kiaw Win (1966)- Geology and hydrocarbon prospects of the Burma Tertiary geosyncline. *Union of Burma J. of Science and Technology*, 1966, p. 53-73.

U Ko Ko (2016)- Structural observations along the Salin-Pyay Pleistocene strike-slip deformation belt. 2nd AAPG/EAGE/MGS Conference Unlocking the complex geology of Myanmar, Yangon 2015, Search and Discovery Article 10845, p. 1-17. (*Abstract + Presentation*)
(online at: www.searchanddiscovery.com/documents/2016/10845ko/ndx_ko.pdf)
(*Major Pleistocene strike-slip deformation over 200- 300 km wide belt of Myanmar sedimentary basins between Sagaing fault and escarpment between shallow and deep waters of Rakhine Yoma foldbelt. Tied to N-ward translational subduction of India below SE Asia plates*)

Ukstins Peate, I. & S.E. Bryan (2008)- Re-evaluating plume-induced uplift in the Emeishan large igneous province. *Nature Geoscience* 1, p. 625-629.
(*Mantle plumes should generate broad domal uplift (>1000 km wide, 500-1000m high) preceding volcanism in large igneous provinces. Most of Emeishan large igneous province in SW China emplaced at sea level, with no evidence for dynamic pre-volcanic uplift. Any positive relief that developed more likely result of formation of volcanic edifice and rapid accumulation of volcanic pile*)

Ukstins Peate, I. & S.E. Bryan (2009)- Pre-eruptive uplift in the Emeishan? *Nature Geoscience* 2, p. 531-532.
(*Part of discussion-reply with He et al. 2009, who argue for subaerial volcanism, as demonstrated by plant fossils (Cladophlebis permica)*)

Utitsan, S., T. Benjawan, S. Thanatit, W. Wetmongkongorn, U.S. Than, K.H. Myint & L.B. Wah (2014)- Geological evolution of Bago-Yoma Basin, Onshore Myanmar. AAPG Asia Pacific Region AAPG/MGS Conf., Yangon 2014, Search and Discovery Article 10659, p. 1-10. (*Extended Abstract*)
(online at: www.searchanddiscovery.com/documents/2014/10659utitsan/ndx_utitsan.pdf)
(*Bago-Yoma Basin 1 of 8 Tertiary basins in onshore Myanmar, with up to 14km of Late Cretaceous-Cenozoic deposits. Basins in N-S trend between Indo-Myanmar ranges to W and Shan Plateau to E. Basins experienced NW-SE extension in Miocene, followed by NE-SW transpression in Pliocene during change of maximum horizontal stress direction. Bago-Yoma Basin SE of main petroleum producing fields of C Myanmar Basin*)

Varga, R.J. (1997)- Burma. *Encyclopedia of Earth Science*, Springer, p. 109-121.

Verencar, A., A. Saha, S. Ganguly & C. Manikyamba (2021)- Tectono-magmatic evolution of Tethyan oceanic lithosphere in supra subduction zone forearc regime: geochemical fingerprints from crust-mantle sections of Naga Hills Ophiolite. *Geoscience Frontiers* 12, 3, 101096, p. 1-23.
(online at: www.sciencedirect.com/science/article/pii/S1674987120302280)
(*Naga Hills Ophiolite belt in Indo-Myanmar range represents segment of Tethyan oceanic crust and upper mantle, involved in E-ward convergence and collision of Indian and Burmese Plates in Late Cretaceous-Eocene. Lithologies correspond to boninitic to slab-proximal island arc tholeiite affinity, suggesting NHO represents Neotethys intra-oceanic supra subduction zone fore arc crust and upper mantle*)

Vigny, C., A. Socquet, C. Rangin, N. Chamot-Rooke, M. Pubellier, M.N. Bouin, G. Bertrand & M. Becker (2003)- Present-day crustal deformation around Sagaing fault, Myanmar. *J. of Geophysical Research: Solid Earth* 108, B11, 2533, p. 1-10.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2002JB001999>)

(GPS campaign in Myanmar in 1998 and 2000 around Sagaing fault system in C Myanmar, near Mandalay. Oblique slip of India along rigid Sundaland block accommodated by partitioned system characterized by distribution of deformation over wide zone)

Vredenburg, E. (1921)- Results of a revision of some portions of Dr. Noetling's second monograph on the Tertiary fauna of Burma. Records Geological Survey India 51, 3, p. 224-302.

(online at: <https://ia801608.us.archive.org/6/items/in.ernet.dli.2015.20723/2015.20723.Records-Of-The-Geological-Survey-Of-India--Vol-51.pdf>)

(Revisions of identifications of F. Noetling (1901) of molluscs from post-Eocene beds of Myanmar)

Wandrey, C. J. (2006)- Eocene to Miocene composite Total Petroleum System, Irrawaddy-Andaman and North Burma geologic provinces, Myanmar. U.S. Geological Survey Bull. 2208-E, p. 1-26.

(online at: <https://pubs.usgs.gov/bul/2208/E/pdf/B2208-E.pdf>)

(Eocene-Miocene petroleum system produced most hydrocarbons in C Burma Basin and Irrawaddy Delta. Structural traps predominant, but stratigraphic traps likely in both ancient and modern delta environments. Mean undiscovered resources estimated at 725 MMB Oil and 20.5 TCFG gas)

Wandrey, C.J., C.J. Schenk, T.R. Klett, M.E. Brownfield, R.R. Charpentier, T.A. Cook, R.M. Pollastro & M.E. Tennyson (2012)- Assessment of undiscovered oil and gas resources of the Central Burma Basin, Irrawaddy-Andaman, and Indo-Burman Geologic Provinces, Myanmar. U.S. Geological Survey (USGS) Fact Sheet 2012-3107, 2p.

(online at: <http://pubs.usgs.gov/fs/2012/3107/>)

Wang, C., J. Deng, E.J.M. Carranza & M. Santosh (2013)- Tin metallogenesis associated with granitoids in the southwestern Sanjiang Tethyan Domain: nature, deposit types, and tectonic setting. Gondwana Research 26, 2, p. 576-593.

(Tin mineralization in SW Sanjiang Tethys Sn metallogenic domain in SW China extends from SE Asia tin belt in S. C part of domain is Changning-Menglian Sn belt and related to ~239-178 Ma (M Triassic- E Jurassic) S-type granitoids generated by Tengchong/Baoshan- Simao Blocks collision (= Paleotethys closing). W part of domain is Tengchong/ Baoshan Sn metallogenic belt, related to Cretaceous S-type granitoids (136-113 Ma, resulting from W Burma- Tengchong/Baoshan Blocks collision and 89-52 Ma, corresponding to India- Asia continental collision. Permian (298-262 Ma) I-type granitoids include Lincang granodiorite)

Wang, J.G., F.Y. Wu, X.C. Tan & C.Z. Liu (2014)- Magmatic evolution of the Western Myanmar Arc documented by U-Pb and Hf isotopes in detrital zircon. Tectonophysics 612-613, p. 97-105.

(online at: https://es.nju.edu.cn/_upload/article/files/01/b4/a58f3a9a45208702f8465f9257f4/ec882d99-d5d5-4758-b298-c08a4f2b5254.pdf)

(Magmatic arc that formed along Asian margin of Neo-Tethys well studied in Trans-Himalaya in Tibet, but SE extension of arc poorly documented in Myanmar. Detrital zircons from Chindwin Basin indicate mid-Cretaceous arc magmatism in W Myanmar (main magmatic stage ~110-80 Ma, with subordinate stage at ~70-40 Ma))

Wang, M. & D. Cheong (2016)- Reconstruction of burial history and analysis of the hydrocarbon potential using sedimentary modeling the middle Bengal Fan, Myanmar. Geosciences Journal 20, 6, p. 813-825.

(Bengal Fan 3 stages of evolution: I (4.5-1.81 Ma; low sedimentation and subsidence), II (1.81-0.79 Ma; highest sedimentation and rapid subsidence), and III (0.79-0 Ma; high sedimentation, slowest subsidence). Biogenic gas typical hydrocarbon in area; generation and migration probably immediately after deposition of Unit 2. Thermogenic hydrocarbon potential low due to relatively low T and short burial)

Wang, X.D., G.R. Shi & T. Sugiyama (2002)- Permian of West Yunnan, Southwest China: a biostratigraphic synthesis. J. Asian Earth Sciences 20, p. 647-656.

(Permian stratigraphic successions in Changning-Menglian Belt range from passive margin, active margin to oceanic basin and seamounts. Permo-Carboniferous carbonate faunas typical Cathaysian (common fusulinids, compound rugose corals). Permian of Tenchong and Baoshan blocks different: Baoshan Block Lower Permian mainly siliciclastic with cool-water faunas and possibly glaciogene diamictites, overlain by basalts and

volcaniclastics of probable rift origin, U Permian carbonates with mixed Cathaysian- Gondwanan faunas. Tengchong Block similar to Baoshan, but lacks volcanics)

Wang, X.D., T. Sugiyama & K. Ueno (1998)- Carboniferous and Permian stratigraphy of the Baoshan Block, West Yunnan, Southwest China. *Permophiles, Newsletter Permian Stratigraphy* 32, p. 38-40.
(Carboniferous and Permian stratigraphy of Baoshan Block (comparable to Sibumasu Block; Gondwana-derived terranes in present-day SE Asia). Basal Permian includes diamictites of possible glaciomarine origin, fusulinid forams *Pseudofusulina* and *Eoparafusulina*, small solitary corals incl. *Cyathaxonia* and basaltic lavas. M Permian Shazipo Fm limestone with forams *Eopolydixodina*, *Neoschwagerina* sp., *Verbeekina*, *Shanita amosi*, *Hemigordius* and massive corals)

Wang, X.D., T. Sugiyama, K. Ueno, Y. Mizuno, Y. Li, W. Wang et al. (2000)- Carboniferous and Permian zoogeographical change of the Baoshan Block, SW China. *Acta Palaeontologica Sinica* 39, 4, p. 493-506.
(Carboniferous- Permian of Baoshan block three main sequences: (1) Lower Carboniferous carbonates (warm, diverse, and abundant 'Eurasian' faunas), (2) Lower Permian siliciclastics (cold, low diverse faunas; conodont *Sweetognathus* fauna at top; glacio-marine diamictites, Sakmarian- E Artinskian; 'peri-Gondwanan') (3) M Permian carbonates (warm water but low diverse fauna; 'marginal Cathaysian/Cimmerian'). Cimmerian blocks comparable in Carboniferous- E Permian. In M Permian E Cimmerian blocks (Sibumasu s.s, Baoshan, Tengchong) not far from Paleo-Eequator, but further than W Cimmerian blocks (lack of *Eopolydixodina* and *Neoschwagerina* fusulinids, corals *Thomasiphyllum*, *Wentzelophyllum*)

Wang, X.D., K. Ueno, Y. Mizuno & T. Sugiyama (2001)- Late Paleozoic faunal, climatic, and geographic changes in the Baoshan block as a Gondwana-derived continental fragment in southwest China. *Palaeogeogr. Palaeoclim. Palaeoecology* 170, p. 197-218.

(Carboniferous-Permian of Baoshan Block of W Yunnan 3 main sequences: (1) Lower Carboniferous carbonate (diverse warm-water 'Eurasian-affinity' faunas, incl. *Cyathaxonia* coral fauna), (2) Lower Permian Asselian-Sakmarian 'peri-Gondwanan' cold water siliciclastics with diamictites overlain by E Artinskian carbonate with low diversity fusulinids *Pseudofusulina*- *Eoparafusulina*, also *Cyathaxonia* coral fauna, and Artinskian rift basalts; (3) M Permian 'marginal Cathaysian/ Cimmerian' carbonates; warm water, but low diversity fusulinids incl. *Eopolydixodina*, also *Shanita* and coral assemblage with *Wentzelophyllum* and of lower diversity than in Cathaysian regions. Upper Carboniferous absent)

Wang, Y. (2013)- Earthquake geology of Myanmar. Ph.D. Thesis, California Institute of Technology, Pasadena, p. 1-300.

(Earthquake distributions in Myanmar suggest three distinct active structural systems that accommodate oblique convergence between Indian plate and SE Asia and extrusion of Asian territory around E syntaxis of Himalayan Range. Focus on right-lateral Sagaing fault and oblique subducting N Sunda megathrust)

Wang, Y., K. Sieh, S.T. Tun, K.Y. Lai & Than Myint (2014)- Active tectonics and earthquake potential of the Myanmar region. *J. of Geophysical Research* 119, 4, p. 3767-3822.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/2013JB010762/epdf>)

(In Myanmar and immediate surroundings three tectonic systems accommodate oblique collision of Indian plate with SE Asia and extrusion of Asia. Subduction and collision associated with Sunda megathrust under and in Indoburman Range and Naga Hills accommodate most of shortening across transpressional plate boundary. Sagaing fault system dominant locus of dextral motion associated with N-ward translation of India. Left-lateral faults of N Shan Plateau, N Laos, Thailand and S China facilitate extrusion of rocks around E syntaxis of Himalaya. All systems produced major earthquakes in recorded history)

Wang, Y., X. Xing, P.A. Cawood, S. Lai, X. Xia, W. Fan, H. Liu & F. Zhang (2013)- Petrogenesis of early Paleozoic peraluminous granite in the Sibumasu Block of SW Yunnan and diachronous accretionary orogenesis along the northern margin of Gondwana. *Lithos* 182-183, p. 67-85.

(SW Yunnan Shan-Tai terrane with E-M Ordovician granitoids with zircon ages of 492-460 Ma. S-type granites, representing S-ward continuation of E Paleozoic granitic belt of E Gondwana N margin)

Wang, Y., L. Zhang, P.A. Cawood, L. Ma, W. Fan, A. Zhang, Y. Zhang & X. Bi (2014)- Eocene supra-subduction zone mafic magmatism in the Sibumasu Block of SW Yunnan: implications for Neotethyan subduction and India-Asia collision. *Lithos* 206-207, p. 384-399.

(Metabasic rocks in NW Yunnan crystallized at 50-55 Ma and metamorphosed at ~39 Ma. Suggest E Eocene magmatism in NW Yunnan represents E-ward continuation of Gangdese magmatic belt and Neotethyan subduction continued until ~50 Ma, followed by India-Asia collision. At least two E-dipping subduction zones in Neotethyan suprasubduction system before 55 Ma. Sudden decrease in convergence rate in E Eocene (55-50 Ma) stimulated rollback of downgoing slab and induced melting of mantle sources)

Wang, Y., A. Zhang, W. Fan, T. Peng, F. Zhang, Y. Zhang & X. Bi (2010)- Petrogenesis of late Triassic post-collisional basaltic rocks of the Lancangjiang tectonic zone, southwest China, and tectonic implications for the evolution of the eastern Paleotethys: geochronological and geochemical constraints. *Lithos* 120, 3, p. 529-546.

(Xiaodingxi and Manghuihe volcanic sequences of Lancangjiang igneous zone in SW China with zircon ages of ~214 and 210 Ma (~Late Norian), i.e. ~15-20 Myrs younger than syn-collisional granite magmatism (230-241 Ma; ~Carnian). Tectonic model involving E-ward subduction in E Permian and collision in Triassic proposed for E Paleotethys Ocean. During Late Triassic, upwelling of asthenospheric mantle, shortly after slab detachment, may have led to melting of metasomatized mantle wedge, resulting in post-collisional Group 1 and Group 2 magmas)

Wang, Y. & Y. Zhang (2010)- Llandovery sporomorphs and graptolites from the Manbo Formation, the Mojiang County, Yunnan, China. *Proc. Royal Society (London)*, B, 277, p. 267-275.

(online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2842664/>)

(E Silurian (Llandoveryan) sporomorphs and graptolites from Manbo Fm, Mojiang area, W Yunnan (part of Indo-China plate in Palaeozoic). Sporomorphs suggest South China and Indo-China paleo-plates may have been in close proximity in Llandoveryan; both closely related to Gondwanaland)

Wang, Z. & X. Tan (1994)- Palaeozoic structural evolution of Yunnan. *J. Southeast Asian Earth Sciences* 9, p. 345-348.

(Yunling-Wuliangshan zone along SW margin of Yangtze Platform was passive margin in E Paleozoic-Devonian and active margin in Carboniferous-Permian. May be main suture of Paleotethys, after E-M Triassic collision. In SW of area Tengcong-Baoshan block (=Sibumasu; JTVG) with Late Carboniferous ice-rafted deposits and Stepanoviella- Lytvolasma fauna Also possible 'Gondwanan E Permian' Glossopteris flora. Paleomag suggests Baoshan was at latitude 38°S in Devonian and 30° S in Carboniferous. E of Baoshan but W of Paleotethys suture are Gengma Block (with Devonian with Monograptus, M Carboniferous-Permian carbonates with Monodioxodina in Permian, no ice-rafted sediments) and Lincang blocks at E side of Changning-Menglian Fracture. Permian 'Cathaysian' Gigantopteris flora at E side of Lancangjiang suture)

Wen, Z., N. Fang & R. Xin (2016)- Meso-Tethys and Neo-Tethys tectonic evolution in Myanmar and adjacent areas. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 55. *(Abstract only)*

(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)

(Two Tethyan suture zones in Myanmar: (1) Mesotethys Taguang-Myitkyina suture (equivalent of Bangong-Nujiang suture in Tibetan Plateau): ophiolites formation in M Jurassic, M Triassic-E Jurassic subduction under Sibumasu block, and M Jurassic-M Cretaceous West Burma block collision with Sibumasu; (2) Neotethys Yarlung-Tsangpo suture (continuation of Yarlung-Tsangpo suture in Tibetan Plateau): Indo-Burma Range ophiolites formation in E Cretaceous, Late Jurassic-E Cretaceous subduction under West Burma block and Late Cretaceous-Tertiary closing of ocean)

Wernette, S.J. (2020)- Late Cambrian (Furongian) and Lower Ordovician (Tremadocian) trilobites of Sibumasu. Ph.D. Thesis, University of California, Riverside, p. 1-328 *(online at:*

https://escholarship.org/content/qt0rc96905/qt0rc96905_noSplash_c8d76f97031c0f836914ccdfe8058f60.pdf)

(Revision of Cambrian-Ordovician trilobite fauna of Sibumasu Terrane in S Shan State (Myanmar) and Ko Tarutao (Thailand))

Wernette, S.J., N.C. Hughes, P.M. Myrow & Aye Ko Aung (2021)- The first systematic description of Cambrian fossils from Myanmar: Late Furongian trilobites from the southern part of the Shan State and the early Palaeozoic palaeogeographical affinities of Sibumasu. *J. Asian Earth Sciences* 214, 104775, p. 1-22.

(online at: <https://escholarship.org/content/qt7nm4g6n0/qt7nm4g6n0.pdf>)

(Late Cambrian trilobites from Molohein Gp, Linwe area, S Shan State (*Asioptychaspis asiatica*, n.sp. *A. lata* and *Eosaukia buravasi*), also known from Peninsular Thailand. Regional geological data supports placement of Sibumasu adjacent to W Australia during Cambrian, without intervening Lhasa Block, and Baoshan at W end of Sibumasu in E Paleozoic, towards Himalayan margin. New Burmese fauna consistent with these suggestions, as they belong to Sino-Australian faunal province)

Wernette, S.J., N.C. Hughes, P.M. Myrow & A.Sardsud (2023)- Trilobites of Thailand's Cambrian-Ordovician Tarutao Group and their geological setting. *Papers in Palaeontology*, 2023, e1516, p. 1-100.

(online at: <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1002/spp2.1516>)

(Rich trilobite fauna in tuff-bearing U Cambrian- lowermost Ordovician on Ko Tarutao island W of S Peninsular Thailand (= Sibumasu Terrane). Overlain by Ordovician limestones. Lower Paleozoic marginal Gondwanan terrane closely associated with Australia, N China (Sino-Korea), S China, etc. Also suggest Kazakhstani and Laurentian affinities. Two biozones for Sibumasu: *Eosaukia buravasi* Zone (Cambrian) and *Asaphellus charoenmiti* Zone (basal Ordovician). 42 taxa, including one new genus and 10 new species)

Westerweel, J. (2020)- The India-Asia collision from the perspective of Myanmar : insights from paleomagnetism and paleogeographic reconstructions. Doctorat Thesis, Universite de Rennes, France, p. 1-662.

(online at: https://theses.hal.science/tel-03466299v1/file/WESTERWEEL_Jan.pdf)

(Mainly collection of publications authored or co-authored by Westerweel. Three key implications from Myanmar thesis work: (1) Burma Terrane was in equatorial position distant from Asia from Cretaceous until Paleogene, (2) it was incorporated onto Indian Plate in latest Paleocene- M Eocene, and (3) it subsequently moved N-ward with India.(explaining why Burma Terrane does not record major compressional deformation before Late Oligocene- E Miocene with record rapid exhumation of Eastern Himalayan Syntaxis. Data suggest India-Asia collision model with Trans-Tethyan Arc (Burma Terrane), formed from Gondwanan crustal fragments)

Westerweel, J., A. Licht, N. Cogne, P. Roperch, G. Dupont-Nivet, Myat Kay Thi, H. Hnin Swe, H. Huang, Z. Win & D.W. Aung (2020)- Burma Terrane collision and northward indentation in the Eastern Himalayas recorded in the Eocene- Miocene Chindwin Basin (Myanmar). *Tectonics* 39, 10, e2020TC006413, p. 1-30.

(online at: www.researchgate.net/publication/344491955_Burma_Terrane_Collision_and_Northward_Etc.)

(Burma Terrane moved >2000 km N-ward during Cenozoic, before colliding with Asian margin. Tertiary of Chindwin Basin in Burmese forearc two unconformities: (1) late Eocene- M Oligocene (start of collision of India and N extent of Burma Terrane with Asian margin) and latest Oligocene- E Miocene (coeval to major deformation in Myanmar and E Himalayan orogen, probably indentation of Burma Terrane into E Himalayan collision zone)

Westerweel, J., P. Roperch, A. Licht, G. Dupont-Nivet, Z. Win, F. Poblete, G. Ruffet, H.H. Swe, M.K. Thi & D.W. Aung (2019)- Burma Terrane part of the Trans-Tethyan arc during collision with India according to palaeomagnetic data. *Nature Geoscience* 12, 10, p. 863-868.

(online at: <https://insu.hal.science/insu-02283010/document>)

(Paleomagnetic data from Burma Terrane (also called West Burma Block) at E edge of India collision zone, which was part of Trans-Tethyan island arc at near-equatorial S latitude at ~95 Ma, suggesting island endemism for Burmese Cretaceous amber biota. Terrane underwent significant CW rotation between ~80-50 Ma, then translated N on Indian Plate by >2000 km along dextral strike-slip fault in E. Reconstructions suggest initial collision of India with low latitude Trans-Tethyan subduction system at ~60 Ma, followed by collision with Asian margin. Cretaceous arc (~97-87 Ma and younger?). Correlates with intra-oceanic mid-Cretaceous Woyla Arc in Sumatra as part of Incertus Arc and may continue W to Kohistan Arc in Pakistan)

Westerweel, J., P. Roperch, Z. Win & G. Dupont-Nivet (2025)- Northward drift of the Burma Terrane with India during the Cenozoic and implications for the India-Asia collision. In: G. Dupont-Nivet et al. (eds.) Asian geodynamics, climate and biodiversity, Geological Society, London, Special Publ. 549, p. 11-54.

(online at: <https://www.lyellcollection.org/doi/epdf/10.1144/SP549-2024-18>)

(New paleomagnetic results for Paleocene- M Eocene of Burma Terrane indicate it remained at equatorial latitudes during Paleocene- E Eocene, at considerable distance from S Asian margin. Also suggest mainly N-S orientation of Burma Terrane over past 45 Myr, showing it was not part of NW-SE-oriented Sundaland margin before collision with India. More likely part of 'Trans-Tethyan subduction system' in Late Cretaceous- E Paleocene, which amalgamated Burmese volcanic arc with continental fragments of Argoland before drifting N with India towards Asia. Myanmar Cretaceous amber formed on isolated Trans-Tethyan Arc. Etc.)

Whittaker, J., L. Zaninetti & D. Altiner (1979)- Further remarks on the micropalaeontology of the Late Permian of eastern Burma. Notes du Laboratoire Paleontologie Universite de Geneve 5, 2, p. 12-18.

(Companion paper to Zaninetti et al. 1978. Includes records of Late Permian Shanita-Hemigordius benthic foram assemblage in Nwabangyi Dolomite (Part of Plateau Limestone) of southern Shan States, E Myanmar (often viewed as typical of Cimmerian/ Sibumasu Terrans; JTvG))

Win, M.M., M. Enami & T. Kato (2016)- Metamorphic conditions and CHIME monazite ages of Late Eocene to Late Oligocene high-temperature Mogok metamorphic rocks in central Myanmar. J. Asian Earth Sciences 117, p. 304-316.

(High T/ P regional Mogok metamorphic belt in C Myanmar, between W margin of Sibumasu block and E edge of W Burma block. Four age components: ~49 Ma (Late Eocene peak metamorphic upper-amphibolite-granulite stage), 38 Ma, ~28 Ma and ~24 Ma (Late Oligocene postdated hydration stage))

Win, S. & M.M. Myint (1998)- Mineral potential of Myanmar. Resource Geology 48, 3, p. 209-218.

(online at: <https://onlinelibrary.wiley.com/doi/abs/10.1111/j.1751-3928.1998.tb00018.x>)

(Myanmar rich in mineral resources, incl deposits of antimony, chromium, nickel, PGM, copper, gold, lead, zinc, silver, tin and tungsten, which form district metallogenic provinces in six geomorphic-tectonic units.)

Win, T.T., R.M. Davies, W.L. Griffin, P. Wathanakul & D.H. French (2001)- Distribution and characteristics of diamonds from Myanmar. J. Asian Earth Sciences 19, p. 563-577.

(online at: https://www.academia.edu/47120426/Distribution_and_characteristics_of_diamonds_from_Myanmar)

(Diamonds in headless placers at several locations in Myanmar. Common abrasion due to alluvial transport. Brown radiation spots suggest long history in surface environments. Syngenetic minerals mainly of peridotitic paragenesis and include olivine, chromite and native iron. Derivation from upper mantle more likely than from crustal metamorphic sources. Primary source of diamonds alkaline igneous rock (lamproitic rather than kimberlitic) but reached present locations via sedimentary redistribution)

Wolfart, R., U.M. Win, S. Boiteau, M. Wai, P.U. Cung & U.T. Lwin (1984)- Stratigraphy of the Western Shan Massif, Burma. Geologisches Jahrbuch, B57, p. 3-92.

(Extensive review of 'Sibumasu terrane-type' Paleozoic stratigraphy in W Shan Massif, Myanmar)

Wolfart, R., U.M. Win, S. Boiteau, M. Wai, P.U. Cung & U.T. Lwin (1984)- The tectonics of the Western Shan Massif, Burma. Geologisches Jahrbuch, A75, p. 285-294.

Wood, H.M. & J. Wunderlich (2023)- Burma Terrane amber fauna shows connections to Gondwana and transported Gondwanan lineages to the Northern Hemisphere (Araneae: Palpimanoidea). Systematic Biology 72, 6, p. 1233-1246.

(online at: <https://academic.oup.com/sysbio/article/72/6/1233/7235006>)

(Mid-Cretaceous (99 Ma) Burmese amber with plants, insects, etc., formed on Burma Terrane (West Burma Block, Myanmar), which broke away from Gondwana and later collided with Asia. Palpimanoidea spider fauna in amber has Gondwana affinities. Burma Terrane may have facilitated faunal/floral exchange by tectonic transportation of biota from Gondwana into Asia in Cretaceous)

Wopfner, H. (1996)- Gondwana origin of the Baoshan and Tengchong terranes of West Yunnan. In: R. Hall & D. Blundell (eds.) Tectonic evolution of Southeast Asia, Geological Society, London, Special Publ. 106, p. 539-547.

(Baoshan and Tengchong Blocks in W Yunnan, China, have Permo-Carboniferous glaciomarine deposits, cold-water faunas and Glossopteris flora, indicating Gondwana position at that time and part of Sibumasu tectono-stratigraphic unit. Glacial series of Baoshan Block rel. thin and overlain by thick basalts and red beds (volcanic rift setting?). Tengchong Block glacial marine beds >1000m, followed by thick Lower Permian reefal limestones (passive margin?). Both terranes separated from Australian Gondwana in late E Permian. Docking started in Late Triassic, with closure of Changning-Menglian Belt)

Wu, S.Y., S.S. Liu, Y.F. Yang, B. Zhang, H.M. Liang, H. Zhang et al. (2023)- Cassiterite U-Pb age in the Bawapin tin deposit, Tanintharyi Region, southern Myanmar. China Geology 6, 2, p. 358-360.

(U-Pb dating of 24 cassiterite grains from Bawapin deposit. Age result 65.6 ± 1.2 Ma, indicating mineralization of Eocene Bawapin tin deposits resulted from Neo-Tethys subduction under Indochina Block)

Xie, L., W.Q. Yang, G.C. Liu & Q.L. Feng (2011)- Late Paleozoic radiolaria from the Upper Triassic sedimentary melange in Shangrila, Southwest China and its geological significance. Palaeoworld 20, p. 203-217.

(Radiolarians in exotic siliceous blocks in U Triassic sedimentary melange in Shangrila, SW China show Garze-Litang tectonic belt was deep-water basin in E Carboniferous-M Permian)

Xing, X., Y. Wang & Y. Zhang (2016)- Detrital zircon U-Pb geochronology and Lu-Hf isotopic compositions of the Wuliangshan metasediment rocks in SW Yunnan (China) and its provenance implications. J. of Earth Science (China) 27, 3, p. 412-424.

(online at: <http://en.earth-science.net/PDF/20160613095735.pdf>)

(Wuliangshan Gp low-grade metasediments E of Lancang giant igneous zone, SW Yunnan, syn-orogenic product of collision between Baoshan with Simao-Indochina blocks. Detrital zircons major age-peak at ~259 Ma, four subordinate-peaks at ~1859, 941, 788 and 447 Ma. Youngest zircon age of 230 ± 5 Ma suggests deposition after M Triassic. Provenance mainly from Simao/ Yangtze blocks to E rather than Baoshan Block to W)

Xu, H.P., K.P. Aung, Y.C. Zhang, G.R. Shi, F.L. Cai, T. Zaw, L. Ding, K. Sein & S.Z. Shen (2021)- A late Cisuralian (early Permian) brachiopod fauna from the Taungnyo Group in the Zwekabin Range, eastern Myanmar and its biostratigraphic, paleobiogeographic, and tectonic implications. Journal of Paleontology 95, 6, p. 1158-1188

(New brachiopod fauna dominated by Spinomartinia prolifica from uppermost Taungnyo Gp in Zwekabin Range, eastern Myanmar (Sibuas Block). Associated with late Kungurian conodonts Vjalovognathus nicolli and Mesogondolella idahoensis. By the by the end of Cisuralian (E Permian), Sibumasu Block (with with glacial-marine diamictites throughout) comprised Irrawaddy Block in S with cool climatic conditions, and Sibuma Block in N with temperate to warm-water environment, separated by incipient Thai-Myanmar Mesotethys)

Xu, Y.G. & B. He (2007)- Thick, high-velocity crust in the Emeishan large igneous province, SW China: evidence for crustal growth by magmatic underplating or intraplating. Geological Society of America (GSA), Special Paper 430, p. 841-858.

Xu, Y., Z. Yang, Y.B. Tong, H. Wang, L. Gao & C. An (2015)- Further paleomagnetic results for lower Permian basalts of the Baoshan Terrane, southwestern China, and paleogeographic implications. J. Asian Earth Sciences, 104, p. 99-114.

(Baoshan Terrane of SW China part of Cimmerian block in Late Paleozoic. Paleomagnetic studies on lower Permian Woniusi Fm basalts suggest Baoshan Terrane located at latitude $38^{\circ}S \pm 3.7^{\circ}$ in late E Permian. Comparison with E Permian from Gondwanan blocks suggests Baoshan Terrane located near junction of N India and NW Australia, and broke away from W Australia after E Permian. Basalts represent extensional setting and may represent start of separation between Baoshan and Gondwana)

Yan, D.P., M.F. Zhou, C.Y. Wang & B. Xia (2006)- Structural and geochronological constraints on the tectonic evolution of the Dulong-Song Chay tectonic dome in Yunnan province, SW China. *J. Asian Earth Sciences* 28, p. 332-353.

(Dulong-Song Chay dome on border of China (SE Yunnan) and N Vietnam consists of metamorphic core complex, probably ~800 Ma protolith age, and cover sequence, separated by extensional detachment fault, both overlain unconformably by Late Triassic strata. Late Silurian- E Devonian (~436-402 Ma) granitic intrusion in core complex. Metamorphic grades upper greenschist-low amphibolite facies in core to low greenschist facies in cover sequence. Major extension at M Triassic (237 Ma). Dulong granites intruded Dulong-Song Chay dome in Early Cretaceous (144-140 Ma) and M Cretaceous (116±10 Ma))

Yan, J.X. & D. Liang (2005)- Early and Middle Permian paleoclimates of the Baoshan Block, western Yunnan, China: insight from carbonates. *J. Asian Earth Sciences* 24, 6, p. 753-764.

(Baoshan Block of W Yunnan, SW China formed E part of Cimmerian Continent in Permian. E Permian formed under influence of Permo-Carboniferous glaciation. After E Permian rifting faunal elements of Gondwana affinity decreased, while those of Cathaysian affinity increased. Late Permian faunas exclusively Cathaysian. E Permian Dingjiazhai Fm carbonates characterized by warm-temperate bryozoan-echinoderm facies of heterozoan association, with no non-skeletal grains. Overlying Yongde and Shazipo Fm carbonates subtropical-tropical chloroform facies of photozoan association, with common non-skeletal grains)

Yan, J.X., D.Y. Liang & M. Wu (2004)- Permian carbonates of Baoshan block, western Yunnan and their paleoclimatic implications. *Science in China, Ser. D, Earth Sci.* 47, p. 385-392.

(online at: <http://earth.scichina.com:8080/sciDe/fileup/PDF/04yd0385.pdf>)

(E Permian carbonates of Djingjiazhai Fm, Baoshan block, temperate facies, dominated by bryozoans, crinoids and brachiopods and without fusulinids. Artinskian basalts (marking rifting-separation from Gondwanaland) overlain by M Permian (Roadian-Wordian) Yongde Fm bryozoan-mollusc limestone with minor fusulinids and algae (incl. Permocalculus). M-L Permian (Wordian- Capitanian- E Wuchiapingian) Shazipo Fm carbonates oolitic, warm-water, incl. common fusulinids and algae)

Yang, J.S., Z.Q. Xu, X.D. Duan, J. Li, F.H. Xiong, F.H., Z. Liu, ZH. Cai & H.Q. Li (2012)- Discovery of a Jurassic SSZ ophiolite in the Myitkyina region of Myanmar. *Acta Petrologica Sinica* 28, p. 1710-1730.

(in Chinese, with English Abstract)

(online at: <https://www.sciengine.com/APS/doi/10.0000/1bf035521f194c9c86b90a51331749a6;JSESSIONID=f2abfa68-5b17-4cc7-ae50-09f5611a5003>)

(M Jurassic supra-subduction zone (SSZ) ophiolite in Myitkyina region, consisting of mantle peridotite, andesite basalt, leucogabbro, gabbro, plagiogranite, etc. Zircon ages between ~165-176 Ma. Possibly part of East Ophiolite Belt of Myanmar and E-ward extension of Yarlung Zangbo suture of S Tibet (EOB formerly also linked to Mesotethys Bangong-Nujiang suture of C Tibet (just outboard of Shan Block = Sibumasu))

Yang, L., W. Xiao, M.J.J. Rahman, B.F. Windley, K. Schulmann, S. Ao, J. Zhang, Z. Chen, M.S. Hossein & Y. Dong (2020)- Indo-Burma passive amalgamation along the Kaladan Fault: Insights from zircon provenance in the Chittagong-Tripura fold belt (Bangladesh). *Geological Society of America (GSA) Bull.* 132, 9-10, p. 1953-1968.

(Detrital zircon assemblages suggest Indian and Burma terranes amalgamation constrained by ~2.5–3.9 Ma boundary between Boka Bil Fm (most zircons derived from Gangdese Arc) and Tipam Fm (increase in young zircons from Burma Plate). Collision of E Indian promontory with Burma plate likely at ~11-12 Ma).

Yang, S., X.F. Liang, M.M. Jiang, L. Chen, Y. He, C.T. Mon, G. Hou, M. Thant, K. Sein & B. Wan (2022)- Slab remnants beneath the Myanmar terrane evidencing double subduction of the Neo-Tethyan Ocean. *Science Advances* 8, 34, eabo1027, p. 1-10.

(online at: <https://www.science.org/doi/epdf/10.1126/sciadv.abo1027>)

(Closure of Neo-Tethyan Ocean in Cenozoic, formed longest continental collision belt on Earth, with collision of India and Asia. Tomography in Myanmar area shows two prominent N-S, parallel, E-dipping slab-like structures with high velocities. Western high-velocity zone represents modern subducting slab. Eastern zone

likely remnant of older Neo-Tethyan oceanic slab that subducted at ~40 Ma. Double subduction of Neo-Tethys during late Mesozoic- E Cenozoic requires re-evaluation of previous tectonic models)

Yang, S.Y. & J.W. Kim (2014)- Pliocene basin-floor fan sedimentation in the Bay of Bengal (offshore northwest Myanmar). *Marine and Petroleum Geology* 49, p. 45-58.

(Late Pliocene basin-floor fan deposits in NE Bay of Bengal, Myanmar, with dry, biogenic gas in three fields on W flank of the NW-SE anticline. Reservoir sands stacked in back-stepping fashion and sourced from NW as part of Bengal fan. Shwe field fan-shaped (12 km long, 4 km wide) and ~30 km off base of slope)

Yang, W. (1999)- Stratigraphic and phytogeographic palynology of late Paleozoic sediments in western Yunnan, China. *Science Reports Niigata University, Ser E (Geology)*, 14, p. 15-99.

(online at: <http://work.geobiology.cn/>)

(Extensive review of W Yunnan geology and Permo-Carboniferous flora. E Permian Gondwanan glacial sediments, overlain by cold-water fauna like *Eurydesma* and cool *Glossopteris* flora. In late E Permian appearance of tropical- subtropical Tethyan elements, incl. *Monodioxodina*, *Costiferina*, etc.)

Yang, X., X. Jin, Z.S. Ji, Y.Z. Wang, J.X. Yao & H.L. Yang (2004)- New materials of the *Shanita-Hemigordius* assemblage (Permian foraminifers) from the Baoshan Block, Western Yunnan. *Acta Geologica Sinica (English Ed.)* 78, 1, p. 15-21.

(Description of abundant late M Permian hemigordioid foraminifera *Shanita* and *Hemigordius* from 'Cracked Lst' NE of Woniu Temple of Baoshan, W Yunnan. Assemblage similar to *Shanita* fauna from Shazipo Fm, Zhengkang, W Yunnan, and to Permian of Burma, Thailand, Iran and Turkey. all believed to originate on tectonic blocks derived from N margin of Gondwana)

Yang, Z.Y., X.W. Bi, J.J. Zhu, R. Hu, H. Zhong., K. Sein, Than Zaw, D.Z. Wang (2022)- Mid-Cretaceous intra-oceanic arc-continent collision recorded by the igneous complex in central Myanmar. *Lithos* 414-415, 106637, p. 1-14.

(Cretaceous magmatic complex in Banmauk-Kawlin area, W Myanmar terrane (WMT) composed of Kanza Chaung granitoid batholith, Mawgyi Volcanic rocks, and Pinhinga plutonic complex. Zircon dating from Kanza Chaung batholith suggest magmatism lasted from ~110 - 94 Ma, roughly overlapping with Mawgyi Volcanics. Basalts from Mawgyi Volcanics and gabbros from Kanza Chaung Batholith with geochemical features resembling intra-oceanic arc magmas. Granitic rocks likely originated from partial melting of juvenile arc lower-crust. Albian unconformity in WMT and paleomagnetic data indicate such continent crustal components likely introduced by collision/subduction of Greater India-derived continental sliver beneath WMT. Indian continent affinity crust possibly accreted to intra-oceanic arc (WMT) during mid-Cretaceous)

Yao, W., L. Ding, F. Cai, H. Wang, Q. Xu & Than Zaw (2017)- Origin and tectonic evolution of upper Triassic turbidites in the Indo-Burman ranges, West Myanmar. *Tectonophysics* 721, p. 90-105.

(manuscript online at: https://www.academia.edu/109392016/Origin_and_tectonic_evolution_of_upper_Triassic_Turbidites_in_the_Indo_Burman_ranges_West_Myanmar)

(Petrography, detrital zircon ages and Hf isotopic data from Late Triassic Pane Chaung Fm exposed in western Indo-Burman Ranges (W Burma Block), with Carnian-Norian *Halobia* molluscs. Max. depositional ages ~233-206 Ma. Detrital zircon age populations and Hf values interpreted to be derived from W Papua region. Triassic zircons (mainly ~210-250 Ma) probably from contemporaneous volcanic source. Older populations (~600-450 Ma, 1250-900 Ma and Archean from orogenic belts and cratons in Australia. Zircon ages different from similar-aged strata in Indochina and Sibumasu, but comparable to NW Australia and Greater India. Probably deposited in Late Triassic submarine fan along N margin of Australia (see also Zhang et al., 2024))

Yao, J., S. Liu, S. Wei, J. Hubbard, B.S. Huang, M. Chen & P. Tong (2021)- Slab models beneath Central Myanmar revealed by a joint inversion of regional and teleseismic traveltimes data. *J. of Geophysical Research: Solid Earth* 126, e2020JB020164, p. 1-17.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1029/2020JB020164>)

(Intermediate-depth seismicity (50-180 km) beneath Myanmar provides direct evidence of subducting Indian slab. Depth extent and morphology of the slab still poorly known. Below 100 km depth, dip angle of slab in S is ~15° larger than that of the slab in N, suggesting possible slab tearing. Etc.)

Yenne, K.A. (1988)- Hydrocarbon (oil, gas and coal) prospect for Burma. U.S. Geological Survey, Open-File Report 88-402, p. 1-25.

(online at: <https://pubs.usgs.gov/of/1988/0402/report.pdf>)

(Brief review of oil occurrences in C Myanmar onshore, where oil has been extracted perhaps as early as 13th century. Future oil-gas discoveries expected to be small)

Yi, H., C. Lee & D.Y. Kim (2015)- Shwe Ga development, Rakhine Offshore, Myanmar. Proc. SEAPEX Exploration Conference 2015, Singapore, 2.2, p. 1-15. (Extended Abstract + Presentation)

(Three Daewoo gas field discoveries in Rakhine basin, NE offshore Myanmar from 2004-2006: Shwe, Shwe Phyu and Mya. Three fields with 2P reserves of 4 TCF. Biogenic gas in deepwater Late Pliocene Bengal Fan turbidite sand reservoirs (interbedded lobes, channels and slumps, sourced from NW and NE) (see also Yang & Kim 2014))

Yin, O.S., Aung May Than & M.M. Ei (2019)- Permian biotic association from the Moulmein Limestone in Pawtaw Taung, Hpa-An township, Kayin State. J. Myanmar Academy Arts and Science 17, 5, p. 123-135.

(online at: <https://maas.edu.mm/Research/Admin/pdf/Vol.XVII%20No.5%20Geol+Geog.pdf>)

(M Permian coral-brachiopod-foraminifera association from Moulmein Limestone in Pawtaw Taung, Kayin (Karen) State, part of Plateau Limestone in SE Myanmar (W part of Sibumasu Terrane). Rugose corals both solitary (*Pavastehphyllum*) and compound (*Polythecalis*, *Waagenophyllum*), generally viewed as typically Tethyan. Brachiopod fauna with *Retimarginifera*, *Stereochia* and *Spiriferella*. Fusuline fauna with *Parafusulina*., *Eopolydiexodina* sp. (= usually viewed as 'Cimmerian') and *Yangchienia*, regarded as transitional biotic province of Shan-Thai Terrane, with mixed Gondwanan and Cathaysian fauna affinities)

Yin, T.H. & C.H.Lu (1937)- On the Ordovician and Silurian beds of Shihtien, Western Yunnan. Acta Geologica Sinica 16, 1, p. 41-56.

(Shihtien Beds lower Ordovician shales rich in brachiopods, trilobites, graptolites, overlain by 90m Hengshuitang Lst, equivalent of Nyaungbaw Lst of Myanmar (N Shan), overlain by Silurian graptolite shale)

Yonemura, K., Y. Osanai, N. Nakano, T. Adachi, P. Charusiri & Z.T. Nain (2013)- EPMA U-Th-Pb monazite dating of metamorphic rocks from the Mogok metamorphic belt, central Myanmar. J. Mineralogical and Petrological Sciences 108, 3, p. 184-188.

(online at: https://www.jstage.jst.go.jp/article/jmps/108/3/108_121019a/_pdf)

(Mogok Metamorphic Belt in C Myanmar with high-grade metamorphics, probably formed during regional Eocene- Oligocene metamorphic event. U-Th-Pb monazite dating in central MMB suggests Eocene- Oligocene deformation. Several Mnz grains from Meikthila and Mandalay areas also record ages of Late Triassic (~200 Ma) and Cretaceous (~80 Ma and 110 Ma) geologic events)

Yuan, D.X., K.P. Aung, C.M. Henderson, Y.C. Zhang, T. Zaw, F. Cai, L. Ding & S.Z. Shen (2020)- First records of Early Permian conodonts from eastern Myanmar and implications of paleobiogeographic links to the Lhasa Block and northwestern Australia. Palaeogeogr. Palaeoclim. Palaeoecology 549, 109363, p. 1-9.

(manuscript online at: www.academia.edu/97555783/First_records_of_Early_Permian_conodonts_Etc.)

(First record of late E Permian conodont fauna from 'Plateau Limestone' in E Myanmar (Sibumasu Terrane). including *Vjalovognathus nicolli* and abundant *Mesogondolella idahoensis*, indicating late Kungurian age, and rel. cool water. Close paleobiogeographic links to Lhasa Block (Tibet) and NW Australia)

Yui, T.F., M. Fukuyama Y. Iizuka, C.M. Wu, T.W. Wu, J.G. Liou & M. Grove (2013)- Is Myanmar jadeitite of Jurassic age? A result from incompletely recrystallized inherited zircon. Lithos 160-161, p. 268-282.

(online at: www.academia.edu/72851755/Is_Myanmar_jadeitite_of_Jurassic_age_A_result_from_incompletely_recrytallized_inherited_zircon)

(Tree types of zircons in two Myanmar jadeitite samples: Type I -inherited zircons with igneous protolith age of 160 ± 1 Ma; Type II- metasomatic/hydrothermal zircons, giving minimum jadeitite formation age of ~ 77 Ma (Late Cretaceous subduction before India collision); Type III- incompletely recrystallized zircons with geologically meaningless ages of 153-105 Ma. Jadeitites formed through metasomatic replacement processes)

Zaw, A.M. (2026)- Middle Permian (Murgabian) foraminifers faunas of the Thitsipin Formation, western part of the Southern Shan State, Myanmar. *Earth Sciences (SPC)* 15, 1, p.:44-51.

(online at: <https://article.sciencepublishinggroup.com/pdf/j.earth.20261501.14>)

(M Permian (Murgabian) smaller benthic foraminifera in Thitsipin Fm of Plateau Limestone, Shan Massif (= Sibumasu Terrane?; JTvG). Includes *Multidiscus padangensis*, *Pachyphloia*, *Tetrataxis*, etc.)

Zaw, A.M. & A.K. Aung (2024)- A new middle Permian waagenophyllid rugose coral species, *Ipciphyllum dilatatum* sp. nov. from the Shan Plateau, Myanmar. *Warta Geologi* 50, 3, p. 165-171.

(online at: <https://gsm.org.my/wp-content/uploads/2024/12/Updated-Warta-503-5.1.2025.pdf>)

(New colonial rugose coral species from Thitsipin Lst of Plateau Limestone Group of M Permian (Roadian-Wordian) substages of Shan Plateau. Co-occurs with other M Permian rugose corals, *Yatsengia*, *Iranophyllum*, *Ipciphyllum*, *Pavastephyllum* (*Thomasiphyllum*), etc. Similarities of M Permian corals between Myanmar and Malaysia (*Ipciphyllum* also known from Timor; JTvG))

Zaw, H.N. & Myint Soe (2016)- Massive iron ore deposit, Hwe Hpa area, Mong Yawng, Myanmar. *Proc. 52nd Annual Session Coord. Comm. Geoscience Programmes E and SE Asia (CCOP)*, Bangkok, p. 165-173.

(online at: www.ccop.or.th/download/as/52as2.pdf)

(Magnetite-hematite mineralization in N continuation of Permian-Triassic Sukhothai island arc system along margin of Indochina terrane, in E Shan State, easternmost Myanmar. Hosted in Paleozoic siltstone-mudstone)

Zaw, K. (1990)- Geological, petrological and geochemical characteristics of granitoid rocks in Burma: with special reference to the associated W-Sn mineralization and their tectonic setting. *J. Southeast Asian Earth Sciences* 4, 4, p. 293-335.

(Burmese granitoids in three N-S trending, major belts (1) U Cretaceous-Lower Eocene E belt granitoids, with porphyry Cu-Au, thought to represent magmatic-volcanic arc above E-dipping, but W-ward migrating, subduction zone; (2) mostly U Cretaceous- Lower Eocene Central granitoid belt plutons, with vein-type W-Sn deposits in deformed, Paleozoic metamorphic rocks; (3) E belt granitoids are largely unknown, immediately N of mostly Triassic granitoids in N Thailand and Sn-W bearing Main Range granitoids in W Malay Peninsula)

Zaw, K. (1998)- Geological evolution of selected granitic pegmatites in Myanmar (Burma): constraints from regional setting, lithology, and fluid-inclusion studies. *International Geology Review* 40, 7, p. 647-662.

(Pegmatite veins and dikes common in 1500km long, N-S-trending, tungsten-tin bearing granitoid belt in Myanmar. Emanated from cooling S-type granitoids, with which they are spatially associated)

Zaw, K. (2017)- Overview of mineralization styles and tectonic metallogenic setting in Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 24, p. 531-556.

(Review of many different styles of mineralization of metallic and non-metallic mineral deposits in Myanmar (tin-tungsten, lead-zinc-silver, copper $\pm$ gold, Ni-Cr $\pm$ platinum (in Jurassic ophiolites), etc.)

Zaw, K., A. Pwa & T.A. Zan (1984)- Lead-zinc mineralization at Theingon Mine, Bawsaing, Southern Shan State, Burma; a Mississippi Valley-type deposit? *Bull. Geological Society Malaysia* 17, p. 283-306.

(online at: www.gsm.org.my/products/702001-101150-PDF.pdf)

(Theingon Pb-Zn deposit near Bawsaing, S Shan State comparable to Mississippi-Valley-type deposits. Pb-Zn mineralization within Lower- M Ordovician Wunbye Fm carbonates (Sibumasu Plate). Epigenetic in origin)

Zaw, K., W. Swe, A.J. Barber, M.J. Crow & Y.Y. Nwe (2017)- Introduction to the geology of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, p. 1-17.

(online at: <http://mem.lyellcollection.org/content/memoirs/48/1/1.1.full.pdf>)

(Myanmar lies at junction of Alpine-Himalayan orogenic belt and Indonesian island arc system. West Myanmar Block considered to have formed part of N margin of Gondwana; subsequent history block contentious: one possibility separation from W Sumatra during Miocene development of Andaman Sea (similar Permian fusulinid assemblages. E Myanmar, including Shan Plateau, part of Sibumasu Block, which extends S-wards from Yunnan through Myanmar to Thailand, Malay Peninsula and Sumatra. In E Paleozoic Slate Belt (Mergui Gp) with diamictites part of Sibumasu Block or separate bloc. Etc.)

Zaw, K., Y.M. Swe, T.A. Myint & J. Knight (2017)- Copper deposits of Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 26, p. 573-588.
(Myanmar with >70 copper occurrences, including large high-sulphidation Cu $\pm$ Au deposits W of Monywa. Production started in 1985 with development of Sabetaung deposit at Monywa in C Myanmar. Copper produced as by-product from Bawdwin Mine, a volcanic-hosted massive sulphide deposit. Most copper associated with epigenetic vein-type and epithermal gold $\pm$ silver deposits)

Zaw Win (1991)- Triassic ammonites from the Plateau Limestone, East of Lungyaw and Baukkewzu, Myit-tha and Ywa-ngan Township, Myanmar. Georeports 1, 1, p. 75-87.

Zaw Win (2004)- Permian-Triassic Plateau Limestone in Lungyaw-Sakangyi Area, Shan State: its depositional and biotic history. J. Myanmar Academy Arts and Science 2, 2, p. 217-239.

Zaw Win (2008)- Triassic organic reefs in Lungyaw-Sakangyi Area, Ywa-ngan Township, Shan State. J. Myanmar Geosciences Soc. 1, 1, p. 21-36.

(M-U Triassic organic reefs in upper Plateau Lst in Myanmar massive ridges forming NNW-SSE trending range. Composed off in situ frame-building hexacorals (incl. *Montlivaltia*), calcisponges (*Paradeningeria*) and encrusting calcareous algae. Foraminifera include *Alpinophragmium perforatum*, *Trocholina*, *Agathammina*, *Duotaxis*, etc. Limestone turbidites flanks limestone masses as fore-reef slope and toe-of slope facies. Reefs probably developed as fringe of steep shelf margin that may have undergone growth-faulting)

Zaw Win (2009)- Fossil brachiopods from the Zwekabin Range. Hpa-an University Research J. 2009, 1, p. 145-149.

(*Spinomartinia prolifica* brachiopod assemblage found for first time from U Taungnyo Gp exposed along NW flank of Zwekabin Range, S Myanmar. Associated with *Retimarginifera* cf. *alata*, *Torynifer*, etc. Correlated with *Spinomartinia prolifica* fauna of E Permian Ko Yao Noi Fm of S Thailand and Kinta Valley of W Malay Peninsula, where age determined as Late Sakmarian (E Permian). *Spinomartinia* fauna viewed as 'transitional' biotic province with both Gondwanan and Tethyan affinities and endemic taxa of Shan-Thai Terrane (S. *prolifica* also in upper part of Mergui Gp of Slate Belt of S Myanmar, below Moulmein Lst; Mitchell 2017, p. 101-102)

Zaw Win, H.H. Aung & K.K. Shwe (2011)- *Shanita thawtinti*, a new milioloid foraminifer from the Middle Permian of Myanmar. Micropaleontology 57, 2, p. 125-137.

(online at: www.micropress.org/micropen2/articles/1/7/30349_articles_article_file_1727.pdf)

(*Shanita thawtinti* n. sp. proposed for pillared miliolid in Plateau Limestone Gp, W Shan Plateau, Myanmar. Characterized by very large size. Age interpreted as M Permian (Murgabian=Wordian) based on fusulinids *Neoschwagerina craticulifera* below and *Neoschwagerina margaritae* above. *Shanita amosi* and *Hemigordopsis renzi* at slightly lower horizons)

Zaw Win & K.K. Shwe (2005)- Study of fusulinaceans from the Plateau Limestone at Kyaukap: taxonomic and biostratigraphic consideration. J. Myanmar Academy Arts and Science 3, p. 73-90.

Zaw Win, K.K. Shwe & O.S. Yin (2017)- Sedimentary facies and biotic associations in the Permian-Triassic limestones on the Shan Plateau, Myanmar. In: A.J. Barber et al. (eds.) Myanmar: geology, resources and tectonics, Geological Society, London, Memoir 48, Chapter 15, p. 343-363.

(Thick late E Permian- M-L Triassic Plateau Limestone on Shan Plateau of E Myanmar (= W part of Sibumasu terrane). Unconformably over Ordovician-Silurian formations. Basal dolomitic limestone unit rich in corals (Wentzelella cf timorica, Ipciphyllum, Polythecalis), fusulinids (Pseudofusulina, Yangchienia, rare Neoschwagerina), small forams (Shanita amosi, Hemigordiopsis renzi, Agathammina, Pachyphloia), algae (Mizzia), etc. Triassic algal and cherty basinal limestones. Plateau Lst correlated with: (1) Ratburi Lst of Peninsular Thailand, (2) Chuping Fm/ Kodiacang Lst of NW Peninsular Malaysia and (3) U Shazipo Fm of Baoshan Block, SW Yunnan)

Zhang, D., S. Guo, Y. Chen, Q. Li, X. Ling, C. Liu & K. Sein (2021)-~25 Ma ruby mineralization in the Mogok Stone Tract, Myanmar: New evidence from SIMS U–Pb dating of coexisting Titanite. *Minerals* (MDPI) 11, 5, 536; p. 1-17.

(Ruby from marbles of Mogok Stone Tract in C Myanmar exploited since 6th century AD. Titanite inclusions dated as ~25 Ma, presumably representing time of ruby formation in Mogok. Age in agreement with timing of post-collisional extension in Himalaya and likely related to high-T metamorphic event in marbles)

Zhang, H., J. Liu & W. Wu (2012)- Geochronology and tectonic evolution of the Lincang Batholith in southwestern Yunnan, China. *J. Geol. Research* 2012, Article ID 287962, p. 1-11.

(online at: www.hindawi.com/journals/jgr/2012/287962/)

(U-Pb zircon dating of Late Triassic (~220, 230 Ma) granites of Lincang Batholith, subduction-related magmatism along W edge of Lanping-Simao-Indochina terrane, prior to latest Triassic closure of Paleo-Tethys) (E Devonian graptolites from SW Yunnan, close to NE Myanmar border. Rel. cosmopolitan species. Three zones of based on Monograptus spp. Part of Sibumasu Block with related graptolite occurrences in E Myanmar, N Thailand, W Malay Peninsula (Jaeger 1969, 1983))

Zhang, J., W. Xiao, B.F. Windley, F. Cai, K. Sein & S. Naing (2017)- Early Cretaceous wedge extrusion in the Indo-Burma Range accretionary complex: implications for the Mesozoic subduction of Neotethys in SE Asia. *Int. J. Earth Sciences (Geologische Rundschau)* 106, 4, p. 1391-1408.

(Indo-Burma Range of Myanmar (E extension of Yarlung-Tsangpo Neotethyan belt of Tibet in China), contains melanges with serpentinite, greenschist facies basalt, chert, sericite schist, silty slate and unmetamorphosed Triassic sandstone, mudstone and siltstone interbedded with chert in E, and farther N high-P blueschist and eclogite blocks in Naga Hills melange. IBR metamorphic rocks exhumed by wedge extrusion in subduction zone accretionary complex. Amphibolites zircon ages of 119 ± 3 Ma and 115 Ma, close to ages of nearby calc-alkaline granite and diorite, which belong to active continental margin arc along W side of Shan-Thai block. IBR accretionary complex generated during E Cretaceous (115-128 Ma) subduction of Neotethys Ocean).

Zhang, J. W. Xiao, J. Wakabayashi, F. Cai & K. Sein (2024)- Detrital zircon dating, deformation stages, and tectonics of the Pane Chaung Formation and surrounding units in the Western Indo-Burma Range, Southeast Asia. *Minerals* (MDPI) 14, 12, p. 1-21.

(online at: <https://www.mdpi.com/2075-163X/14/12/1290>)

(Western Indo-Burma Range in NW Myanmar and Nagaland, NE India, one of youngest accreted units in Eastern Neotethys. Triassic flysch units correlated between Western IBR (Pane Chaung Fm) and Tethyan Himalaya, sharing common characteristics like Carnian-Norian Halobia fossils, and dominant detrital zircons of 220–280, 500–620, 900–1000, and 1100–1140 Ma. Major tectonic units of Western IBR-Tethyan Himalaya are result of amalgamation of West Burma Block with microcontinent that rifted from East Gondwana as fragment of Argoland archipelago in Late Jurassic. Etc (see also Yao et al., 2017, who proposed paleoposition near New Guinea).)

Zhang, J. W. Xiao, B.F. Windley, J. Wakabayashi, F. Cai, K. Sein, H. Wu & Soe Naing (2018)- Multiple alternating forearc- and backarc-ward migration of magmatism in the Indo-Myanmar orogenic belt since the Jurassic: Documentation of the orogenic architecture of eastern Neotethys in SE Asia. *Earth-Science Reviews* 185, p. 704-731.

(Review of Indo-Myanmar orogenic belt of E Neotethys in Myanmar, W Yunnan (China) and Naga Hills (India). Present trench on margin of Indian Ocean evolved by continuous E-ward subduction since Jurassic, with

magmatic arc axis migrated E-ward (landward) during some periods (Jurassic- E Cretaceous, Late Cretaceous-M Eocene) and W-ward during E Cretaceous- late E Cretaceous, and M Eocene-Present)

Zhang, J., W. Xiao, B. Zhang, J. Wakabayashi, F. Cai & K. Sein (2023)- Continental scale shearing triggered by Oligocene subduction in Myanmar-Indochina, SE Asia. *Geological Journal* 59, 3, p. 1018-1038.
(Oligocene shearing along Mogok Metamorphic Belt in Myanmar (boundary of Indochina block) exposes paragneiss, marble and quartzite schist. Right-lateral shearing zircon-dated to 33-25 Ma, coeval with other 31-24.5 Ma shear zones in Indochina. After restoration of ~80-45° CW rotation, Oligocene conjugate shear zones reflect ~N-S-directed shortening, corresponding to back-arc contraction during N-ward subduction of Indian Ocean. Oligocene continental-scale shearing may be triggered by syn-subduction compression in SE Asia)

Zhang, K.J. & J.X. Cai (2009)- NE-SW-trending Hepu-Hetai dextral shear zone in southern China: penetration of the Yunkai Promontory of South China into Indochina. *J. Structural Geology* 31, 7, p. 737-748.
(NE-SW-trending Hepu-Hetai shear zone extends for ~480 km along Guangdong-Guangxi provinces boundary in S China. Dextral ductile strike-slip deformation, with estimated displacement of >500 km. Inclusions in quartz within mylonite suggest that ductile shear deformation under medium T/P conditions of greenschist facies; $^{40}\text{Ar}/^{39}\text{Ar}$ muscovite ages of 213-195 Ma. Shear zone originated via penetration of Yunkai Promontory of South China into Indochina during Late Triassic)

Zhang, K., J. Wang, W. He, S. Wang, Y. Xu, X. Zhang, B. Song, X. Kou & G. Wang (2022)- Reconstructed ocean plate stratigraphy sequences from the Permian subduction-accretionary complex in the Qinghai-Tibet Plateau. *Geosystems and Geoenvironment (China)* 1, 2, 100034, p. 1-12.
(online at: <https://www.sciencedirect.com/science/article/pii/S2772883822000139>)
(Permian Tethys subduction-accretionary complex (SAC) in Qinghai-Tibet Plateau (QTP) distributed in six geotectonic provinces across Tibet (N of Lhasa-Baoshan terrane). Permian SAC two types, i.e., convergent zone and accretionary zone. Six types of Ocean Plate tectonostratigraphies recognized: (1) mid-ocean ridge; (2) abyssal plain (gabbro-pillow basalt-pelagic limestone-radiolarian chert-shale, (3) seamount (oceanic island basalts, overlain by reefal fusulinid limestone or radiolarian cherts or ammonite limestone, etc.) (4) intra-oceanic arc; (5) fore-arc trench; (6) continental fore-arc trench (capped by turbidites) (Formed in two branches of Paleo-Tethys, Buqingshan and Shuanghu Oceans, which opened in Carboniferous and E-M Permian)

Zhang, L., W. Fan, L. Ding, A. Pullen, M.N. Ducea, J. Li, C. Wang, Xu & K. Sein (2022)- Forced subduction initiation within the Neotethys: an example from the mid-Cretaceous Wuntho-Popa arc in Myanmar. *Geological Society of America (GSA) Bull.* 134, 3-4, p. 849-870.
(online at: <http://www.geodin.ro/CUTE/wp-content/uploads/2021/12/Zhang-L.Y.-2021-GSAB-12.pdf>)
(Mid-Cretaceous Mawgyi Volcanics earliest volcanics in Wuntho-Popa Arc of W Myanmar (105-93 Ma). Diverse magmatic compositions of massive MORB-like lavas and dikes, and subordinate island arc tholeiite and calc-alkaline lavas. Albian-Cenomanian ages coincident with formation of many Neotethyan supra-subduction zone ophiolites and intra-oceanic arcs along orogenic strike, from E Mediterranean, Middle East, Pakistan to SE Asia. Combined with near-equatorial paleo-latitudes Wuntho-Popa Arc interpreted as segment of N-dipping trans-Neotethyan subduction system in M Cretaceous. New evidence supporting M Cretaceous initiation of this >8000-km-long subduction system by inversion of ~E-W-trending Neotethys oceanic spreading ridges, contemporaneous with final breakup of Gondwana and global plate reorganization)

Zhang, L.Y., W.M. Fan, L. Ding, M.N. Ducea, A. Pullen, J.X. Li, Y.L. Sun, Y.H. Yue, F.L. Cai et al. (2020)- Quaternary volcanism in Myanmar: A record of Indian slab tearing in a transition zone from oceanic to continental subduction. *Geochem. Geophysics Geosystems* 21, 8, e2020GC009091, p. 1-20.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020GC009091>)
(Two Quaternary volcanic centers of Myanmar: Monywa with arc signatures and Singu with asthenosphere-derived magmas. Singu OIB-like rocks indicate large contribution of isotopically enriched asthenosphere layer under Burma microplate, which possibly flowed from SE Tibet. Possibly triggered by position above slab window, after tearing of the oceanic lithosphere from buoyant continental lithosphere of Indian plate)

Zhang, P., S.Y. Jiang, R.A. Donelick, R. Li, C.J. Soares & L. Mei (2023)- Frontal expansion of an accretionary wedge under highly oblique plate convergence: Southern Indo-Burman Ranges, Myanmar. Geological Society of America (GSA) Bull. 135, 9-10, p. 2348-2374.

(online at: https://www.researchgate.net/publication/366553072_Frontal_expansion_of_an_accretionary_wedge_under_highly_oblique_plate_convergence_Southern_Indo-Burman_Ranges_Myanmar)

(About formation of Southern Indo-Burman accretionary wedges, with oversteepened slopes and uplifted axial zones, and associated with highly oblique plate convergence between Indian plate and West Burma Terrane. Evolution: (1) deposition of Late Cretaceous-Eocene Rakhine Flysch and forward expansion of the proto-wedge; (2) Transpressional wedge development since E Miocene? Rakhine flysch overlain by Eocene deep marine and Oligocene- Miocene shallow marine and deltaic sediments(?). Eocene rocks with prominent detrital zircon age peak of 90-105 Ma (= from nearby mid-Cretaceous Wuntho-Popa Arc in Wuntho Ranges, Myanmar))

Zhang, P., S.Y. Jiang, Khin Zaw, R. Li, L. Mei & Q. Li (2024)- Development of major unconformities in the forearc regions: A signal of West Myanmar-Asia assemblage before the late Paleocene. J. Structural Geology 185, 105174, p.

(Late Paleogene angular unconformity (~40-28 Ma; Late Eocene- E Oligocene) in W Myanmar, developed around same time as Assam unconformity in NE India, suggesting oblique convergence margin in W Myanmar formed before M Eocene. Interpreted as partial continental collision between NE India and W Myanmar Terrane (implying West Burma already part of continental SE Asia since at least Paleocene (ca. 60-58 Ma). Etc. (see also discussion in 'Comments on Zhang et al. (2024)', by Aung Moe, Kyi Khin & K.P. Aung (2025))

Zhang, P., L. Mei, X. Hu, R. Li, L. Wu, Z. Zhou & H. Qiu (2017)- Structures, uplift, and magmatism of the Western Myanmar Arc: constraints to mid-Cretaceous-Paleogene tectonic evolution of the western Myanmar continental margin. Gondwana Research 52, p. 18-38.

(Arc-basin system along W Myanmar continental margin, with at least three igneous events in W Myanmar Arc (Wuntho-Popa): mid-Cretaceous (110-90 Ma), latest Cretaceous- earliest Paleocene (69-64 Ma) and Eocene (53-38 Ma), and associated uplift events in Late Cretaceous, Eocene and Late Oligocene. Magmas significant juvenile mantle source component involving subducted sediments and juvenile crustal materials. Magmatism can be correlated with Gangdese arc in Lhasa terrane of S Tibetan Plateau. Model of E-ward subduction of Neo-Tethyan/ Indian plate oceanic crust under Sibumasu starting in mid-Cretaceous, with long-lived back-arc extension in W Myanmar)

Zhang, P., L. Mei, S.Y. Jiang, S. Xu, R.A. Donelick, R. Li & H. Zhang (2021)- Erosion and sedimentation in SE Tibet and Myanmar during the evolution of the Burmese continental margin from the Late Cretaceous to Early Neogene. Gondwana Research 95, p. 149-175.

(online at: https://www.researchgate.net/publication/351014274_Erosion_and_sedimentation_in_SE_Tibet_and_Myanmar_during_the_evolution_of_the_Burmese_continental_margin_from_the_Late_Cretaceous_to_Early_Neogene)

(Provenance of Burmese forearc and backarc depressions shifted from proximal W Myanmar Arc to northern Mogok Metamorphic Belt and Dianxi-Burman batholiths in SE Tibet during late Paleogene. Transition synchronous with tectonic evolution of Burma Terrane from oceanic/continental island arc setting to active continental margin. Increase in sediment accumulation rates in Burmese forearc indicates input from basement rocks in N Burma Terrane (Tagaung-Myitkyina Belt) became more prominent and Eastern Belt of northern Indo-Burman Ranges were totally exposed in M-L Eocene. This result corroborates Burma Terrane assembled with SE Asia (Sibumasu) before M Eocene)

Zhang, Q., Y. Chen, S. Chen, Bin Su, Y. Li, K. Shi, Me M. Aung & K. Sein (2024)- Intra-Neo-Tethyan subduction initiation inferred from the Indawgyi mafic rocks in the Central Ophiolite Belt, Myanmar. Geological Society of America (GSA) Bull. 136, 7-8, p. 2753-2766.

(online at: https://www.researchgate.net/publication/375505977_Intra-Neo-Tethyan_subduction_initiation_inferred_Etc.)

(Much evidence for Cretaceous intra- Neotethyan subduction system. Initiation in E Neotethys not well constrained. Indawgyi mafic rocks from C Ophiolite Belt in West Burma Block record early forearc spreading during intra-Neo-Tethyan subduction initiation. Indawgyi gabbro from intra-Neo-Tethyan forearc setting

during early stage of subduction initiation in E Cretaceous (~120 Ma), with subsequent mature subduction resulting in M Cretaceous (ca. 108-90 Ma= Albian-Turonian)) arc magmatism in West Burma Block).

Zhang, Q., K.D. Zhao, W.Q. Li, M.R. Palmer, S.Y. Jiang, H. Jiang, W. Zhang et al. (2022)- Timing and tectonic setting of tin mineralization in southern Myanmar: constraints from cassiterite and wolframite U-Pb ages. *Mineralium Deposita* 57, 6, p. 977-999.

(manuscript online at: https://eprints.soton.ac.uk/453803/1/Timing_and_tectonic_setting_of_tin_mineralization....pdf)

(Cassiterite samples from S Myanmar yield zircon ages mainly of ~60-64 Ma, also 69 and 85 Ma. SE Asia tin belt three epochs of Sn metallogeny: (1) E Cretaceous (~125-110 Ma; related to post-collision slab break-off after collision between W Burma terrane and Sibumasu-Tengchong terrane); (2) Late Cretaceous- Paleocene (~90-60 Ma; in Andean-type accretionary setting during subduction of Neo-Tethys oceanic lithosphere); (3) E Eocene (~50-40 Ma; in post-collision setting after India-Asia collision)

Zhang, R.Y., C.H. Lo, S.L. Chung, M. Grove, S. Omoti, Y. Iizuka, J.G. Liou & T.V. Tri (2013)- Origin and tectonic implication of ophiolite and eclogite in the Song Ma Suture zone between the South China and Indochina Blocks. *J. Metamorphic Geology* 31, 1, p. 49-62.

(online at: https://www.academia.edu/24679243/Origin_and_tectonic_implication_of_Triassic_eclogite_from_the_Song_Ma_suture_zone_between_the_Indochina_and_South_China_blocks)

(Song Ma belt in N Vietnam with ophiolite, metabasite, metasediments and eclogite, and believed to be suture zone between Indochina and South China blocks. Eclogite high-P metamorphism in subduction zone with low T gradient (~8 °C/km). Song Ma ophiolite experienced ocean-floor metamorphism. Metabasalt and gabbro with MORB-type geochemical affinities. Eclogite U-Pb zircons mean age 230.5 ± 8 Ma (Carnian, L Triassic), interpreted as closure age of Paleotethys and subsequent collision in M Triassic (main Indosinian Orogeny))

Zhang, R.Y., C.H. Lo, X.H. Li, S.L. Chung, Tran Tuan Anh & Tran V. Tri (2014)- U-Pb dating and tectonic implication of ophiolite and metabasite from the Song Ma suture zone, northern Vietnam. *American Journal of Science* 314, 2, p. 649-678.

(Song Ma ophiolites mainly peridotite, basalt and gabbro with greenschist- lower amphibolite-facies metamorphism. U-Pb zircon ages 340 ± 29 Ma (E Carboniferous), interpreted as protolith age. Metamorphic rims age of ~280 Ma (E Permian). Metabasalt protolith age ~315 Ma. Eclogite and garnet hornblende metamorphic ages ~230 Ma. Three-stage evolution: (1) Paleotethys oceanic crust formation at 340-315 Ma and ocean-floor metamorphism at 283-280 Ma, (2) <280-230 Ma: Paleotethys lithosphere subduction and HP metamorphism at ~230 Ma; closure of Paleotethys in M Triassic; and (3) <230 Ma: breakoff of Paleotethys oceanic lithosphere and exhumation of subducted slabs. Subduction polarity still problematic)

Zhang, Y., W.H. He, G.R. Shi & K.X. Zhang (2013)- A new Changhsingian (Late Permian) Rugosochonetidae (Brachiopoda) fauna from the Zhongzhai section, southwestern Guizhou Province, South China. *Alcheringa* 37, p. 223-247.

Zhang, Y., W.H. He, G.R. Shi, K.X. Zhang & H.T. Wu (2015)- A new Changhsingian (Late Permian) brachiopod fauna from the Zhongzhai section (South China) Part 3: Productida. *Alcheringa* 39, 3, p. 295-314.
(Latest Permian Brachiopod fauna from section at Zhongzhai, Guizhou Province (S China). 15 species of Productida. Etc.)

Zhang, Y., G.R. Shi, W.H. He, K.X. Zhang & H.T. Wu (2014)- A new Changhsingian (Late Permian) brachiopod fauna from the Zhongzhai section (South China), Part 2: Lingulida, Orthida, Orthotetida and Spiriferida. *Alcheringa* 38, 4, p. 480-503.

Zhang, Y., Y. Wang, R. Zhan, J. Fan, Z. Zhou & X. Fang (2014)- Ordovician and Silurian stratigraphy and palaeontology of Yunnan, Southwest China- A guide to the field excursion across the South China, Indochina and Sibumasu. IGCP Project 591 Post-conference fieldtrip, Kunming 2014, Science Press, Beijing, p. 1-128.

(Yunnan province of SW China comprises three terrains: South China (E Yunnan), Indochina (Simao; C and S Yunnan) and Sibumasu (Baoshan- Tengchong; W Yunnan- E Myanmar, etc.). All were part of NE Peri-Gondwana Region in Early Paleozoic, possibly off the NW Australia sector)

Zhang, Y.C., K.P. Aung, S.Z. Shen, H. Zhang, T. Zaw, L. Ding, F.L. Cai & K. Sein (2020)- Middle Permian fusulines from the Thitsipin Formation of Shan State, Myanmar and their palaeobiogeographical and palaeogeographical implications. *Papers in Palaeontology* 6, 2, p. 293-327.

(online at: https://www.academia.edu/97555790/Middle_Permian_fusulines_from_the_Thitsipin_Formation_of_Shan_State_Myanmar_and_their_palaeobiogeographical_and_palaeogeographical_implications.....)

(Fusuline faunas of 29 species/19 genera in Thitsipin Fm in Shan Plateau, E Myanmar (= W Sibumasu block), indicating Midian (M Permian, Guadalupian) age. Rel. low diversity and presence of *Monodiexodina* and *Eopolydixodina*, suggest Sibumasu belonged to Cimmerian paleobiogeographic province in Midian time. Close fusulinid affinities between Shan Plateau, Sibumasu and Baoshan Block in W Yunnan. Widespread *Eopolydixodina afghanensis* and *Jinzhangia shengi* on Shan Plateau similar to Baoshan and S Qiangtang Blocks, but different from Tengchong and Lhasa Blocks (dominated by *Nankinella-Chusenella* assemblage). Paleobiogeographical analysis of fusuline faunas from Lhasa, Tengchong, S Qiangtang, Baoshan and Sibumasu Blocks implies Bangong-Nujiang Ocean may have been present before Midian (also with *Sumatrina annae*))

Zhang, Y.C., L.R. Cheng & S.Z. Shen (2010)- Late Guadalupian (Middle Permian) Fusuline fauna from the Xiala Formation in Xainza County, Central Tibet: Implication of the rifting time of the Lhasa Block. *Journal of Paleontology* 84, 5, p. 955-973.

(Fusuline fauna of 9 species from Xiala Fm in Tibet, dominated by *Nankinella* and *Chusenella* and indicates Midian (Late Guadalupian) age. Earliest record of fusuline fauna during Midian in Lhasa Block suggests block rifted later than Qiangtang Block to N and Baoshan and Tengchong blocks to E, all of which yield earlier fusuline faunas of Yakhtashian (Artinskian) age)

Zhang, Y.D., J.X. Fan, B.D. Erdtmann & X. Liu (2009)- Darriwilian graptolites of the Shihtien Formation (Ordovician) in west Yunnan, China. *Alcheringa* 33, 4, p. 303-329.

(online at: www.tandfonline.com/doi/pdf/10.1080/03115510903043762?needAccess=true)

(W Yunnan in SW China part of Sibumasu Terrane. Ordovician rocks affected by several phases of tectonics. M-L Darriwilian graptolite fauna from Shihtien Fm at Baoshan and Shidian with 15 species, incl. *Didymograptus artus*, *D. murchisoni*, *D. spinulosus*, *Pterograptus* sp., *Hustedograptus* spp, *Archiclimacograptus* spp., etc. Two biozones: *Didymograptus artus* and *D. murchisoni*. Graptolite fauna similar to Baltica and S China)

Zhang, Y.D., J.X. Fan & X. Liu (2009)- Graptolite biostratigraphy of the Shihtien Formation (Darriwilian) in West Yunnan, China. *Bull. Geosciences* 84, 1, p. 35-40.

(online at: www.geology.cz/bulletin/fulltext/bullgeosci841_1103.pdf)

(Rich M Ordovician graptolite fauna from Shihtien Fm at Baoshan and Shidian in W Yunnan, SW China (W Yunnan generally considered part of Sibumasu/ Shan-Tai terrane). Incl. *Didymograptus artus*, *D. murchisoni*, *D. spinulosus*, *Pterograptus*, *Hustedograptus*, etc., indicating Darriwilian age.)

Zhang, Y.D. & A.C. Lenz (1998)- Early Devonian graptolites from southwest Yunnan, China. *Journal of Paleontology* 72, 2, p. 353-360.

Zhang, Z.K. & J.X. Zhang (1986)- Paleomagnetic research on the upper Carboniferous basalts in Baoshan block, Yunnan and the tectonic belonging of the block. *Bull. Inst. Geology, Chinese Acad. Geol. Sci.*, p. 184-189. (In Chinese with English abstract. Xu et al. 2014: Paleomagnetic work on E Permian Woniusi Fm basalts 12 km NE of Baoshan, SW China, suggest terrane was at 34.1° S in E Permian. Result comparable to Xu et al. 2014)

Zhao, J., B. Huang, Y. Yan, Q. Bai, Y. Dong, Zaw Win, H.H. Aung & X. Yang (2019)- A palaeomagnetic study of the Middle Permian and Middle Triassic limestones from Shan State, Myanmar: implications for collision of the Sibumasu Terrane and Indochina Terrane. *Geological Journal* 55, 2, p. 1179-1194.

(online at: https://www.academia.edu/88453426/A_palaeomagnetic_study_of_the_Middle_Permian_and_Middle_Triassic_limestones_from_Shan_State_Myanmar_Implications_for_collision_of_the_Sibumasu)

(Paleomagnetic study of M Permian and M Triassic Plateau Limestones from Shan State, E Myanmar, suggests Sibumasu Terrane was at paleolatitude of 13°S in M Permian, and at 18.3°N in M Triassic. Supports view that collision of Sibumasu and Indochina Terranes occurred during or before M-L Triassic times)

Zhao, J., B. Huang, Y. Yan & D. Zhang (2015)- Late Triassic paleomagnetic result from the Baoshan Terrane, West Yunnan of China: implication for orientation of the East Paleotethys suture zone and timing of the Sibumasu-Indochina collision. *J. Asian Earth Sciences* 111, p. 350-364.

(Paleomagnetic study of Late Triassic basalts from S part of Baoshan Terrane (= northernmost Sibumasu Block) in W Yunnan indicates 15°N paleolatitude in Late Triassic time. Wider paleomagnetic comparison supports view that E Paleotethys Ocean separated Sibumasu and Indochina blocks and closed no later than Late Triassic. N-S directed Changning-Menglian suture zone likely E-W at time of Sibumasu-Indochina collision)

Zhao, J.M. & G.D. Zhou (1987)- Discovery of *Lytvolasma* fauna from western section of Eastern Kunlun Mountains. *Acta Palaeontologica Sinica* 26, 4, p. 486-491.

(Lytvolasma late E Permian coral fauna from E Kunlun Mts, W Qinghai. Also with Pleramplexus, Wannerophyllum, Lophophyllidium wichmanni, Timorphyllum, etc. Coral fauna characterized by simple forms with no dissepiments, signifying cold-water fauna. Comparable to Basleo beds of Timor)

Zhao, T., Q. Feng, I. Metcalfe, L.A. Milan, G. Liu & Z. Zhang (2017)- Detrital zircon U-Pb-Hf isotopes and provenance of Late Neoproterozoic and Early Paleozoic sediments of the Simao and Baoshan blocks, SW China: Implications for Proto-Tethys and Paleo-Tethys evolution and Gondwana reconstruction. *Gondwana Research* 51, p. 193-208.

(online at: https://www.researchgate.net/publication/318869190_Detrital_zircon_U-Pb-Hf_isotopes_and_prov)

(Detrital zircons from Ordovician? Lancang Gp (separate Lancang Block?) and Mengtong and Mengdingjie Gps (Baoshan Block) with three age peaks: older Grenvillian (1200-1060 Ma), younger Grenvillian (~960 Ma) and Pan-African (650-500 Ma), with εHf(t) values similar to W Australia and N India. E Paleozoic Proto-Tethys represents narrow ocean basin separating 'Asian Hun superterrane' (N China, S China, Tarim, Indochina, N Qiangtang blocks) from N margin of Gondwana in Late Neoproterozoic- E Paleozoic. Proto-Tethys closed in Silurian at ~440-420 Ma when 'Asian Hun superterrane' collided with N Gondwana margin. Lancang Block separated from Baoshan Block in E Devonian when Paleo-Tethys opened as back-arc basin)

Zhao, T., X. Qin & Q. Feng (2015)- Zircon U-Pb-Hf isotopes and whole-rock geochemistry of the Late Triassic rhyolites from Lampang Zone, northern Thailand: implications for the closure of Paleo-Tethys. *Proc. 4th Int. Symposium Int. Geosciences Program (IGCP) Project 589, Bangkok 2015*, p. 102-106. *(Extended Abstract)*

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(E Norian (225.1±1.2 Ma) ages of post-collisional rhyolites in Lampang area minimum age of final closure of E Paleo-Tethys between Sibumasu and Indochina blocks. Older age from inherited zircons (242±1.9 Ma) resembles arc volcanic rocks from Doi Luang belt in same area. High-K calc-alkaline Lampang rhyolites formed in post-collisional extensional environment, controlled mainly by lithospheric delamination or slab breakoff. Youngest pelagic sediments in Changning-Menglian and Inthanon Suture Zones M Triassic (Triassicampe deweveri radiolarian assemblage), suggesting Paleo-Tethys ocean not yet closed in M Triassic)

Zhao W.W., M.F. Zhou & S. Dudka (2023)- In situ U-Pb dating of garnet and cassiterite from the Kanbauk W-Sn(-F) skarn deposit, Dawei region, southern Myanmar: new insights on the regional Sn-W metallogeny in the Southeast Asian tin belt. *Economic Geology* 118, 5, p: 1219-1229.

(Kanbauk tin placers in S Myanmar related to one of largest W-Sn skarn deposits in SE Asian tin belt. Mineralized skarns between marbles to East and metasediments of Mergui Gp to W. Garnet and cassiterite dating suggest ages around 55 Ma (basal Eocene). Rollback of Neo-Tethyan subducting slab since Late Cretaceous probably main mechanism for regional extensive Sn-W mineralization)

Zhao, Y., Z. Liu, Y. Yu, C. Shih, A. Ślipinski & D. Ren (2022)- First species of Prionoceridae from mid-Cretaceous amber of northern Myanmar (Coleoptera: Cleroidea). *Cretaceous Research* 133, 105118, p.

(online at: <https://www.sciencedirect.com/science/article/abs/pii/S0195667121003669>)

(New species of beetle in Burmese amber from E Cenomanian (~99 Ma) in Kachin, N Myanmar))

- Zheng, D., S.C. Chang, V. Perrichot, S. Dutta, A. Rudra, Lin Mu, R.S. Kelly, Sha Li et al. (2018)- A Late Cretaceous amber biota from central Myanmar. *Nature Communications* 9, 3170, p. 1-6.
(online at: www.ncbi.nlm.nih.gov/pmc/articles/PMC6085374/pdf/41467_2018_Article_5650.pdf)
(*Insect faunas in U Campanian (~72.1 Ma) amber from Tilin, C Myanmar. Chemical composition suggests conifer tree source, indicating gymnosperms still abundant in latest Campanian equatorial forests. Twelve families of insects found, incl. ants, wasps, midges, lice, etc.*)
- Zheng, T., Y. He, L. Ding, M. Jiang, Y. Ai, C.T. Mon, G. Hou, K. Sein & M. Thant (2020)- Direct structural evidence of Indian continental subduction beneath Myanmar. *Nature Communications* 11, 1944, p. 1-9.
(online at: <https://www.nature.com/articles/s41467-020-15746-3>)
(*Seismic array detects present-day Indian continental subduction beneath Asia. Subducting Indian crust with average crustal thickness of ~30 km, dips angle of ~19°, and extends to depth of 100 km under C Myanmar*)
- Zherikhin, V.V. & A.J. Ross (2000)- A review of the history, geology and age of Burmese amber (burmite). *Bull. Natural History Museum, London (Geology)* 56, 1, p. 3-10.
(online at: <https://ia800304.us.archive.org/24/items/bulletinofnatura561natu/bulletinofnatura561natu.pdf>)
(*Burmese amber has been known since 1st century AD. Recorded from five regions in Myanmar, but only mined commercially in Hukawng Valley in N Myanmar. Amber in clastic deposits with Nummulites of M Eocene age, but amber as reworked pebbles and probably of Cretaceous age (also associated with reworked Cenomanian limestone clasts with Orbitolina birmanica). With 10 additional papers on insects from Burmese amber*)
- Zhou, Z. & Z. Yang (2005)- Permian ammonoids from Xinjiang, Northwest China. *Journal of Paleontology* 79, 2, p. 378-388.
(*late E Permian ammonoid faunas from Xinjiang in W China (edge of Tarim Basin, E of Pamir). With Parapronorites, Propinacoceras, Medlicottia, Agathiceras, Prostacheoceras, Metaperrinites, Perrinites, etc., similar to faunas from adjacent Pamirs and Thailand. Associated with fusulinid limestones*)
- Zhou, Z.R., Y.J. Wang, J.Z. Sheng & K.Y. Zhu (2000)- *Neofusulinella lantenoisi* Deprat, 1913, type species of the Permian fusulinid genus *Neofusulinella* from Baoshan County, West Yunnan, China. *Acta Palaeontologica Sinica* 39, 4, p. 457-465.
(*E-M Permian Neofusulinella present in Baoshan area (Yunnan; Maokouan age = ?) and Rat Buri Limestone near Takli, Thailand, along W margin of S China- SE Asia block*)
- Zhu, B., Z. Guo, R. Liu, D. Liu & W. Du (2014)- No pre-eruptive uplift in the Emeishan large igneous province; new evidences from its 'inner zone', Dali area, southwest China. *J. Volcanology Geothermal Research* 269, p. 57-67.
(*M-L Permian Emeishan LIP considered example of crustal domal uplift caused by mantle plume upwelling before onset of volcanism, but emplacement began in deeper water setting. Lower Succession volcanism had grown into shallower water; Upper Succession subaerial lavas and tuffs. Inconsistent with domal uplift model*)
- Zhu, B.Q., C.X. Mao, G.W. Lugmair & J.D. Macdougall (1983)- Isotopic and geochemical evidence for the origin of Plio-Pleistocene volcanic rocks near the Indo-Eurasian collisional margin at Tengchong, China. *Earth Planetary Science Letters* 65, 2, p. 263-275.
(*In Yunnan Province, SW China, regional extension associated with India- Asia collision formed series of N-S trending basins. Near Tengchong close to Myanmar border, basin is characterized by K-rich basalt-dacite volcanism which began in Pliocene (~ 7 Ma) and continued to historic times. Five chemical groups recognized*)
- Zhu, D.C., Q. Wang, S.L. Chung, P.A. Cawood & Z.D. Zhao (2019)- Gangdese magmatism in southern Tibet and India-Asia convergence since 120 Ma. In: P.J. Treloar & M.P. Searle (eds.) *Himalayan tectonics: a modern synthesis*, Geological Society, London, Special Publ. 483, p. 583-604.
(online at: <http://tethys.ac.cn/kycg2017/lw2017/201904/W020190417798251302032.pdf>)
(*Gangdese Batholith in Southern Lhasa subterranean of S Tibet emplaced from ~210 Ma to ~10 Ma. During 120-75 Ma, Gangdese Batholith magmatism migrated from S to N. Two intense magmatic pulses (1) 90 ± 5 Ma, and (2) 50 ± 3 Ma. Gangdese magmatism restricted to southern portion of S Lhasa subterranean from 120-70 Ma (but*

migrated slightly northwards at 95-70 Ma), then propagated both S and N with enhanced mantle input at 70-45 Ma, before finally being restricted to S margin of S Lhasa at 45-26 Ma. Enhanced mafic magmatism since ~70 Ma, magmatic flare-up with compositional diversity at ~51 Ma and increased magmatic T at 52-50 Ma interpreted as slab rollback from ~70 Ma and slab breakoff of Neo-Tethyan oceanic lithosphere since ~53 Ma)

IX.5. Cambodia, Vietnam, Laos, South China (Indochina - South China Plates)

Relevance for Indonesia: potential analogs for NE Sumatra- Sundaland Pretertiary stratigraphy and tectonic evolution around the Paleotethys suture zone, Indochina Plate stratigraphy and biostratigraphy, etc.

Amare, K. & C. Koeberl (2006)- Variation of chemical composition in Australasian tektites from different localities in Vietnam. *Meteoritics Planetary Science* 41, 1, p. 107-123.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.2006.tb00196.x/epdf>)

(Pleistocene tektites from Vietnam either of splash form (SiO₂ 70-77%), or larger, blocky Muong Nong-type (SiO₂ 74-81%). Geochemistry similar to Muong Nong-type indochinites, indicating same source and composition similar to average upper continental crust, without obvious extraterrestrial components)

Anh, P.L., A.G. Vladimirov, N.N. Kruk, G.V. Polyakov, V.A. Ponomarchuk, T.T. Hoa et al. (2010)- Stanniferous granites of Vietnam: Rb-Sr and Ar-Ar isotope age, composition, sources, and geodynamic formation conditions. *Doklady Earth Sciences* 432, 2, p. 839-845.

(Granite-leucogranite massifs in Vietnam, linked to cassiterite placer deposits, are of Late Cretaceous age (~85 Ma) by Rb-Sr and Ar-Ar isotope dating)

Bao, N.X. & T.D. Luong (1982)- Geological map of Vietnam, 1:500,000 with explanatory notes. Geological Department of Vietnam, Ha Noi, 52 p.

Barnes, V.E. & K. Pitakpaivan (1962)- Origin of indochinite tektites. *Proc. National Academy of Sciences USA* 48, p. 947-955.

(online at: www.pnas.org/content/48/6/947)

(Chemical analyses of Muong Nong-type and 'normal' splashform indochinite glassy tektites from Laos and Thailand)

Barr, S.M. & A.S. MacDonald (1981)- Geochemistry and geochronology of Late Cenozoic basalts of Southeast Asia: summary. *Geological Society of America (GSA) Bull.* 92, 8, p. 508-512.

(Brief review of Late Cenozoic (12 Ma- Recent) basalts in Vietnam, Cambodia, Thailand. Wide diversity in geochemistry. Hawaiites appear to be most voluminous, but tholeiites also abundant, especially in Vietnam. Basanitoid basalts relatively minor, as small isolated flows, vents, or plugs, or as youngest extrusions capping more voluminous, less-undersaturated, older flows)

Battail, B. (2009)- Late Permian dicynodont fauna from Laos. In: E. Buffetaut, G. Cuny et al. (eds.) *Late Palaeozoic and Mesozoic continental ecosystems in SE Asia*, Geological Society, London, Special Publ. 315, p. 33-40.

(New collection of Dicynodon spp. tetrapod skulls from Late Permian purple beds of Luang Prabang area. This indicates Indochina Plate was probably connected to mainland Eurasia (Pangea) by Late Permian time)

Battail, B., J. Dejax, P. Richir, P. Taquet & M. Veran (1995)- New data on the continental Upper Permian in the area of Luang Prabang, Laos. *Proc. IGCP Symposium on Geology of SE Asia, Hanoi, Journal of Geology, Hanoi*, B, 5-6, p. 11-15.

(Permian N of Luang Prabang contains ~120m thick 'fourth zone' of continental purple clays- sandstones with silicified wood and tetrapod fauna dominated by Dicynodon, a cosmopolitan terrestrial animal widespread in Late Permian of Pangea. Sshows NW edge of Indochina block probably had land connection to Pangea in Late Permian. Basal section of zone with (reworked?) Late Murgabian corals, incl Ipciphyllum, Multimurus)

Bercovici A., S. Bourquin, J. Broutin, J.S. Steyer, B. Battail, M. Veran, R. Vacant, B. Khentavong & S. Vongphamany (2012)- Permian continental paleoenvironments in Southeastern Asia: new insights from the Luang Prabang Basin (Laos). *J. Asian Earth Sciences* 60, p. 197-211.

(On M-L Permian fluvial and shallow marine clastics along Mekong River in Luang Prabang area, Indochina Block. Basal marine limestones with Spiriferina, clastics with Cathaysian-affinity floras (but also Glossopteris-like leaves) and 'Pangean' tetrapod reptile fossils of genus Dicynodon)

Blanchard, S., C. Rossignol, S. Bourquin, M.P. Dabard, E. Hallot, T. Nalpas, M. Poujol, B. Battail, N.E. Jalil et al. (2013)- Late Triassic volcanic activity in South-East Asia: new stratigraphical, geochronological and paleontological evidence from the Luang Prabang Basin (Laos). *J. Asian Earth Sciences* 70-71, p. 8-28.

(Luang Prabang Basin in N Laos asymmetric NE-SW syncline with NE-SW thrusts between Late Permian and Late Triassic deposits. Late Triassic fluvial volcanoclastics with euhedral zircon grains aged ~225, 220 to 216 Ma, indicating Carnian-Norian volcanism during sedimentation. Anhedral inherited zircons older, many of them ~1870 Ma)

Blanche, J.B. (1990)- An overview of the exploration history and hydrocarbon potential of Cambodia and Laos. *Proc. 8th Offshore South East Asia Conference, Singapore 1990, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 9, OSEA 90178, p. 89-99.*

Blanche, J.B. & J.D. Blanche (1992)- An overview of the exploration history and hydrocarbon potential of Cambodia and Laos. *Bull. Geological Society Malaysia* 32, p. 135-154.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1992019.pdf>)

(Petroleum geology and hydrocarbon potential of Cambodia and Laos virtually unknown. Only 3 wells drilled in Cambodia. Mesozoic and Cenozoic basins may have potential)

Blondel, F. (1932)- La geologie et les mines de l'Indochine francaise. *Annales Academie des Sciences Coloniales, Societe Editions Geographiques Maritimes et Coloniales, Paris, p. 1-148.*

('The geology and the mines of French Indochina', by Fernand Blondel, former Chief of the Geological Survey of Indochina in 1926-1928)

Bohme, M., M. Aiglstorfer, P.O. Antoine, E. Appel, P. Havlik, G. Metais, Laq The Phuc, S. Schneider et al. (2013)- Na Duong (northern Vietnam) - an exceptional window into Eocene ecosystems from Southeast Asia. *Zitteliana A* 53, p. 121-167.

(online at: www.wahre-staerke.com/~madelaine/2014_Boehme_NaDuong.pdf)

(Na Duong Basin in N Vietnam with high diversity Paleogene vertebrate, invertebrate and plant fossils in 220 m thick coal-bearing Na Duong section, ~20km SE of Lang Son. Affinities of new mammal species suggest M-L Eocene age (late Bartonian-Priabonian). High biodiversity unionid mussels (Nodularia, Cristaria), freshwater gastropods, fishes, turtles and crocodiles. Dipterocarp trees and tree ferns identified. In-situ tree-stump horizons suggest maximum canopy height (35m). Environment changed abruptly from swamp forest to tropical-warm subtropical lake. Strong biogeographic link with Eocene mammal faunas from Europe)

Bohme, M., J. Prieto, S. Schneider, Nguyen Viet Hung, Do Duc Quang & Dang Ngoc Tran (2011)- The Cenozoic on-shore basins of Northern Vietnam: biostratigraphy, vertebrate and invertebrate faunas. *J. Asian Earth Sciences* 40, p. 672-687.

(Na Duong, Cao Bang, and Hang Mon basins of N Vietnam (at boundary of Indochina- S China plates) contain rich non-marine fauna and flora of supposed Oligocene age, including mammals, crocodiles, >6 turtle species, 20 fish taxa, 20 mollusc species and plant remains. Most taxa new to science)

Bounliyong, P., A. Arribas, Y. Watanabe, T. Echigo & H. Wong (2021)- A new orogenic gold belt in Southeast Asia: Geology, mineralogy and genesis of the Vangtat gold deposit, Southeastern Laos. *Resource Geology* 72, 1, e12283, p.

(Vangtat orogenic gold deposit formed within convergent margin along W segment of Poko suture zone, which marks collision between Indochina Terrane and Kontum Massif)

Bounliyong, P., T. Itaya, A. Arribas, Y. Watanabe, H. Wong & T. Echigo & (2021)- K-Ar geochronology of orogenic gold mineralization in the Vangtat gold belt, southeastern Laos: Effect of excess argon in hydrothermal quartz. *Resource Geology* 71, 2, p. 167-175.

(Newly discovered orogenic gold belt in SE Laos in Vangtat shear zone. Large range of K–Ar ages (348 to 206 Ma). Youngest age of 206 Ma (Late Triassic) deemed closest to age of mineralization)

Boura, A., D. Pons, C. Vozenin-Serra & Bui Phu My (2013)- Mesozoic fossil wood of Kien Giang Province, southwestern Vietnam. *Palaeontographica*, B 290, 1-3, p. 11–40

(New fossil wood from E Cretaceous continental red beds ('Gres superieurs') of islands in NE Gulf of Thailand off S Vietnam. Fossil wood samples belong to Agathoxylon saravanensis, Protophyllocladoxylon, Cycadeanoxylon. Brachyoxylon orientale and Prototaxoxylon asiaticum already known from this area. Associated with rel. common Classopollis pollen, Signify rel. aridclimate with some seasonality (growth rings))

Boureau, E. (1950)- Contribution a l'etude paleoxylologique de l'Indochine. Presence du *Xenoxylon latiporosum* (Cramer) Gothan dans le Lias du Centre-Amman. *Bull. Service Geologique de l'Indochine*, Hanoi, 29, p. 1-16.

('Contribution to a study of fossil wood from Indochina. Presence of Xenoxylon latiporosum (Cramer) Gothan in the Lias of Centre-Amman'. Early Jurassic wood (supposedly Boreal Northern Hemisphere genus; Philippe 2013))

Bouttathep, B. (2013)- Geology of the Sepon copper and gold deposits, Laos. In: C. Senebottalath et al. (eds.) *Proc. 2nd Lao-Tai Conference Geology and Mineral resources*, Vientiane, p. 164-187.

(online at: www.dmr.go.th/download/English/LAO%20-THAI%20Conference%202012_Proceedings.pdf)

(Sepon Mining District in S C Laos in Sepon basin within NW trending Truongson fold belt of Devonian-Carboniferous sediments and metamorphic rocks (Indochina terrane). Major compressional event, likely associated with Indosinian orogeny and with Carlin-type? gold mineralization-forming intrusion of rhyodacite porphyry dikes)

Cannell, J.B., J. Stewart, P. Williams, M. Wallace, C.F. Burrett & B. Davis (2015)- The Sepon copper deposits (Laos) and their relation to Carlin-like gold mineralisation. *Proc. PACRIM 2015 Congress*, Hongkong, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, Publ. Series 2/2015, p. 399-408. *(Extended Abstract)*

(Sepon district in Lao PDR 1.8 Mt of Cu and >4.5 Moz of Carlin-like Au in Paleozoic sedimentary package. Cu deposits near Permian rhyodacite porphyry. Carlin-like Au deposits outboard of Cu deposits, but may be related to copper mineralisation, with differences in style related to palaeodepth and proximity to intrusive centres)

Carbonnel, J.P. (1972)- Le Quaternaire cambodgien: structure et stratigraphie. *Mem. ORSTOM* 60, p. 1-254.

(online at: http://horizon.documentation.ird.fr/exl-doc/pleins_textes/pleins_textes_2/memoires/05936.pdf)

('The Quaternary of Cambodia'. Include M Pleistocene tektites occurrence in upper gravels of 40m terrace of Mekong River)

Carter, A. & P.D. Clift (2008)- Was the Indosinian orogeny a Triassic mountain building or a thermotectonic reactivation event? *Comptes Rendus Geoscience* 340, 2, p. 83-93.

(online at: https://www.academia.edu/1265344/Was_the_Indosinian_orogeny_a_Triassic_mountain_building_or_thermotectonic_reactivation_event)

(No definitive evidence for Triassic age of collision between Indochina and S China blocks. Indosinian event in S China/ Vietnam is reactivation event caused by closure of Paleotethys with accretion of Sibumasu block to Indochina in E-M Triassic (~250-220 Ma))

Carter, A., D. Roques & C. Bristow (2000)- Denudation history of onshore central Vietnam: constraints on the Cenozoic evolution of the western margin of the South China Sea. *Tectonophysics* 322, p. 265-277.

(Apatite fission track analysis suggests denudation across C Vietnam during syn- and post-rift phases of South China Sea occurred at similar rates (~40m/ Myr), suggesting extension was not dominant factor controlling Cenozoic denudation. Regional Late Miocene cooling linked to enhanced erosion and deposition of prograding sediments in adjacent offshore basins and associated with initiation of regional basaltic magmatism and development of topography)

Carter, A., D. Roques, C. Bristow & P. Kinny (2001)- Understanding Mesozoic accretion in Southeast Asia: significance of Triassic thermotectonism (Indosinian orogeny) in Vietnam. *Geology (GSA)* 29, 3, p. 211-214. *(Zircon U-Pb study of metamorphic basement of Vietnam show large part was affected by short-lived episode of ductile deformation and high T metamorphism between 258 ± 6 Ma and 243 ± 5 Ma (Late Permian- earliest Triassic), caused by accretion of Sibumasu to Indochina- S China ('Indosinian Orogeny'). Coincident with final N-S China collision (Qinling orogenesis))*

Cawood, P.A., Y. Wang, Y. Xu & G. Zhao (2013)- Locating South China in Rodinia and Gondwana: a fragment of greater India lithosphere? *Geology* 2013, 41, p. 903-906.
(online at: <http://geology.gsapubs.org/content/41/8/903.full.pdf+html>)
(From formation of Rodinia at end of Mesoproterozoic to Pangea breakup at end Paleozoic, S China craton (Cathaysia+Yangtze blocks) was adjacent to W Australia and N India. Neoproterozoic arc-backarc assemblages ages from ~1000 to 820 Ma, with NW decrease in ages, suggesting SE-directed subduction at periphery of Rodinia. E Paleozoic detrital zircon age spectra require E Gondwana source, similar to Tethyan Himalaya and W Australia, suggesting common source and accumulation along N margin of Gondwana. S China block rifted from Gondwana in Late Devonian- E Carboniferous, before drifting across Tethys Ocean, and accreting to Asia (N China) along Qinling-Dabie suture in Permian-Triassic)

Charoentitirat, T., K. Ueno & N. Rathaporn (2011)- Late Paleozoic carbonates and foraminiferal faunas in northern Lao PDR: their geotectonic implications. *Proc. Int. Conference Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011)*, Khon Kaen, p. 6-8. *(Extended Abstract)*
(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2011/34445.pdf)
(N Laos limestones NW of Luang Prabang and S of Sayabouli with Late Permian foraminifera Dagmarita, Septoglobivalvulina? and Reichelina?. Similar to W margin of Indochina Block in Thailand, suggesting link between NE Thailand and NW Laos. Nan-Uttaradit Suture between Sukhothai zone and Indochina Block runs NNE-ward into NW Laos and continues to Lancangjiang suture in W Yunnan (similar to Ueno et al. 2010))

Charvet, J., H. Lapiere & Y. Yu (1994)- Geodynamic significance of the Mesozoic volcanism of southeastern China. *J. Southeast Asian Earth Sciences* 9, 4, p. 387-396.
(Two main magmatic episodes during Yenshanian cycle, separated by tectonic event: (1) Late Jurassic-M Cretaceous, and (2) Late Cretaceous bimodal suite of continental basalts and acidic rocks, separated by angular unconformity. Geodynamic evolution: (1) subduction of Izanagi plate beneath E Asian continental margin until M Cretaceous; (2) collision with W Philippines Block around E-L Cretaceous boundary; (3) post-collisional extension and onset of rifting during Late Cretaceous)

Chen, Q., H. Cheng, P.P. Liu & M. Sun (2024)- Late Cretaceous basalts in the eastern South China Block: The result of slab tearing during retreating subduction of the Paleo-Pacific plate. *J. Asian Earth Sciences* 261, 105979, p.
(Late Cretaceous arc-like, ocean island basalt-like, and transitional basalts erupted on E South China Block, related to Paleo-Pacific plate subduction. Basalts in coastal regions erupted in 104-81 Ma. Retreating Paleo-Pacific plate promoted melting of sediment-hybridized mantle wedge, then triggered opening of slab window and asthenosphere-slab interactions)

Chen, Z., Wei Lin, M. Faure, C. Lepvrier, Nguyen Van Vuong & Vu Van Tich (2013)- Geochronology and isotope analysis of the Late Paleozoic to Mesozoic granitoids from northeastern Vietnam and implications for the evolution of the South China block. *J. Asian Earth Sciences* 86, p. 131-150.
(In NE Vietnam widespread Late Paleozoic and Permo-Triassic granitic plutons. Zircon ages suggest at least four thermal events, at ~525, 254-251, ~245-220 and ~91 Ma. Granitic rocks formed by re-melting of Paleoproterozoic continental crust. NE Vietnam granites belongs to S China block. Late Cretaceous magmatism in back-arc extensional tectonic setting)

Cheng, R., E. Uchida, M. Katayose, K. Yarimizu, K.C. Shin, S. Kong & T. Nakano (2019)- Petrogenesis and tectonic setting of Late Paleozoic to Late Mesozoic igneous rocks in Cambodia. *J. Asian Earth Sciences* 185, 104046, p.

(Emplacement of Carboniferous- M Jurassic igneous rocks in Cambodia linked to Indosinian Orogeny, which was related to the sequence of suturing and collision between the continental fragments from Gondwana. Two provinces, divided by Mae Ping fault: (1) magnetite series in NE and (2) ilmenite series in SW). Late Triassic-M Jurassic igneous rocks formed by subduction of Paleo-Tethys Ocean crust associated with collision of Sibumasu Terrane with Indochina Terrane (Indosinian Orogeny II)).

Cheng, Y., J. Mao & P. Liu (2016)- Geodynamic setting of Late Cretaceous Sn-W mineralization in southeastern Yunnan and northeastern Vietnam. *Solid Earth Sciences* 1, 3, p. 79-88
(online at: www.sciencedirect.com/science/article/pii/S2451912X16300046)
(Late Cretaceous (~80-100 Ma) Sn-W mineralization in SE Yunnan (S China) and NE Vietnam many similarities, representing one regional magmatic-mineralization event. Late Cretaceous magmatic-mineralization- metamorphic activities widely distributed along E Asian continental margin, and product of subduction of Paleo-Pacific Plate under Eurasia (also Triassic magmatism with Sn-W mineralization))

Chi, C.T. & J.W. Geissman (2013)- A review of the paleomagnetic data from Cretaceous to lower Tertiary rocks from Vietnam, Indochina and South China, and their implications for Cenozoic tectonism in Vietnam and adjacent areas. *J. Geodynamics* 69, p. 54-64.
(Review of paleomagnetic data from Cretaceous of Vietnam, Indochina and S China in common reference frame with respect to Eurasia's coeval paleopoles. S China Block has been relatively stable with respect to Eurasia since mid-Cretaceous. Cretaceous - E Tertiary paleomagnetic data from Indochina-Shan Thai Block reveal complex patterns of intra-plate deformation in response to the India-Eurasia collision. Red River transcurrent fault system complicated slip history in area with modest (~800 km) S-ward translation)

Clift, P.D., A. Carter, I.H. Campbell, M.S. Pringle, Nguyen Van Lap, C.M. Allen, K.V. Hodges & M.T. Tan (2006)- Thermochronology of mineral grains in the Red and Mekong Rivers, Vietnam: provenance and exhumation implications for Southeast Asia. *Geochem. Geophysics Geosystems* 7, 10, p. 1-28.
(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2006GC001336/epdf>)
(Zircon dating of sand samples from mouths of Red and Mekong Rivers shows main sources from crust within Yangtze Craton, formed during Triassic Indosinian Orogeny. Indosinian grains in Mekong younger (210-240 Ma) than in Red River (230-290 Ma))

Colani, M. (1915)- Sur un *Araucarioxylon* du Rhetien de Hongay. *Bull. Service Geologique de l'Indochine*, Hanoi, 3, 1, p. 1-10 + Plates.
(online at: <https://patrimoine.sorbonne-universite.fr/viewer/7450> Etc.)
(‘On a Rhaetian *Araucarioxylon* from Honay’. Latest Triassic fossil wood collected from Hongay coal mines, Bas-Tonkin, N Vietnam, by R. Zeiller)

Colani, M. (1924)- Nouvelle contribution a l’etude des fusulinides de l’Extreme-Orient. *Memoires du Service Geologique de l’Indochine*, Hanoi, 11, 1, p. 1-191.
(Well-known work on Permian fusulinid foraminifera of SE Asia, by Madeleine Colani, a self-taught palaeontologist who worked at Geological Survey of Indochina in Hanoi in 1914-1928 under Henri Mansuy. Colani’s work built on the pioneering works by Douville (1906) and the controversially disgraced French geologist-paleontologist Dr. Jacquet Deprat (1913), but was reportedly too harshly critical of Deprat’s work on fusulinids (Genovese, 2011))

Counillon, H. (1896)- Documents pour servir a ' l'etude geologique de Luang Prabang (Cochinchine). *Comptes Rendus Academie Sciences Paris* 123, p. 1330-1333.
(Incl. first record of Permian dicynodonts vertebrates in Luang Prabang area of N Laos (known throughout Pangea and linking N Laos to main Eurasian continent by Permian time; see also Battail (2009))

Cung, T.C., S. Dorobek, S.C. Richter, M.F.J. Flower, E. Kikawa, Y.T. Nguyen & R. McCabe (1998)- Paleomagnetism of late Neogene basalts in Vietnam and Thailand; implications for the post-Miocene tectonic history of Indochina. *AGU Geodynamics Series, Mantle dynamics and plate interactions in East Asia*, 1998, 27, p. 289-299.

(Paleomagnetic poles for Late Miocene-Quaternary basalts in Vietnam indistinguishable from other Neogene paleomagnetic poles for Indochina, Borneo, S China, and Eurasia, suggesting little or no relative motion between these regions since at least Late Miocene (and possibly earlier). CW declinations from coeval basalts in W and C Thailand probably related to local strike-slip faults that developed during late Neogene uplift and extension of Indochina)

Corsin, P. & C. Desreumaux (1972)- Decouverte d'une flore neocomienne dans les "Gres superieurs" de Bokor (Cambodge meridional). Annales Soc. Geol. du Nord 92, p. 199-212.

('Discovery of a Neocomian flora in the 'Upper sands' of Bokor (East Cambodia)'. Philippe et al. (2004) noted that wood from 'Gres superieurs' of Indochina very similar to that from Phu Kradung Fm of NE Thailand (= Late Jurassic oldest formation of Khorat Gp))

Cromie, P.W. (2010)- Geological setting, geochemistry and genesis of the Sepon gold and copper deposits, Laos. Ph.D. Thesis, University of Tasmania, p. 1-395.

(online at: <http://eprints.utas.edu.au/10703/>)

(Sepon Mineral District gold-copper deposits along Truong Son Fold Belt on NE margins of Indochina Terrane in SE Laos. Geology dominated by Ordovician- Devonian fluvial and marine sediments. Mineralization tied to intrusion of rhyodacite porphyry along faults in E Permian (U-Pb zircons ages ~280-300 Ma) and mainly hosted in Devonian calcareous shale)

Cullen, P.J., P.L. Birch, S.C. Wright, C.J. Keamey & A.T. Pink (1997)- Exploration in the Savannakhet Basin, Peoples Democratic Republic of Laos. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Conf. Petroleum Systems of SE Asia and Australasia, Indonesian Petroleum Association (IPA), Jakarta, p. 425-447.

(Collision of Indochina Block with S China Plate in E Carboniferous led to initiation of Khorat Basin as foreland basin to Annamitic fold-belt of NE Vietnam. Subsequent Permo-Triassic collision of Shan-Thai plate from W trapped Indochina Block between converging thrust-fold belts. Marine clastic foredeep and carbonate foreland ramp sedimentation gave way to continental foreland basin deposition across Mesozoic Khorat intermontane basin. Later collision of Lhasa/Myanmar Block and Indian Plate from W rejuvenated earlier compressional structures and propagated fold belts into foreland, resulting in isolation of sub-basins including Savannakhet Basin. Three hydrocarbon plays: Paleozoic carbonate play (analogous to Khorat Plateau play of Thailand), Triassic clastic play, and E Jurassic Khorat Group clastics play)

Cung, T.C. (1996)- Paleomagnetism of Mesozoic and Cenozoic rocks from Vietnam: implications for the Tertiary tectonic history of Indochina and a test of the extrusion model. Ph.D. Thesis Texas A&M University, College Station, p. 1-227.

Cung, T.C. (2007)- Paleomagnetism of Cretaceous continental redbed formations from Indochina and South China, their Cenozoic tectonic implications: a review. VNU Journal of Science: Earth Sciences 23, p. 220-230.

(online at: www.js.vnu.edu.vn/e_4_07/B3.pdf)

(Cretaceous paleomagnetic data from S China block confirms S China block has been relatively stable with respect to Eurasia since Cretaceous time. Cretaceous paleomagnetic data from Indochina- Shan Thai block reveal complex intraplate deformations due to India- Eurasia collision. CCW rotations recorded from Borneo and Malay Peninsula indicate complex tectonic evolution of SE Asian region)

Cung, T.C. & S.L. Dorobek (2004)- Cretaceous palaeomagnetism of Indochina and surrounding regions: Cenozoic tectonic implications. In: J. Malpas et al. (eds.) Aspects of the geological evolution of China, Geological Society, London, Special Publ. 226, p. 273-287.

(Paleomagnetic studies of Cretaceous volcanics and sediments from S Vietnam suggests ~5-10° S-ward displacement and virtually no rotation since Cretaceous. Review of paleomag data suggests Sundaland three domains with different rotation/ translation histories: Shan-Thai, Indochina, offshore Sundaland)

Cung, T.C. & J.W. Geissman (2013)- A review of the paleomagnetic data from Cretaceous to lower Tertiary rocks from Vietnam, Indochina and South China, and their implications for Cenozoic tectonism in Vietnam and adjacent areas. J. Geodynamics 69, p. 54-64.

(Cretaceous paleomagnetic data from S China Block show present geographic position of S China Block relatively stable relative to Eurasia since mid-Cretaceous. Cretaceous- E Tertiary data from Indochina- Shan Thai Block reveal complex patterns of intra-plate deformation in response to India-Eurasia collision. Most paleomagnetic results from E and S of Red River fault system at latitude of Yunnan consistent with modest (~800 km) S-ward component of latitudinal translation)

Cung, T.C., J.W. Geissman, V.Q. Hoang, T.P.D. Nguyen & T.H. Nguyen (2014)- New paleomagnetic results of upper Permian- lower Triassic volcanic sequences from the Hoa Binh area, northwest Vietnam. Vietnam J. Earth Sciences 36, p. 413-423.

(online at: www.vjs.ac.vn/index.php/jse/article/download/6429/5701)

(Paleomag work on late Permian- E Triassic volcanics (basalt ages 257-270 Ma; distal equivalents of Emeishian?) of Viet Nam Fm at Hoa Binh dam suggest paleolatitude of ~15°S, and that volcanic terrane was close to or part of S China Block since late Permian)

Cuny, G., J. Mo, R. Amiot, E. Buffetaut, S. Suteethorn, V. Suteethorn & H. Tong (2017)- New data on Cretaceous freshwater hybodont sharks from Guangxi Province, South China. Research and Knowledge 3, 1, p. 11-15.

(online at: <https://rk.msu.ac.th/wp-content/uploads/2017/09/04-Gilles.pdf>)

*(Fluvial Lower Cretaceous Xinlong Fm in Guangxi with diverse assemblage of vertebrates, incl. fresh-water hybodont shark teeth *Acrorhizodus khoratensis*)*

De Franceschi, D. & C. Vozenin-Serra C. (1997)- La flore du Trias superieur vietnamien. Implications paleogeographiques. Comptes Rendus Academie Sciences, Paris, Serie 2, 324, 4, p. 333-340.

('The flora of the Upper Triassic of Vietnam; paleogeographic implications'. Vietnamese U Triassic flora belongs to coastal floristic assemblage of SW Pacific (see also Vozenin-Serra & De Franceschi, 1999))

Deng, J., C. Wang, J.W. Zi, R. Xia & Q. Li (2018)- Constraining subduction-collision processes of the Paleo-Tethys along the Changning-Menglian suture: new zircon U-Pb ages and Sr-Nd-Pb-Hf-O isotopes of the Lincang Batholith. Gondwana Research 62, p. 75-92.

(Changning-Menglian suture remnant of main Paleo-Tethys in SW China, with abundant magmatic rocks formed during orogenic processes related to closure of Paleo-Tethys. Lincang granitoid batholith crystallization ages of 261, 252 (Late Permian) to 203 Ma (Late Triassic), suggesting multi-stage emplacement. Three episodes related to subduction (before ~252 Ma), syn-collision (250-237 Ma) and post-collision (235-203 Ma))

Deprat, J. (1912)- Etude des fusulinides de Chine et d'Indochine et classification des calcaires a fusulines. Memoires du Service Geologique de l'Indochine, Hanoi, 1, 3, p. 1-76.

('Study of the fusulinids of China and Indochina and classification of the fusulinid limestones'. First of 4 pioneering papers on Late Paleozoic fusulinid foraminifera by French geologist Deprat of the French Indochina Geological Survey in Hanoi)

Deprat, J. (1913)- Etude des fusulinides de Chine et d'Indochine et classification des calcaires a fusulines. II. Les fusulinides des calcaires Carboniferiens et Permians du Tonkin, du Laos et du Nord-Annam. Memoires du Service Geologique de l'Indochine, Hanoi, 2, p. 1-74.

(online at: <https://humazur.univ-cotedazur.fr/omeka-s-dev/s/humazur/item/1565#?c=&m=&s=&cv=>)

('Study of the fusulinids of China and Indochina and classification of the fusulinid limestones. The fusulinids of the Carboniferous and Permian of Tonkin, Laos and North Annam')

Deprat, J. (1915)- Etude des fusulinides de Chine et d'Indochine et classification des calcaires a fusulines. IV. Les fusulinides des calcaires carboniferiens et permians du Tonkin, du Laos et du Nord-Annam. Memoires du Service Geologique de l'Indochine 4, 1, p. 1-30.

(Final of 4 volumes on fusulinid foraminifera from Indochina by Deprat. Deprat's pioneering works were unnecessarily harshly criticized by Colani (1924))

- Deprat, J. & H. Mansuy (1912)- Etude geologique du Yun-Nan oriental. Memoires du Service Geologique de l'Indochine, Hanoi, 1, 1, p. 1-365 + Atlas.
(online at: <https://babel.hathitrust.org/cgi/pt?id=uiuo.ark:/13960/t89h01c28&seq=9>)
(*'Geological study of eastern Yunnan'. Major pioneering study of geology, Paleozoic- Triassic stratigraphy and paleontology of western part of 'French Indochina' / southern China*))
- Douville, H. (1906)- Les calcaires a fusulines de l'Indo-Chine. Bull. Societe Geologique France (4) 6, p. 575-587.
(*'The fusulinid limestones of Indochina'. Early paper on Permian fusulinid foraminifera from Vietnam and Laos*)
- Du, Y., A. Bertinelli, X. Jin, Z. Shi, V. Karadi, He Yin, Lu Han, Q. Wu & M. Rigo (2020)- Integrated conodont and radiolarian biostratigraphy of the upper Norian in Baoshan Block, Southwestern China. Lethaia, p. 1-13.
(*Baoshan Block was located in E Tethys during Late Triassic. New samples from Hongyan section thin-layered limestones, sandstone and siltstone, with Sevatian (Norian) conodont and radiolarian faunas*)
- Dussault, L. (1919)- Contribution a la geologie du Laos. Bull. Service Geologique de l'Indochine 6, 4, p.
(online at: <https://patrimoine.sorbonne-universite.fr/fonds/item/7478-contribution-a-la-geologie-du-laos>)
(*'Contribution to the geology of Laos'. Pioneering fieldwork in 1912-1913 on geology of Laos- Cambodia by French colonial Army officer, in what was at that time French Indochina. Devonian- Permian sediments (incl. Permian limestones with Verbeekina verbeeki, Sumatrina annae, etc. (fusulinids identified by Deprat (1913))*)
- ESCAP/ Geoscientists of Socialist Republic of Vietnam (1986)- Stratigraphy and sedimentary basins of Viet Nam. In: ESCAP Atlas of Stratigraphy VI. Socialist Republic of Viet Nam, United Nations Mineral Resources Development Series, New York, 54, p. 1-11.
(online at: <https://repository.unescap.org/items/281483a2-6a28-4be3-8c3f-c0cd3fa65417>)
- ESCAP (UN) (1990)- Lao People's Republic. Atlas of mineral resources of the ESCAP region 7, United Nations Publications, New York, p. 1-19.
(*Brief review of mineral occurrences of Laos*)
- Fan, P.F. (2000)- Accreted terranes and mineral deposits of Indochina. J. Asian Earth Sciences 18, p. 342-350.
(*Summary of Indochina terranes and mineral deposits. Indochina is amalgamation of Sino-Vietnam (=S China), and Viet-Lao, Uttaradit, and Khorat-Kontum (combined into Indochina) terranes*)
- Faure, C. & H. Fontaine (1969)- Geochronologie du Viet-Nam meridional. Archives Geologiques Vietnam 12, p. 213-222.
(*'Geochronology of South Vietnam'. see also Lasserre et al. 1974*)
- Feng Rulin (1998)- Discovery of Australia Early Permian brachiopods faunas from Bianping Section of Southwestern Guizhou Province, China and it's significance. Guizhou Geology 1998, 3, p.
(*E Permian brachiopod fauna from Bianping section, Guizhou, with Strophomenida, Ptaluctida and Spiriferida, of high diversity and warm water. Faunas chiefly Asselian-Sakmarian, incl. Globiella foordi, Elivina bisnaini, Spiriferella sp., etc., similar similar to E Permian of W Australia. E Permian brachiopods can be correlated with those of E Permian of Irian Jaya, Pakistan Salt Range, Afghanistan, Pamirs, Thailand, Timor, etc. (another example of fairly similar Permian brachiopod assemblages across different tectonic terranes; JTVG)*)
- Feng, Q., W. He, S. Gu, Y. Jin & Y. Meng (2006)- Latest Permian Spumellaria and Entactinaria (Radiolaria) from South China. Revue de Micropaleontologie 49, p. 21-43.
(*33 species of latest Permian radiolaria from bedded cherts in S China*)
- Findlay, R.H. (1997)- The Song Ma Anticlinorium, northern Vietnam: the structure of an allochthonous terrane containing an early Palaeozoic island arc sequence. J. Asian Earth Sciences 15, p. 453-464.
(*Argues for Indochina- South China blocks collision in Ordovician- E Silurian, older than commonly accepted*)

Findlay, R.H. & P.T. Trinh (1997)- The structural setting of the Song Ma Region, Vietnam and the Indochina-South China plate boundary problem. *Gondwana Research* 1, 1, p. 11-33.

(Song Ma- Song Da region of N Vietnam contains Song Ma Anticlinorium, a polydeformed E Paleozoic island arc/ forearc terrane accreted to S China plate in Siluro-Devonian. Anticlinorium not Indosinian subduction zone. Song Ma Fault is one of many NW-trending post-Cretaceous oblique-slip faults and thrusts)

Chung, S.L., B.M. Jahn, Wu Genyao, C.H. Lo & B. Cong (1998)- The Emeishan flood basalt in SW China: a mantle plume initiation model and its connection with continental breakup and mass extinction at the Permian-Triassic boundary. In: M.F.J. Flower (ed.) *Mantle dynamics and plate interactions in East Asia*, AGU Geodynamics Ser. 27, p. 47-58.

(online at: www.agu.org/books/gd/v027/GD027p0047/GD027p0047.pdf)

(Mantle plume model proposed to account for generation of the Emeishan LIP in SW China and N Vietnam. Magmatism may have played role in rifting of Qiangtang Terrane of Tibet from S China Block (Yangtze Craton) in Permian when these blocks were near equator)

Fan, P.F. (1995)- Tectonic patterns and Cenozoic basalts in the western margin of the South China Sea. In: G.H. Teh (ed.) *Proc. AAPG-GSM Int. Conference Southeast Asian basins; oil and gas for the 21st century*, Kuala Lumpur 1994, *Bull. Geological Society Malaysia* 37, p. 91-99.

(online at: www.gsm.org.my/products/702001-100960-PDF.pdf)

(Allochthonous fragments (Indosinia, Sibumasu, E Malaya, and SW Kalimantan) rifted from Gondwanaland and drifted N. At ~50 Ma collision of Indian continent led to fragmentation of Asia, followed by Andaman Sea opening, clockwise rotation of Indochina plate and S China Sea rifting and opening. Indian-Eurasian collision pushed Indochina Peninsula in ESE direction. Most M Tertiary movements along left-lateral Red River, Tonle Sap-Mekong faults, with extension along these faults responsible for widespread Plio-Pleistocene alkaline basalts from Vietnam/Kampuchea N-ward into E Thailand. Basalts composition tholeiitic to alkalic)

Faure, M., C. Lèpvrier, Vuong Van Nguyen, Tich Van Vu, W. Lin & Z. Chen (2014)- The South China block-Indochina collision: where, when, and how? *J. Asian Earth Sciences* 79, p. 260-274.

(Two NW-SE striking orogens in NW and NE Vietnam, each stack of NE-directed nappes, due to SW-directed subduction with arc magmatism, ocean closure, and continental collision. Song Ma zone and Song Chay ophiolitic melange represent two ophiolitic sutures (closing N branch of Paleotethys). Late Triassic unconformity, 225-205 Ma (Norian) postorogenic plutonism, and 250-230 Ma syntectonic metamorphism support E-M Triassic age for tectonic events)

Faure, M., W. Lin, Y. Chu & C. Lèpvrier (2016)- Triassic tectonics of the southern margin of the South China Block. *Comptes Rendus Geoscience* 348, 1, p. 5-14.

(M Triassic orogens widespread around and inside S China Block, resulting from oceanic, then continental subduction of S China Block below Indochina. Triassic suture hypothesized offshore of SCB, E of Hainan Island. Within SCB Xuefengshan M Triassic intracontinental orogen)

Faure, M., W. Lin, P. Monie & S. Meffre (2008)- Palaeozoic collision between the North and South China blocks, Triassic intracontinental tectonics, and the problem of the ultrahigh-pressure metamorphism. *Comptes Rendus Geoscience* 340, p. 139-150.

(Widespread ultrahigh-pressure rocks in Qinling-Dabie suture between N and S China blocks. Structures and zircon dating of migmatites in core of C Qinling suggests Silurian continent collision, before 400 Ma. Late Permian- M Triassic N-ward continental subduction of SCB responsible for development of UHP metamorphism. Age of UHP metamorphism unsettled. Radiometric ages from Neoproterozoic- Cretaceous, with cluster of ages around 240-210 Ma, leading previous authors to accept Triassic age for NCB-SCB collision)

Faure, M., Van Vuong Nguyen, Luong Thi Thu Hoai & C. Lèpvrier (2018)- Early Paleozoic or Early-Middle Triassic collision between the South China and Indochina Blocks: The controversy resolved? Structural insights from the Kon Tum massif (Central Vietnam). *J. Asian Earth Sciences* 166, p. 162-180.

(Kon Tum massif in C Vietnam is E-M Triassic Metamorphic Core Complex. Top-to-NW ductile shearing accommodated exhumation. MCC superimposed on E Paleozoic collision belt between N and S Vietnam. Interaction between Emeishan mantle plume and continental subduction proposed)

Fiske, P.S. (1996)- Constraints on the formation of layered tektites from the excavation and analysis of layered tektites from northeast Thailand. *Meteoritics Planetary Science* 31, 1, p. 42-45.

Fiske, P.S., P. Putthapiban & J.Y. Wasson (1996)- Excavation and analysis of layered tektites from northeast Thailand: results of 1994 field expedition. *Meteoritics Planetary Science* 31, 1, p. 36-41.
(6 kg of layered tektite fragments excavated from 3×3 m area near Ban Huai Sai in NE Thailand represent single homogeneous mass that underwent fragmentation and has undergone little disturbance since deposition. Tektites found along disconformable paleo-erosion surface and covered by recent aeolian sand (see also Tada et al., 2020))

Fiske, P.S., C.C. Schnetzler, J. McHone, K.K. Chanthavaichith et al. (1999)- Layered tektites of southeast Asia: Field studies in central Laos and Vietnam. *Meteoritics Planetary Science* 34, 5, p. 757-761.
(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.1999.tb01388.x/epdf>)
(Pleistocene layered tektites particularly big and abundant near Muong Nong (Laos). Layered tektites also common in C Vietnam and NE Thailand. Part of large layered tektites subfield of Australasian strewn field)

Flower, M.F.J., N. Hoang, N. Trong Yem, N.X. Bao, R. McCabe & S.H. Harder (1993)- Cenozoic magmatism in Indochina: lithosphere extension and mantle potential temperature. In: G.H. Teh (ed.) *Proc. Symposium on tectonic framework and energy resources of the Western margin of the Pacific Basin, Kuala Lumpur 1992*, Bull. Geological Society Malaysia 33, p. 211-222.
(Cenozoic basaltic magmatism of Vietnam- Cambodia initiated at ~15Ma, peaked between ~5 and 0.5 Ma, postdates opening of S China Sea and is associated with lithospheric extension)

Fontaine, H. (1954)- Etude et revision des Tabules et Heliolitides du Devonien d'Indochine et du Yunnan. *Archives Geologiques Vietnam* 2, p. 1-86.
('Study and review of Devonian Tabulata and Heliolitidae from Indochina and Yunnan'. Rel. rich Devonian coral assemblages from Laos and S China. Including Heliolites porosus (also in NE Thailand))

Fontaine, H. (1962)- Gisements fossiliferes du Bassin houiller du Quang-Nam. *Travaux de Geologie*, 1, p. 33-52.
('Fossiliferous beds from the coal basin of Quang-Nam', Vietnam)

Fontaine, H. (1976)- Tectites du Viet-Nam meridional: repartition géographique, richesse des gisements. *Compte Rendu Sommaire des Seances Societe Geologique de France, Paris*, 2, p. 37-39.
('Tektites of southern Vietnam: geographic distribution and richness of the deposits')

Fontaine, H., P. Putthapiban & D. Vachard (1999)- A microfossil-rich Kubergandian (Lower Middle Permian) limestone of Southern Laos. In: B. Ratanasthien & S.L. Rieb (eds.) *Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999*, Dept. of Geological Science, Chiang Mai University, p. 170-184
(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)
(Diverse M Permian Tethyan fusulinid and smaller foraminiferal assemblage in limestone NE of Salavan in S Laos. With Cancellina, Misellina, Maklaya, Schubertella, etc. and algae Mizzia, Permocalculus, etc.)

Fontaine, H. & D.R. Workman (1978)- Review of the geology and mineral resources of Kampuchea, Laos and Viet Nam. In: P. Nutalaya (ed.) *Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III)*, Bangkok 1978, p. 539-605.
(online at: http://library.dmr.go.th/library/DMR_Technical_Reports/1978/5242.pdf)
(Major review of Paleozoic-Recent stratigraphy, tectonics and mineral occurrences of Cambodia, Laos and Vietnam)

- Fromaget, J. (1927)- Etudes geologiques sur le nord de l'Indochine centrale. Bull. Service Geologique de l'Indochine, Hanoi, 16, 2, p. 1-368.
(*'Geologic studies on the north of central Indochina'*)
- Fromaget, J. (1934)- Observations et reflexions sur la geologie stratigraphique et structurale de l'Indochine. Bull. Societe Geologique France (5) 4, p. 101-164.
(*'Observations and reflections on the stratigraphic and structural geology of Indochina'*)
- Fromaget, J. (1934)- Contribution a l'etude structurale du Sud-Est de l'Asie. Essai sur l'evolution paleogeographique de l'Indochine et des contrees avoisinantes depuis le Permian jusqu'au Lias. Hanoi, p. 1-22.
(*'Contribution to the structural study of SE Asia. Essay on the paleogeographic evolution of Indochina and neighboring regions from the Permian to Liassic'*)
- Fromaget, J. (1941)- L'Indochine francaise: sa structure geologique, ses roches, ses mines et leurs relations possibles avec la tectonique. Bull. Service Geologique de l'Indochine 26, Imprimerie d'Extreme-Orient, Hanoi, p. 1-140.
(*'French Indochina: its geological structure, its rocks, its mines and their relations to tectonics'. Classic geology review of Vietnam-Cambodia-Laos during French colonial time'*)
- Gan, J., Z. He, Y. Gan, J. Mu, H. Liu & L. Wang (2022)- Application and significance of geological, geochemical, and geophysical methods in the Nanpo gold field in Laos. Minerals (MDPI) 12, 1, p. 1-16.
(online at: <https://www.mdpi.com/2075-163X/12/1/96/htm>)
(*Nanpo hydrothermal Au-Ag-Cu deposit in Indosinian felsic volcanic rocks (diorite, etc.) and mineralization related to earliest Triassic felsic magmatism of Luang Prabang-Loei volcanic arc*)
- Gardner, C.J., I.T. Graham, E. Belousova, G.W. Booth & A. Greig (2017)- Evidence for Ordovician subduction-related magmatism in the Truong Son terrane, SE Laos: implications for Gondwana evolution and porphyry Cu exploration potential in SE Asia. Gondwana Research 44, p. 139-156.
(*Truong Son Fold Belt with Late Carboniferous-Late Triassic metamorphic, volcanic and plutonic rocks, the product of accretion of Indochina Terrane onto S China Terrane, with subduction, collision and extensional events. Dioritic intrusion and rhyolitic tuff in Donken area of SE Laos dated as ~470-476 Ma, probably part of broader E Ordovician magmatism. With subeconomic hydrothermal Cu mineralisation*)
- Garnier, V., D. Ohnenstetter, G. Giuliani, A.E. Fallick, T. Phan Trong et al. (2005)- Basalt petrology, zircon ages and sapphire genesis from Dak Nong, southern Vietnam. Mineralogical Magazine 69, 1, p. 21-38.
(*Basalts with sapphires in S Vietnam. U-Pb dating of zircons from basaltic placers show two eruptional events, at ~6.5 Ma and at ~1 Ma. No evidence that sapphires in recent alluvial deposits came from basalts*)
- Garnier, V., D. Ohnenstetter, G. Giuliani, H. Maluski, E. Deloule et al. (2005)- Age and significance of ruby-bearing marble from the Red River shear zone, northern Vietnam. Canadian Mineralogist 43, p. 1315-1329.
(online at: https://rruff.info/doclib/cm/vol43/CM43_1315.pdf)
(*Marble-hosted ruby deposits in Red River Shear Zone, N Vietnam. Wide range of zircon ages (266-38 Ma) suggest complex metamorphic history with two main thermal events: (1) zircon in spinel crystallized in Permian (257± 9Ma), (2) Ruby formed at ~38 Ma during Red River Shear Zone ductile deformation peak metamorphism*)
- Gonez, P., Hung Nguyen Huu, Phuong Ta Hoa, G. Clement & P. Janvier (2012)- The oldest flora of the South China Block, and the stratigraphic bearings of the plant remains from the Ngoc Vung Series, northern Vietnam. J. Asian Earth Sciences 43, 1, p. 51-63.
(*Late Silurian- Devonian of Ngoc Vung Series of N Vietnam with plant remains. Late Silurian localities earliest known flora of S China block. Flora supports hypothesis that more derived plants were present on E Gondwana earlier than elsewhere. Devonian localities with thick fibrous stem fragment, of Eifelian-Emsian age*)
- Gubler, J. (1935)- Etudes geologiques au Cambodge Occidental. Bull. Service Geologique de l'Indochine 22, 2, p.

(*'Geological studies in western Cambodia'*)

Gubler, J. (1935)- Les fusulinides du Permian de l'Indochine: leur structure et leur classification. Memoires Societe Geologique France, n.s., 11, 4, 26, p. 1-173.

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(online at: <https://www.sciencedirect.com/science/article/pii/S0169136824001367>)

(*Geochemisrty of Sanakham gold deposit newly discovered hydrothermal vein-type orogenic gold deposit in Luang Prabang (Laos) to Loei (Thailand) metallogenetic belt. Late Triassic? mineralization during collision, hosted in U Carboniferous low-grade metamorphic rocks*)

Guo, L., Y. Tang, L. Hou, S. Liu, C. Huang, Z. Han, S. Xu, Z. Luo & H. Liang (2025)- Late Triassic orogenic gold mineralization along the northwest margin of the Indochina Block: Revealed from calcite U-Pb ages and geochemistry of the Phapon gold deposit, Laos. J. Asian Earth Sciences 276, 106350, p.

(*Phapon orogenic gold deposit in Luang Prabang (Laos) - Loei (Thailand) metallogenetic belt, along NW margin of Indochina Block, is unique vein-type deposit with calcite as main gold-bearing mineral. Interpretation of age of Au mineralization ~222 Ma (Norian, Late Triassic), formed during collision between Sibumasu Terrane and Indochina Block*).

Guo, L., K. Zaw, S. Liu, Y. Yang, F. Nie, S. Wu, M. Shi, C. Huang, X. Zhang, H. Liang et al. (2025)- A review of Carboniferous-Triassic tectonic-magmatic evolution of Luang Prabang-Loei metallogenetic belt in Laos and Thailand and implications for gold-copper mineralization. Geosciences (MDPI) 15, 2, p. 1-22.

(online at: <https://www.mdpi.com/2076-3263/15/2/68>)

(*Luang Prabang (Laos) to Loei (Thailand) metallogenetic belt along NW margin of Indochina Block one of most important gold-copper metallogenetic belts in SE Asia. Mineralization tied to subduction and closure of Paleo-Tethys Ocean, resulting in (1) epithermal Au-Ag during late Permian- E Triassic Paleotethys subduction, (2) porphyry-skarn Au-Cu during E-M Triassic closing of ocean and Luang Prabang- Loei backarc basins, and (3) orogenic Au during late Triassic collision of Sibumasu and Indochina*)

Halle, T.G. (1927)- Palaeozoic plants from Central Shansi. Palaeontologica Sinica, ser. A, 2, 1, p. 1-316.

(*Extensive documentation of diverse collection of Permian plant fossils from Upper Shihhotze Formation in C Shanxi Province, C-N China (N China Plate, Cathaysian). With comparisons to Late Paleozoic floras from other parts of SE Asia: of all Asian floras most closely related to Jambi flora of Sumatra which is probably Lower Permian in age and of 'northern type', not Gondwanan*)

Guo, F., Y. Wu, B. Zhang, X. Zhang, L. Zhao & J. Liao (2021)- Magmatic responses to Cretaceous subduction and tearing of the paleo-Pacific Plate in SE China: an overview. Earth-Science Reviews 212, 103448, p. 1-22.

(*In SE China, mid-Cretaceous arc-type mafic rocks (120-80 Ma) along coastal region in NE-NNE direction; mantle source metasomatized by melts derived from subducted terrestrial sediments and reflect relatively hot subduction zone during Cretaceous. Intraplate mafic rocks (110-70 Ma) in SE China interior with geochemistry similar to oceanic island-like basalts. Their mantle source also asthenosphere metasomatized by added slab melts, but with higher recycled sediments. Cretaceous mafic magmatism records tectonic transition from E Cretaceous advanced subduction to Late Cretaceous rollback of Paleo-Pacific slab with slab tearing and resultant melting of dehydrated subducted slab*)

Halpin, J.A., H.T. Tran, C.K. Lai, S. Meffre, A.J. Crawford & Khin Zaw (2016)- U-Pb zircon geochronology and geochemistry from NE Vietnam: a 'tectonically disputed' territory between the Indochina and South China blocks. Gondwana Research 34, p. 254-273.

(*NE Vietnam complex geological history records collision between Indochina- S China blocks. Magmatic rocks in Lo-Gam-Song Hien domain represent latest Permian- E Triassic (~245-254 Ma) early post-collisional rift, not genetically linked to Late Permian Emeishan Large Igneous Province in Yangtze block of S China*)

Hanski, E., R.J. Walker, H. Huhma, G.V. Polyakov, P.A. Balykin, T.T. Hoa & N.T. Phuong (2004)- Origin of the Permian-Triassic komatiites, northwestern Vietnam. *Contributions to Mineralogy and Petrology* 147, p. 453-469.

(Komatiites in Song Da zone, NW Vietnam, erupted through continental crust over late-Permian carbonates and may belong to SE extension of Permo-Triassic Emeishan volcanic province in SW China)

Hara, H., T. Ito, T. Tokiwa, S. Kong & P. Lim (2020)- The origin of the Pailin Crystalline Complex in western Cambodia, and back-arc basin development in the Paleo-Tethys Ocean. *Gondwana Research* 82, p. 299-316.

(Pailin Crystalline Complex in W Cambodia, between Sukhothai Arc and Sa Kao backarc basin. With amphibolites, metagabbros, and felsic igneous rocks. Geochemical analyses indicate mid-ocean ridge basalts, similar to Sa Kao back-arc of SE Thailand. Zircon ages 283 Ma (anorthosite dike) to 275 Ma (plagiogranite). Triassic sediments in Sa Kao Back-arc Basin derived from Pailin CC, which is part of dismembered ophiolite related to E Permian back-arc basin, related to subduction of Paleo-Tethys oceanic crust and Sukhothai Arc)

Hartung, J.B. & C. Koeberl (1994)- In search of the Australasian tektite source crater: the Tonle Sap hypothesis. *Meteoritics Planetary Science* 29, 3, p. 411-416.

(online at: <http://adsabs.harvard.edu/full/1994Metic..29..411H>)

(Tonle Sap lake in S-C Cambodia may be remnant of source crater of Australasian tektites strewn field)

Hartung, J.B. & A.R. Rivolo (1979)- A possible source in Cambodia for Australasian tektites. *Meteoritics* 14, 1, p. 153-159.

(A 10x6 km ring of hills in NE Cambodia is possible impact crater of Pleistocene Australasian tektite strewn field)

Hayami, I. (1964)- Some Lower Jurassic pelecypods from South Vietnam, collected by Dr. H. Fontaine. In: T. Kobayashi (ed.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 1, p. 253-267.

(Lower Jurassic in Indochina transgressive epoch, with marine deposits in several areas. Black shales in Huu-Nien area (C E Vietnam) with poorly preserved bivalves, incl. Grammatodon, Modiolus, Gervillia, Parainoceramus, Chlamys, Cardinia, Goniomya, etc.)

Hayami, I. (1972)- Lower Jurassic bivalvia from the environs of Saigon. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 10, p. 179-230.

(Shallow marine late Early Jurassic (Toarcian) bivalve assemblage from Lo-Duc, 30km NNE of Saigon. 21 species, incl. Grammatodon tenuis, Parvamussium donaiense, Palaeonucula, Modiolus, Tancredia, similar to first Jurassic transgressive beds over Indosinian unconformity across Thailand (Kozai et al., 2006))

Hayashi, M. (1989)- The hydrocarbon potential and tectonics of Indochina. *Bull. Geological Society Malaysia* 25, p. 65-78.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1989c05.pdf>)

He, B., Y.G. Xu, S.L. Chung, L. Xiao & Y. Wang (2003)- Sedimentary evidence for a rapid, kilometer-scale crustal doming prior to the eruption of the Emeishan flood basalts. *Earth Planetary Science Letters* 213, p. 391-405.

(Investigations in 67 sections of M Permian Maokou Fm that underlies Emeishan flood basalts in SW China suggests domal crustal thinning and uplift of >1000m in area 800 km in radius, before emplacement of basalts. Duration of uplift estimated to be <3 Myr)

He, W., G.R. Shi, Y. Zhang, T. Yang, K. Zhang, S. Wu, Z. Niu & Z. Zhang (2014)- Changhsingian (latest Permian) deep-water brachiopod fauna from South China. *J. Systematic Palaeontology* 12, 8, p. 907-960.

(45 brachiopod species from latest Permian Talung F of marine deep-water facies of S China)

Hennig, J. (2017)- SE Vietnam U-Pb zircon ages and provenance: correlating the Da Lat zone on land with the Cuu Long basin offshore. American Geophysical Union (AGU) Fall Meeting, New Orleans, EP21A-1830, 1p.

(Abstract and Poster)

(online at: <https://agu.confex.com/agu/fm17/meetingapp.cgi/Paper/223717>)

(Onshore SE Vietnam Da Lat zone with Cretaceous intrusions with zircons aged ~122-76 Ma. Jurassic metasediments of Ban Don Gp contain dominant Jurassic, Permo-Triassic and Paleoproterozoic (c. 1.8 Ga) age populations. Oligocene samples from offshore Cuu Long Basin strong Cretaceous age peak (mainly 90-110 Ma, and not much else. M Miocene sandstones mainly Triassic peak (220-240 Ma) and subordinate peaks of Cretaceous and many older ages, mainly 1.8 Ga (from proto-Mekong Delta more distant sources?))

Hennig, J., H.T. Breiffeld, A. Gough, R. Hall, Trinh Van Long, Vinh Mai Kim & Sang Dinh Quang (2018)- U-PB zircon ages and provenance of Upper Cenozoic sediments from the Da Lat Zone, SE Vietnam: implications for an intra-Miocene unconformity and paleo-drainage of the Proto-Mekong River. *Journal of Sedimentary Research* 88, 4, p. 495-515.

(online at: http://searg.rhul.ac.uk/pubs/hennig_etal_2018%20Vietnam%20provenance%20Da%20Lat.pdf)

(Oligo-Miocene Di Linh Fm with abundant Cretaceous zircons and subordinate Paleoproterozoic (c. 1.8-1.9 Ga), sourced mainly from Cretaceous plutons. Pliocene- Pleistocene Song Luy Fm with additional Permian-Triassic and Ordovician-Silurian age populations, interpreted to be from basement in C and N Vietnam and reflecting intra-Miocene unconformity)

Hennig-Breiffeld, J., H.T. Breiffeld, D.Q. Sang, M.K. Vinh, T.V. Long, M. Thirlwall & T.X. Cuong (2021)- Ages and character of igneous rocks of the Da Lat Zone in SE Vietnam and adjacent offshore regions (Cuu Long and Nam Con Son basins). *J. Asian Earth Sciences* 218, 104878, p. 1-26.

(Da Lat Zone in SE Vietnam Mesozoic orogenic belt with abundant Cretaceous igneous rocks intruded into or deposited on Permo-Triassic rocks and Jurassic metasedimentary rocks. (Cretaceous magmatic arc that probably continues into W Borneo). Three Cretaceous magmatic phases of within-plate and continental arc magmatism during Paleo-Pacific subduction. Arc magmatism started in E Cretaceous (Dinh Quan suite at ~113-135 Ma), and continued into M-L Cretaceous with magmatism from ~90-109 Ma. Granitoid basement rocks of offshore Cuu Long Basin similar ages of ~90-92 Ma, representing offshore equivalents. Cretaceous rocks very few older zircons, indicating magmas from juvenile arc crust)

Hieu, P.T., S.Q. Li, Y.Yu, N.X. Thanh, L.T. Dung, Vu Le Tu, W. Siebel & F. Chen (2017)- Stages of late Paleozoic to early Mesozoic magmatism in the Song Ma belt, NW Vietnam: evidence from zircon U-Pb geochronology and Hf isotope composition. *Int. J. Earth Sciences (Geologische Rundschau)*, 106, 3, p. 855-874.

(Song Ma zone in NW Vietnam subduction corridor between Indochina and S China blocks. Two-stage magmatic evolution: ocean subduction at ~290-260 Ma and post-collisional magmatism at ~245-230 Ma)

Hilde, T.W.C. & C.G. Engel (1967)- Age, composition and tectonic setting of the granite island Hon Trung Lon, off the coast of South Vietnam. *Geological Society of America (GSA) Bull.* 78, p. 1289-1294.

(Hon Trung Lon island off S Vietnam composed of Cretaceous high-silica alkali granite with K-Ar age between 70-100 Ma, a previously unrecognized period of intrusion along NE side of Gulf of Thailand)

Hoa, T.T., T.T. Anh, N.T. Phuong, P.T. Dung, T.V. Anh, A.E. Izokh, A.S. Borisenko, C.Y. Lan, S.L. Chung & C.H. Lo (2008)- Permo-Triassic intermediate-felsic magmatism of the Truong Son belt, eastern margin of Indochina. *Comptes Rendus Geoscience* 340, p. 112-126.

(Permo-Triassic intermediate-felsic magmatism along Truong Son fold belt in N Vietnam, along E margin of Indochina Block: calc-alkaline volcano-plutonic associations (272-248 Ma), peraluminous granites (259-245 Ma), and subalkaline felsic volcano-plutonic associations (<245 Ma). Products of Paleotethys subduction during Indochina/ N Vietnam- S China amalgamation. Event ended in E-M Triassic (246-240 Ma))

Hoang, B.H., M.B.W. Fyhn, J. Hovikoski, L.O. Boldreel, N.Q. Tuan, M.H. Dam, H.V. Long et al. (2023)- Cenozoic structural development of the western flank of the Song Hong Basin, Gulf of Tonkin, Vietnam: linking with onshore strike-slip faulting and regional tectonics. *J. Asian Earth Sciences* 246, 105581, p. 1-18.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912023000421>)

(Indochina considered rigid block during continental extrusion, but Song Ca-Rao Nay Fault in N-C Vietnam and its offshore extension (Hue Sub-basin), subdivided Indochina into discrete blocks. Late Oligocene initiation

with right-lateral motion, causing pull-apart onshore and Hue Sub-basin opening offshore. End-Oligocene inversion affecting both basins. E Miocene rifting resumed in Hue Sub-basin. During latest E Miocene earliest M Miocene, SCRNFS switched to left-lateral transpression, causing inversion and prolonged uplift in northernmost Hue Sub-basin. Inversion-associated unconformity can be traced onshore. Possibly tied to Australia-SE Asia collision (escape of Indochina))

Hoang, C.M., M.V. Du, P.K. Hoan & T.D. Hung (2013)- Hydrocarbon potential of Champasak & Saravan area, Southern Lao PDR. In: C. Senebottalath et al. (eds.) Proc. 2nd Lao-Tai Conference Geology and Mineral resources, Vientiane, p. 226-235.

(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/2013/36787.pdf)

(Hydrocarbon exploration in Champasak and Saravan provinces, geologically SE part of Khorat Plateau. No significant hydrocarbon flows obtained yet)

Hoang, N. & M. Flower (1998)- Petrogenesis of Cenozoic basalts from Vietnam: implication for origins of a 'Diffuse Igneous Province'. Journal of Petrology 39, 3, p. 369-395.

(online at: <http://petrology.oxfordjournals.org/content/39/3/369.full.pdf+html>)

(Widespread M Miocene- Recent basalt plateaux in S and C Vietnam associated with pull-apart structures. Activity does not conform to 'Large Igneous Province', more consistent with clockwise rotating stress field)

Hoang, T.H.A., S.H. Choi, Y. Yu, T.H. Pham, K.H. Nguyen & J.S. Ryu (2018)- Geochemical constraints on the spatial distribution of recycled oceanic crust in the mantle source of late Cenozoic basalts, Vietnam. Lithos 296-299, p. 382-395.

(online at: <https://www.sciencedirect.com/science/article/pii/S002449371730405X>)

(Geochemical composition of Late Cenozoic intraplate basaltic rocks from C and S Vietnam indicates basalts sourced from mantle dominated by garnet peridotite, and recycled oceanic crustal material (sediment, basalt, and gabbro). Possibly result of entrainment of accumulated Paleo-Pacific slab into rising Hainan plume)

Hoffet, J.H. (1933)- Etude geologique sur le centre de l'Indochine entre Tourane et le Mekong (Annam Central et Bas-Laos). Bull. Service Geologique de l'Indochine, Hanoi, 20, 2, p. 1-154.

('Geologic study of the center of Indochina between Tourane and the Mekong (C Annam and Lower Laos)')

Hoffet, J.H. (1937)- Les lamellibranches saumâtres du Senonien de Muong Phalane. Bull. Service Geologique de l'Indochine, Hanoi, 24, 1, p. 3-25.

('The freshwater bivalves of the Senonian of Muong Phalane (Laos)'. Upper Cretaceous freshwater molluscs, mainly Trigonoides spp. and Unio spp. and Plicatounio. Locally associated with large reptiles Titanosaurus and Mandchurosaurus)

Hoffet, J.H. (1937)- Note sur la geologie du Bas-Laos. Bull. Service Geologique de l'Indochine, Hanoi, 24, 2, p. 1-22.

('Note on the geology of lower Laos')

Hoffet, J.H. (1942)- Description de quelques ossements de Titanosauriens du Senonien du Bas-Laos. Comptes Rendus Seances Conseil Recherches Scientifiques Indochine 1942, 1, p. 51-57.

('Description of some titanosaurian bones from the Senonian of Lower Laos'. See also Buffetaut 1991)

Hovikoski, J., J. Therkelse, L.H. Nielsen, J.A. Bojesen-Koefoed, H.P. Nytoft, H.I. Petersen, I. Abatzis, H.A. Tuan, B.T.N. Phuong, C.V. Dao & M.B.W. Fyhn (2016)- Density-flow deposition in a fresh-water lacustrine rift basin, Paleogene Bach Long Vi Graben, Vietnam. Journal of Sedimentary Research 86, 9, p. 982-1007.

(Bach Long Vi Island is crest of inverted Eo-Oligocene Bach Long Vi Graben in Gulf of Tonkin area, at intersection of Song Hong and Beibuwan basins, N Vietnam. 500m-thick Paleogene lacustrine oil-prone source rock succession in Enreca-3 core-hole)

Hu, L., P.A. Cawood, Y. Du, J. Yang & L. Jiao (2015)- Late Paleozoic to Early Mesozoic provenance record of Paleo-Pacific subduction beneath South China. Tectonics 34, 5, p. 986-1008.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2014TC003803>)

(NE-trending Yong'an Basin, SE S China craton, preserves Permian-Jurassic marine-continental, clastic-dominated retroarc foreland basin succession. Sources for M Paleozoic- E Mesozoic detrital zircons include input from beyond currently exposed China mainland, possibly from active convergent plate margin along SE rim of craton that incorporated part of SW Japan and is related to subduction of Paleo-Pacific Ocean. Termination of Paleo-Tethys subduction beneath SW margin in Permo-Triassic)

Huang, B.C., R.X. Zhu, Y. Otofujii & Z.Y. Yang (2000)- The Early Paleozoic paleogeography of the North China block and the other major blocks of China. Chinese Science Bull. 45, 12, p. 1057-1065.

(Review of paleomagnetic data of N China, S China and Tarim blocks suggests blocks were adjacent to E Gondwana in low latitudes in E Cambrian)

Huang, K. & N.D. Opdyke (2016)- Paleomagnetism of the Upper Triassic rocks from south of the Ailaoshan Suture and the timing of the amalgamation between the South China and the Indochina Blocks. J. Asian Earth Sciences 119, p. 118-127.

(Paleomagnetic work on redbed samples of U Triassic Yiwanshui Fm S of Ailaoshan Suture in S Yunnan consistent with results previously reported from same section. Indicates Simao and Baoshan terranes amalgamated by Late Triassic times but coalescence between them and S China Block not until end-Triassic)

Hung, K.T. (2010)- Overview of magmatism in northwestern Vietnam. Annales Societatis Geologorum Poloniae, 80, 2, p. 185-226.

(online at: <https://bibliotekanauki.pl/articles/191922.pdf>)

(Six groups of magmatic rocks in NW Vietnam, related to tectonic events: (1) related to crustal formation in S China block or Gondwana; (2) granitoids related to Caledonian-Hercynian folding; (3) U Permian ophiolites and extrusives, formed in intraplate setting, related to back-arcs spreading; (4) related to Triassic Indosinian orogeny; (5) Jurassic-Cretaceous intraplate granitoids; (6) Cenozoic alkaline granitoids, related to strike-slip faulting collision of India and Eurasia plates)

Hung, K.T., J. Golonka & Du Nguyen Khac (2023)- The collision between Indochina and South China Blocks in Northwestern Vietnam and its controversy. Proc. 7th International Conference POL-VIET, Krakow 2023, Inżynieria Mineralna (Mineral Engineering; J. Polish Mineral Engineering Society) 2, 1, p. 103-112.

(online at: <https://yadda.icm.edu.pl/baztech/element/bwmeta1.element.baztech-bcc9a9e6-989e-4c7b-b325-b168d6b6db60>)

(No conclusive evidence to suggest that Indochina and South China blocks collided during Triassic. Favored plate tectonic scenario here views Indosinian orogeny (Song Ma suture) as reactivation event triggered by accretion of Sibumasu block to Indochina. First collision between ICB and SCB possibly in Late Silurian-Early Devonian, leading to formation of new oceanic basin between the two blocks during Late Permian times)

Ishihara, S. & Y. Orihashi (2014)- Zircon U-Pb age of the Triassic granitoids at Nui Phao, northern Viet Nam. Bull. Geological Survey of Japan 65, p. 17-22.

(online at: https://www.jstage.jst.go.jp/article/bullgsj/65/1-2/65_17/_pdf)

(Zircons from granitoids at Nui Phao in N Vietnam dated as earliest Triassic (~250 Ma). Possibly associated with Sn-W and REE ore deposits hosted in granitoids)

Ishii, K., M. Kato & K. Nakamura (1969)- Permian limestones of West Cambodia. In: T. Matsumoto (ed.) Litho- and bio-facies of sedimentary rocks- a symposium, Palaeontological Society Japan, Special Paper 14, p. 41-56.

(online at: www.palaeo-soc-japan.jp/download/SP/SP14.pdf)

(Sisophon Limestone hills on plains of SW Cambodia (W of Indosinian Massif; = part of Chanthaburi Terrane/ Sukhothai Arc of Metcalfe 2013?). Limestone ~150-200m thick, on folded and partially metamorphosed Devonian-Carboniferous or older rocks. Volcanics- tuffs in basal beds suggest possible deposition of limestone on volcanic seamounts. Nearby granite intrusion with 227 Ma Rb-Sr age (= Late Triassic). Rich in M-U Permian fauna, including fusulinids (incl. Pseudodoliolina, Yabeina, Neoschwagerina, Sumatrana, Verbeekina), corals (incl. Verbeekiella, Lophophyllidium, Wannerophyllum))

- Ishii, K. & Y. Nogami (1964)- Contributions to the geology and paleontology of Cambodia. Part 1. Permian fusulinids. J. Geosciences, Osaka City University, 8, p. 9-68.
(online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DBe0080002.pdf)
(Late Middle Permian fusulinids, corals and brachiopods from limestone hills W of Siem Reap in NW plains of Cambodia, from where fusulinids were first described by Gubler (1935). Species present include *Yabeina* (also called *Lepidolina*) *multiseptata*, *Yabeina elongata*, *Verbeekina verbeeki*, *Pseudofusulina* aff. *crassa padangensis* (Lange) and *Chusenella cambodgiensis*)
- Ito, T., H. Hara, S. Kong & P. Lim (2020)- New materials of Cisuralian (early Permian) radiolarians from western Cambodia: Paleobiogeographic implications in the Paleotethys. *Palaeoworld* 29, 3, p. 568-576.
(*Radiolaria from Pailin area, W Cambodia, indicate Asselian-Sakmarian age (E Permian)*)
- Janvier, P., P. Gerienne and T. Tong-Dzut (1989)- Les placodermes, arthropodes et lycophytes des gres devoniens de Do Son (Haiphong, Viet Nam). *Geobios* 25, 5, p. 625-638.
(*The placoderms, arthropodes and lycophytes from the Devonian sandstones of Do Son (Haiphong, Vietnam)*)
- Janvier, P., T.D. Thanh & D.N. Truong (1994)- Devonian fishes from Vietnam: new data from Central Vietnam and their paleobiogeographical significance. In: P. Angsuwathana et al. (eds.) *Proc. Int. Symposium Stratigraphic correlation of Southeast Asia, Bangkok 1994*, Dept. Mineral Resources and IGCP 306, p. 69-74.
(*Devonian fish of Vietnam mainly in Bac Bo, N Vietnam, and E Devonian age. Faunas similar to S China, with many taxa endemic to S China Block. New M Devonian fish fauna reported*)
- Janvier, P. & T.D. Tran (1998)- The Silurian and Devonian vertebrates of Viet Nam: a review. *Journal of Geology (Geological Survey of Viet Nam)*, B 11/12, p. 18-28.
- Janvier, P., T.D. Tran, T.H. Phuong & D.N. Truong (1997)- The Devonian vertebrates (Placodermi, Sarcopterygii) from Central Vietnam and their bearing on the Devonian palaeogeography of Southeast Asia. *J. Asian Earth Sciences* 15, 4, p. 393-406.
(*New placoderm fish remains from terrigenous facies of Givetian Dong Tho Fm in C Vietnam confirm close ties between Indochina and S China blocks as early as M Devonian*)
- Jeoung, J. (2018)- Exploitation minière et exploitation humaine. Les charbonnages dans le Vietnam colonial 1874-1945. Doct. Thesis Universite Sorbonne, Paris, p. 1-533 + Annexe volume.
(online at: https://theses.hal.science/tel-02155129v1/file/JEOUNG_Jaehyun_1_incomplete_20180913.pdf)
(*'Mining exploitation and human exploitation: coal mining in colonial Vietnam, 1874-1945' Extensive history of coal industry in Vietnam during French colonial era*)
- Jiang, X.Y., X.H. Li, W.J. Collins & H.Q. Huang (2015)- U-Pb age and Hf-O isotopes of detrital zircons from Hainan Island: implications for Mesozoic subduction models. *Lithos* 239, p. 60-70.
(*Detrital zircon samples from Cretaceous Lumuwan Fm on Hainan Island (SE China/NW S China Sea) suggest three major episodes of Mesozoic magmatic activity along continental margin of E Asia in S China: ~120 and 155 Ma (Yanshanian) and 235 Ma (Carnian/Triassic; Indosinian?)*)
- Johansen, K.B., L. Endebrock, K. Oh & S. Maingarm (2009)- An insight to the petroleum geology in the Kampong Som and Tonle Sap basins, onshore Cambodia. *Proc. 2009 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore*, p. 1-39. (*Abstract + Presentation*)
(*Onshore Cambodia Kampong Som and Tonle Sap basins outlined with gravity and reconnaissance seismic. At least three phases of uplift and erosion of pre-Tertiary age. Basins surrounding Tonle Sap Lake at least 5-6 km of Mesozoic and older sediments. Potential Triassic and Permian source rocks mature for oil and gas over large parts of basins. Khorat Plateau-like stratigraphy, with Indosinian? major unconformity*)
- Jolivet, L., O. Beyssac, B. Goffe, D. Avigad, C. Lepvrier, H. Maluski & T.T. Ta (2001)- Oligo-Miocene midcrustal subhorizontal shear zone in Indochina. *Tectonics* 20, p. 46-57.
(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2000TC900021/pdf>)

(Oligo-Miocene left-lateral strike-slip shear deformation along Red River Shear Zone in N Vietnam restricted to upper and middle crust above horizontal shear zone. Deformation associated with low P- low T (greenschist) parageneses. Above horizontal shear zone active left-lateral transpression during first stage, changing to transtension at ~33Ma, with exhumation of extensional and transtensional metamorphic domes)

Jolivet, L., H. Maluski, O. Beyssac, B. Goffe, C. Lepvrier, Phan Truong Thi & Nguyen Van Vuong (1999)- Oligocene-Miocene Bu Khang extensional gneiss dome in Vietnam; geodynamic implications. *Geology (GSA)* 27, 1, p. 67-70.

(Large Oligocene-Miocene extensional gneiss dome in Vietnam, with major NE-dipping extensional shear zone separating Bu Khang dome from less-metamorphosed units above. 40Ar-39Ar ages from 36-21 Ma. NE-SW extension during opening of S China Sea. Kinematic model of left-lateral shear and block rotation)

Kasahara, N., S. Niki, E. Uchida, K. Yarimizu, R. Cheng & T. Hirata (2021)- Zircon U-Pb chronology on plutonic rocks from northeastern Cambodia. *Heliyon* 7, 4, e06752, p. 1-12.

(online at: www.ncbi.nlm.nih.gov/pmc/articles/PMC8079463/pdf/main.pdf)

(Zircon U-Pb ages of plutonic rocks in NE Cambodia show two age groups: Late Permian- Triassic (278-202 Ma) and E Cretaceous (118-98 Ma))

Katz, M.B. (1993)- The Kannack complex of the Vietnam Kontum Massif of the Indochina Block: an exotic fragment of Precambrian Gondwanaland? In: R.H. Findlay et al. (eds.) *Gondwana 8- Assembly, evolution and dispersal*, Balkema, Rotterdam, p. 161-164.

Komatsu, T., D.T. Huyen & J.H. Chen (2006)- Depositional environments and fossil bivalves in the lowermost parts of the Triassic systems in North Vietnam and South China. *J. of Geography (Chigaku Zasshi)* 115, 4, p. 470-483.

(online at: www.jstage.jst.go.jp/article/jgeography1889/115/4/115_4_470/_pdf)

(Similar to paper below: E Triassic Claraia, etc. open marine bivalves)

Komatsu, T., D.T. Huyen & J. Chen (2007)- Bivalve assemblages in North Vietnam and South China following the end-Permian crisis. In: S.G. Lucas & J.A. Spielmann (eds.) *The Global Triassic*, New Mexico Museum Natural History Science Bulletin 41, p. 134-136.

(On thin-walled, flat molluscs Claraia spp., Eumorphotis, Towapteria, etc. in basal Triassic calcareous mudstones of Yangtze Block of S China and N Vietnam)

Komatsu, T., D.T. Huyen & J.H. Chen (2008)- Lower Triassic bivalve assemblages after the end-Permian mass extinction in South China and North Vietnam. *Palaeontological Research (Japan)* 12, 2, p. 119-128.

(online at: https://bioone.org/journals/paleontological-research/volume-12/issue-2/1342-8144_2008_12_119_LTBAAT_2.0.CO_2/Lower-Triassic-bivalve-assemblages-after-the-end-Permian-mass-extinction/10.Etc)

(Lower Triassic thin-shelled bivalve assemblages in S China, and N Vietnam: (1) basinal mudstones carbonates with Claraia wangi; deep ramp with Eumorphotis teilhardi- Towapteria scythica assemblage; shallow ramp with Claraia stachei-C. phobangensis assemblage)

Komatsu, T., H. Naruse, Y. Shigeta, R. Takashima, T. Maekawa, Huyen T. Dang, Tien C. Dinh et al. (2014)- Lower Triassic mixed carbonate and siliciclastic setting containing Smithian to Spathian anoxic to dysoxic facies in the An Chau basin, northeastern Vietnam. *Sedimentary Geology* 300, p. 28-48.

Krobicki, M., J. Golonka & K.T. Hung (2008)- Major tectonic events and plates of Northwest Vietnam. *Proc. Int. Symposium Geoscience resources and environments of Asian Terranes (GREAT 2008)*, Bangkok, 2008, p. 101-104. *(Extended Abstract)*

(Major tectonic events of NW Vietnam include: Paleozoic (Silurian-Devonian?) suturing of Indochina and S China plate, Triassic Indosinian orogeny associated with strong deformation, metamorphism and magmatic activity and strike-slip faulting related to Cenozoic collision of India with Asia)

Kusnir, I. (2000)- Mineral resources of Vietnam. *Acta Montanistica Slovaca* 5, 2, p. 165-172.

(online at: <https://actamont.tuke.sk/pdf/2000/n2/10kusnir.pdf>)
(Brief overview of mineral resources of Vietnam)

Lacassin, R., P.H. Leloup, T. Phan Trong & P. Tapponnier (1998)- Unconformity of red sandstones in North Vietnam: field evidence for Indosinian orogeny in northern Indochina? *Terra Nova* 10, p. 106-111.

(Black-River (Song Da) region red sandstones/conglomerates, reportedly of Cretaceous age, unconformably above schistose epi-metamorphic M Triassic sediments, probably Indosinian Mesozoic unconformity. Age of deformation poorly constrained. Unconformity strongly deformed, implying Tertiary deformation probably due to India-Asia collision in N part of Indochina block)

Lacroix, M.A. (1932)- Les tectites de l'Indochine. *Archives Museum d'Histoire Naturelle, Paris*, ser. 6, 8, p. 139-236.

('The tektites of Indochina'. Old but extensive review of distribution of Pleistocene tektite strewn field that stretches from Indochina to Thailand, Philippines, W Indonesia and Australia. Various called billitonites, australites, javanites, etc. See also Verbeek 1897, Von Koenigswald 1960, Chapman 1964, Stauffer 1978, Ford 1988, etc))

Lai, X.L., W. Wang, P.B. Wignall, D.P.G. Bond, H.S. Jiang, J.R. Ali, E.H. John & Y.D. Sun (2008)- Palaeoenvironmental change during the end-Guadalupian (Permian) mass extinction in Sichuan, China. *Palaeogeogr. Palaeoclim. Palaeoecology* 269, p. 78-93.

(End-Guadalupian mass extinction in Sichuan, SW China. Platform carbonates of Maokou Fm overlain by Emeishan flood basalts. Extinction primarily loss of fusulinaceans and possibly by species turnover amongst calcareous algae (Permocalculus dominant in pre-Emeishan, Mizzia more common after))

Lan, C.Y., S.L. Chung, C.H. Lo, T.Y. Lee, P.L. Wang, H. Li & D. Van Toan (2001)- First evidence for Archean continental crust in northern Vietnam and its implications for crustal and tectonic evolution in Southeast Asia. *Geology (GSA)* 29, 3, p. 219-222.

(Indochinese continent previously considered to be composed entirely of Proterozoic-Phanerozoic rocks. First evidence of Late Archean continental crust in SE Asia on S China Block from gneisses of Cavin Complex, S of Red River shear zone, N Vietnam. Archean Nd model ages 3.4-3.1 Ga, zircon U-Pb ages of 2.8-2.5 Ga first in SE Asia. One of oldest crustal nuclei of South China block)

Lan, C.Y., S.L. Chung, T.V. Long, C.H. Lo, T.Y. Lee, S.A. Mertzman & J.J.S. Shen (2003)- Geochemical and Sr-Nd isotopic constraints from the Kontum massif, central Vietnam, on the crustal evolution of the Indochina block. *Precambrian Research* 122, p. 7-27.

(Kontum massif, C Vietnam, mainly amphibolite-granulite facies metamorphic rocks and is largest basement core complex of Indochina block. Basement rocks yield depleted-mantle model ages from 1.2-2.4 Ga and TDM of 2.7 Ga for granulite, suggesting Indochina block crustal formation mainly in Paleoproterozoic and Mesoproterozoic, not Archean. During accretion with other SE Asian continental blocks in Permo-Triassic, Indochina core complex subjected to Indosinian orogeny, characterized by high-T, granulite facies metamorphism in lower crust with charnockite magmatism and subsequent regional exhumation)

Lasserre, M., H. Fontaine & E. Saurin (1974)- Geochronologie du Sud Viet-Nam. *Archives Geologiques Vietnam* 17, p. 17-34.

('Geochronology of South Vietnam')

Le Dzuy Bach & Ngo Gia Thang (1995)- Phanerozoic ophiolites in Indochina. *Proc. Int. Symposium Geology of Southeast Asia and adjacent areas, Hanoi 1995, Journal of Geology, Hanoi, B, 1995*, 5-6, p. 212-221.

Lee, K.Y. (1984)- Geology of the Dian-Qian-Gui foldbelt, Southwest China. U.S. Geological Survey (USGS), Open-File Report 84-357, p. 1-52.

(online at: <http://pubs.usgs.gov/of/1984/0357/report.pdf>)

Lee, T.Y., C.H. Lo, S.L. Chun, C.Y. Chen, P.L. Wang, W.P. Lin et al. (1998)- $^{40}\text{Ar}/^{39}\text{Ar}$ dating result of Neogene basalts in Vietnam and its tectonic implication. In: M.F.J. Flower et al. (eds.) *Mantle dynamics and plate interactions in East Asia*, AGU Geodynamics Ser. 27, p. 317-330.

(Large scale Late Neogene magmatic activity around S China Sea, from Taiwan Straits, S China to Hainan Island and Indochina Peninsula. Ar/Ar ages of basalts from Vietnam show oldest rocks early M Miocene (~16 Ma; mainly quartz tholeiite). Since Late Miocene (~8 Ma) it changed to olivine tholeiite, and from Pliocene-Quaternary common alkali basalt and basanite. First appearance of igneous activity in Vietnam coincides with cessation of sea-floor spreading in S China Sea. See also Flower et al. 1993, Hoang & Flower 1998)

Leloup, P.H., N. Arnaud, R. Lacassin, J.R. Kienast, T.M. Harrison, T.T. Phan Trong, A. Replumaz & P. Tapponnier (2001)- New constraints on the structure, thermochronology and timing of the Ailao Shan- Red River shear zone. *J. of Geophysical Research: Solid Earth* 106, B4, p. 6683-6732.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2000JB900322>)

(Cooling diachronism along Ailao Shan fault suggests left-lateral rates of 4-5 cm/yr from 27 Ma- ~17 Ma. Similarities of deformation kinematics along ASRR and in S China Sea confirms causal link between continental strike-slip faulting and marginal basin opening)

Leloup, P.H., R. Lacassin, P. Tapponnier, U. Scharer, D. Zhong, X. Liu, L. Zhang Liangshang, S. Ji & Phan Trong Trinh (1995)- The Ailao Shan- Red River shear zone (Yunnan, China), Tertiary transform boundary of Indochina. *Tectonophysics* 251, p. 3-84.

(Red River Fault zone is major geological discontinuity that separates S China from Indochina. Today it corresponds to great right-lateral fault along several metamorphic complexes. U/Pb ages of deformation-associated melts ~22.4- 26.3 Ma, implying shear in Lower Miocene. ASRR belt site of major left-lateral motion, as Indochina was extruded toward SE as result of India-Asia collision)

Leloup, P., P. Tapponnier, R. Lacassin & M. Searle (2007)- Discussion on the role of the Red River shear zone, Yunnan and Vietnam, in the continental extrusion of SE Asia. *J. Geological Society, London*, 164, p. 1253-1260.

(Critique and response of Searle (2006) paper)

Lepvrier, C. (2010)- Jacques Deprat et les nappes de charriage du Tonkin. *Tavaux de Comite Francais d'Histoire de la Geologie (COFRHIGEO)*, ser. 3, 24, 2, p. 11-30.

(online at: www.researchgate.net/publication/279260027_Jacques_Deprat_et_les_nappes_de_charriage_du_Tonkin)

(Attempt at rehabilitation of the valid 1915 first description of presence of overthrust nappes in the 'Annamitic Range' of Tonkin by Jacques Deprat, former chief geologist of the French Indochina Geological Survey, who was unfairly accused of paleontological fraud in 1919 ('the Deprat affair'))

Lepvrier, C., M. Faure, V.N. Van, T.V. Vu, W. Lin, T.T. Trong & P.T. Hoa (2012)- North-directed Triassic nappes in Northeastern Vietnam (East Bac Bo). *J. Asian Earth Sciences* 41, 1, p. 56-68.

(NE Vietnam structure system of slightly metamorphosed nappes formed in Triassic, prior to unconformable deposition of U Triassic terrigenous sediments)

Lepvrier, C., H. Maluski, Vu Van Tich, A. Leyreloup, Phan Truong Thi & Nguyen Van Vuong et al. (2004)- The Early Triassic Indosinian orogeny in Vietnam (Truong Son Belt and Kontum Massif); implications for the geodynamic evolution of Indochina. *Tectonophysics* 393, p. 87-118.

(online at: https://www.academia.edu/78400065/The_Early_Triassic_Indosinian_orogeny_in_Vietnam_Truong_Son_Belt_and_Kontum_Massif_implications_for_the_geodynamic_evolution_of_Indochina)

(E Triassic (~250-240 Ma) Indosinian Orogeny interpreted as result of synchronous oblique collision of Indochina block with both Sibumasu and S China)

Lepvrier, C., Nguyen V. Vuong, H. Maluski, P.T. Thi, T.V. Vu (2008)- Indosinian tectonics in Vietnam. *Comptes Rendus Geoscience* 340, 2-3, p. 94-111.

(online at: <https://comptes-rendus.academie-sciences.fr/geoscience/item/10.1016/j.crte.2007.10.005.pdf>)

(In Vietnam E Triassic Indosinian collision affected Truong Son belt and Kontum Massif, which were parts of Gondwana-derived Indochina continental block, around 250-240 Ma. Collisional process resulted from NW-striking convergence of Indochina with respect to adjacent blocks. Indosinian evolution applied on continental crust that had been probably affected by Devonian event, as in S China)

Le Van De (1997)- Outline of plate-tectonic evolution of continental crust of Vietnam. In: P. Dheeradilok (ed.) Proc. International Conference Stratigraphy and tectonic evolution of Southeast Asia and South Pacific (GEOTHAI'97), Dept. of Mineral Resources (DMR), Bangkok, 2, p. 465-475.

Li, M., M. Yan, X. Fang, Z. Zhang & X. Liu (2018)- Origins of the Mid-Cretaceous evaporite deposits of the Sakon Nakhon Basin in Laos: Evidence from the stable isotopes of halite. *J. Geochemical Exploration* 184, A, p. 209-222.

(online at: <https://www.sciencedirect.com/science/article/pii/S0375674217303035>)

(Evaporite deposits in Sakon Nakhon Basin, SE Laos, is northern continuation of M-L Cretaceous salt basin of Khorat Plateau (Thailand; Indochina Plate). Isotopes and trace metals in 600m halite-dominated core suggest continental and hydrothermal origins, with trace marine remnants (probably formed originally by evaporation of seawater, being dissolved in meteoric water and hydrothermal fluid, and subsequently precipitated))

Li, S.M., Q. Wang, D.C. Zhu, R.J. Stern, P.A. Cawood, Q.L. Sui & Z. Zhao (2018)- One or two Early Cretaceous arc systems in the Lhasa Terrane, Southern Tibet. *J. of Geophysical Research: Solid Earth* 123, 5, p. 3391-3413.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2018JB015582>)

(E Cretaceous volcanic rocks from N Lhasa Terrane around Yanhu indicate S-dipping subduction of Bangong Tethys marginal ocean basin. Two ~Aptian calc-alkaline arc successions in 'Baingoin-Yanhu arc' in N Lhasa Terrane: (1) medium-K basalts and Mg-rich andesites of typical arc signature (131-116 Ma), and (2) high-K basalts and trachyandesites (116-110 Ma), with higher MgO contents, interpreted as partial melting of previously metasomatized asthenosphere mantle. E Cretaceous arc magmatism across Lhasa Terrane had width of >600 km, suggesting two arc systems, related to opposed oceanic plate subduction: N-dipping Neo-Tethys and S-dipping Bangong Tethys subduction. Change from medium-K to high-K calc-alkaline volcanism may reflect rollback and breakoff of S-dipping Bangong Tethyan slab)

Li, Y., C.Q. Ma, G.F. Xing & H.W. Zhou (2015)- The Early Cretaceous evolution of SE China: insights from the Changle-Nan'ao metamorphic belt. *Lithos* 230, p. 94-104.

(SE China widespread Jurassic- Cretaceous magmatism, but episode of 'magmatic quiescence' at ~130-110 Ma. E Cretaceous (~140-130 Ma) magmatism in coastal SE China attributed to Paleo-Pacific plate subduction beneath SE China. Collision between W Philippines and SE China blocks at ~130-120 Ma resulted in magmatic quiescence and formation of Changle-Nan'ao metamorphic belt. Post-collisional extension triggered reinitiation of magmatism associated with amphibolite-facies metamorphism at ~110 Ma)

Li, X. (2000)- Cretaceous magmatism and lithospheric extension in Southeast China. *J. Asian Earth Sciences* 18, p. 293-305.

(E-M Cretaceous 'Yanshanian' magmatism in SE China in four episodes: (1) 136-146 Ma, (2) 122-129 Ma, (3) 101-109 Ma (possibly subduction-related calc-alkaline) and (4) 87-97 Ma (A-type granites and bimodal volcanics, marking initiation of extensional environment). Associated with formation of extensional basin systems. Belt of Yanshanian magmatism usually explained as magmatic arc, but width of >1000 km far greater than normally observed in subduction zones (300-400 km))

Li, X.H., Z.X. Li, W.H. Li & Y.J. Wang (2006)- Initiation of the Indosinian orogeny in South China: evidence for a Permian magmatic arc on Hainan Island. *J. Geol.* 114, p. 341-353.

(Syntectonic granites on Hainan Island, off SE China, with calc-alkaline I-type affinities and zircon ages of 267-262 Ma, reflecting initiation of late E Permian continental margin arc along E margin of China)

Li, X.H., Z.X. Li & W.X. Li (2014)- Detrital zircon U-Pb age and Hf isotope constrains on the generation and reworking of Precambrian continental crust in the Cathaysia Block, South China: a synthesis. *Gondwana Research* 25, p. 1202-1215.

(S China Block (Yangtze and Cathaysia blocks) one of largest Precambrian blocks in E Asia. Precambrian detrital zircon ages from (meta)sedimentary samples and river sands three major peaks (~2485, 1853 and 970 Ma) and four subordinate peaks (~1426, 1074, 780 and 588 Ma). Five of seven detrital zircon age peaks coincident with crystallisation ages of igneous rocks exposed in Cathaysia (~1.89-1.83 Ga, 1.43 Ga, 1.0-0.98 Ga and 0.82-0.72 Ga. Cathaysia Block is orogenic belt between E Antarctica, Laurentia and Australia during the assembly of Columbia/Nuna supercontinent at ~1.9-1.8 Ga to become part of supercontinent Rodinia. Cathaysia Block amalgamated with Yangtze Block during Sibao Orogeny at ~1.0-0.89 Ga)

Li, X., J. Zheng, S. Li, Bo Liu, L. Xiang, Y. Wang & X. Liu (2016)- Late Triassic orogenic collapse and Palaeo-Pacific slab roll-back beneath central South China: constraints from mafic granulite xenoliths and structural features. In: *Evolution of West Pacific Ocean, South China Sea and Indian Ocean*, Geological Journal 51, Supplement S1, p. 123-136.

(Daoxian mafic granulite xenoliths in basalts from S Hunan Province and structural features of Xuefengshan belt suggest Late Triassic orogenic collapse under central S China Block, accompanied by lithospheric extension and asthenospheric upwelling. Could have contributed to mantle disturbance to enhance rollback of Paleo-Pacific slab)

Li, Z., J.S. Qiu & X.M. Yang (2014)- A review of the geochronology and geochemistry of Late Yanshanian (Cretaceous) plutons along the Fujian coastal area of southeastern China: implications for magma evolution related to slab break-off and rollback in the Cretaceous. *Earth-Science Reviews* 128, p. 232-248.

(Cretaceous Late Yanshanian magmatic belt along SE coast of China define linear NNE–SSW-trending belt of magmatism. Emplacement mainly ~125-90 Ma, with major peak from 115-90 Ma. First appearance of sparse I-type granitoids with post-collisional extensional granite affinities and emplacement of A-type granites mark start of extension during E Cretaceous at ~125-119 Ma. Subsequent bimodal magmatism at 115-90Ma suggests major igneous event as response to back-arc extension. Break-off and rollback of subducting Paleo-Pacific Plate during Cretaceous responsible for Late Yanshanian tectono-magmatic evolution in area)

Liem, N.V. (1966)- Some Triassic foraminifera from Hoang Mai Limestone, Nghe An Province. *Acta Scientiarum Vietnamicarum, Section Geographica et Geologica*, 1, p. 37-44.

(Small arenaceous foraminifera) in M Triassic of Indochina Block in C Vietnam. Pioneering work on Triassic carbonate sequences of North Vietnam)

Liem, N.V. (1967)- Fusulinids of central Vietnam, Carboniferous fusulinids from Quy Dat. *Acta Scientiarum Vietnamicarum, Section Geographica et Geologica*, 2, p. 1-51

Lin, W., F. Liu, Y. Wang, L. Meng, M. Faure, Y. Chu, Vuong Van Nguyen, Q. Wu et al. (2024)- Temporal and spatial heterogeneity of the Ailaoshan-Song Ma–Song Chay ophiolitic melange, and its significance on the evolution of Paleo-Tethys. *Comptes Rendus Geoscience- Sciences de la Planete* 356, Special Issue S2 (J. Aubouin tribute volume), p. 115-136

(online at: <https://comptes-rendus.academie-sciences.fr/geoscience/item/10.5802/crgeos.248.pdf>)

(Detrital zircons ages and Hf isotopes in matrix of ophiolitic melange, suggest four units(M1-M4) in Ailaoshan-Song Ma- Song Chay Indosinian suture zone, and different deposition ages: (310–270 Ma, 260–255 Ma, ~245 Ma, and >255 Ma). Temporal and spatial heterogeneities correspond to evolutionary stages of E Paleotethys)

Liu, C., Y. Pan & R. Zhu (2012)- New paleomagnetic investigations of the Emeishan basalts in NE Yunnan, southwestern China: constraints on eruption history. *J. Asian Earth Sciences* 52, p. 88-97.

(Magnetostatigraphic studies of Emeishan basalts and known radiometric ages (peaking at ~260 Ma), suggests eruption period of Emeishan large igneous province <3 Myr)

Liu, H., Y. Wang, P.A. Cawood, W. Fan, Y. Cai & X. Xing (2015)- Record of Tethyan Ocean closure and Indosinian collision along the Ailaoshan suture zone (SW China). *Gondwana Research* 27, 3, p. 1292-1306.

(online at: <http://or.nsf.gov.cn/bitstream/00001903-5/252870/1/1000014253494.pdf>)

(NW-SE trending Ailaoshan suture part of ~2900 km long Jinshajiang- Ailaoshan- Song Ma- Hainan suture, and separates Yangtze (S China Craton) block in N from Simao (Indochina) block in S. Granitic plutons in Ailaoshan zone yield zircon ages of 247-252 Ma. Indosinian magmatism confirmed along Ailaoshan zone. Latest Permian convergent margin magmatism represented by Xin'anzhai granitoid (~252 Ma) terminated through accretion of Simao-Indochina to S China Blocks, marking start of Triassic Indosinian Orogeny, resulting in generation of the ~247 Ma (earliest Triassic) Tongtiane S-type leucogranite)

Liu, H.C., Y.J. Wang, X.F. Guo, W.M. Fan & J.J. Song (2016)- Late Triassic post-collisional slab break-off along the Ailaoshan suture: insights from OIB-like metagabbros and associated rocks. *Int. J. Earth Sciences (Geologische Rundschau)* 106, 4, p. 1359-1373.

(Late Triassic gabbroic intrusion in Mengdong village in S China- Indochina collision zone, Yunnan, SW China, metamorphosed to amphibolite. Late Triassic magmatic flare-up at ~222± 5 Ma in Ailaoshan suture zone post-collisional setting, with heat source from slab break-off and OIB-type asthenospheric mantle upwelling)

Liu, J., M.D. Tran, Y. Tang, Q.L. Nguyen, T.H. Tran, W. Wu, J. Chen, Z. Zhang & Z. Zhao (2012)- Permo-Triassic granitoids in the northern part of the Truong Son belt, NW Vietnam: geochronology, geochemistry and tectonic implications. *Gondwana Research* 22, p. 628-644.

(N segment of Truong Son belt of NW Vietnam (on N margin Indochina Block) three granitoid complexes. U-Pb dating of magmatic zircons three populations, suggesting M Permian- E Triassic arc magmatism at 280-270 Ma and 250-245 Ma, and magmatism of Dien Bien complex during post-collisional extension at ~229- 202 Ma)

Liu, L., X. Xu & Y. Xia (2016)- Asynchronizing paleo-Pacific slab rollback beneath SE China: insights from the episodic Late Mesozoic volcanism. *Gondwana Research* 37, p. 397-407.

(Late Jurassic - Cretaceous NW-directed Paleo-Pacific subduction under SE China caused widespread Andean-type active margin magmatism between ~160-88 Ma. Multiple stages: 160-148, 145-130, 130-127 and 110-88 Ma. General SE-ward younging trend in Cretaceous indicates increasing slab dip angle/ slab rollback of Paleo-Pacific subduction after 150 Ma)

Liu, S., L. Guo, J. Ding, L. Hou, S. Xu, M. Shi, H. Liang, F. Nie & X. Cui (2022)- Evolution of ore-forming fluids and gold deposition of the Sanakham lode gold deposit, SW Laos: Constraints from fluid inclusions study. *Minerals (MDPI)* 12, 2, 259, p.

(online at: <https://www.mdpi.com/2075-163X/12/2/259>)

(Sanakham gold deposit in Luang Prabang (Laos)- Loei (Thailand) metallogenic belt along along W edge of Indochina Block. Consists of series of auriferous quartz-sulfide veins. Four mineralization stages. Etc.)

Liu, S., R.Z. Hua, S. Gao, C.X. Feng., Z. Huang, S. Lai et al. (2009)- U-Pb zircon, geochemical and Sr-Nd-Hf isotopic constraints on the age and origin of Early Palaeozoic I-type granite from the Tengchong-Baoshan Block, Western Yunnan Province, SW China. *J. Asian Earth Sciences* 36, p. 168-182.

(Cambrian monzogranite from Tengchong-Baoshan Block, W Yunnan, zircon ages of ~499- 502 Ma. Numerous other granitoids of similar age (490-470 Ma) across Tengchong-Baoshan Block and on Indian Plate and Himalayan Orogenic Belt, both parts Gondwana supercontinent. Tengchong-Baoshan Block also formed part of Gondwana, and separated in Late Paleozoic)

Lovatt Smith, P.F. & R.B. Stokes (1997)- Geology and petroleum potential of the Khorat Plateau basin in the Vientiane area of the Lao P.D.R. *J. Petroleum Geology* 20, 1, p. 27-50.

(N part of Thailand Khorat Plateau Basin extends into Laos. Three gas discoveries. Structural inversion began in mid-Cretaceous, not Tertiary. Permian carbonates main reservoir in basin)

Lovatt Smith, P.F., R.B. Stokes, C. Bristow & A. Carter (1996)- Mid-Cretaceous inversion in the northern Khorat plateau of Lao PDR and Thailand. In: R. Hall & D.J. Blundell (eds.) *Tectonic evolution of SE Asia*, Geological Society, London, Special Publ. 106, p. 233-247.

(Regional compressive tectonic event in N Khorat Basin in Aptian-Cenomanian, attributed to distant continent-continent collision to W. Reactivated structural trends parallel to paleo-continental sutures and interrupted

latest Jurassic- earliest Paleocene subsidence and continental sedimentation of Khorat Plateau Basin. Some reactivation of mid-Cretaceous structures during regional uplift in Tertiary)

Loydell, D.K., M. Udchachon & C. Burrett (2019)- Llandovery (lower Silurian) graptolites from the Sepon Mine, Truong Son Terrane, central Laos and their palaeogeographical significance. *J. Asian Earth Sciences* 170, p. 360-374.

(manuscript online at: https://pure.port.ac.uk/ws/files/12052237/Llandovery_lower_Silurian_graptolites.pdf)
(*Llandoveryian graptolites from Sepon mine area, C Laos, part of Truong Son Terrane. Paleobiogeographical affinities of Rhuddanian graptolites with peri-Gondwanan Europe and Arabia rather than equatorial regions such as S China. Graptolites from Mojiang area, Yunnan typical of low latitude Silurian faunas and suggest this area (Simao or Loei Terrane) was separate from Truong Son Terrane*)

Mai Hoang Dam, Nguyen Tan Trieu, Nguyen Thi Tham, Bui Thi Ngoc Phuong & Tran Van Xuan (2023)- Sequence stratigraphy and petrographic characteristics of Oligocene sediments in the West trough of the Cuu Long Basin, Vietnam. *Marine and Petroleum Geology* 155, 106395, p. 1-26.

(*Cuu Long Basin Vietnam's main oil- gas producing basin. Reservoirs Oligocene- Lower Miocene clastics. Fluvial-lacustrine Oligocene sediments both source and reservoir rocks; can be divided into three sequences and eight parasequences. Ages constrained by palynomorphs, incl. Cicatricosisporites dorogensis, Lycopodiumsporites neogenicus, Verrutricolporites pachydermus, Crassoretitrites vanraadshooveni, etc.*)

Mai Hoang Dam, Vu Thi Tuyen, Nguyen Tan Trieu & Nguyen Thi Tham (2021)- Biostratigraphic and petrological characteristics of Cretaceous- Paleogene sediments in the eastern Cuu Long delta. *J. Petroleum Exploration Production Technology* 11, p. 2055-2073.

(online at: <https://link.springer.com/article/10.1007/s13202-021-01156-8>)
(*Biostratigraphic framework of Cuu Long Basin off S Vietnam:: Cretaceous metasediments 'basement' (with palynomorphs), overlain by Late Eocene- M Miocene synrift, mainly non-marine, clastics and Late Miocene- Recent post-rift clastics. Marine transgression at end of E Miocene, with common rotalid foraminifera*)

Manaka, T., K. Zaw, S. Meffre, A. Salam & Y. Lim (2014)- An overview of geological setting and ore deposits of southern Indochina- a focus on Cambodia. In: I. Basuki & A.Z. Dahlius (eds.) *Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI)*, Palembang, p. 103-107.

(*Brief review of Cambodia porphyry gold-copper deposits, associated with Permian- Triassic (260-230 Ma magmatic system, Cu in Jurassic and gold in Cretaceous magmatic systems (SW continuation of Yanshanian Orogenic Belt of S China)*)

Mansuy, H. (1913)- Faunes des calcaires a *Productus* de l'Indochine. *Memoires du Service Geologique de l'Indochine* 2, 4, p. 1-133.

(online at: https://books.google.com/books/about/Faunes_des_calcaires_%C3%A0_Productus_de_Etc.)
(*'Faunas of the Productus Limestone of Indochina'. Fossils from Permian brachiopod limestone from Cambodia, Laos and Vietnam, which is also rich in fusulinid foraminifera*)

Mansuy, H. (1914)- Faunes des calcaires a *Productus* de l'Indochine- 2 serie. *Memoires du Service Geologique de l'Indochine*, Hanoi, 3, 3, p. 1-61.

(*'Faunas of the Productus Limestone of Indochina- 2nd series'. Fossils from Permian brachiopod limestone*)

Mansuy, H. (1916)- Faunes Paleozoiques du Tonkin septentrional. Nouvelle contribution a l'etude des faunes des calcaires a *Productus* de l'Indochine. *Memoires du Service Geologique de l'Indochine*, Hanoi, 5, 4, p. 26-38.

(online at: https://books.google.com/books/download/Faunes_pal%C3%A9ozoiques_du_Tonkin_septentr.pdf)
(*'Paleozoic faunas of northern Tonkin. New contribution to the study of the faunas of the Productus Limestone of Indochina*).

Mansuy, H. (1918)- Description de quelques fossiles paleozoiques de la region de Pho-Binh-Gia et de Thai-Nguyen, Tonkin. *Bull. Service Geologique de l'Indochine*, Hanoi, 5, 2, p. 1-13 + 2 plates.

(online at: <https://patrimoine.sorbonne-universite.fr/fonds/item/7476-description-de-quelques-fossiles-paleozoiques-de-la-region-de-pho-binh-gia-et-de-thai-nguyen-tonkin>)
(*'Description of some Paleozoic fossils of the areas of Pho-Binh-Gia and Thai-Nguyen, Tonkin'. Ordovicianian macrofossils from Tonkin, North Vietnam. Incl. graptolites, brachiopods (Chonetes, Orthis, Spirifer, etc., trilobites (Proetus, Proetus), Coleolus,*)

Mao, J., H. Ye, K. Liu, Z. Li, Y. Takahashi, X. Zhao & W.S. Kee (2013)- The Indosinian collision- extension event between the South China Block and the Palaeo-Pacific plate: evidence from Indosinian alkaline granitic rocks in Dashuang, eastern Zhejiang, South China. *Lithos* 172-173, p. 81-97.
(*M Triassic (~232 Ma) Dashuang pluton in Jinhua, S China reflect collisional granite, emplaced during Indosinian Orogeny*)

Martini, R., L. Zaninetti, J.J. Cornee, M. Villeneuve, N. Tran & T.T. Ta (1998)- Decouverte de foraminiferes du Trias dans les calcaires de la region de Ninh Binh (Nord-Vietnam). *Comptes Rendus Academie Sciences, Paris, Ser. IIA*, 326, p. 113-119.
(*'Discovery of Triassic foraminifera in limestones from the Ninh Binh Area (North Vietnam)'. Lower Triassic(?) to Anisian benthic foraminifera in Dong Giao Fm limestones, Ninh Binh area (Song Da Terrane, South China Block, N Vietnam), deposited on wide, shallow water carbonate platform. With Glomospirella, Meandrospira, Arenovidalina, etc. Affinities to coeval faunas from N Malaysia and S China Block suggest connections during Triassic between continental blocks of Indochina Peninsula*)

Maung, M., A.N. Thu & H. Suzuki (2014)- Latest Jurassic radiolarian fauna from the Chinghkran area, Myitkyina Township, Kachin State, northern Myanmar. *Proc. Regional Congress on Mineral and Energy Resources of SE Asia (GEOSEA 13)*, Yangon, p. 38-39. (*Abstract only*)
(*Late Jurassic radiolaria chert in Tagaung-Myitkyina belt, a presumed suture zone with ophiolites in Myanmar (= Medial Myanmar Suture Zone of Mitchell et al., 2015= Mesotethys suture?)*)

Meister, C., Vu Khuc, D.T. Huyen & P. Doyle (2000)- Les ammonites et les belemnites du Jurassique inferieur de Huu Nien, province de Quang Nam, Viet Nam Central. *Geobios* 33, p. 79-96.
(*'The ammonites and belemnites of the Lower Jurassic of Huu Nien, Central Vietnam'. Rare and low diversity Sinemurian- Pliensbachian ammonites (incl. Ectocentrites, Tongdzuyites) and belemnites (incl. Atractites) in Liassic of Nong Son basin*)

Meister, C., Vu Khuc & D.T. Huyen (2002)- Les ammonites du Jurassique inferieur des provinces de Dak Lak et de Ho Chi Minh Ville, Viet Nam du Sud. *Revue de Paleobiologie, Geneve*, 21, 1, p. 439-483.
(*'Lower Jurassic ammonites of the Dak Lak province and Ho Chi Minh city. South Vietnam'. Lower Sinemurian rel. unique ammonite fauna*)

Meng, Q.R. & G.W. Zhang (1999)- Timing of collision of the North and South China blocks: controversy and reconciliation. *Geology (GSA)* 27, 2, p. 123-126.
(*Late Triassic collision of S China block with S Qinling orogen along Mianlue suture led to final integration of N and S China blocks*)

Metcalf, I. (2012)- Changhsingian (Late Permian) conodonts from Son La, northwest Vietnam and their stratigraphic and tectonic implications. *J. Asian Earth Sciences* 50, p. 141-149.
(*First record of Late Permian conodonts from Vietnam: Changhsingian Hindeodus julfensis in 40cm thick limestone in M Yenduyet Fm near Son La, NW Vietnam, in Song Da Rift Zone, above basaltic volcanics. Conodont Colour Alteration Index of 5 (T ~600°C), but no evidence of compressional Indosinian Orogeny*)

Meyer, K., R. Grenier & D. Hoang (2009)- Exploration in Vietnam: exploration experiences in a re-emerging Cuu Long basin. *Proc. 2009 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore*, p. 1-15.
(*Abstract + Presentation*)
(*Cuu Long basin off S Vietnam with 12 or more oil discoveries, 80% of oil in fractured-weathered granite basement, with additional production from onlapping and draping clastics*)

Miyahigashi, A., H. Hara, K. Hisada, N. Nakano, T. Charoentitirat, P. Charusiri, K. Khamphavong & R. Martini (2017)- Middle Triassic foraminifers from northern Laos and their paleobiogeographic significance. *Geobios* 50, 5-6, p. 441-451.

(online at: https://www.academia.edu/123605900/Middle_Triassic_foraminifers_from_northern_Laos_and_their_paleobiogeographic_significance)

(First Triassic foraminifera reported from shallow marine limestones in U Nam Sam Suite, Sam Neua area, N Laos (N part of Indochina Block). 17 taxa, incl. Pilamina densa, Pilamminella grandis, Citaella dinarica, etc. Age M Anisian (M Triassic). Fauna shares several important species with Sibumasu Block, Sukhothai Zone and S China Block, suggesting these domains formed single paleobiogeographic province in Anisian time)

Morley, R., T. Nguyen, Bui Viet Dung, A.J. Kullman & R.T. Bird (2019)- A revised chronostratigraphy for the Cuu Long Basin based on the interpretation of climate-driven depositional cycles during the Late Eocene/Oligocene and VIM depositional cycles during the Mio-Pliocene. SEAPEX Exploration Conference, Singapore 2019, p. 1-4.

Morley, R., Bui Viet Dung, T.T. Nguyen, A.J. Kullman & H.C. Nguyen (2019)- High-resolution Palaeogene sequence stratigraphic framework for the Cuu Long Basin, offshore Vietnam, driven by climate change and tectonics, established from sequence biostratigraphy. *Palaeogeogr. Palaeoclim. Palaeoecology* 530, p. 113-135.

(Biostratigraphic database from 46 wells in Cuu Long Basin, off Vietnam identified 36 transgressive-regressive depositional cycles in M Eocene- Oligocene. Cycles climate-driven and correlate to 406 kyr eccentricity cycles. Two types of depositional sequences, 3rd order sequences and 4th order para-sequences. Unconformities reflecting 3rd order sequence boundaries dated at 33.4 Ma, 29.8 Ma and 27.4 Ma.)

Nagy, E.A., H. Maluski, C. Lepvrier, U. Scharer, Phan Truong Thi, A. Leyreloup & Vu Van Thich (2001)- Geodynamic significance of the Kontum Massif in Central Vietnam: composite 40Ar/39Ar and U-Pb ages from Paleozoic to Triassic. *Journal of Geology* 109, p. 755-770.

(online at: www.csun.edu/~ean7513/NagyetalKontum.pdf)

(Kontum massif of S-C Vietnam long regarded as Precambrian (Archean) lower continental crust, but younger ages from U-Pb zircon (~250 Ma) and 40Ar/39Ar (243 Ma), implying two Paleozoic thermal events: (1) Permo-Triassic magmatism, probably related to closing of Paleo-Tethys Sea; (2) Carboniferous crustal thickening and heating during suturing of Indochina and S China blocks along Song Ma suture zone may have produced 340 Ma low-T thermal event. Kontum massif and Kannack metamorphic complex are exposures of deep crustal levels of Permo-Triassic orogeny. Kontum massif did not rift from Precambrian granulite belt in Gondwana)

Nagy, E.A., U. Scharer & Nguyen Trung Minh (2000)- Oligo-Miocene granitic magmatism in Central Vietnam and implications for continental deformation in Indochina. *Terra Nova* 12, p. 67-76.

(Two granitoids intrusions in Bu Khang extensional complex with radiometric ages of 26.0, 23.7 Ma (previously assigned to Precambrian- Devonian))

Nakano, N. (2016)- Variation and evolution of Vietnamese metamorphic rocks. *Japanese Magazine of Mineralogical and Petrological Sciences* 45, 1, p. 26-32. *(in Japanese with English abstract)*

(online at: https://www.jstage.jst.go.jp/article/gkk/45/1/45_151215b/pdf/-char/en)

(Trans Vietnam Orogenic Belt composed mainly of Permo-Triassic metamorphic rocks (Indochina- South China cratons collision), also Ordovician-Silurian metamorphics. Etc.)

Nakano, N., Y. Osanai, N.T. Minh, T. Miyamoto, Y. Hayasaka & M. Owada (2008)- Discovery of high-pressure granulite-facies metamorphism in northern Vietnam: constraints on the Permo-Triassic Indochinese continental collision tectonics. *Comptes Rendus Geoscience* 340, 2, p. 127-138.

(High-P mafic granulites from Song Ma Suture zone in N Vietnam, regarded as microcontinental boundary between S China and Indochina blocks. U-Th-Pb age of 233±5Ma of pelitic gneiss strongly suggests E-M Triassic metamorphic event)

Nakano, N., Y. Osanai, M. Owada, Tran Ngoc Nam, P. Charusiri & K. Khamphavong (2013)- Tectonic evolution of high-grade metamorphic terranes in central Vietnam: constraints from large-scale monazite geochronology. *J. Asian Earth Sciences* 73, p. 520-539.

(High-grade metamorphism observed in so-called Precambrian basement terranes in C Vietnam occurred during Permian-Triassic and Ordovician-Silurian, while peraluminous granitoid magmatism is Triassic. Presence of Ordovician- Silurian volcanic arc magmatism in region. Metamorphic rocks from C Vietnam provide continuous record of subduction-accretion-collision tectonics between S China and Indochina blocks: Ordovician- Silurian active continental margin tectonics, followed by continental collision in Late Permian- E Triassic, exhumation in Late Triassic)

Nakano, N., Y. Osanai & M. Owada (2008)- Textural varieties in the Indochinese metamorphic rocks: a key for understanding Asian tectonics. *Island Arc*, 17, p. 2-5.

Nakano, N., Y. Osanai, K. Sajeev, Y. Hayasaka, T. Miyamoto, N.T. Minh, M. Owada & B. Windley (2010)- Triassic eclogite from northern Vietnam: inferences and geological significance. *J. Metamorphic Geology* 28, p. 59-76.

(Eclogites along Song Ma Suture zone, N Vietnam, widely regarded as boundary between S China and Indochina cratons. Main lithology of area pelitic garnet-phengite schist with garnet, with monazite chemical age of 243 Ma, but some monazite inclusions in garnet and cores of zoned monazite in schist record older thermal event (~424Ma). Indicates Indochina craton deeply (>70 km) subducted underh S China craton in Triassic)

Nam, T.N. (1995)- The geology of Vietnam: a brief summary and problems. *Geoscience Reports Shizuoka University* 22, p. 1-10.

(online at: <http://ir.lib.shizuoka.ac.jp/bitstream/10297/334/1/KJ00000102390.pdf>)

Nam, T.N. (1998)- Thermotectonic events from Early Proterozoic to Miocene in the Indochina craton: implication of K-Ar ages in Vietnam. *J. Asian Earth Sciences* 16, p. 475-484.

(K-Ar dating of hornblende, biotite, and muscovite from Vietnam clustered into four groups: Early Proterozoic (ca. 1700-2000 Ma), E Triassic (~240-258 Ma), E Cretaceous (115-116 Ma), and Late Oligocene- E Miocene (24-29 Ma). -Ar age data indicate cooling ages of thermotectonic events. Indosinian orogeny in Vietnam occurred during Earliest Triassic times)

Nam, T.N., Y. Sano, K. Terada, M. Toriumi, P.V. Quynh & L.T. Dung (2001)- First SHRIMP U-Pb zircon dating of granulites from the Kontum massif (Vietnam) and tectonothermal implications. *J. Asian Earth Sciences* 19, p. 77-84.

(Kontum massif in C Vietnam is largest exposure of crystalline basement of Indochina craton, and commonly thought to be of Archean age. Granulites of Kannack complex, metamorphosed under T of 800-850°C and P 8 kbars, and contain zircons with U-Pb ages of ~254 Ma (one sample ~1400 Ma age for zircon core, with 250 Ma rim), suggesting they formed at E Triassic 'Indosinian' tectonothermal event. Cooling history from 850°C at ~254 Ma to 300°C at 242 Ma)

Neubauer, T.A., S. Schneider, M. Bohme & J. Prieto (2012)- First records of freshwater rissooidean gastropods from the Palaeogene of Southeast Asia. *J. Molluscan Studies* 78, 3, p. 275-282.

(online at: <http://mollus.oxfordjournals.org...>)

(First records of freshwater rissooidean gastropods, from uppermost Eocene- Lower Oligocene of Cao Bang Basin, N Vietnam. Dominated by well-preserved new genus Bacbotricula (Pomatiopsidae: Triculinae?), with two new species. Also two other poorly preserved species. Assemblage is among earliest Cenozoic freshwater gastropod faunas from SE Asia. Paleo-Red River may have served as early dispersal corridor for Triculinae. Gastropods likely lived on delta plains in Lake Cao Bang and were preyed upon by cyprinid fishes)

Ngo, T.X., M. Santosh, H.T. Tran & H.T. Pham (2016)- Subduction initiation of Indochina and South China blocks: insight from the forearc ophiolitic peridotites of the Song Ma suture zone in Vietnam. *Geological Journal* 51, 3, p. 421-442.

Nguyen, A.H. (2021)- Characterization of poroperm development in a Paleozoic carbonate reservoir analog, Northern Vietnam. Bull. Earth Sciences. Thailand (BEST) 8, 2, p. 1-12.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246728/167713>)

(Geological characterization of fractured Devonian carbonates, undertaken in quarry in Thuy Nguyen district of N Vietnam, as potential analog for offshore 'buried hill' hydrocarbon play in karsted/ fractured Devonian carbonates (so far with moderate to no economic success))

Nguyen Dinh Chuc, Mai Thanh Tan, Tran Van Xuan & Tran Nhu Huy (2019)- Oligocene combination/ stratigraphic traps and their reservoir quality in Cuu Long basin, offshore Vietnam. Petrovietnam Journal 2019/6, p. 30-40.

(online

at:

<https://www.pvn.vn/DataStore/Documents/2019/TapchiDK/TCDK%20062019/Oligocene%20combination.pdf>)

(Assessments of combination/stratigraphic trap types in Oligocene of Cuu Long basin, off S Vietnam)

Nguyen, Hiep Huu (2019)- The Cenozoic evolution of the South Vietnam margin of the South China Sea and the origin of coastal placer deposits. Ph.D. Thesis, Department of Earth and Planetary Sciences, Birkbeck College, University of London, p. 1-326.

(online at: https://eprints.bbk.ac.uk/id/eprint/40385/1/Hiep_Huu_Nguyen_2019.pdf)

(On Quaternary ilmenite placer deposits along the coasts of Vietnam and their origin)

Nguyen, Hiep Huu, A. Carter, L.V. Hoang & S.T. Vu (2018)- Provenance, routing and weathering history of heavy minerals from coastal placer deposits of southern Vietnam. Sedimentary Geology 373, p. 228 -238.

(Heavy mineral rich sands along coast of S Vietnam often with commercial deposits of titanium (ilmenite; TiO₂) and zircon. Detrital zircons age peaks in beach sands 90-120 Ma and 220-250 Ma, with minor group at 400-500 Ma. Proterozoic grains also present. Main source terrain Mesozoic magmatic rocks of S Vietnam (river sands in N Vietnam and Mekong abundant Paleozoic and Proterozoic zircons))

Nguyen, H.H., A. Carter, L.V. Hoang, M. Fox, S.N. Pham & H.B. Vinh (2022)- Evolution of the continental margin of south to central Vietnam and its relationship to opening of the South China Sea (East Vietnam Sea). Tectonics 41, 2, e2021TC006971, p. 1-17.

(Continental margin of S-C Vietnam high elevation plateaus many of which covered by late Cenozoic basalt flows. Forms W-most margin of wide continental rift of S China Sea. Thermal history models show regional fast cooling between c. 37-30 Ma after which cooling rates remained low. Fast cooling coincides with rapid extension across S China Sea that preceded continental break-up recorded by Oligocene grabens onshore)

Nguyen, Hiep Huu & N.V. Dac (eds.) (2018)- Geology and petroleum resources of Vietnam. The Science and Technology Publishing House, Hanoi, p. 1-745

(Second edition of 'The Petroleum Geology and Resources of Vietnam', Hanoi 2007, 551p.?)

Nguyen, H.X., N.T. San, W. Bae & C.M.Hoang (2014)- Formation mechanism and petroleum system of Tertiary sedimentary basins, offshore Vietnam. Energy Sources, Part A: Recovery Utilization and Environmental Effects, Taylor & Francis, 36, 15, p. 1634-1649.

(Vietnamese sedimentary basins mainly Tertiary rift and pull-apart stages. Source rocks in Eocene-Lower Oligocene, Upper Oligocene, and Lower Miocene. Local seal on Upper Oligocene, regional seals on Lower Miocene (Rotalia shale) and U Miocene-Pliocene marine regional seal. Reservoirs pre-Tertiary fractured basement, Upper Oligocene-Lower Miocene fractured extrusive rock, Eocene-Oligocene-Miocene and Lower Pliocene sandstones and M Miocene carbonate reservoirs)

Nguyen Quang Tuan, Nguyen Thanh Tung & Tran Van Tri (2016)- Seismic interpretation of the Nam Con Son basin and its implication for the tectonic evolution. Indonesian J. on Geoscience (IJOG) 3, 2, p. 127-137.

(online at: <http://ijog.bgl.esdm.go.id/index.php/IJOG/article/view/312/210>)

(Nam Con Son Basin offshore Vietnam two extensional phases: (1) N-S extension terminating at ~30 Ma, forming E-W grabens, complicated by multiple half grabens filled by Lower Oligocene sediments (2) Grabens reactivated during M Miocene NW-SE extension. Most fault systems inactive by Upper Miocene)

Nguyen, Thi Tham & Nguyen Van Su (2016)- Neogene calcareous nannofossils from the Nam Con Son Basin, offshore Vietnam. Proc. 15th INA Conference, Bohol, Philippines, J. Nannoplankton Research 36, 2, p. 151-160.

(online at: [http://ina.tmsoc.org/JNR/online/36/Tham%20%20Su%202016%20JNR%2036-2%20Neogene%20Vietnam%20\[C2%A7N2067\].pdf](http://ina.tmsoc.org/JNR/online/36/Tham%20%20Su%202016%20JNR%2036-2%20Neogene%20Vietnam%20[C2%A7N2067].pdf))

(Miocene-Recent calcareous nannofossils from post-rift stage in Nam Con Son Basin. Dua Fm spans NN2-NN4, Thong-Mang Cau Fm NN5-NN7, Nam Con Son Fm NN9-NN11, Bien Dong Fm NN12-NN18)

Nguyen Thi Thanh (2015)- Sequence stratigraphy and seismic facies mapping of the syn-rift to post-rift transition in offshore Vietnam. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 375-385.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246708/167700>)

(Seven sequences in Miocene late rifting to post rifting phase in SE offshore Vietnam. No age constraints)

Nguyen, T.T.B., M. Satir, W. Siebel & S. Chen (2004)- Granitoids in the Dalat zone, southern Vietnam: age constraints on magmatism and regional geological implications. Int. J. Earth Sciences (Geologische Rundschau) 93, 3, p. 329-340.

(Dalat zone Cretaceous Andean-type magmatic arc with granitoids and volcanic rocks. Three suites: Dinhquan at ~112-100 Ma, Cana at ~96-93 Ma and Deoca at ~92-88 Ma. Geochronological data support continuation of Andean-type arc running from SE China via S Vietnam to SW Borneo)

Nguyen, T.T.B., M. Satir, W. Siebel, T. Vennemann & Trinh Van Long (2004)- Geochemical and isotopic constraints on the petrogenesis of granitoids from the Dalat zone, southern Vietnam. J. Asian Earth Sciences 23, p. 467-482.

(Cretaceous granitoids of Dalat zone are of sub-alkaline affinity, belong to high-K calc-alkaline series and display features typical of I-type granites)

Nguyen, Tu-Anh, M.B.W. Fyhn, J.A. Kristensen, L.H. Nielsen, T.B. Thomsen, N. Keulen et al. (2021)- Provenance of the Phuquoc Basin fill, southern Indochina: Implication for Early Cretaceous drainage patterns and basin configuration in Southeast Asia. Gondwana Research 98, p. 166-190.

(Phuquoc Basin, exposed in SW Cambodia and continues into Gulf of Thailand. Basin fill resembles fill of Khorat Basin. Basin rotated ~33°CW, probably in Eo-Oligocene. Lower Cretaceous sandstones five main zircon age populations: 130-145 Ma, 165-200 Ma (Jurassic), major peak ~243-255 Ma (latest Permian- E Triassic), ~430 Ma (Silurian), ~1840-1880 Ma (Paleoproterozoic) and two minor clusters of 2400-2700 Ma, 750-1000 Ma. Ages resemble Qinling-Dabie and Songpan-Ganzi orogenic belts outcrops. Zircon age pattern also resembles ages in Khorat and Sichuan basins, and M Cretaceous in Lanping-Simao Basin (all parts of former Cretaceous mega-basin covering much of central SE Asia?))

Nguyen, Tu-Anh, N.T.T. Quy V.T. Hao & P. Minh (2020)- An overview of the tectonic evolution of the Indochina block and granitoid emplacement, particularly in the central and south Vietnam. Science and Technology Development J. (Viet Nam National University, Ho Chi Minh City), 23, 3, p. 615-636.

(online at: <https://stdj.scienceandtechnology.com.vn/index.php/stdj/article/view/2062/2778>)

Nguyen Van Liem (1981)- A Late Permian microfauna from Ta Thiet Limestone southern Viet Nam. Proc. 4th Regional Conference on the Geology, Mineral and Energy Resources of South East Asia (GEOSEA IV), Manila 1981, p. 329-340.

Nguyen Van Phuc (1981)- Graptolite fauna in Vietnam. In: Proc. Fourth Regional Conference on the Geology, Mineral and Energy Resources of SE Asia (GEOSEA IV), Manila, Geological Society of the Philippines, p. 347-354

Nguyen Van Phuc (2002)- Ordovician-Silurian and Lower Devonian graptolite-bearing beds from Vietnam. VNU (Vietnam National university) Journal of Science: Natural Sciences and Technology 18, 1, p. 38-50.
(online at: https://dulieu.itrithuc.vn/media/dataset/2020_08/tc_000394.pdf)
(Review of graptolites from E Paleozoic deep water clastics from C Vietnam with black graptolite bituminous shales (= Ordovician suture zone, between S margin of Cathaysian Massif (N Vietnam) and N margin of Indosinian Massif (S Vietnam)?). No fossils plates)

Nguyen, V.V., B.T. Hansen, K. Wemmer, C. Lepvrier, V.V. Tich & T. Thanh (2013)- U/Pb and Sm/Nd dating on ophiolitic rocks of the Song Ma suture zone (northern Vietnam): Evidence for upper Paleozoic Paleotethyan lithospheric remnants. J. Geodynamics 69, p. 140-147.
(Sm/Nd dating of lenses of ophiolitic rocks in Song Ma suture zone, reveals crystallization ages of 387-313 Ma (Carboniferous) for titanites from metagabbros/ metabasalts. Suggests blocks are remnants of E branch of Paleotethys. Metamorphism overprint during Triassic Indosinian orogeny suturing of Indochina- S China blocks. U/Pb and Ar/Ar data show peak metamorphism at 266-265 Ma, followed by cooling at 250-245 Ma)

Nguyen, Vuong Van & Luong Thi Thu Hoai (2019)- Cenozoic paleostress evolution in south central Vietnam: Implication for changing dynamics of faulting along the eastern Indochina continental margin. J. Asian Earth Sciences 185, 104006, p.
(Analysis of 1500 striated faults in different Cretaceous-Quaternary rocks suggest four paleostress regimes affecting E Indochina from Oligocene- today. First three regimes have evolved clockwise, induced by force exerted from E Himalayan syntaxis during N-ward Indian plate motion. Fourth stress regime (Late Miocene-today) most likely linked to force originated from Sunda subduction.)

Nguyen Xuan Dinh (1990)- Phu Cu- Phong Chau sandstone play, Hanoi Basin, Vietnam. In: CCOP/WRGA Play modelling exercise 1989-1990, United Nations ESCAP, CCOP, Technical Publication 23, p. 113-126.
(Assessment of undiscovered hydrocarbons and play description of E Miocene in Oligocene- Pliocene Hanoi rift basin)

Nielsen, L.H., H.I. Petersen, N.D. Thai, N.A. Duc, M.B.W. Fyhn, L.O. Boldreel, H.A. Tuan, S. Lindstrom & L.V. Hien (2007)- A Middle-Upper Miocene fluvial-lacustrine rift sequence in the Song Ba Rift, Vietnam: an analogue to oil-prone, small-scale continental rift basins. Petroleum Geoscience 13, 2, p. 145-168.
(Small Neogene Krong Pa graben within continental Song Ba Rift, Vietnam, which is bounded by strike-slip faults that were reactivated as extensional faults in M Miocene. Thickness of graben-fill ~500m. Basal graben-fill mainly fluvial sandstones, overlain by deep lacustrine sediments, including two excellent oil-prone lacustrine source-rock units. In late phase of graben development return to fluvial sedimentation)

Nong, A.T.Q., C.A. Hauzenberger, D. Gallhofer, J. Booth, E. Skrzypek & S.Q. Dinh (2022)- Early Mesozoic granitoids in southern Vietnam and Cambodia: a continuation of the Eastern Province granitoid belt of Thailand. J. Asian Earth Sciences 224, 105025, p. 1-19.
(online at: <https://www.sciencedirect.com/science/article/pii/S1367912021003631>)
(Latest Triassic - earliest Jurassic granitoids in SW Vietnam and SE Cambodia (~190-200 Ma). Ages consistent with intrusion during and soon after the Indosinian II Orogeny, driven by docking of Sibumasu and Indochina Blocks. Likely derived from syn to post-collisional magmatism. Correlate with Late Triassic-E Jurassic Eastern Province granitoids in Loei Fold Belt along W margin of Indochina Block, and extending into E Thailand and S Cambodia (and south into East Malaysia and Bangka-Belitung?: JTVG))

Nong, A.T.Q., C.A. Hauzenberger, D. Gallhofer & S.Q. Dinh (2021)- Geochemistry and zircon U Pb geochronology of Late Mesozoic igneous rocks from SW Vietnam- SE Cambodia: implications for episodic magmatism in the context of the Paleo-Pacific subduction. Lithos 390-391, 106101, p. 1-21.
(online at: <https://www.sciencedirect.com/science/article/pii/S0024493721001377>)
(Cretaceous igneous rock suites in SW Vietnam- SE Cambodia indicate several pulses of magmatism during late stages of long-lived convergent margin. Can be related to two tectonic stages: (1) Paleo-Pacific subduction (110-90 Ma) and (2) a transitional phase leading to opening of S China Sea (83-75 Ma))

Nong, A.T.Q., C.A. Hauzenberger, D. Gallhofer, E. Skrzypek & S.Q. Dinh (2021)- Geochemical and zircon U-Pb geochronological constraints on late Mesozoic Paleo-Pacific subduction-related volcanism in southern Vietnam. *Mineralogy and Petrology* 116, p. 349–368,

(online at: <https://link.springer.com/article/10.1007/s00710-022-00785-z>)

(Cretaceous basalt, basaltic-andesite to dacite in S-C Vietnam (Dalat zone). Zircon U-Pb data for volcanic rocks indicate 95-105 Ma (~late Albian- Cenomanian) eruption age, linking this mid-Cretaceous volcanism to continental arc magmatism driven by subduction of Paleo-Pacific beneath E Indochina. Zircon xenocrysts with likely magmatic origin cluster around 350 Ma and 250 Ma, indicating two earlier magmatic events, likely related to subduction of Paleo-Tethys beneath W Indochina and subsequent Indosinian orogeny)

Okui, A., A. Imayoshi & K. Tsuji (1997)- Petroleum system in the Khmer Trough, Cambodia. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum Systems of SE Asia and Australasia Conference*, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 365-379.

(Khmer Trough in E part of Gulf of Thailand, with oils generated from lacustrine source rock, probably from upper part of Oligocene section)

Osanoai, Y., N. Nakano, M. Owada, T.N. Nam, T. Miyamoto et al. (2008)- Collision zone metamorphism in Vietnam and adjacent South-eastern Asia: proposition for Trans Vietnam orogenic belt. *J. Mineralogical and Petrological Sciences* 103, p. 226-241.

(online at: www.jstage.jst.go.jp/article/jmps/103/4/103_226/_article)

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(online at: www.geo.sc.chula.ac.th/Geology/English/News/Technique/GREAT_2008/PDF/034.pdf)

(Various types of Permo-Triassic UHT and UHP metamorphic rocks in Red River zone and Kontum Massif. Peak metamorphic stage took ~250 Ma and result of collision between Indochina and S China cratons)

Osanai, Y., N. Nakano, M. Owada, T.N. Nam, T. Miyamoto, Nguyen Thi Minh, Nguyen Van Nam & Tran Van Tri (2008)- Collision zone metamorphism in Vietnam and adjacent South-eastern Asia: proposition for Trans Vietnam Orogenic Belt. *J. Mineralogical and Petrological Sciences* 103, 4, p. 226-241.

(online at: https://www.jstage.jst.go.jp/article/jmps/103/4/103_080620e/_pdf)

(Investigations of Vietnam metamorphic complexes suggest peak metamorphic conditions at Kontum Massif, the Song Ma suture zone and Red River zone are linked and may represent continental collision event between Indochina and S China cratons, which led to formation of Trans Vietnam Orogenic Belt)

Otofujii, Y., Van Duc Tung, M. Fujihara, M. Tanaka, M. Yokoyama, K. Kitada & H. Zaman (2012)- Tectonic deformation of the southeastern tip of the Indochina Peninsula during its southward displacement in the Cenozoic time. *Gondwana Research* 22, 2, p. 615-627.

(Kontum Massif of S Vietnam, in SE part of Indochina Block, experienced S-ward displacement by $5.1^\circ \pm 2.4^\circ$ between 32-17 Ma. During displacement Kontum massif rotated CCW by $27 \pm 10^\circ$ within Indochina block. Left lateral motion along E Vietnam Boundary Fault brought about this CCW rotation)

Owada, M., Y. Osanai, N. Nakano, T. Adachi, I. Kitano, Tran Van Tre & H. Kagami (2016)- Late Permian plume-related magmatism and tectonothermal events in the Kontum Massif, central Vietnam. *J. Mineralogical and Petrological Sciences* 111, 3, p. 1-15.

(online at: https://www.jstage.jst.go.jp/article/jmps/advpub/0/advpub_151019b/_pdf/-char/en)

Palin, R.M., M.P. Searle, D.J. Waters, M.S.A. Horstwood, R.R. Parrish, N.M.W. Roberts, M.S.A. Horstwood, M.W. Yeh & S.L. Chung (2013)- A geochronological and petrological study of anatectic paragneiss and associated granite dykes from the Day Nui Con Voi metamorphic core complex, North Vietnam; constraints upon the timing of metamorphism within the Red River Shear Zone. *J. Metamorphic Geology* 31, 4, p. 359-387.

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(Rel. complete Permian section in Indochina. With common limestones rich in fusulinid foraminifera)

Phan, C.T. et al. (eds.) (1991)- Geology of Cambodia, Laos and Vietnam. Explanatory note to the geological map of Cambodia, Laos and Vietnam, 2nd ed., Geological Survey of Vietnam, Hanoi, p. 1-156.

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(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246700/167694>)

(Pliocene deepwater systems as imaged across continental shelf-slope offshore Mekong Delta. Nine sequence boundaries, correlatable to Gulf of Mexico, etc.)

Pokorny, R. & Pham Ba Trung (2017)- The trace fossils in Da Lat Basin (Nha Trang district, Khanh Hoa Province, SE Vietnam). Geoscience Research Reports 50, p. 141-146. *(in Czech with English abstract)*

(online at: www.geology.cz/img/zpravyvyzkum/fulltext/10_Pokorny_170628.pdf)

(Da Lat basin in SE Vietnam initiated during marine transgression in E Jurassic (Hettangian, ~198 Ma) and ended by regression in M Jurassic (Bathonian, ~165 Ma). Aalenian- Bajocian with common molluscs (?Myophorella) and mid-outer shelf ichnofossils (Skolithis, Paleophycus, Thalassinoides))

Pubellier, M., C. Rangin, P.V. Phach, B.C. Que, D.T. Hung & C.L. Sang (2003)- The Cao Bang- Tien Yen fault: implications on the relationships between the Red River Fault and the South China coastal belt. Advances in Natural Sciences 4, 4, p. 347-361.

Qian, X., Q. Feng, Y. Wang, C. Chonglakmani & D. Monjai (2016)- Geochronological and geochemical constraints on the mafic rocks along the Luang Prabang zone: Carboniferous back-arc setting in northwest Laos. Lithos 245, p. 60-75.

(Paleotethyan sutures/collisional zones: Luang Prabang tectonic zone in NW Laos links with Jinshajiang-Ailaoshan suture zone to N and Nan suture zone to SW. Diabase and basalt in Luang Prabang tectonic zone with zircon ages of ~335, 305 Ma, suggesting Carboniferous age of mafic rocks (also 430-470 Ma peak). E-MORB-like characteristics with addition of subduction-related component. Ages of mafic rocks along Luang Prabang tectonic zone similar to mafic rocks from Jinshajiang-Ailaoshan, Song Ma and Nan suture zones, and suggest development of Carboniferous back-arc basin separating Sukhothai Terrane and Indochina Block. Luang Prabang tectonic zone remnant of synchronous back-arc basins to NE of Paleotethyan Main Ocean)

Qian, X., Q. Feng, Y. Wang, C. Chonglakmani & D. Monjai (2016)- Petrochemistry and tectonic setting of the Middle Triassic arc-like volcanic rocks in the Sayabouli area, NW Laos. J. of Earth Science (China) 27, 3, p. 365-377.

(online at: <http://en.earth-science.net/PDF/20160612013151.pdf>)

(Volcanic rocks from Sayabouli area in NW Laos traditionally mapped as Permian- E Triassic sequences on geologic map, but basaltic-andesite with zircon U-Pb age of 238±2 Ma, suggests M Triassic age. Rocks similar to continental arc volcanic rocks from Phetchabun belt in NE Thailand, through W Loei sub-belt (E-dipping subduction linked closing of Nan backarc basin between Sukhothai terrane and W margin of Indochina Block))

Qian, X., Q. Feng, W. Yang, Y. Wang, C. Chonglakmani & D. Monjai (2015)- Arc-like volcanic rocks in NW Laos: geochronological and geochemical constraints and their tectonic implications. J. Asian Earth Sciences 98, p. 342-357.

(Loei Fold Belt at W margin of Indochina Block linked to subduction of Paleotethys Ocean. In NW Laos andesitic and rhyolitic samples from Muang Feueng region of Belt have E Carboniferous zircon ages (~330, 335, 350 Ma). Basaltic and basaltic-andesitic samples from Pak Lay region zircon ages of ~315 Ma. Suggest Carboniferous active continental margin along W margin of Indochina Block)

Qian, X., Y. Wang, Y. Zhang, Y. Wang, C. Gan, Y. Wang, M. Udchachon & V. Senebottalath (2021)- Constraints of Late Triassic mafic-felsic volcanic rocks in northwestern Laos on the Eastern Paleotethyan post-collisional setting. *J. Asian Earth Sciences* 218, 104889, p. 1-15.
(*Three groups of U Triassic basaltic andesite, andesite, and rhyolite in NW Laos. Zircon U-Pb ages of 228-234 Ma (~Carnian). Formed in post-collisional setting*)

Qian, X., Y. Wang, Y. Zhang, Y. Wang & V. Senebottalath (2020)- Late Triassic post-collisional granites related to Paleotethyan evolution in northwestern Lao PDR: Geochronological and geochemical evidence. *Gondwana Research* 84, pp. 163-176.
(*NW Lao granites with Late Triassic (231-220 Ma) zircon U-Pb ages. Dominated by monzogranite and biotite granite with I-type geochemical affinity. Originated from mixed source of ancient metamorphic rocks with juvenile mafic crust, and formed in post-collisional setting in response to thickened crustal collapse during assembly of Sibumasu with Indochina (Eastern granite province of E Paleotethyan domain in SE Asia)*)

Racheboeuf, P., P. Ta Hoa, H.H. Nguyen, M. Feist & P. Janvier P. (2006)- Brachiopods, crustaceans, vertebrates, and charophytes from the Devonian Ly Hoa, Nam Can and Dong Tho formations of Central Vietnam. *Geodiversitas* 28, 1, p. 5-36.
(*online at: <http://sciencepress.mnhn.fr/sites/default/files/articles/pdf/g2006n1a1.pdf>*)
(*New vertebrate remains from Devonian of C Vietnam (Indochina Block): fish fossils (similar to Yangtze Platform, S China block, brachiopods (Corbicularia, etc.) and charophytes (Sycidium))*)

Rangin, C., P. Huchon, X. Le Pichon, H. Bellon, C. Léprier, D. Roques, Nguyen Dinh Hoe & Phan Van Quynh (1995)- Cenozoic deformation of central and south Vietnam. *Tectonophysics* 251, p. 179-196.
(*Pre-Tertiary basement of C and S Vietnam pervasive strike-slip and normal faulting. Two superposed strike-slip systems: (1) Paleogene (large NW-SE left-lateral strike-slip faults, parallel to Red River Fault; E-W maximum shortening axis) and (2) E Neogene (dominant N 160°E to N-S right-lateral faults). Indochina affected by collision of India with Eurasia, first through pervasive NW-SE left-lateral strike-slip faulting (extrusion of Indochina), then through N160°E to N-S right-lateral faulting, compatible with large right-lateral sub-meridian shear zone over E margin of Indochina as S China Sea basin was opening*)

Ren, Q.H., Y.S. Du, D.L. Gao, B. Li, X. Zhang & X.L. Yuan (2018)- A multi-fluid constrain for the forming of potash deposits in the Savannakhet basin: geochemical evidence from halite. *Acta Geologica Sinica (English Ed.)* 92, 2, p. 755-768.
(*Khorat Plateau on Indochina Terrane formed during the closure of Tethys Ocean. Borehole in Savannakhet Basin is used in this study to re-define Cretaceous evaporation processes. Four stages. Evaporites primarily formed via marine evaporation, also influenced by non-marine fresh water and hydrothermal fluids*)

Roger, F., M. Jolivet, H. Maluski, J.P. Respaut, P. Munch, J.L. Paquette, Tich Vu Van & Vuong Nguyen Van (2014)- Emplacement and cooling of the Dien Bien Phu granitic complex: Implications for the tectonic evolution of the Dien Bien Phu Fault (Truong Son Belt, NW Vietnam). *Gondwana Research* 26, p. 785-801.
(*Dien Bien Phu and Muong Lay granites in N Vietnam exposed E and W of DPB fault. U/Pb age of ~277 Ma and considered related to subduction of Song Ma Ocean under Indochina Block during Indosinian orogeny.*)

Roger, F., P.H. Leloup, M. Jolivet, R. Lacassin, P.T. Trinh, M. Brunel & D. Seward (2000)- Long and complex thermal history of the Song Chay metamorphic dome (northern Vietnam) by multi-system geochronology. *Tectonophysics* 321, p. 449-466.
(*Song Chay Range with high-grade granitic and metamorphic dome near Cenozoic Ailao Shan-Red River fault zone. Previously considered to be Proterozoic S China basement. Granite with zircon age of 428 ± 5 Ma. Rb/Sr on and $^{39}\text{Ar}/^{40}\text{Ar}$ ages suggest Late Triassic episode of rapid cooling interpreted as due to doming. AFT age of 33.6 ± 3.6 Ma confirms rapid Eocene-Oligocene cooling event, final exhumation of Song Chay dome*)

Roger, F., H. Maluski, C. Léprier, V.V. Tich & J.L. Paquette (2012)- LA-ICPMS zircons U/Pb dating of Permo-Triassic and Cretaceous magmatism in northern Vietnam- geodynamic implications: *J. Asian Earth Sciences* 48, p. 72-82.

(NE Vietnam major tectonic episode with nappes emplacement in Triassic. Allochthonous structures intruded by E-M Triassic post-tectonic granitic melts (Phia Bioc granite intrusive; 245-248 Ma), possibly synchronous with strike-slip faulting events (250-245 Ma) in Truong Son Belt Indosinian orogen. Probably linked with intra-plate magmatism of Emeishan Large Igneous Province or with magmatism associated with Paleotethys closure. Cretaceous Phia Oac granite (87.3 ± 1.2 Ma) probably tied to 'late Yanshanian' Paleo-Pacific subduction)

Rossignol, C., S. Bourquin, E. Hallot, M. Poujol, M.P. Dabard, F. Roger, R. Martini & M. Villeneuve (2016)- Les bassins sedimentaires permo-triasiques Nord vietnamiens: archives de la collision Indochine- Chine du Sud (orogenese Indosinienne). Reunion des Sciences de la Terre 25, Caen, p. 280. *(Abstract only)*
('The Permo-Triassic sedimentary basins of North Vietnam: archives of the Indochina- South China collision (Indosinian orogeny'. Indosinian unconformity in N Vietnam postdates Middle Triassic. E Triassic arc S of Song Ma suture suggests S-dipping subduction of oceanic crust under Indochina Block)

Rossignol, C., S. Bourquin, E. Hallot, M. Poujol, M.P. Dabard, R. Martini, M. Villeneuve, J.J. Cornee, A. Brayard & F. Roger (2018)- The Indosinian orogeny: a perspective from sedimentary archives of north Vietnam. J. Asian Earth Sciences 158, p. 352-380.
(New Triassic stratigraphic framework for Song Da and Sam Nua basins, N Vietnam. Song Da Basin at S margin of S China Block in foreland setting during late E- M Triassic, not rift. Sam Nua basin on N margin of Indochina Block records activity of proximal magmatic arc from late Permian-Anisian, resulting from subduction of S-dipping oceanic slab that separated S China and Indochina blocks. Both basins M-L Triassic erosion, creating major unconformity from erosion of M Triassic Indosinian S China -Indochina collisional belt. Late Triassic terrestrial syn- to post-orogenic foreland basins with coarse detrital material)

Rossignol, C., S. Bourquin, M. Poujol, E. Hallot, M.P. Dabard & T. Nalpas (2016)- The volcanoclastic series from the Luang Prabang Basin, Laos: a witness of a Triassic magmatic arc? J. Asian Earth Sciences 120, p. 159-183.
(manuscript online at: <https://hal-insu.archives-ouvertes.fr/insu-01267172/file/rossignol-2016.pdf>)
(Luang Prabang Basin in NW Laos with long lasting Triassic subduction related arc volcanism (~ 35My; but rock age data mainly E Norian). Zircon ages of volcanic and volcanoclastic rocks ~233-215 Ma. Triassic active margin along W margin of Indochina Block, with E-dipping subduction from ~250(?) -215 Ma. Oceanic subduction episode followed by continental collision of Indochina Block with E Simao Block (area is E of Sukhothai terrane and Nan-Uttaradit suture= closing of Paleotethys or marginal basin/ branch?; see also Blanchard et al. 2013, Qian et al. 2016)

Sanematsu, K. & S. Ishihara (2011)- 40Ar/39Ar Ages of the Da Lien Granite related to the Nui Phao W mineralization in Northern Vietnam. Resource Geology 61, 3, p. 304-310.
(40Ar/39Ar dating of biotite and muscovite of Da Lien granite, Nui Phao, N part of Vietnam on South China Plate indicate Late Cretaceous cooling age (82.8- 81.5 Ma) age of granite with polymetallic mineralization)

Sanematsu, K., H. Murakami, S. Duangsurigna, S. Vilayhack, R.A. Duncan & Y. Watanabe (2011)- 40Ar/39Ar ages of granitoids from the Truong Son fold belt and Kontum massif in Laos. J. Mineralogical and Petrological Sciences 106, p. 13-25.
(online at: https://www.jstage.jst.go.jp/article/jmps/106/1/106_091216/_pdf)
(Granitoids of Truong Son fold belt of C Laos formed in Indosinian orogeny, contemporaneous with Late Permian-Early Jurassic granites in SE Asian Tin Belt (253-247 Ma in SW, from 244-199 Ma in NE). Carboniferous-Permian I-type granitoids in Kontum massif of SE Laos (414-252 Ma))

Sanematsu, K., H. Murakami, Y. Watanabe, S. Duangsurigna & S. Vilayhack (2009)- Enrichment of rare earth elements (REE) in granitic rocks and their weathered crusts in central and southern Laos. Bull. Geological Survey of Japan, 60, 11/12, p. 527-558.
(online at: https://www.gsj.jp/data/bulletin/60_11_02.pdf)

Sato, T. (1972)- Ammonites du Toarcien au Nord de Saigon (Sud Viet-Nam). In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 10, p. 231-242.

('Ammonites from the Toarcian N of Saigon, S Vietnam'. Ammonites collected by Fontaine at Lo-Duc, NNE of Saigon. Dumortieria lantenoisi, Pseudogrammoceras, Pseudammatoceras molukkanum, Hammatoceras suggest U Toarcian- lower Aalenian age and Tethyan affinities. Associated with rich bivalve fauna described by Hayami 1972)

Saurin, E. (1932)- Sur le Trias et le Lias marin du Cambodge nord-Oriental et du Darlac. Comptes Rendus. Academie Sciences, Paris, 197, p. 925-927.
('On the Triassic and the marine Liassic of NE Cambodia and of Darlac')

Saurin, E. (1935)- Etudes geologiques sur l'Indochine du Sud Est (Sud Annam, Cochinchine, Cambodge oriental). Bull. Service Geologique de l'Indochine, Hanoi, 22, 1, p. 1-419.
('Geological studies on the SE of Indochina (South Annam, Conchinchine, East Cambodia')

Saurin, E. (1935)- Sur quelques gisements de tectites de l'Indochine du Sud. Comptes Rendus Hebd. Academie Sciences, Paris, 200, 3, p. 246-248.
('On some deposits of tektites of Southern Indochina')

Saurin, E. (1956)- La geologie de l'Indochine. Proc. 8th Pacific Science Congress, Quezon City 1953, 2, p. 313-324.
('The geology of Indochina'. With fossiliferous sediments of M Cambrian- Quaternary ages)

Saurin, E. (1957)- Indochine. Lexique Stratigraphique International, Congress Geol. Int., Commission de Stratigraphie, Paris, III, Asie 6A, p. 1-149.
('Stratigraphic lexicon of Indochina (Cambodia, Laos, Vietnam); alphabetical listing and descriptions of stratigraphic units from Cambrian- Recent)

Saurin, E. (1960)- Foraminiferes Viseens de Bhan Phit. Annales Faculte Sciences Saigon, p. 345-376.
('Visean foraminifera of Bhan Phit', Vietnam)

Saurin, E. & A. Millies-Lacroix (1961)- Tectites par 1270m de fond au large du Vietnam. Comptes Rendus Sommaires Societe Geologique France 5, p. 128-129.

Schmidt, W.J., J.W. Handschy, B.H. Hoang, C.K. Morley, Do VanLinh, Nguyen Thanh Tung & N.Q Tuan (2021)- Structure and tectonics of a Late Jurassic, arcuate fold belt in the Ban Don Group, Southern Vietnam. Tectonophysics 817, 229040, p. 1-30.
('Ban Don Group of SC Vietnam and NE Cambodia with major unconformities reflecting fold belt development during latest M to Late Jurassic. Ban Don Fold Belt 350x 240 km wide. Well documented Late Jurassic-Cretaceous Andean-type margin of SE Asia also existed during E-M Jurassic. Etc.)

Schmidt, W.J., B.H. Hoang, J.W. Handschy, Vu Trong Hai, Trinh Xuan Cuong & Nguyen Thanh Tung (2019)- Tectonic evolution and regional setting of the Cuu Long Basin, Vietnam. Tectonophysics 757, p. 36-57.
('Cuu Long Basin is off SE coast of Vietnam, with two major deformational events: transtensional rifting from M Eocene- mid-E Oligocene (40-31 Ma), followed by transpression from mid-E Oligocene- mid-Late Oligocene (31-25 Ma). Straight major tributaries of Mekong River Delta follow NW trending faults that link into to SW end of Cuu Long Basin fault system. The Mekong Delta Fault Zone exhibited left-lateral displacement during extension in Cuu Long Basin and right-lateral displacement during younger transpression. Etc.)

Schnetzler, C.C., L.S. Walter & J.G. Marsh (1988)- Source of the Australasian tektite strewn field: a possible offshore impact site. Geophysical Research Letters 15, 4, p. 357-360.
('Large negative Qui Nhon Slope Anomaly is sea surface depression of ~1.5 m over 100km diameter. Corresponds to gravity anomaly of ~-50 mgal. May be impact structure that produced Australasian strewn field)

Serra, C. (1963)- Presence d'un *Brachoxylon rotuaensis* Mathiesen dans la flore mesozoique du Bas-Laos. Comptes Rendus 88e Congres National des Societes Savantes, Science 2, Clermont Ferrand, p. 469-482.

(*'Presence of Brachoxylon rotmaensis Mathiesen in the Mesozoic flora of lower Laos'. Fossil wood*)

Serra, C. (1966)- Etude anatomique et paleogeographique de quelques especes homoxylees du Sud-Vietnam et du Cambodge. Archives Geologiques Vietnam 8, p. 59-131.

(*'Anatomic and paleogeographic studies of some of homxylous species from South Vietnam and Cambodia'. Jurassic-Cretaceous fossil wood from 4 localities in S Vietnam and Cambodia. Six new conifer species. Mesozoic forests dominated by podocarps, with araucarias and ginkgos also present. Dadoxylon khmerinum n. sp. from Kazanian (Permian) of Sisophon (Cambodia). Brachyoxylon boureaui from 'Gres Superieurs' in Cambodia (also known from Phu Kradung Fm/ Khorat Gp of NE Thailand; Philippe et al. 2004)*)

Serra, C. (1966)- Nouvelle contribution a l'etude paleoxylologique du Cambodge, du Laos et du Viet-nam. Archives Geologiques Vietnam 9, p. 17-40.

(*'New contribution to the paleoxylological study of Cambodia, Laos and Vietnam'. Incl. Araucarioxylon saravanensis (= Agathoxylon; Philippe et al. 2004)*)

Serra, C. (1969)- Sur des bois fossiles de l'Archipel de Tho Chau (Golfe de Thaïlande). Archives Geologiques Vietnam 12, p. 1-15.

(*'On fossil wood of the Tho Chau Archipelago (Gulf of Thailand)'. Fossilized tree trunk in Late Jurassic or Early Cretaceous redbeds of Khorat Group-equivalent of Tho Chau islands, Vietnam part of Gulf of Thailand*)

Shellnutt, J.G., C.Y. Lan, T. Van Long, T. Usuki, H.Y. Yang, S.A. Mertzman et al. (2013)- Formation of Cretaceous Cordilleran and post-orogenic granites and their microgranular enclaves from the Dalat zone, southern Vietnam: tectonic implications for the evolution of Southeast Asia. Lithos 182-183, p. 229-241.

(*Cordilleran-type batholiths of Dalat zone of S Vietnam preserve evidence of Cretaceous convergent zone magmatism superimposed on Precambrian rocks of Indochina Block. Plutons of Dalat zone transitioned from active continental margin batholiths to highly extended crust with within-plate plutons. Deoca and Dinhquan plutons zircon U/Pb ages ~118-115 Ma, Ankroet pluton zircon age ~87Ma. Compositional change of Dalat zone granitic rocks in M-L Cretaceous indicates tectonic regime evolved from continental arc environment to post-orogenic extension. Region of highly extended crust facilitated opening of S China Sea in Cenozoic*)

Shellnutt, J.G., G.S.K. M, J.S.L. Chan, P.M. Wong & K.L. Wang (2023)- Early Cretaceous volcanic-arc magmatism in the Dalat-Kratie Fold Belt of eastern Cambodia: implications for the lithotectonic evolution of the Indochina terrane. Frontiers in Earth Science, Petrology, 11, 1110568, p. 1-19.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2023.1110568/full>)

(*Granitic plutons in Indochina terrane of E Cambodia and S Vietnam range in age from E Triassic (240 Ma) to Late Cretaceous (80 Ma) and record distinct tectonomagmatic periods associated with subduction of Paleotethys and Paleo-Pacific oceans. Detail study of Albian Snoul pluton of E Cambodia*)

Shen, J.W., T. Kawamura & W.R Yang (1998)- Upper Permian coral reef and colonial rugose corals in northwest Hunan, South China. Facies 39, p. 35-65.

(*Late Permian (Palaeofusulina zone) coral reef limestone in Kanjia-ping, Hunan. Bafflestones formed by in-situ colonies of Waagenophyllum. Associated with fusulinids (Palaeofusulina, Nankinella, Staffella, Codonofusiella) and smaller foraminifera (Colaniella). Reef at Kanjia-ping is youngest Permian reef known*)

Shi, M.F., F.C. Lin, W.Y. Fan, Q. Deng, F. Cong, M.D. Tran, H.P. Zhu & H. Wang (2015)- Zircon U-Pb ages and geochemistry of granitoids in the Truong Son terrane, Vietnam: Tectonic and metallogenic implications. J. Asian Earth Sciences 101, p. 101-120.

(*Truong Son terrane in N Indochina block composed of six or more volcano-plutonic complexes. At least four stages of magmatic activity in Paleozoic- E Mesozoic: Ordovician-Silurian (420-470 Ma), Late Carboniferous-E Permian (280-300 Ma), Late Permian- M Triassic (245-270 Ma) and M-L Triassic (200-245 Ma).*)

Shi, M.F., Zaw Khin, S Liu, B. Xu, S. Meffre, Feng Cong et al. (2021)- Geochronology and petrogenesis of Carboniferous and Triassic volcanic rocks in NW Laos: implications for the tectonic evolution of the Loei Fold Belt. J. Asian Earth Sciences 219, 104661, p. 1-21.

(NW Laos Loei Fold Belt basaltic and andesitic tuffaceous rocks have Late Carboniferous zircon U-Pb ages (304 ± 2.1 Ma and 299 ± 1.8 Ma), with MORB-like and arc-like geochemical signatures. Zircon Lu-Hf isotopic indicate metasomatic mantle source formed in back-arc basin environment. Andesite and rhyolites zircon ages 236-224 Ma (Late Triassic), formed in continental margin arc. Four magmatic events in Loei Fold Belt: Ordovician-Silurian (450-400 Ma), Late Devonian-M Permian (ca. 361-265 Ma), E-M Triassic (250-237 Ma) and Late Triassic (ca. 236-200 Ma), with peaks in Triassic and Carboniferous. Luang Prabang-Loei belt was Late Devonian-M Permian spreading back-arc basin behind Sukhothai Arc, connected with Nan back-arc basin in Thailand. Largest extent in Permian and start of subduction in earliest Triassic; closing in Late Triassic)

Shi, M.F., B.C. Xu, Z.B. Wu, S.S.g Liu, G.P. Goosen, Z.M. Peng, F. Nie & H.M.Liang (2021)- Geochronology and petrogeochemistry of Late Permian volcanic rocks in the B.Xiengnou area, Northwestern Laos: Petrogenesis and tectonic significance. *China Geology*, 4, 630-643.

(online at: <http://en.cgsjournals.com/zgdzdcqkw-data/zgdzyw/2021/4/PDF/cg2021005.pdf>)

(Nan Suture and Sukhothai Arc Terrane presumably products of E-ward subduction of Paleotethyan Ocean during Late Carboniferous-Triassic. In NW Laos Late Permian origin for andesitic rocks in B.Xiengnou area rather than Late Triassic (andesitic tuffs with zircon U-Pb age of ~ 260 Ma (and MORB-like signature) and ~ 254 Ma (with arc-like geochemical affinity) (= latest Permian 'Sukhothai continental arc' setting))

Spagnuolo, S.A., J. Chambers & C. Luxton (2009)- Comparison of the geologic evolution and petroleum system of the Hai Phong sub-basin and the Phu Khanh Basin, offshore Vietnam. Proc. 2009 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, p. 1-31. (Abstract + Presentation)

(Two underexplored basins off Vietnam, both with initial extension tectonics but have contrasting post syn-rift evolution. Phu Khan Basin no evidence for wrench fault system; mild M Miocene compressional event caused re-activation of pre-existing extensional faults. Compression event appears to have ceased by end M Miocene. Post M Miocene transformation of basin into passive margin with progradational-aggradational mega-sequences. Hai Phong sub-basin in N with major M Miocene and Late Pliocene inversion events)

Sritangsirikul, P., S. Meffre, K. Zaw, I. Belousov, Y.J. Lai, . Richards & P. Charusiri (2024)- Using compositions of zircon to reveal fertile magmas for the formation of porphyry deposits in the Loei and Truong Son fold belts, northern Laos. *J. Asian Earth Sciences* 272, 106244, p. 1-17.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912024002396>)

(Loei-Phetchabun and Truong Son Fold Belts highly mineralized volcano-magmatic arcs in SE Asia. LFB lies to E of Sukhothai Fold Belt/ Nan-Uttaradit Suture, at W. margin of the Indochina Terrane; TSFB along NE margin of Indochina Terrane. Three main magmatic events: 434-411 Ma (Silurian earliest Devonian), 299-277 Ma (E Permian) and 253-243 Ma (latest Permian- M Triassic))

Steyer, J.S. (2009)- The geological and palaeontological exploration of Laos; following in the footsteps of J.B.H. Counillon and A. Pavie. In: E. Buffetaut et al. (eds.) Late Palaeozoic and Mesozoic continental ecosystems in SE Asia, Geological Society, London, Special Publ. 315, p. 25-32.

(Brief history of geological exploration in Laos since late 1800's, mainly by Counillon)

Stokes, R.B. (2013)- Deprat's trilobites and the position of the Indochina Terrane in the Early Palaeozoic. Proc. International Symposium Geoscience resources and environments of Asian terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 201-207.

(Late Ordovician-Silurian trilobite faunas collected by Deprat in ~ 1915 from Laos and C Vietnam on Indochina Terrane, have European affinities (paleo-location adjacent to Bohemia ? (but topic of controversy in 1919: according to Mansuy trilobites came from Europe and had been 'planted' in Laos by Deprat)

Stokes, R.B., P. Lovatt Smith, A. Racey, C.H.C. Brunton, O. Dawson, A.R.H. Swan & M.F. Whitaker (2012)- Some Upper Palaeozoic fossil localities in the Vientiane Contract Area, Lao PDR, and their geological importance. *J. Science Technology Mahasarakham University (MSU)* 31, p. 63-73.

(online at: http://journal.msu.ac.th/2012/_index.php/SCI/article/view/286/294)

(New Upper Paleozoic (Carboniferous- Permian) localities from C and W Laos. Includes latest Permian limestone with Palaeofusulina- Colaniella fauna N of Vientiane)

Stokes, R.B., P.F. Lovatt Smith & K. Soumphonphakdy (1996)- Timing of the Shan-Thai-Indochina collision: new evidence from the Pak Lay Foldbelt of the Lao PDR. In: R. Hall & D.J. Blundell (eds.) Tectonic evolution of SE Asia, Geological Society, London, Special Publ. 106, p. 225-232.

(Pak Lay Foldbelt in NW Laos is product of Indosinian orogeny (collision of Shan-Thai and Indochina along Nan-Uttaradit ophiolite suture). Current hypotheses place timing of collision in Permian or Triassic. However, in area S of Pak Lay M-U Jurassic argillites (with Classopollis spp., Calliatissporites dampieri, etc.) and volcanic rocks in steeply dipping imbricated wedge, which is unconformably overlain by Cretaceous Khorat Gp, suggesting Late Jurassic Shan-Thai-Indochina suturing)

Suasta, M., O. Arifin. & K. Suhanto (2014)- Gold mineralization along Ban Mai- Nakachan trend, west part of Sepon mineral district, Savannakhet Province, LAO PDR. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI), Palembang, p. 319-329.

Sun, L.Q., H.F. Ling, K.D. Zhao, P.R. Chen, W.F. Chen, T. Sun, W.Z. Shen & G.L. Huang (2017)- Petrogenesis of Early Cretaceous adakitic granodiorite: implication for a crust thickening event within the Cathaysia Block, South China. Science China (Earth Sciences) 60, 7, p. 1237-1255.

(E Cretaceous Lingxi pluton in interior of Cathaysia Block (zircon U-Pb age 100 ± 1 Ma). Granodiorite with geochemical features of adakitic rocks, derived from partial melting of thickened Proterozoic lower continental crust at $P \geq 12$ kbar (= crust thickness ≥ 40 km), leaving garnet-bearing amphibolite residue. Crust thickened by late E Cretaceous compressive event (angular unconformity between Upper Cretaceous rift deposits and folded early Lower Cretaceous or Jurassic). During subsequent lithospheric extension (driven by Paleo-Pacific subduction?) lower crust heated by upwelling asthenospheric materials, resulting in Lingxi and other coeval granitoids in Cathaysia Block)

Svetlitskaya, T.V., T.H. Ngo, P.A. Nevolko, T.A. Tran, A.E. Izokh, R.A. Shelepaev et al. (2022)- Zircon U-Pb ages of Permian-Triassic igneous rocks in the Song Hien structure, NE Vietnam: the Emeishan mantle plume or the Indosinian orogeny? J. Asian Earth Sciences 224, 105033, p.

(New zircon U-Pb ages indicate peak of magmatic activity at Song Hien structure in NE Vietnam at 247-248 Ma (E Triassic; both mafic and felsic units), 12 Myr younger than Emeishan mantle plume. Probably linked linked to Indosinian orogeny in N Vietnam (pre-collision (245–255 Ma), syn-collision (230-245 Ma), main peak at 230-240 Ma), and post-collision (200-230 Ma))

Takemoto, K., N. Halim, Y. Otofujii, Tran Van Tri, Le Van De & S. Hada (2005)- New paleomagnetic constraints on the extrusion of Indochina: Late Cretaceous results from the Song Da terrane, northern Vietnam. Earth Planetary Science Letters 229, p. 273-285

(U Cretaceous redbeds of Song Da terrane between Indochina and S China blocks suggest Song Da terrane behaved as part of S China Block, when Shan-Thai Block and S part of Indochina Block experienced $10.5^\circ \pm 9.5^\circ$ S-ward displacement accompanied with CW rotation later than Indo-Asian collision)

Tang, Y., J. Liu, M.D. Tran, Z. Song, W. Wu, Z. Zhang, Z. Zhao & W. Chen (2013)- Timing of left-lateral shearing along the Ailao Shan-Red River shear zone: constraints from zircon U-Pb ages from granitic rocks in the shear zone along the Ailao Shan Range, Western Yunnan, China. Int. J. Earth Sciences (Geologische Rundschau) 102, p. 605-626.

(Zircon U-Pb ages of granites along Ailo Shan- Red River FZ constrain on timing of left-lateral shearing: initiation later than 31 Ma from pre-shearing granitic plutons but earlier than 27 Ma from syn-shearing granitic dykes, and termination ~ 21 Ma from the post-shearing granitic dykes. Left-lateral shearing result of SE-ward extrusion of Indochina block during Indian-Eurasian plate collision)

Thang, Bui Duc (1989)- Lower Triassic conodonts from North Vietnam. Acta Palaeontologica, Warsaw, 34, 4, p. 391-416.

Thanh, T.D., P. Janvier & T.H. Phuong (1996)- Fish suggests continental connections between the Indochina and South China blocks in Middle Devonian time. Geology (GSA) 24, 6, p. 571-574.

(Yunnanolepiform antiarch (placoderm fish) from the Givetian Dong Tho Fm of C Vietnam, well S of Song Ma suture, in marginal marine facies. Hitherto known exclusively from Lower Devonian of S China block, suggesting close links between Indochina and South China blocks in M Devonian time)

Thanh, N.X., Mai Trong Tu, T. Itaya & S. Kwon (2011)- Chromian-spinel compositions from the Bo Xinh ultramafics, northern Vietnam; implications on tectonic evolution of the Indochina Block. *J. Asian Earth Sciences* 42, 3, p. 258-267.

(Bo Xinh ultramafics, N of Song Ma fault zone isolated bodies long considered as remnants of Paleotethys Ocean lithosphere between Indochina and S China blocks. Cr-spinel compositions suggest parental magma was lherzolite-harzburgite in composition, indicating forearc tectonic environment. Combined with information on magmatism, metamorphism and sedimentary environment, suggest presence of S-ward subduction zone since Cambrian and collision of Indochina and S China in Late-Silurian- E Devonian. Permian-Triassic magmatic-metamorphic events in Indochina block linked to N-ward subduction of Paleo-oceanic plate beneath Indochina block, followed by M-L Triassic Sibumasu collision)

Thassanapak, H., M. Udchachon & C. Burrett (2012)- Devonian radiolarians and tentaculitids from central Laos. *J. Asian Earth Sciences* 60, p. 104-113.

(Radiolaria (Trilonche spp, Stigmospaerostylus spp., etc.) and tentaculitids (Homoctenus ultimus, Costulatostylionina vesca) in 4m of thick M-U Devonian section of silicified shales at Ban Phonxai, C Laos (N part of Indochina Terrane). Indicative of Frasnian age. Pelagic deep shelf fauna from Indochina Terrane similar to that from S China)

Thassanapak, H., M. Udchachon & C. Burrett (2017)- Silurian radiolarians from the Sepon Mine, Truong Son Terrane, central Laos and their palaeogeographic and tectonic significance. *Geological Magazine* 155, 8, p. 1621-1640.

(Late Silurian radiolarian fauna of 18 species from cherts in Sepon Mine area, C Laos. With Futobari morishitai, F. solidus, Zadrappolus yoshikiensis and Z. tenuis. Evidence from Silurian-Devonian of S Truong Son Terrane indicates deepening to S (radiolarian cherts; terrestrial red sandstone facies to NE). In contact with E Silurian limestone and U Ordovician- E Silurian graptolitic shale, overlain by turbiditic volcanoclastics from nearby Long Dai Volcanic Arc. Arc probably maintained by N-ward subduction along Thakhek-Danang Shear Zone)

Thuong Chi Cung & J.W. Geissman (2012)- A review of the paleomagnetic data from Cretaceous to lower Tertiary rocks from Vietnam, Indochina and South China, and their implications for Cenozoic tectonism in Vietnam and adjacent areas. *J. Geodynamics* 69, p. 54-64.

(Cretaceous- E Tertiary paleomagnetic data from Indochina- Shan Thai Block reveal complex patterns of intra-plate deformation in response to India-Eurasia collision)

Thuy T.N. Ha, H. Takayanagi, K. Ueno, Y. Asahara, K. Yamamoto & Y. Iryu (2019)- Litho-, bio-, and chemostratigraphy of the Middle Triassic carbonate succession in the North-Central Coast Region of Vietnam. *Progress in Earth and Planetary Science* 6, 47, p. 1-21.

(online at: <https://progearthplanetsci.springeropen.com/track/pdf/10.1186/s40645-019-0293-y.pdf>)

(M Triassic carbonates extend along NE margin of Indochina Block, from North-Central Coast region of Vietnam to N Laos. Hoang Mai Fm limestones with common dasycladalean algae and 24 foraminiferal taxa, incl. Pilamina grandis, suggesting M Anisian (lower Middle Triassic) age)

Tien, Nguyen D. (1970)- Quelques fusulinides de Nui Com, Sud Viet-Nam (Zone a). *Archives Geologiques Vietnam* 13, 1, p. 1-70.

(Rel. high diversity 'Tethyan' M Permian fusulinid assemblage with Neoschwagerina from Nui Com, S Vietnam)

Tien, Nguyen D. (1979)- Etude micropaleontologique (foraminifères) de matériaux du Permien du Cambodge. Thesis 3me Cycle, Université Paris Sud, Orsay, p. 1-166. *(Unpublished)*

('Micropaleontological study (foraminifera) of materials from the Permian of Cambodia')

Tien, Nguyen D. (1986)- Foraminifera and algae from the Permian of Kampuchea. In: H. Fontaine (ed.) The Permian of Southeast Asia, Appendix 2, United Nations, CCOP, Technical Bulletin 18, p. 116-137.
(online at: <https://repository.unescap.org/items/312125a5-1653-453e-97d7-3adb1899913d>)
(Well-illustrated summary of foraminifera from Permian limestones from W and S Cambodia, using thin sections originally used by Gubler (1935) for his studies on fusulinids of Indochina)

Tien, Phan Cu et al. (eds.) (1991)- Geology of Cambodia, Laos and Vietnam. Explanatory note to Geological map, 1,000,000 scale, 2nd ed., Geol. Survey Vietnam, Hanoi, p. 1-158.

Tong-Dzuy, T., A.J. Boucot, J.Y. Rong & Z.J. Fang (2001)- Late Silurian marine shelly fauna of Central and Northern Vietnam. *Geobios* 34, 3, p. 315-338.
(Late Silurian brachiopods and bivalves from Kien An (N Vietnam) and My Duc (C Vietnam) localities. Both with similar 'Retziella fauna', indicating that during Late Silurian both areas, situated on S China and Indochina Plates respectively, were probably fairly close to each other (Retziella fauna also in E Australia))

Tong-Dzuy, T., P. Ta Hoa, A.J. Boucot, D. Goujet & P. Janvier (1997)- Vertebres siluriens du Viet Nam Central. *Compte Rendus Academie Sciences, Paris, Ila*, 324, p. 1023-1030.
(*'Silurian vertebrates from Central Vietnam'. New placoderm fish Myducosteus anmaensis from Indochina Plate, associated with brachiopods*)

Tong-Dzuy T., T.H. Phuong, P. Janvier, Nguyen H. Hong, Nguyen T.T. Coc & Nguyen.T. Duong (2013)- Silurian and Devonian in Vietnam- stratigraphy and facies. *J. Geodynamics* 69, p. 165-185.
(Review of Silurian and Devonian sediments in Vietnam. Most Devonian units in N and C Vietnam consist of shelfal shallow water sediments, apparently deposited in passive margin marine setting)

Tong-Dzuy, Thanh & Vu Khuc (eds.) (2011)- Stratigraphic units of Vietnam, 2nd Edition. Vietnam National University Publ., Hanoi, p. 1-553.

Tran, H.T., N.X. Thanh, J. Halpin & K. Zaw (2011)- The occurrence of ophiolite-style assemblages along Sino-Vietnam border, Northeastern Vietnam and its implication to the tectonic evolution of Northeastern Indochina. In: *Int. Conf. Geology, geotechnology and mineral resources of Indochina (GEOINDO 2011)*, Khon Kaen, p. 479-488.
(*Ophiolites in Sino-Vietnam border, linked to closing of Paleotethys back-arc style oceanic basin flanking NE margin of Indochina Block in Late Paleozoic- E Mesozoic*)

Tran Ngoc Nam (1995)- The geology of Vietnam: A brief summary and problems. *Geoscience Reports Shizuoka University* 22, p. 1-10.
(online at: <https://ci.nii.ac.jp/els/contents110000413364.pdf?id=ART0000542361>)
(Vietnam five structural blocks, from N to S: NE, NW, Truongsong, Kontum, Nambo)

Tran Van Tri (1994)- The geotectonic framework of Vietnam and adjacent areas. In: J.L. Rau (ed.) *Proc. 29th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP)*, Hanoi 1992, 2, p. 183-190.
(Review of Vietnam tectonics. Indochina foldbelt/ Mekong-Indosinian orogeny with folded Carboniferous-Triassic clastics, andesites and ultramafic bodies marks Late Triassic closure of SE branch of Paleo-Tethys and collision of Sino-Vietnamese (Cathaysia), Indosinian, Shan and W Borneo blocks)

Tran, T.A., Hoa Tran Trong, Can Pham Ngoc, J.G. Shellnutt, T.T. Pham, A.E. Izokhet al. (2022)- Petrology of the Permian-Triassic granitoids in Northwest Vietnam and their relation to the amalgamation of the Indochina and Sino-Vietnam composite terranes. *Vietnam J. Earth Sciences* 44, 3, p. 343-368.
(online at: <https://vjs.ac.vn/index.php/jse/article/view/17002/2543254465>)
(Permian-Triassic granitoids from seven massifs in NW Vietnam)

Tran Van Tri, Do Canh Duong, Dang Quoc Lich et al. (2016)- Coal-forming episodes in Vietnam, Cambodia and Lao PDR. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium Int. Geoscience Program (IGCP) Project 589, Yangon, p. 50-53. *(Extended Abstract)*
(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)
(Coal-forming episodes in Indochina region: M-L Devonian, E Carboniferous, Late Permian, Late Triassic, E Jurassic, Tertiary and Quaternary. Only E Carboniferous, Late Triassic and Tertiary coals economically important)

Tran Van Tri, M. Faure, V.V. Nguyen, Hoang Huy Bui, M.B.W. Fyhn, T.Q. Nguyen, C. Lepvrier, T.B. Thomsen, K. Tani & P. Charusiri (2020)- Neoproterozoic to Early Triassic tectono-stratigraphic evolution of Indochina and adjacent areas: A review with new data. *J. Asian Earth Sciences* 191, 104231, p. 1-23.
(pre-proof online at: <https://insu.hal.science/insu-02434825/preview/1-s2.0-S1367912020300067-main.pdf>)
(Indochina is core of SE Asia. Neoproterozoic- E Triassic tectono-stratigraphic evolution of Indochina and adjacent areas divided into six mega-episodes. By the end of M Ordovician-Silurian mega-episode, a unified Sino-Vietnam-Indochina super-terrane was established. Etc.)

Trung, N.M., T. Tsujimori & T. Itaya (2006)- Honvong serpentinite body of the Song Ma fault zone, Northern Vietnam: a remnant of oceanic lithosphere within the Indochina- South China suture. *Gondwana Research* 9, 1-2, p. 225-230.
(Honvong serpentinite body in Song Ma fault zone consists mainly of massive serpentinite, altered gabbro and rare chromitite. Original peridotite was spinel-bearing lherzolitic harzburgite. Serpentinite body of Song Ma fault zone represents remnant of Tethyan oceanic lithosphere between Indochina- S China blocks)

Trung, S. Nguyen (2019)- Deposition, diagenesis and reservoir quality of sandstone reservoirs: a case study in the Cuu Long Basin, offshore Vietnam. *Bull. Earth Sciences Thailand (BEST)*, 11, 2, p. 25-36.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246767/167749>)

Tsuchiyama, Y., H. Zaman, S. Sotham, Y. Samuth, E. Sato, H.S. Ahna, K. Unoe, K. Tsumura, M. Miki, Y. Otofujii (2016)- Paleomagnetism of Late Jurassic to Early Cretaceous red beds from the Cardamom Mountains, southwestern Cambodia: Tectonic deformation of the Indochina Peninsula. *Earth Planetary Science Letters* 434, p. 274-288.
(Paleomag of Late Jurassic- E Cretaceous red beds in Phuquoc-Kampot Som Basin (part of Indochina Block) suggests S-ward displacement of $6.0 \pm 3.5^\circ$ and CW rotation of $33 \pm 4^\circ$. CW rotation $\sim 15^\circ$ larger than Khorat Basin, attributed to dextral motion along Wang Chao Fault since M Oligocene. Comparison with CCW rotation reported from Da Lat area in Vietnam suggests differential tectonic rotation in S tip of Indochina Block)

Uchida, E., S. Nagano & T. Hirata (2023)- U-Pb dating for zircons from granitic rocks in southwestern Cambodia. *Heliyon* 9, 9, e19734, p. 1-12.
(online at: <https://www.sciencedirect.com/science/article/pii/S2405844023069426>)
(Zircon U-Pb dating of 13 granite bodies in SW Cambodia SW of Mae Ping Fault, extending from NW Cambodia to S Vietnam. Three distinct ages: 295-309 Ma (Paleotethys subduction beneath Indochina Block), 191-232 Ma (amalgamation of Sibumasu- Indochina Blocks), and 75-98 Ma (Paleo-Pacific subduction beneath Indochina; near SE Cambodia- S Vietnam border)

Udachon, M., H. Thassanapak & C. Burrett (2018)- Early Permian radiolarians from the extension of the Sa Kao Suture in Cambodia- tectonic implications. *Geological Magazine* 155, 7, p. 1449-1464.
*(E-W melange-ophiolite belt of chert and basalts in volcanoclastic matrix, 3 km wide and 20 km long, separating northern block of amphibolitic Pailin Crystalline Complex from southern area of Triassic submarine fan siliciclastic rocks. Cherts with Asselian-Sakmarian radiolarian fauna of *Pseudoalbaillella* spp, etc. Sa Kao Suture appears to extend E into Cambodia. then possibly turns S-wards along strike of Pursat-Kampot Foldbelt)*

Udachon, M., H. Thassanapak, Q. Feng & C. Burrett (2017)- Palaeoenvironmental implications of geochemistry and radiolarians from Upper Devonian chert/shale sequences of the Truong Son fold belt, Laos. *Geological Journal* 52, 1, p. 154-173.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/gj.2743/epdf>)
(*Frasnian radiolarian chert and siliceous shale in Truong Son fold belt of C Laos (NE part of Indochina Terrane). Radiolarian fauna similar to S China, N Thailand and W Australia. Associated with tentaculitids Homotenus ultimus and Costulatostyliolina vesca, previously described from S China and Ban Phonxai. Deposited in pull-apart basins along NW-SE trending Thakhek-Danang Shear Zone*)

Ueno, K. (1999)- *Robustoschwagerina*-bearing limestone pebbles from southern Laos. Annual Report Institute of Geoscience, University of Tsukuba, 24, p. 57-64.

Ueno, K., T. Charoentitirat, Y. Kamata, H. Hara, M. Ichise, P. Charusiri, K. Khamphavong & K. Hisada (2007)- A new Pennsylvanian fusuline fauna from northern Laos. *Acta Micropaleontologica Sinica* 24, 4, p. 359-369.
(online at: www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper/83.pdf)
(*Small fusuline fauna in limestone hill in SW Luang Prabang Province, N Laos (Indochina Block) with Staffella, Neostaffella, Profusulinella, etc., suggests Late Carboniferous (latest Bashkirian- E Moscovian) age*)

Ueno, K., T. Charoentitirat, Y. Kamata, H. Hara, M. Ichise, K. Hisada, K. Khamphavong, S. Kongthiphavong & S.P. Charusiri (2007)- Late Paleozoic carbonates in northern Laos: their foraminiferal faunas and geotectonic implications. In: *Geological Anatomy of East and South Asia, Third Symposium of IGCP Project 516*, Delhi, p. 154-156.

Ueno, K., T. Charoentitirat, Y. Kamata, K. Khamphavong, K. Hisada, P. Charusiri, H. Hara & S. Chantraprasert (2010)- Late Paleozoic carbonates and foraminiferal faunas in northern Lao PDR: their geotectonic implications. *Proc. Thai-Lao Tech. Conf. on Geology and Mineral Resources*, Bangkok, p. 141-146. (*Extended Abstract*)

(online at: www.eatgru.sc.chula.ac.th/Thai/research/pdf/paper_2/102.pdf)
(*N Laos Carboniferous and Permian limestones NW of Luang Prabang and S of Sayabouli. Carboniferous limestone with Profusulinella, Fusulinella, Beedeina, and Fusulina. E-M Permian platform carbonates with Yangchienia, Parafusulina, Neoschwagerina, Afghanella, Presumatrina, Verbeekina, etc. Similar to W margin of Indochina Block in Loei area of M Thailand, suggesting link between NE Thailand and NW Laos. Nan-Uttaradit Suture between Sukhothai zone and Indochina Block runs NNE-ward into NW Laos and continues to Lancangjiang suture in W Yunnan*)

Ueno, K., N. Hayakawa, T. Nakazawa, Y. Wang & X.D. Wang (2013)- Pennsylvanian- Early Permian cyclothemic succession on the Yangtze carbonate platform, South China. In: A. Gasiewicz & M. Slowakiewicz (eds.) *Palaeozoic climate cycles: their evolutionary and sedimentological impact*. Geological Society, London, Special Publ. 376, p. 235-267.

(*Large Carboniferous-Permian Yangtze carbonate platform of S China (Yangtze) Block), with 26 Late Carboniferous- E Permian cyclothems identified. Probably rel. arid climate*)

Ueno, K., Y. Kamata, K. Uno, T. Charoentitirat, P. Charusiri, K. Vilaykham & R. Martini (2018)- The Sukhothai Zone (Permian-Triassic island-arc domain of Southeast Asia) in Northern Laos: insights from Triassic carbonates and foraminifers. *Gondwana Research* 61, p. 88-99.

(online at: www.researchgate.net/publication/325384723_The_Sukhothai_Zone_Permian-Triassic_island-arc_domain_of_Southeast_Asia_in_Northern_Laos_Insights_from_Triassic_carbonates_and_foraminifers)
(*Sukhothai Zone Permian-Triassic Paleo-Tethyan island-arc system along W margin of Indochina Block considered to extend from N Thailand to SW Yunnan (China), but no evidence from N Laos in between. Foraminifers from shallow marine limestone in Long area of NW Laos of Triassic (Carnian) age (Aulotortus sinuosus, A. tumidus, Ophthalmidium, Endotriada, Endoteba, Palaeolituonella, etc.). In Thailand similar Carnian limestone only in Doi Long Fm in Sukhothai Zone*)

Ueno, K., A. Miyahigashi, Y. Kamata, K. Hisada, H. Hara, K. Uno, T. Charoentitirat, P. Charusiri et al. (2014)- Permian and Triassic carbonates in the Oudom Xai- Luang Namtha area, northern Laos: stratigraphical and paleontological constraints for connecting Northern Laos with Northern Thailand. In: *Development of the Asian*

Tethyan Realm, Proc. 3rd Int. Symposium Int. Geosciences Program (IGCP) Project 589, Tehran 2014, p. 2-4. (Extended Abstract)

(Permian limestones in N Laos dominated by sponge- Tubiphytes-microbial reefal boundstone with *Colaniella cylindrica*, *Agathammina*, *Pachyphloia*, *Neoendothyra*, *Reichelina*, *Palaeofusulina?*, etc., referable to Changhsingian (latest Permian). Also M Triassic (Anisian) carbonates with ooid grainstones and Late Triassic (Carnian) sponge-microbial boundstones. In Thailand similar carbonate succession only in Lampang-Phrae-Nan area of Sukhothai Zone, suggesting Sukhothai Zone extends to W part of N Laos)

Ueno, K., Thuy T.N. Ha & Y. Iryu (2019)- Foraminiferal biochronology of the Triassic Hoang Mai Formation, Central Vietnam. J. Foraminiferal Research 49, 3, p. 339-354.

(Foraminiferal biostratigraphy of ~300m thick early M Triassic (Anisian) Hoang Mai Fm carbonates in SE part of Sam Nua Basin, C Vietnam. Overlying volcano-sedimentary Dong Trau Fm (developed along NE margin of Indochina Block during Permian-Triassic. With *Pilamina* spp., *Citaella*, *Endotriada*, etc.)

Usuki, T., C.Y. Lan, K.L. Wang, T.A. Tran, M.W. Yeh, H.Y. Chiu & S.L. Chung (2010)- Early Archean crustal components in the Indochina block: evidence from U-Pb ages and Hf isotope of detrital zircons from the central Vietnam. In: 7th Int. Symposium Gondwana to Asia: evolution of Asian continent and its continental margins, Qingdao 2010, Int. Association for Gondwana Research, Japan, p. 45. (Abstract only)

(online at: www.igm.nsc.ru/labs/lab212/~safonova/pdf/7thiagrabstracts.pdf)

(U-Pb dating and Hf isotope analysis of detrital zircons from C Vietnam rivers, to characterize continental crust of Indochina block. Zircon dating results: Archean- Cambrian zircons four major clusters (2.5, 1.6, 1.0-0.9 and 0.65-0.5 Ga), younger zircons three clusters (450, 250, 30 Ma). Indochina block long crustal evolution history, involving significant amount of Archean continental crustal components)

Usuki, T., C.Y. Lan, T.F. Yui, Y. Iizuka, Van Tich Vu, Tuan Anh Tran, K. Okamoto, J.L. Wooden, J.G. Liou (2016)- Early Paleozoic medium-pressure metamorphism in central Vietnam: evidence from SHRIMP U-Pb zircon ages. Geosciences Journal 13, 3, p. 245-256.

(Zircon analyses of two paragneiss samples of Kham Duc Complex, C Vietnam ~447, 452Ma, different from the available Ar-Ar mineral ages of 254-225 Ma. ~450 Ma zircon rim ages reflect possible crustal thickening event in Late Ordovician (most likely collisional orogeny between Indochina and S China blocks), while Permo-Triassic Ar-Ar ages would result from Indosinian overprint. Late Neoproterozoic-Neoproterozoic ages from detrital zircon cores suggest protoliths may have derived from sediments at Gondwana margin)

Van Doorninck, N.H. (1940)- Kort overzicht over de geologie en de nuttige delfstoffen van Fransch Indochina. De Ingenieur in Nederlandsch-Indie (IV) 7, 11, p. IV.147- IV.157.

(online at: <https://www.stichtingblauwelijn.nl/assets/files/1940-11.pdf>)

('Brief review of geology and useful minerals of French Indochina'. Part I, mainly review of Cambrian- Recent geology of Cambodia, Laos and Vietnam)

Van Doorninck, N.H. (1940)- Kort overzicht over de geologie en de nuttige delfstoffen van Fransch Indochina- (Vervolg en Slot). De Ingenieur in Nederlandsch-Indie (IV) 7, 12, p. IV.162- IV.165.

(online at: <https://www.stichtingblauwelijn.nl/assets/files/1940-12.pdf>)

('Brief review of geology and useful minerals of French Indochina- continuation and end'. Main export minerals coal (mainly Late Triassic age, Haiphong area), tin-wolframite, zinc-lead, gold and others)

Villeneuve, M., C. Rossignol, R. Martini, J.J. Cornee & S. Bourquin (2020)- New insights into the Triassic sedimentary environment of the eastern parts of the Song Da and Sam Nua basins alongside the Indosinian Song Ma suture, Northern Vietnam. J. Asian Earth Sciences 187, 104067, p. 1-15.

(online at: www.sciencedirect.com/science/article/pii/S1367912019304195)

(Triassic formations from E part of Truong Son Belt, N Vietnam from both sides of M Triassic Song Ma suture between Indochina and S China Blocks. M-L Triassic (Anisian-Carnian) ~1200m thick carbonate deposits at both sides of suture. Depositional settings and deformation patterns support S-ward subduction under Indochina Block, ending with collision of S China Block in M Triassic. Comparisons of Triassic carbonate

platforms of N Vietnam with other platforms. Triassic carbonates in Indonesia (Sulawesi, Seram, Misool) younger (Norian-Rhaetian) and thinner (<250m)

Vozenin-Serra, C. & E. Boureau (1978)- Sur l'interet phytostratigraphique du bassin houiller mesozoique de Nong-Son-Vinh Phuoc dans le centre Vietnam et ses rapports avec la phylogenie des especes. Comptes Rendus Hebdomadaires Seances Academie des Sciences, Paris, D, 287, 8, p. 791-796.

('The phytostratigraphic significance of the Mesozoic Nong-Son-Vinh Phuoc coal basin, Central Vietnam, and phylogeny of species')

Vozenin-Serra, C. & D. de Francesci (1999)- Flore du Trias superieur du Vietnam (bassins houillers du Quang-Nam et de Hongay). Palaeontographica, B 249, p. 1-62.

('Flora of the Upper Triassic of Vietnam (coal basins of Quang-Nam and Hongay)'. Vietnam M-U Triassic flora belongs to Dictyophyllum-Clathropteris coastal floristic assemblage of SE China-Indochina- S Japan- NW Borneo. Affinities of plant assemblage with Krusin flora (NW Borneo). Remarkable presence of Gondwanan elements Paleovittaria, Glossopteris indica and Noeggerathiopsis; also observed in Triassic of China)

Vu Khuc, D. (1990)- Palaeogeography of Viet Nam during the Triassic. ESCAP Atlas of Stratigraphy 9, p. 54-72.

Vu Khuc (1984)- Triassic ammonoids in Vietnam. Institute Geol. Mineral Resources, Hanoi, p. 1-134.

Vu Khuc (ed.) (1991)- Paleontological Atlas of Vietnam, vol. 3, Molluscs, Geol. Survey Vietnam, Hanoi, p.

Vu Khuc (2000)- Cretaceous environments in Viet Nam, Laos and Cambodia. In: H. Okada, H. & N.J. Mateer (eds.) Cretaceous environments of Asia, Elsevier Science B 17, p. 201-206.

(Indochina Peninsula Cretaceous sedimentation under continental conditions. Some basins with normal red beds, others with volcanogenic formations. Climate became hotter and drier in Late Cretaceous)

Vu Khuc (2000)- The Triassic of Indochina Peninsula and its interregional correlation. In: H. Yin, J.M. Dickins et al. (eds.) Permian-Triassic evolution of Tethys and Western Circum-Pacific, Developments in Palaeontology and Stratigraphy, Elsevier, 18, p. 221-233.

(Triassic correlations in Vietnam, Laos, Myanmar, Thailand. Two types of Triassic: (1) An Chau, with felsic volcanogenic Anisian unconformable on older formations, Carnian continental red beds or absent; (2) Song Da, with calcareous Anisian conformable on Lw Triassic and marine Carnian with deep-water halobiid bivalves)

Vu Khuc & E. Cariou (1998)- Ammonites from Jurassic basins of Viet Nam and their stratigraphic implications. Journal of Geology, Hanoi, B, 11-12, p. 107-120.

Vu Khuc, C., A.S. Dagys, V.D. Kiparisova, N.Ba Nguyen, T.C. Bao & I.N. Sredrodolskaia (1965)- Les fossiles caracteristiques du Trias du Nord Vietnam. Direct. General Geologie de la Republique Democratique Vietnam, Hanoi, p. 1-118.

('The characteristic fossils of the Triassic of North Vietnam'. Incl. Anisian ammonite Beyrichites sp.)

Vu Khuc & Dang T. Huyen (1998)- Triassic correlation of the Southeast Asian mainland. Palaeogeogr. Palaeoclim. Palaeoecology 143, p. 285-291.

(Triassic in SE Asia mainly marine sediments. Fossils mostly bivalves and ammonoids. Biostratigraphic scales to help correlate Triassic sequences of different SE Asian areas. Twelve assemblage zones distinguished. SE Asia Triassic many species in common with S China and Himalayas. M Triassic with thin-shelled bivalves Daonella, Late Triassic with Halobia, etc.)

Vu Khuc, D. & J.A. Grant-Mackie (1997)- A new Bajocian molluscan faun, Dalat Basin, southern Vietnam. In: P. Dheeradilok et al. (eds.) Proc. International Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources, 1, p. 142. *(Abstract only)*

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7641.pdf)
(Discovery of new *M Jurassic (E Bajocian) marine fauna in Langa Fm of Datat Basin, S Vietnam, incl. ammonite Fontannesia and bivalves Bositra ornati and B. buchii*)

Vu Khuc, C. Meister & Dang T. Huyen (2005)- New results of the study on Early Jurassic ammonites from Viet Nam and their stratigraphic implications. *Int. Subcommision Jurassic Stratigraphy Newsletter* 32, p. 38-41.
(online at: http://jurassic.earth.ox.ac.uk/_data/assets/pdf_file/0011/10244/ISJS32.pdf)

Vu Khuc, Vu Chau, Trinh D., Dang Tran Huyen, Nguyen D.H. & Trinh Tho (1991)- *Paleontological Atlas of Vietnam, vol.3, Mollusca. Science and Technics Publ. House, p. 1-276.*

Vysotsky, V.I., R.D. Rodnikova & M.N. Li (1994)- The petroleum geology of Cambodia. *J. Petroleum Geology* 17, p. 195-210.
(*Six possibly oil-gas-bearing basins identified in Cambodia: Siam (N Gulf of Thailand), Tonle Sap, Khorat (S portion), Preah, Chung and Svairieng Basins*)

Waight, T., M.B.W. Fyhn, T.B. Thomsen, Tran VanTri, L.H. Nielsen, I. Abatzis & D. Frei (2021)- Permian to Cretaceous granites and felsic volcanics from SW Vietnam and S Cambodia: implications for tectonic development of Indochina. *J. Asian Earth Sciences* 219, 104902, p. 1-21.
(online at: www.sciencedirect.com/science/article/pii/S1367912021002406)
(*Zircon ages and geochemistry for igneous rocks from SW Vietnam and S Cambodia. Four main age groupings: Cretaceous (107-75 Ma), Early Jurassic (195 Ma), Late Triassic (230-222 Ma), and Permian (294-265 Ma). Cretaceous and Jurassic samples are amphibole-bearing biotite granodiorites to biotite granites and occur mainly E of Kampot Fold Belt. Pre-Cretaceous within Kampot Fold Belt and dominantly felsic volcanics. Cretaceous granites similar to Dalat Zone Granites and formed during Pacific subduction. Permian magmatism in region also likely related to Paleo-Pacific subduction*)

Wang, D. & L. Shu (2012)- Late Mesozoic basin and range tectonics and related magmatism in Southeast China. *Geoscience Frontiers (China University of Geosciences, Beijing)* 3, 2, p. 109-124.
(online at: www.sciencedirect.com/science/article/pii/S1674987111001095)
(*M Jurassic- Late Cretaceous extensional basin-and-range tectonics and associated magmatism widespread in SE China, tied to W Pacific Plate subduction. Basin types: (1) post-orogenic Late Triassic- E Jurassic coarse clastics, and (2) intra-continental extensional basins characterized by grabens/ half-grabens. Grabens mainly E-M Jurassic, with bimodal volcanism; half-grabens E Cretaceous, with rhyolitic tuff- lavas and mainly Late Cretaceous-Paleogene redbeds. Ranges composed of granitoids, volcanics and dome-type metamorphic core complexes. Basin and range terrane developed on pre-Mesozoic folded belt, derived from polyphase tectonic evolution, mainly due to subduction of W Pacific Plate since Late Mesozoic*)

Wang, S., G. Wang & Q. Chen (1999)- Sedimentary facies of the lower Permian Ngangze Formation in the Coquen Basin, Xizang. *Sedimentary Facies and Paleogeography* 19, p. 44-48. (*in Chinese*)

Wang, S., Y. Mob, C. Wang & P. Yea (2016)- Paleotethyan evolution of the Indochina Block as deduced from granites in northern Laos. *Gondwana Research* 38, p. 183-196.
(online at: www.sciencedirect.com/science/article/pii/S1342937X15002890)
(*Jinsha River- Song Ma Suture- Kontum Massif suture is boundary between Indochina and South China Blocks. Granitoids from N Laos I-type Indosinian volcanic arc granites of 234-256 Ma age (~M Triassic)*)

Wang, X.D., W. Qie, Q. Sheng, Y. Qi, Y. Wang, Z. Liao, S. Shen & K. Ueno (2013)- Carboniferous and Lower Permian sedimentological cycles and biotic events of South China. In: A. Gasiewicz & M. Slowakiewicz (eds.) *Palaeozoic climate cycles: their evolutionary and sedimentological impact*, Geological Society, London, Special Publ. 376, p. 33-46.

Wang, Y., J.V. Aitchison & H. Luo (2003)- Devonian radiolarian faunas from South China. *Micropaleontology* 49, 2, p. 127-145.

(Devonian radiolarians from 4 new sections in SW Yunnan, S China, with 15 genera/ 30 species. Stratigraphic significance of M Devonian *Eoalibaillella lilaensis* fauna, morphotypic variation within genus *Heleniifera* and abundance and diversity of U Devonian *Holoeciscus foremanae* fauna discussed)

Wang, Y.J., W. Fan, G. Zhang & Y. Zhang (2011)- Phanerozoic tectonics of the South China Block: key observations and controversies. *Gondwana Research* 23, 4, p. 1273-1305.

(South China Block: 3 tectonothermal events periods: M Paleozoic (Kwanghsian), Triassic (Indosinian) and Late Jurassic- mid-Cretaceous (Yanshanian). Yanshanian wide magmatic belt of >1300 km and broad deformational belt of >2000 km (Jurassic in inland regions, Cretaceous in coastal provinces?). Driven by subduction of oceanic crust from Pacific in E. Zircons of Yanshanian I-, S- and A-type granites three age clusters: 152-180 Ma (mainly calc-alkaline, I-type, peak at ~165-155 Ma= ~Oxfordian), 120-130 Ma (I, S and A-types) and 87-107 Ma (93 Ma peak))

Wang, Y.J., Y. Wang, X. Qian, Y. Zhang, C. Gan, V. Senebottalath & Y. Wang (2020)- Early Paleozoic subduction in the Indochina interior: revealed by Ordo-Silurian mafic-intermediate igneous rocks in South Laos. *Lithos* 362-363, 105488, p. 1-26.

(E Paleozoic orogenic processes in Indochina interior. S Laos Ordovician-Silurian mafic-intermediate igneous rocks in S Truong Son zone dated as 434-438 Ma. Tam Ky-Phuoc Son tectonic zone yield zircons 447-485 Ma. S-ward consumption of E Paleozoic Tam Ky-Phuoc Son Ocean in Indochina interior continued until at least ~430 Ma and assemblage of N Indochina with Kontum terrane likely terminated in E Devonian)

Wang, Y.J. & Q. Yang (2011)- Biostratigraphy, phylogeny and paleobiogeography of Carboniferous- Permian radiolarians in South China. *Palaeoworld* 20, p. 134-145.

(Carboniferous-Permian radiolarian faunas from deep marine bedded chert of S China (Paleotethys?) divided into 22 radiolarian zones. *Panthalassa* and *Paleo-Tethys* no clear biotic differentiation in open ocean environment. Discussion of evolutionary series of *Pseudoalibaillella* (late Guadalupian *P. ishigai*- *P. fusiformis*- *P. monacanthus* lineage) and *Follicucullus* (latest Guadalupian- E Lopingian *F. scholasticus*- *F. ventricosus*- *F. orthogon*/*F. scholasticus*- *F. hamatus*- *F. bipartitus* lineage). No locality details)

Wang, Y.J., Q. Yang, Y.N. Cheng & J.X. Li (2006)- Lopingian (Upper Permian) radiolarian biostratigraphy of South China. *Palaeoworld* 15, p. 31-53.

(U Permian radiolarian cherts well-developed basins in S China. Six biozones, incl. *Follicucullus bipartitus*- *F. charveti*- *F. orthogonus* Zone, *Foremanhelenae*, *Alibaillella* and *Neoalibaillella* zones. Paleobiogeographically U Permian radiolarian faunas cosmopolitan in nature)

Wang, Y.J., T.X. Yang, Y.Z. Zhang, X. Qian, C.S. Gan, Y. Wang, Y. Wang & V. Senebottalath (2020)- Late Paleozoic back-arc basin in the Indochina block: constraints from the mafic rocks in the Nan and Luang Prabang tectonic zones, Southeast Asia. *J. Asian Earth Sciences* 195, 104333, p. 1-20.

(Permian mafic rocks in Nan and Luang Prabang zones with zircon ages of 279-294 Ma and 265-294 Ma, respectively (E Permian). Likely formed in continental back-arc basin setting, behind Lincang-Sukhothai-Chanthaburi arc. Nan tectonic zone links to N with Luang Prabang zone in late Paleozoic and comparable to Banpo-Nanlinshan and Sa Kao back-arc basin in SW Yunnan and SE Thailand-NW Cambodia)

Wang, Y., Y. Zhang, X. Qian, Y. Wang, P.A. Cawood, C. Gan & V. Senebottalath (2021)- Early Paleozoic accretionary orogenesis in the northeastern Indochina and implications for the paleogeography of East Gondwana: constraints from igneous and sedimentary rocks. *Lithos* 382-383, 105921, p.

(E Paleozoic tectonic event in E Laos (Indochina Block) possibly part of North Indo-Australia Orogen, related to subduction of Proto-Tethyan Ocean)

Wei, W., M. Faure, Y. Chen, W. Lin, Q. Wang, Q. Yan & Q. Hou (2015)- Back-thrusting response of continental collision: Early Cretaceous NW-directed thrusting in the Changle-Nan'ao belt (Southeast China). *J. Asian Earth Sciences* 100, p. 98-114.

(SE coastal area of S China Block generally interpreted as Cretaceous active continental margin due to subduction of Paleo-Pacific plate beneath Eurasian plate. NW-directed ductile thrusting at ~130-105 Ma,

before deposition of undeformed (~104 Ma) volcanic rocks and intrusion of ~90 Ma plutons. Interpreted as back-thrust resulting W Philippines microcontinent collision with SCB rather than effect of oceanic subduction)

Wen, S., Y.L. Yeh, C. Tang, H.P. Lai, V.T. Dinh, W.Y. Chang & C. Chen (2015)- The tectonic structure of the Song Ma fault zone, Vietnam. *J. Asian Earth Sciences* 107, p. 26-34.
(*Seismotectonic structures of Song Ma fault zone indicate a complex fault system at different segments*)

Whitford-Stark, J.L. (1987)- A survey of Cenozoic volcanism on mainland Asia. Geological Society of America (GSA), Special Paper 213, p. 1-74.
(*Cenozoic magmatism, mainly along E margin of Asia. Peaks of volcanic activity in Oligocene-Miocene and Pliocene-Pleistocene. Main tectonic controls on volcanism: E Cenozoic subduction along E seaboard, collision of Indian continent, development of back-arc basins, and interactions between Asian- N American plates*)

Workman, D.R. (1972)- Mineral resources of the Lower Mekong Basin and adjacent areas of Khmer Republic, Laos, Thailand and Republic of Vietnam. United Nations. Document E/CN.11/1002, UN Economic Commission for Asia and the Far East, Mineral Resources Development Series 39, p. 1-148.

Workman, D.R. (1975)- Tectonic evolution of Indochina. *J. Geological Society Thailand* 1, 1-2, p. 3-19.

Workman, D.R. (1977)- Geology of Laos, Cambodia, South Vietnam and the eastern part of Thailand. Overseas Geology and Mineral Resources (Institute of Geological Sciences (IGS)/ British Geological Survey), London, 50, p. 1-33.
(view online at: <https://webapps.bgs.ac.uk/data/Publications/publication.html?id=19864516>)

Workman, D.R. (1978)- Geological structure of the Indochina Peninsula. In: Wiryosujono & A. Sudradjat (eds.) Proc. 2nd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA), Jakarta 1975, Indonesian Association Geologists (IAGI), p. 201-211.
(online at: <https://www.iagi.or.id/web/digital/32/PIT-IAGI-1975-Paper-19.pdf>)
(*Indochina Block of Cambodia, Laos, S Vietnam and E Thailand 3 main periods of folding from Late Paleozoic- U Triassic/ E Jurassic; essentially rigid since Jurassic*)

Xia S., Y. Shen, D. Zhao & X. Qiu (2015)- Lateral variation of crustal structure and composition in the Cathaysia Block of South China and its geodynamic implications. *J. Asian Earth Sciences* 109, p. 20-28.

Xia, W., J. Zhou, W. Yuan, S. Zhang & Y. Yang (1994)- Genetic stratigraphic framework and evolutionary history of Late Triassic foreland basins in South China. *Earth Science. J. China University of Geoscience* 19, 1, p. 19-29. (*in Chinese*)
(*Late Triassic foreland basin in W Guizhou and E Yunnan provinces*)

Xin, Q., Q. Feng, Y. Wang, W. Yang, C. Chonglakmani & D. Monjai (2016)- Petrochemistry and tectonic setting of the Middle Triassic arc-like volcanic rocks in the Sayabouli Area, NW Laos. *J. of Earth Science (China)* 27, 3, p. 365-377.
(*Volcanic rocks from Sayabouli area in NW Laos mapped as Permian- E Triassic, but basaltic-andesite with zircon U-Pb age of 238±2 Ma, suggests M Triassic age. Geochemical affinity to continental arc volcanics, and similar to arc volcanics from Phetchabun belt in NE Thailand, suggesting Late Permian- M Triassic continental margin/ volcanic belt at margin of Indochina Block, from NW Laos to C Thailand through W Loei sub-belt*)

Xu, Y., C.Y. Wang & T. Zhao (2016)- Using detrital zircons from river sands to constrain major tectono-thermal events of the Cathaysia Block, SE China. *J. Asian Earth Sciences* 124, p. 1-13.
(*Detrital zircons from Minjiang and Zhujiang Rivers in SE China show five major U/Pb age populations: 90-250 Ma, 400-500 Ma, 0.7-1.2 Ga, 1.6-2.0 Ga and 2.3-2.6 Ga. About 80-90% of present crust in NE and SW Cathaysia Blocks formed by 1.6 Ga. The 140-120 Ma tectono-thermal events likely related to change of subduction direction of Paleo-Pacific plate from N-ward to NW ward at 140 Ma. The 112-90 Ma tectono-thermal events may be correlated with rollback of subducted Paleo-Pacific plate at ~110 Ma*)

Yang, Z., V. Courtillot, J. Besse, X. Ma, L. Xing, S. Xu & J. Zhang (1992)- Jurassic paleomagnetic constraints on the collision of the North and South China Blocks. *Geophysical Research Letters* 19, 6, p. 577-580.
(*S China Block underwent final accretion to N China Block in M Jurassic. Accretion of N China Block to Siberia not complete until Late Jurassic and possibly even until E Cretaceous*)

Yang, Z., Z. Sun, T. Yang & J. Pei (2004)- A long connection (750-380 Ma) between South China and Australia: paleomagnetic constraints. *Earth Planetary Science Letters* 220, p. 423-434.
(*Paleomagnetic study on M Cambrian in N Sichuan Basin (Yangtze Block). S China Block placed against NW Australia, correlating Grenville-age Jiangnan orogenic belt with Rudall belt of W Australia, and subsequently Late Proterozoic Jiangnan and Officer/Adelaide rift systems. Paleobiogeographic evidence indicates this configuration might maintain by M Devonian*)

Yao, A., K. Kuwahara, Y. Ezaki, J. Liu & W. Hao (2004)- Permian radiolarians from the Qinfang Terrane, South China, and its geological significance. *J. Geosciences, Osaka City University* 47, 3, p. 71-83.
(*online at: http://dlisv03.media.osaka-cu.ac.jp/infolib/user_contents/kiyo/DB00011403.pdf*)
(*Early- Late Permian radiolarian chert of Qinfang Terrane with nine zones, probably signifying deep basin between Yangzi Block in NW and Cathaysia block in SE*)

Yonemura, K., Y. Osanai, N. Nakano, M. Owada & S. Baba (2013)- Petrology, geochemistry, and origin of metamorphosed mafic rocks of the Trans Vietnam orogenic belt, Southeast Asia. *J. Mineralogical and Petrological Sciences* 108, p. 55-86.
(*online at: https://www.jstage.jst.go.jp/article/jmps/108/2/108_120813/_pdf*)
(*NW-SE trending Trans-Vietnam Orogenic Belt thought to have formed by continent-continent collision between S China and Indochina blocks in Permian- Triassic. Amphibolite-facies metamorphosed mafic rocks widespread in Song Ma suture zone, Kontum Massif, etc., derived from arc and oceanic crust between these plates*)

Yu, Y., S.S. Gao, K.H. Liu, T. Yang, M. Xue & Khanh Phon Le (2017)- Mantle transition zone discontinuities beneath the Indochina Peninsula: implications for slab subduction and mantle upwelling. *Geophysical Research Letters* 44, 14, p. 7159-7167.
(*Velocity model shows evidence for presence of slab segments in Mantle Transition Zone beneath C and slab window beneath W Indo-China plate. Also broad mantle upwelling adjacent to E edge of slab segments, which may responsible for widespread Cenozoic volcanism and pervasive low upper mantle velocities in area*)

Zeiller, R. (1903)- Flore fossile des gites de charbon du Tonkin. Etudes des gites minéraux de la France, Colonies Françaises, Ministère des Travaux Publics, Paris. p. 1-328 + Atlas.
(*text online at: <https://archive.org/details/florefossil01zeil/page/n5/mode/1up>*)
(*'Fossil flora from the coal beds of Tonkin' (North Vietnam). ?Permian - Triassic plant fossils from three mines in Bas-Tonkin (Hongai coalfield, etc.) and one in Nong Son Basin (Amman)): With Sphenopteris, Pecopteris, Taeniopteris spp., Glossopteris spp., Dictyophyllum, Clathropteris, etc. (= first description of Triassic 'Tonkin Flora'; interpreted as Norian-Rhaetian in age by Dobruskina, 1994; Mixed Permian and Triassic flora? JTVG)*)

Zeng, G., Z.Y. He, Z. Li, X.S. Xu & L.H. Chen (2016)- Geodynamics of paleo-Pacific plate subduction constrained by the source lithologies of Late Mesozoic basalts in southeastern China. *Geophysical Research Letters* 43, p. 10,189-10,197.
(*SE China Late Mesozoic basalts four age groups: 178-172 Ma, ~150 Ma, 137-123 Ma and 109-64 Ma. Mainly pyroxenites. Subduction of Paleo-Pacific plate most likely candidate for mantle-derived magmatism after ~150 Ma. Slab rollback with increased dip angle possible model for lithological variations of Late Mesozoic mantle*)

Zeng, X.T., F. Cong, H.P. Zhu & M.F. Shi (2022)- Petrogenesis of the Early Jurassic Ora batholith in south-western Cambodia. *Geological Journal* 57, 8, p. 3230-3250.
(*Ora batholith in SW Cambodia in W part of Indochina block, E of Inthanon-Bentong-Raub Palaeo-Tethys suture. Consists of two groups of I-type granitoids, and related to E Jurassic post-collisional magmatism that resulted from crustal thickening and mantle lithospheric delamination after Palaeo-Tethys Ocean closure*)

Zhang, X.Y., H.D. Cheng, H.B. Tan, X.L. Yuan, Y.S. Li, W.L. Miao et al. (2015)- Late Cretaceous potash evaporites in Savannakhet Basin of middle Laos: geochemical evidences of non-marine inputs. *Acta Petrologica Sinica* 31, 9, p. 2783-2793.

(online at: <http://data.igg-journals.cn/dzdqs-data/aps/2015/9/PDF/20150925.pdf>)

Zhang, X.Y., H. Ma, Y. Ma, Q. Tang & X. Yuan (2013)- Origin of the late Cretaceous potash-bearing evaporites in the Vientiane Basin of Laos: $\delta^{11}\text{B}$ evidence from borates. *J. Asian Earth Sciences* 62, p. 812-818.

(Late Cretaceous Maha Sarakham Fm evaporites on Khorat Plateau with one of largest potash deposits in world. Origin has long been controversial. Main borates boracite and hilgardite with isotopic values suggesting marine borates)

Zhao, J., J. Qiu, L. Liu & R. Wang (2016)- The Late Cretaceous I- and A-type granite association of southeast China; implications for the origin and evolution of post-collisional extensional magmatism. *Lithos* 240-243, p. 16-33.

(SE China coast granites two groups: (1) in N, I-type alkali-feldspar granites generated by mixing of mantle-derived material with crustal-derived magmas (98-96 Ma); and (2) in S, A-type plutons (89-86 Ma). All granites highly siliceous, K-rich. Both granite types emplaced during post-collisional extensional tectonism associated with rollback of steeply subducting Paleo-Pacific Plate (increase of dip angle of subducted Paleo-Pacific plate between Early- Late Cretaceous)

Zhao, L., X. Zhou, M. Zhai, M. Santosh & Y. Geng (2015)- Zircon U-Th-Pb-Hf isotopes of the basement rocks in northeastern Cathaysia block, South China: implications for Phanerozoic multiple metamorphic reworking of a Paleoproterozoic terrane. *Gondwana Research* 28, p. 246-261

(Zircon age peaks of 1.86-1.87 Ga and 230-250 Ma interpreted to represent time of metamorphic reworking. The extensive ~1870 Ma Paleoproterozoic thermal event may be response of Cathaysia block to assembly of Columbia supercontinent)

Zhao, X., Y. Jiang, G. Xing, M. Yu, J. Mao & S. Yu (2018)- Newly discovered Late Cretaceous adakites in South Fujian Province: implications for the late Mesozoic tectonic evolution of Southeast China. *Island Arc* 27, 2, e12236, p. 1-17.

(online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/iar.12236>)

(Late Cretaceous Yongchun pluton adakitic intrusion in S Fujian, SE China. Zircon U-Pb ages of ~98-100 Ma, similar to those of nearby plutons. Magmas generated by partial melting of Mesoproterozoic continental crust mixed with mantle-derived magmas. Magmatism associated with thickening of lower crust during change in subduction angle and convergence rate of Paleo-Pacific Plate at 100 Ma)

Zhang, D., M. Yan, X. Fang, Y. Yang, T. Zhang, J. Zan, W. Zhang, C. Liu & Q. Yang (2018)- Magnetostratigraphic study of the potash-bearing strata from drilling core ZK2893 in the Sakhon Nakhon Basin, eastern Khorat Plateau. *Palaeogeogr. Palaeoclim. Palaeoecology* 489, p. 40-51.

(online at: <https://www.sciencedirect.com/science/article/pii/S0031018217302080>)

(Khorat Plateau one of world's largest potash evaporite deposits. Magnetostratigraphic study of 595m deep borehole in SE Sakhon Nakhon Basin in C Laos penetrated entire potash-bearing Nong Boua Fm and reached underlying sandstone beds. Combined with palynological, isotopic and other evidence, polarity zones correlated to geomagnetic polarity time scale, giving magnetostratigraphic ages of >63.5 Ma- ~92 Ma for evaporite section (= ~Turonian- Maastrichtian?))

Zhang, F., Y. Wang, X. Qian, P.A. Cawood, C. Gan, Y. Dong, H. Gao & M. Wang (2023)- Paleo-Pacific subduction in Southeast Vietnam: evidence from Late Cretaceous intrusive rocks in the Dalat zone. *Lithos* 454-455, 107233, p. 1-15.

(Dalat zone in SE Vietnam with gabbros aged ~93 Ma, which probably originated from mantle wedge modified by sediment-derived melts. Cretaceous igneous rocks in Dalat zone two age-clusters: (1) ~122-112 Ma and ~108-75 Ma, resembling those in Coastal S China and West Borneo. Rocks considered part of Cretaceous Paleo-Pacific subduction system, providing connection between S China in N and W Borneo in S)

Zhang, Y., X. Yang, Y. Wang, X. Qian, Y. Wang, Q. Gou, V. Senebottalath & A. Zhang (2021)- Rifting and subduction records of the Paleo-Tethys in North Laos: constraints from Late Paleozoic mafic and plagiogranitic magmatism along the Song Ma tectonic zone. Geological Society of America (GSA) Bull. 133, 1-2, p. 212-232.
(Geochemical and geochronological data of mafic and plagiogranitic rocks along Song Ma suture zone in N Laos support development of Carboniferous-Permian Paleotethys branch in N Laos, connecting Jinshajiang-Ailaoshan suture zone in SW China and Chenxing-Bangxi suture zone in Hainan Island)

Zhong, W.F., Q.L. Feng, C. Chonglakmani, D. Monjai & Z.B. Zhang (2012)- Permian-Triassic stratigraphic correlations between Laos and Yunnan and their tectonic significance. Earth Science (J. China University of Geosciences) 2012, S2, p. 73-80.
(New work in NW Laos shows Permian- Triassic (incl. U Permian clastics with coal) between Luangprabang and Chiang Rai belts are comparable to Simao basin between Ailaoshan and Lancangjiang belts. Nan River belt in N Thailand can therefore not be linked with Lancangjing belt by crossing NW Laos)

Zhou, J.X., K. Luo, Bo Li, Z.L. Huang & Z.F. Yan (2016)- Geological and isotopic constraints on the origin of the Anle carbonate-hosted Zn-Pb deposit in northwestern Yunnan Province, SW China. Ore Geology Reviews 74, p. 88-100.

Zhou, M.F., J. Malpas, M. Sun, X.Y. Song, P.T. Robinson, A.K. Kennedy, C.M. Lesher & R.R. Keays (2002)- A temporal link between the Emeishan large igneous province (SW China) and the end-Guadalupian mass extinction. Earth Planetary Science Letters 196, 3-4, p. 113-122.
(Emeishan flood basalt province in SW China zircon ages show age of Xinjie intrusion feeder to main phase of EFB volcanism is 259±3 Ma, coincident with proposed end-Guadalupian extinction event at 256-259 Ma)

Zhou, X., T. Sun, W. Shen, L. Shu & Y. Niu (2006)- Petrogenesis of Mesozoic granitoids and volcanic rocks in South China: a response to tectonic evolution. Episodes 29, 1, p. 26-33.
(online at: www.episodes.co.in/www/Backissues/291/26-33.pdf)
(Mesozoic granitoids and volcanic rocks in S China two main phases, responding to regional tectonic regime (1) mainly Late Triassic 'Indosinian' granites, tied to continent-continent collision within Tethyan orogenic domain; (2) Late Jurassic- Cretaceous 'Yanshanian' associated with NW-WNW-ward subduction of Paleo-Pacific ocean. Late Yanshanian K1 granitoid-volcanic rocks represent active continental margin magmatism; K2 tholeiitic basalts (85-105 Ma?) interlayered with red beds are interpreted as genetically associated with development of back-arc extensional basins in interior of S China Block)

Zi, J.W. (2012)- Late Paleozoic- Triassic tectono-magmatism in the Paleo-Tethys ocean, SW China: timing, nature and implications for continental amalgamation and orogenic processes. Ph.D. Thesis, University of Western Australia, Perth, p. 1-189.
(online at: research-repository.uwa.edu.au/files/3214568/Zi_Jianwei_2012.pdf)

Zi, J.W., P.A. Cawood, W.M. Fan, E. Tohver, Y.J. Wang, T.C. McCuaig & T.P. Peng (2013)- Late Permian-Triassic magmatic evolution in the Jinshajiang orogenic belt, SW China and implications for orogenic processes following closure of the Paleo-Tethys. American Journal of Science 313, 2, p. 81-112.
(Jinshajiang orogenic belt, SW China, records closure of Paleo-Tethys seaway and ensuing collision. Following consumption of ocean, M Triassic (247-237 Ma) collision zone magmatism. From 234-214 Ma emplacement of high-K, calc-alkaline granodiorites-monzogranites prior to isostatic uplift and extension, probably caused by breakoff of subducted slab. Melange and collision-related magmatic suites unconformably overlain by Late Triassic (229-217 Ma) conglomerate-rich sequence that represents overlap assemblage, across Qamdo-Simao terrane (Indochina) and Yangtze Block of S China)

Zi, J.W., P.A. Cawood, W.M. Fan, Y.J. Wang & E. Tohver (2012)- Contrasting rift and subduction-related plagiogranites in the Jinshajiang ophiolitic melange, southwest China, and implications for the Paleo-Tethys. Tectonics 31, 2, TC2012, p. 1-18.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2011TC002937>)

(Jinshajiang ophiolitic melange zone in SW China represents remnant of eastern Paleo-Tethys Ocean. Two distinct suites of plagiogranites within melange: Dongzhulin trondhjemite (rift setting; zircon age ~347 Ma) and Jiyidu tonalite (subduction setting; ~283 Ma; related to closing of ocean)

Zi, J.W., P.A. Cawood, W. Fan, Y. Wang, E. Tohver, C. McCuaig & T. Peng (2012)- Triassic collision in the Paleo-Tethys Ocean constrained by volcanic activity in SW China. *Lithos* 144-145, p. 145-160.

(Collision-related Triassic volcanic rocks in Jinshajiang-Ailaoshan orogenic belt in SW China suggest initial collision and amalgamation of Qamdo-Simao (Indochina) terrane with Yangtze Block (S China) along Jinshajiang- Ailaoshan and Song Ma sutures probably in E Triassic, following consumption of (one of the branches of the) Paleo-Tethys Ocean. 247-246 Ma Pantiang high-Si rhyolites represent early magmatic products. 245-237 Ma bimodal volcanism interpreted as extension within evolving collisional orogen, probably related to oblique convergence)

Zuo, X., L.S. Chan & J.F. Gao (2017)- Compression-extension transition of continental crust in a subduction zone: A parametric numerical modeling study with implications on Mesozoic-Cenozoic tectonic evolution of the Cathaysia Block. *PLOS One* 12, 2, e0171536, p. 1-35.

(online at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5300286/pdf/pone.0171536.pdf>)

(Numerical modeling of transition from Mesozoic compression to extension in Cathaysia Block, SE China (upper plate of Paleo-Pacific subduction zone). Initiation of Late Cretaceous- Paleogene extensional regime probably triggered by roll-back of slowly subducting slab)

IX.6. Malay Basin, Gulf of Thailand

Relevance for Indonesia: analogs for Natuna and nearby Sundaland Cenozoic rift basins

Abdelaziz, N. (2021)- Stratigraphic traps delineation, Southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 9, 2, p. 45–52.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247029/167856>)

(*Seismic study of potential stratigraphic traps in Eocene- Miocene fluvio-deltaic fill of S Pattani Basin*)

Achalabhuti, C. (1976)- Petroleum geology of Thailand (Gulf of Thailand and Andaman Sea) -summary. Proc. Conf. Circum-Pacific Energy and Mineral Resources, Honolulu 1974, American Assoc. Petroleum Geol. (AAPG), Special Volume M25, p. 251-255.

Achalabhuti, C. (1981)- Natural gas deposits of Gulf of Thailand. In: M.T. Halbouty (ed.) Energy Resources of the Pacific Region, American Assoc. Petroleum Geol. (AAPG), Special Volume SG 12, p. 155-166.

(*Two commercial gas-condensate fields with reserves up to 5 TCF found in Union Oil Block 12 and Texas Pacific's concession block 15 and block 16. Union field in S Pattani trough, Texas Pacific field in N part Malay basin. Several gas-condensate reservoirs identified in E-M Miocene deltaic sandstones*)

Achalabhuti, C. (1981)- Offshore hydrocarbon production and potential of Thailand. In: M.J. Valencia (ed.) Proc. EAPI/CCOP Workshop, Honolulu 1980, Energy 6, 11, p. 1247-1254.

(*Four commercial gas/condensate fields delineated in Gulf of Thailand with gas reserves of >7 TCF. Also small amounts of crude oil in some wells. Continental woody material primary source, minor components from marine algae. Deep water drilling in Andaman Sea revealed Tertiary source beds mainly immature. Pre-Tertiary sedimentary basins beneath offshore areas of Andaman Sea and Gulf of Thailand more favorable for hydrocarbon potential*)

Ahmad, M.N. & P. Rowell (2012)- Application of spectral decomposition and seismic attributes to understand the structure and distribution of sand reservoirs within Tertiary rift basins of Gulf of Thailand. AAPG Annual Convention Exh., Long Beach 2012, Search and Discovery Article 40992, p. 1-32. (*Abstract/ Presentation*)

Ahmad, M.N. & P. Rowell (2012)- Application of spectral decomposition and seismic attributes to understand the structure and distribution of sand reservoirs within Tertiary Rift Basins of Gulf of Thailand. The Leading Edge 31, 6, p. 630-634.

(*Same story as Ahmad and Rowell (2012), above*)

Ahmad, M.N. & P. Rowell (2013)- Mapping of fluvial sand system using rock physics analysis and simultaneous inversion for density: case study from the Gulf of Thailand. First Break 31, p. 49-54.

Ali, M.F., K.A. Mustapha, M. Madon, S.H. Sidik, A.Z. Ishak, G. Brink, J. Hernandez et al. (2022)- Reconstruction of the gross depositional environment evolution in the northern Malay Basin, Malaysia-Thailand joint development area (MTJDA). Marine and Petroleum Geology 144, 105836, p. 1-21.

(online at: <https://www.sciencedirect.com/science/article/pii/S0264817222003142>)

(*Overview of stratigraphy, facies and paleogeography of Oligocene- E Miocene syn-rift and E-M Miocene post-rift successions of N Malay Basin*)

Almasgari, A.A., M. Elsaadany, A.H.A. Latiff, M. Hermana et al. (2020)- Application of seismic attributes to delineate the geological features of the Malay Basin. Bull. Geological Society Malaysia 69, p. 97-110.

(online at: <https://gsm.org.my/products/702001-101830-PDF.pdf>)

Alqahtani, F.A., C.A.L. Jackson, H.D. Johnson & M.R.B. Som (2017)- Controls on the geometry and evolution of humid-tropical fluvial systems: insights from 3D seismic geomorphological analysis of the Malay Basin, Sunda Shelf, Southeast Asia. Journal of Sedimentary Research 87, 1, p. 17-40.

(*High-resolution 3D seismic data from Malay Basin Pleistocene- Recent shows six fluvial channel types in eight 18-145m thick depositional units, with (1) relatively large (300-3000m wide, 15-45m deep) and straight*

channels at bases, and (2) smaller (75-250m wide, 8-23m deep), highly sinuous channels at tops. Cyclical architecture interpreted as mainly climatically driven changes in fluvial sediment supply. Two large incised valleys interpreted to be formed due relative sea-level fall during Last Glacial Maximum)

Alqahtani, F.A., H.D. Johnson, C.A.L. Jackson & M.R.B. Som (2015)- Nature, origin and evolution of a Late Pleistocene incised valley-fill, Sunda Shelf, Southeast Asia. *Sedimentology* 62, 4, p. 1198-1232.
(*Analysis of 3D seismic data over large (18km wide, 80m deep and >180km long), well-imaged Late Pleistocene incised valley from Malay Basin, Sunda Shelf, S China Sea ('Paleo-Choa Phraya-Johore valley')*)

Ampaiwan, T., Minarwan, P. Swire & P. Tognini & P. Charusiri (2016)- Hydrocarbon prospectivity definition, the Kra Basin, Northern Gulf of Thailand. AAPG Geoscience Techn. Workshop Characterization of Asian hydrocarbon reservoirs, Bangkok, Search and Discovery Article 20357, p. 1-10. (*Extended Abstract*)
(*online at: www.searchanddiscovery.com/documents/2016/20357ampaiwan/ndx_ampaiwan.pdf*)
(*Kra basin in NW Gulf of Thailand is Tertiary N-S rifted, mainly lacustrine basin with hydrocarbon discoveries (Manora Field, Malida well). Top zone VIMT 50 marks top syn-rift mainly lacustrine section and also regional M Miocene Unconformity. Above syn-rift section mainly M- Late Miocene fluvial section. Post-Oligocene source rock potential*)

Armitage, J.H. & C. Viotti (1977)- Stratigraphic nomenclature- Southern end Malay Basin. Proc. 6th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, 1, p. 69-94.

Armitage, J.H. (1980)- A decade of exploration and development by EPMI off the east coast of Peninsular Malaysia. Offshore South East Asia Conference, Singapore 1980 (OFFSEA 80) preprint, p. 1-51.

Attavithamthorn, V., J. Vilcaez, Kozo Sato (2013)- Integrated CCS aspect into CO₂ EOR Project under wide range of reservoir properties and operating conditions. *Energy Procedia* 37, p. 6901-6908.
(*online at: <https://www.sciencedirect.com/science/article/pii/S1876610213008655>*)
(*Petroleum engineering study of Carbon Capture and Storage (CCS) and Enhanced oil recovery (EOR) aspects of oil field in Pattani Basin, Gulf of Thailand*)

Barr, D. & K. Dharmarajan (2015)- The hydrocarbon resources of Block A-18, Gulf of Thailand: a brief overview and history. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2015, Singapore, 6.1, p. 1-24.
(*Block A-18 in Malaysia-Thailand Joint Development Area with series of gas fields in stacked E Miocene-Pliocene sandstone reservoirs. Most production from Late Miocene. In central part of North Malay Basin, overlying series of N-S trending horsts and grabens*)

Barr, D.C., M.J. Flynn, Ong Cheng Sun & K. Dharmarajan (2012)- Interpreting geological systems from seismic attributes: reasons for caution from the Northern Malay Basin. Proc. International Petroleum Technical Conference, Bangkok, IPTC 14830, p. 1-10.
(*Example of channel-like feature clearly imaged from seismic attributes, but where size of channel did not match that implied by pressure transient analysis*)

Basu, T., M. Claverie, D. Nolan, K.B. Yahya & M. Suleiman (2004)- Facies analysis; integration of core and log data using a neural network as input for reservoir modeling in Betty Field, Malaysia. *The Leading Edge* 23, 8, p. 794-797.

Bishop, M.G. (2002)- Petroleum systems of the Malay Basin Province, Malaysia. U.S. Geological Survey (USGS), Open File Report 99-50T, p. 1-24.
(*online at: <http://pubs.usgs.gov/of/1999/ofr-99-0050/OF99-50T/OF99-50T.pdf>*)
(*Discovered hydrocarbon reserves in Tertiary Malay Basin 12 billion BOE. USGS assessment of potential added conventional oil, gas and condensate by 2025 is 6.3 BBOE*)

Brami, J.B. & M.Y. Muhaiyuddin (1984)- History and geology of the Tinggi Field, offshore Peninsular Malaysia. Proc. 5th Offshore South East Asia Conference, SE Asia Petroleum Exploration Society (SEAPEX), Singapore, p. 4.1-4.13.

(Tinggi 1980 oil discovery in J and K sands in small E-W trending anticline in Malay basin)

Brink, G., J. Hernandez, J. Bencomo, L. Jiang, N. Koronful, D. Basu, A.Z. Ishak, M.F. Ali & J. Skulsanjutr (2019)- Oligocene and Miocene sequence stratigraphy of the North Malay Basin, Malaysia and Thailand. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2019), EAGE, Kuala Lumpur, p. 1-5.

(Extended Abstract)

Brown, A.R., C.G. Dahm, R.J. Graebner (1981)- A stratigraphic case history using three-dimensional seismic data in the Gulf of Thailand. Geophys. Prospecting 29, 3, p. 327-349.

(Early paper on use of 3D seismic. Improved fault resolution and structural definition of gas field in Gulf of Thailand and seismic amplitudes used to map distribution of bars and channels Sands >10m thick mappable)

Bustin, R.M. & A. Chonchawalit (1995)- Formation and tectonic evolution of the Pattani Basin, Gulf of Thailand. International Geology Review 37, p. 866-892.

(Pattani Basin the most prolific petroleum basin in Thailand. E-W extension since E Tertiary resulted in series of N-S-trending sedimentary basins. Sediment succession divisible into Late Eocene- E Miocene non-marine synrift and E-M Miocene and younger shallow marine- non marine post-rift sequences. Crustal stretching factor (β) varies from 1.3 at basin margin to 2.8 in center. High heat flow (1.9-2.5 HFU) and geothermal gradient (45-60° C/km))

Bustin, R.M. & A. Chonchawalit (1997)- Petroleum source rock potential and evolution of Tertiary strata, Pattani Basin, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 81, 12, p. 2000-2023.

(Pattani Basin in Gulf of Thailand with 10 km of synrift U Eocene- Lw Miocene mainly nonmarine clastics and E Miocene- Holocene postrift marine-nonmarine clastics. Organic matter dispersed, terrestrial type III kerogen with minor type II kerogen, and consists primarily of vitrinite. Current depth to top oil window 1.4- 1.7 km. Main phase of hydrocarbon generation began at ~34 Ma. Presence of commercial gas fields suggests source rocks are effective in producing and liberating hydrocarbons, despite low hydrocarbon potential)

Carney, S., I.A. Aziz, W. Martins, A. Low & J. Kennedy (2010)- Reservoir characterisation of the Mio-Pliocene reservoirs of PM301 in the North Malay Basin. Proc. Int. Oil and Gas Conference Exhibition, China, Beijing, Soc. Petroleum Engineers (SPE) 131017-MS, p. 1-25.

(Block PM301 in N Malay Basin with seven relatively small and geologically complex gas fields discovered to date. Fields. Reservoir study)

Carson, T.G. & G.G. Phipps (1982)- The exploration applications of seismic DHI analysis in the Malay Basin. In: Offshore Southeast Asia '82 Conf. (OFFSEA 82), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 1-18.

Centhonglang, C. (2022)- Facies analysis and reservoir characteristics of 2E unit in North Malay Basin, Gulf of Thailand. Bull Earth Sciences Thailand 14, 2, p. 105-120.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/248821/170103>)

(Northern Malay Basin successful petroleum basin in Gulf of Thailand. M Miocene 2E reservoir sandstones deposited in tide-dominated delta setting)

Centhonglang, C., P. Promsen, P. Loboontert, T. Charoenpun & J. Yingyuen (2015)- Success of structural stratigraphic combination trap, Arthit Field, Gulf of Thailand. AAPG/SEG International Conference Exhib., Melbourne, Search and Discovery Article 20333, 2p. *(Abstract + Poster)*

(online at: www.searchanddiscovery.com/documents/2015/20333centhonglang/ndx_centhonglang.pdf)

(Arthit gas field in NW North Malay Basin, offshore Thailand, mostly in Miocene- Oligocene reservoir. Most of the gas production from stacked channel reservoir in structural traps. 2012 appraisal well confirmed gas in 'nose structure' combination trap)

Chadwick, R.A., D.W. Holliday & W.J. Rowley (1991)- Thermal history of petroliferous basins of the CCOP region: 1. The northern part of the Gulf of Thailand. British Geological Survey, Technical Report WC/91/01C, p. 1-86.

(online at: www.bgs.ac.uk/research/international/dfid-kar/WC91001C_col.pdf)

Chadwick, R.A., D.W. Holliday & W.J. Rowley (1991)- Thermal history of petroliferous basins of the CCOP region: 1. The Malay Basin. British Geological Survey, Technical Report WC/91/02C, p. 1- .

Chantraprasert, S. (2000)- Extensional faults and fault linkages, Southern Pattani Basin, Gulf of Thailand. Ph.D. Thesis, University of London, p. (*Unpublished*)

Chantraprasert, S., J. Kongchum & N.Kuenphan (2019)- Role of strike-slip faulting in the evolution of the Chumphon Basin, Gulf of Thailand. Proc. EAGE/AAPG Workshop on Reducing exploration risk in rift basins, Kuala Lumpur 2019, 2p. (*Abstract only*)

(*Chumphon Basin is Tertiary half-graben basin on W margin of Gulf of Thailand, at NE tip of NNE-SSW-trending Khlong Marui Fault. Basin experienced M Miocene- Quaternary inversion episodes, possibly resulting from restraining-bend deformation at tip of Khlong Marui Fault. During inversion, existing oil accumulations re-migrated and traps were breached by inversion-related faults*)

Chen, H.W.W., S. Shukriah, O.A.B. Mahmud, N. Pendkar & D. Hasspariah (2013)- An integrated approach of sequence stratigraphic study in southwestern of Malay Basin. Int. Petroleum. Technical Conf. (IPTC), Beijing, IPTC 16787, p. 1-7.

(*Sequence stratigraphic framework and implication for petroleum system understanding of SW Malay Basin. Six main 3rd order sequences in Oligocene-Pliocene. Two source rock intervals in study area: Late Oligocene deeper synrift with lacustrine deposits and E Miocene marine inner neritic rocks. Potential reservoirs (fluvial, lacustrine and shallow marine sands) thin basinward (SW to NE)*)

Chenrai, P. (2013)- Structural style and tectonic evolution of the Nakhon Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 70-75.

(online at: www.geo.sc.chula.ac.th/BEST/volume4/number2/12_Piyaphong_BEST_4_2_p%2070-75.pdf)

(*Nakhon Basin at W margin of Gulf of Thailand. Initial rifting created halfgrabens in Late Oligocene. Rifting followed by inversion and second phase of rifting in M Miocene. Basin formed in response to oblique extension resulting from right-lateral motion*)

Chew, H.H. & A.H. Hussein (1986)- Bekok reservoir model study. Proc. SE Asia Petroleum Exploration Society (SEAPEX) 7, p. 87-95.

(*Reservoir model of E Miocene J18/20 sands in Esso 1971 Bekok field, Block PM-9, Malay Basin*)

Chonchawalit, A. (1993)- Basin analysis of Tertiary strata in the Pattani Basin Gulf of Thailand. Ph.D. Thesis University of British Columbia, Vancouver, p. 1-366.

(online at: <https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/831/items/1.0052735>)

(*Stratigraphic-structural evolution of N-S trending Pattani basin in Gulf of Thailand. Up to 10 km of Tertiary sediment fill. Synrift phase 3 units: Late Eocene- E Oligocene alluvial-fluvial deposits, Late Oligocene- E Miocene fluvial and E Miocene mixed marine- non-marine deposits. Post rift succession: E-M Miocene regressive shallow marine- fluvial series, late E Miocene transgressive package and Late Miocene-Pleistocene transgressive package. Organic matter mainly of detrital and continental origin. Modeling suggests main phase of hydrocarbon generation started around 34 Ma*)

Chua, B.Y. & R. Wong (1997)- Some possible new exploration ideas in the northern and western Malay Basin of Peninsular Malaysia. ASCOPE Proc. 2, p. 177-191.

Chua, B.Y. (1998)- A decade (1987-1997) of exploration in Malaysia under the 1985 PSC. Proc. Offshore South East Asia Conference 1998 (OFFSEA 98), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 109-122.

(Brief review of new discoveries and new play fairways in Malay Basin (Bunga Kekwa, Yong/North Raya, Rhu) and offshore Sarawak (Jintan gas, Helang gas, Kinabalu oil, Kebabangan oil-gas)

Chuenbunchom, S., A.P. Heward & G. Makel (2000)- The reservoir geology of the 'pre-Tertiary' sequences of palaeokarst structures, Gulf of Thailand. J. Geological Society Thailand 1, p. 8-18.

(online at: <http://library.dmr.go.th/library/J-Index/2000/145.pdf>)

(Pre-Tertiary 'basement' highs below Late Oligocene/Base Tertiary in Chumphon Basin penetrated variable Permian- Triassic lithologies. 5 of 6 Pre-Tertiary penetrations encountered losses of drilling fluids. Porous zones in carbonate of B6/27 from subsurface hydrothermal leaching, not near-surface tropical weathering)

Clark, S.J.A. & R.C. Davis (2017)- Observations of hydrocarbon migration within the Jasmine Field and the impact on risk assignment for exploration prospectivity in Eastern Block B5/27, Gulf of Thailand. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, Session 8, p. 1-4. *(Extended Abstract)*

(Jasmine Field (Jasmine and Ban Yen) in NW Pattani Basin, Gulf of Thailand. Discovered in 1974, cumulative production 65 MMSTB Oil from >160 pools in 30 fault blocks and 27 M-L Miocene reservoirs. Oils appear to be expelled from similar organofacies at similar maturities, from kitchen S of Ban Yen area)

Creaney, S. & A.H.Hussein (1992)- Oil quality variations in the Malay basin - geochemical insights. Proc. Int. Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin, Kuala Lumpur, Warta Geologi 18, 6, p. 276. *(Abstract only)*

Creaney, S., A.H. Hussein, D. Curry, K.M. Bohacs & R. Hassan (1994)- Source facies and oil families of the Malay Basin, Malaysia. American Assoc. Petroleum Geol. (AAPG) Bull. 78, p. 1139. *(Abstract only)*

(Malay Basin several petroleum systems with Oligocene- M Miocene non-marine source rocks. Lower Oligocene- Lw Miocene lacustrine-dominated, Lw-M Miocene coastal/delta plain coal-related sources. Two lacustrine sources, with low pristane/phytane ratios, low oleanane, general absence of resin-derived terpanes. Multiple sources in coaly section (pristane/phytane ratios up to 8, very high oleanane, often abundant resinous compounds). All source rocks generally overmature in basin center and immature toward basin margin. Oils low in sulfur. Migration largely strata parallel with little cross-stratal mixing of families)

Cuny, G., C. Laojumpon, O. Cheychiw & K. Lauprasert (2010)- Fossil vertebrate remains from Kut Island (Gulf of Thailand, Early Cretaceous). Cretaceous Research 31, p. 415-423.

(Mesozoic vertebrate fauna from sandstones on Ko Kut, E Gulf of Thailand, includes fresh water hybodont sharks, actinopterygians, turtles, goniopholidid crocodiles and theropod dinosaurs. Incl. Heteroptychodus kokutensis n.sp. Fauna same age as Sao Khua Fm (Khorat Group) and not Jurassic, but Berriasian or younger. Tectonic affinities of Kut island unclear, may represent Sibumasu or Indochina Block)

Duval, B.C. & J. Gouadain (1994)- Exploration and development in the Bongkot Field Area (Gulf of Thailand): an integrated approach. Proc. 14th World Petroleum Congress, Stavanger 1994, p. 247-257.

(Bongkot gas- condensate field, largest in Gulf of Thailand. Complex geometry of reservoirs: faulted blocks and mid to late Tertiary fluvio-deltaic sands distributed across 2000m thick sedimentary section)

Fontaine, H., D. Rodziah & U. Singh (1990)- A Triassic 'reefal' limestone in the basement of the Malay Basin, South China Sea: regional implications. Bull. Geological Society Malaysia 27, p. 1-25.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1990016.pdf>)

(Sotong B1 well in SW part of Malay Basin (4.9° N, 104.8° E) drilled ~300m of Late Triassic limestone at TD. Two limestone types: (1) black wackestone-packstone (10,000-10,017') with some oolites, sponges, Tubiphytes; (2) grey wackestone-packstone (9736-9761') rich in fragments of sponges, bryozoa, corals (Pinacophyllum, Thecosmilia?). Common Tubiphytes (= Shamovella), calcareous sponges (Colospongia). Foraminifera: Alpinophragmium perforatum, Opthalmidium, Tetrataxis, etc. 'Tethyan', probably reefal, Norian-age)

Fontaine, H., D. Rodziah & U. Singh (1990)- Discovery of an Upper Triassic limestone basement in the Malay Basin, offshore Peninsular Malaysia: regional implications. *J. Southeast Asian Earth Sciences* 4, 3, p. 219-232. *(Same paper as above on limestone at base of Sotong B1 well with Triassic limestone penetrated from 9030-10,017'. With pseudoalgae, foraminifera (Alpinophragmium) and abundant calcisponges)*

Fujiwara, M. (2010)- Significant erosion during development of the Middle Miocene unconformity and its effect on hydrocarbon generation in the Gulf of Thailand. AAPG International Conference Exhib., Rio de Janeiro 2009, Search and Discovery Article 20084, p. 1-9.

(online at: www.searchanddiscovery.com/documents/2010/20084fujiwara/ndx_fujiwara.pdf)

(>20 oil-gas fields in Pattani Trough rift basin, with up to 7500m of Tertiary sediment. Source rocks Oligocene lacustrine shales and M Miocene coaly shales. M Miocene Unconformity with ~4500' of erosion at Erawan gas field, based on shale compaction trend and 'paleo-anticline' below MMU, possibly related to 'Himalayan' compressional event in Gulf of Thailand)

Fujiwara, M. (2011)- The Middle Miocene Unconformity (MMU) in the southern part of the Pattani Trough in the Gulf of Thailand. *J. Japanese Association for Petroleum Technology* 76, 6, p. 545-555.

(online at: https://www.jstage.jst.go.jp/article/japt/76/6/76_545/_pdf)

(In Japanese, with English summary. Gulf of Thailand >4000 wells drilled since 1971. Over 30 oil-gas fields discovered. mainly in Cenozoic Pattani Trough rift basin, 200km long/ 50km wide, with 2 main unconformities: deep MTU (below drill depths) and shallower Mid-Miocene Unconformity (MMU). Compaction trends from sonic logs suggest ~1000m of erosion at MMU (possibly too high). MMU between Florschuetzia levipoli and F. meridionalis zones)

Fujiwara, M., M. Yamada & A. Sasaki (2009)- Possible inorganic origin of the high CO₂ gas reservoirs in the Platong and the Erawan Gas Fields, Gulf of Thailand. AAPG Hedberg Conference, Variations in fluvial-deltaic and coastal reservoirs deposited in tropical environments, Jakarta 2009, Search and Discovery Article 90102, 2p. *(Abstract only)*

(online

at:

www.searchanddiscovery.com/pdfz/abstracts/pdf/2010/hedberg_indonesia/abstracts/ndx_fujiwara.pdf.html)

(Some oil-gas fields in Gulf of Thailand (Erawan-1981, Platong- 1976, Pailin) with some high CO₂ reservoirs. Origin of CO₂ and nitrogen in natural gas from Erawan gas field mixture of inorganic (from Pre-Tertiary basement) and organic (thermal maturation). Platong field with some high CO₂ gas, interpreted to be of hydrothermal origin)

Fyhn, M.B.W., L.O. Boldreel & L.H. Nielsen (2010)- Escape tectonism in the Gulf of Thailand: Paleogene left-lateral pull-apart rifting in the Vietnamese part of the Malay Basin. *Tectonophysics* 483, p. 365-376.

(Vietnamese part of Malay basin large, deep pull-apart basin formed through M-Late Eocene- Oligocene left-lateral strike-slip along NNW-trending fault zones, likely associated with SE Asian extrusion tectonism. Deep rift widens to S and connects with main Malay Basin. Neogene thermal sag led to thick sediment succession. Moderate rifting resumed in E Miocene. Late Neogene basin inversion attributed to 70 km of right-lateral movement across major N-S-trending faults in central part of basin, but not in Vietnamese territory)

Fyhn, M.B.W., S.A.S. Pedersen, L.O. Boldreel, L.H. Nielsen, P.F. Green, P.T. Dien, L.T. Huyen & D. Frei (2010)- Palaeocene- early Eocene inversion of the Phuquoc-Kampot Som Basin: SE Asian deformation associated with the suturing of Luconia. *J. Geological Society, London*, 167, 2, p. 281-295.

(Phuquoc-Kampot Som Basin, Gulf of Thailand (Cambodia- Vietnam) is Late Jurassic-E Cretaceous foreland basin. Paleocene- E Eocene basin inversion-erosion event associated with Luconia suturing to SE Asia and shutdown of Paleo-Pacific subduction under SE Asia segregated larger Mesozoic basin. Inversion focused along Kampot and Khmer-Chanthaburi fold belts and indicate link between initial SE Asian left-lateral strike-slip faulting and Luconia suturing)

Fyhn, M.B.W., H.I. Petersen, A. Mathiesen, L.H. Nielsen, S.A.S. Pedersen, S. Lindstrom, J.A. Bojesen-Koefoed, I. Abatzis & L.O. Boldreel (2010)- Vietnamese sedimentary basins: geological evolution and petroleum potential. Geol. Survey Denmark and Greenland Bull. 20, p. 91-94.

(online at: www.geus.dk/publications/bull/nr20/nr20_p091-094.pdf)

(Review of two basins in Vietnamese part of Gulf of Thailand: (1) Phu Quoc Basin undrilled, 500 km long, N-S trending basin with up to 4km of mainly non-marine Late Jurassic- Lower Cretaceous sediments, bordered in E by Jurassic-Cretaceous magmatic arc, inverted in Late Paleocene- E Eocene (AFTA data suggest Late Paleocene- E Eocene cooling); unconformably overlain by Eocene-Neogene; (2) Tho Chu basin= NE part of Malay Basin, initiated between M-L Eocene, with mainly NNW-trending rifts)

Ghazali, K., A. Baker, M. Mathur, S. Aziz, A. Manaf, M. Johari, F. Ismail, F. Fauzi, A. Mohd & W. Shariffudin (2017)- Unveiling insights of stratigraphic element in Malay Basin. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017), EAGE, Kuala Lumpur, 43554, p. 121-125.

Ghosh, D., M.F.A. Halim, M. Brewer, B. Viratno & N. Darman (2010)- Geophysical issues and challenges in Malay and adjacent basins from an E & P perspective. The Leading Edge 29, 436, p. 1-11.

(Malay Basin N-S-trending pull-apart rift basin, formed during Late Eocene-E Oligocene, underwent thermal subsidence and sedimentation in E Miocene. M Miocene structural inversion resulting in E-W anticlines)

Ghosh, D., S. Jirim, S. Isa & P. Abolins (2010)- The roles of coal in hydrocarbon exploration in the Malay Basin: the good, the bad and the ugly. In: Petroleum Geology Conference Exhib., Kuala Lumpur (PGCE 2010), p. (Extended Abstract)

Ghosh, D., M. Sajid, N.A. Ibrahim & B. Viratno (2014)- Seismic attributes add a new dimension to prospect evaluation and geomorphology offshore Malaysia. The Leading Edge 33, 5, p. 536-545.

Goodall, J.G.S., A. Racey & P. Highton (1997)- Early Carboniferous (Tournasian) palynomorphs from the Gulf of Thailand. In: P. Dheeradolok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), 1, p. 56-61.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7622.pdf)

(Clastic basement in wells 7-152-1X and 8-320-1X at W flank of N Pattani Trough in Gulf of Thailand with moderately diverse, cosmopolitan mid-Tournasian miospore assemblage. Dominant species *Punctatisporites/Retusotrilletes* spp., *Speleotrilletes balteatus* and *Vallatisporites vallatus*. Spore color 4-5 (heavily carbonised; in dry gas or barren maturity window))

Halim, M.F.A. (1994)- Geothermics of the Malayan sedimentary basins. Bull. Geological Society Malaysia 36, p. 163-174.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994031.pdf>)

(Study of heat flow distribution in Malay, Sarawak and Sabah sedimentary basins from 400 exploration and production wells. Highest heat flow in Malay basin (av. 143 m W/m²), followed by Sarawak basin (104 mW/m²) and lowest in Sabah basin (74 m W/m²))

Hassaan, M., S.K. Bhattacharya, M.J. Mathew & N.A. Siddiqui (2015)- Understanding basin evolution through sediment accumulation modeling: a case study from Malay Basin. Research J. Applied Sciences, Engineering Technology 11, 4, p. 388-395.

(online at: <http://maxwellsci.com/msproof.php?doi=rjaset.11.1792>)

(Malay Basin with up to 14 km of sediments. Sedimentation rate analysis and 2D modeling suggest sediment accumulation started at 33.9 Ma towards basinal side, possibly associated with activation of Tenggol fault. Prior to unit K (25.2 Ma) sediments absent on Tenggol arch. During Late Miocene basin wide inversion sediments still accumulated in SW part)

Hassan, M.H.A., R. Tahir & A.K. Ali (2013)- Facies architecture of a complex, heterolith-filled incised valley system, Miocene Malay Basin, Malaysia. Proc. Petroleum Geoscience Conference Exhib. (PGCE 2013), Kuala Lumpur, P15, p. 1-4. (Extended Abstract)

(Facies analysis and stratigraphic study of tidal heterolithic deposits infilling deep (up to 43 m thick) incisions in H Group of Field I, WD, ED, CG and C, offshore Malay Basin. Interpret presence of 3 separate, NW-SE trending valley incisions associated with base level fall, which are infilled mainly by tidal heteroliths)

Heward, A.P., S. Chuenbunchom, G. Makel, D. Marsland & L. Spring (2000)- Nang Nuan Field, B6/27, Gulf of Thailand: karst reservoirs of meteoric or deep burial origin? *Petroleum Geoscience* 6, p. 15-27.

(Permian karst reservoirs in Chumphon Basin of Gulf of Thailand produced oil at >10,000 BBL/day. Previously presumed to be from meteorically karstified buried hills in Ratburi carbonates, but apparently unrelated to subaerial exposure. Highs are probably syn-rift horsts and inversion features, with karstification in karst in Ratburi carbonate reservoirs primarily of deep-burial origin, related to geothermal circulation)

Higgs, R. (1999)- Gravity anomalies, subsidence history and the tectonic evolution of the Malay and Penyu Basins (offshore Peninsula Malaysia) - Discussion. *Basin Research* 11, 3, p. 285-290.

(Critical discussion of Madon & Watts 1998 paper, suggesting paleobathymetry needed to be incorporated and speculating whether there may be two rift intervals in Malay Basin instead of one (possible renewed rifting in Late Miocene))

Highton, P.J.C., A. Racey, M.I. Wakefield, A.J. Carmichael & N.R.W. Glendinning (1997)- Quantitative biostratigraphy: an example from the Neogene of the Gulf of Thailand. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA97)*, Bangkok, Dept. Mineral Resources (DMR), p. 563-585.

(online at: <http://library.dmr.go.th/library/7657.pdf>)

(Gulf of Thailand Eocene?- Recent intra-cratonic basin with up to 8000m Neogene section in mainly non-marine facies. Biostratigraphic zonation mainly based on palynology. Most onshore basins lack coastal palynomorphs like Florschuetzia. Existing zonations can be refined by quantitative analysis of biostrat data. Late M Miocene Unconformity (MMU) separates deformed mainly non-marine section from more marine and less deformed younger section)

Hill, J.A., D.K.Y. Soo & T. Verriah (1992)- Clay mineralogy in subsurface sandstones of Malaysia and the effects on petrophysical properties. *Bull. Geological Society Malaysia* 32, p. 15-43.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101041-PDF.pdf)

(Clay minerals are common constituents of the subsurface sandstones in Malaysia sedimentary basins)

Hou, J., T. Takahashi, A. Katoh, S. Jaroonsiththa, K.P. Chumsena & K. Nakayama (2008)- Application of seismic attributes and neural network for sand probability prediction- a case study in the North Malay Basin. *Bull. Geological Society Malaysia* 54, p. 115-121.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100476-PDF.pdf)

Ibrahim, N.A. & M. Madon (1990)- Depositional environments, diagenesis, and porosity of reservoir sandstones in the Malong Field, offshore West Malaysia. *Bull. Geological Society Malaysia* 27, p. 27-55.

(online at: <https://gsm publ.wordpress.com/wp-content/uploads/2014/09/bgsm1990017.pdf>)

(Reservoir interval in Malong Field, Tenggol Arch, Malay Basin, three main types of sand bodies: (1) prograding shoreface, (2) shallow marine (inner-shelf), and (3) fluvial channel sequences)

Inthana, C. (2013)- Mapping of Middle Miocene reservoir sands and subtle faults to understand reservoir compartmentalization in Erawan Field of Pattani Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 6, 2, p. 17-28.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246622/167645>)

(Erawan gas field in W flank of Pattani Basin, Gulf of Thailand (near suture zone between Shan-Tai (= Sibumasu) and Indochina terranes). With E-M Miocene fluvial sands reservoirs, largely controlled by N-S faults and NW-SE and SW-NE 'discontinuities'))

Intawong, A. (2006)- Evolution of the Chumphon Basin, Gulf of Thailand. Ph.D. Thesis, University of London, p. (Unpublished)

(In W Gulf of Thailand close relationship between basins such as Chumphon Basin and NE-SW trending Khlong Marui Fault. S Thailand basins early period of rifting started in Late Eocene and became widespread by Oligocene. Inversion took place in eastern basins (Chumphon, Songkhla) at start of Miocene. Extension was renewed in E Miocene, and M Miocene corresponds to period of basin subsidence in Chumphon, Songkhla, and Andaman Sea Basins. Second period of inversion in Pliocene in Chumphon Basin, possibly coinciding with uplift on Thai Peninsula and in Andaman Sea)

Jaithan, P. (2012)- Maturity modeling of Gomin and South Gomin fields southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 5, 2, p. 95-101.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246589/167627>)

(Two exploration wells found oil in S Gomin area. Oligocene and Lower Miocene source rocks are overmature across study area except in E where they are still in main gas generation phase. Lower M Miocene source rocks in main gas generation phase to W and in oil generation window to E. M-U Miocene -Pliocene source rocks are in oil generation phase. Maturity model generally matches hydrocarbon discoveries. Etc.)

Jamaludin, S.N.F., A.H. Abdul Latiff & A.A.Kadir (2016)- Interpretation of gas seepage on seismic data: example from Malaysian offshore. Proc. 3rd International Conference AeroEarth, Jakarta 2015, IOP Conference Series 30, 012002, p. 1-6.

(online at: <http://iopscience.iop.org/article/10.1088/1755-1315/30/1/012002/pdf>)

(Features of gas seepage on Malay Basin seismic data (amplitude anomalies, wipe out zones, sag or push down, pockmarks/ craters, etc.)

Jardine, E. (1997)- Dual petroleum systems governing the prolific Pattani basin, offshore Thailand. In: J.V.C. Howes & R.A. Noble (eds.) Proc. International Conference Petroleum Systems of SE Asia & Australia, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 351-363.

(Pattani Basin largest of series of N-S trending Tertiary rifts in Gulf of Thailand. Gas and less oil trapped in Miocene fluvial sandstones in faulted graben systems. Two petroleum systems in basin: (1) dominant Miocene gas-generating coals and shales, currently mature in deeper portions of basin; (2) Oligocene oil-prone lacustrine shales, mature in basin flank areas but overmature in central trough)

Jardine, E. (1997)- Dual petroleum systems governing the prolific Pattani basin, offshore Thailand. In: P. Dheeradolok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Dept. Mineral Resources (DMR), Bangkok, 2, p. 525-534.

(same as Jardine 1997)

Jirin, S., M. Mohamed & S.S. Hasan (2013)- Transgressive-regressive cycles in the Malay Basin: new insights. Int. Petroleum. Technical Conference (IPTC 2013), Beijing, IPTC 16838, p. 1-6. *(Extended Abstract)*

(8 pulses of marine transgressions in Late Oligocene- Pliocene interval)

Johansson, M., S. Farag, J. Phillips, J. van Doorn & I. Roberts (2024)- The fractured basement of Malaysia- a comparison with Vietnam. SE Asia Petroleum Exploration Society, GESGB-SEAPEX Asia Pacific Conference, London, 22p. *(Abstract + Presentation)*

(Paper on potential Pretertiary basement hydrocarbon reservoirs in Malay Basin (metamorphic and igneous rocks, limestones)

Jong, J., F.L. Kessler, M. Madon & H. Mohamad (2019)- Radioactive apatite-rich “Hot Sands” of the Tenggol Arch: stratigraphic curiosity or sub-seismic reservoir correlation tool? Bull. Geological Society Malaysia 67, p. 1-8.

(online at: <https://gsm.org.my/products/702001-101790-PDF.pdf>)

(Late Oligocene to Early Miocene reservoir sandstones in Tenggol Arch with intervals with anomalous radioactive levels within the K, J and I Tertiary sequences. Thorium-bearing, apatite-rich sandstones and siltstones main source of radioactivity. Sediment derived from Malay Peninsula, Johor Platform and perhaps local cuesta ridges. Could be used for correlating reservoir units at reservoir or field scale)

Jong, J., F.L. Kessler, M. Madon & L. Your (2019)- The Tembakau gas accumulation, Tenggol Arch, offshore Peninsular Malaysia: petroleum system, gas composition and gas migration. Bull. Geological Society Malaysia 68, p. 639-84.

(online at: <https://gsm.org.my/products/702001-101810-PDF.pdf>)

(Tembakau 2013 Lundin gas discovery E Miocene clastics in center of Tenggol Arch, off E Peninsular Malaysia in S China Sea, up-dip from Sotong Field. Mixed biogenic and thermogenic gas)

Kachi, T., H. Yamada, K. Yasuhara, M. Fujimoto, S. Hasegawa, S. Iwanaga & R. Sorkhabi (2005)- Fault-seal analysis applied to the Erawan gas-condensate field in the Gulf of Thailand. In R. Sorkhabi & Y. Tsuji (eds.) Faults, fluid flow, and petroleum traps, American Assoc. Petroleum Geol. (AAPG), Memoir 85, p. 59-78.

(Unocal Erawan gas field in Gulf of Thailand with series of E- and W-dipping normal faults that displace E-M Miocene clastic reservoirs. Most faults adequate seal capacity)

Kader, M.S. (1994)- Abnormal pressure occurrence in the Malay and Penyu Basins, a regional understanding. Bull. Geological Society Malaysia 36, p. 81-91.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1994024.pdf>)

(Majority of wells in Malay and Penyu basins terminated due to abnormal pressure. Data from 94 exploratory wells show abnormal pressure in progressively older units towards basin margins, which are normally pressured. Onset of abnormal pressure abrupt in N and more gradual in S part of Malay Basin)

Kader, M.S. & W. Leslie (1995)- Occurrence, origin and implications of overpressure in the Malay and Penyu Basins, offshore Malaysia. Bull. Geological Society Malaysia 37, p. 191-204.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a14.pdf>)

(80% of wells drilled in Malay-Penyu Basin terminated due to overpressure. Overpressure neither depth dependent nor age -related. Margins of Malay Basin and entire Penyu Basin normally pressured; central part of Malay Basin overpressured. Onset of overpressure abrupt in N and more gradual in S portion)

Kaewkor, C., I.M. Watkinson & P. Burgess (2015)- Structural style and evolution of the Songkhla Basin, western Gulf of Thailand. Proc. Int. Conference Geology, Geotechnology and Mineral Resources of INDOCHINA, Khon Kaen, Thailand (GEOINDO 2015), p. 1-12.

(Gulf of Thailand part of suite of Cenozoic basins within Sundaland, with multiple phases of extension and inversion, rapid post-rift subsidence, low-angle normal faults and Basin and Range-style. Songkhla Basin in SW Gulf asymmetric half-graben, bounded by NNW-SSE- faults along W edge, ~75 km long, 30 km wide. Two oil fields in basin. Pre-Cenozoic basement fabrics broadly N-S. Sediments thicken to W along growth fault surfaces; most faults E-dipping. Three main tectonostratigraphic packages in basin: 1) Eocene- E Miocene syn-rift, with three sub-extensional packages; 2) early M Miocene inversion and deposition of post-rift package, terminated by M-Miocene Unconformity; 3) Late Miocene-Recent post-rift)

Kantatong, K. (2010)- Hydrocarbon distribution in the North Jakrawan Field, Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 3, 2, p. 33-36.

Kartikasari, H.A. (2011)- Structural style of Songkhla Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 38-47.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246513>)

(Songkhla Basin in Western Graben of Gulf of Thailand asymmetric half-graben, bounded by NNW-SSE-trending major extensional faults. Basin fill thicker in W due to growth faulting. Maximum displacement along main boundary fault in W ~1.2 km in E Oligocene. Most faults E-dipping. Three tectonic phases: Eocene or E Oligocene initial rifting, E Miocene inversion, M Miocene resumption of extensional tectonics)

Kessler, F.L. & J. Jong (2018)- Sandstone diagenesis: establishing threshold temperature and depth of porosity deterioration, Penyu Basin and Tenggol Arch, offshore Peninsular Malaysia. Berita Sedimentologi 41, p. 5-21.

(online at: www.iagi.or.id/fosi/files/2018/09/FOSI_BeritaSedimentologi_BS41_September_2018.pdf)

(Penyu Basin SW of Malay Basin possible pull-apart basin rather than rift basin, affected by repeated strike-slip movements in Oligocene (possibly also before and after. Pre-Oligocene sediments in center of basin with

high vitrinite reflectivity values, suggesting removal of >1000m of pre-Oligocene. Quartz cementation started at paleo-depth of ~2000m tvdss (105°C), and porosity was mostly destroyed at ~3000m tvdss and 130°C)

Kessler, F.L., J. Jong & M. Madon (2020)- Sedimentary record of Paleogene sequences in the Penyu and Malay Basins, offshore Peninsular Malaysia. *Berita Sedimentologi* 46, p. 6-20.

(online at: <https://www.iagi.or.id/fosi/berita-sedimentologi-no-46-is-now-online.html>)

(Review of mid-Eocene- Lower Oligocene deposits of Penyu (fluvial- lacustrine) and Malay basins (with marine influence)

Kessler, F.L., J. Jong & M. Madon (2021)- Eocene Sediments in the South China Sea, precursor deposits of the Oligocene expansion? *Berita Sedimentologi* 47, 2, p. 1-24.

(online at: <https://journal.iagi.or.id/index.php/FOSI/article/view/319/294>)

(Review of Eocene sediment in basins around the S China Sea. Generally non-marine deposits on continental crust, possible precursors of rifting of S China Sea)

Khanna, M., N. Comrie-Smith, M. Lawlor & M.K. Viridy (2013)- Bualuang Oilfield, Gulf of Thailand: a successful development using geosteered horizontal wells. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 20189, p. 1-23. (Extended Abstract)

(online at: www.searchanddiscovery.com/documents/2013/20189khanna/ndx_khanna.pdf)

(Bualuang field in W Basin of Gulf of Thailand, initially discovered in 1993 and named Pornsiri field. Oil 27°API, viscosity 8.5 cp. Main T4 reservoir M Miocene fluvial channel sandstones, >50m thick, porosity almost 30%, av. perm 1.8 darcys. Oil column up to 32 m)

Klinkaew, B. (2012)- Sand distribution and reservoir characteristics North Jamjuree Field, Pattani Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 5, 2, p. 15-24.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246555/167607>)

(North Jamjuree field in W part of Pattani Basin high pay counts but less than expected gas recovery, due to stratigraphic complexity. Miocene fluvial sands are discontinuous and reserves are low)

Kongnonkok, W. (2011)- Carbon dioxide distribution in Erawan, Platong and Pailin Fields, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 4, 2, p. 119-125. (online at:

https://www.geo.sc.chula.ac.th/BEST/volume4/number2/19_Weerawat_BEST_4_2_p%20119-125.pdf)

(Geochemical analysis of CO₂ in Platong, Erawan and Pailin fields suggests main source is from mineral decomposition of basement rocks, migrating into Miocene reservoirs by faults)

Kongwung, B. & S. Ronghe (2000)- Reservoir identification and characterization through sequential horizon mapping and geostatistical analysis: a case study from the Gulf of Thailand. *Petroleum Geoscience* 6, 1, p. 47-57.

(Reconstruction of reservoir units/ reservoir geometry in ~50 ms thick interval of 3D seismic data on NW flank of Malay Basin, Gulf of Thailand. Depositional environment fluvio-deltaic, with channel sands, point bars, etc., as potential reservoirs)

Kornsawan, A. & C.K. Morley (2002)- The origin and evolution of complex transfer zones (graben shifts) in conjugate fault systems around the Funan Field, Pattani basin, Gulf of Thailand. *J. Structural Geology* 24, p. 435-449.

(On transfer zones between sets of convergent conjugate faults in Pattani Basin, Gulf of Thailand. In Funan Field area graben shift seen as W-dipping faults into zone of E-dipping faults. Initial Oligocene- E Miocene syn-rift fault pattern influenced by pre-existing basement trends. No indication of strike-slip faulting affecting graben shift geometry. Early (Late Oligocene- E Miocene), W-dipping normal faults influenced location of higher M-L Miocene conjugate faults)

Kuenphan, N., K. Kaenmee, Y. Gonecome & R. Shoup (2010)- Application of satellite-based analog studies to resolving reservoir complexity in the North Malay Basin. AAPG Hedberg Conference, Jakarta 2009, Search and Discovery Article 50256, p. 1-17. (Extended Abstract)

(Thailand river patterns used as potential analogs for N Malay Basin reservoir sand distribution patterns)

Lambiase, J.J. (2016)- Transgressive events in the Lower and Middle Miocene of the Gulf of Thailand: implications for reservoir characterization. AAPG Geoscience Techn. Workshop Characterization of Asian hydrocarbon reservoirs, Bangkok, Search and Discovery Article 51266, p. 1-37. *(Abstract + Presentation)*
(online at: www.searchanddiscovery.com/documents/2016/51266lambiase/ndx_lambiase.pdf)
(Recognition of two marine transgressions (late E Miocene, M Miocene) and several minor transgressive events, expressed as coaly mudstones in fluvial-dominant E-M Miocene of Pattani Basin, Gulf of Thailand)

Lambiase, J.J., J. Narapan & P. Champasa (2017)- Marginal marine mudstones in the Pattani Basin, Gulf of Thailand: implications for stratigraphic development, reservoir characterization and correlation potential. AAPG/SPE 2016 Int. Conference Exhib., Barcelona 2016, Search and Discovery Article 51366, p. 1-21. *(Abstract + Presentation)*
(online at: www.searchanddiscovery.com/documents/2017/51366lambiase/ndx_lambiase.pdf)
(E-M Miocene late rift- early post-rift sediments in Gulf of Thailand traditionally viewed as fluvial, but also widely distributed marginal marine mudstones and coaly mudstones and tide-dominated sandy facies)

Lau, J.W.E. (1977)- Stratigraphic correlation of Tertiary basins in offshore Malaysia, South China Sea. ASCOPE, p. 1-30.

Leo, C.T.A.M. (1997)- Exploration in the Gulf of Thailand in deltaic reservoirs, related to the Bongkot Field. In: A.J. Fraser, S.J. Matthews & R.W. Murphy (eds.) Petroleum geology of Southeast Asia, Geological Society, London, Special Publ. 126, p. 77-87.
(History of Statoil involvement since 1985 in Bongkot Field in NW Thai sector of Malay Basin)

Leong, K.M. (1978)- Malaysia, onshore sedimentary basins of Malaysia. In: United Nations ESCAP Atlas of Stratigraphy, 1. United Nations ECAFE Mineral Resources Development Ser. 44, Chapter 3, p. 26-31.
(online at: <https://repository.unescap.org/items/bb52a31d-ca39-4fad-9391-ad4d1b7df8a7>)

Lian, H.M. & K. Bradley (1987)- Exploration and development of natural gas, Pattani Basin, Gulf of Thailand. In: M.K. Horn (ed.) Trans. 4th Circum Pacific Council for Energy and Mineral Resources Conf., Singapore 1986, Chapter 15, p. 171-181.
(Gulf of Thailand series of N-S trending mid-Tertiary rift basins with up to 8km of mainly non-marine Upper Tertiary sediments. Four Unocal gas fields in faulted structures at W side of Pattani basin. First gas discovery in 1972, first production in 1981. Gas typically 65-72% methane, 17-19% C₂+ and 14-17% CO₂)

Liew, K.K. (1994)- Structural development at the west-central margin of the Malay Basin. Bull. Geological Society Malaysia 36, p. 67-80.
(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1994023.pdf>)
(Regional structure interpretation of west-central margin of Malay Basin (Dungun Graben, etc.))

Liew, K.K. (1995)- Timing of Cenozoic basin formation in northern Sundaland, Southeast Asia. Bull. Geological Society Malaysia 37, p. 231-251.
(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a161.pdf>)
(Cenozoic continental wrench shear basins and back-arc basins developed on present stable N Sundaland, at both sides of Malay Peninsula. Wrench faulting played significant role in basin formation basins. Collision of Indian Subplate with Eurasian Plate in E Cenozoic caused redistribution of stress in region, reactivating zones of weakness. Two major episodes of basin formation in N Sundaland: Eocene- E Oligocene and Late Miocene)

Liew, K.K. (1995)- Structural analysis of the Malay Basin. Bull. Geological Society Malaysia 40, p. 157-176.
(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1997012.pdf>)

Limpornpipat, O., A. Laird, M. Tingay, C.K. Morley, C. Kaewla & H. Macintyre (2012)- Overpressures in the Northern Malay Basin: part 2- implications for pore pressure prediction. Int. Petroleum. Technical Conf. (IPTC), Bangkok 2012, 4, IPTC 15350, p. 3278-3289.

(see also Tingay et al. (2012) for Part 1)

(Pore pressure can be accurately predicted from sonic velocity. In N Malay Basin compaction coefficient varies spatially with geological structure)

Lobtong, W. & K. Lewis (2019)- Unlocking hidden reserve potential in Northern Pattani Basin, Gulf of Thailand. Proc. AAPG Asia Pacific Region GTW, Bangkok 2018, Search and Discovery Article 1205, p. 1-4.

(online at: https://www.searchanddiscovery.com/documents/2019/11205lobtong/ndx_lobtong.pdf)

Lockhart, B.E., O. Chinoroje, C.B. Enomoto & G.A. Hollomon (1997)- Early Tertiary deposition in the southern Pattani Trough, Gulf of Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97), Bangkok, Dept. Mineral Resources (DMR), p. 476-489.

Lundegard, P.D. & A.S. Trevena (1990)- Sandstone diagenesis in the Pattani Basin (Gulf of Thailand): history of water-rock interaction and comparison with the Gulf of Mexico. Applied Geochemistry 5, p. 669-685.

(In Pattani Basin extensive interaction between Miocene subquartzose alluvial sandstones and formation fluids. Diagenetic rates and pathways strongly influenced by high geothermal gradients, high CO₂ and low pore water salinities. Comparisons with other sedimentary basins demonstrate chemical diagenesis of Pattani Basin especially rapid, reflecting high temperatures, with net effect high rate of porosity loss with burial (11%/ km))

Madon, M. (1992)- Note on dolerite, rhyolite, and granophyre in the basement of the Tenggol Arch, offshore Terengganu. Bull. Geological Society Malaysia 31, p. 133-143.

(online at: www.gsm.org.my/products/702001-101045-PDF.pdf)

(Tenggol Arch in well Malong 5G-17.2 well at edge of Malay Basin, 150 km off E coast of Terengganu Basement at 1582 m highly fractured porphyritic rhyolite with dolerite dyke. Overlain by lower Miocene conglomerate composed of rhyolite and granophyre clasts. Dolerite dyke may have been intruded during incipient rifting of basin in early Cenozoic)

Madon, M. (1992)- Depositional setting and origin of berthierine oolitic ironstones in the Lower Miocene Terengganu Shale, Tenggol Arch, Offshore Peninsular Malaysia. Journal of Sedimentary Research 62, 5, p. 899-916.

(Berthierine oolitic ironstones in Lower Miocene Terengganu shale of Tenggol Arch, basement high between S Malay Basin and Penyu basin. Ironstones in 30-50m-thick, laterally extensive dark green mudstone, deposited during regional marine transgression over SW margin of ancestral S China Sea. Oolitic ironstones possibly deposited as offshore shelf storm layers and derived from lateritic soils on land)

Madon, M. (1994)- Depositional and diagenetic histories of reservoir sandstones in the Jerneh Field, central Malay Basin. Bull. Geological Society Malaysia 36, p. 31-53.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1994020.pdf>)

(U Miocene reservoir sandstones in Jerneh field at 1250-2000m. Sandbodies facies: distributary mouthbar-shoreface in delta front, channel point bar deposits in delta plain. Laterally continuous sheet sandstones characterize shallow marine facies deposited during transgression over delta. Increasing compaction and quartz cementation with depth, resulting in reduced porosities (10% and 25%). Quartz overgrowths started forming at ~1200m. K-feldspar dissolved by acidic formation waters; plagioclase relatively stable)

Madon, M. (1995)- Tectonic evolution of the Malay and Penyu Basins, offshore Peninsular Malaysia. Ph.D. Thesis, University of Oxford, p. 1-325.

(online at: <http://ora.ox.ac.uk/objects/uuid%3Af00a727d-8769-4ac8-88ab-35d8c662ea61>)

(Malay and Penyu Basins formed in E Oligocene as result of regional dextral shear deformation caused by indentation of India into Eurasia. Basement inhomogeneities control basin development. Penyu Basin first developed as isolated grabens at fault intersections, in response to N-S extension. Low-angle listric normal

faults, pull-apart grabens and flower structures suggest thin-skinned crustal extension and strike-slip tectonics. E-W Basement faults in Malay Basin oblique to NW basin trend. Basin developed by transtension of NW-trending sinistral shear zone, in which fault-bounded blocks rotate, creating E-trending half-grabens. M-L Miocene transpressive inversion related to rotation of regional stress field by progressive indentation of India into Eurasia. Lithospheric stretching dominant process of basin formation. High heat flows (85-100 mW m⁻²) consistent with β stretching factors of 1.2- 4.3)

Madon, M. (1997)- Analysis of tectonic subsidence and heat flow in the Malay Basin. In: Geological Society Malaysia Annual Geological Conference '97, Terengganu, Bull. Geological Society Malaysia 41, p. 95-108.

(online at: www.gsm.org.my/products/702001-100867-PDF.pdf)

(Malay Basin high present-day surface heat flow (~33-42 mW m⁻², interpreted as result of lithosphere thinning during basin formation. Basin relatively young (~35 Ma), and still undergoing thermal subsidence. Lithospheric stretching model with rifting over 10 Myrs starting at 35 Ma. Subsidence curves suggest stretching factors (B) of 1.2 on basin flanks to ~4.3 in centre. Basin flanks uplifted during initial rifting, causing subsidence to be delayed for ~10 Ma)

Madon, M. (1997)- The kinematics of extension and inversion in the Malay Basin. Bull. Geological Society Malaysia 41, p. 127-138.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1997029.pdf>)

(Malay Basin development began in Late Eocene- E Oligocene with sinistral transtensional shear of NW-trending shear zone that contains pre-existing E-trending basement faults. Shearing caused crustal blocks to rotate anticlockwise and form E trending half-grabens between them. Reversal of shear during E-M Miocene caused transpressive deformation and en echelon pattern of inverted half-grabens. Intensity of deformation increases SE-wards towards W Natuna Basin due to buttressing effect of Natuna basement ridge)

Madon, M. (2006)- Overpressure history of the Malay Basin, offshore Peninsular Malaysia. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2003, Bull. Geological Society Malaysia 49, p. 135-144.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm2004021.pdf>)

(Malay Basin present-day depth to top overpressure in basin center between 1900-2000m, in lower Group E. Top overpressure shallower at basin flanks, <1500m deep along faulted W basin margin. Top overpressure in basin center influenced by Group F regional shale)

Madon, M. (2007)- Overpressure development in rift basins: an example from the Malay Basin, offshore Peninsular Malaysia. Petroleum Geoscience 13, 2, p. 169-180.

(Malay Basin Tertiary transtensional rift basin with at least two major overpressure compartments, sealed by regional shale units. Main, basin-centre overpressure compartment has domal shape, shallower in basin center. In basin center, top of overpressure ~1900-2000m depth and confined mainly to M Miocene unit E. Smaller overpressure compartment on NE flank of basin, sealed by the onlapping, transgressive shale of unit L (Lower Miocene) and at a depth of 2600-3000m. Disequilibrium compaction primary cause of overpressure, and consequence of high subsidence and sedimentation rates)

Madon, M. (2021)- Five decades of petroleum exploration and discovery in the Malay Basin (1968-2018) and remaining potential. Bull. Geological Society Malaysia 72, p. 63-88.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101921-PDF.pdf)

(Since first oil discovery in Malay Basin in 1969, >700 exploratory wells drilled, resulting in 181 oil and gas discoveries. By 2014 >14.8 billion BOE of recoverable hydrocarbon resource discovered. As of end of 2018, >2100 exploration and development wells drilled in entire basin. By 1981 prolific anticlinal play type had been practically exhausted, as all giant fields (> 0.5 bboe) had been found. Etc.)

Madon, M., P. Abolins, J.B.H. Mohammad & B.A. Mansor (1999)- Malay Basin. In: The petroleum geology and resources of Malaysia, Chapter 8, Petronas, Kuala Lumpur, p. 173-217.

(Review of Malay Basin offshore E coast Peninsular Malaysia, straddling Thai border in NW and Vietnam border in NE. Over 50 oil and 30 gas fields discovered since 1969. NW-SE trending Oligo-Miocene rift-sag basin with up to 14km of sediment)

Madon, M., Rashidah B. Abd. Karim & R. Wong Hin Fatt (1999)- Tertiary stratigraphy and correlation schemes. In: The petroleum geology and resources of Malaysia, Chapter 6, Petronas, Kuala Lumpur, p. 115-137.

(online at: https://www.researchgate.net/publication/292317015_Chapter_6_Tertiary_stratigraphy_and_correlation_schemes)

Madon, M. & A. Anuar (1999)- Penyu Basin. In: The petroleum geology and resources of Malaysia, Chapter 9, Petronas, Kuala Lumpur, p. 220-223.

(Review of Penyu Basin offshore of Kuantan, Peninsular Malaysia. Small extensional basin of interior Sundaland, S of main Malay Basin and W of W Natuna Basin. Oligocene non-marine syn-rift sediments overlain by Miocene sag phase. Several sub-basins. Main structures E-M Miocene transpressional folds ('Sunda folds'). Much of section in basin is immature for hydrocarbons. Top of oil window at ~2100m. With Rhu Field sub-commercial oil discovery)

Madon, M.B., A. Anuar & R. Wong (1997)- Structural evolution, maturation history and hydrocarbon potential of the Penyu Basin. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Int. Conference Petroleum Systems of SE Asia and Australasia, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 403-424.

(Penyu Basin offshore Malaysia between Pahang and Johor Platforms on N Sunda Shelf under-explored. Basin structurally contiguous with W Natuna Basin. Comprises half-grabens bounded by two NW and ENE-trending faults, probably formed in E Oligocene by N-S extension. Early Oligocene alcastrine facies, marine incursions starting in Late Oligocene. Inversion of rift faults around E-M Miocene boundary)

Madon, M. & J. Jong (2022)- Seismic and gravity evidences of Pre-Tertiary subcrops beneath the Malay Basin. Asia. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE), Kuala Lumpur, p. 1-19.

(Abstract + Presentation)

(online at: https://www.researchgate.net/publication/365870640_Seismic_and_Gravity_Evidences_of_Pre-Tertiary_Subcrops_Beneath_the_Malay_Basin)

(About 'basement play' in Malay basin. Base-Tertiary Unconformity (BTU) well-defined surface onto which increasingly younger post-rift sediments onlap (Sundaland-wide hiatus spanning Late Cretaceous- ?Middle Eocene))

Madon, M.B., J. Jong, F.L. Kessler, M.H. Damanhuri & M.K.A. Amin (2020)- Pre-Tertiary basement subcrops beneath the Malay and Penyu basins, offshore Peninsular Malaysia: their recognition and hydrocarbon potential. Bull. Geological Society Malaysia 70, 1, p. 163-193.

(online at: <https://gsm.org.my/products/702001-101854-PDF.pdf>)

(Pre-Tertiary basement subcrops beneath Malay and Penyu basins represent continuation of onshore geology. Mesozoic terrane. Wells penetrated igneous, metamorphic and sedimentary rocks. Seismic shows presence of layered rocks beneath Base Tertiary (low-grade Late Triassic-Cretaceous? metasediments). Fractured reservoirs, like in Anding well associated with major strike-slip fault zones. Paleokarsts and buried hills also recognisable. Pre-Tertiary plays rely on hydrocarbon charge from overlying Tertiary source rocks)

Madon, M.B., J. Jong, F.L. Kessler, C. Murphy, L. Your, M. Hamid & N.B.M. Sharef (2020)- Overview of the structural framework and hydrocarbon plays in the Penyu Basin, offshore Peninsular Malaysia. Bull. Geological Society Malaysia 68, p. 1-23.

(online at: <https://gsm.org.my/products/702001-101815-PDF.pdf>)

(Review of Penyu Basin off E Malaysia. With 1991 Rhu-1 oil discovery, but not much success since, generally attributed to poor or immature source rocks in half-grabens. Basin formed on continental crust, generally considered as pull-apart or "rift-wrench" basin)

Madon, M.B. & A.B. Watts (1998)- Gravity anomalies, subsidence history and the tectonic evolution of the Malay and Penyu basins (offshore Peninsular Malaysia). *Basin Research* 10, p. 375-392.
(*Malay and Penyu basins up to 14 km sediment fill, with 20-30 mGal negative free air gravity anomalies. Modeling suggests basins formed by combination lithosphere stretching and thin-skinned crustal extension*)

Madon, M., J.S. Yang, P. Abolins, R. Abu Hassan, A.M. Yakzan & S.B. Zainal (2006)- Petroleum systems of the Northern Malay Basin. *Proc. Petroleum Geology Conference Exhibition (PGCE)*, Kuala Lumpur 2003, *Bull. Geological Society Malaysia* 49, p. 125-134.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004020.pdf>)
(*N Malay Basin petroleum province central/basinal gas-rich area, flanked on both sides and to S by mixed oil/gas zones. Non-associated gas fields in central zone mainly in D and E reservoirs, in Late Miocene inversion anticline. Vertical migration dominant process in basin center. High CO₂ gases typical of reservoirs in groups I and older and derived from inorganic sources. Low CO₂ gas (<6%) more typical of D-E reservoirs and derived from organic thermal degradation*)

Madsen, E.B., L.O. Boldreel & S.A. Schack Pedersen (2012)- Thin-skinned thrust-fault complex in the Phu Quoc Basin, SW Vietnam. *Proc. Int. Petroleum Technical Conference (IPTC)*, Bangkok 2012, p. 1409-1416.
(*Phu Quoc Basin is Late Jurassic- E Cretaceous foreland basin SW of Vietnam in undrilled E part of Gulf of Thailand. Deformation of basin took place during orogenic build-up of Kampot Fold Belt in E-M Cretaceous, which resulted in formation of thin-skinned thrust-fault complex, with complex piggyback basins. Main part of complex concealed under Neogene marine deposits*)

Madsen, E.B. & S.A. Schack Pedersen (2012)- Thin-skinned thrust-fault complex in the Phu Quoc Basin, SW Vietnam. *International Petroleum. Technical Conference (IPTC)*, Bangkok, IPTC 14624, p. 1-8.
(*Phu Quoc Basin Late Jurassic- E Cretaceous foreland basin SW of Vietnam, E Gulf of Thailand. Structural model for basin from reflection seismic. Deformation of basin during orogenic build-up of Kampot Fold Belt in E-M Cretaceous, which resulted in thin-skinned thrust-fault complex. Main part of thrust belt concealed under Neogene marine deposits, but outcrops on Phu Quoc island and islands in Nam Du archipelago*)

Maga, D., J. Jong, M. Madon & F.L. Kessler (2015)- Fluid inclusions in quartz: implications for hydrocarbon charge, migration and reservoir diagenetic history of the Penyu Basin and Tenggol Arch, offshore Peninsular Malaysia. *Bull. Geological Society Malaysia* 61, p. 59-73.
(online at: www.gsm.org.my/products/702001-101675-PDF.pdf)
(*In Penyu Basin and Tenggol Arch area, SW of Malay Basin fluid inclusions in quartz in Oligocene Groups L and M reservoirs and in Miocene Groups K and H reservoirs (none in I, J). Two populations in 'oil quartzes': (1) oil inclusions in detrital quartz grains; (2) oil inclusions in quartz cement, indicating oil migration preceded quartz cementation*)

Makeen, Y.M., W.H. Abdullah, H.A. Ayinla, X. Shan, Y. Liang, S. Su, N.M. Noor, H.K. Hasnan & L. Asiwaju (2019)- Organic geochemical characteristics and depositional setting of Paleogene oil shale, mudstone and sandstone from onshore Penyu Basin, Chenor, Pahang, Malaysia. *Int. J. Coal Geology* 207, p. 52-72.
(*Organic geochem of Paleogene of Chenor Pahang area of the Penyu Basin show excellent petroleum potential and deposition in suboxic lacustrine environment*)

Makeen, Y.M., W.H. Abdullah, M.N.A. Ghofur, H.A. Ayinla, M.H. Hakimi, X. Shan et al. (2018)- Hydrocarbon generation potential of Oligocene oil shale deposit at onshore Penyu Basin, Chenor, Pahang, Malaysia. *Energy and Fuels* 33, 1, p. 89-105.

Malasri, C. (2014)- Sequence stratigraphic interpretation of channel sand distribution using well logs from the Bualuang Field, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 7, 1-2, p. 16-25.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246630/167651>)
(*Late synrift M Miocene fluvial channel sandstone reservoirs in Bualuang oil field in western Gulf of Thailand*)

Manshor, N.A., M.H.A. Hassan & M. Madon (2021)- Tidally-influenced fluvial channel systems from the Miocene Malay Basin, Malaysia: Evidence from core facies and seismic geomorphological analyses, *Marine and Petroleum Geology* 135, 105384, p. 1-22.

(Evidence of tidal influence in Miocene channels in Malay Basin)

Mansor, M.Y., A.H.A. Rahman, D. Menier & M. Pubellier (2014)- Structural evolution of Malay Basin, its link to Sunda Block tectonics. *Marine and Petroleum Geology* 58, B, p. 736-748.

(Malay Basin developed partly as result of strike-slip shear of SE Asia continental slabs, as Indian Plate collided into Eurasia, and subsequent extrusion of lithospheric blocks towards Indochina. Sunda Block earliest rift margins are Paleogene W-E rift valleys, formed during NW-SE sinistral shear. Later Eocene NW-SE dextral shear of Indochina Block against E Malaya Block rifted opened Malay Basin, with N-S en-echelon ridges and grabens. Fast subsidence from Late Oligocene- M Miocene. Compressional inversion in Late Miocene, basin sag in Plio-Pleistocene with mild compressional episodes. Mio-Pliocene folding history of Malay Basin connected to collision of Sunda Block against subducting Indian-Australian Plate)

Martens, D., R. Lin & R.G. Hickman (2000)- Source, migration and CO₂ occurrences in the Pailin Field, Gulf of Thailand. *American Assoc. Petroleum Geol. (AAPG) Bull.* 84, 9, p. 1459-1460. *(Abstract only)*

(Unocal summary of Pailin gas field in S Pattani Trough. Two hydrocarbon sources: (1) fluvial coaly, with high pristane/phytane ratios and high angiosperm resin markers (biscadinanes) and (2) lacustrine shale, with low pristane/phytane ratios and high gammacerane. Lacustrine sources require vertical migration. Majority of hydrocarbons sourced locally from M Miocene coals and carbonaceous shales, with predominantly lateral migration. Gas high CO₂ (5- >65%), from organic and inorganic sources)

Matsubayashi, O. & S. Uyeda (1979)- Estimation of heat flow in certain exploration wells in offshore areas of Malaysia. *Bull. Earthquake Research Institute (Tokyo University)* 54, p. 31-44.

(Early paper on heatflow in Malay and Sabah basins. See also Halim 1994)

McClay, K.R., T. Dooley, P. Whitehouse, L. Fullarton & S. Chantpraser (2004)- 3D analogue models of rift systems: templates for 3D seismic interpretation. In: R.J. Davies et al. (eds.) *3D Seismic technology: application to the exploration of sedimentary basins*, Geological Society, London, Memoir 29, p. 101-115.

(Rift models paper, with example of S Pattani Basin, Gulf of Thailand)

Md Nor, M., A.H. Abd Rahman, S.S.W.S K Wafa, B.H. Wei, M.R. Aripin, J. Baharom & N.F. Zawri (2022)- Basin development, paleogeographic evolution and sandstone reservoirs characteristics within the Early-Late Miocene play, Northern Malay Basin. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2022)*, Kuala Lumpur, p. 1-5.

Miall, A.D. (2002)- Architecture and sequence stratigraphy of Pleistocene fluvial systems in the Malay Basin, based on seismic time slices analysis. *American Assoc. Petroleum Geol. (AAPG) Bull.* 86, p. 1201-1216.

(3-D seismic data from nonproductive, shallow Pleistocene section in N Malay Basin show 5 types of fluvial systems, from braided systems with >4 km wide channel-belts to small-scale meandering systems with meander-belt widths of few 100m. Incised-valley system 40m deep forms is base of one of two sequence boundaries)

Minezaki, T. & K. Moriyama (2002)- The origin of hydrocarbon and carbon dioxide in the gas fields for the Pattani Trough, the Gulf of Thailand. *J. Japanese Association for Petroleum Technology* 67, 1, p. 16-29.

(online at: https://www.jstage.jst.go.jp/article/japt1933/67/1/67_16/_pdf/-char/en)

(In Japanese with English abstract. Gases in Pattani Trough derived from thermal cracking of Type III kerogens and of pre-existing oils. Oils waxy and heavy, probably of lacustrine algal origin. Two source facies: Oligocene lacustrine-algal and Miocene fluvial-coaly. Oil generation from Oligocene source rocks started in E Miocene; gas generation mainly M-L Miocene in central trough. CO₂ contents increase with depth from few to ~25% in Trough. Some wells CO₂ as high as 91% (Platong gas field), probably of inorganic origin (magmatic decomposition of carbonate basement)

Mohamad, H., R. Wong & M.F.A. Halim (2001)- Seismic facies analysis of the synrift sediments in the North Malay Basin and their impact on the deep reservoir potential. Proc. CCOP 37th Annual Session Bangkok 2000, 2, Technical Reports, p. 30-32.

Mokhtar, S.S.S., M. Elsaadany, B. Sautter & N.H.M. Jamin (2021)- Miocene polyphase structural evolution of the T Field, NW Malay Basin. *Petroleum and Coal* 63, 2, p. 595-603.

(online at: www.vurup.sk/wp-content/uploads/2021/07/PC-X_Mokhtar_21_rev1.pdf)

(Malay Basin with thick Cenozoic sequences in relatively stable center of Sundaland. Earliest rift started in Paleogene, triggered by transtension along NW-SE trending Axial Malay Fault Zone. M Miocene major inversion, reactivating Malay Basin axial shear zone and development of large folds. N-S compression originated from S, likely related to indentation of Australian Plate in S margin of Sundaland. E-W faults active from M Miocene- Lower Pliocene, and N-S faults between M Miocene-Upper Pliocene, possibly minor tectonic episode or sedimentary load driven extension on top of post inversion morphologies)

Morley, C.K. & R. Westaway (2006)- Subsidence in the super-deep Pattani and Malay basins of Southeast Asia: a coupled model incorporating lower-crustal flow in response to post-rift sediment loading. *Basin Research* 18, 1, p. 51-84.

(Two Early Cenozoic rifts in SE Asia (beneath Pattani and Malay basins) limited upper-crustal extension ($\beta \leq 1.5$), yet very thick post-rift fill with 6-12 km of Late Cenozoic terrestrial and shallow marine sediment. Explanation for high post-rift subsidence involves lower-crustal flow caused by sediment loading and erosion of sediment sources)

Morley, C.K., N. Wonganan, N. Sankumarn, T.B. Hoon, A. Alief & M. Simmons (2001)- Late Oligocene-Recent stress evolution in rift basins of northern and central Thailand: implications for escape tectonics. *Tectonophysics* 334, p. 115-150.

(Thailand Tertiary rift basins evolved under E-W extension, but extension direction changed periodically. Extension interrupted by inversion events. Basins evolution: (1) widespread Oligocene- Lower Miocene extension; (2) In C and N Thailand extension persisted into U Miocene-Pliocene; (3) In W Natuna, Penyu, Malay basins extension ceased in earliest Miocene, in N Gulf of Thailand in M Miocene. Inversion in Gulf of Thailand in Lower and M Miocene. Relationship between strike-slip and extensional and inversion events more complex than can be explained by simple escape tectonic models)

Morley, R.J., S.S. Hasan, H.P. Morley, J.H.M. Jais, A. Mansor, M.R. Aripin, M.H. Nordin & M.H. Rohaizar (2021)- Sequence biostratigraphic framework for the Oligocene to Pliocene of Malaysia: High-frequency depositional cycles driven by polar glaciation. *Palaeogeogr. Palaeoclim. Palaeoecology* 561, 110058, p. 1-37.

(online at: www.sciencedirect.com/science/article/pii/S003101822030506X)

(Quantitative biostratigraphic data from 101 exploration wells in Malay, Sarawak and Sabah basins placed into Oligocene-Pliocene chronostratigraphic framework of 41 climate-driven transgressive-regressive cycles)

Morrison, K. & S. Aursiruk (2025)- The Manora oil field: A success story providing valuable lessons on the prospectivity of the northern Gulf of Thailand rift basins. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, SEC 2025, Singapore, p. 1-20. (Abstract + Presentation)

(Manora Oil Field (2009) is N-most field in the Gulf of Thailand. Located in W of Kra Basin N-S trending Paleogene rift basin with >4000m of Tertiary sediments. With 54 m TVD oil column in 20 late E Miocene lacustrine turbidite sandstone reservoirs. Produced 25 MMBO since 2014. Hanging-wall traps seal against Oligocene shales. Sourced from Oligocene- E Miocene lacustrine shales)

Muhamad, Abdul J. & A.S.A. Jamil (2010)- Organic facies variation in lacustrine source rocks in the southern Malay Basin. *Bull. Geological Society Malaysia* 56, p. 27-33.

(online at: <https://gsmpublic.wordpress.com/wp-content/uploads/2014/08/bgsm2010004.pdf>)

(On source rock quality of Oligocene lacustrine shales in Groups K, L, M in S Malay Basin Anding Barat Laut 1 well. Kerogens mixture of algal, bacterial and higher plant organic matter. Group L lacustrine shales best oil-prone source rock with TOC 0.45-1.95%, HI values 300-400, predominantly Type II kerogen. Groups L- M more algal input, shown by lower Pr/Ph ratio (3.1-4.0), lower Tm/Ts ratio, high C30-diahopane, etc. E Miocene

Group K more fluvial, more terrigenous organics, higher Pr/Ph ratio (5.1-6.2), higher oleanane, predominance of C29-steranes. Change in organic facies reflect transition from synrift to post-rift phase)

Narapan, J. (2015)- Different types of organic-rich geological markers in South Pailin Field, Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 240-246.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246679/167681>)

(S Pailin Field area in S Pattani Basin, northern Gulf of Thailand, with three types of organic-rich sediments: (1) marginal marine shale, (2) coal with pyrite and (3) mudstone with coal. Overall succession deposited in fluvial/floodplain and marginal marine settings, with two major marine transgressions in late Early and M Miocene. Marginal marine shale best geological marker in S Pailin area)

Ng Tong San (1987)- Trap styles of the Tenggol Arch and the southern part of the Malay Basin. Bull. Geological Society Malaysia 21, p. 177-193.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1987010.pdf>)

(Tenggol Arch at S end of Malay Basin rel. stable block between Malay and Penyu E Oligocene(?) rift systems. Drape over basement topography and anticlinal features identified. Anticlines elongated with great reliefs near E flank of S Malay basin, believed to be related to M Miocene shear movement. 23 wells drilled in area, with several oil-gas discoveries)

Ngah, K. (1990)- Deposition and diagenesis of Oligocene- Lower Miocene sandstones in the Southern Malay Basin. Ph.D. Thesis Imperial College, University of London, p. 1-267.

(online at: <https://spiral.imperial.ac.uk/handle/10044/1/46470>)

*(Deposition and diagenesis of U Oligocene- Lower Miocene reservoir sandstones in S Malay basin from seismic data, cores, and well logs. Depositional model of Miocene Pulau-II Fm reservoirs. Pulau Sst interval no marine microfauna, only *Pediastrum* and common mangrove pollen; brackish water *Miliammina fusca* in Terengganu Shale. Deposited during initial marine influence in Malay Basin. Braided fluvial sst in N and NE; lower delta plain in S and SW)*

Ngah, K. (2000)- Upper Oligocene- Lower Miocene sandstone reservoirs, Southern Malay Basin. AAPG Search and Discovery Article 10008, p. 1-15.

(online at: www.searchanddiscovery.com/documents/khalid/)

(Pulau-II Fm reservoirs in S Malay basin deposited during early opening of backarc basin. Braided fluvial channel sandstones dominant in NE, tributary and tidal-channel sands dominate in S. Reservoir quality primarily result of burial diagenesis and depositional facies. Destruction of porosity by precipitation of quartz and ferroan calcite and porosity enhancement by dissolution of framework feldspars and chert. Up to 40% of porosity dissolution by meteoric water introduced during Late Miocene uplift. Porosity up to 45% in braided-channel sandstones. Poor porosity fine sandstones and some m-c sandstones buried deeper than 3000m)

Ngah, K. (2000)- Structural framework of Southeastern Malay Basin. AAPG Search and Discovery Article 10009, p. 1-7.

(online at: www.searchanddiscovery.net/documents/khalid02/index.htm)

(Malay Basin intracratonic basin in relatively stable Sunda Shelf. Extensional opening from Late Cretaceous-Late Eocene to Late Miocene. Late Miocene- Pliocene compressional phase created anticlinal hydrocarbon traps. Pliocene-Recent extensional basin rejuvenation, with extensive marine incursion. Fault trends N-S in NW Malay Basin, in S two-thirds E-W and NW-SE trends dominant. S Malay Basin relatively oil-prone)

Ngah, K., M. Madon & H.D. Tjia (1996)- Role of Pre-Tertiary fractures in formation and development of the Malay and Penyu basins. In: R. Hall & D.J. Blundell (eds.) Tectonic evolution of Southeast Asia, Geological Society, London, Special Publ. 106, p. 281-289.

(Major faults in Sundaland trend NNW to NW, WNW, N and E. Old NNW to NW, N and E-striking faults in pre-Tertiary basement of Malay and Penyu basins, reactivated before Late Oligocene and in M-Late Miocene. Common N-striking faults in pre-Tertiary of Sundaland, possibly Jurassic regional fractures. NNW-NW and WNW fractures may have originated as strike-slip faults during late Mesozoic deformation. NW-striking basement faults of Malay basin continue onshore SE Asia as Three Pagodas fault zone. M-Late Miocene stress

field change resulted in reversal of slip movement along major wrench faults and structural inversion of sedimentary basins (E-W anticlines located over half-graben))

Ngo T.S., Cu M.H., Phung K.H. & Vu M.T. (2010)- The geology and hydrocarbon potential of a Mesozoic basin in western offshore Vietnam. Proc. 46th Annual Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Vung Tau 2009, p. 4-17.

(Phu Quoc basin is Mesozoic forearc basin developed on margin of Indochina cratonic block, in contact with Sibumasu block, N of East Malay Basin. Over 8 km of Paleozoic- Mesozoic section in depocenters. Three stages: Paleozoic passive margin, Late Permian- Mesozoic forearc, Tertiary- Quaternary sag)

Noon, S. S. Rahmad, M.T. Nguyen, S.L. Chan & S. Mhd. Sabohi (2019)- High-resolution biostratigraphy: its impact on reservoir modelling, a case study from the Malay Basin. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2019), EAGE, Kuala Lumpur, p. 1-5.

Noor, H.M. (1987)- Tinggi Field- analyzing the DHIs. Bull. Geological Society Malaysia 21, p. 133-149.

(online at: www.gsm.org.my/products/702001-101131-PDF.pdf)

(Esso Tinggi oil-gas field in Malay Basin 1980 discovery with many uneconomic but hazardous shallow gas sands, with clear gas DHI's on seismic)

Noosri, R., K. Jankaew, J. Curiale, W. Choowala & N. Yamanee (2025)- Carbon dioxide distribution and origins in North Malay Basin, Gulf of Thailand. Proc. 32nd International Meeting on Organic Geochemistry (IMOG),

Porto, p. 1-2. (Abstract)

(online at: <https://www.earthdoc.org/content/papers/10.3997/2214-4609.202533279>)

(CO₂) is key component in gas reservoirs of North Malay Basin. Generally increases with depth. High CO₂ concentrations (40-90%) commonly linked to mantle or carbonate sources and are spatially associated with structural highs and deep-seated faults. Organic and mixed-origin CO₂ tends to occur near basin depocenters, where hydrocarbons display high thermal maturity)

Ong Tee Suan, M. Lambert, B. Goodin & M. Othman (2012)- Malaysia East Belumut Field: doubling a marginal field's reserves by understanding the application of "Enabling" technology. Proc. Int. Petroleum Technical Conference (IPTC), Bangkok, IPTC 14538, p. 1-11.

Osman, S., M.F. Nianamuthu, F.A. Ismail, J.J.M. Idris & J. Ping (2012)- Sepat Barat Deep-2: the deepest and hottest HPHT well in North Malay Basin. Proc. Petroleum Geology Conference Exhibition (PGCE 2012), Kuala Lumpur, Warta Geologi (Newsletter Geological Society Malaysia) 38, 2, p. 122-123.

(online at: https://gsmpubl.files.wordpress.com/2014/09/warta38_21.pdf)

(Abstract. Sepat Barat Deep-2 only well to successfully evaluate N Malay Basin deeper Group F and H deltaic sandstone reservoirs. Total depth 2768m ss. Overpressure started at 1748m, steep pressure ramp for 200m until lower Group F sand. Maximum formation pressure 7826 psi at 2623m and maximum T 340 °F. 8 new hydrocarbon bearing sands encountered with gross thickness of 69 m. F sands over-pressured reservoirs with porosity up to 24%)

Othman, M. (2008)- Angsi K-sands production performance- a case history of hydraulically fractured retrograde gas condensate reservoir. Proc. 70th EAGE Conference & Exhibition, Rome, SPE-113816, p. 1-10.

(Angsi field 170km off Terengganu. Hydrocarbons in Group I, J and K sandstones of Lower Oligocene- M Miocene age. Lower Miocene K-sand is first tight gas reservoir development in Malaysia, developed in 2002. Hydraulic fracturing improved well deliverability, but production declined relatively fast, then stabilized at very low rate due to condensate banking)

Oudomugsorn, P., C. Rojanachan & K. Sakdejayont (1987)- Evaluation of the petroleum potential of the western basin, Gulf of Thailand. Proc. 23rd Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Madang 1986, 2, p. 80-97.

(Western basin in N Gulf of Thailand is N-S trending Early Tertiary rift basin. Possibly >3500m of Oligocene-Recent sediments, mainly in fluvial- lacustrine facies. Less than 400m of sediment over basement highs)

Paibon, P. & R. Kawphoy (2025)- Improving CO₂ prediction at the r eservoir Level Using Gas Samples: Case study in Pattani Basin, Gulf of Thailand. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, SEC 2025, Singapore, 12p. (Abstract + Presentation)

(CO₂ is common inert gas in Pattani basin, Gulf of Thailand. Nine CO₂ trends identified in study area. CO₂ tends to increase with depth from M Miocene into E Miocene reservoirs. Etc. (no numbers on CO₂ graphs!?!; JTvG))

Paramita, D. (2012)- Structural evolution of the Songkhla Basin, Gulf of Thailand: a palinspastic restoration Study. Bull. Earth Sciences Thailand (BEST) 5, 2, p. 38-47.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246568/167619>)

(Songhla Basin in Gulf of Thailand N-S trending, Eocene rift basin. Early Oligocene and Late Oligocene- E Miocene local inversion structures at E and W sides of basin in overall extensional regime)

Pedersen, S.A.S., L.O. Boldreel, E.B.Madsen, M.B.Filttenborg & L.H. Nielsen (2010)- Thin-skinned thrust-fault tectonics offshore south-west Vietnam. Geological Survey Denmark Greenland Bull. 20, p. 99-102.

(online at: www.geus.dk/publications/bull/nr20/nr20_p099-102.pdf)

(Phu Quoc basin SW of Vietnam in NE Gulf of Thailand underlain by thin-skinned thrust-fault complex concealed by Neogene marine sediments. Fold belt continues into hills at border between Vietnam of Cambodia and Kampot foldbelt. Width of tectonic complex ~200 km wide; shortening ~50%. Deformation of sedimentary succession in E-M Cretaceous (documented by biostratigraphical studies on Phu Quoc island) and tied to subduction of Pacific Ocean plate. Piggy-back basins formed during displacement along thrust faults. Translations 3-8 km from E to W. See also Madsen et al. 2012))

Petersen, H.I., A. Mathiesen, M.B.W. Fyhn, N.T. Dau, J.A. Bojesen-Koefoed, H. Nielsen & H.P. Nytoft (2011)- Modeling of petroleum generation in the Vietnamese part of the Malay Basin using measured kinetics. American Assoc. Petroleum Geol. (AAPG) Bull. 95, 4, p. 509-536.

(2-D modeling of hydrocarbon generation for Malay-Cho Thu Basin in Gulf of Thailand-S China Sea. Source rocks comprise Oligocene synrift lacustrine mudstones and coals, postrift coals, and coaly mudstones. Main play risks include timing of generation from oil-prone lacustrine synrift deposits relative to structural trap formation and relatively small kitchen areas. Minor contribution from lacustrine deposits after principal trap formation consistent with prominent terrigenous geochemical signature of oils in basin)

Petersen, H.I., N. Sherwood, A. Mathiesen, M.B.W. Fyhn, N.T. Dau, N. Russell, J.A. Bojesen-Koefoed & L.A. Nielsen (2009)- Application of integrated vitrinite reflectance and FMM analyses for thermal maturity assessment of the northeastern Malay Basin, offshore Vietnam: implications for petroleum prospectivity evaluation. Marine and Petroleum Geology 26, p. 319-332.

(In NE Vietnam part of Malay Basin oil- gas discovery well 46-CN-1x encountered a ~55 m of lacustrine mudstones with good potential as oil source. Vitrinite reflectance (VR) measurements may be suppressed in alginite-bearing rocks by 0.14%. Modelled temperature histories indicate onset of hydrocarbon generation for the uppermost Oligocene source rocks between 2 Ma and present-day, which post-dates trap formation)

PETRONAS (1999)- The petroleum geology and resources of Malaysia. Petroliaam Nasional Berhad (Petronas) Press, Kuala Lumpur, 665p.

(Major review of Malaysian basins and hydrocarbons by collective of authors. Many of the chapters listed here separately)

PETRONAS (2007)- Chronostratigraphic chart of the Cenozoic and Mesozoic basins of Malaysia. Petroliaam Nasional Berhad, Kuala Lumpur, p. 1-71.

(Elegant review of Cenozoic chronostratigraphy, sequence stratigraphy, biostratigraphy and unconformities of Malaysian basins (incl. Malay Basin, Malacca Straits, Sarawak, Sabah. With extensive reference list)

- Phoosongsee, J. & C.K. Morley (2019)- Evolution of a major extensional boundary fault system during multi-phase rifting in the Songkhla Basin, Gulf of Thailand. *J. Asian Earth Sciences* 172, p. 1-13.
(N-S trending Songkhla rift basin in SW Gulf of Thailand is half-graben structure that developed in phases between Late Eocene and early M Miocene. Two phases of rifting in are Eocene-Oligocene in E and Oligocene-Miocene in W Gulf of Thailand and onshore. Songkhla: Eocene early rift; (2) Oligocene- E Miocene late rift (3) M Miocene and younger post-rift)
- Phoosongsee, J., C.K. Morley & A.J. Ferguson (2019)- Quantitative interpretation of seismic attributes for reservoir characterization of Early-Middle Miocene syn- and post-rift successions (Songkhla Basin, Gulf of Thailand). *Marine and Petroleum Geology* 109, p. 791-807.
(Hydrocarbon reservoirs in Gulf of Thailand mainly in E-M Miocene and predominantly fluvial channels. In Songkhla Basin two distinctive channel characteristics: (A) N-S oriented meandering channel complexes, developed during late syn-rift (upper E Miocene), (B) NE-SW oriented long, narrow fluvial channels with tidal and marine influence in post-rift phase I (M Miocene))
- Pigott, J.D. & N. Sattayarak (1993)- Aspects of sedimentary basin evolution assessed through subsidence analysis. Example: northern Gulf of Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 407-420.
(Oligocene- Recent subsidence analysis suggests N Gulf of Thailand basins exhibit time-transient characteristics of cratonic rift and wrench style basins; basin evolution varied in time and space)
- Pigott, J.D., R. Zhai, K.L. Pigott & T. Tonianse (2012)- Searching for the missing link: The regressive system tract- seismic stratigraphic evidence from the Southern Gulf of Thailand In: Int. Petroleum Technology Conference (IPTC), Bangkok 2012, IPTC 15113, p. 1-21.
(Seismic stratigraphic and geomorphic analysis of 3D seismic from S Gulf of Thailand reveal preservation of complete eustatic cycle on Quaternary tropical coastal plain periodically affected by oscillating sea levels. Aggradational interfluvial coastal plain records mainly Highstand Systems Tract)
- Polchai, T. (2011)- Depositional environment and facies in Units 2A, 2B and 2C of the Graben Trend in Arthit Field, North Malay Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 4, 2, p. 108-111.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246528/167972>)
(Arthit field at NW margin of N Malay Basin, with ?Miocene sandstone reservoirs deposited in tide-dominated shoreline setting)
- Pongwapee, S., C.K. Morley & Krit Won-in (2019)- Impact of pre-existing fabrics and multi-phase oblique extension on Cenozoic fault patterns, Wichianburi sub-basin of the Phetchabun rift, Thailand. *J. Structural Geology* 118, p. 340-361.
(Cenozoic fault patterns associated with rift development in Wichianburi sub-basin show controls at different scales, including influence by margin of Permian basin and NW-SE to NE-SW trending Triassic folds/ faults. Regional change from E-W to NW-SE extension in M Miocene)
- Praditan, S. (1990)- Calculation of heat flow of the Tertiary basins in the Gulf of Thailand. In: B. Elishewitz (ed.) Proc. CCOP Heat Flow Workshop III, Bangkok 1988, United Nations ESCAP, CCOP, Technical Publication 21, p. 99-106.
(Heatflow values from 9 wells in Gulf of Thailand rel. high)
- Praditan, S. & R. Dook (1992)- Petroleum geology of the northern part of the Gulf of Thailand. In: C. Piencharoen (ed.) Proc. Nat. Conf. Geologic resources of Thailand: potential for future development, Bangkok, Dept. Mineral Resources, p. 235-246.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6222.pdf)
(Numerous Tertiary intra-cratonic rift basins in N Gulf of Thailand: Sakon, Paknam, Hua Hin, NW, W, Kra, East Kra, North Kra, Prachuap, Chumphon and N pat of Pattani basin. Tertiary sediments almost entirely non-marine, with limited biostratigraphic controls. three lower units synrift fluvial and lacustrine facies, upper unit Late Miocene- Recent post-rift. Locally organic-rich lacustrine source rocks)

Praditnan, S. & S. Polachen (1990)- TH-40 sandstone play Hua Hin Basin, Thailand. In: CCOP/WRGA Play modelling exercise 1989-1990, United Nations ESCAP, CCOP, Technical Publication 23, p. 97-112.
(*Assessment of undiscovered hydrocarbons and play description of TH-40 Oligocene stacked fluvio-lacustrine sands in rotated fault blocks in Hua Hin Basin, N Gulf of Thailand*)

Praditnan, S.C. Singhasene & R. Charusirisawad (1990)- Stratigraphy of Tertiary basins in the Gulf of Thailand. Proc. Development geology for Thailand into the year 2000, Chulalongkorn University, Bangkok 1990, p. 408-429.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1990/24729.pdf)
(*Stratigraphy of multiple Oligo-Miocene rift basins in Gulf of Thailand*))

Praidee, A. (2013)- Controls on reservoir geometry and distribution, Tantawan Field, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 6, 2, p. 1-10.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246620/167643>)
(*On M Miocene gas sands reservoirs in Tantawan gas field in Pattani Basin, Gulf of Thailand*)

Priyanto, B., M.N. Ahmad & P. Rowell (2013)- Delineation of rift-related Miocene fluvial sands in the Gulf of Thailand using seismic inversion techniques. Proc. 37th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA13-G-022, p. 1-9.
(*Gulf of Thailand basins form series of en-echelon grabens and half-graben systems, with main gas reservoirs in Lower-Middle Miocene fluvial sands. Seismic inversion techniques used to map reservoir sands*)

Puchała, R.J., S.J. Porebski, W.R. Sliwinski & C.J. August (2011)- Pleistocene to Holocene transition in the central basin of the Gulf of Thailand, based on geoacoustic survey and radiocarbon ages. Marine Geology 288, p. 103-111.
(*Acoustic and coring record of Last Glacial Maximum and postglacial sea-level rise in central Gulf of Thailand. Valley incision (Kelantan River), followed by estuarine- marine transgression, interrupted by deltaic progradation. Transgressive ravinement followed by thin, condensed cover of modern marine muds*)

Putthapiban, P., W. Chantong, P. Srisuwon, C. Praipiban & P. Pananont (2012)- Geothermal and seismic evidence for a southeastern continuation of the Three Pagodas Fault zone into the Gulf of Thailand. Songklanakarin J. Science Technology (SJST) 34, 4, p. 445-452
(online at: <https://www.thaiscience.info/journals/Article/SONG/10891195.pdf>)
(*NW-SE trending Three Pagodas strike-slip fault in C Thailand continues SE into Gulf of Thailand*))

Radovich, B.J. (1997)- Proximal nonmarine sequence stratigraphy, reservoir quality and tectonic controls in the southern Gulf of Thailand. In: K.W. Shanley & B.F. Perkins (eds.) Shallow marine and nonmarine reservoirs: sequence stratigraphy, reservoir architecture and production characteristics, 18th Annual Research Conference Gulf Coast section SEPM Foundation, 18, p. 235-244.
(*Texaco 1994 Mayura 1 well in S Pattani Basin of Gulf of Thailand drilled on the ramp side of half-graben. Numerous oil shows in nonmarine reservoirs in synrift section. Permeability of reservoir units compromised by kaolinite in pore system. Typical sequence composed of stacked, fining-upward parasequences that aggrade during times of relative base level rise*)

Radzi, A., Y. Bazleigh & A. Khalil (2016)- Quantifying the uncertainty of Gross Rock Volume: a decade of time-to-depth conversion in Sepat Field, Malay Basin. First Break 34, p. 73-77.
(*On estimates of GRV from seismic data in Sepat Field in Malay Basin (1983 discovery, structure 30km x 10 km E-W trending structure dissected by normal faults)*)

Ramli, N. (1986)- Depositional model of a Miocene barred wave- and storm-dominated shoreface and shelf, SE Malay Basin. American Assoc. Petroleum Geol. (AAPG) Bull. 70, 1, p. 34-47.
(*J sandstone reservoir in SE Malay basin composed of shoreface and offshore sediments. Barred wave- and storm-dominated shoreface, laterally associated with stacked offshore bars*)

Ramli, N. (1988)- Characteristics of J Sandstone (Tapis Formation) reservoirs in the Southeastern part of the Malay Basin, Offshore West Malaysia. In: Offshore South East Asia Conference 1988, Singapore, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 8, p. 239-248.

(Reservoir quality of Miocene J sandstone mainly controlled by sedimentary texture (absence of bioturbation) and presence of secondary porosity)

Ramli, M.N. (1988)- Humid tropical fan-delta sedimentation: an ancient model from the 'K' sandstones (Late Oligocene-Early Miocene), SE part of the Malay basin, offshore W Malaysia. In: W. Nemec & R.J. Steel (eds.) Fan deltas and related systems: sedimentology and tectonic settings, Blackie & Son Publishers, Glasgow, p. 341-353.

Ramli, M.N. (1988)- Stratigraphy and paleofacies development of Carigali's operating areas in the Malay basin. Bull. Geological Society Malaysia 22, p. 153-187.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1988008.pdf>)

(Stratigraphic scheme, cross-sections and paleofacies maps for Late Oligocene-Pliocene in Malay Basin Blocks PM 6 and PM 12)

Ramli, M.N. (1989)- Stratigraphy and paleofacies development of Carigali's operating areas in the Malay basin, South China Sea. In: B. Situmorang (ed.) Proc. 6th Regional Conference Geology mineral hydrocarbon Resources of SE Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 171-196.

(Similar to Ramli (1988). New time-stratigraphic scheme and regional Late Oligocene- Pliocene paleofacies maps for blocks PM6 and PM12. Predominantly coastal plain- fluviomarine facies)

Rashid, N.S. (2014)- Depositional system and facies analysis in the Central Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 146-153.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246666/167669>)

(Study of reservoir architecture and sand distribution from 47 development wells in N-S trending fluvial meander belts in E-M Miocene of C Pattani Basin)

Reijnenstein, H.M., H.W. Posamentier & J.P. Bhattacharya (2011)- Seismic geomorphology and high-resolution seismic stratigraphy of inner-shelf fluvial, estuarine, deltaic, and marine sequences, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 95, 11, p. 1959-1990.

(3-D seismic-derived images of channels in Pleistocene fluvial, estuarine, marine, and deltaic depositional systems in the upper 80m of central Gulf of Thailand continental shelf. Most fluvial systems lie within incised valleys in lower parts of each depositional sequence)

Restrepo-Pace, P.A., M. Dalrymple & R. Morley (2014)- Finding new exploration targets in 'mature' petroleum basins offshore Thailand: all about nuance. AAPG International Conference Exhib., Istanbul 2014, Search and Discovery Article 10696, p. 1-5. *(Extended Abstract)*

(Thailand's offshore Tertiary basins yielded nearly 5 BBOE (~80% gas). Exploration started in 1970s and peaked by mid 1990s. Some fields in N Pattani Basin with significant oil (Jasmine, 60 MMBO). Eocene-Oligocene NW-SE grabens, overprinted by narrow N-S faulted depocenters developed during Miocene 'back-arc' stretching of continental Sundaland crust. Basins fill: lower synrift lake/fluvial deposits, post -rift fluvial sequences and drowning brackish intertidal to marine succession. Hydrocarbons sourced from synrift lacustrine shales. Mature stage of exploration, but complex trapping mechanisms still have exploration potential)

Restrepo-Pace, P., S. King, R. Jones, C. Goulder, Y. Ah Chim & C. Russell (2010)- The Penyu Basin revisited: the abandoned 'mate' of the Malay-Natuna Basin. Proc. Petrol. Geological Conference Exhib., Kuala Lumpur 2010, Geological Society Malaysia, p. 141-144. *(Extended Abstract)*

(Penyu basin transtensional-transpressional basin that developed coeval to Malay Basin to N. No commercial discoveries yet made on Malaysian side of basin, but straddling Malay- Penyu basin is ~350-400 MMBO Belida field, an inverted structure on basement ridge that separates Malay from Penyu basin, and not underpinned by

source rock. Distinctive oil signature may be linked to contribution from Penyu source. Rhu oil discovery indicates working petroleum system within Penyu)

Rinsiri, T. (2021)- Sand distribution and depositional environments East Yala Field, Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 112-118.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246529/167593>)

((Miocene?) Fluvial-dominated sands in main hydrocarbon-bearing reservoir units E-F in East Yala Field, Pattani Basin, C Gulf of Thailand)

Rivas, S., J.O.W. Grimmer, A. Alaminos & J. Navarro (2017)- Basin modelling at the Songkhla Basin (Gulf of Thailand) or: How many source rocks do I have? AAPG/SEG Int. Conf. Exhib., Barcelona 2016, Search and Discovery Article 10922, p. 1-10. (Abstract + Presentation)

(online at: www.searchanddiscovery.com/documents/2017/10922rivas/ndx_rivas.pdf)

(Songkhla basin in W Gulf of Thailand, with several producing oil fields. Asymmetric Tertiary rift basin formed between 40-20 Ma, controlled by NNW-SSE faults mainly at W side, filled by Eocene-Miocene continental sequence. Reservoir intervals fluvial- alluvial sandstones of Eocene, Lower Oligocene and Lower Miocene age. Lower Oligocene lacustrine shales supposed source rocks of basin)

Robinson, K. (1985)- Assessment of undiscovered conventionally recoverable petroleum resources in Tertiary sedimentary basins of Malaysia and Brunei. Bull. Geological Society Malaysia 18, p. 119-131.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1985005.pdf>)

Said, A. (1982)- Overview of exploration for petroleum in Malaysia under the PSC's. Proc. Offshore South East Asia Conference (OFFSEA 82), p. 1-14.

Salam, O.A., S.A. Aziz & M.Y. Ali (2008)- Pre-Tertiary carbonate play, offshore Peninsula Malaysia, a revival of forgotten play. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2008, Paper 25, Geological Society Malaysia, p. 177-181.

(In early 1970's sections of Pre-Tertiary carbonates, 8 -492m thick, tested dry at three localities on Sotong and Bunga Raya structures. New potential Pre-Tertiary carbonate plays identified on 'basement' highs in S Malay Basin near Sotong and Tenggol Arch areas. Model requires mature Oligocene lacustrine source rocks in adjacent deeper grabens)

Samorn, H. (2006)- Fluvial reservoir architecture from near surface 3-D seismic data, Block B8/32, Gulf of Thailand. M.S. Thesis, Colorado School of Mines, p. 1-156. (Unpublished)

Sasaki, A. (1986)- Geological studies on origin of carbon dioxide in Platong Field, Gulf of Thailand. J. Japanese Association for Petroleum Technology 51, 3, p. 218-227.

(online at: [www.journalarchive.jst.go.jp/..](http://www.journalarchive.jst.go.jp/))

(In Japanese, with English abstract) (Platong gas field CO₂ content average 15%, locally >40%. Most CO₂ in nearby Natuna, Malay, N Sumatra basins tied to carbonates, but here believed to be generated from woody-coaly kerogens during thermal diagenesis, and also from 'magmatic origin' through faults)

Schenk, O., Ching Tu, H. Maulana, P. Mullin, A. Hassan, F. Ali et al. (2023)- Revisiting the hydrocarbon prospectivity of the Penyu Basin, offshore Malaysia. Third SEG-AAPG International Meeting for Applied Geoscience & Energy (IMAGE23), Houston, p. 1-5.

(Penyu Basin offshore Eastern Malay Peninsula, with only 17 wells drilled in 50-years, suggesting area is underexplored. Sediment thickness up to ~ 9 km, mainly Eo-Oligocene rift fill and-Mio-Pliocene post-rift sediments in non-marine facies, and similar to producing West Natuna Basin).

Shahar, S. (2008)- Structural evolution of the Tenggol Arch and its implication for basement fracture patterns in the Malay Basin, Malaysia. Masters Thesis Durham University, p. 1-324. (Unpublished)

(online at: <http://etheses.dur.ac.uk/2233/>)

(Evaluation of fracture patterns and hydrocarbon potential of Tenggol Arch, a basement high at W margin of Malay Basin)

Shamsudin Jirin & R.J. Morley (2006)- Integration of biostratigraphy with seismic for sequence stratigraphic interpretation in the Malay basin. Proc. Petroleum Geology Conference and Exhibition (PGCE 2006), Kuala Lumpur, p. 101-102. *(Extended Abstract)*

(online at: <https://www.earthdoc.org/docserver/fulltext/2214-4609/256/P22.pdf>)

(Brief discussion of criteria for recognition of transgressive-regressive sequences from palynology assemblages and seismic lines. 21 sequences recognised in Oligocene- Pleistocene interval of Malay Basin (see also Morley et al., 2021))

Shamsudin Jirin, R.J. Morley, M. Mohamed & S.S. Hasan (2011)- Characterisation of peat forming environments of Miocene coal using biofacies in the Malay basin, Malaysia Proc. Petroleum Geology Conf. Exhibition, Kuala Lumpur 2011, Geology Paper 14, Warta Geologi 37, 1, p 37. *(Abstract)*

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100396-PDF.pdf)

(Coals common in Miocene paralic successions in Malay Basin. Four types of peat-forming environments recognized by biofacies analysis: (1) basinal (most common; begin as topogeneous peats and develop into domed, ombrotrophic peats at later stage; widespread peat type across SE Asia and frequently form thick coals in Malay Basin; (2) watershed or 'kerapah', (3) brackish/marine' and (4) freshwater alluvial peats)

Shing, C.Y. (1992)- Petrographic and diagenetic studies of the reservoir sandstone of the Malay Basin. Bull. Geological Society Malaysia 32, p. 261-283.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1992027.pdf>)

(Reservoir properties of Late Oligocene-Miocene sandstones of Malay Basin depend on depositional facies, mineralogy and burial diagenesis. Oldest sandstones (Group K) mainly m-grained braided stream deposits, J sandstones f-m brackish- shallow marine; E to I zones sandstones generally fine, matrix-rich estuarine deposits. Clean sands prone to quartz cementation. Secondary porosity generated by dissolution of feldspars, etc. Porosity decreases significantly with depth in sandstones of all groups)

Shoup, R. (2008)- Paleogeographic reconstruction of the Arthit area, North Malay Basin. Proc. International Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 375-381.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/112.pdf)

(Paleogeographic evolution of Arthit area, one of Gulf of Thailand E Tertiary rift basins. No age control)

Shoup, R.C., R.J. Morley, T. Swiecicki & S. Clark (2012)- Tectono-stratigraphic framework and Tertiary paleogeography of Southeast Asia: Gulf of Thailand to South Vietnam shelf. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 30246, p. 1-16. *(Abstract and Presentation package)*

(online at: www.searchanddiscovery.com/documents/2012/30246shoup/ndx_shoup.pdf)

(Top Basement map and Oligocene- Miocene paleogeography maps of Tertiary rift basins in Gulf of Thailand- Malay Basin- Natuna- S Vietnam shelf)

Sidik, S.H., Khairul Azlan Mustapha & Alok Kumar (2023)- Biological markers, oil-oil and oil-source correlation of Miocene source rocks and crude oils from Malaysia-Thailand Joint Development Area (JDA), North Malay Basin. Social Science Research Network, Electronic journal, p. 1-29.

(manuscript online at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4467693)

(Hydrocarbons most likely originated from deeper interval Group I source rock, migrated via numerous faults.)

Singh, H. (2005)- The occurrence and exploitation of Malaysian oil and gas resources. In: Oil-industry history, Petroleum History Institute, Meadville, 6, 1, p. 129-152.

Singh, I. & C.H. Ford (1982)- The occurrence, causes and detection of abnormal pressure in the Malay Basin. Proc. Offshore Southeast Asia 82 Conf. (OFFSEA 82), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 1-11.

(Abnormal pressure present throughout Malay Basin, except in SW and NE margins. Attributed to rapid burial, faulting and hydrocarbon column effects)

Sunico, R.J.S. (2021)- Seismic geomorphology of fluvial systems from Pleistocene to Recent in Southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 354-362.

(<https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246705/167697>)

(Architecture of fluvial systems in Pleistocene- Recent on 3D seismic time slices in SE margin of Pattani Basin, Gulf of Thailand)

Supriatna, J.M. (2011)- Maturity modeling of the Songkhla Basin. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 32-35.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246514/167577>)

(Maturation level of lacustrine ?Eocene-Oligocene source rock in Songkhla Basin half-graben in W Gulf of Thailand is early-middle mature. Oil generation started in ~M Miocene)

Tan, D.N.K. (2009)- Malay and Penyu Basins. In: C.S. Hutchison & D.N.K. Tan (eds.) The geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 175-196.

Tang, M., A.C. Yee, S. King, R.A. Jones, M. Farouki, K. Agbebi, Z. Ye & A. Betteridge (2013)- The geology of the Tenggol Arch, offshore Peninsular Malaysia. In: Petroleum Geoscience Conf. Exhib. (PGCE 2013), Kuala Lumpur, O54, p. 1-4. *(Extended Abstract)*

(Tenggol Arch Pre-Tertiary structural high is remnant of collapse of regional domal uplift associated with failed rift triple junction of Malay, Penyu and W Natuna Basins. N and S flanks of Tenggol Arch low-angle ramps into Malay and Penyu Basins. Pre-Tertiary basement on crest of arch at 1500m to 2000m depth. Composed of two distinct seismic facies: (1) transparent facies of high grade metamorphic and granitic rocks and (2) layered facies of sedimentary and low-grade metasediments of most likely Mesozoic age)

Thakharw, A. (2010)- Trap mechanism in the Southern Kra Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST), 3, 2, p. 1-4.

(online at: http://cupetrogeoscience.com/BEST_Thakharw,%20A%20.pdf)

(Main trap styles in S Kra Basin, Gulf of Thailand, NE-SW trending listric normal faults that extend into post-rift reservoir. Faults usually trap hydrocarbons on up-thrown sides. Fault traps higher probability for trapping and sealing basinward, where there is thick shale and large fault throws; traps on basin edge low potential)

The, R., J. Pringle, K. Brazier, G. Peace, A. Laird & R. Kudisri (2013)- Songkhla D and E, exploration & development. Proc. SE Asia Petroleum Exploration Soc (SEAPEX) Conference 2013, Singapore, p. 1-8.

(Presentation) (online at: www.seapex.org/im_images/pdf/Simon/13%20Ronald%20The_Coastal%20Energy%20Songkhla%20D&E_SEC%202013.pdf)

(Brief summary of Songkhla oil field discovery and development in stacked Miocene fluvial sand reservoirs in S Gulf of Thailand (other reports suggest reservoir sands of Oligocene age; JTvG))

Tingay, M., C.K. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, H. Macintyre & Suwit Pabchanda (2012)- Origin and distribution of overpressure in the Northern Malay Basin. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 41103, p. *(Presentation)*

(online at: www.searchanddiscovery.com/documents/2012/41103tingay/ndx_tingay.pdf)

(Gas generation accounts for ~46-67% of measured excess pore pressure in N Malay basin, with remaining 33-54% generated by coincident disequilibrium compaction)

Tingay, M., C. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, S. Pabchanda & H. Macintyre (2012)- Overpressures in the Northern Malay Basin: part 1- origin and distribution. International Petroleum Technical Conference (IPTC), Bangkok 2012, 4, IPTC 15345, p. 3260-3271.

(see also companion paper Limpornpipat et al. (2012) for Part 2. Pore pressure data and sonic velocity-vertical effective stress plots from 31 wells reveal overpressures in N Malay Basin mainly generated by fluid expansion)

within 2A, 2B and 2C source rock formations. Gas generation accounts for ~70-50% of excess pore pressure in region, with remaining 30-50% generated by coincident disequilibrium compaction)

Tingay, M.R.P., C.K. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, S. Pabchanda & H.R. Macintyre (2013)- Evidence for overpressure generation by kerogen-to-gas maturation in the northern Malay Basin. *American Assoc. Petroleum Geol. (AAPG) Bull.* 97, 4, p. 639-672.

(Pore-fluid pressure data and sonic velocity-vertical effective stress plots from 30 wells reveal overpressures in N Malay Basin primarily generated by fluid expansion and are located within Miocene 2A, 2B, and 2C source rock formations. Association of fluid expansion overpressures with gas, combined with sonic density response to overpressure and regional geology that precludes other overpressuring mechanisms, provides in-situ evidence for basinwide gas generation overpressuring. Gas generation accounts for ~1/2 to 2/3 of measured excess pore pressure in region, with remainder generated by coincident disequilibrium compaction)

Tjia, H.D. (1994)- Inversion tectonics in the Malay Basin: evidence and timing of events. *Bull. Geological Society Malaysia* 36, p. 119-126.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994027.pdf>)

(Pre-Oligocene half grabens of Malay Basin are pull-apart depressions formed by dextral divergent wrenching. Oligocene- U Miocene sediment fill subjected to compressional deformation, probably in Late Miocene. Extensional regime attributed to 'extrusion' of continental SE Asia and Malay Basin basement due to hard collision between India with Asian Plate. Miocene regional compression probably result of change in motion of Pacific Plate from earlier NNW direction to W-ward direction, combined with N-ward progression of Indo-Australian Plate)

Tjia, H.D. (1998)- Origin and tectonic development of Malay-Penyu-West Natuna basins. *Bull. Geological Society Malaysia* 42, p. 147-160.

(online at: www.gsm.org.my/products/702001-100849-PDF.pdf)

(Late Cretaceous hot spot arched up continental crust of N Sunda Shelf into Malay Dome. Crest broke into three rift arms, now represented by Malay, Penyu and W Natuna basins. Triple junction is still one of highest heat-flow areas of region. Hot spot activity ended by M Eocene, allowing basins to become aulacogens with up to 12 km thick Oligocene and younger sediments. Widespread M Miocene fault inversions and unconformity may be tied to end of South China Sea spreading and end of subduction along N Borneo margin)

Tjia, H.D. (2000)- Tectonic and structural development of Cenozoic basins of Malaysia. *Proc. Geological Society Malaysia, Annual Geological Conference 2000, Penang*, p. 3-16.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_01.pdf)

(Cenozoic Malaysian basins in: (1) interior of semi-cratonic continental crust (Malay and Penyu basins); (2) marginal belts of semi-cratonic continental crust (small basins of Strait of Melaka and onshore Peninsular Malaysia); (3) straddling collisional plate boundaries (Sarawak and NW Sabah basins); (4) associated with microcontinent (Sandakan, Labuk Bay, Malawali and Tidung basins). Basins may develop as (a) aulacogens above mantle-plume dome (Malay and Penyu); (b) pull-aparts where wrench faulting is dominant (onshore basins of Peninsular Malaysia and Malacca Straits; inverted structures common). (c) At collisional plate boundaries; (d) NE Sabah and Tidung basins originated as rifts in breakup of E Sabah microcontinent)

Tjia, H.D. (2010)- Growing evidence of active deformation in the Malay basin region. *Bull. Geological Society Malaysia* 56, p. 35-40.

(online at: <https://gsmpubl.files.wordpress.com/2014/08/bgsm2010005.pdf>)

Very young crustal movements in Malay basin region point to possibility of late reactivation of regional faults. Malay basin originated in Late Cretaceous as aulacogen on Malay Dome, modified by sinistral transtensional wrenching, post M Miocene transpression and general structural inversion. From Pliocene onward most of basin area considered tectonically quiet, but basement-rooted regional fault zones may intrude into Pliocene-Pleistocene strata and almost reach seabed)

Tjia, H.D., Z. Mohamed, A.S.M. Saad, A. Ridhwan, A. Rahim, J. Baharom et al. (2010)- In the quest of open fractures in the crystalline basement of the Malay and Penyu Basins. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2010, p. *(Extended Abstract)*

Tjia, H.D. & M.I. Ismail (1994)- Tectonic implications of well-bore breakouts in Malaysian basins. Bull. Geological Society Malaysia 36, p. 175-186.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994032.pdf>)

(In Sarawak Basin well-bore breakout directions follow change of tectonic grain in Rajang Accretionary Prism and major tectonic boundaries (W Baram Line, etc.)) and rotations of certain tectonic domains. Other sets directions associated with SW segment of S China Sea spreading ridge. Breakout patterns in Sabah Basin differentiate SW and NE domains which experienced 25° CW rotation. Sandakan Basin experienced compression normal to its axis and also E-W regional compression that is active)

Trevena, A.S. & R.A. Clark (1986)- Diagenesis of sandstone reservoirs of Pattani Basin, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 70, 3, p. 299-308.

(Miocene sandstones from Pattani basin gas fields, central Gulf of Thailand, show rapid decline in porosity-permeability with depth, from rapid mechanical compaction and cementation by quartz overgrowths, kaolinite, and illite, related to high geothermal gradients. Best porosity- permeability in large pores between 915- 1980m. At greater depths most interparticle pores occluded, and porosity mainly secondary in origin)

Uttarathiyang, T. & J.D. Pigott (2008)- The unexplored post rift Oligocene deltas frontier: North Malay Basin, Thailand. Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 370-373.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/110.pdf)

(Seismic stratigraphic study of deep post-rift Oligocene deltas in Gulf of Thailand)

Tong, H., W. Naksri, E. Buffetaut, S. Suteethorn, V. Suteethorn, U. Deesri & J. Claude (2021)- Turtle remains from the Early Cretaceous of Kut Island, Gulf of Thailand. Comptes Rendus Palevol 20, 19, p. 345-349.

(online at: <https://sciencepress.mnhn.fr/fr/periodiques/comptes-rendus-palevol/20/19>)

(Isolated turtle plate from E Cretaceous of Kut Island, NE part of Gulf of Thailand. Kut beds can be correlated with Sao Khua Fm of Khorat Gp, NE Thailand)

Twarog, M.R., S.J. Culver, D.J. Mallinson, E. Leorri, B. Donovan, E. I. Harrison, H. Hindes et al. (2021)- Depositional environments and sequence stratigraphy of post-last glacial maximum incised valley-fill, Malay Basin, northern Sunda Shelf. Marine Geology 436, 106457, p.

(manuscript online at: <https://www.sciencedirect.com/science/article/abs/pii/S0025322721000396>)

16 cores in Late Quaternary sediments of N Sunda shelf, off Peninsular Malaysia. Four post-last glacial maximum (LGM) chronostratigraphic units. LGM incised valleys almost filled before post-LGM transgression)

Virdy, M.K., S. Adams, T. Kearney, S. Ross & S. Koysamran (2013)- Bualuang Oilfield, Gulf of Thailand: a success story utilising integrated field development planning. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2013, Singapore, p. 1-22. *(Abstract + Presentation)*

(online at: www.seapex.org/im_images/pdf/Simon/15%20Manjeet%20Kaur%20SEAPEX_Salamander%20Bualuang.pdf)

(Brief summary of Bualuang oil field development in stacked M Miocene fluvial sand reservoirs in W Basin of Gulf of Thailand. W Basin is N-S trending Oligocene half-graben, affected by Late Miocene transtension)

Wan Ismail Wan Yusoff (1984)- Heat flow study in the Malay Basin. United Nations ESCAP, CCOP, Technical Publication 15, p. 77-87.

Wan Ismail Wan Yusoff (1990)- Heat flow in offshore Malaysian basins. In: B. Elishewitz (ed.) Proc. CCOP Heat Flow Workshop III, Bangkok 1988, United Nations ESCAP, United Nations ESCAP, CCOP, Technical Publication 21, p. 39-54.

(Heat flows over Malay and offshore Sarawak basins variable, from normal to very high (47- 137 mW/m²). In Sabah and Sandakan basins values between 34.5- 64 mW/m²)

Wan Ismail Wan Yusoff (1993)- Geothermics of the Malay basin, offshore Malaysia. M.Sc. Thesis Durham University, p. 1-202.

(online at: http://etheses.dur.ac.uk/5537/1/5537_2976.PDF)

(Review of temperature/ heat flow data of Malay Basin from 59 exploration wells. Malay Basin average heat flow 86 mWm⁻², average geothermal gradient 47°C/km, both high. Heat flow regional highs in NW, S and C portions of basin and lower heat flow in SE and NE peripheries. Anomalous heat flow related to subsurface fluid movement and overpressures)

Waples, D.S., R. Mahadir & Meor S. Mahmood (2000)- Geochemistry of gases in the Malay Basin. AAPG International Conference & Exh. 2000, Bali, American Assoc. Petroleum Geol. (AAPG) Bull. 84, p. (Abstract only)

(Three end-member gas types in Malay Basin: biogenic, thermal and basement gas. Most gas samples mixtures. Gases with significant biogenic component limited to NE corner of basin, was probably generated locally and does not appear to offer an important exploration. Gases dominated by CO₂ predominantly sourced from basement. North central part of basin gas mainly of "normal" thermal origin, with accumulations of moderate size. "Deep" thermal gas seems to dominate over "normal" thermal gas in large accumulations)

Waples, D.S., R. Mahadir & L. Warren (1995)- Implications of vitrinite-reflectance suppression for the tectonic and thermal history of the Malay Basin. Bull. Geological Society Malaysia 37, p. 269-284.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a18.pdf>)

(Vitrinite-reflectance (Ro) values in Malay Basin wells lower than expected for high present-day geothermal gradients. Calculated Ro values can only be fitted to measured Ro data by assuming late heat pulse in last few million years. Ro may also be suppressed by abundant liptinite and perhydrous vitrinite. In alternative model paleo heat flow increased during Oligocene rifting and decayed exponentially to modern levels, leading to much earlier hydrocarbon generation)

Waples, D.S. & M. Ramly (1995)- A simple statistical method for correcting and standardizing heat flows and subsurface temperatures derived from logs. Bull. Geological Society Malaysia 37, p. 253-267.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a17.pdf>)

Waples, D.S. & M. Ramly (1996)- Geochemistry of gases in the Malay Basin. Bull. Geological Society Malaysia 39, 241-258.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1996020.pdf>)

(Three end-member gas types in Malay Basin: biogenic, thermal and basement gas. Most gas samples in Malay Basin mixtures of these. Gases with significant biogenic component limited to NE corner of basin, in small accumulations. Gases dominated by CO₂ predominantly sourced from basement. North central part of basin gas mainly of 'normal' thermal origin)

Waples, D.W., L. Warren & R. Mahadir (1994)- A thermal model for the evolution of the Malay Basin. American Assoc. Petroleum Geol. (AAPG) Bull.78, p. 1169. (Abstract only)

(Reconstruction of thermal structure of Malay Basin: (1) major heating event in last 100,000 yr; (2) low Ro values throughout basin indicates heat flow prior to heating event, only slightly higher stable cratons, (3) present-day heat flow lowest in E Malay Basin and highest in NW, where Pliocene-Pleistocene subsidence greatest. Basin evolution model: (1) slight Late Eocene extension of stable craton without high heat flow, thermal doming or rift development; (2) continued slight extension and downwarping until end of M Miocene, when local compression uplifted basement in E portion of basin, leading to 15 km of erosion in some areas; (3) stronger extensional regime throughout basin during Pliocene, causing submergence and greatest subsidence in W, accompanied by increase in heat flow. Strong subsidence (and presumably the increase in basal heat flow) began at ~5.5 Ma, but thermal effects not noted in upper section until recently)

Watcharanantakul, R. & C.K. Morley (2000)- Syn-rift and post-rift modeling of the Pattani Basin, Thailand: evidence for a ramp-flat detachment. Marine and Petroleum Geology 17, p. 937-958.

(Syn-rift section in Pattani Basin has synformal geometry atypical of rifts. Not all subsidence can be modelled as extension-related. Basin probably developed due to both extensional faulting and as synformal basin developed over ramp-flat geometry along major low-angled extensional fault in upper crust. Discrepancy suggests active mantle processes or non-uniform extension (subduction rollback) beneath Gulf of Thailand)

Woollands, M.A. & D. Haw (1976)- Tertiary stratigraphy and sedimentation in the Gulf of Thailand. In: Offshore South East Asia Conference 1976, Singapore, SE Asia Petroleum Exploration Society (SEAPEX), Paper 7, p. 1-22.

(Subdivide Tertiary of Gulf of Thailand into three major cycles of sedimentation)

Wong, R. & S.S. Karimi (2001)- Occurrences of two major transgressive cycles in the North Malay Basin and their impact on the deep reservoir potential. Proc. CCOP 37th Annual Session Bangkok 2000, 2, Technical Reports, p. 27-29.

(Two major transgressive cycles in N Malay Basin: (1) E-M Miocene Group I, H lower coastal plain sands deepening and fining upwards to M Miocene Group F marine shales; (2) U Miocene Group E and D fluvial coastal sands capped by Pliocene Group A/B marine shales. Sandy formation in Groups I, H, E, and D display high amplitude, continuous seismic signature, shale-prone Groups F and A/B weak amplitude, discontinuous seismic facies. Strong indication of deep reservoir potential below overpressured Group F shales)

Yakzan, A.M., H. Awalludin, M.N. Bahari & R.J. Morley (1996)- Integrated biostratigraphic zonation for the Malay Basin. Bull. Geological Society Malaysia 39, p. 157-184.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1996015.pdf>)

(Biostratigraphic scheme for Malay Basin based on foraminiferal, nannofossil and quantitative palynological data. Stratigraphic relationships in U Oligocene fluvial-lacustrine sediments best determined from miospores and freshwater algae. In E Miocene marine flooding surfaces characterized by benthic foraminifera not age diagnostic, but permit accurate correlations. E-M Miocene boundary marine transgressive unit dated by nannofossils and benthic foram and palynological events. Uppermost Miocene- Pleistocene marine facies dated using planktonic foraminifera and nannofossils)

Yamada, H., T. Kachi, J. Maeda & N. Hashimoto (2008)- Recent exploration and development in the Gulf of Thailand oil and gas fields- Investigation of field developing technology and application of fault seal analysis. J. Japanese Association for Petroleum Technology 73, 1, p. 74-82.

(online at: https://www.jstage.jst.go.jp/article/japt/73/1/73_1_74/_pdf/-char/en)

(in Japanese, with English abstract))

Yap, C.B. & R. Wong (1997)- Some possible new exploration ideas in the northern and western Malay Basin of Peninsular Malaysia. Proc. 6th Asean Council on Petroleum Conference and Exhibition (ASCOPE 97), Jakarta, 2, p. 177-192.

Yeo, L.G. (2008)- Investigation of the amount of erosion at the upper Miocene unconformity in the southeastern part of the Malay Basin. M.Sc. Thesis Imperial College, London, p. 1-57. *(Unpublished)*

(Malay Basin underwent inversion period in Late Miocene, which led to erosion and basin-wide unconformity. Erosion greatest in SE basin margin (up to 1400m). Paleogeographic maps support theory that inversion was initiated by rotation of Borneo. Erosion thickness little effect on hydrocarbon generation timing)

Yusak, S.A.M. (2012)- Sedimentological characterization of deeper Group M reservoirs in Malay Basin. Proc. Petroleum Geology Conference Exhibition (PGCE 2012), Kuala Lumpur, Warta Geologi (Newsletter Geological Society Malaysia) 38, 2, p. 213.

(Abstract. early Oligocene Group M sediments deposited in early rift continental sequence in braided stream to lacustrine environments)

Yu Sheng Mo & Yap Kok Thye (2019)- Malay and Penyu basins: Seismic stratigraphy and structural styles. In: Geophysical Applications in Malaysian Basins, PETRONAS, Kuala Lumpur, p. 51-68.

Zainul, A.J.B., R.B. Misman & A.J.B. Ali (1999)- Overview of petroleum resources of Malaysia. In: Petronas (1999) The petroleum geology and resources of Malaysia, p. 35-58.

(Malaysia has 8 sedimentary basins, oil is produced from the Malay, Sabah and Sarawak basins. At 1-1998 7.7 billion STB Oil and 99 TCF Gas discovered in 122 oil fields and 208 gas fields. First oil production from Miri Field in 1910. First offshore discovery in 1968: West Lutong offshore Sarawak.)

Zhang, J., Y. Lu, B. Shi, N. Xu, G. Fan, F. Lu & D. Shao (2014)- Eocene petroleum play: new petroleum system in northeast Gulf of Thailand. Haiyang Xuebao 36, 7, p. 70-76.

(online at: <http://english.hyxh.org.cn/EN/abstract/abstract4519.shtml>)

(In Chinese with English summary. NE Gulf of Thailand stronger inversion structures than elsewhere, enabling petroleum play with Eocene lacustrine source, Eocene- Oligocene deltaic sandstone reservoirs and Miocene delta front and marine shale seals)

IX.6. Malay Basin, Gulf of Thailand

Relevance for Indonesia: analogs for Natuna and nearby Sundaland Cenozoic rift basins

Abdelaziz, N. (2021)- Stratigraphic traps delineation, Southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 9, 2, p. 45–52.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/247029/167856>)

(*Seismic study of potential stratigraphic traps in Eocene- Miocene fluvio-deltaic fill of S Pattani Basin*)

Achalabhuti, C. (1976)- Petroleum geology of Thailand (Gulf of Thailand and Andaman Sea) -summary. Proc. Conf. Circum-Pacific Energy and Mineral Resources, Honolulu 1974, American Assoc. Petroleum Geol. (AAPG), Special Volume M25, p. 251-255.

Achalabhuti, C. (1981)- Natural gas deposits of Gulf of Thailand. In: M.T. Halbouty (ed.) Energy Resources of the Pacific Region, American Assoc. Petroleum Geol. (AAPG), Special Volume SG 12, p. 155-166.

(*Two commercial gas-condensate fields with reserves up to 5 TCF found in Union Oil Block 12 and Texas Pacific's concession block 15 and block 16. Union field in S Pattani trough, Texas Pacific field in N part Malay basin. Several gas-condensate reservoirs identified in E-M Miocene deltaic sandstones*)

Achalabhuti, C. (1981)- Offshore hydrocarbon production and potential of Thailand. In: M.J. Valencia (ed.) Proc. EAPI/CCOP Workshop, Honolulu 1980, Energy 6, 11, p. 1247-1254.

(*Four commercial gas/condensate fields delineated in Gulf of Thailand with gas reserves of >7 TCF. Also small amounts of crude oil in some wells. Continental woody material primary source, minor components from marine algae. Deep water drilling in Andaman Sea revealed Tertiary source beds mainly immature. Pre-Tertiary sedimentary basins beneath offshore areas of Andaman Sea and Gulf of Thailand more favorable for hydrocarbon potential*)

Ahmad, M.N. & P. Rowell (2012)- Application of spectral decomposition and seismic attributes to understand the structure and distribution of sand reservoirs within Tertiary rift basins of Gulf of Thailand. AAPG Annual Convention Exh., Long Beach 2012, Search and Discovery Article 40992, p. 1-32. (*Abstract/ Presentation*)

Ahmad, M.N. & P. Rowell (2012)- Application of spectral decomposition and seismic attributes to understand the structure and distribution of sand reservoirs within Tertiary Rift Basins of Gulf of Thailand. The Leading Edge 31, 6, p. 630-634.

(*Same story as Ahmad and Rowell (2012), above*)

Ahmad, M.N. & P. Rowell (2013)- Mapping of fluvial sand system using rock physics analysis and simultaneous inversion for density: case study from the Gulf of Thailand. First Break 31, p. 49-54.

Ali, M.F., K.A. Mustapha, M. Madon, S.H. Sidik, A.Z. Ishak, G. Brink, J. Hernandez et al. (2022)- Reconstruction of the gross depositional environment evolution in the northern Malay Basin, Malaysia-Thailand joint development area (MTJDA). Marine and Petroleum Geology 144, 105836, p. 1-21.

(online at: <https://www.sciencedirect.com/science/article/pii/S0264817222003142>)

(*Overview of stratigraphy, facies and paleogeography of Oligocene- E Miocene syn-rift and E-M Miocene post-rift successions of N Malay Basin*)

Almasgari, A.A., M. Elsaadany, A.H.A. Latiff, M. Hermana et al. (2020)- Application of seismic attributes to delineate the geological features of the Malay Basin. Bull. Geological Society Malaysia 69, p. 97-110.

(online at: <https://gsm.org.my/products/702001-101830-PDF.pdf>)

Alqahtani, F.A., C.A.L. Jackson, H.D. Johnson & M.R.B. Som (2017)- Controls on the geometry and evolution of humid-tropical fluvial systems: insights from 3D seismic geomorphological analysis of the Malay Basin, Sunda Shelf, Southeast Asia. Journal of Sedimentary Research 87, 1, p. 17-40.

(High-resolution 3D seismic data from Malay Basin Pleistocene- Recent shows six fluvial channel types in eight 18-145m thick depositional units, with (1) relatively large (300-3000m wide, 15-45m deep) and straight channels at bases, and (2) smaller (75-250m wide, 8-23m deep), highly sinuous channels at tops. Cyclical architecture interpreted as mainly climatically driven changes in fluvial sediment supply. Two large incised valleys interpreted to be formed due relative sea-level fall during Last Glacial Maximum)

Alqahtani, F.A., H.D. Johnson, C.A.L. Jackson & M.R.B. Som (2015)- Nature, origin and evolution of a Late Pleistocene incised valley-fill, Sunda Shelf, Southeast Asia. *Sedimentology* 62, 4, p. 1198-1232.
(Analysis of 3D seismic data over large (18km wide, 80m deep and >180km long), well-imaged Late Pleistocene incised valley from Malay Basin, Sunda Shelf, S China Sea ('Paleo-Choa Phraya-Johore valley'))

Ampaiwan, T., Minarwan, P. Swire & P. Tognini & P. Charusiri (2016)- Hydrocarbon prospectivity definition, the Kra Basin, Northern Gulf of Thailand. AAPG Geoscience Techn. Workshop Characterization of Asian hydrocarbon reservoirs, Bangkok, Search and Discovery Article 20357, p. 1-10. *(Extended Abstract)*
(online at: www.searchanddiscovery.com/documents/2016/20357ampaiwan/ndx_ampaiwan.pdf)
(Kra basin in NW Gulf of Thailand is Tertiary N-S rifted, mainly lacustrine basin with hydrocarbon discoveries (Manora Field, Malida well). Top zone VIMT 50 marks top syn-rift mainly lacustrine section and also regional M Miocene Unconformity. Above syn-rift section mainly M- Late Miocene fluvial section. Post-Oligocene source rock potential)

Armitage, J.H. & C. Viotti (1977)- Stratigraphic nomenclature- Southern end Malay Basin. Proc. 6th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, 1, p. 69-94.

Armitage, J.H. (1980)- A decade of exploration and development by EPMI off the east coast of Peninsular Malaysia. Offshore South East Asia Conference, Singapore 1980 (OFFSEA 80) preprint, p. 1-51.

Attavittkamthorna, V., J. Vilcaeza, Kozo Sato (2013)- Integrated CCS aspect into CO₂ EOR Project under wide range of reservoir properties and operating conditions. *Energy Procedia* 37, p. 6901-6908.
(online at: <https://www.sciencedirect.com/science/article/pii/S1876610213008655>)
(Petroleum engineering study of Carbon Capture and Storage (CCS) and Enhanced oil recovery (EOR) aspects of oil field in Pattani Basin, Gulf of Thailand)

Barr, D. & K. Dharmarajan (2015)- The hydrocarbon resources of Block A-18, Gulf of Thailand: a brief overview and history. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2015, Singapore, 6.1, p. 1-24.
(Block A-18 in Malaysia-Thailand Joint Development Area with series of gas fields in stacked E Miocene-Pliocene sandstone reservoirs. Most production from Late Miocene. In central part of North Malay Basin, overlying series of N-S trending horsts and grabens)

Barr, D.C., M.J. Flynn, Ong Cheng Sun & K. Dharmarajan (2012)- Interpreting geological systems from seismic attributes: reasons for caution from the Northern Malay Basin. Proc. International Petroleum Technical Conference, Bangkok, IPTC 14830, p. 1-10.
(Example of channel-like feature clearly imaged from seismic attributes, but where size of channel did not match that implied by pressure transient analysis)

Basu, T., M. Claverie, D. Nolan, K.B. Yahya & M. Suleiman (2004)- Facies analysis; integration of core and log data using a neural network as input for reservoir modeling in Betty Field, Malaysia. *The Leading Edge* 23, 8, p. 794-797.

Bishop, M.G. (2002)- Petroleum systems of the Malay Basin Province, Malaysia. U.S. Geological Survey (USGS), Open File Report 99-50T, p. 1-24.
(online at: <http://pubs.usgs.gov/of/1999/ofr-99-0050/OF99-50T/OF99-50T.pdf>)
(Discovered hydrocarbon reserves in Tertiary Malay Basin 12 billion BOE. USGS assessment of potential added conventional oil, gas and condensate by 2025 is 6.3 BBOE)

Brami, J.B. & M.Y. Muhaiyuddin (1984)- History and geology of the Tinggi Field, offshore Peninsular Malaysia. Proc. 5th Offshore South East Asia Conference, SE Asia Petroleum Exploration Society (SEAPEX), Singapore, p. 4.1-4.13.

(Tinggi 1980 oil discovery in J and K sands in small E-W trending anticline in Malay basin)

Brink, G., J. Hernandez, J. Bencomo, L. Jiang, N. Koronful, D. Basu, A.Z. Ishak, M.F. Ali & J. Skulsanjutr (2019)- Oligocene and Miocene sequence stratigraphy of the North Malay Basin, Malaysia and Thailand. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2019), EAGE, Kuala Lumpur, p. 1-5.
(Extended Abstract)

Brown, A.R., C.G. Dahm, R.J. Graebner (1981)- A stratigraphic case history using three-dimensional seismic data in the Gulf of Thailand. Geophys. Prospecting 29, 3, p. 327-349.
(Early paper on use of 3D seismic. Improved fault resolution and structural definition of gas field in Gulf of Thailand and seismic amplitudes used to map distribution of bars and channels Sands >10m thick mappable)

Bustin, R.M. & A. Chonchawalit (1995)- Formation and tectonic evolution of the Pattani Basin, Gulf of Thailand. International Geology Review 37, p. 866-892.
(Pattani Basin the most prolific petroleum basin in Thailand. E-W extension since E Tertiary resulted in series of N-S-trending sedimentary basins. Sediment succession divisible into Late Eocene- E Miocene non-marine synrift and E-M Miocene and younger shallow marine- non marine post-rift sequences. Crustal stretching factor (β) varies from 1.3 at basin margin to 2.8 in center. High heat flow (1.9-2.5 HFU) and geothermal gradient (45-60° C/km))

Bustin, R.M. & A. Chonchawalit (1997)- Petroleum source rock potential and evolution of Tertiary strata, Pattani Basin, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 81, 12, p. 2000-2023.
(Pattani Basin in Gulf of Thailand with 10 km of synrift U Eocene- Lw Miocene mainly nonmarine clastics and E Miocene- Holocene postrift marine-nonmarine clastics. Organic matter dispersed, terrestrial type III kerogen with minor type II kerogen, and consists primarily of vitrinite. Current depth to top oil window 1.4- 1.7 km. Main phase of hydrocarbon generation began at ~34 Ma. Presence of commercial gas fields suggests source rocks are effective in producing and liberating hydrocarbons, despite low hydrocarbon potential)

Carney, S., I.A. Aziz, W. Martins, A. Low & J. Kennedy (2010)- Reservoir characterisation of the Mio-Pliocene reservoirs of PM301 in the North Malay Basin. Proc. Int. Oil and Gas Conferene Exhibition, China, Beijing, Soc. Petroleum Engineers (SPE) 131017-MS, p. 1-25.
(Block PM301 in N Malay Basin with seven relatively small and geologically complex gas fields discovered to date. Fields. Reservoir study)

Carson, T.G. & G.G. Phipps (1982)- The exploration applications of seismic DHI analysis in the Malay Basin. In: Offshore Southeast Asia '82 Conf. (OFFSEA 82), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 1-18.

Centhonglang, C. (2022)- Facies analysis and reservoir characteristics of 2E unit in North Malay Basin, Gulf of Thailand. Bull Earth Sciences Thailand 14, 2, p. 105-120.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/248821/170103>)
(Northern Malay Basin successful petroleum basin in Gulf of Thailand. M Miocene 2E reservoir sandstones deposited in tide-dominated delta setting)

Centhonglang, C., P. Promsen, P. Loboontert, T. Charoenpun & J. Yingyuen (2015)- Success of structural stratigraphic combination trap, Arthit Field, Gulf of Thailand. AAPG/SEG International Conference Exhib., Melbourne, Search and Discovery Article 20333, 2p. *(Abstract + Poster)*
(online at: www.searchanddiscovery.com/documents/2015/20333centhonglang/ndx_centhonglang.pdf)

(Arthit gas field in NW North Malay Basin, offshore Thailand, mostly in Miocene- Oligocene reservoir. Most of the gas production from stacked channel reservoir in structural traps. 2012 appraisal well confirmed gas in 'nose structure' combination trap)

Chadwick, R.A., D.W. Holliday & W.J. Rowley (1991)- Thermal history of petroliferous basins of the CCOP region: 1. The northern part of the Gulf of Thailand. British Geological Survey, Technical Report WC/91/01C, p. 1-86.

(online at: www.bgs.ac.uk/research/international/dfid-kar/WC91001C_col.pdf)

Chadwick, R.A., D.W. Holliday & W.J. Rowley (1991)- Thermal history of petroliferous basins of the CCOP region: 1. The Malay Basin. British Geological Survey, Technical Report WC/91/02C, p. 1- .

Chantraprasert, S. (2000)- Extensional faults and fault linkages, Southern Pattani Basin, Gulf of Thailand. Ph.D. Thesis, University of London, p. *(Unpublished)*

Chantraprasert, S., J. Kongchum & N.Kuenphan (2019)- Role of strike-slip faulting in the evolution of the Chumphon Basin, Gulf of Thailand. Proc. EAGE/AAPG Workshop on Reducing exploration risk in rift basins, Kuala Lumpur 2019, 2p. *(Abstract only)*

(Chumphon Basin is Tertiary half-graben basin on W margin of Gulf of Thailand, at NE tip of NNE-SSW-trending Khlong Marui Fault. Basin experienced M Miocene- Quaternary inversion episodes, possibly resulting from restraining-bend deformation at tip of Khlong Marui Fault. During inversion, existing oil accumulations re-migrated and traps were breached by inversion-related faults)

Chen, H.W.W., S. Shukriah, O.A.B. Mahmud, N. Pendkar & D. Hasspariah (2013)- An integrated approach of sequence stratigraphic study in southwestern of Malay Basin. Int. Petroleum. Technical Conf. (IPTC), Beijing, IPTC 16787, p. 1-7.

(Sequence stratigraphic framework and implication for petroleum system understanding of SW Malay Basin. Six main 3rd order sequences in Oligocene-Pliocene. Two source rock intervals in study area: Late Oligocene deeper synrift with lacustrine deposits and E Miocene marine inner neritic rocks. Potential reservoirs (fluvial, lacustrine and shallow marine sands) thin basinward (SW to NE))

Chenrai, P. (2013)- Structural style and tectonic evolution of the Nakhon Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 70-75.

(online at: www.geo.sc.chula.ac.th/BEST/volume4/number2/12_Piyaphong_BEST_4_2_p%2070-75.pdf)

(Nakhon Basin at W margin of Gulf of Thailand. Initial rifting created halfgrabens in Late Oligocene. Rifting followed by inversion and second phase of rifting in M Miocene. Basin formed in response to oblique extension resulting from right-lateral motion)

Chew, H.H. & A.H. Hussein (1986)- Bekok reservoir model study. Proc. SE Asia Petroleum Exploration Society (SEAPEX) 7, p. 87-95.

(Reservoir model of E Miocene J18/20 sands in Esso 1971 Bekok field, Block PM-9, Malay Basin)

Chonchawalit, A. (1993)- Basin analysis of Tertiary strata in the Pattani Basin Gulf of Thailand. Ph.D. Thesis University of British Columbia, Vancouver, p. 1-366.

(online at: <https://open.library.ubc.ca/soa/cIRcle/collections/ubctheses/831/items/1.0052735>)

(Stratigraphic-structural evolution of N-S trending Pattani basin in Gulf of Thailand. Up to 10 km of Tertiary sediment fill. Synrift phase 3 units: Late Eocene- E Oligocene alluvial-fluvial deposits, Late Oligocene- E Miocene fluvial and E Miocene mixed marine- non-marine deposits. Post rift succession: E-M Miocene regressive shallow marine- fluvial series, late E Miocene transgressive package and Late Miocene-Pleistocene transgressive package. Organic matter mainly of detrital and continental origin. Modeling suggests main phase of hydrocarbon generation started around 34 Ma)

Chua, B.Y. & R. Wong (1997)- Some possible new exploration ideas in the northern and western Malay Basin of Peninsular Malaysia. ASCOPE Proc. 2, p. 177-191.

Chua, B.Y. (1998)- A decade (1987-1997) of exploration in Malaysia under the 1985 PSC. Proc. Offshore South East Asia Conference 1998 (OFFSEA 98), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 109-122.

(Brief review of new discoveries and new play fairways in Malay Basin (Bunga Kekwa, Yong/North Raya, Rhu) and offshore Sarawak (Jintan gas, Helang gas, Kinabalu oil, Kebabangan oil-gas)

Chuenbunchom, S., A.P. Heward & G. Makel (2000)- The reservoir geology of the 'pre-Tertiary' sequences of palaeokarst structures, Gulf of Thailand. J. Geological Society Thailand 1, p. 8-18.

(online at: <http://library.dmr.go.th/library/J-Index/2000/145.pdf>)

(Pre-Tertiary 'basement' highs below Late Oligocene/Base Tertiary in Chumphon Basin penetrated variable Permian- Triassic lithologies. 5 of 6 Pre-Tertiary penetrations encountered losses of drilling fluids. Porous zones in carbonate of B6/27 from subsurface hydrothermal leaching, not near-surface tropical weathering)

Clark, S.J.A. & R.C. Davis (2017)- Observations of hydrocarbon migration within the Jasmine Field and the impact on risk assignment for exploration prospectivity in Eastern Block B5/27, Gulf of Thailand. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, Session 8, p. 1-4. *(Extended Abstract)*

(Jasmine Field (Jasmine and Ban Yen) in NW Pattani Basin, Gulf of Thailand. Discovered in 1974, cumulative production 65 MMSTB Oil from >160 pools in 30 fault blocks and 27 M-L Miocene reservoirs. Oils appear to be expelled from similar organofacies at similar maturities, from kitchen S of Ban Yen area)

Creaney, S. & A.H.Hussein (1992)- Oil quality variations in the Malay basin - geochemical insights. Proc. Int. Symposium on Tectonic Framework and Energy Resources of the Western Margin of the Pacific Basin, Kuala Lumpur, Warta Geologi 18, 6, p. 276. *(Abstract only)*

Creaney, S., A.H. Hussein, D. Curry, K.M. Bohacs & R. Hassan (1994)- Source facies and oil families of the Malay Basin, Malaysia. American Assoc. Petroleum Geol. (AAPG) Bull. 78, p. 1139. *(Abstract only)*

(Malay Basin several petroleum systems with Oligocene- M Miocene non-marine source rocks. Lower Oligocene- Lw Miocene lacustrine-dominated, Lw-M Miocene coastal/delta plain coal-related sources. Two lacustrine sources, with low pristane/phytane ratios, low oleanane, general absence of resin-derived terpanes. Multiple sources in coaly section (pristane/phytane ratios up to 8, very high oleanane, often abundant resinous compounds). All source rocks generally overmature in basin center and immature toward basin margin. Oils low in sulfur. Migration largely strata parallel with little cross-stratal mixing of families)

Cuny, G., C. Laojumpon, O. Cheychiw & K. Lauprasert (2010)- Fossil vertebrate remains from Kut Island (Gulf of Thailand, Early Cretaceous). Cretaceous Research 31, p. 415-423.

(Mesozoic vertebrate fauna from sandstones on Ko Kut, E Gulf of Thailand, includes fresh water hybodont sharks, actinopterygians, turtles, goniopholidid crocodiles and theropod dinosaurs. Incl. Heteroptychodus kokutensis n.sp. Fauna same age as Sao Khua Fm (Khorat Group) and not Jurassic, but Berriasian or younger. Tectonic affinities of Kut island unclear, may represent Sibumasu or Indochina Block)

Duval, B.C. & J. Gouadain (1994)- Exploration and development in the Bongkot Field Area (Gulf of Thailand): an integrated approach. Proc. 14th World Petroleum Congress, Stavanger 1994, p. 247-257.

(Bongkot gas- condensate field, largest in Gulf of Thailand. Complex geometry of reservoirs: faulted blocks and mid to late Tertiary fluvio-deltaic sands distributed across 2000m thick sedimentary section)

Fontaine, H., D. Rodziah & U. Singh (1990)- A Triassic 'reefal' limestone in the basement of the Malay Basin, South China Sea: regional implications. Bull. Geological Society Malaysia 27, p. 1-25.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1990016.pdf>)

(Sotong B1 well in SW part of Malay Basin (4.9° N, 104.8° E) drilled ~300m of Late Triassic limestone at TD. Two limestone types: (1) black wackestone-packstone (10,000-10,017') with some oolites, sponges, Tubiphytes; (2) grey wackestone-packstone (9736-9761') rich in fragments of sponges, bryozoa, corals (Pinacophyllum,

Thecosmilia?). Common Tubiphytes (= Shamovella), calcareous sponges (Colospongia). Foraminifera: Alpinophragmium perforatum, Ophalmidium, Tetraxis, etc. 'Tethyan', probably reefal, Norian-age)

Fontaine, H., D. Rodziah & U. Singh (1990)- Discovery of an Upper Triassic limestone basement in the Malay Basin, offshore Peninsular Malaysia: regional implications. J. Southeast Asian Earth Sciences 4, 3, p. 219-232. (Same paper as above on limestone at base of Sotong B1 well with Triassic limestone penetrated from 9030-10,017'. With pseudoalgae, foraminifera (Alpinophragmium) and abundant calcisponges)

Fujiwara, M. (2010)- Significant erosion during development of the Middle Miocene unconformity and its effect on hydrocarbon generation in the Gulf of Thailand. AAPG International Conference Exhib., Rio de Janeiro 2009, Search and Discovery Article 20084, p. 1-9.

(online at: www.searchanddiscovery.com/documents/2010/20084fujiwara/ndx_fujiwara.pdf)

(>20 oil-gas fields in Pattani Trough rift basin, with up to 7500m of Tertiary sediment. Source rocks Oligocene lacustrine shales and M Miocene coaly shales. M Miocene Unconformity with ~4500' of erosion at Erawan gas field, based on shale compaction trend and 'paleo-anticline' below MMU, possibly related to 'Himalayan' compressional event in Gulf of Thailand)

Fujiwara, M. (2011)- The Middle Miocene Unconformity (MMU) in the southern part of the Pattani Trough in the Gulf of Thailand. J. Japanese Association for Petroleum Technology 76, 6, p. 545-555.

(online at: https://www.jstage.jst.go.jp/article/japt/76/6/76_545/_pdf)

(In Japanese, with English summary. Gulf of Thailand >4000 wells drilled since 1971. Over 30 oil-gas fields discovered. mainly in Cenozoic Pattani Trough rift basin, 200km long/ 50km wide, with 2 main unconformities: deep MTU (below drill depths) and shallower Mid-Miocene Unconformity (MMU). Compaction trends from sonic logs suggest ~1000m of erosion at MMU (possibly too high). MMU between Florschuetzia levipoli and F. meridionalis zones)

Fujiwara, M., M. Yamada & A. Sasaki (2009)- Possible inorganic origin of the high CO₂ gas reservoirs in the Platong and the Erawan Gas Fields, Gulf of Thailand. AAPG Hedberg Conference, Variations in fluvial-deltaic and coastal reservoirs deposited in tropical environments, Jakarta 2009, Search and Discovery Article 90102, 2p. (Abstract only)

(online

at:

www.searchanddiscovery.com/pdfz/abstracts/pdf/2010/hedberg_indonesia/abstracts/ndx_fujiwara.pdf.html)

(Some oil-gas fields in Gulf of Thailand (Erawan-1981, Platong- 1976, Pailin) with some high CO₂ reservoirs. Origin of CO₂ and nitrogen in natural gas from Erawan gas field mixture of inorganic (from Pre-Tertiary basement) and organic (thermal maturation). Platong field with some high CO₂ gas, interpreted to be of hydrothermal origin)

Fyhn, M.B.W., L.O. Boldreel & L.H. Nielsen (2010)- Escape tectonism in the Gulf of Thailand: Paleogene left-lateral pull-apart rifting in the Vietnamese part of the Malay Basin. Tectonophysics 483, p. 365-376.

(Vietnamese part of Malay basin large, deep pull-apart basin formed through M-Late Eocene- Oligocene left-lateral strike-slip along NNW-trending fault zones, likely associated with SE Asian extrusion tectonism. Deep rift widens to S and connects with main Malay Basin. Neogene thermal sag led to thick sediment succession. Moderate rifting resumed in E Miocene. Late Neogene basin inversion attributed to 70 km of right-lateral movement across major N-S-trending faults in central part of basin, but not in Vietnamese territory)

Fyhn, M.B.W., S.A.S. Pedersen, L.O. Boldreel, L.H. Nielsen, P.F. Green, P.T. Dien, L.T. Huyen & D. Frei (2010)- Palaeocene- early Eocene inversion of the Phuquoc-Kampot Som Basin: SE Asian deformation associated with the suturing of Luconia. J. Geological Society, London, 167, 2, p. 281-295.

(Phuquoc-Kampot Som Basin, Gulf of Thailand (Cambodia- Vietnam) is Late Jurassic-E Cretaceous foreland basin. Paleocene- E Eocene basin inversion-erosion event associated with Luconia suturing to SE Asia and shutdown of Paleo-Pacific subduction under SE Asia segregated larger Mesozoic basin. Inversion focused along Kampot and Khmer-Chanthaburi fold belts and indicate link between initial SE Asian left-lateral strike-slip faulting and Luconia suturing)

Fyhn, M.B.W., H.I. Petersen, A. Mathiesen, L.H. Nielsen, S.A.S. Pedersen, S. Lindstrom, J.A. Bojesen-Koefoed, I. Abatzis & L.O. Boldreel (2010)- Vietnamese sedimentary basins: geological evolution and petroleum potential. Geol. Survey Denmark and Greenland Bull. 20, p. 91-94.

(online at: www.geus.dk/publications/bull/nr20/nr20_p091-094.pdf)

(Review of two basins in Vietnamese part of Gulf of Thailand: (1) Phu Quoc Basin undrilled, 500 km long, N-S trending basin with up to 4km of mainly non-marine Late Jurassic- Lower Cretaceous sediments, bordered in E by Jurassic-Cretaceous magmatic arc, inverted in Late Paleocene- E Eocene (AFTA data suggest Late Paleocene- E Eocene cooling); unconformably overlain by Eocene-Neogene; (2) Tho Chu basin= NE part of Malay Basin, initiated between M-L Eocene, with mainly NNW-trending rifts)

Ghazali, K., A. Baker, M. Mathur, S. Aziz, A. Manaf, M. Johari, F. Ismail, F. Fauzi, A. Mohd & W. Shariffudin (2017)- Unveiling insights of stratigraphic element in Malay Basin. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017), EAGE, Kuala Lumpur, 43554, p. 121-125.

Ghosh, D., M.F.A. Halim, M. Brewer, B. Viratno & N. Darman (2010)- Geophysical issues and challenges in Malay and adjacent basins from an E & P perspective. The Leading Edge 29, 436, p. 1-11.

(Malay Basin N-S-trending pull-apart rift basin, formed during Late Eocene-E Oligocene, underwent thermal subsidence and sedimentation in E Miocene. M Miocene structural inversion resulting in E-W anticlines)

Ghosh, D., S. Jirim, S. Isa & P. Abolins (2010)- The roles of coal in hydrocarbon exploration in the Malay Basin: the good, the bad and the ugly. In: Petroleum Geology Conference Exhib., Kuala Lumpur (PGCE 2010), p. (Extended Abstract)

Ghosh, D., M. Sajid, N.A. Ibrahim & B. Viratno (2014)- Seismic attributes add a new dimension to prospect evaluation and geomorphology offshore Malaysia. The Leading Edge 33, 5, p. 536-545.

Goodall, J.G.S., A. Racey & P. Highton (1997)- Early Carboniferous (Tournasian) palynomorphs from the Gulf of Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Bangkok, Dept. Mineral Resources (DMR), 1, p. 56-61.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/1997/7622.pdf)

(Clastic basement in wells 7-152-1X and 8-320-1X at W flank of N Pattani Trough in Gulf of Thailand with moderately diverse, cosmopolitan mid-Tournasian miospore assemblage. Dominant species *Punctatisporites/Retusotriletes* spp., *Speleotriletes balteatus* and *Vallatisporites vallatus*. Spore color 4-5 (heavily carbonised; in dry gas or barren maturity window))

Halim, M.F.A. (1994)- Geothermics of the Malayan sedimentary basins. Bull. Geological Society Malaysia 36, p. 163-174.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994031.pdf>)

(Study of heat flow distribution in Malay, Sarawak and Sabah sedimentary basins from 400 exploration and production wells. Highest heat flow in Malay basin (av. 143 mW/m²), followed by Sarawak basin (104 mW/m²) and lowest in Sabah basin (74 mW/m²))

Hassaan, M., S.K. Bhattacharya, M.J. Mathew & N.A. Siddiqui (2015)- Understanding basin evolution through sediment accumulation modeling: a case study from Malay Basin. Research J. Applied Sciences, Engineering Technology 11, 4, p. 388-395.

(online at: <http://maxwellsci.com/msproof.php?doi=rjaset.11.1792>)

(Malay Basin with up to 14 km of sediments. Sedimentation rate analysis and 2D modeling suggest sediment accumulation started at 33.9 Ma towards basinal side, possibly associated with activation of Tenggol fault. Prior to unit K (25.2 Ma) sediments absent on Tenggol arch. During Late Miocene basin wide inversion sediments still accumulated in SW part)

Hassan, M.H.A., R. Tahir & A.K. Ali (2013)- Facies architecture of a complex, heterolith-filled incised valley system, Miocene Malay Basin, Malaysia. Proc. Petroleum Geoscience Conference Exhib. (PGCE 2013), Kuala Lumpur, P15, p. 1-4. (Extended Abstract)

(Facies analysis and stratigraphic study of tidal heterolithic deposits infilling deep (up to 43 m thick) incisions in H Group of Field I, WD, ED, CG and C, offshore Malay Basin. Interpret presence of 3 separate, NW-SE trending valley incisions associated with base level fall, which are infilled mainly by tidal heteroliths)

Heward, A.P., S. Chuenbunchom, G. Makel, D. Marsland & L. Spring (2000)- Nang Nuan Field, B6/27, Gulf of Thailand: karst reservoirs of meteoric or deep burial origin? *Petroleum Geoscience* 6, p. 15-27.

(Permian karst reservoirs in Chumphon Basin of Gulf of Thailand produced oil at >10,000 BBL/day. Previously presumed to be from meteorically karstified buried hills in Ratburi carbonates, but apparently unrelated to subaerial exposure. Highs are probably syn-rift horsts and inversion features, with karstification in karst in Ratburi carbonate reservoirs primarily of deep-burial origin, related to geothermal circulation)

Higgs, R. (1999)- Gravity anomalies, subsidence history and the tectonic evolution of the Malay and Penyu Basins (offshore Peninsula Malaysia) - Discussion. *Basin Research* 11, 3, p. 285-290.

(Critical discussion of Madon & Watts 1998 paper, suggesting paleobathymetry needed to be incorporated and speculating whether there may be two rift intervals in Malay Basin instead of one (possible renewed rifting in Late Miocene))

Highton, P.J.C., A. Racey, M.I. Wakefield, A.J. Carmichael & N.R.W. Glendinning (1997)- Quantitative biostratigraphy: an example from the Neogene of the Gulf of Thailand. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA197)*, Bangkok, Dept. Mineral Resources (DMR), p. 563-585.

(online at: <http://library.dmr.go.th/library/7657.pdf>)

(Gulf of Thailand Eocene?- Recent intra-cratonic basin with up to 8000m Neogene section in mainly non-marine facies. Biostratigraphic zonation mainly based on palynology. Most onshore basins lack coastal palynomorphs like Florschuetzia. Existing zonations can be refined by quantitative analysis of biostrat data. Late M Miocene Unconformity (MMU) separates deformed mainly non-marine section from more marine and less deformed younger section)

Hill, J.A., D.K.Y. Soo & T. Verriah (1992)- Clay mineralogy in subsurface sandstones of Malaysia and the effects on petrophysical properties. *Bull. Geological Society Malaysia* 32, p. 15-43.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101041-PDF.pdf)

(Clay minerals are common constituents of the subsurface sandstones in Malaysia sedimentary basins)

Hou, J., T. Takahashi, A. Katoh, S. Jaroonsiththa, K.P. Chumsena & K. Nakayama (2008)- Application of seismic attributes and neural network for sand probability prediction- a case study in the North Malay Basin. *Bull. Geological Society Malaysia* 54, p. 115-121.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100476-PDF.pdf)

Ibrahim, N.A. & M. Madon (1990)- Depositional environments, diagenesis, and porosity of reservoir sandstones in the Malong Field, offshore West Malaysia. *Bull. Geological Society Malaysia* 27, p. 27-55.

(online at: <https://gsm publ.wordpress.com/wp-content/uploads/2014/09/bgsm1990017.pdf>)

(Reservoir interval in Malong Field, Tenggol Arch, Malay Basin, three main types of sand bodies: (1) prograding shoreface, (2) shallow marine (inner-shelf), and (3) fluvial channel sequences)

Inthana, C. (2013)- Mapping of Middle Miocene reservoir sands and subtle faults to understand reservoir compartmentalization in Erawan Field of Pattani Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 6, 2, p. 17-28.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246622/167645>)

(Erawan gas field in W flank of Pattani Basin, Gulf of Thailand (near suture zone between Shan-Tai (= Sibumasu) and Indochina terranes). With E-M Miocene fluvial sands reservoirs, largely controlled by N-S faults and NW-SE and SW-NE 'discontinuities'))

Intawong, A. (2006)- Evolution of the Chumphon Basin, Gulf of Thailand. Ph.D. Thesis, University of London, p. (Unpublished)

(In W Gulf of Thailand close relationship between basins such as Chumphon Basin and NE-SW trending Khlong Marui Fault. S Thailand basins early period of rifting started in Late Eocene and became widespread by Oligocene. Inversion took place in eastern basins (Chumphon, Songkhla) at start of Miocene. Extension was renewed in E Miocene, and M Miocene corresponds to period of basin subsidence in Chumphon, Songkhla, and Andaman Sea Basins. Second period of inversion in Pliocene in Chumphon Basin, possibly coinciding with uplift on Thai Peninsula and in Andaman Sea)

Jaithan, P. (2012)- Maturity modeling of Gomin and South Gomin fields southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 5, 2, p. 95-101.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246589/167627>)

(Two exploration wells found oil in S Gomin area. Oligocene and Lower Miocene source rocks are overmature across study area except in E where they are still in main gas generation phase. Lower M Miocene source rocks in main gas generation phase to W and in oil generation window to E. M-U Miocene -Pliocene source rocks are in oil generation phase. Maturity model generally matches hydrocarbon discoveries. Etc.)

Jamaludin, S.N.F., A.H. Abdul Latiff & A.A.Kadir (2016)- Interpretation of gas seepage on seismic data: example from Malaysian offshore. Proc. 3rd International Conference AeroEarth, Jakarta 2015, IOP Conference Series 30, 012002, p. 1-6.

(online at: <http://iopscience.iop.org/article/10.1088/1755-1315/30/1/012002/pdf>)

(Features of gas seepage on Malay Basin seismic data (amplitude anomalies, wipe out zones, sag or push down, pockmarks/ craters, etc.)

Jardine, E. (1997)- Dual petroleum systems governing the prolific Pattani basin, offshore Thailand. In: J.V.C. Howes & R.A. Noble (eds.) Proc. International Conference Petroleum Systems of SE Asia & Australia, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 351-363.

(Pattani Basin largest of series of N-S trending Tertiary rifts in Gulf of Thailand. Gas and less oil trapped in Miocene fluvial sandstones in faulted graben systems. Two petroleum systems in basin: (1) dominant Miocene gas-generating coals and shales, currently mature in deeper portions of basin; (2) Oligocene oil-prone lacustrine shales, mature in basin flank areas but overmature in central trough)

Jardine, E. (1997)- Dual petroleum systems governing the prolific Pattani basin, offshore Thailand. In: P. Dheeradolok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97), Dept. Mineral Resources (DMR), Bangkok, 2, p. 525-534.

(same as Jardine 1997)

Jirin, S., M. Mohamed & S.S. Hasan (2013)- Transgressive-regressive cycles in the Malay Basin: new insights. Int. Petroleum. Technical Conference (IPTC 2013), Beijing, IPTC 16838, p. 1-6. *(Extended Abstract)*

(8 pulses of marine transgressions in Late Oligocene- Pliocene interval)

Johansson, M., S. Farag, J. Phillips, J. van Doorn & I. Roberts (2024)- The fractured basement of Malaysia- a comparison with Vietnam. SE Asia Petroleum Exploration Society, GESGB-SEAPEX Asia Pacific Conference, London, 22p. *(Abstract + Presentation)*

(Paper on potential Pretertiary basement hydrocarbon reservoirs in Malay Basin (metamorphic and igneous rocks, limestones)

Jong, J., F.L. Kessler, M. Madon & H. Mohamad (2019)- Radioactive apatite-rich “Hot Sands” of the Tenggol Arch: stratigraphic curiosity or sub-seismic reservoir correlation tool? Bull. Geological Society Malaysia 67, p. 1-8.

(online at: <https://gsm.org.my/products/702001-101790-PDF.pdf>)

(Late Oligocene to Early Miocene reservoir sandstones in Tenggol Arch with intervals with anomalous radioactive levels within the K, J and I Tertiary sequences. Thorium-bearing, apatite-rich sandstones and siltstones main source of radioactivity. Sediment derived from Malay Peninsula, Johor Platform and perhaps local cuesta ridges. Could be used for correlating reservoir units at reservoir or field scale)

Jong, J., F.L. Kessler, M. Madon & L. Your (2019)- The Tembakau gas accumulation, Tenggol Arch, offshore Peninsular Malaysia: petroleum system, gas composition and gas migration. Bull. Geological Society Malaysia 68, p. 639-84.

(online at: <https://gsm.org.my/products/702001-101810-PDF.pdf>)

(Tembakau 2013 Lundin gas discovery E Miocene clastics in center of Tenggol Arch, off E Peninsular Malaysia in S China Sea, up-dip from Sotong Field. Mixed biogenic and thermogenic gas)

Kachi, T., H. Yamada, K. Yasuhara, M. Fujimoto, S. Hasegawa, S. Iwanaga & R. Sorkhabi (2005)- Fault-seal analysis applied to the Erawan gas-condensate field in the Gulf of Thailand. In R. Sorkhabi & Y. Tsuji (eds.) Faults, fluid flow, and petroleum traps, American Assoc. Petroleum Geol. (AAPG), Memoir 85, p. 59-78.

(Unocal Erawan gas field in Gulf of Thailand with series of E- and W-dipping normal faults that displace E-M Miocene clastic reservoirs. Most faults adequate seal capacity)

Kader, M.S. (1994)- Abnormal pressure occurrence in the Malay and Penyu Basins, a regional understanding. Bull. Geological Society Malaysia 36, p. 81-91.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994024.pdf>)

(Majority of wells in Malay and Penyu basins terminated due to abnormal pressure. Data from 94 exploratory wells show abnormal pressure in progressively older units towards basin margins, which are normally pressured. Onset of abnormal pressure abrupt in N and more gradual in S part of Malay Basin)

Kader, M.S. & W. Leslie (1995)- Occurrence, origin and implications of overpressure in the Malay and Penyu Basins, offshore Malaysia. Bull. Geological Society Malaysia 37, p. 191-204.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a14.pdf>)

(80% of wells drilled in Malay-Penyu Basin terminated due to overpressure. Overpressure neither depth dependent nor age -related. Margins of Malay Basin and entire Penyu Basin normally pressured; central part of Malay Basin overpressured. Onset of overpressure abrupt in N and more gradual in S portion)

Kaewkor, C., I.M. Watkinson & P. Burgess (2015)- Structural style and evolution of the Songkhla Basin, western Gulf of Thailand. Proc. Int. Conference Geology, Geotechnology and Mineral Resources of INDOCHINA, Khon Kaen, Thailand (GEOINDO 2015), p. 1-12.

(Gulf of Thailand part of suite of Cenozoic basins within Sundaland, with multiple phases of extension and inversion, rapid post-rift subsidence, low-angle normal faults and Basin and Range-style. Songkhla Basin in SW Gulf asymmetric half-graben, bounded by NNW-SSE- faults along W edge, ~75 km long, 30 km wide. Two oil fields in basin. Pre-Cenozoic basement fabrics broadly N-S. Sediments thicken to W along growth fault surfaces; most faults E-dipping. Three main tectonostratigraphic packages in basin: 1) Eocene- E Miocene syn-rift, with three sub-extensional packages; 2) early M Miocene inversion and deposition of post-rift package, terminated by M-Miocene Unconformity; 3) Late Miocene-Recent post-rift)

Kantatong, K. (2010)- Hydrocarbon distribution in the North Jakrawan Field, Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 3, 2, p. 33-36.

Kartikasari, H.A. (2011)- Structural style of Songkhla Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 38-47.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246513>)

(Songkhla Basin in Western Graben of Gulf of Thailand asymmetric half-graben, bounded by NNW-SSE-trending major extensional faults. Basin fill thicker in W due to growth faulting. Maximum displacement along main boundary fault in W ~1.2 km in E Oligocene. Most faults E-dipping. Three tectonic phases: Eocene or E Oligocene initial rifting, E Miocene inversion, M Miocene resumption of extensional tectonics)

Kessler, F.L. & J. Jong (2018)- Sandstone diagenesis: establishing threshold temperature and depth of porosity deterioration, Penyu Basin and Tenggol Arch, offshore Peninsular Malaysia. Berita Sedimentologi 41, p. 5-21.

(online at: www.iagi.or.id/fosi/files/2018/09/FOSI_BeritaSedimentologi_BS41_September_2018.pdf)

(Penyu Basin SW of Malay Basin possible pull-apart basin rather than rift basin, affected by repeated strike-slip movements in Oligocene (possibly also before and after. Pre-Oligocene sediments in center of basin with

high vitrinite reflectivity values, suggesting removal of >1000m of pre-Oligocene. Quartz cementation started at paleo-depth of ~2000m tvdss (105°C), and porosity was mostly destroyed at ~3000m tvdss and 130°C)

Kessler, F.L., J. Jong & M. Madon (2020)- Sedimentary record of Paleogene sequences in the Penyu and Malay Basins, offshore Peninsular Malaysia. *Berita Sedimentologi* 46, p. 6-20.

(online at: <https://www.iagi.or.id/fosi/berita-sedimentologi-no-46-is-now-online.html>)

(Review of mid-Eocene- Lower Oligocene deposits of Penyu (fluvial- lacustrine) and Malay basins (with marine influence)

Kessler, F.L., J. Jong & M. Madon (2021)- Eocene Sediments in the South China Sea, precursor deposits of the Oligocene expansion? *Berita Sedimentologi* 47, 2, p. 1-24.

(online at: <https://journal.iagi.or.id/index.php/FOSI/article/view/319/294>)

(Review of Eocene sediment in basins around the S China Sea. Generally non-marine deposits on continental crust, possible precursors of rifting of S China Sea)

Khanna, M., N. Comrie-Smith, M. Lawlor & M.K. Viridy (2013)- Bualuang Oilfield, Gulf of Thailand: a successful development using geosteered horizontal wells. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 20189, p. 1-23. (Extended Abstract)

(online at: www.searchanddiscovery.com/documents/2013/20189khanna/ndx_khanna.pdf)

(Bualuang field in W Basin of Gulf of Thailand, initially discovered in 1993 and named Pornsiri field. Oil 27°API, viscosity 8.5 cp. Main T4 reservoir M Miocene fluvial channel sandstones, >50m thick, porosity almost 30%, av. perm 1.8 darcys. Oil column up to 32 m)

Klinkaew, B. (2012)- Sand distribution and reservoir characteristics North Jamjuree Field, Pattani Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 5, 2, p. 15-24.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246555/167607>)

(North Jamjuree field in W part of Pattani Basin high pay counts but less than expected gas recovery, due to stratigraphic complexity. Miocene fluvial sands are discontinuous and reserves are low)

Kongnonkok, W. (2011)- Carbon dioxide distribution in Erawan, Platong and Pailin Fields, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 4, 2, p. 119-125. (online at:

https://www.geo.sc.chula.ac.th/BEST/volume4/number2/19_Weerawat_BEST_4_2_p%20119-125.pdf)

(Geochemical analysis of CO₂ in Platong, Erawan and Pailin fields suggests main source is from mineral decomposition of basement rocks, migrating into Miocene reservoirs by faults)

Kongwung, B. & S. Ronghe (2000)- Reservoir identification and characterization through sequential horizon mapping and geostatistical analysis: a case study from the Gulf of Thailand. *Petroleum Geoscience* 6, 1, p. 47-57.

(Reconstruction of reservoir units/ reservoir geometry in ~50 ms thick interval of 3D seismic data on NW flank of Malay Basin, Gulf of Thailand. Depositional environment fluvio-deltaic, with channel sands, point bars, etc., as potential reservoirs)

Kornsawan, A. & C.K. Morley (2002)- The origin and evolution of complex transfer zones (graben shifts) in conjugate fault systems around the Funan Field, Pattani basin, Gulf of Thailand. *J. Structural Geology* 24, p. 435-449.

(On transfer zones between sets of convergent conjugate faults in Pattani Basin, Gulf of Thailand. In Funan Field area graben shift seen as W-dipping faults into zone of E-dipping faults. Initial Oligocene- E Miocene syn-rift fault pattern influenced by pre-existing basement trends. No indication of strike-slip faulting affecting graben shift geometry. Early (Late Oligocene- E Miocene), W-dipping normal faults influenced location of higher M-L Miocene conjugate faults)

Kuenphan, N., K. Kaenmee, Y. Gonecome & R. Shoup (2010)- Application of satellite-based analog studies to resolving reservoir complexity in the North Malay Basin. AAPG Hedberg Conference, Jakarta 2009, Search and Discovery Article 50256, p. 1-17. (Extended Abstract)

(Thailand river patterns used as potential analogs for N Malay Basin reservoir sand distribution patterns)

Lambiase, J.J. (2016)- Transgressive events in the Lower and Middle Miocene of the Gulf of Thailand: implications for reservoir characterization. AAPG Geoscience Techn. Workshop Characterization of Asian hydrocarbon reservoirs, Bangkok, Search and Discovery Article 51266, p. 1-37. *(Abstract + Presentation)*
(online at: www.searchanddiscovery.com/documents/2016/51266lambiase/ndx_lambiase.pdf)
(Recognition of two marine transgressions (late E Miocene, M Miocene) and several minor transgressive events, expressed as coaly mudstones in fluvial-dominant E-M Miocene of Pattani Basin, Gulf of Thailand)

Lambiase, J.J., J. Narapan & P. Champasa (2017)- Marginal marine mudstones in the Pattani Basin, Gulf of Thailand: implications for stratigraphic development, reservoir characterization and correlation potential. AAPG/SPE 2016 Int. Conference Exhib., Barcelona 2016, Search and Discovery Article 51366, p. 1-21. *(Abstract + Presentation)*
(online at: www.searchanddiscovery.com/documents/2017/51366lambiase/ndx_lambiase.pdf)
(E-M Miocene late rift- early post-rift sediments in Gulf of Thailand traditionally viewed as fluvial, but also widely distributed marginal marine mudstones and coaly mudstones and tide-dominated sandy facies)

Lau, J.W.E. (1977)- Stratigraphic correlation of Tertiary basins in offshore Malaysia, South China Sea. ASCOPE, p. 1-30.

Leo, C.T.A.M. (1997)- Exploration in the Gulf of Thailand in deltaic reservoirs, related to the Bongkot Field. In: A.J. Fraser, S.J. Matthews & R.W. Murphy (eds.) Petroleum geology of Southeast Asia, Geological Society, London, Special Publ. 126, p. 77-87.
(History of Statoil involvement since 1985 in Bongkot Field in NW Thai sector of Malay Basin)

Leong, K.M. (1978)- Malaysia, onshore sedimentary basins of Malaysia. In: United Nations ESCAP Atlas of Stratigraphy, 1. United Nations ECAFE Mineral Resources Development Ser. 44, Chapter 3, p. 26-31.
(online at: <https://repository.unescap.org/items/bb52a31d-ca39-4fad-9391-ad4d1b7df8a7>)

Lian, H.M. & K. Bradley (1987)- Exploration and development of natural gas, Pattani Basin, Gulf of Thailand. In: M.K. Horn (ed.) Trans. 4th Circum Pacific Council for Energy and Mineral Resources Conf., Singapore 1986, Chapter 15, p. 171-181.
(Gulf of Thailand series of N-S trending mid-Tertiary rift basins with up to 8km of mainly non-marine Upper Tertiary sediments. Four Unocal gas fields in faulted structures at W side of Pattani basin. First gas discovery in 1972, first production in 1981. Gas typically 65-72% methane, 17-19% C₂+ and 14-17% CO₂)

Liew, K.K. (1994)- Structural development at the west-central margin of the Malay Basin. Bull. Geological Society Malaysia 36, p. 67-80.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994023.pdf>)
(Regional structure interpretation of west-central margin of Malay Basin (Dungun Graben, etc.))

Liew, K.K. (1995)- Timing of Cenozoic basin formation in northern Sundaland, Southeast Asia. Bull. Geological Society Malaysia 37, p. 231-251.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a161.pdf>)
(Cenozoic continental wrench shear basins and back-arc basins developed on present stable N Sundaland, at both sides of Malay Peninsula. Wrench faulting played significant role in basin formation basins. Collision of Indian Subplate with Eurasian Plate in E Cenozoic caused redistribution of stress in region, reactivating zones of weakness. Two major episodes of basin formation in N Sundaland: Eocene- E Oligocene and Late Miocene)

Liew, K.K. (1995)- Structural analysis of the Malay Basin. Bull. Geological Society Malaysia 40, p. 157-176.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1997012.pdf>)

Limpornpipat, O., A. Laird, M. Tingay, C.K. Morley, C. Kaewla & H. Macintyre (2012)- Overpressures in the Northern Malay Basin: part 2- implications for pore pressure prediction. Int. Petroleum. Technical Conf. (IPTC), Bangkok 2012, 4, IPTC 15350, p. 3278-3289.

(see also Tingay et al. (2012) for Part 1)

(Pore pressure can be accurately predicted from sonic velocity. In N Malay Basin compaction coefficient varies spatially with geological structure)

Lobtong, W. & K. Lewis (2019)- Unlocking hidden reserve potential in Northern Pattani Basin, Gulf of Thailand. Proc. AAPG Asia Pacific Region GTW, Bangkok 2018, Search and Discovery Article 1205, p. 1-4.

(online at: https://www.searchanddiscovery.com/documents/2019/11205lobtong/ndx_lobtong.pdf)

Lockhart, B.E., O. Chinoroje, C.B. Enomoto & G.A. Hollomon (1997)- Early Tertiary deposition in the southern Pattani Trough, Gulf of Thailand. In: P. Dheeradilok et al. (eds.) Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97), Bangkok, Dept. Mineral Resources (DMR), p. 476-489.

Lundegard, P.D. & A.S. Trevena (1990)- Sandstone diagenesis in the Pattani Basin (Gulf of Thailand): history of water-rock interaction and comparison with the Gulf of Mexico. Applied Geochemistry 5, p. 669-685.

(In Pattani Basin extensive interaction between Miocene subquartzose alluvial sandstones and formation fluids. Diagenetic rates and pathways strongly influenced by high geothermal gradients, high CO₂ and low pore water salinities. Comparisons with other sedimentary basins demonstrate chemical diagenesis of Pattani Basin especially rapid, reflecting high temperatures, with net effect high rate of porosity loss with burial (11%/ km))

Madon, M. (1992)- Note on dolerite, rhyolite, and granophyre in the basement of the Tenggol Arch, offshore Terengganu. Bull. Geological Society Malaysia 31, p. 133-143.

(online at: www.gsm.org.my/products/702001-101045-PDF.pdf)

(Tenggol Arch in well Malong 5G-17.2 well at edge of Malay Basin, 150 km off E coast of Terengganu Basement at 1582 m highly fractured porphyritic rhyolite with dolerite dyke. Overlain by lower Miocene conglomerate composed of rhyolite and granophyre clasts. Dolerite dyke may have been intruded during incipient rifting of basin in early Cenozoic)

Madon, M. (1992)- Depositional setting and origin of berthierine oolitic ironstones in the Lower Miocene Terengganu Shale, Tenggol Arch, Offshore Peninsular Malaysia. Journal of Sedimentary Research 62, 5, p. 899-916.

(Berthierine oolitic ironstones in Lower Miocene Terengganu shale of Tenggol Arch, basement high between S Malay Basin and Penyu basin. Ironstones in 30-50m-thick, laterally extensive dark green mudstone, deposited during regional marine transgression over SW margin of ancestral S China Sea. Oolitic ironstones possibly deposited as offshore shelf storm layers and derived from lateritic soils on land)

Madon, M. (1994)- Depositional and diagenetic histories of reservoir sandstones in the Jerneh Field, central Malay Basin. Bull. Geological Society Malaysia 36, p. 31-53.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1994020.pdf>)

(U Miocene reservoir sandstones in Jerneh field at 1250-2000m. Sandbodies facies: distributary mouthbar-shoreface in delta front, channel point bar deposits in delta plain. Laterally continuous sheet sandstones characterize shallow marine facies deposited during transgression over delta. Increasing compaction and quartz cementation with depth, resulting in reduced porosities (10% and 25%). Quartz overgrowths started forming at ~1200m. K-feldspar dissolved by acidic formation waters; plagioclase relatively stable)

Madon, M. (1995)- Tectonic evolution of the Malay and Penyu Basins, offshore Peninsular Malaysia. Ph.D. Thesis, University of Oxford, p. 1-325.

(online at: <http://ora.ox.ac.uk/objects/uuid%3Af00a727d-8769-4ac8-88ab-35d8c662ea61>)

(Malay and Penyu Basins formed in E Oligocene as result of regional dextral shear deformation caused by indentation of India into Eurasia. Basement inhomogeneities control basin development. Penyu Basin first developed as isolated grabens at fault intersections, in response to N-S extension. Low-angle listric normal

faults, pull-apart grabens and flower structures suggest thin-skinned crustal extension and strike-slip tectonics. E-W Basement faults in Malay Basin oblique to NW basin trend. Basin developed by transtension of NW-trending sinistral shear zone, in which fault-bounded blocks rotate, creating E-trending half-grabens. M-L Miocene transpressive inversion related to rotation of regional stress field by progressive indentation of India into Eurasia. Lithospheric stretching dominant process of basin formation. High heat flows (85-100 mW m⁻²) consistent with β stretching factors of 1.2- 4.3)

Madon, M. (1997)- Analysis of tectonic subsidence and heat flow in the Malay Basin. In: Geological Society Malaysia Annual Geological Conference '97, Terengganu, Bull. Geological Society Malaysia 41, p. 95-108.

(online at: www.gsm.org.my/products/702001-100867-PDF.pdf)

(Malay Basin high present-day surface heat flow (~33-42 mW m⁻², interpreted as result of lithosphere thinning during basin formation. Basin relatively young (~35 Ma), and still undergoing thermal subsidence. Lithospheric stretching model with rifting over 10 Myrs starting at 35 Ma. Subsidence curves suggest stretching factors (B) of 1.2 on basin flanks to ~4.3 in centre. Basin flanks uplifted during initial rifting, causing subsidence to be delayed for ~10 Ma)

Madon, M. (1997)- The kinematics of extension and inversion in the Malay Basin. Bull. Geological Society Malaysia 41, p. 127-138.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1997029.pdf>)

(Malay Basin development began in Late Eocene- E Oligocene with sinistral transtensional shear of NW-trending shear zone that contains pre-existing E-trending basement faults. Shearing caused crustal blocks to rotate anticlockwise and form E trending half-grabens between them. Reversal of shear during E-M Miocene caused transpressive deformation and en echelon pattern of inverted half-grabens. Intensity of deformation increases SE-wards towards W Natuna Basin due to buttressing effect of Natuna basement ridge)

Madon, M. (2006)- Overpressure history of the Malay Basin, offshore Peninsular Malaysia. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2003, Bull. Geological Society Malaysia 49, p. 135-144.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm2004021.pdf>)

(Malay Basin present-day depth to top overpressure in basin center between 1900-2000m, in lower Group E. Top overpressure shallower at basin flanks, <1500m deep along faulted W basin margin. Top overpressure in basin center influenced by Group F regional shale)

Madon, M. (2007)- Overpressure development in rift basins: an example from the Malay Basin, offshore Peninsular Malaysia. Petroleum Geoscience 13, 2, p. 169-180.

(Malay Basin Tertiary transtensional rift basin with at least two major overpressure compartments, sealed by regional shale units. Main, basin-centre overpressure compartment has domal shape, shallower in basin center. In basin center, top of overpressure ~1900-2000m depth and confined mainly to M Miocene unit E. Smaller overpressure compartment on NE flank of basin, sealed by the onlapping, transgressive shale of unit L (Lower Miocene) and at a depth of 2600-3000m. Disequilibrium compaction primary cause of overpressure, and consequence of high subsidence and sedimentation rates)

Madon, M. (2021)- Five decades of petroleum exploration and discovery in the Malay Basin (1968-2018) and remaining potential. Bull. Geological Society Malaysia 72, p. 63-88.

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-101921-PDF.pdf)

(Since first oil discovery in Malay Basin in 1969, >700 exploratory wells drilled, resulting in 181 oil and gas discoveries. By 2014 >14.8 billion BOE of recoverable hydrocarbon resource discovered. As of end of 2018, >2100 exploration and development wells drilled in entire basin. By 1981 prolific anticlinal play type had been practically exhausted, as all giant fields (> 0.5 bboe) had been found. Etc.)

Madon, M., P. Abolins, J.B.H. Mohammad & B.A. Mansor (1999)- Malay Basin. In: The petroleum geology and resources of Malaysia, Chapter 8, Petronas, Kuala Lumpur, p. 173-217.

(Review of Malay Basin offshore E coast Peninsular Malaysia, straddling Thai border in NW and Vietnam border in NE. Over 50 oil and 30 gas fields discovered since 1969. NW-SE trending Oligo-Miocene rift-sag basin with up to 14km of sediment)

Madon, M., Rashidah B. Abd. Karim & R. Wong Hin Fatt (1999)- Tertiary stratigraphy and correlation schemes. In: The petroleum geology and resources of Malaysia, Chapter 6, Petronas, Kuala Lumpur, p. 115-137.

(online at: https://www.researchgate.net/publication/292317015_Chapter_6_Tertiary_stratigraphy_and_correlation_schemes)

Madon, M. & A. Anuar (1999)- Penyu Basin. In: The petroleum geology and resources of Malaysia, Chapter 9, Petronas, Kuala Lumpur, p. 220-223.

(Review of Penyu Basin offshore of Kuantan, Peninsular Malaysia. Small extensional basin of interior Sundaland, S of main Malay Basin and W of W Natuna Basin. Oligocene non-marine syn-rift sediments overlain by Miocene sag phase. Several sub-basins. Main structures E-M Miocene transpressional folds ('Sunda folds'). Much of section in basin is immature for hydrocarbons. Top of oil window at ~2100m. With Rhu Field sub-commercial oil discovery)

Madon, M.B., A. Anuar & R. Wong (1997)- Structural evolution, maturation history and hydrocarbon potential of the Penyu Basin. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Int. Conference Petroleum Systems of SE Asia and Australasia, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 403-424.

(Penyu Basin offshore Malaysia between Pahang and Johor Platforms on N Sunda Shelf under-explored. Basin structurally contiguous with W Natuna Basin. Comprises half-grabens bounded by two NW and ENE-trending faults, probably formed in E Oligocene by N-S extension. Early Oligocene alcastrine facies, marine incursions starting in Late Oligocene. Inversion of rift faults around E-M Miocene boundary)

Madon, M. & J. Jong (2022)- Seismic and gravity evidences of Pre-Tertiary subcrops beneath the Malay Basin. Asia. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE), Kuala Lumpur, p. 1-19.

(Abstract + Presentation)

(online at: https://www.researchgate.net/publication/365870640_Seismic_and_Gravity_Evidences_of_Pre-Tertiary_Subcrops_Beneath_the_Malay_Basin)

(About 'basement play' in Malay basin. Base-Tertiary Unconformity (BTU) well-defined surface onto which increasingly younger post-rift sediments onlap (Sundaland-wide hiatus spanning Late Cretaceous- ?Middle Eocene))

Madon, M.B., J. Jong, F.L. Kessler, M.H. Damanhuri & M.K.A. Amin (2020)- Pre-Tertiary basement subcrops beneath the Malay and Penyu basins, offshore Peninsular Malaysia: their recognition and hydrocarbon potential. Bull. Geological Society Malaysia 70, 1, p. 163-193.

(online at: <https://gsm.org.my/products/702001-101854-PDF.pdf>)

(Pre-Tertiary basement subcrops beneath Malay and Penyu basins represent continuation of onshore geology. Mesozoic terrane. Wells penetrated igneous, metamorphic and sedimentary rocks. Seismic shows presence of layered rocks beneath Base Tertiary (low-grade Late Triassic-Cretaceous? metasediments). Fractured reservoirs, like in Anding well associated with major strike-slip fault zones. Paleokarsts and buried hills also recognisable. Pre-Tertiary plays rely on hydrocarbon charge from overlying Tertiary source rocks)

Madon, M.B., J. Jong, F.L. Kessler, C. Murphy, L. Your, M. Hamid & N.B.M. Sharef (2020)- Overview of the structural framework and hydrocarbon plays in the Penyu Basin, offshore Peninsular Malaysia. Bull. Geological Society Malaysia 68, p. 1-23.

(online at: <https://gsm.org.my/products/702001-101815-PDF.pdf>)

(Review of Penyu Basin off E Malaysia. With 1991 Rhu-1 oil discovery, but not much success since, generally attributed to poor or immature source rocks in half-grabens. Basin formed on continental crust, generally considered as pull-apart or "rift-wrench" basin)

Madon, M.B. & A.B. Watts (1998)- Gravity anomalies, subsidence history and the tectonic evolution of the Malay and Penyu basins (offshore Peninsular Malaysia). *Basin Research* 10, p. 375-392.
(*Malay and Penyu basins up to 14 km sediment fill, with 20-30 mGal negative free air gravity anomalies. Modeling suggests basins formed by combination lithosphere stretching and thin-skinned crustal extension*)

Madon, M., J.S. Yang, P. Abolins, R. Abu Hassan, A.M. Yakzan & S.B. Zainal (2006)- Petroleum systems of the Northern Malay Basin. *Proc. Petroleum Geology Conference Exhibition (PGCE)*, Kuala Lumpur 2003, *Bull. Geological Society Malaysia* 49, p. 125-134.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm2004020.pdf>)
(*N Malay Basin petroleum province central/basinal gas-rich area, flanked on both sides and to S by mixed oil/gas zones. Non-associated gas fields in central zone mainly in D and E reservoirs, in Late Miocene inversion anticline. Vertical migration dominant process in basin center. High CO₂ gases typical of reservoirs in groups I and older and derived from inorganic sources. Low CO₂ gas (<6%) more typical of D-E reservoirs and derived from organic thermal degradation*)

Madsen, E.B., L.O. Boldreel & S.A. Schack Pedersen (2012)- Thin-skinned thrust-fault complex in the Phu Quoc Basin, SW Vietnam. *Proc. Int. Petroleum Technical Conference (IPTC)*, Bangkok 2012, p. 1409-1416.
(*Phu Quoc Basin is Late Jurassic- E Cretaceous foreland basin SW of Vietnam in undrilled E part of Gulf of Thailand. Deformation of basin took place during orogenic build-up of Kampot Fold Belt in E-M Cretaceous, which resulted in formation of thin-skinned thrust-fault complex, with complex piggyback basins. Main part of complex concealed under Neogene marine deposits*)

Madsen, E.B. & S.A. Schack Pedersen (2012)- Thin-skinned thrust-fault complex in the Phu Quoc Basin, SW Vietnam. *International Petroleum. Technical Conference (IPTC)*, Bangkok, IPTC 14624, p. 1-8.
(*Phu Quoc Basin Late Jurassic- E Cretaceous foreland basin SW of Vietnam, E Gulf of Thailand. Structural model for basin from reflection seismic. Deformation of basin during orogenic build-up of Kampot Fold Belt in E-M Cretaceous, which resulted in thin-skinned thrust-fault complex. Main part of thrust belt concealed under Neogene marine deposits, but outcrops on Phu Quoc island and islands in Nam Du archipelago*)

Maga, D., J. Jong, M. Madon & F.L. Kessler (2015)- Fluid inclusions in quartz: implications for hydrocarbon charge, migration and reservoir diagenetic history of the Penyu Basin and Tenggol Arch, offshore Peninsular Malaysia. *Bull. Geological Society Malaysia* 61, p. 59-73.
(online at: www.gsm.org.my/products/702001-101675-PDF.pdf)
(*In Penyu Basin and Tenggol Arch area, SW of Malay Basin fluid inclusions in quartz in Oligocene Groups L and M reservoirs and in Miocene Groups K and H reservoirs (none in I, J). Two populations in 'oil quartzes': (1) oil inclusions in detrital quartz grains; (2) oil inclusions in quartz cement, indicating oil migration preceded quartz cementation*)

Makeen, Y.M., W.H. Abdullah, H.A. Ayinla, X. Shan, Y. Liang, S. Su, N.M. Noor, H.K. Hasnan & L. Asiwaju (2019)- Organic geochemical characteristics and depositional setting of Paleogene oil shale, mudstone and sandstone from onshore Penyu Basin, Chenor, Pahang, Malaysia. *Int. J. Coal Geology* 207, p. 52-72.
(*Organic geochem of Paleogene of Chenor Pahang area of the Penyu Basin show excellent petroleum potential and deposition in suboxic lacustrine environment*)

Makeen, Y.M., W.H. Abdullah, M.N.A. Ghofur, H.A. Ayinla, M.H. Hakimi, X. Shan et al. (2018)- Hydrocarbon generation potential of Oligocene oil shale deposit at onshore Penyu Basin, Chenor, Pahang, Malaysia. *Energy and Fuels* 33, 1, p. 89-105.

Malasri, C. (2014)- Sequence stratigraphic interpretation of channel sand distribution using well logs from the Bualuang Field, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 7, 1-2, p. 16-25.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246630/167651>)
(*Late synrift M Miocene fluvial channel sandstone reservoirs in Bualuang oil field in western Gulf of Thailand*)

Manshor, N.A., M.H.A. Hassan & M. Madon (2021)- Tidally-influenced fluvial channel systems from the Miocene Malay Basin, Malaysia: Evidence from core facies and seismic geomorphological analyses, *Marine and Petroleum Geology* 135, 105384, p. 1-22.

(Evidence of tidal influence in Miocene channels in Malay Basin)

Mansor, M.Y., A.H.A. Rahman, D. Menier & M. Pubellier (2014)- Structural evolution of Malay Basin, its link to Sunda Block tectonics. *Marine and Petroleum Geology* 58, B, p. 736-748.

(Malay Basin developed partly as result of strike-slip shear of SE Asia continental slabs, as Indian Plate collided into Eurasia, and subsequent extrusion of lithospheric blocks towards Indochina. Sunda Block earliest rift margins are Paleogene W-E rift valleys, formed during NW-SE sinistral shear. Later Eocene NW-SE dextral shear of Indochina Block against E Malaya Block rifted opened Malay Basin, with N-S en-echelon ridges and grabens. Fast subsidence from Late Oligocene- M Miocene. Compressional inversion in Late Miocene, basin sag in Plio-Pleistocene with mild compressional episodes. Mio-Pliocene folding history of Malay Basin connected to collision of Sunda Block against subducting Indian-Australian Plate)

Martens, D., R. Lin & R.G. Hickman (2000)- Source, migration and CO₂ occurrences in the Pailin Field, Gulf of Thailand. *American Assoc. Petroleum Geol. (AAPG) Bull.* 84, 9, p. 1459-1460. *(Abstract only)*

(Unocal summary of Pailin gas field in S Pattani Trough. Two hydrocarbon sources: (1) fluvial coaly, with high pristane/phytane ratios and high angiosperm resin markers (biscadinanes) and (2) lacustrine shale, with low pristane/phytane ratios and high gammacerane. Lacustrine sources require vertical migration. Majority of hydrocarbons sourced locally from M Miocene coals and carbonaceous shales, with predominantly lateral migration. Gas high CO₂ (5- >65%), from organic and inorganic sources)

Matsubayashi, O. & S. Uyeda (1979)- Estimation of heat flow in certain exploration wells in offshore areas of Malaysia. *Bull. Earthquake Research Institute (Tokyo University)* 54, p. 31-44.

(Early paper on heatflow in Malay and Sabah basins. See also Halim 1994)

McClay, K.R., T. Dooley, P. Whitehouse, L. Fullarton & S. Chantpraser (2004)- 3D analogue models of rift systems: templates for 3D seismic interpretation. In: R.J. Davies et al. (eds.) *3D Seismic technology: application to the exploration of sedimentary basins*, Geological Society, London, Memoir 29, p. 101-115.

(Rift models paper, with example of S Pattani Basin, Gulf of Thailand)

Md Nor, M., A.H. Abd Rahman, S.S.W.S K Wafa, B.H. Wei, M.R. Aripin, J. Baharom & N.F. Zawri (2022)- Basin development, paleogeographic evolution and sandstone reservoirs characteristics within the Early-Late Miocene play, Northern Malay Basin. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2022)*, Kuala Lumpur, p. 1-5.

Miall, A.D. (2002)- Architecture and sequence stratigraphy of Pleistocene fluvial systems in the Malay Basin, based on seismic time slices analysis. *American Assoc. Petroleum Geol. (AAPG) Bull.* 86, p. 1201-1216.

(3-D seismic data from nonproductive, shallow Pleistocene section in N Malay Basin show 5 types of fluvial systems, from braided systems with >4 km wide channel-belts to small-scale meandering systems with meander-belt widths of few 100m. Incised-valley system 40m deep forms is base of one of two sequence boundaries)

Minezaki, T. & K. Moriyama (2002)- The origin of hydrocarbon and carbon dioxide in the gas fields for the Pattani Trough, the Gulf of Thailand. *J. Japanese Association for Petroleum Technology* 67, 1, p. 16-29.

(online at: https://www.jstage.jst.go.jp/article/japt1933/67/1/67_16/_pdf/-char/en)

(In Japanese with English abstract. Gases in Pattani Trough derived from thermal cracking of Type III kerogens and of pre-existing oils. Oils waxy and heavy, probably of lacustrine algal origin. Two source facies: Oligocene lacustrine-algal and Miocene fluvial-coaly. Oil generation from Oligocene source rocks started in E Miocene; gas generation mainly M-L Miocene in central trough. CO₂ contents increase with depth from few to ~25% in Trough. Some wells CO₂ as high as 91% (Platong gas field), probably of inorganic origin (magmatic decomposition of carbonate basement)

Mohamad, H., R. Wong & M.F.A. Halim (2001)- Seismic facies analysis of the synrift sediments in the North Malay Basin and their impact on the deep reservoir potential. Proc. CCOP 37th Annual Session Bangkok 2000, 2, Technical Reports, p. 30-32.

Mokhtar, S.S.S., M. Elsaadany, B. Sautter & N.H.M. Jamin (2021)- Miocene polyphase structural evolution of the T Field, NW Malay Basin. *Petroleum and Coal* 63, 2, p. 595-603.

(online at: www.vurup.sk/wp-content/uploads/2021/07/PC-X_Mokhtar_21_rev1.pdf)

(Malay Basin with thick Cenozoic sequences in relatively stable center of Sundaland. Earliest rift started in Paleogene, triggered by transtension along NW-SE trending Axial Malay Fault Zone. M Miocene major inversion, reactivating Malay Basin axial shear zone and development of large folds. N-S compression originated from S, likely related to indentation of Australian Plate in S margin of Sundaland. E-W faults active from M Miocene- Lower Pliocene, and N-S faults between M Miocene-Upper Pliocene, possibly minor tectonic episode or sedimentary load driven extension on top of post inversion morphologies)

Morley, C.K. & R. Westaway (2006)- Subsidence in the super-deep Pattani and Malay basins of Southeast Asia: a coupled model incorporating lower-crustal flow in response to post-rift sediment loading. *Basin Research* 18, 1, p. 51-84.

(Two Early Cenozoic rifts in SE Asia (beneath Pattani and Malay basins) limited upper-crustal extension ($\beta \leq 1.5$), yet very thick post-rift fill with 6-12 km of Late Cenozoic terrestrial and shallow marine sediment. Explanation for high post-rift subsidence involves lower-crustal flow caused by sediment loading and erosion of sediment sources)

Morley, C.K., N. Wonganan, N. Sankumarn, T.B. Hoon, A. Alief & M. Simmons (2001)- Late Oligocene-Recent stress evolution in rift basins of northern and central Thailand: implications for escape tectonics. *Tectonophysics* 334, p. 115-150.

(Thailand Tertiary rift basins evolved under E-W extension, but extension direction changed periodically. Extension interrupted by inversion events. Basins evolution: (1) widespread Oligocene- Lower Miocene extension; (2) In C and N Thailand extension persisted into U Miocene-Pliocene; (3) In W Natuna, Penyu, Malay basins extension ceased in earliest Miocene, in N Gulf of Thailand in M Miocene. Inversion in Gulf of Thailand in Lower and M Miocene. Relationship between strike-slip and extensional and inversion events more complex than can be explained by simple escape tectonic models)

Morley, R.J., S.S. Hasan, H.P. Morley, J.H.M. Jais, A. Mansor, M.R. Aripin, M.H. Nordin & M.H. Rohaizar (2021)- Sequence biostratigraphic framework for the Oligocene to Pliocene of Malaysia: High-frequency depositional cycles driven by polar glaciation. *Palaeogeogr. Palaeoclim. Palaeoecology* 561, 110058, p. 1-37.

(online at: www.sciencedirect.com/science/article/pii/S003101822030506X)

(Quantitative biostratigraphic data from 101 exploration wells in Malay, Sarawak and Sabah basins placed into Oligocene-Pliocene chronostratigraphic framework of 41 climate-driven transgressive-regressive cycles)

Morrison, K. & S. Aursiruk (2025)- The Manora oil field: A success story providing valuable lessons on the prospectivity of the northern Gulf of Thailand rift basins. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, SEC 2025, Singapore, p. 1-20. (Abstract + Presentation)

(Manora Oil Field (2009) is N-most field in the Gulf of Thailand. Located in W of Kra Basin N-S trending Paleogene rift basin with >4000m of Tertiary sediments. With 54 m TVD oil column in 20 late E Miocene lacustrine turbidite sandstone reservoirs. Produced 25 MMBO since 2014. Hanging-wall traps seal against Oligocene shales. Sourced from Oligocene- E Miocene lacustrine shales)

Muhamad, Abdul J. & A.S.A. Jamil (2010)- Organic facies variation in lacustrine source rocks in the southern Malay Basin. *Bull. Geological Society Malaysia* 56, p. 27-33.

(online at: <https://gsmpublic.wordpress.com/wp-content/uploads/2014/08/bgsm2010004.pdf>)

(On source rock quality of Oligocene lacustrine shales in Groups K, L, M in S Malay Basin Anding Barat Laut 1 well. Kerogens mixture of algal, bacterial and higher plant organic matter. Group L lacustrine shales best oil-prone source rock with TOC 0.45-1.95%, HI values 300-400, predominantly Type II kerogen. Groups L- M more algal input, shown by lower Pr/Ph ratio (3.1-4.0), lower Tm/Ts ratio, high C30-diahopane, etc. E Miocene

Group K more fluvial, more terrigenous organics, higher Pr/Ph ratio (5.1-6.2), higher oleanane, predominance of C29-steranes. Change in organic facies reflect transition from synrift to post-rift phase)

Narapan, J. (2015)- Different types of organic-rich geological markers in South Pailin Field, Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 240-246.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246679/167681>)

(S Pailin Field area in S Pattani Basin, northern Gulf of Thailand, with three types of organic-rich sediments: (1) marginal marine shale, (2) coal with pyrite and (3) mudstone with coal. Overall succession deposited in fluvial/floodplain and marginal marine settings, with two major marine transgressions in late Early and M Miocene. Marginal marine shale best geological marker in S Pailin area)

Ng Tong San (1987)- Trap styles of the Tenggol Arch and the southern part of the Malay Basin. Bull. Geological Society Malaysia 21, p. 177-193.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1987010.pdf>)

(Tenggol Arch at S end of Malay Basin rel. stable block between Malay and Penyu E Oligocene(?) rift systems. Drape over basement topography and anticlinal features identified. Anticlines elongated with great reliefs near E flank of S Malay basin, believed to be related to M Miocene shear movement. 23 wells drilled in area, with several oil-gas discoveries)

Ngah, K. (1990)- Deposition and diagenesis of Oligocene- Lower Miocene sandstones in the Southern Malay Basin. Ph.D. Thesis Imperial College, University of London, p. 1-267.

(online at: <https://spiral.imperial.ac.uk/handle/10044/1/46470>)

(Deposition and diagenesis of U Oligocene- Lower Miocene reservoir sandstones in S Malay basin from seismic data, cores, and well logs. Depositional model of Miocene Pulau-II Fm reservoirs. Pulau Sst interval no marine microfauna, only Pediatrum and common mangrove pollen; brackish water Miliammina fusca in Terengganu Shale. Deposited during initial marine influence in Malay Basin. Braided fluvial sst in N and NE; lower delta plain in S and SW)

Ngah, K. (2000)- Upper Oligocene- Lower Miocene sandstone reservoirs, Southern Malay Basin. AAPG Search and Discovery Article 10008, p. 1-15.

(online at: www.searchanddiscovery.com/documents/khalid/)

(Pulau-II Fm reservoirs in S Malay basin deposited during early opening of backarc basin. Braided fluvial channel sandstones dominant in NE, tributary and tidal-channel sands dominate in S. Reservoir quality primarily result of burial diagenesis and depositional facies. Destruction of porosity by precipitation of quartz and ferroan calcite and porosity enhancement by dissolution of framework feldspars and chert. Up to 40% of porosity dissolution by meteoric water introduced during Late Miocene uplift. Porosity up to 45% in braided-channel sandstones. Poor porosity fine sandstones and some m-c sandstones buried deeper than 3000m)

Ngah, K. (2000)- Structural framework of Southeastern Malay Basin. AAPG Search and Discovery Article 10009, p. 1-7.

(online at: www.searchanddiscovery.net/documents/khalid02/index.htm)

(Malay Basin intracratonic basin in relatively stable Sunda Shelf. Extensional opening from Late Cretaceous-Late Eocene to Late Miocene. Late Miocene- Pliocene compressional phase created anticlinal hydrocarbon traps. Pliocene-Recent extensional basin rejuvenation, with extensive marine incursion. Fault trends N-S in NW Malay Basin, in S two-thirds E-W and NW-SE trends dominant. S Malay Basin relatively oil-prone)

Ngah, K., M. Madon & H.D. Tjia (1996)- Role of Pre-Tertiary fractures in formation and development of the Malay and Penyu basins. In: R. Hall & D.J. Blundell (eds.) Tectonic evolution of Southeast Asia, Geological Society, London, Special Publ. 106, p. 281-289.

(Major faults in Sundaland trend NNW to NW, WNW, N and E. Old NNW to NW, N and E-striking faults in pre-Tertiary basement of Malay and Penyu basins, reactivated before Late Oligocene and in M-Late Miocene. Common N-striking faults in pre-Tertiary of Sundaland, possibly Jurassic regional fractures. NNW-NW and WNW fractures may have originated as strike-slip faults during late Mesozoic deformation. NW-striking basement faults of Malay basin continue onshore SE Asia as Three Pagodas fault zone. M-Late Miocene stress

field change resulted in reversal of slip movement along major wrench faults and structural inversion of sedimentary basins (E-W anticlines located over half-graben))

Ngo T.S., Cu M.H., Phung K.H. & Vu M.T. (2010)- The geology and hydrocarbon potential of a Mesozoic basin in western offshore Vietnam. Proc. 46th Annual Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Vung Tau 2009, p. 4-17.

(Phu Quoc basin is Mesozoic forearc basin developed on margin of Indochina cratonic block, in contact with Sibumasu block, N of East Malay Basin. Over 8 km of Paleozoic- Mesozoic section in depocenters. Three stages: Paleozoic passive margin, Late Permian- Mesozoic forearc, Tertiary- Quaternary sag)

Noon, S. S. Rahmad, M.T. Nguyen, S.L. Chan & S. Mhd. Sabohi (2019)- High-resolution biostratigraphy: its impact on reservoir modelling, a case study from the Malay Basin. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2019), EAGE, Kuala Lumpur, p. 1-5.

Noor, H.M. (1987)- Tinggi Field- analyzing the DHIs. Bull. Geological Society Malaysia 21, p. 133-149.

(online at: www.gsm.org.my/products/702001-101131-PDF.pdf)

(Esso Tinggi oil-gas field in Malay Basin 1980 discovery with many uneconomic but hazardous shallow gas sands, with clear gas DHI's on seismic)

Noosri, R., K. Jankaew, J. Curiale, W. Choowala & N. Yamanee (2025)- Carbon dioxide distribution and origins in North Malay Basin, Gulf of Thailand. Proc. 32nd International Meeting on Organic Geochemistry (IMOG),

Porto, p. 1-2. (Abstract)

(online at: <https://www.earthdoc.org/content/papers/10.3997/2214-4609.202533279>)

(CO₂) is key component in gas reservoirs of North Malay Basin. Generally increases with depth. High CO₂ concentrations (40-90%) commonly linked to mantle or carbonate sources and are spatially associated with structural highs and deep-seated faults. Organic and mixed-origin CO₂ tends to occur near basin depocenters, where hydrocarbons display high thermal maturity)

Ong Tee Suan, M. Lambert, B. Goodin & M. Othman (2012)- Malaysia East Belumut Field: doubling a marginal field's reserves by understanding the application of "Enabling" technology. Proc. Int. Petroleum Technical Conference (IPTC), Bangkok, IPTC 14538, p. 1-11.

Osman, S., M.F. Nianamuthu, F.A. Ismail, J.J.M. Idris & J. Ping (2012)- Sepat Barat Deep-2: the deepest and hottest HPHT well in North Malay Basin. Proc. Petroleum Geology Conference Exhibition (PGCE 2012), Kuala Lumpur, Warta Geologi (Newsletter Geological Society Malaysia) 38, 2, p. 122-123.

(online at: https://gsmpubl.files.wordpress.com/2014/09/warta38_21.pdf)

(Abstract. Sepat Barat Deep-2 only well to successfully evaluate N Malay Basin deeper Group F and H deltaic sandstone reservoirs. Total depth 2768m ss. Overpressure started at 1748m, steep pressure ramp for 200m until lower Group F sand. Maximum formation pressure 7826 psi at 2623m and maximum T 340 °F. 8 new hydrocarbon bearing sands encountered with gross thickness of 69 m. F sands over-pressured reservoirs with porosity up to 24%)

Othman, M. (2008)- Angsi K-sands production performance- a case history of hydraulically fractured retrograde gas condensate reservoir. Proc. 70th EAGE Conference & Exhibition, Rome, SPE-113816, p. 1-10.

(Angsi field 170km off Terengganu. Hydrocarbons in Group I, J and K sandstones of Lower Oligocene- M Miocene age. Lower Miocene K-sand is first tight gas reservoir development in Malaysia, developed in 2002. Hydraulic fracturing improved well deliverability, but production declined relatively fast, then stabilized at very low rate due to condensate banking)

Oudomugsorn, P., C. Rojanachan & K. Sakdejayont (1987)- Evaluation of the petroleum potential of the western basin, Gulf of Thailand. Proc. 23rd Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Madang 1986, 2, p. 80-97.

(Western basin in N Gulf of Thailand is N-S trending Early Tertiary rift basin. Possibly >3500m of Oligocene-Recent sediments, mainly in fluvial- lacustrine facies. Less than 400m of sediment over basement highs)

Paibon, P. & R. Kawphoy (2025)- Improving CO₂ prediction at the r eservoir Level Using Gas Samples: Case study in Pattani Basin, Gulf of Thailand. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference, SEC 2025, Singapore, 12p. (Abstract + Presentation)

(CO₂ is common inert gas in Pattani basin, Gulf of Thailand. Nine CO₂ trends identified in study area. CO₂ tends to increase with depth from M Miocene into E Miocene reservoirs. Etc. (no numbers on CO₂ graphs!?!; JTvG))

Paramita, D. (2012)- Structural evolution of the Songkhla Basin, Gulf of Thailand: a palinspastic restoration Study. Bull. Earth Sciences Thailand (BEST) 5, 2, p. 38-47.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246568/167619>)

(Songhla Basin in Gulf of Thailand N-S trending, Eocene rift basin. Early Oligocene and Late Oligocene- E Miocene local inversion structures at E and W sides of basin in overall extensional regime)

Pedersen, S.A.S., L.O. Boldreel, E.B.Madsen, M.B.Filténborg & L.H. Nielsen (2010)- Thin-skinned thrust-fault tectonics offshore south-west Vietnam. Geological Survey Denmark Greenland Bull. 20, p. 99-102.

(online at: www.geus.dk/publications/bull/nr20/nr20_p099-102.pdf)

(Phu Quoc basin SW of Vietnam in NE Gulf of Thailand underlain by thin-skinned thrust-fault complex concealed by Neogene marine sediments. Fold belt continues into hills at border between Vietnam of Cambodia and Kampot foldbelt. Width of tectonic complex ~200 km wide; shortening ~50%. Deformation of sedimentary succession in E-M Cretaceous (documented by biostratigraphical studies on Phu Quoc island) and tied to subduction of Pacific Ocean plate. Piggy-back basins formed during displacement along thrust faults. Translations 3-8 km from E to W. See also Madsen et al. 2012))

Petersen, H.I., A. Mathiesen, M.B.W. Fyhn, N.T. Dau, J.A. Bojesen-Koefoed, H. Nielsen & H.P. Nytoft (2011)- Modeling of petroleum generation in the Vietnamese part of the Malay Basin using measured kinetics. American Assoc. Petroleum Geol. (AAPG) Bull. 95, 4, p. 509-536.

(2-D modeling of hydrocarbon generation for Malay-Cho Thu Basin in Gulf of Thailand-S China Sea. Source rocks comprise Oligocene synrift lacustrine mudstones and coals, postrift coals, and coaly mudstones. Main play risks include timing of generation from oil-prone lacustrine synrift deposits relative to structural trap formation and relatively small kitchen areas. Minor contribution from lacustrine deposits after principal trap formation consistent with prominent terrigenous geochemical signature of oils in basin)

Petersen, H.I., N. Sherwood, A. Mathiesen, M.B.W. Fyhn, N.T. Dau, N. Russell, J.A. Bojesen-Koefoed & L.A. Nielsen (2009)- Application of integrated vitrinite reflectance and FAMM analyses for thermal maturity assessment of the northeastern Malay Basin, offshore Vietnam: implications for petroleum prospectivity evaluation. Marine and Petroleum Geology 26, p. 319-332.

(In NE Vietnam part of Malay Basin oil- gas discovery well 46-CN-1x encountered a ~55 m of lacustrine mudstones with good potential as oil source. Vitrinite reflectance (VR) measurements may be suppressed in alginite-bearing rocks by 0.14%. Modelled temperature histories indicate onset of hydrocarbon generation for the uppermost Oligocene source rocks between 2 Ma and present-day, which post-dates trap formation)

PETRONAS (1999)- The petroleum geology and resources of Malaysia. Petrolia Nasional Berhad (Petronas) Press, Kuala Lumpur, 665p.

(Major review of Malaysian basins and hydrocarbons by collective of authors. Many of the chapters listed here separately)

PETRONAS (2007)- Chronostratigraphic chart of the Cenozoic and Mesozoic basins of Malaysia. Petrolia Nasional Berhad, Kuala Lumpur, p. 1-71.

(Elegant review of Cenozoic chronostratigraphy, sequence stratigraphy, biostratigraphy and unconformities of Malaysian basins (incl. Malay Basin, Malacca Straits, Sarawak, Sabah. With extensive reference list)

- Phoosongsee, J. & C.K. Morley (2019)- Evolution of a major extensional boundary fault system during multi-phase rifting in the Songkhla Basin, Gulf of Thailand. *J. Asian Earth Sciences* 172, p. 1-13.
(N-S trending Songkhla rift basin in SW Gulf of Thailand is half-graben structure that developed in phases between Late Eocene and early M Miocene. Two phases of rifting in are Eocene-Oligocene in E and Oligocene-Miocene in W Gulf of Thailand and onshore. Songkhla: Eocene early rift; (2) Oligocene- E Miocene late rift (3) M Miocene and younger post-rift)
- Phoosongsee, J., C.K. Morley & A.J. Ferguson (2019)- Quantitative interpretation of seismic attributes for reservoir characterization of Early-Middle Miocene syn- and post-rift successions (Songkhla Basin, Gulf of Thailand). *Marine and Petroleum Geology* 109, p. 791-807.
(Hydrocarbon reservoirs in Gulf of Thailand mainly in E-M Miocene and predominantly fluvial channels. In Songkhla Basin two distinctive channel characteristics: (A) N-S oriented meandering channel complexes, developed during late syn-rift (upper E Miocene), (B) NE-SW oriented long, narrow fluvial channels with tidal and marine influence in post-rift phase I (M Miocene))
- Pigott, J.D. & N. Sattayarak (1993)- Aspects of sedimentary basin evolution assessed through subsidence analysis. Example: northern Gulf of Thailand. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 407-420.
(Oligocene- Recent subsidence analysis suggests N Gulf of Thailand basins exhibit time-transient characteristics of cratonic rift and wrench style basins; basin evolution varied in time and space)
- Pigott, J.D., R. Zhai, K.L. Pigott & T. Tonianse (2012)- Searching for the missing link: The regressive system tract- seismic stratigraphic evidence from the Southern Gulf of Thailand In: Int. Petroleum Technology Conference (IPTC), Bangkok 2012, IPTC 15113, p. 1-21.
(Seismic stratigraphic and geomorphic analysis of 3D seismic from S Gulf of Thailand reveal preservation of complete eustatic cycle on Quaternary tropical coastal plain periodically affected by oscillating sea levels. Aggradational interfluvial coastal plain records mainly Highstand Systems Tract)
- Polchai, T. (2011)- Depositional environment and facies in Units 2A, 2B and 2C of the Graben Trend in Arthit Field, North Malay Basin, Gulf of Thailand. *Bull. Earth Sciences Thailand (BEST)* 4, 2, p. 108-111.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246528/167972>)
(Arthit field at NW margin of N Malay Basin, with ?Miocene sandstone reservoirs deposited in tide-dominated shoreline setting)
- Pongwapee, S., C.K. Morley & Krit Won-in (2019)- Impact of pre-existing fabrics and multi-phase oblique extension on Cenozoic fault patterns, Wichianburi sub-basin of the Phetchabun rift, Thailand. *J. Structural Geology* 118, p. 340-361.
(Cenozoic fault patterns associated with rift development in Wichianburi sub-basin show controls at different scales, including influence by margin of Permian basin and NW-SE to NE-SW trending Triassic folds/ faults. Regional change from E-W to NW-SE extension in M Miocene)
- Praditan, S. (1990)- Calculation of heat flow of the Tertiary basins in the Gulf of Thailand. In: B. Elishewitz (ed.) Proc. CCOP Heat Flow Workshop III, Bangkok 1988, United Nations ESCAP, CCOP, Technical Publication 21, p. 99-106.
(Heatflow values from 9 wells in Gulf of Thailand rel. high)
- Praditan, S. & R. Dook (1992)- Petroleum geology of the northern part of the Gulf of Thailand. In: C. Piencharoen (ed.) Proc. Nat. Conf. Geologic resources of Thailand: potential for future development, Bangkok, Dept. Mineral Resources, p. 235-246.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1992/6222.pdf)
(Numerous Tertiary intra-cratonic rift basins in N Gulf of Thailand: Sakhon, Paknam, Hua Hin, NW, W, Kra, East Kra, North Kra, Prachuap, Chumphon and N pat of Pattani basin. Tertiary sediments almost entirely non-marine, with limited biostratigraphic controls. three lower units synrift fluvial and lacustrine facies, upper unit Late Miocene- Recent post-rift. Locally organic-rich lacustrine source rocks)

Praditnan, S. & S. Polachen (1990)- TH-40 sandstone play Hua Hin Basin, Thailand. In: CCOP/WRGA Play modelling exercise 1989-1990, United Nations ESCAP, CCOP, Technical Publication 23, p. 97-112.
(*Assessment of undiscovered hydrocarbons and play description of TH-40 Oligocene stacked fluvio-lacustrine sands in rotated fault blocks in Hua Hin Basin, N Gulf of Thailand*)

Praditnan, S.C. Singhasene & R. Charusirisawad (1990)- Stratigraphy of Tertiary basins in the Gulf of Thailand. Proc. Development geology for Thailand into the year 2000, Chulalongkorn University, Bangkok 1990, p. 408-429.
(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/1990/24729.pdf)
(*Stratigraphy of multiple Oligo-Miocene rift basins in Gulf of Thailand*))

Praidee, A. (2013)- Controls on reservoir geometry and distribution, Tantawan Field, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 6, 2, p. 1-10.
(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246620/167643>)
(*On M Miocene gas sands reservoirs in Tantawan gas field in Pattani Basin, Gulf of Thailand*)

Priyanto, B., M.N. Ahmad & P. Rowell (2013)- Delineation of rift-related Miocene fluvial sands in the Gulf of Thailand using seismic inversion techniques. Proc. 37th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA13-G-022, p. 1-9.
(*Gulf of Thailand basins form series of en-echelon grabens and half-graben systems, with main gas reservoirs in Lower-Middle Miocene fluvial sands. Seismic inversion techniques used to map reservoir sands*)

Puchała, R.J., S.J. Porebski, W.R. Sliwinski & C.J. August (2011)- Pleistocene to Holocene transition in the central basin of the Gulf of Thailand, based on geoacoustic survey and radiocarbon ages. Marine Geology 288, p. 103-111.
(*Acoustic and coring record of Last Glacial Maximum and postglacial sea-level rise in central Gulf of Thailand. Valley incision (Kelantan River), followed by estuarine- marine transgression, interrupted by deltaic progradation. Transgressive ravinement followed by thin, condensed cover of modern marine muds*)

Putthapiban, P., W. Chantong, P. Srisuwon, C. Praipiban & P. Pananont (2012)- Geothermal and seismic evidence for a southeastern continuation of the Three Pagodas Fault zone into the Gulf of Thailand. Songklanakarin J. Science Technology (SJST) 34, 4, p. 445-452
(online at: <https://www.thaiscience.info/journals/Article/SONG/10891195.pdf>)
(*NW-SE trending Three Pagodas strike-slip fault in C Thailand continues SE into Gulf of Thailand*))

Radovich, B.J. (1997)- Proximal nonmarine sequence stratigraphy, reservoir quality and tectonic controls in the southern Gulf of Thailand. In: K.W. Shanley & B.F. Perkins (eds.) Shallow marine and nonmarine reservoirs: sequence stratigraphy, reservoir architecture and production characteristics, 18th Annual Research Conference Gulf Coast section SEPM Foundation, 18, p. 235-244.
(*Texaco 1994 Mayura 1 well in S Pattani Basin of Gulf of Thailand drilled on the ramp side of half-graben. Numerous oil shows in nonmarine reservoirs in synrift section. Permeability of reservoir units compromised by kaolinite in pore system. Typical sequence composed of stacked, fining-upward parasequences that aggrade during times of relative base level rise*)

Radzi, A., Y. Bazleigh & A. Khalil (2016)- Quantifying the uncertainty of Gross Rock Volume: a decade of time-to-depth conversion in Sepat Field, Malay Basin. First Break 34, p. 73-77.
(*On estimates of GRV from seismic data in Sepat Field in Malay Basin (1983 discovery, structure 30km x 10 km E-W trending structure dissected by normal faults)*)

Ramli, N. (1986)- Depositional model of a Miocene barred wave- and storm-dominated shoreface and shelf, SE Malay Basin. American Assoc. Petroleum Geol. (AAPG) Bull. 70, 1, p. 34-47.
(*J sandstone reservoir in SE Malay basin composed of shoreface and offshore sediments. Barred wave- and storm-dominated shoreface, laterally associated with stacked offshore bars*)

Ramli, N. (1988)- Characteristics of J Sandstone (Tapis Formation) reservoirs in the Southeastern part of the Malay Basin, Offshore West Malaysia. In: Offshore South East Asia Conference 1988, Singapore, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 8, p. 239-248.

(Reservoir quality of Miocene J sandstone mainly controlled by sedimentary texture (absence of bioturbation) and presence of secondary porosity)

Ramli, M.N. (1988)- Humid tropical fan-delta sedimentation: an ancient model from the 'K' sandstones (Late Oligocene-Early Miocene), SE part of the Malay basin, offshore W Malaysia. In: W. Nemec & R.J. Steel (eds.) Fan deltas and related systems: sedimentology and tectonic settings, Blackie & Son Publishers, Glasgow, p. 341-353.

Ramli, M.N. (1988)- Stratigraphy and paleofacies development of Carigali's operating areas in the Malay basin. Bull. Geological Society Malaysia 22, p. 153-187.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1988008.pdf>)

(Stratigraphic scheme, cross-sections and paleofacies maps for Late Oligocene-Pliocene in Malay Basin Blocks PM 6 and PM 12)

Ramli, M.N. (1989)- Stratigraphy and paleofacies development of Carigali's operating areas in the Malay basin, South China Sea. In: B. Situmorang (ed.) Proc. 6th Regional Conference Geology mineral hydrocarbon Resources of SE Asia (GEOSEA VI), Jakarta 1987, IAGI, p. 171-196.

(Similar to Ramli (1988). New time-stratigraphic scheme and regional Late Oligocene- Pliocene paleofacies maps for blocks PM6 and PM12. Predominantly coastal plain- fluviomarine facies)

Rashid, N.S. (2014)- Depositional system and facies analysis in the Central Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 146-153.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246666/167669>)

(Study of reservoir architecture and sand distribution from 47 development wells in N-S trending fluvial meander belts in E-M Miocene of C Pattani Basin)

Reijnenstein, H.M., H.W. Posamentier & J.P. Bhattacharya (2011)- Seismic geomorphology and high-resolution seismic stratigraphy of inner-shelf fluvial, estuarine, deltaic, and marine sequences, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 95, 11, p. 1959-1990.

(3-D seismic-derived images of channels in Pleistocene fluvial, estuarine, marine, and deltaic depositional systems in the upper 80m of central Gulf of Thailand continental shelf. Most fluvial systems lie within incised valleys in lower parts of each depositional sequence)

Restrepo-Pace, P.A., M. Dalrymple & R. Morley (2014)- Finding new exploration targets in 'mature' petroleum basins offshore Thailand: all about nuance. AAPG International Conference Exhib., Istanbul 2014, Search and Discovery Article 10696, p. 1-5. *(Extended Abstract)*

(Thailand's offshore Tertiary basins yielded nearly 5 BBOE (~80% gas). Exploration started in 1970s and peaked by mid 1990s. Some fields in N Pattani Basin with significant oil (Jasmine, 60 MMBO). Eocene-Oligocene NW-SE grabens, overprinted by narrow N-S faulted depocenters developed during Miocene 'back-arc' stretching of continental Sundaland crust. Basins fill: lower synrift lake/fluvial deposits, post -rift fluvial sequences and drowning brackish intertidal to marine succession. Hydrocarbons sourced from synrift lacustrine shales. Mature stage of exploration, but complex trapping mechanisms still have exploration potential)

Restrepo-Pace, P., S. King, R. Jones, C. Goulder, Y. Ah Chim & C. Russell (2010)- The Penyu Basin revisited: the abandoned 'mate' of the Malay-Natuna Basin. Proc. Petrol. Geological Conference Exhib., Kuala Lumpur 2010, Geological Society Malaysia, p. 141-144. *(Extended Abstract)*

(Penyu basin transtensional-transpressional basin that developed coeval to Malay Basin to N. No commercial discoveries yet made on Malaysian side of basin, but straddling Malay- Penyu basin is ~350-400 MMBO Belida field, an inverted structure on basement ridge that separates Malay from Penyu basin, and not underpinned by

source rock. Distinctive oil signature may be linked to contribution from Penyu source. Rhu oil discovery indicates working petroleum system within Penyu)

Rinsiri, T. (2021)- Sand distribution and depositional environments East Yala Field, Pattani Basin, Gulf of Thailand . Bull. Earth Sciences Thailand (BEST) 4, 2, p. 112-118.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246529/167593>)

((Miocene?) Fluvial-dominated sands in main hydrocarbon-bearing reservoir units E-F in East Yala Field, Pattani Basin, C Gulf of Thailand)

Rivas, S., J.O.W. Grimmer, A. Alaminos & J. Navarro (2017)- Basin modelling at the Songkhla Basin (Gulf of Thailand) or: How many source rocks do I have? AAPG/SEG Int. Conf. Exhib., Barcelona 2016, Search and Discovery Article 10922, p. 1-10. (Abstract + Presentation)

(online at: www.searchanddiscovery.com/documents/2017/10922rivas/ndx_rivas.pdf)

(Songkhla basin in W Gulf of Thailand, with several producing oil fields. Asymmetric Tertiary rift basin formed between 40-20 Ma, controlled by NNW-SSE faults mainly at W side, filled by Eocene-Miocene continental sequence. Reservoir intervals fluvial- alluvial sandstones of Eocene, Lower Oligocene and Lower Miocene age. Lower Oligocene lacustrine shales supposed source rocks of basin)

Robinson, K. (1985)- Assessment of undiscovered conventionally recoverable petroleum resources in Tertiary sedimentary basins of Malaysia and Brunei. Bull. Geological Society Malaysia 18, p. 119-131.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1985005.pdf>)

Said, A. (1982)- Overview of exploration for petroleum in Malaysia under the PSC's. Proc. Offshore South East Asia Conference (OFFSEA 82), p. 1-14.

Salam, O.A., S.A. Aziz & M.Y. Ali (2008)- Pre-Tertiary carbonate play, offshore Peninsula Malaysia, a revival of forgotten play. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2008, Paper 25, Geological Society Malaysia, p. 177-181.

(In early 1970's sections of Pre-Tertiary carbonates, 8 -492m thick, tested dry at three localities on Sotong and Bunga Raya structures. New potential Pre-Tertiary carbonate plays identified on 'basement' highs in S Malay Basin near Sotong and Tenggol Arch areas. Model requires mature Oligocene lacustrine source rocks in adjacent deeper grabens)

Samorn, H. (2006)- Fluvial reservoir architecture from near surface 3-D seismic data, Block B8/32, Gulf of Thailand. M.S. Thesis, Colorado School of Mines, p. 1-156. (Unpublished)

Sasaki, A. (1986)- Geological studies on origin of carbon dioxide in Platong Field, Gulf of Thailand. J. Japanese Association for Petroleum Technology 51, 3, p. 218-227.

(online at: [www.journalarchive.jst.go.jp/..](http://www.journalarchive.jst.go.jp/))

(In Japanese, with English abstract) (Platong gas field CO₂ content average 15%, locally >40%. Most CO₂ in nearby Natuna, Malay, N Sumatra basins tied to carbonates, but here believed to be generated from woody-coaly kerogens during thermal diagenesis, and also from 'magmatic origin' through faults)

Schenk, O., Ching Tu, H. Maulana, P. Mullin, A. Hassan, F. Ali et al. (2023)- Revisiting the hydrocarbon prospectivity of the Penyu Basin, offshore Malaysia. Third SEG-AAPG International Meeting for Applied Geoscience & Energy (IMAGE23), Houston, p. 1-5.

(Penyu Basin offshore Eastern Malay Peninsula, with only 17 wells drilled in 50-years, suggesting area is underexplored. Sediment thickness up to ~ 9 km, mainly Eo-Oligocene rift fill and-Mio-Pliocene post-rift sediments in non-marine facies, and similar to producing West Natuna Basin).

Shahar, S. (2008)- Structural evolution of the Tenggol Arch and its implication for basement fracture patterns in the Malay Basin, Malaysia. Masters Thesis Durham University, p. 1-324. (Unpublished)

(online at: <http://etheses.dur.ac.uk/2233/>)

(Evaluation of fracture patterns and hydrocarbon potential of Tenggol Arch, a basement high at W margin of Malay Basin)

Shamsudin Jirin & R.J. Morley (2006)- Integration of biostratigraphy with seismic for sequence stratigraphic interpretation in the Malay basin. Proc. Petroleum Geology Conference and Exhibition (PGCE 2006), Kuala Lumpur, p. 101-102. *(Extended Abstract)*

(online at: <https://www.earthdoc.org/docserver/fulltext/2214-4609/256/P22.pdf>)

(Brief discussion of criteria for recognition of transgressive-regressive sequences from palynology assemblages and seismic lines. 21 sequences recognised in Oligocene- Pleistocene interval of Malay Basin (see also Morley et al., 2021))

Shamsudin Jirin, R.J. Morley, M. Mohamed & S.S. Hasan (2011)- Characterisation of peat forming environments of Miocene coal using biofacies in the Malay basin, Malaysia Proc. Petroleum Geology Conf. Exhibition, Kuala Lumpur 2011, Geology Paper 14, Warta Geologi 37, 1, p 37. *(Abstract)*

(online at: https://gsm.org.my/wp-content/uploads/gsm_file_2/702001-100396-PDF.pdf)

(Coals common in Miocene paralic successions in Malay Basin. Four types of peat-forming environments recognized by biofacies analysis: (1) basinal (most common; begin as topogeneous peats and develop into domed, ombrotrophic peats at later stage; widespread peat type across SE Asia and frequently form thick coals in Malay Basin; (2) watershed or 'kerapah', (3) brackish/marine' and (4) freshwater alluvial peats)

Shing, C.Y. (1992)- Petrographic and diagenetic studies of the reservoir sandstone of the Malay Basin. Bull. Geological Society Malaysia 32, p. 261-283.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1992027.pdf>)

(Reservoir properties of Late Oligocene-Miocene sandstones of Malay Basin depend on depositional facies, mineralogy and burial diagenesis. Oldest sandstones (Group K) mainly m-grained braided stream deposits, J sandstones f-m brackish- shallow marine; E to I zones sandstones generally fine, matrix-rich estuarine deposits. Clean sands prone to quartz cementation. Secondary porosity generated by dissolution of feldspars, etc. Porosity decreases significantly with depth in sandstones of all groups)

Shoup, R. (2008)- Paleogeographic reconstruction of the Arthit area, North Malay Basin. Proc. International Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 375-381.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/112.pdf)

(Paleogeographic evolution of Arthit area, one of Gulf of Thailand E Tertiary rift basins. No age control)

Shoup, R.C., R.J. Morley, T. Swiecicki & S. Clark (2012)- Tectono-stratigraphic framework and Tertiary paleogeography of Southeast Asia: Gulf of Thailand to South Vietnam shelf. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 30246, p. 1-16. *(Abstract and Presentation package)*

(online at: www.searchanddiscovery.com/documents/2012/30246shoup/ndx_shoup.pdf)

(Top Basement map and Oligocene- Miocene paleogeography maps of Tertiary rift basins in Gulf of Thailand- Malay Basin- Natuna- S Vietnam shelf)

Sidik, S.H., Khairul Azlan Mustapha & Alok Kumar (2023)- Biological markers, oil-oil and oil-source correlation of Miocene source rocks and crude oils from Malaysia-Thailand Joint Development Area (JDA), North Malay Basin. Social Science Research Network, Electronic journal, p. 1-29.

(manuscript online at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4467693)

(Hydrocarbons most likely originated from deeper interval Group I source rock, migrated via numerous faults.)

Singh, H. (2005)- The occurrence and exploitation of Malaysian oil and gas resources. In: Oil-industry history, Petroleum History Institute, Meadville, 6, 1, p. 129-152.

Singh, I. & C.H. Ford (1982)- The occurrence, causes and detection of abnormal pressure in the Malay Basin. Proc. Offshore Southeast Asia 82 Conf. (OFFSEA 82), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 1-11.

(Abnormal pressure present throughout Malay Basin, except in SW and NE margins. Attributed to rapid burial, faulting and hydrocarbon column effects)

Sunico, R.J.S. (2021)- Seismic geomorphology of fluvial systems from Pleistocene to Recent in Southern Pattani Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST) 7, 1-2, p. 354-362.

(<https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246705/167697>)

(Architecture of fluvial systems in Pleistocene- Recent on 3D seismic time slices in SE margin of Pattani Basin, Gulf of Thailand)

Supriatna, J.M. (2011)- Maturity modeling of the Songkhla Basin. Bull. Earth Sciences Thailand (BEST) 4, 2, p. 32-35.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246514/167577>)

(Maturation level of lacustrine ?Eocene-Oligocene source rock in Songkhla Basin half-graben in W Gulf of Thailand is early-middle mature. Oil generation started in ~M Miocene)

Tan, D.N.K. (2009)- Malay and Penyu Basins. In: C.S. Hutchison & D.N.K. Tan (eds.) The geology of Peninsular Malaysia, University of Malaya and Geological Society Malaysia, Kuala Lumpur, p. 175-196.

Tang, M., A.C. Yee, S. King, R.A. Jones, M. Farouki, K. Agbebi, Z. Ye & A. Betteridge (2013)- The geology of the Tenggol Arch, offshore Peninsular Malaysia. In: Petroleum Geoscience Conf. Exhib. (PGCE 2013), Kuala Lumpur, O54, p. 1-4. *(Extended Abstract)*

(Tenggol Arch Pre-Tertiary structural high is remnant of collapse of regional domal uplift associated with failed rift triple junction of Malay, Penyu and W Natuna Basins. N and S flanks of Tenggol Arch low-angle ramps into Malay and Penyu Basins. Pre-Tertiary basement on crest of arch at 1500m to 2000m depth. Composed of two distinct seismic facies: (1) transparent facies of high grade metamorphic and granitic rocks and (2) layered facies of sedimentary and low-grade metasediments of most likely Mesozoic age)

Thakharw, A. (2010)- Trap mechanism in the Southern Kra Basin, Gulf of Thailand. Bull. Earth Sciences Thailand (BEST), 3, 2, p. 1-4.

(online at: http://cupetrogeoscience.com/BEST_Thakharw,%20A%20.pdf)

(Main trap styles in S Kra Basin, Gulf of Thailand, NE-SW trending listric normal faults that extend into post-rift reservoir. Faults usually trap hydrocarbons on up-thrown sides. Fault traps higher probability for trapping and sealing basinward, where there is thick shale and large fault throws; traps on basin edge low potential)

The, R., J. Pringle, K. Brazier, G. Peace, A. Laird & R. Kudisri (2013)- Songkhla D and E, exploration & development. Proc. SE Asia Petroleum Exploration Soc (SEAPEX) Conference 2013, Singapore, p. 1-8.

(Presentation) (online at: www.seapex.org/im_images/pdf/Simon/13%20Ronald%20The_Coastal%20Energy%20Songkhla%20D&E_SEC%202013.pdf)

(Brief summary of Songkhla oil field discovery and development in stacked Miocene fluvial sand reservoirs in S Gulf of Thailand (other reports suggest reservoir sands of Oligocene age; JTvG))

Tingay, M., C.K. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, H. Macintyre & Suwit Pabchanda (2012)- Origin and distribution of overpressure in the Northern Malay Basin. AAPG International Conference Exhib., Singapore 2012, Search and Discovery Article 41103, p. *(Presentation)*

(online at: www.searchanddiscovery.com/documents/2012/41103tingay/ndx_tingay.pdf)

(Gas generation accounts for ~46-67% of measured excess pore pressure in N Malay basin, with remaining 33-54% generated by coincident disequilibrium compaction)

Tingay, M., C. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, S. Pabchanda & H. Macintyre (2012)- Overpressures in the Northern Malay Basin: part 1- origin and distribution. International Petroleum Technical Conference (IPTC), Bangkok 2012, 4, IPTC 15345, p. 3260-3271.

(see also companion paper Limpornpipat et al. (2012) for Part 2. Pore pressure data and sonic velocity-vertical effective stress plots from 31 wells reveal overpressures in N Malay Basin mainly generated by fluid expansion)

within 2A, 2B and 2C source rock formations. Gas generation accounts for ~70-50% of excess pore pressure in region, with remaining 30-50% generated by coincident disequilibrium compaction)

Tingay, M.R.P., C.K. Morley, A. Laird, O. Limpornpipat, K. Krisadasima, S. Pabchanda & H.R. Macintyre (2013)- Evidence for overpressure generation by kerogen-to-gas maturation in the northern Malay Basin. *American Assoc. Petroleum Geol. (AAPG) Bull.* 97, 4, p. 639-672.

(Pore-fluid pressure data and sonic velocity-vertical effective stress plots from 30 wells reveal overpressures in N Malay Basin primarily generated by fluid expansion and are located within Miocene 2A, 2B, and 2C source rock formations. Association of fluid expansion overpressures with gas, combined with sonic density response to overpressure and regional geology that precludes other overpressuring mechanisms, provides in-situ evidence for basinwide gas generation overpressuring. Gas generation accounts for ~1/2 to 2/3 of measured excess pore pressure in region, with remainder generated by coincident disequilibrium compaction)

Tjia, H.D. (1994)- Inversion tectonics in the Malay Basin: evidence and timing of events. *Bull. Geological Society Malaysia* 36, p. 119-126.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994027.pdf>)

(Pre-Oligocene half grabens of Malay Basin are pull-apart depressions formed by dextral divergent wrenching. Oligocene- U Miocene sediment fill subjected to compressional deformation, probably in Late Miocene. Extensional regime attributed to 'extrusion' of continental SE Asia and Malay Basin basement due to hard collision between India with Asian Plate. Miocene regional compression probably result of change in motion of Pacific Plate from earlier NNW direction to W-ward direction, combined with N-ward progression of Indo-Australian Plate)

Tjia, H.D. (1998)- Origin and tectonic development of Malay-Penyu-West Natuna basins. *Bull. Geological Society Malaysia* 42, p. 147-160.

(online at: www.gsm.org.my/products/702001-100849-PDF.pdf)

(Late Cretaceous hot spot arched up continental crust of N Sunda Shelf into Malay Dome. Crest broke into three rift arms, now represented by Malay, Penyu and W Natuna basins. Triple junction is still one of highest heat-flow areas of region. Hot spot activity ended by M Eocene, allowing basins to become aulacogens with up to 12 km thick Oligocene and younger sediments. Widespread M Miocene fault inversions and unconformity may be tied to end of South China Sea spreading and end of subduction along N Borneo margin)

Tjia, H.D. (2000)- Tectonic and structural development of Cenozoic basins of Malaysia. *Proc. Geological Society Malaysia, Annual Geological Conference 2000, Penang*, p. 3-16.

(online at: https://gsmpubl.files.wordpress.com/2014/10/agc2000_01.pdf)

(Cenozoic Malaysian basins in: (1) interior of semi-cratonic continental crust (Malay and Penyu basins); (2) marginal belts of semi-cratonic continental crust (small basins of Strait of Melaka and onshore Peninsular Malaysia); (3) straddling collisional plate boundaries (Sarawak and NW Sabah basins); (4) associated with microcontinent (Sandakan, Labuk Bay, Malawali and Tidung basins). Basins may develop as (a) aulacogens above mantle-plume dome (Malay and Penyu); (b) pull-aparts where wrench faulting is dominant (onshore basins of Peninsular Malaysia and Malacca Straits; inverted structures common). (c) At collisional plate boundaries; (d) NE Sabah and Tidung basins originated as rifts in breakup of E Sabah microcontinent)

Tjia, H.D. (2010)- Growing evidence of active deformation in the Malay basin region. *Bull. Geological Society Malaysia* 56, p. 35-40.

(online at: <https://gsmpubl.files.wordpress.com/2014/08/bgsm2010005.pdf>)

Very young crustal movements in Malay basin region point to possibility of late reactivation of regional faults. Malay basin originated in Late Cretaceous as aulacogen on Malay Dome, modified by sinistral transtensional wrenching, post M Miocene transpression and general structural inversion. From Pliocene onward most of basin area considered tectonically quiet, but basement-rooted regional fault zones may intrude into Pliocene-Pleistocene strata and almost reach seabed)

Tjia, H.D., Z. Mohamed, A.S.M. Saad, A. Ridhwan, A. Rahim, J. Baharom et al. (2010)- In the quest of open fractures in the crystalline basement of the Malay and Penyu Basins. Proc. Petroleum Geology Conference Exhibition (PGCE), Kuala Lumpur 2010, p. *(Extended Abstract)*

Tjia, H.D. & M.I. Ismail (1994)- Tectonic implications of well-bore breakouts in Malaysian basins. Bull. Geological Society Malaysia 36, p. 175-186.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1994032.pdf>)

(In Sarawak Basin well-bore breakout directions follow change of tectonic grain in Rajang Accretionary Prism and major tectonic boundaries (W Baram Line, etc.)) and rotations of certain tectonic domains. Other sets directions associated with SW segment of S China Sea spreading ridge. Breakout patterns in Sabah Basin differentiate SW and NE domains which experienced 25° CW rotation. Sandakan Basin experienced compression normal to its axis and also E-W regional compression that is active)

Trevena, A.S. & R.A. Clark (1986)- Diagenesis of sandstone reservoirs of Pattani Basin, Gulf of Thailand. American Assoc. Petroleum Geol. (AAPG) Bull. 70, 3, p. 299-308.

(Miocene sandstones from Pattani basin gas fields, central Gulf of Thailand, show rapid decline in porosity-permeability with depth, from rapid mechanical compaction and cementation by quartz overgrowths, kaolinite, and illite, related to high geothermal gradients. Best porosity- permeability in large pores between 915- 1980m. At greater depths most interparticle pores occluded, and porosity mainly secondary in origin)

Uttarathiyang, T. & J.D. Pigott (2008)- The unexplored post rift Oligocene deltas frontier: North Malay Basin, Thailand. Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok 2008, p. 370-373.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/110.pdf)

(Seismic stratigraphic study of deep post-rift Oligocene deltas in Gulf of Thailand)

Tong, H., W. Naksri, E. Buffetaut, S. Suteethorn, V. Suteethorn, U. Deesri & J. Claude (2021)- Turtle remains from the Early Cretaceous of Kut Island, Gulf of Thailand. Comptes Rendus Palevol 20, 19, p. 345-349.

(online at: <https://sciencepress.mnhn.fr/fr/periodiques/comptes-rendus-palevol/20/19>)

(Isolated turtle plate from E Cretaceous of Kut Island, NE part of Gulf of Thailand. Kut beds can be correlated with Sao Khua Fm of Khorat Gp, NE Thailand)

Twarog, M.R., S.J. Culver, D.J. Mallinson, E. Leorri, B. Donovan, E. I. Harrison, H. Hindes et al. (2021)- Depositional environments and sequence stratigraphy of post-last glacial maximum incised valley-fill, Malay Basin, northern Sunda Shelf. Marine Geology 436, 106457, p.

(manuscript online at: <https://www.sciencedirect.com/science/article/abs/pii/S0025322721000396>)

16 cores in Late Quaternary sediments of N Sunda shelf, off Peninsular Malaysia. Four post-last glacial maximum (LGM) chronostratigraphic units. LGM incised valleys almost filled before post-LGM transgression)

Virdy, M.K., S. Adams, T. Kearney, S. Ross & S. Koysamran (2013)- Bualuang Oilfield, Gulf of Thailand: a success story utilising integrated field development planning. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2013, Singapore, p. 1-22. *(Abstract + Presentation)*

(online at: www.seapex.org/im_images/pdf/Simon/15%20Manjeet%20Kaur%20SEAPEX_Salamander%20Bualuang.pdf)

(Brief summary of Bualuang oil field development in stacked M Miocene fluvial sand reservoirs in W Basin of Gulf of Thailand. W Basin is N-S trending Oligocene half-graben, affected by Late Miocene transtension)

Wan Ismail Wan Yusoff (1984)- Heat flow study in the Malay Basin. United Nations ESCAP, CCOP, Technical Publication 15, p. 77-87.

Wan Ismail Wan Yusoff (1990)- Heat flow in offshore Malaysian basins. In: B. Elishewitz (ed.) Proc. CCOP Heat Flow Workshop III, Bangkok 1988, United Nations ESCAP, United Nations ESCAP, CCOP, Technical Publication 21, p. 39-54.

(Heat flows over Malay and offshore Sarawak basins variable, from normal to very high (47- 137 mW/m²). In Sabah and Sandakan basins values between 34.5- 64 mW/m²)

Wan Ismail Wan Yusoff (1993)- Geothermics of the Malay basin, offshore Malaysia. M.Sc. Thesis Durham University, p. 1-202.

(online at: http://etheses.dur.ac.uk/5537/1/5537_2976.PDF)

(Review of temperature/ heat flow data of Malay Basin from 59 exploration wells. Malay Basin average heat flow 86 mWm⁻², average geothermal gradient 47°C/km, both high. Heat flow regional highs in NW, S and C portions of basin and lower heat flow in SE and NE peripheries. Anomalous heat flow related to subsurface fluid movement and overpressures)

Waples, D.S., R. Mahadir & Meor S. Mahmood (2000)- Geochemistry of gases in the Malay Basin. AAPG International Conference & Exh. 2000, Bali, American Assoc. Petroleum Geol. (AAPG) Bull. 84, p. (Abstract only)

(Three end-member gas types in Malay Basin: biogenic, thermal and basement gas. Most gas samples mixtures. Gases with significant biogenic component limited to NE corner of basin, was probably generated locally and does not appear to offer an important exploration. Gases dominated by CO₂ predominantly sourced from basement. North central part of basin gas mainly of "normal" thermal origin, with accumulations of moderate size. "Deep" thermal gas seems to dominate over "normal" thermal gas in large accumulations)

Waples, D.S., R. Mahadir & L. Warren (1995)- Implications of vitrinite-reflectance suppression for the tectonic and thermal history of the Malay Basin. Bull. Geological Society Malaysia 37, p. 269-284.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a18.pdf>)

(Vitrinite-reflectance (Ro) values in Malay Basin wells lower than expected for high present-day geothermal gradients. Calculated Ro values can only be fitted to measured Ro data by assuming late heat pulse in last few million years. Ro may also be suppressed by abundant liptinite and perhydrous vitrinite. In alternative model paleo heat flow increased during Oligocene rifting and decayed exponentially to modern levels, leading to much earlier hydrocarbon generation)

Waples, D.S. & M. Ramly (1995)- A simple statistical method for correcting and standardizing heat flows and subsurface temperatures derived from logs. Bull. Geological Society Malaysia 37, p. 253-267.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a17.pdf>)

Waples, D.S. & M. Ramly (1996)- Geochemistry of gases in the Malay Basin. Bull. Geological Society Malaysia 39, 241-258.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1996020.pdf>)

(Three end-member gas types in Malay Basin: biogenic, thermal and basement gas. Most gas samples in Malay Basin mixtures of these. Gases with significant biogenic component limited to NE corner of basin, in small accumulations. Gases dominated by CO₂ predominantly sourced from basement. North central part of basin gas mainly of 'normal' thermal origin)

Waples, D.W., L. Warren & R. Mahadir (1994)- A thermal model for the evolution of the Malay Basin. American Assoc. Petroleum Geol. (AAPG) Bull.78, p. 1169. (Abstract only)

(Reconstruction of thermal structure of Malay Basin: (1) major heating event in last 100,000 yr; (2) low Ro values throughout basin indicates heat flow prior to heating event, only slightly higher stable cratons, (3) present-day heat flow lowest in E Malay Basin and highest in NW, where Pliocene-Pleistocene subsidence greatest. Basin evolution model: (1) slight Late Eocene extension of stable craton without high heat flow, thermal doming or rift development; (2) continued slight extension and downwarping until end of M Miocene, when local compression uplifted basement in E portion of basin, leading to 15 km of erosion in some areas; (3) stronger extensional regime throughout basin during Pliocene, causing submergence and greatest subsidence in W, accompanied by increase in heat flow. Strong subsidence (and presumably the increase in basal heat flow) began at ~5.5 Ma, but thermal effects not noted in upper section until recently)

Watcharanantakul, R. & C.K. Morley (2000)- Syn-rift and post-rift modeling of the Pattani Basin, Thailand: evidence for a ramp-flat detachment. Marine and Petroleum Geology 17, p. 937-958.

(Syn-rift section in Pattani Basin has synformal geometry atypical of rifts. Not all subsidence can be modelled as extension-related. Basin probably developed due to both extensional faulting and as synformal basin developed over ramp-flat geometry along major low-angled extensional fault in upper crust. Discrepancy suggests active mantle processes or non-uniform extension (subduction rollback) beneath Gulf of Thailand)

Woollands, M.A. & D. Haw (1976)- Tertiary stratigraphy and sedimentation in the Gulf of Thailand. In: Offshore South East Asia Conference 1976, Singapore, SE Asia Petroleum Exploration Society (SEAPEX), Paper 7, p. 1-22.

(Subdivide Tertiary of Gulf of Thailand into three major cycles of sedimentation)

Wong, R. & S.S. Karimi (2001)- Occurrences of two major transgressive cycles in the North Malay Basin and their impact on the deep reservoir potential. Proc. CCOP 37th Annual Session Bangkok 2000, 2, Technical Reports, p. 27-29.

(Two major transgressive cycles in N Malay Basin: (1) E-M Miocene Group I, H lower coastal plain sands deepening and fining upwards to M Miocene Group F marine shales; (2) U Miocene Group E and D fluvial coastal sands capped by Pliocene Group A/B marine shales. Sandy formation in Groups I, H, E, and D display high amplitude, continuous seismic signature, shale-prone Groups F and A/B weak amplitude, discontinuous seismic facies. Strong indication of deep reservoir potential below overpressured Group F shales)

Yakzan, A.M., H. Awalludin, M.N. Bahari & R.J. Morley (1996)- Integrated biostratigraphic zonation for the Malay Basin. Bull. Geological Society Malaysia 39, p. 157-184.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1996015.pdf>)

(Biostratigraphic scheme for Malay Basin based on foraminiferal, nannofossil and quantitative palynological data. Stratigraphic relationships in U Oligocene fluvial-lacustrine sediments best determined from miospores and freshwater algae. In E Miocene marine flooding surfaces characterized by benthic foraminifera not age diagnostic, but permit accurate correlations. E-M Miocene boundary marine transgressive unit dated by nannofossils and benthic foram and palynological events. Uppermost Miocene- Pleistocene marine facies dated using planktonic foraminifera and nannofossils)

Yamada, H., T. Kachi, J. Maeda & N. Hashimoto (2008)- Recent exploration and development in the Gulf of Thailand oil and gas fields- Investigation of field developing technology and application of fault seal analysis. J. Japanese Association for Petroleum Technology 73, 1, p. 74-82.

(online at: https://www.jstage.jst.go.jp/article/japt/73/1/73_1_74/_pdf/-char/en)

(in Japanese, with English abstract)

Yap, C.B. & R. Wong (1997)- Some possible new exploration ideas in the northern and western Malay Basin of Peninsular Malaysia. Proc. 6th Asean Council on Petroleum Conference and Exhibition (ASCOPE 97), Jakarta, 2, p. 177-192.

Yeo, L.G. (2008)- Investigation of the amount of erosion at the upper Miocene unconformity in the southeastern part of the Malay Basin. M.Sc. Thesis Imperial College, London, p. 1-57. *(Unpublished)*

(Malay Basin underwent inversion period in Late Miocene, which led to erosion and basin-wide unconformity. Erosion greatest in SE basin margin (up to 1400m). Paleogeographic maps support theory that inversion was initiated by rotation of Borneo. Erosion thickness little effect on hydrocarbon generation timing)

Yusak, S.A.M. (2012)- Sedimentological characterization of deeper Group M reservoirs in Malay Basin. Proc. Petroleum Geology Conference Exhibition (PGCE 2012), Kuala Lumpur, Warta Geologi (Newsletter Geological Society Malaysia) 38, 2, p. 213.

(Abstract. early Oligocene Group M sediments deposited in early rift continental sequence in braided stream to lacustrine environments)

Yu Sheng Mo & Yap Kok Thye (2019)- Malay and Penyu basins: Seismic stratigraphy and structural styles. In: Geophysical Applications in Malaysian Basins, PETRONAS, Kuala Lumpur, p. 51-68.

Zainul, A.J.B., R.B. Misman & A.J.B. Ali (1999)- Overview of petroleum resources of Malaysia. In: Petronas (1999) The petroleum geology and resources of Malaysia, p. 35-58.

(Malaysia has 8 sedimentary basins, oil is produced from the Malay, Sabah and Sarawak basins. At 1-1998 7.7 billion STB Oil and 99 TCF Gas discovered in 122 oil fields and 208 gas fields. First oil production from Miri Field in 1910. First offshore discovery in 1968: West Lutong offshore Sarawak.)

Zhang, J., Y. Lu, B. Shi, N. Xu, G. Fan, F. Lu & D. Shao (2014)- Eocene petroleum play: new petroleum system in northeast Gulf of Thailand. Haiyang Xuebao 36, 7, p. 70-76.

(online at: <http://english.hyxh.org.cn/EN/abstract/abstract4519.shtml>)

(In Chinese with English summary. NE Gulf of Thailand stronger inversion structures than elsewhere, enabling petroleum play with Eocene lacustrine source, Eocene- Oligocene deltaic sandstone reservoirs and Miocene delta front and marine shale seals)

IX.7. (Southern) South China Sea

(see also related references in Vietnam offshore chapter)

Andersen, C., A. Mathiesen, L.H. Nielsen, P.V. Tiem, H.I. Petersen & P.T. Dien (2005)- Distribution of source rocks and maturity modelling in the northern Cenozoic Song Hong Basin (Gulf of Tonkin), Vietnam. *J. Petroleum Geology* 28, 2, p. 167-184.

(Oil- source rock correlation indicates coal source for sub-commercial oil and gas accumulations in Miocene deltaic sandstones. Coaly source rock interval entered main oil window prior to formation of Late Miocene inversion traps. Lacustrine mudstones interpreted to be preserved in undrilled NW–SE Paleogene half-grabens NE of Song Lo Fault Zone, based on presence of intervals with continuous, high reflection seismic amplitudes)

Areshev, E.G., T.L. Dong, N.T. San & O.A. Shnip (1992)- Reservoirs in fractured basement on the continental shelf of southern Vietnam. *J. Petroleum Geology* 15, 3, p. 451-464.

(Several recent oil- and gas discoveries on continental shelf of S Vietnam in weathered Late Jurassic- E Cretaceous granite- granodiorite reservoirs. Largest field is White Tiger. Fracture porosity reservoir may be >1km thick; oil-water contact not yet located. Flow-rates up to 2000 m3/day. Granitoids overlain by Oligocene- younger argillaceous rocks, 2.5-4.4 km thick (locally up to 8 km). Source rocks mostly E Oligocene argillites (or deep abiogenic origin))

ASCOPE/ CCOP- Asean Council on Petroleum (1981)- Tertiary sedimentary basins of the Gulf of Thailand and South China Sea: stratigraphy, structure and hydrocarbon occurrences. ASCOPE Secretariat, Jakarta, p. 1-72.

Bache, F., P. Despland, R. Johns & Z. Eterovic (2015)- A new tectonostratigraphic model for the evolution of the South China Sea. AAPG Geosciences Technology Workshops, Kota Kinabalu 2015, Search and Discovery Article 90236, p. 1-3. *(Extended Abstract)*

(online at: www.searchanddiscovery.com/abstracts/pdf/2015/90236apr/abstracts/ndx_bache.pdf)

Bai, Y.L., S.G. Wu, Z. Liu, R.D. Muller, S.E. Williams, S. Zahirovic & D. Dong (2015)- Full-fit reconstruction of the South China Sea conjugate margins. *Tectonophysics* 661, p. 121-135.

(Restoration of conjugate margins of S China Sea to original Late Cretaceous unstretched geometries. Model suggests more extension of continental basement on W part of conjugate margins relative to E margin prior to initiation of seafloor spreading. Mid ocean ridge initially formed in E and propagated W-ward)

Baillie, P., T.V. Thang, P. Carter, P. Barber & T. Spry (2005)- Petroleum prospectivity in the Indonesia/ Vietnam border region. Proc. 2005 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, p. 1-12.

(TGS Heimdal seismic survey)

Banerjee, A. & A.M.A. Salim (2020)- Seismic attribute analysis of deep-water Dangerous Grounds in the South China Sea, NW Sabah Platform region, Malaysia. *J. Natural Gas Science and Engineering* 83, p.

Banerjee A. & A.A. Salim (2021)- Stratigraphic evolution of deep-water Dangerous Grounds in the South China Sea, NW Sabah Platform region, Malaysia. *J. Petroleum Science Engineering* 201, 108434, p. 1-18.

(Evolution of the Dangerous Grounds in NW Sabah Platform, S China Sea. Seven seismic horizons interpreted from 3D seismic data. Two mega-sequences, Paleocene -E Oligocene syn-rift and Late Oligocene to Recent post-rift siliciclastics and carbonates. Late Oligocene-M Miocene deposition of carbonate platform and reefs on top of pre-existing structural highs. Late Oligocene to Middle Miocene channel-levee complexes prominent in seismic data. Mass Transport Deposits and turbidites above M Miocene Unconformity. Pelagic and hemipelagic succession deposited from Pliocene- Recent recent in a passive margin setting)

Banerjee, A., A.M.A. Salim, M. Hermana & A.H.A. Latiff (2022)- Evaluation of carbonate platform in the deep-water Dangerous Grounds, NW Sabah Platform Region, Malaysia. *Petroleum and Coal* 64, 3, p. 515-532.

(online at: https://www.vurup.sk/wp-content/uploads/2022/08/PC-X_Banerjee_189_rev1.pdf)

(Late Oligocene- M Miocene carbonate platform in SE South China Sea)

Barckhausen, U., M. Engels, D. Franke, S. Ladage & M. Pubellier (2014)- Evolution of the South China Sea: revised ages for breakup and seafloor spreading. *Marine and Petroleum Geology* 58 B, p. 599-611.

(Continental breakup of S China Sea basin began in latest Cretaceous in NE and propagated S and W over possibly >40 My. Revised interpretation of seafloor spreading anomalies: onset of seafloor spreading in central SCS at 32 Ma. After ridge jump at 25 Ma spreading began in SW sub-basin, ending at 20.5 Ma in entire basin, followed by phase of magmatic seamount formation mainly along abandoned spreading ridge. Seafloor spreading ended probably because due to blocking of subduction zone along E and S margin by collision with N Palawan or part of Dangerous Grounds continental fragment (see also commentary by Chang et al. 2015))

Barckhausen, U., M. Engels, D. Franke, S. Ladage & M. Pubellier (2014)- Reply to Chang et al., 2014, Evolution of the South China Sea: revised ages for breakup and seafloor spreading. *Marine and Petroleum Geology* 59, p. 679-681.

(Chang et al. (2015) evidence for ~15 Ma end of seafloor spreading in S China Sea, based on age of E Taiwan Ophiolite, may be questioned because it is based on single K-Ar age of questionable accuracy and E Taiwan Ophiolite may not be obducted piece of S China Sea ocean floor)

Barckhausen, U. & H.A. Roeser (2004)- Seafloor spreading anomalies in the South China Sea revisited. In: P. Clift et al. (eds.) *Continent-ocean interactions within East Asian marginal seas*, American Geophysical Union (AGU), Geophysical Monograph 149, p. 121-125.

(Updated interpretation of seafloor spreading anomalies in S China Sea based on new magnetic data. Symmetric seafloor spreading of 5.6 cm/year full rate began at ~31 Ma at E-W trending ridge in central part of SCS. After ridge jump of ~50 km to S at 25 Ma spreading accelerated to 7.3 cm/ year. Second spreading center became active in SW part of SCS, which remained separated from original spreading axis. Formation of oceanic crust ended at 20.5 Ma at both axes (earlier than generally interpreted age of ~17-16 Ma; JTvG))

Ben-Avraham, Z. & S. Uyeda (1973)- The evolution of the China Basin and the Mesozoic paleogeography of Borneo. *Earth Planetary Science Letters* 18, p. 365-376.

(At least three stages in tectonic evolution of S China Sea basin: (1) N-S extension associated with formation of oceanic crust in middle Mesozoic; (2) and (3) stages of E-W compression associated with closing of China Basin in Tertiary, involving NW movement of Borneo toward Asia with underthrusting along Palawan Trough. Early Mesozoic paleogeographic reconstruction places Borneo adjacent to mainland China and Hainan. Opening of basin explained by simple rotation of small plate, which included Borneo and Natuna Islands)

Blanche, J.B. & J.D. Blanche (1997)- An overview of the hydrocarbon potential of the Spratly Islands archipelago and its implications for regional development. In: A.J. Fraser et al. (eds.) *Petroleum geology of Southeast Asia*, Geological Society, London, Special Publ. 126, p. 293-310.

(Hydrocarbon potential of Spratly Islands archipelago relatively unknown and in region of many territorial disputes. Surrounded by oil-producing areas of Vietnam, Natuna, NW Palawan, Luconia Shelf, etc.)

Bochu, Y. (1996)- Tectonic evolution of the South China Sea in Cenozoic. *Marine Geol. Quaternary Geology* 16, 2, p. 1-13. *(In Chinese, with English Abstract)*

(S China Sea underlain by Cenozoic oceanic crust. Two episodes of spreading: (1) NW-SE spreading in Late Eocene- E Oligocene (42-35 Ma), producing NW and SW basins; (2) Late Oligocene- E Miocene (32-17 Ma), forming Central Basin. Tectonic evolution controlled by subduction of Pacific plate under Eurasian continent and collision of India plate with Asian continent)

Bochu, Y. (1999)- The geotectonic character of SE Asia and Cenozoic tectonic history of South China Sea. *Gondwana Research* 2, 4, p. 512-515. *(Extended Abstract)*

(Brief review of SE Asia blocks surrounding S China Sea. Three tectonic movements and two seafloor spreading events in Cenozoic in S China Sea area: (1) late Cretaceous E Tertiary Shenhui movement; (2) Late Eocene- E Oligocene Nanhai movement, with seafloor spreading in NW, SW and Zenmu sub-basins, possibly related to collision of Indian plate with Asian plate; (3) late Oligocene- E Miocene second phase of extension, separating

Liyue-NE Palawan from S China block and forming Central basin. In late M Miocene (~13 Ma), Sulawesi block collided with Great Sunda block, at ~11 Ma, Liyue-NE Palawan block collided with Sulu block)

Bochu, Y., L. Wang, N. Wu & T. Dizhi (2005)- Cenozoic tectonic evolution and the 3D structure of the lithosphere of the South China Sea. *Geological Bulletin of China* 24, 1, p. 1-8. *(In Chinese, with English Abstract)*

Bochu, Y., L. Wang & Z. Liu (2004)- Tectonic dynamics of Cenozoic sedimentary basins and hydrocarbon resources in the South China Sea. *Earth Science. J. China University of Geoscience* 29, 5, p. 543-549. *(In Chinese, with English Abstract)*

Bojesen-Koefoed, J.A., L.H. Nielsen, H.P. Nytoft, H.I. Petersen, Nguyen Thi Dau et al. (2005)- Geochemical characteristics of oil seepages from Dam Thi Nai, Central Vietnam: implications for hydrocarbon exploration in the offshore Phu Khanh Basin. *J. Petroleum Geology* 28, p. 3-18.
(Active oil seepage on E coast of C Vietnam, adjacent to N part of offshore and largely unexplored Phu Khanh Basin. Petroleum generated from Tertiary marine marl source rock)

Bojesen-Koefoed, J.A., H.P. Nytoft & Nguyen Thi Dau (2009)- Petroleum composition in the Cuu Long Basin (Mekong Basin) offshore southern Vietnam. *Marine and Petroleum Geology* 26, p. 899-908.
(Cuu Long (Mekong) rift basin off S Vietnam important petroleum basin. Oils from four fields are highly paraffinic. Originated from lacustrine source rocks, presumably Oligocene lacustrine shales in syn-rift)

Boubacar, L., J. Ren, J. Zhang & C. Lei (2015)- En echelon faults and basin structure in Huizhou Sag, South China Sea: implications for the tectonics of the SE Asia. *J. of Earth Science (China)* 26, 5, p. 690-699.
(Huizhou sag on N continental margin of S China Sea with en echelon fault distribution at margins of basin, suggesting oblique extension and caused by subduction of Proto-South China Sea towards NW Borneo. Tectonic evolution of basin: rifting (49–32 Ma), post-rift (32–15.5 Ma) and rapid subsidence (15.5-0 Ma))

Boulay, S., C. Colin, A. Trentesaux, S. Clain, Z. Liu & C. Lauer-Leredde (2007)- Sedimentary responses to the Pleistocene climate variations recorded in the South China Sea. *Quaternary Research* 68, 1, p. 162-172.

Braitenberg, C., S. Wienecke & Y. Wang (2006)- Basement structures from satellite-derived gravity field: South China Sea ridge. *J. of Geophysical Research* 111B, p. 1-15.
(online at: <https://www2.units.it/geodin/bib/JGR06.pdf>)
(Satellite gravity shows linear feature of ~1000 km length, paralleling S China Sea extinct spreading center. Model crustal thickness between 8-12 km over oceanic, 10- 20 km over continental crust parts of S China Sea. Spreading center is continuous and bends from older E-W orientation to younger SW-NE orientation rather than being made up of two separate axis segments)

Breitfeld, H.T., J. Hennig-Breitfeld, M. BouDagher-Fadel, W.J. Schmidt, K. Meyer, J. Reinprecht, T. Lukie et al. (2022)- Provenance of Oligocene–Miocene sedimentary rocks in the Cuu Long and Nam Con Son basins, Vietnam and early history of the Mekong River. *Int. J. Earth Sciences* 111, p. 1773-1804.
(online at: <https://link.springer.com/content/pdf/10.1007/s00531-022-02214-0.pdf>)
(Offshore Cuu Long and Nam Con Son basins in S China Sea of SE Vietnam. Oligocene- E Miocene basin fill of Cuu Long dominated by sediment sourced from Da Lat Zone basement. Sandstones with abundant Cretaceous detrital zircons. Bach Ho Unconformity at ~16 21 Ma provenance change to large river system which drained Indochina, resembling the present-day Mekong River. Zircon populations dominated by Triassic ages. Nam Con Son Basin comparable drainage history: at Dua Unconformity at ~15.4-17 Ma Indochina provenance signature changes from Indochina to predominant Sibumasu signature.)

Briaies, A. & G. Pautot (1990)- Reconstructions of the South China Sea from structural data and magnetic anomalies. In: X. Jin et al. (eds.) *Proc. Symposium Recent contributions to the geological history of the South China Sea*, Hangzhou 1990, p. 60-70.
(online at: https://epic.awi.de/38705/2/south-china-sea_1990.pdf)

(Oceanic spreading in S China Sea very asymmetric and at least one ridge jump. Spreading probably started at ~26 Ma and stopped synchronously along spreading ridge at ~15.5 Ma. Extension mostly related to extrusion of Indochina Block as consequence of India-Asia collision)

Briaais, A., P. Tapponnier & G. Pautot (1989)- Constraints of Sea Beam data on crustal fabrics and seafloor spreading in the South China Sea. *Earth Planetary Science Letters* 95, p. 307-320.

Briaais, A., P. Patriat & P. Tapponnier (1993)- Updated interpretation of magnetic anomalies and seafloor spreading stages in the South China Sea; implications for the Tertiary tectonics of Southeast Asia. *J. of Geophysical Research* 98, p. 6299-6328.

(New set of magnetic profiles in NE and SW South China Sea. Spreading between 32-27 Ma created rel. smooth basement, now covered by thick sediments. Ridge jumped S and created rough basement, with thinner sediments than in N, from ~27-16 Ma, while spreading rate was slower. Spreading stopped at ~15.5 Ma. Reconstruction of Oligo-Miocene SE Asia blocks movements tied to extrusion of Indochina after India-Asia collision. Cessation of spreading after 16 Ma synchronous with final increments of left-lateral shear and normal uplift in Ailao Shan (18 Ma) and incipient Australian-Eurasian plates collisions)

Buhring, C., M. Sarnthein & H. Erlenkeuser (2004)- Toward a high-resolution stable isotope stratigraphy of the last 1.1 M.y.: Site 1144, South China Sea. In: W.L. Prell et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results* 184, Chapter 2, p. 1-29.

(online at: www-odp.tamu.edu/publications/184_SR/VOLUME/CHAPTERS/205.PDF)

(High-resolution oxygen and carbon stable isotope stratigraphy of 518m-long cored Quaternary section of ODP Site 1144 in northern S China Sea. One 5 cm thick layer with Australasian microtektites (386.18- 386.23 mcd) near Brunhes/Matuyama boundary and within transition of lower MIS 19- MIS 20 oxygen isotope stages. Proposed age model layer suggests age of microtektites layer 787 ka. Microtektite layer also in SONNE-95 core 17957 from southern SCS, within MIS 19-20 transition, 10 cm (~11.6 ky) below Brunhes/Matuyama reversal)

Bui Viet Dung (2011)- The Late Quaternary evolution of the southern Vietnamese continental shelf. Ph.D. Thesis, Christian-Albrechts Universitat, Kiel, p. 1-118.

(online at: <http://d-nb.info/1013154398/34>)

Bui Viet Dung, K. Stattegger, D. Unverricht, P. Van Phach & N.T. Thanh (2013)- Late Pleistocene-Holocene seismic stratigraphy of the Southeast Vietnam Shelf. *Global and Planetary Change* 110, p. 156-169.

(Late Pleistocene-Holocene sequence of SE Vietnam Shelf with basal sequence boundary formed by subaerial exposure during Late Pleistocene sea-level fall and subsequent marine reworking during transgression. Northern incised-valley system narrow and deep V-shape in cross-section (<5 km wide, 10s of m deep) likely result of high-gradient of paleo-shelf. Off Mekong Delta and Ca Mau Peninsula low-gradient paleo-shelf created shallow incised-valleys (5-15 km wide, <15m deep. Lowstand ST prograding outer shelf delta-wedge formed during Last Glacial Maximum. Transgressive ST preserved in incised-valleys, with thickness 15-25m)

Bui Viet Dung, K. Stattegger, N.T. Thanh, P. Van Phach, T.T. Dung & B.X. Thong (2014)- Late Pleistocene-Holocene seismic stratigraphy of Nha Trang shelf, central Vietnam. *Marine and Petroleum Geology* 58, p. 789-800.

(Two sequences in Late Pleistocene-Holocene on steep and narrow shelf off Nha Trang. Relict beach ridge deposits ~130m below present water depth indicate Last Glacial Lowstand sea level in this area lower than in neighboring areas, probably resulting from subsidence due to high sedimentation rate and/or neotectonic movements of E Vietnam Fault System)

Burton-Johnson, A. & A.B. Cullen (2023)- Continental rifting in the South China Sea through extension and high heat flow: an extended history. *Gondwana Research* 120, p. 235-263.

(online at: <https://www.sciencedirect.com/science/article/pii/S1342937X2200243X>)

(New (?) model, showing that geological and geophysical correlations between opposing SCS margins best agrees with common initial development on S China Margin, with protracted extension since Mesozoic, in agreement with paleomagnetic data for Borneo. Protracted lithospheric extension in SE Asia initiated by

Mesozoic slab rollback and migration of subduction zone beneath S China, leading to intracontinental thinning and extension. This drove passive asthenospheric upwelling, increasing heat flow and crustal ductility, etc.)

Cai, G., Z. Wan, Y. Yao, L. Zhong, H. Zheng, A. Kapsiotis & C. Zhang (2019)- Mesozoic northward subduction along the SE Asian continental margin inferred from magmatic records in the South China Sea. *Minerals* (MDPI) 9, 10, 598, p. 1-25.

(online at: <https://www.mdpi.com/2075-163X/9/10/598>)

(Aptian (~124 Ma) adakitic granodiorites and Nb-enriched basalts from Xiaozhenzhu Seamount in S China Sea. Propose new geotectonic model involving subduction of young oceanic lithosphere during Late Jurassic, and N-ward subduction of proto-S China Sea along SE Asian continental margin in E Cretaceous)

Calvert, S.E., T.F. Pedersen & R.C. Thunell (1993)- Geochemistry of the surface sediments of the Sulu and South China Seas. *Marine Geology* 114, p. 207-231.

Cameselle, A.L., C.R. Ranero & U. Barckhausen (2020)- Understanding the 3D formation of a wide rift: the Central South China Sea rift system. *Tectonics* 39, 12, e2019TC006040, p. 1-26.

(Central S China Sea rift system 850-km-wide region of continental crust where extension formed pattern of lithospheric boudinage, defined by seven 100-200-km-long segments. Each segment 18-24-km-thick crust sector laterally thinning into interboudin neck with ≤ 10 -km ultra-thin crust (β factors ~ 3.3 -6.5). Extension continued at all six interboudin necks until ~ 23 Ma, when breakup by seafloor spreading propagation reached one of them. Seven segments evolved as discrete subsystems from early rifting to breakup. Structurally equivalent ultrathin crust grabens NE and SW of both SCS conjugate margins, supporting wide rift mode of deformation across SCS. Breakup not controlled by further continental lithospheric thinning but by seafloor spreading propagation to SW)

Cameselle, A.L., C.R. Ranero, D. Franke & U. Barckhausen (2017)- The continent-ocean transition on the northwestern South China Sea. *Basin Research* 29, S1, p. 73-95.

Cao, L., T. Jiang & J. He (2021)- Fingerprinting sand from Asian rivers to the deep central South China Sea since the Late Miocene. *Geological Society of America (GSA) Bull.* 133, 9-10, p. 1964-1978.

(Heavy minerals and detrital zircons in sandy turbidite deposits in U Miocene- Pleistocene strata in IODP 349 wells in deep central S China Sea show several provenance shifts. Sands mainly derived from E Vietnam and Pearl River Basin. Less significant, contributions from Red and Mekong river basins and coastal SE China)

Cao, L., L. Shao, P. Qiao, Y. Cui, G. Zhang & X. Zhang (2021)- Formation and paleogeographic evolution of the Palawan continental terrane along the Southeast Asian margin revealed by detrital fingerprints. *Geological Society of America (GSA) Bull.* 133, 5-6, p. 1167-1193.

(online at: https://www.researchgate.net/publication/345828748_Formation_and_paleogeographic_evolution_of_the_Palawan_continental_terrane_along_the_Southeast_Asian_margin_revealed_by_detrital_fingerprints)
(Sediment provenance shifts corresponding to paleogeography of Palawan continental terrane evolving from (1) accretionary complex in Jurassic, to (2) NE S China Sea rifted margin in latest Cretaceous to early Cenozoic and (3) to microcontinent after Oligocene-Miocene spreading of S China Sea)

Cao, Y., C.F. Li & Y. Yao (2017)- Thermal subsidence and sedimentary processes in the South China Sea Basin. *Marine Geology* 394, p. 30-38.

(Differences in sedimentation rate changes and calculated subsidence between East and SW subbasins of S China Sea. Abrupt increase in sedimentation rates since Pliocene suggests glacial-interglacial climate variability impacted erosion rates)

Chang, J.H., H.H. Hsieh, A. Mirza, S.P. Chang, H.H. Hsu, C.S. Liu, C.C. Su, S.D. Chiu et al. (2017)- Crustal structure north of the Taiping Island (Itu Aba Island), southern margin of the South China Sea. *J. Asian Earth Sciences* 142, p. 119-133.

(Taiping Island in Spratly (Nansha) Islands in N part of S margin of SW sub-basin of S China Sea. Basement highs dominated by fault blocks and volcanic basement structures)

Chang, J.H., T.Y. Lee & H.H. Hsu (2015)- Comment on Barckhausen et al., 2014- Evolution of the South China Sea: revised ages for breakup and seafloor spreading. *Marine and Petroleum Geology* 59, p. 676-678.
(*Youngest available age for fragment of S China Sea (now part of E Taiwan ophiolite) is ~15 Ma, suggesting cessation of S China Sea seafloor spreading more consistent with previous studies than Barckhausen et al. (2014) suggested age of 20.5 Ma (validity of K-Ar dating and interpretation of E Taiwan Ophiolite as piece of S China Sea oceanic crust questioned by Barckhausen et al. 2015; Reply)*)

Chang, S.P. & M. Pubellier (2023)- Rifting and seafloor spreading in the South China sea: a subduction-related extension on the down-going plate? *Comptes Rendus Geoscience* 355, Special Issue S2, p. 29-52.
(online at: <https://comptes-rendus.academie-sciences.fr/geoscience/item/10.5802/crgeos.232.pdf>)
(*Rifting, spreading and cessation of activity in S China Sea basin in Cenozoic appears to be coeval with progressive closure of Proto-South China Sea which ended with collision in Borneo and Palawan. Evolution between 45 Ma and 16 Ma, migrated through time from NE to SW. Far-field subduction process may impact regional tectonics in terms of both rifting and contraction of crust from initiation to termination*)

Chang, S.P., M. Pubellier, M. Delescluse, Y. Qiu, M. Nirrengarten, G. Mohn, N. Chamot-Rooke & Y. Liang (2021)- Crustal architecture and evolution of the southwestern South China Sea: implications to continental breakup. *Marine and Petroleum Geology* 136, 105450, p. 1-16.
(Ms online at: https://hal.archives-ouvertes.fr/hal-03601934/file/SCS_SungPing_rev2_clean%20copy.pdf)
(*SW S China Sea marginal basin exhibits asymmetrical hyper-extension architecture, with S margin being lower plate margin. Two stages: initial N-S extension coeval with first phase of seafloor spreading in E sub-basin, changing to NW-SE opening at ~23 Ma in SW sub-basin in relation to ridge jump. Variable extension direction linked to changes in compressional tectonic regime along Borneo and Palawan*)

Chen, S.S., R. Gao, Z. Wang, T. Hou, J. Liao & C. Yan (2021)- Coexistence of Hainan Plume and stagnant slab in the mantle transition zone beneath the South China Sea spreading ridge: constraints from volcanic glasses and seismic tomography. *Lithosphere* 2021, Special 2, 6619463, p. 1-22.
(online at: <https://pubs.geoscienceworld.org/gsa/lithosphere/article/2021/Special%202/6619463/596242/Coexistence-of-Hainan-Plume-and-Stagnant-Slab-in>)
(*On Hainan mantle plume and stagnant subducted slab on seismic tomography model*)

Chen, W., S. Wu, D. Wang, C. Betzler & Y. Ma (2023)- Stratigraphic evolution and drowning steps of a submerged isolated carbonate platform in the northern South China Sea. *Frontiers in Marine Sciences*. 10:1200788, p. 1-21.
(online at: <https://www.frontiersin.org/journals/marine-science/articles/10.3389/fmars.2023.1200788/full>)
(*Drowned E-M Miocene isolated carbonate platform at water depth 536-800m in Xisha Uplift (Parecel) area in northern S China Sea. 45x12 km in diameter*)

Cheng, J., S. Wan, G. Li, W. Xu, W. Yan, Y. Luo, Y. Tian & M.M. Wang (2022)- Origin of large-scale variegated reef limestones in the southern South China Sea: Implications for Miocene regional and global geological evolution. *J. Asian Earth Sciences* 230, 105202, p. 1-14.
(*Deep Nanke-1 well, drilled on Meiji Atoll in 2017, penetrated Cenozoic reef strata in the central Nansha Block (= Dangerous Grounds) in southern S China Sea, with two layers of variegated (white, reddish and red brown) reef limestone in Miocene. Represent subaerial exposure surfaces. Much of M Miocene missing (~20-11 Ma?)*)

Choi, T. & J. McArdle (2015)- Hydrocarbon prospectivity of the deep water Phu Khanh Basin. *Proc. AAPG Asia Workshop, Tectonic evolution and sedimentation of South China Sea region, Kota Kinabalu, Sabah, Search and Discovery Article 10751*, 2p. (*Extended Abstract*)
(online at: www.searchanddiscovery.com/documents/2015/10751choi/ndx_choi.pdf)
(*Frontier Phu Khanh Basin, offshore Vietnam, at transition zone between Indochina block and S China Sea margin. Post-2008 deep water wells proved working petroleum system. Two main depocenters with two syn-rift phases (Late Eocene- Oligocene and E-M Miocene). Several Late Oligocene inverted structures, related to opening of S China Sea. Basin history similar to NW Palawan Basin. Play types: basement, Miocene reefal*)

buildups, U Miocene-Pliocene turbidite fans and Oligocene- E Miocene syn-rift clastics below major Mid-Miocene unconformity)

Chung Nguyen (2014)- A review of Tertiary palynomorph assemblage in Cuu Long Basin: case study of palynomorphs in Miocene-Oligocene sediments. *Int. J. Sciences Basic Applied Research (IJSBAR)* 24, 3, p. 103-111.

(online at: <http://gssrr.org/index.php?journal=JournalOfBasicAndApplied&page=issue&op=archive>)

(E Oligocene- Late Miocene palynomorph assemblages and Vietnam Petroleum Institute (VPI) palynological zonation, with age-restricted taxa Florschuetzia trilobata, F. meridionalis, Stenochlaenidites papuanus (= S. laurifolia), Jussiena, Verutricolporites pachydermus, Gothanipollis basensis, Cicatricosisporites dorogensis, Lycopodiumsporites neogenicus, Meyeripolis nahankotensis, etc)

Chung, S.L., H. Cheng, B.M. Jahn, S.Y. O'Reilly & B. Zhu (1997)- Major and trace element and Sr-Nd isotope constraints on the origin of Paleogene volcanism in South China prior to the South China Sea opening. *Lithos* 40, p. 203-220.

(Paleogene volcanics crop out in Sanshui, Heyuan and Lienping basins, in attenuated continental margin of S China. Bimodal lavas from Sanshui basin (64-43 Ma) bimodal, geochemically similar to Cretaceous A-type granites from nearby region. Paleogene volcanic activities resulted from lithospheric extension in S China that migrated S and eventually led to opening of S China Sea during ~30-16 Ma)

Chungkham, P. (2004)- Phu Khanh Basin, a frontier deepwater basin in Vietnam. *SEAPLEX Press* 7, 3, p. 56-69.

Clift, P.D. (2015)- Coupled onshore erosion and offshore sediment loading as causes of lower crust flow on the margins of South China Sea. *Geoscience Letters* 2, 13, p. 1-11.

(online at: <https://link.springer.com/article/10.1186/s40562-015-0029-9>)

(Several basins around S China Sea with accelerated phases of basement subsidence associated with phases of fast erosion onshore and deposition of thick sediments offshore, causing flow of ductile crust from offshore towards continental interior after end of active extension, partly reversing flow during continental breakup)

Clift, P.D. (2016)- Assessing effective provenance methods for fluvial sediment in the South China Sea. In: P.D. Clift et al. (eds.) *River-dominated shelf sediments of East Asian seas*, Geological Society, London, Special Publ. 429, p. 9-29.

(online at: http://www.geol.lsu.edu/pclift/pclift/Publications_files/2015_Clift_GSSP.pdf)

(Thermochronology methods best suited for provenance analysis in S China Sea, especially apatite fission track, which shows more diversity in sources than U-Pb zircon or Ar/Ar muscovite dating. Triassic Indosinian ages very common in many of source regions)

Clift, P.D., S. Brune & J. Quinteros (2015)- Climate changes control offshore crustal structure at South China Sea continental margin. *Earth Planetary Science Letters* 420, p. 66-72.

(online at: http://earthbyte.org/Resources/Pdf/Clift_etal_2015_Climate_changes_control_offshore_crustal_structure_SouthChinaSea.pdf)

(Rifted continental lithosphere subsides as consequence of combined crustal thinning and mantle lithosphere cooling, but some continental margin basins experience anomalous subsidence after active extension. Deep basins on N margin of S China Sea (Baiyun Sag, etc.) show basement subsidence accelerating after ~21 Ma, postdating extension by several million years. Sediment loading by increased sediment flux after faster onshore erosion following E Miocene monsoon intensification is viable trigger for ductile flow after active extension)

Clift, P., G.H. Lee, N.A. Duc, U. Barckhausen, H.V. Long & S. Zhen (2008)- Seismic reflection evidence for a Dangerous Grounds miniplate: no extrusion origin for the South China Sea. *Tectonics* 27, TC3008, p. 1-16.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2007TC002216>)

(S boundary of Dangerous Grounds is subduction zone that jammed in M Miocene. Dangerous Grounds bounded by strike-slip zone, also active until ~16 Ma. W Baram Line originates as strike-slip fault in Dangerous Grounds and continuous with Red River Fault Zone. Because Dangerous Grounds independent of Sundaland until ~16 Ma, extrusion impossible as mechanism to rift S China Sea. SE motion by Dangerous

Grounds and Sundaland suggests subduction (slab rollback?) main trigger for plate motions. Reconstruction places ~280km upper limit on motion on Red River Fault and ~1400km width to Paleo-S China Sea)

Clift, P. & J. Lin (2001)- Preferential mantle lithospheric extension under the South China margin. *Marine and Petroleum Geology* 18, p. 929-945.

(online at: www.whoi.edu/science/GG/people/jlin/papers/Clift&Lin_M&P.Geol.2001.pdf)

(Continental rifting in northern S China Sea culminated in seafloor spreading at ~30 Ma (Late Oligocene). Basin and margins classic break-up in juvenile arc crust environment. Extension of crust exceeded that in mantle lithosphere under S China Shelf, but depth-dependent extension rather than lithospheric-scale detachment. Timing of major extension is mid-late Eocene- Late Oligocene (~45-25 Ma))

Clift, P., J. Lin & U. Barckhausen (2002)- Evidence of low flexural rigidity and low viscosity lower continental crust during continental break-up in the South China Sea. *Marine and Petroleum Geology* 19, 8, p. 951-970.

(S China Sea formed by seafloor spreading in Late Oligocene at ~30 Ma following series of extensional events within Mesozoic continental arc crust. Study of faults on seismic reflection profiles from margins. Forward models based on upper crustal faulting underpredicted subsidence, especially towards continent-ocean transition (COT). Interpreted to indicate preferential extension of continental lower crust along COT on both margins. Forward models based on upper crustal faulting support idea of very weak continental crust)

Clift, P.D., J. Lin & ODP Leg 184 Scientific Party (2001)- Patterns of extension and magmatism along the continent-ocean boundary, South China margin. In: R.C.L. Wilson, R.B. Whitmarsh et al. (eds.) *Non-volcanic rifting of continental margins: a comparison of evidence from land and sea*, Geological Society, London, Special Publ. 187, p. 489-510.

(Early Oligocene sea-floor spreading in S China Sea preceded by Maastrichtian and Mid-Eocene continental extension that generated rift basins on margin and outer structural high. Seismic evidence of rift-related volcanic rocks ~25 km landward of continent-ocean boundary. S China margin may be intermediate type of continental extension between Iberia-type non-volcanic and Greenland-type volcanic margin)

Clift, P.D. & Z. Sun (2001)- The sedimentary and tectonic evolution of the Yinggehai-Song Hong basin and the southern Hainan margin, South China Sea: implications for Tibetan uplift and monsoon intensification. *J. of Geophysical Research* 111, B06405, p. 1-28.

(Yinggehai-Song Hong large pull-apart basin along Red River fault zone in South China Sea, cross-cutting rifted margin of northern South China Sea. Basins started to open after ~45 Ma, especially after ~34 Ma. Yinggehai basin folded and inverted in M Miocene, after 21 Ma in N and 14 Ma in S, rapidly subsiding again after ~5 Ma. Sediment supply peak in M Miocene. Major uplift in Red River drainage in M Miocene or older)

Collins, D.S., A. Avdis, P.A. Allison, H.D. Johnson, J. Hill, M.D. Piggott, M.H.A. Hassan & A.R. Damit (2017)- Tidal dynamics and mangrove carbon sequestration during the Oligo-Miocene in the South China Sea. *Nature Communications* 8, 15698, p. 1-12.

(online at: <https://www.nature.com/articles/ncomms15698.pdf>)

(Evaluation of processes controlling productivity and preservation of mangrove-bearing successions in Oligo-Miocene of basins of S China Sea (Vietnam, Gulf of Thailand, N Borneo). High tidal ranges optimize mangrove development along tide-influenced tropical coastlines. Preservation of mangrove organic carbon promoted by high tectonic subsidence and fluvial sediment supply)

Corchete V. (2020)- Crustal and upper mantle structure beneath the South China Sea and Indonesia. *Geological Society of America (GSA) Bull.* 133, 1-2, p. 177-184.

(3-D S-velocity model shows differences between Java Sea and Banda Sea regions and transitional boundary between the two regions. Model confirms oceanic crust in center of S China Sea, crustal thinning from N continental margin of SCS to this oceanic crust, high-velocity layer in the lower crust of N margin, etc.)

Cossey, S.P.J. & W.T. Valenta (1984)- Seismic hydrocarbon indicators in South China Sea. *Oil and Gas Journal*, 13 June 1984, p. 212-224.

Cullen, A., P. Reemst, G. Henstra, S. Gozzard & A. Ray (2010)- Rifting of the South China Sea: new perspectives. *Petroleum Geoscience* 16, 3, p. 273-282.

(online at: <https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.702.3577&rep=rep1&type=pdf>)

(Oligocene seafloor spreading and rift propagation in S China Sea critical tectonic events that overprint earlier regional extension. Two models proposed to explain opening of S China Sea. Sarawak Orogeny attributed to Eocene-Early Oligocene collision of Dangerous Grounds-Reed Bank with Sabah and Palawan. Oligo-Miocene subduction of oceanic crust under NW Borneo is minimal. Sabah Orogeny and younger inversion events related to underthrusting of Dangerous Grounds driven by both opening of S China Sea and NW-directed subduction beneath SE Sabah in Semporna-Dent Peninsula)

Cuong, Trin Xuan & J.K. Warren (2009)- Bach Ho field, a fractured granitic basement reservoir, Cuu Long basin, offshore SE Vietnam: a "buried-hill" play. *J. Petroleum Geology* 32, 2, p. 129-156.

(Bach Ho field originally discovered by Mobil in 1975. Producing since mid-1980's from Late Cretaceous granite-granodiorite, associated with major NE-SW Late Oligocene transpressional fault with ~2000m of lateral displacement cross-cutting Central Block. 1000m liquids column, effective porosities 3-5%)

Dam, M.H., Pham Thi Duyen, Dao Thu Ha & Nguyen Thi Tham (2019)- Biostratigraphy and sequence stratigraphy of Middle Miocene - Lower Pliocene sediments, Block 05-1, Nam Con Son Basin. *Dao Khi (Petro-Vietnam)* 2019, 9, p. 23-34 *(in Vietnamese)*

(online at: https://www.researchgate.net/publication/374631757_Biostratigraphy_and_sequence_stratigraphy_of_Middle_Miocene_-_Lower_Pliocene_sediments_Block_05-1_Nam_Con_Son_Basin)

(Sequence biostratigraphic study of marine M Miocene - Lower Pliocene sediments of eastern part of Block 05-1, Nam Con Son basin, S China Sea)

Dam, M.H., Vu Thi Tuyen, Nguyen Tan Trieu & Nguyen Thi Tham (2021)- Biostratigraphic and petrological characteristics of Cretaceous–Paleogene sediments in the eastern Cuu Long delta. *J. Petroleum Exploration Production Technology* 11, p. 2055-2073.

(online at: <https://link.springer.com/content/pdf/10.1007/s13202-021-01156-8.pdf>)

(TC1 and TC2 well in S edge of Cuu Long delta in southernmost Vietnam with Eocene-Recent clastic section overlying Cretaceous meta-sediments of 'basement' high below 800m (deeper in offshore wells). Cretaceous age determined with palynology)

Dao, D.V. & T. Huyen (1995)- Heat flow in the oil basins of Vietnam. *CCOP, Technical Bulletin* 25, p. 55-61.

Delescluse, M., T. Pichot, N. Chamot-Rooke, M. Pubellier, Y. Qiu, G. Sun, J. Wang & J.L. Auxietre (2015)- Seismic imaging of the SW South China Sea deep crustal structure shows evidence for a ductile lower crust during rifting. *AAPG Workshop 'Tectonic evolution and sedimentation of South China Sea region'*, Kota Kinabalu, Search and Discovery Article 30404, p. 1-36. *(Abstract + Presentation)*

(online at: www.searchanddiscovery.com/documents/2015/30404delescluse/ndx_delescluse.pdf)

(S China Sea very wide rifted continental crust margins (~400 km in N, nearly 800 km in SW). Rift-related normal faults of S China Sea rooted in mid-lower-crustal detachment. Extension of SW SCS margins distributed on small-scale and large-scale normal faulting with spacing of ~15-30 km and ~45-90 km, respectively, probably related to presence of competent layers (upper-middle crust and shallow upper mantle) separated by ductile lower crust)

Deng, H., J. Ren, X. Pang, P.F. Rey, K.R. McClay, I.M. Watkinson, J. Zheng & P. Luo (2020)- South China Sea documents the transition from wide continental rift to continental break up. *Nature Communications* 11, Art. Nr. 4583, p. 1-9.

(online at: <https://www.nature.com/articles/s41467-020-18448-y>)

(Wide continental rifts can reach 1,000 km across. Eocene extension across N margin of S China Sea records transition between wide continental rift and highly extended (<15 km) continental margin. Seismic data show presence of dome structures, corrugated and grooved detachment fault, and subdetachment deformation with crustal-scale nappe folds and magmatic intrusions coeval with supra-detachment basins. Thermal- mechanical weakening of broad continental domain allowed for formation of metamorphic core complexes, boudinage of

upper crust and exhumation of middle/lower crust through detachment faulting. Similar to broad rifts in N American Cordillera and in Aegean domain, and reflects the transition from wide rift to continental breakup)

Dickson, W. (2023)- Geology of the South China Sea and regional tectonics of South East Asia, Part XI(A): Southern margin banks or observing terranes with detachment(s). SEAPEX Press 112, 26, 2, p. 44-51.
(Southern Margin Banks area (Sabah Platform) off NW Borneo and Palawan. Underlain by attenuated continental crust that originated on N side of the S China Sea and detached in series of terranes. W-most terrane is Luconia, which docked with Borneo in Late Eocene, with NE part in Southern Margin Banks, but most buried beneath Sarawak Basin. North Palawan-Mindoro, Reed Bank, Dangerous Grounds East and West, and Tu Chinh-Spratly terranes detached from S China/E Indochina in Late Oligocene- E Miocene as S China Sea oceanic crust spread, and docked with Borneo/Palawan by early M Miocene. Etc.)

Dickson, W. (2023)- Geology of the South China Sea and regional tectonics of South East Asia, Part XII: Northwest Palawan Basin: new year, new play trend or, is Ian Longley correct? SEAPEX Press 114, 26, 4, p. 68-84.
(Review of geology and hydrocarbon potential of NW Palawan Basin (with Malampaya-Camago Field) (SW Palawan Basin and Reed Bank Basin do not exist). Located on N Palawan-Mindoro continental terrane or microplate, rifted off S China margin in mid-Oligocene time, with Late Paleozoic-Mesozoic sediments and metasediments)

Dien, Phan Trung (1995)- Some Cenozoic hydrocarbon bearing basins on the continental shelf of Vietnam. Bull. Geological Society Malaysia 37, p. 33-54.
*(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1995a03.pdf>)
(Offshore basins of Vietnam contain hydrocarbon traps in Tertiary sediments and Pre-Cenozoic fractured basement (with Oligocene source rock and topseal). Basement composed of U Jurassic-Eocene meta-molasses and plutonic-volcanic arcs (45-168 Ma). Sedimentary basins continental shelf filled by Oligocene-Miocene marine and deltaic sediments, related to rifting of S China Sea. Main basins Cuulong, Nam Con Son)*

Dien, P.T. (1996)- Some pre-Cenozoic petroleum plays on the continental shelf of Vietnam. Petrovietnam Review 1, p. 7-20.

Dien, P.T., C. Andersen, L.H. Nielsen, N.H. Quy, P.V. Tiem & P.S. Tai (2000)- Basin analysis and petroleum system of the Song Hong Basin. Proc. 36th Session Coord. Comm. Coastal and Offshore Programmes E and SE Asia (CCOP), Hanoi 1999, p. 1-33.
(Song Hong Basin series of complexly faulted sub-basins on NW margin S China Sea. In NE area oil play in U Devonian- Lw Carboniferous fractured carbonates, sourced from juxtaposed Oligocene syn-rift lacustrine shales. Also U Oligocene- Miocene clastics play)

Dien, P.T., P.S. Tai & N. Van Dung (1997)- Basin analysis and petroleum system of the Cuu Long Basin on the continental shelf of Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conference, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 521-529.

Ding, W.F., L. Qin, X. Feng, C. Wu, G. Wu, Y. Diao, S. Yin, C. Yang, J. Gao & J. Li (2022)- A new perspective on the continent-ocean boundary of Palawan continental block identified with geophysical data. Tectonophysics 826, 229239, p.
(Continent-ocean boundary between Palawan continental block and South China Sea oceanic basin delineated at foot of massif NW Palawan slope (with hyper-extended crust and seaward-dipping listric faults) and obvious dividing boundary in shipboard magnetic data)

Ding, W.W., D. Franke, J.B. Li & S. Steuer (2013)- Seismic stratigraphy and tectonic structure from a composite multi-channel seismic profile across the entire Dangerous Grounds, South China Sea. Tectonophysics 582, p. 162-176.
(500km long seismic profile across Dangerous Grounds and S China Sea. Two major phases of extension, separated by unconformity, which likely corresponds with beginning of sea-floor spreading in S China Sea.

Early extension during continental rifting (Late Cretaceous- E Oligocene), with formation of half-grabens and rotated blocks. Extension continued in Late Oligocene- E Miocene. Dangerous Grounds magma-poor rift system at initial stage of mantle unroofing. Widespread carbonate platform developed across Dangerous Grounds, concurrent with seafloor spreading in SW Subbasin of S China Sea)

Ding, W.W. & J.B. Li (2011)- Seismic stratigraphy, tectonic structure and extension factors across the Dangerous Grounds: evidence from two regional multi-channel seismic profiles. Chinese J. Geophysics 54, 6, p. 921-941.

(online at: www.agu.org/wps/ChineseJGeo/54/06/dww.pdf)

(Two regional NW-SE seismic lines from Dangerous Grounds area to Borneo. Five tectono-stratigraphic units recognized, the SCS, together with seven sequence boundaries. Main extension during E Tertiary continental rifting and resulted in formation of half-grabens and rotated blocks, controlled by deeply rooted detachment system. Late Oligocene- E Miocene second extension phase)

Ding, W.W. & J.B. Li (2016)- Conjugate margin pattern of the Southwest Sub-basin, South China Sea: insights from deformation structures in the continent-ocean transition zone. Geological Journal 51, S1, p. 524-534.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/gj.2733/pdf>)

Ding, W.W. & J.B. Li (2016)- Propagated rifting in the Southwest Sub-basin, South China Sea: Insights from analogue modelling. J.Geodynamics 100, p. 71-86.

(online at: www.sciencedirect.com/science/article/pii/S0264370716300199)

(Modeling of rifting in SW S China Sea suggests rifting partly controlled by presence of rigid tectonic blocks in continental margin, like Reed Bank and Macclesfield Bank. Extension and break-up centered on deep troughs between rigid blocks)

Ding, W.W., J.B. Li, P.D. Clift & IODP Exp. 349 Scientists (2016)- Spreading dynamics and sedimentary process of the southwest Sub-basin, South China Sea: constraints from multi-channel seismic data and IODP Expedition 349. J. Asian Earth Sciences 115, p. 97-113.

(online at: www.who.edu/filesserver.do?id=226584&pt=2&p=68128)

(S China Sea three basement domains: hyper-stretched crust, exhumed subcontinental mantle and steady state oceanic crust. SW subbasin has asymmetric geometry and experienced detachment faulting in final stage of continental rifting and exhumation of continental mantle lithosphere. Mantle lithospheric breakup post-dates crustal separation, delaying establishment of oceanic spreading and steady state crust production)

Ding, W.W., J.B. Li, C. Dong & Y. Fang (2015)- Oligocene-Miocene carbonates in the Reed Bank area, South China Sea, and their tectono-sedimentary evolution. Marine Geophysical Research 36, 2-3, p. 149-165.

(online at: <https://link.springer.com/content/pdf/10.1007/s11001-014-9237-5.pdf>)

(In Reed Bank area wide carbonate platform, developed in Late Oligocene and E Miocene (32-20 Ma), concurrent with opening of South China Sea. Top carbonates is regional unconformity, marking cessation of seafloor spreading with erosional/non-depositional hiatus, spanning 3 or My. Sharp increase in subsidence rate after end of spreading (17 Ma), causing carbonate platforms drowning, except at some structural highs where carbonate sedimentation continued to M Miocene)

Ding, W.W., J.B. Li, C. Dong, Y. Fang, Y. Tang & J. Fu (2014)- Carbonate platforms in the Reed Bank Area, South China Sea: seismic characteristics, development and controlling factors. Energy Exploration & Exploitation 32, 1, p. 243-261.

(online at: <https://journals.sagepub.com/doi/pdf/10.1260/0144-5987.32.1.243>)

(Seismic characteristics of Late Oligocene- E Miocene carbonate platforms and other reef types in Reed Bank area. Reefal carbonate build-ups continued in structural highs almost up to M Miocene and to present in Reed Bank. Development of platforms and reefs controlled by tectonics and sea level. Thermal subsidence after cessation of S China Sea opening in E Miocene and rising sea level drowned carbonate platforms)

Ding, W.W., Z. Sun, K. Dadd, Y. Fang & J.B. Li (2018)- Structures within the oceanic crust of the central South China Sea basin and their implications for oceanic accretionary processes. *Earth Planetary Science Letters* 488, p. 115-125.

(online at: <https://www.sciencedirect.com/science/article/pii/S0012821X18300736>)

(On bright reflectors within Oligocene- M Miocene oceanic crust of S China Sea. Dipping reflectors generally confined to lower crust above Moho reflection)

Dmitriyevskiy, A.N., F.A. Kireyev, R.A. Bochko & T.A. Fedorova (1993)- Hydrothermal origin of oil and gas reservoirs in Basement rock of the South Vietnam continental shelf. *International Geology Review* 35, 7, p. 621-630.

(Oil-saturated granites, with mineral parageneses typical of hydrothermal metasomatism and leaching haloes, near faults in crystalline basement of S Vietnam continental shelf. Presence of native silver, barite, copper, etc., indicates deep origin for mineralizing fluids)

Dong, D.D., S.G. Wu, J.B. Li & T. Ludmann (2014)- Tectonic contrast between the conjugate margins of the South China Sea and the implication for the differential extensional model. *Science China Earth Sciences* 57, 6, p. 1415-1426.

(Conjugate margins of S China Sea strongly asymmetric)

Dong, M., S.G. Wu & J. Zhang (2016)- Thinned crustal structure and tectonic boundary of the Nansha Block, southern South China Sea. *Marine Geophysical Research* 37, p. 281-296.

(southern S China Sea margin consists of thinned crustal Nansha Block (Spratly islands) and compressional collision zone. Nansha Block N boundary is narrow continent-ocean transition zone, with Moho depth ~13 km. Block extends S-ward beneath deformed sediment wedge caused by uplift on land after collision. SW boundary close to Lupa Line)

Dong, M., S.G. Wu, J. Zhang, X. Xu, J. Gao & T. Song (2020)- Lithospheric structure of the Southwest South China Sea: implications for rifting and extension. *International Geology Review* 62, 7-8, p. 924-937.

(Study of SW part of S China Sea margin. Average thickness of crust ~15 km and thermal lithosphere ~57 km. Overall extension of continental crust and lithosphere >200 km. Continental margins in warm thermal state. SW SCS characterized by ultra-wide, thinned continental crust and lithosphere, high Moho heat flow, early syn-rift faulted basins, undeformed late syn-rifting, and high seismic velocities in lower crust. Break-up of mantle lithosphere occurred before that of continental crust)

Dong, M., J. Zhang, S.G. Wu, B.Y. Wang & Y.F. Ai (2019)- Cooling of the lithosphere beneath the Nansha Block, South China Sea. *J. Asian Earth Sciences* 171, p. 169-177.

(Nansha Block (= Dangerous Grounds) in southern S China Sea is exotic micro-continent, and remnant of passive continental margin of Proto-S China Sea that disappeared under Borneo. Extensional regime since Late Cretaceous. Nansha Block experienced rapid cooling)

Dorobek, S.L. (2000)- Cenozoic carbonate buildups of the South China Sea and the early post-rift history of passive continental margins. *Geological Society of America (GSA), Annual Meeting 2000, Abstracts with Programs* 32, 7, p. 226. *(Abstract only)*

(S China Sea underlain by Paleogene rifted continental and young (32-15 Ma) oceanic crust. Extensional basement highs became nucleation sites for carbonate sedimentation during latest syn-rift to early post-rift phases. Longest lived, largest and thickest buildups in most offshore rift basins. Large isolated platforms commonly coalesce from smaller buildups. Growth of buildups strongly influenced by long-term subsidence. Many of farthest offshore buildups still growing today. Termination of more inboard Cenozoic buildups due to hypernutrification or increasing turbidity from major river systems. Only in offshore Palawan and E parts of Dangerous Grounds tectonic subsidence rates rapid enough to drown carbonate buildups)

Du Bois, E.P. (1981)- Review of principal hydrocarbon-bearing basins of the South China Sea area. *Energy* 6, 11, p. 1113-1140.

(S China Sea area basins include: Thai, Malay, West Natuna and Penyu, Saigon and Mekong (Vung Tau), E Natuna, Greater Sarawak including C Luconia and Balingian provinces, Baram Delta/Brunei-Sabah and NW Palawan Shelf. Hydrocarbons commonly associated with M and Upper Miocene age rocks. Oligocene and Pliocene occurrences locally significant.)

Du Bois, E.P. (1985)- Review of principal hydrocarbon-bearing basins around the South China Sea. Bull. Geological Society Malaysia 18, p. 167-209.

(online at: www.gsm.org.my/products/702001-101139-PDF.pdf)

(Review of ~12 basins around S China Sea in Thailand (Kharat, Thai), Malaysia (Malay, Penyu), Vietnam, N Borneo, E and W Natuna, Sarawak, Brunei-Sabah and NW Palawan)

Emery, K.O. & Z. Ben-Avraham (1972)- Structure and stratigraphy of China Basin. American Assoc. Petroleum Geol. (AAPG) Bull. 56, 5, p. 839-859.

(Early seismic interpretation of S China Sea. Acoustic basement in S part of basin that may be continuation of igneous and metamorphic rocks beneath adjacent shelf which were peneplaned during Late Cretaceous- Early Cenozoic. More irregular basement in N of basin may be oceanic basement, etc.)

Emery, K.O. & Z. Ben-Avraham (1972)- Structure and stratigraphy of the China Basin. United Nations ECAFE, CCOP, Technical Bulletin 6, p. 117-140.

(online at: <https://repository.unescap.org/handle/20.500.12870/5064>)

(Same paper Emery & Ben-Avraham (1972) above)

Fang, P., W. Ding, Y. Fang & Z. Zhao (2017)- Cenozoic tectonic subsidence in the southern continental margin, South China Sea. Frontiers of Earth Science 11, 2, p. 427-441.

(Tectonic subsidence history from seismic profiles across Dangerous Grounds and Reed Bank area in S China Sea. Delay of tectonic subsidence after break-up, likely related to major mantle convection during seafloor spreading. Stage with delayed subsidence rate in Reed Bank area 32-23.8 Ma, in the Dangerous Grounds 19-15.5 Ma, tied to rift propagation)

Fang, P., W. Ding, X. Wei & Y. Zhao (2023)- Unravelling rift propagation from Cenozoic subsidence patterns: Examples from the Dangerous Grounds, South China Sea. Basin Research 35, p. 1856-1879.

(online at: <https://onlinelibrary.wiley.com/doi/pdfdirect/10.1111/bre.12783>)

(Geological interpretation from backstripping of 37 HR seismic sections. Rapid subsidence in E Dangerous Grounds from Paleocene- E Oligocene, then migrated W to middle Dangerous Grounds during E Oligocene- E Miocene, and reached W Dangerous Grounds during E-M Miocene. Etc.)

Ferre, E.C., S. Satolli, H. Wu, P. Persaud, D. Cukur & S. A. Bowden (2023)- Red or green: overprinting of the climatic signal in Miocene sediments, South China Sea (IODP Expedition 368, Site U1502). Terra Nova 35, 6, p. 498-505.

(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/ter.12670>)

(Red and green colored sediments commonly interpreted to reflect climate or other environment changes. IODP Hole U1502A marine sediments in S China Sea suggest post-depositional fluids locally changed sediment color from red (caused by hematite) to green (reduction processes forming pyrrhotite- magnetite))

Flower, M.F.J., M. Zhang, C.Y. Chen, Kan Tu & G. Xie (1992)- Magmatism in the South China Basin: 2. Post-spreading Quaternary basalts from Hainan Island, south China. Chemical Geology 97, p. 65-87.

(Cenozoic magmatism on N Hainan Island post-dates opening of S China Sea Basin. Tholeiite lava flows from WSW-ENE-trending fissures and interlayered with M Miocene-Quaternary sediments, forming 200-1000m sequence. With time basalts change from thin intercalated quartz tholeiite and alkali olivine basalt flows to more massive olivine tholeiites. Hainan basalts resemble Dupal-type oceanic island basalt)

Franke, D. (2013)- Rifting, lithosphere breakup and volcanism: comparison of magma-poor and volcanic rifted margins. Marine and Petroleum Geology 43, p. 63-87.

(Volcanic rifted margins evolve by extension accompanied by extensive extrusive magmatism during breakup, (up to 15km volcanic flows, seaward dipping reflectors). Magma-poor rifted margins with wide domains of extended crust (rotated fault blocks with detachment surfaces near base of continental crust), but limited magmatism. South China Sea intermediate between above end-members, with basin-and-range type rifting followed by formation of oceanic crust)

Franke, D., U. Barckhausen, N. Baristean, M. Engels, S. Ladage, R. Lutz, J. Montano, N. Pellejera, E.G. Ramos & M. Schnabel (2011)- The continent-ocean transition at the southeastern margin of the South China Sea. *Marine and Petroleum Geology* 28, 6, p. 1187-1204.

(S China Sea created by magma-poor rifting in Paleogene. Study of continent-ocean transition (COT) at S margin off NW Palawan between continental blocks of Reed Bank and Palawan- Calamian islands. Two major NE trending rifted basins. Continent-ocean transition interpreted at seaward limit of continental crust, but magnetic spreading anomalies terminate ~80-100 km farther N. Area in-between extensive volcanism (dykes, extrusive basaltic lava flows, occurring after breakup). COT varies from distinct outer ridge with steep seafloor relief to rotated fault blocks and half-grabens above eroded pre-rift basement and no seafloor relief. Gravity modelling shows extremely thinned crust across shelf)

Franke, D., D. Savva, M. Pubellier, S. Steuer, B. Mouly, J.L. Auxietre, F. Meresse & N. Chamot-Rooke (2014)- The final rifting evolution in the South China Sea. *Marine and Petroleum Geology* 58, B, p. 704-720.

(S China Sea ~30-40 Myrs of rifting. Initial latest Cretaceous- E Paleocene rift architecture preserved at distal margins. Rift basins bounded to crustal blocks by listric normal faults on either side and with Moho uplifts under major rift basins. Most basin-bounding faults sole out in middle crust. Only in region within ~50 km from Continent-Ocean Transition normal faults reach mantle, dipping seaward or landward, which may indicate presence of exhumed mantle bordering continental margins. Post-rift (Oligocene-E Miocene) platform carbonates indicate delay in subsidence during rifting. Symmetric process predominate in initial rift stage. Considerable along-margin variations suggested, with alternating 'upper and lower plate' margins. Breakup in major E subbasin of SCS in E Oligocene, breakup of SW subbasin in Late Oligocene)

Funnell, R., R. Allis & T. Huyen (1997)- Thermal regimes in two Vietnamese basins, Cuu Long and Nam Con Son, and implications for hydrocarbon generation. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum systems of SE Asia and Australasia Conference*, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 499-509.

(Steady-state surface heat flow $\sim 70 \pm 5$ mW/m² for hydrocarbon-producing Cuu Long Basin and 80 ± 8 mW/m² for Nam Con Son Basin about 100 km to SE)

Fyhn, M.B.W., L.O. Boldreel & L.H. Nielsen (2009)- Tectonic and climatic control on growth and demise of the Phan Rang carbonate platform offshore south Vietnam. *Basin Research* 21, 2, p. 225-251.

(Phan Rang carbonate platform offshore S Vietnam >15,000 km², one of largest in S China Sea. Platform growth initiated in late M Miocene and terminated in Pliocene. Late Miocene regional uplift and subaerial exposure, causing karstification. Deteriorated growth conditions and fast subsidence resulted in platform split-up, backstepping and local drowning. Isolated platforms nucleated on structural highs as transgression continued. Longest surviving platform now crops out at seafloor at ~500m depth)

Fyhn, M.B.W., L.O. Boldreel & L.H. Nielsen (2009)- Geological development of the central and south Vietnamese margin: implications for the establishment of the South China Sea, Indochinese escape tectonics and Cenozoic volcanism. *Tectonophysics* 478, p. 184-214.

(Vietnamese margin of S China Sea underlain by Paleogene rift basins established through SE-ward extrusion of Indochina. Late Oligocene, basin inversions offshore contemporaneously with initial right-lateral inversion along Mae Ping Shear Zone and onset of major uplift of metamorphic core complexes, probably in response to N-ward movement of India. Renewed rifting offshore after jump of SCS spreading axis and Neogene SW-ward propagation of continental break-up, consequence of slab-pull associated with subduction of proto-SCS under Borneo. Rifting and continued until end M Miocene. Termination of seafloor spreading marked by latest M Miocene unconformity in Nam Con Son and Phu Khanh basins. Neogene volcanism)

Fyhn, M.B.W., L.O. Boldreel, L.H. Nielsen, T.C. Giang, L.H. Nga, N.T.M. Hong, N.D. Nguyen & I. Abatzis (2013)- Carbonate platform growth and demise offshore Central Vietnam: effects of Early Miocene transgression and subsequent onshore uplift. *J. Asian Earth Sciences* 76, p. 152-168.

(online at: repository.vnu.edu.vn/bitstream/VNU_123/27728/1/BS2013.53.pdf)

(Miocene carbonate platforms off C Vietnam mainly on two regional platforms separated by E Vietnam Boundary Fault Zone: (1) Tuy Hoa Platform to W (platform growth E-M Miocene, terminated by M Miocene time regional uplift/ subaerial exposure) (2) Triton Platform in E (also initiated in E Miocene, partial drowning in M Miocene; repeated partial drowning events through M-L Miocene resulted in W-wards retreat of platform growth and eventual platform drowning and termination of carbonate deposition). Modern carbonate growth continues on isolated platforms of Paracel Islands)

Fyhn, M.B.W., B.H. Hoang, Nguyen T. Anh, J. Hovikoski, Tong D. Cuong, B.V. Dung, M. Olivarius et al. (2020)- Eocene-Oligocene syn-rift deposition in the northern Gulf of Tonkin, Vietnam. *Marine and Petroleum Geology* 111, p. 390-413.

Fyhn, M.B.W., L.H. Nielsen, L.O. Boldreel, L.D. Thang, J. Bojesen-Koefoed, H.I. Petersen, T.H. Nguyen et al. (2009)- Geological evolution, regional perspectives and hydrocarbon potential of the northwest Phu Khanh Basin, offshore Central Vietnam. *Marine and Petroleum Geology* 26, p. 1-24.

(Seismic stratigraphic and structural analyses of NW Phu Khanh Basin, off C Vietnam. Initial rifting in latest Cretaceous? or Paleogene controlled by left-lateral transtension. Rifting stopped due to M Oligocene transpression but resumed by left-lateral transtension in Late Oligocene. Thick lacustrine and alluvial sediments deposited in Paleogene rift periods. Late Oligocene rifting ended due to inversion, triggered by right-lateral wrenching near Oligo-Miocene boundary. Direct Hydrocarbon Indicators and oil-gas seeps)

Fyhn, M.B.W., L.H. Nielsen, H.I. Petersen, A. Mathiesen, L.O. Boldreel, J.A. Bojesen-Koefoed, H.P. Nytoft et al. (2010)- Geological evolution and aspects of the petroleum potential of the underexplored parts of the Vietnamese margin. *Petrovietnam Journal* 10, p. 2-19.

(online at: www.vpi.pvn.vn/Upload/TapChi/TCDK20110522080147.pdf)

(Vietnamese margin includes underexplored basins with significant hydrocarbon potential. Review of origin and petroleum potential of Song Hong, Phu Khanh, Malay-Tho Chu and Phu Quoc basins. Jurassic-Cretaceous magmatic arc (Paleo-Pacific subduction) underlies part of Vietnamese margin. Phu Quoc basin formed in response to magmatic arc and was inverted during Paleocene- E Eocene, plate collision. Eocene-Oligocene left-lateral strike-slip faulting along margin resulted in rifting and source-rock deposition. Widespread Miocene carbonate deposition along E Vietnamese margin. Magmatism affected the margin from Early Neogene; associated Late Neogene onshore uplift and denudation promoted offshore sedimentation)

Fyhn, M.B.W., H.I. Petersen, L.H. Nielsen, T.C. Giang, L.H. Nga, N.T.M. Hong, N.D. Nguyen & I. Abatzis (2012)- The Cenozoic Song Hong and Beibuwan Basins, Vietnam. *Geol. Survey Denmark and Greenland Bull.* 26, p. 81-84.

(online at: www.geus.dk/publications/bull/nr26/nr26_p81-84.pdf)

(Song Hong Basin offshore Vietnam in NW part of S China Sea with up to 15-20 km of Cenozoic sediment. Not clear yet whether this part of Vietnam margin is transform margin or oblique rift margin. Inverted Eo-Oligocene syn-rift succession outcrops on Bach Long Vi island 500m core demonstrates thick lacustrine section with oil-prone source-rock with 2-7% total organic carbon)

Glass, B.P. & C. Koeberl (2006)- Australasian microtektites and associated impact ejecta in the South China Sea and the Middle Pleistocene supereruption of Toba. *Meteoritics Planetary Science* 41, 2, p. 305-326.

(Australasian microtektites and associated unmelted ejecta in ODP holes in central S China Sea. Hole 1144A highest microtektites abundance of any known Australasian microtektite site, associated with partly melted particles with fractured mineral inclusions, probably close to source crater, possibly near 22° N/ 104° E. Parent material for Australasian tektites may be fine-grained (Jurassic?) sedimentary deposit. Size of source crater 43 ± 9 km, based on thickness of ejecta layers and distance from proposed source. Rhyolitic volcanic ash layer just above microtektite layer may be from supereruption of Toba caldera complex ~800 ka ago)

Granath, J.W., W.G. Dickson, J.M. Christ & M.E. Odegard (2004)- Exploration-scale features from high resolution gravity and topographic datasets and their derivatives. In: R.A. Noble et al. (eds.) Proc. Deepwater and Frontier Exploration in Asia & Australia Symposium, Jakarta, Indonesian Petroleum Association (IPA), DFE04-PO-052, p. 1-11.

(High-resolution gravity survey examples, mainly from S China Sea)

Guan, D., X. Ke & Y. Wang (2016)- Basement structures of East and South China Seas and adjacent regions from gravity inversion. J. Asian Earth Sciences 117, p. 242-255.

Guan, Q., T. Zhang, B. Taylor, J. Gao & J. Li (2021)- Ridge jump reorientation of the South China Sea revealed by high-resolution magnetic data. Terra Nova 33, 5, p. 475-482.

(High-resolution magnetic isochron pattern in East Subbasin (ESB) of S China Sea provides an updated age of seafloor spreading (Chron 11n.1r /29.7 Ma to Chron 5Br/ 15.6 Ma). Successive ridge jumps between Chrons 9r and 7n, which explains asymmetric geometry of the ESB)

Hao, F. (1988)- Cenozoic reefs- new targets for oil fields in the northern part of the South China Sea. In: H.C. Wagner et al. (eds.) Petroleum Resources of China and related subjects, Circum-Pacific Council for Energy Mineral Resources, Earth Science Series, Houston, 10, p. 199-218.

(Seismic examples of Cenozoic reefs in Pearl River Mouth Basin and Yinggehai Basin in N part of S China Sea)

Hayes, D.E. & S.S. Nissen (2005)- The South China Sea margins: implications for rifting contrasts. Earth Planetary Science Letters 237, p. 601-616.

(Dramatic differences in crustal thicknesses along margin of S China. Continental crustal extension much less along E and C segments than W segment of margin. Differences accommodated by early formation of oceanic crust adjacent to E margin, with continued extension of continental crust to W. Two models predict oceanic crust of SCS basin toward W not forming until 6-12 My after initial formation to E (~32 Ma). Total crustal extension ~1100 km, remarkably consistent for all segments)

He, E., M. Zhao, X. Qiu, J.C. Sibuet, J. Wang & J. Zhang (2016)- Crustal structure across the post-spreading magmatic ridge of the East Sub-basin in the South China Sea: tectonic significance. J. Asian Earth Sciences 121, p. 139-152.

(Last phase of opening of S China Sea ~N145° direction of spreading. Seafloor spreading features of East Subbasin cut by post-spreading volcanic ridge, ~E-W in W part (Zhenbei-Huangyan seamounts chain))

He, L., K. Wang, L. Xiong & J. Wang (2001)- Heat flow and thermal history of the South China Sea. Physics Earth Planetary Interiors 126, p. 211-220.

(Heatflow values from S China Sea widely scattered, with mean of 77 mW/m². Heat flow increases gradually from N margin to central basin, with two high heat flow centers. S margin average heat flow 80 mW/m², similar to N margin. W margin (Manila trench) average 49 mW/m². Thermal history inferred from multistage pure-shear extension model shows that since Late Miocene basement heat flow increased as result of greater extension. Present-day high heat flow primarily result of Pliocene extension)

He, L., J. Wang, X. Xu, J. Liang, H. Wang & G. Zhang (2009)- Disparity between measured and BSR heat flow in the Xisha Trough of the South China Sea and its implications for the methane hydrate. J. Asian Earth Sciences 34, p. 771-780.

(Calculated heat flow from depth of bottom-simulating seismic reflectors (BSRs) on seismic profile in Xisha Trough of S China Sea (32-80 mW/m²) lower than measured heat flow (83-112 mW/m²). Disparity between measured and BSR heat flows may be due to theoretical error. Based on theoretical model, assuming BSR at top of free gas zone, the methane flux along the Xisha seismic profile is estimated, and the thickness of the methane hydrate occurrence zone is predicted.

Hinz, K. & H.U. Schluter (1985)- Geology of the Dangerous Grounds, South China Sea, and the continental margin of southwest Palawan: results of Sonne cruises SO-23 and SO-27. Energy 10, p. 297-315.

(Seismic, magnetic and gravity data recorded along 51 profiles in SE part of S China Sea (Dangerous Grounds, Palawan Trough), combined with geological sampling. Five unconformities: (1) Miocene-Pliocene; (2) M Miocene, coinciding with end of seafloor spreading in S China Sea; (3) Lower Miocene, which often marks top of carbonate platform; (4) M-U Oligocene, representing transition from rift to drift phase in S China Sea; (5) Cretaceous-Paleocene, interpreted as onset of rifting. Dangerous Grounds and parts of Palawan Trough underlain by stretched continental crust. Oldest rocks in Dangerous Grounds of U Triassic-Jurassic age. U Oligocene- Lower Miocene carbonate platform extends from Dangerous Grounds E beneath Palawan Trough and C-S Palawan shelf. C-S Palawan part of microcontinent with Dangerous Grounds/Reed Bank, N Palawan and Calamian block. E edge of carbonate platform overlain by wedge of chaotically deformed allochthonous sediments, overthrust from S onto carbonate platform, implying Palawan Trough does not represent the location of ancient subduction zone but is elastic downwarp of crust below overthrust allochthonous wedge)

Hoang Ngoc Dang & C. Sladen (1997)- Petroleum geology of offshore Da Nang, Central Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum systems of SE Asia and Australasia Conference, Indonesian Petroleum Association, Jakarta 1997, p. 449-460.

(Offshore Da Nang area of Vietnamese S China Sea with gas fields in large Miocene carbonate platform/buildups on Tri Ton Horst. Source rock most likely E Miocene marine source in Quang Ngai Graben to W and possibly Tri Ton Rift in E. Non-marine lacustrine and carbonaceous claystones source rocks (29m thick) encountered in well 118-CVX-IX beneath carbonates, but these are immature)

Holland, D.C., J.S. Dickens & A.D. Horbury (1992)- A case of drowning; death of a carbonate platform in the South China Sea. AAPG International Conference, Sydney 1992, Search and Discovery Article 91015 (*Poster Abstract*)

(Da Nang carbonate platform in S China Sea off Vietnam with characteristics of terminal drowning event at variety of data scales. Seismic data show backstepping at large scale. Evolution of M Miocene drowning preserved in detail in changes in environmental stress of faunal assemblage, rates of sedimentation and facies, and cementation history. Biostratigraphic data indicate slightly different ages of platform termination at different locations. Exposure surfaces within carbonate, but transition from shallow water carbonate to deeper water carbonates and final covering by deep water clastic sediments without surface exposure)

Hsu, S.K., Y.C. Yeh, W.B. Doo & C.H. Tsai (2004)- New bathymetry and magnetic lineations identifications in the northernmost South China Sea and their tectonic implications. Marine Geophysical Research 25, p. 29-44.

(Seafloor spreading of S China Sea (SCS) commonly believed to take place between ~32-15 Ma. New magnetic data in northernmost SCS suggests existence of E-W trending magnetic patterns and demonstrate oldest SCS oceanic crust could be Late Eocene (37 Ma, anomaly C17), with half-spreading rate of 44 mm/yr)

Hu, Y., L. Chen, D. Feng, Q. Liang, Z. Xia & D. Chen (2017)- Geochemical record of methane seepage in authigenic carbonates and surrounding host sediments: a case study from the South China Sea. J. Asian Earth Sciences 138, p. 51-61.

Huang, C.D., T.Y. Lee, C.H. Lo, S.L. Chung, J.C. Wu, C.L. Tien, M.W. Yeh, S.C. Chen et al. (2017)- Structural inversion in the northern South China Sea continental margin and its tectonic implications. J. Terrestrial Atmospheric Oceanic Sciences (TAO) 28, 6, 891-922.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1540-2017032701tt>)

(N continental margin of SCS active margin in Mesozoic. Seismic lines show structural inversion of older normal faults in Late Cretaceous. Inversion restricted to W Dongsha-Penghu Uplift and ~100 km in width. Inversion likely formed by collision of seamounts of current North Palawan block and continental margin)

Huang, C. & J. Zhong (1995)- Characteristics of Cenozoic sedimentary formation and tectonic evolution of South China Sea. In: G.H. Teh (ed.) Proc. AAPG-GSM Int. Conference Southeast Asian basins; oil and gas for the 21st century, Kuala Lumpur 1994, Bull. Geological Society Malaysia 37, p. 125-131.

(online at: www.gsm.org.my/products/702001-100957-PDF.pdf)

(Cenozoic sediments of S China Sea classified into three types, stable, substable and unstable, and two cycles, Lower (E1 -E2) and Upper (Q-E3) by Late Middle Eocene unconformity. Lower Cycle (Paleocene- Eocene)

mainly fluvial-lacustrine facies. Upper Cycle is onlap sediment and mainly shallow marine or deep ocean. Central Ocean Basin formed after Mid-Oligocene, and nappe and obduction of Philippines Island-Arc and CCW rotation of Kalimantan resulted in gradual closing of Paleo-South China Sea)

Huang, C.Y., M. Zhao, C.C. Wang & G. Wei (2001)- Cooling of the South China Sea by the Toba eruption and correlation with other climate proxies 71,000 years ago. *Geophysical Research Letters* 28, 20, p. 3915-3918.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2000GL006113/pdf>)

(Toba tephra layer identified in core MD972151 in southern S China Sea (SCS). Tied to 1° cooling for ~1 kyr following Toba eruption (71 ka) during marine isotope stage 5a-4 transition)

Huang, W., H. Lai, Z. Wan, W. Zhang, M. Meng, J. Shang, J. Liang, M. Xu & L. Lin (2024)- Origin and geological significance of the first discovered seafloor oil seepage in the Beikang Basin, southern South China Sea. *J. Asian Earth Sciences* 263, 106031, p. 1-18.

(Seafloor seep oils were sampled by piston coring in Beikang Basin, southern South China Sea. Hydrocarbons from deep source, most likely coaly sediments in Oligocene-Lower Miocene, and migrated upward via paleo-uplift-related faults. Biomarkers suggest both marine and terrestrial organic matter)

Huang, X., C. Betzler, S. Wu, A. Bernhardt, G. Eagles, X. Han & M. Hovland (2020)- First documentation of seismic stratigraphy and depositional signatures of Zhongsha atoll (Macclesfield Bank), South China Sea. *Marine and Petroleum Geology* 117, 104349, p. 1-12.

(online at: <https://www.sciencedirect.com/science/article/pii/S026481722030132X?via%3Dihub>)

(Undrilled, submerged Zhongsha atoll (Macclesfield Bank) is largest atoll system in S China Sea (23,500 km²). 2D seismic acquired in 2017 show Neogene carbonate platform of >1 km thick carbonate sequence over metamorphic basement. SE part of atoll fault-controlled graben system, formed during Paleogene rifting stage of S China Sea. Most faults trend NE-SW and E-W and terminate at or slightly above top of M Miocene. Reefs initiated on positive relief during E Miocene and continued growing through M Miocene-Present. Regional uplift led to subaerial exposure, termination of platform growth and karstification during M Miocene)

Huang, Y., M. Meng, W. Zhang, J. Shang, J. Liang, Z. Wan & T.B. Yang (2022)- Geological, geophysical, and geochemical characteristics of deep-routed fluid seepage and its indication of gas hydrate occurrence in the Beikang Basin, Southern South China Sea. *Marine and Petroleum Geology* 139, 105610, p. 1-20.

(Investigation of fluid seepage from seismic data, bathymetry, geochemistry. Multiple types of deep-routed conduits, manifested as mud volcanoes, diapirs, fluid escape pipes, etc., generally accompanied by Bottom Simulating Reflectors (BSRs), pockmarks, mounds and gas plumes. Deep-sourced hydrocarbons and thermogenic gas migrated into shallow layer through deep-routed conduits)

Huchon, P., T.N.H. Nguyen & N. Chamot-Rooke (1998)- Finite extension across the South Vietnam basins from 2D gravimetric modeling: relation to South China Sea kinematics. *Marine and Petroleum Geology* 15, p. 619-634.

(Crustal thickness map over S Vietnam basins from inversion used to estimate stretching: 190 km in E to 30 km in W. Comparison with S China Sea kinematics implies decoupling relative to Indochina block and supports formation of S China Sea in Late Oligocene- E Miocene by S-ward subduction of Proto-South China Sea)

Huchon, P., T.N.H. Nguyen & N. Chamot-Rooke (2001)- Propagation of continent break-up in the southwestern South China Sea. In: R.C.L. Wilson et al. (eds.) *Non-volcanic rifting of continental margins: a comparison of evidence from land and sea*, Geological Society, London, Special Publ. 187, p. 31-50.

(Bathymetric, seismic and gravity data on SW tip of S China Sea oceanic basin, where propagation of continental break-up occurred before ~15 Ma. Oceanic domain V-shaped, typical of oceanic propagating rifts. Main stretching direction slightly oblique to rift axis. At continent-ocean boundary, continental crust stretched by factor 4, rapidly decreasing to ~2 over few 10s of km (corresponds to >1 Ma of break-up propagation)

Hui, G.G., S. Li, X. Li, L.L. Guo, Y.H. Suo, I.D. Somerville, S. Zhao, M. Hu, H. Lan & J. Zhang (2016)- Temporal and spatial distribution of Cenozoic igneous rocks in the South China Sea and its adjacent regions:

implications for tectono-magmatic evolution. In: Evolution of West Pacific Ocean, South China Sea and Indian Ocean, Geological Journal 51, Suppl. S1, p. 429-447.

(S China Sea marginal basins with >70 Cenozoic magmatic activities identified. Geodynamic evolution: (1) early bimodal volcanism (>32 Ma) mainly in Paleogene basins at N margin, under dextral transtensional regime from India- Eurasia collision; (2) syn-spreading igneous rocks, with magmatic emplacement resulting from NNE-trending dextral strike-slip pull-apart tectonics; (3) Quaternary E-W-trending post-spreading basalts, under extrusion regime from collision between Luzon-Taiwan Arc and Eurasian Plate. In Indochina and Malay Peninsula, widespread Cenozoic extensional post-spreading plutons possibly derived from mantle plume or controlled by Ailaoshan Red River left-lateral strike-slip fault zone)

Hutchison, C.S. (2004)- Marginal basin evolution: the southern South China Sea. Marine and Petroleum Geology 21, 9, p. 1129-1148.

(Southern S China Sea W of W Baram Line is Sundaland extinct passive margin, with rifting from Eocene (~46 Ma) - E Miocene (19-21 Ma). E of line is convergent margin that became collision zone in M Miocene. Oil-prolific Baram Delta, resulting from uplift and erosion of W Cordillera, built out to NW Borneo Trough. Passive margin continental rise (Dangerous Grounds) underthrust beneath Sabah to cause uplift of W Cordillera. W Baram Line now extinct major right-lateral transform fault)

Hutchison, C.S. (2014)- South China Sea carbonate build-up seismic characteristics. Bull. Geological Society Malaysia 60 (C.S. Hutchison Memorial Issue), p. 19-26.

(online at: <https://gsmpubl.files.wordpress.com/2015/04/bgsm2014002.pdf>)

(More than 600 active reefs in Spratly Islands and 200 build-ups in C Luconia, buried in U Miocene, all begun at 'Middle Miocene Unconformity' (= late E Miocene). C Luconia build-ups buried by U Miocene influx from nearby Sarawak (Setap Shale). Build-ups at Dangerous Grounds and NW Borneo Trough drowned by rapidly deepening water. Spratly Islands reefs kept pace with deepening sea)

Hutchison, C.S. & V.R. Vijayan (2010)- What are the Spratly Islands? J. Asian Earth Sciences 39, p. 371-385.

(Spratly Islands, Dangerous Ground Province, are active carbonate build-ups that probably initiated in Miocene on NE-SW trending sea-floor cuestas that parallel magnetic anomalies of S part of S China Sea. Cuestas composed of Triassic and Cretaceous strata indicating Dangerous Ground is part of pre-rift Sundaland continent that included S China, Vietnam, Peninsular Malaysia, W Sarawak and possibly part of Sabah)

Janson, X., G.P. Eberli, A.J. Lomando & F. Bonafie (2010)- Seismic characterization of large-scale platform-margin collapse along the Zhujiang carbonate platform (Miocene) of the South China Sea, based on Miocene outcrop analogs from Mut Basin, Turkey. In: W.A. Morgan, A.D. George et al. (eds.) Cenozoic carbonate systems of Australasia, Soc. Sedimentary Geology (SEPM), Special Publ. 95, p. 79-98.

(On carbonate platform margin collapse or slumps, seen on seismic sections across Lower Miocene Zhujiang Platform margin, subsurface Pearl River Mouth Basin. Truncation of margin suggests several slump scars, associated downslope with rotated and folded strata that are still connected to detachment surfaces)

Jia, Y., H. Wu, Wen Yan, C. Zhang, B. Hu, J. Zhang, L. Tian & C. Deng (2024)- Rare earth element geochemistry of reef carbonates in the South China Sea since the Miocene: Insights into paleoclimatic significance. J. Asian Earth Sciences 265, p. 106094, p.

(Rare earth element (REE) patterns in NK-1 Neogene shallow marine carbonate core in southern SCS indicate enhanced terrigenous input since ~13 Ma, reflecting climate cooling and enhanced aridity)

Jian, Z., X. Cheng, Q. Zhao, J. Wang & P. Wang (2001)- Oxygen isotope stratigraphy and events in the northern South China Sea during the last 6 million years. Science in China 44, 10, p. 952-960.

(Stable isotopic analysis of foraminifera from ODP Site 1148 in N South China Sea (SCS). Before ~3.1 Ma SCS more influenced by warm intermediate Pacific water. Decrease in deepwater temperature between 3.1- 2.5 Ma demonstrates formation of N Hemisphere ice-sheet. Sea surface temperature reductions during E-M Pliocene may be related to Antarctic region ice-sheet growth)

- Jian, Z., H. Jin, M.A. Kaminski, F. Ferreira, B. Li & P.S. Yu (2019)- Discovery of the marine Eocene in the northern South China Sea. *National Science Review (China)* 6, 5, p.s 881-885.
(online at: <https://academic.oup.com/nsr/article/6/5/881/5524375>)
(In southern SCS, Eocene marine deposits often considered as representing part of Proto-South China Sea (modern SCS= post-Eocene rifting). Site U1501 of IODP Expedition 368 with continuous Eocene clastic to deep-sea sedimentary record. Planktonic foraminifera and calcareous nannofossils abundant in upper 300m (Late Eocene and up). Carbonate from 134.4 m with abundant larger benthic foraminifera (*Nummulites* and *Assilina*))
- Jian, Z., J. Tian and X. Sun (2009)- Upper water structure and paleo-monsoon. In: P. Wang & Q. Li (eds.) *The South China Sea: paleoceanography and sedimentology*. Springer, Developments in Paleoenvironmental Research 13, p. 297-394.
(Review of Late Cenozoic changes in paleo-sea surface temperature, thermocline depth and paleo-vegetation of the surrounding continents/islands on tectonic and orbital time scales in South China Sea marginal basin)
- Jian, Z., P. Wang, M.P. Chen, B. Li, Q. Zhao, C. Buhring et al. (2000)- Foraminiferal response to major Pleistocene paleoceanographic changes in the southern China Sea. *Paleoceanography* 15, 2, p. 229-243.
(Age model for southern S China Sea core 17957-2 for last 1.5 Myr. $\delta^{18}O$ record has clear ~100-kyr cycles after M Pleistocene Revolution near 900 ka. Planktonic foraminifera show increased sea surface temperature and dissolution after MPR)
- Jiang, X. & Z. Wang (2021)- A critical review of existing models for the origin of the South China Sea and a new proposed model. *J. Asian Earth Sciences*: X, 6, 100065, p. 1-13.
(online at: www.sciencedirect.com/journal/journal-of-asian-earth-sciences-x/vol/6/suppl/C)
- Jin, X., H.R. Kudrass & G. Pautot (eds.) (1990)- Marine geology and geophysics of the South China Sea. *Proceedings Symposium on the recent contributions to the geological history of the South China Sea, Hangzhou 1990*, China Ocean Press, p. 1-266.
(online at: https://epic.awi.de/id/eprint/38705/2/south-china-sea_1990.pdf)
(Collection of papers on tectonics, geophysics, geochemistry and paleoceanography of South China Sea)
- Johansen, K.B. (2011)- Phu Khanh Basin, offshore Vietnam; the last true frontier of the Vietnam East Sea margin- an insight into the petroleum system. *SEAPEX Exploration Conference, Singapore 2011, Presentation 14*, p. 1-44.
(online at: <http://c299791.r91.cf1.rackcdn.com/PGSFeb21.pdf>)
(Presentation package. Phu Khanh Basin at W side of S China Sea, offshore Vietnam. Eocene- M Oligocene rift half-grabens with locally >3km of syn-rift sediment. Late Oligocene inversion event, E-M Miocene extension, M Miocene inversion, etc. Upper Miocene basin floor fan complexes. Numerous leads)
- Katili, J.A. (1981)- Geology of Southeast Asia with particular reference to the South China Sea. *Proc. EAPI/CCOP Workshop, Energy 6*, 11, p. 1077-1091.
(Review of S China Sea- W Indonesia plate tectonics)
- Katili, J.A. (1981)- Geology of Southeast Asia with particular reference to the South China Sea. *Bull. Geological Research Development Centre (GRDC)* 4, p. 1-12
(Same paper as above)
- Kawagata, S., B.W. Hayward & W. Kuhnt (2007)- Extinction of deep-sea foraminifera as a result of Pliocene-Pleistocene deep-sea circulation changes in the South China Sea (ODP Sites 1143 and 1146). *Quaternary Science Reviews* 26, p. 808-827.
(Late Pliocene- M Pleistocene extinction of many elongate, cylindrical benthic foraminifera in deep South China Sea ODP Sites 1143 and 1146, as part of 'last global extinction' in deep sea. Pulsed decline in abundance and richness, mostly during glacials, particularly during M-Pleistocene Climate Transition (1.2-0.6 Ma). Result of the increased glacial cooling and increased ventilation of deep-sea water masses)

Kenyon, C.S. (1999)- The use of the petroleum system approach in exploration of the Southwest China Sea: an example from the Vung May Basin, offshore Vietnam. Proc. Offshore South East Asia Conference Exhibition (OSEA98), Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 234-255.
(*Vung May basin ?Eocene- E Oligocene early synrift sequence, with likely lacustrine source rocks. Miocene-Pliocene carbonate buildups. Earliest Late Miocene inversion event, etc.*)

Kessler, F. & J. Jong (2023)- A discussion on the relationship between prominent unconformities on the SCS shelf margins and the end of seafloor spreading in the South China Sea. *Berita Sedimentologi* 49, 1, p. 53-82.
(online at: <https://journal.iagi.or.id/index.php/FOSI/article/view/396/376>)
(*Review of unconformity records around S China Sea (SCS), focused on time of end of seafloor spreading in SCS (near magnetic Anomaly 5= ~15.5 Ma, Langhian). In NW Borneo coeval with Deep Regional Unconformity in Sabah and Brunei and Mid-Miocene Unconformity (MMU) in Sarawak. MMU also seen offshore Vietnam and Palawan. MMU/DRU may constitute transition between active and passive margin deposits in SCS sub-basins. Created prolific sandstone reservoir sequences offshore NW Borneo and Vietnam*)

Kienast, M. (2002)- Sedimentary biogeochemistry and palaeoceanography of the South China Sea during the late Pleistocene. Ph.D. Thesis University of British Columbia, p. 1-155.

Koloskov, A.V., P.I. Fedorov & V.A. Rashidov (2016)- New data on the composition of products of Quaternary volcanism at the northwestern margin of the South China Sea shelf zone and the problem of asthenospheric diapirism. *Russian J. Pacific Geology* 10, 2, p. 79-104.
(*Young volcanics from S China Sea shelf zone (Thu, Cu-Lao Re, Hong Jo islands, Katuik- Ile des Cendres) related to same type of rift volcanism in onshore Vietnam, basaltoids of S China Sea, Thailand and N Hainan island, despite different structural zones. Leading role of mantle diapirism in evolution of Indochina volcanism*)

Kudrass, H.R., M. Wiedicke, P. Cepek, H. Kreuzer & P. Muller (1986)- Mesozoic and Cainozoic rocks dredged from the South China Sea (Reed Bank area) and Sulu Sea and their significance for plate-tectonic reconstructions. *Marine and Petroleum Geology* 3, p. 19-30.
(*Rocks dredged from NW flank of Reed Bank, S China Sea, include possible M-U Triassic claystone with molds resembling Halobia- Daonella, Late Triassic- E Jurassic deltaic clastics with Dictyophyllum-Clathropteris fern flora (Clathropteris cf. meniscoides leaf), E Cretaceous metamorphics (113-122 Ma) and latest Jurassic amphibolite schist (146 Ma) at NW flank Reed Bank. Late Oligocene- E Miocene carbonate platform developed on this S-drifting continental fragment during seafloor spreading in S China Sea. M Miocene andesite and E-M Miocene reefal carbonates recovered from Cagayan Ridge, Sulu Sea*)

Kuhnt, W., A. Holbourn & Q. Zhaq (2002)- The early history of the South China Sea: evolution of Oligocene-Miocene deep water environments. *Revue de Micropaleontologie* 45, 2, p. 99-159.
(*Study of Early Oligocene- Miocene deep water benthic forams of ODP Site 1148 in northern S China Sea. 'Flysck-type' assemblages of 'Para-Tethys' character dominant in Oligocene; Miocene assemblages typically 'Pacific'. With detailed species descriptions*)

Kullman, A.J., W. Dharmasamdhhi, M. Jones, Nguyen Tran Nhu Ngoc, Nguyen Tien Long, Le Tuan Viet et al. (2017)- Low-cost exploration in a frontier area: breaking our model with data, Phu Khanh Basin, East Sea, Vietnam. In: SEAPEX Exploration Conference 2017, Singapore, Session 9, p. 1-10. (*Extended Abstract*)
(*Offshore E Vietnam Phu Khanh Basin last remaining true frontier basin in SE Asia. Seafloor coring identified Miocene-Pliocene stratigraphy and thermogenic hydrocarbons*)

Larvet, T., L. Le Pourhiet, M. Pubellier & T. Gyomlai (2023)- Slab pull driven South China Sea opening implies a Mesozoic Proto South China Sea. *Geophysical Research Letters* 50, 22, e2023GL105292, p. 1-8.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2023GL105292>)
(*Most paleo-reconstructions agree that S China Sea opens within a continental domain located at trailing edge of subducting plate of now-vanished Proto South China Sea (PSCS). Oceanic domain must be stronger than*

continental margin for slab pull force to be transmitted to continental margin, resulting in continental breakup. Our simulations support Cretaceous age for at least part of PSCS sea-floor spreading, not Eocene)

Larsen, H.C., G. Mohn, M. Nirrengarten, Z. Sun, J. Stock, Z. Jian, A. Klaus, C.A. Alvarez-Zarikian, J. Boaga et al. (2018)- Rapid transition from continental breakup to igneous oceanic crust in the South China Sea. *Nature Geoscience* 11, 10, p. 782-789.

(Summary of recent IODP 367/368 expeditions work from northern South China Sea margin. Results show initiation of Mid-Ocean Ridge basalt type magmatism during breakup, with a narrow and rapid transition into igneous oceanic crust. Asthenospheric upwelling yielding Mid-Ocean Ridge basalt-type magmatism from normal-T mantle during final breakup interpreted to reflect rapid rifting within thin pre-rift lithosphere)

Lee, G.H. & J.S. Watkins (1998)- Seismic sequence stratigraphy and hydrocarbon potential of the Phu Khanh Basin, offshore central Vietnam, South China Sea. *American Assoc. Petroleum Geol. (AAPG) Bull.* 82, p. 1711-1735.

(Phu Khanh Basin, offshore C Vietnam, is undrilled basin on Vietnam margin of S China Sea. Seismic data indicate typical rift-margin development. Initial rifting began in Late Cretaceous(?)- Paleogene. Rifting and uplift resumed or continued locally in Late Oligocene- E Miocene. Post-rift sedimentation evolved from transgressive ramp phase (with carbonate buildups) to regressive shelf-slope phase. Regressive interval contains number of sequences. Potential source rocks syn-rift lacustrine sediments. Carbonate complexes, weathered basement, shallow-water sands, and basin-floor fans all have reservoir potential)

Lee, M.Y. & K.Y. Wei (2000)- Australasian microtektites in the South China Sea and the West Philippine Sea: implications for age, size, and location of the impact crater. *Meteoritics Planetary Science* 35, 6, p. 1151-1155.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.2000.tb01504.x/epdf>)

(Glassy microtektites from Pleistocene horizon of deep-sea cores in S China Sea and W Philippine Sea identified as belonging to Australasian tektite strewn field. Impact event dated at 793 ka, in upper Matuyama magnetic chron. Peak concentration of microtektites in S China Sea supports hypothesis of impact crater on Indochina Peninsula. Size of source crater estimated to be 90-116 km in diameter)

Lee, M.Y., K.Y. Wei & Y.G. Chen (1999)- High resolution oxygen isotope stratigraphy for the last 150,000 years in the southern South China Sea: Core MD972151. *J. Terrestrial Atmospheric Oceanic Sciences (TAO)* 10, 1, p. 239-245.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/oceanic-science/item/299-1999101239images>)

($\delta^{18}O$ oxygen stratigraphy across last two glacial-interglacial cycles in southern S China Sea off SE Vietnam. Tephra layer of Toba eruption at 71ka helps anchor transition of O-isotope stages 5/4)

Lee, T.Y. & L.A. Lawver (1992)- Tectonic evolution of the South China Sea region. *J. Geological Society China* 35, 4, p. 353-388.

Lee, T.Y. & L.A. Lawver (1994)- Cenozoic plate reconstruction of the South China Sea region. *Tectonophysics* 235, p. 149-180.

(online at: [www.researchgate.net/profile/L-Lawver/publication/223727783_Cenozoic_plate_reconstruction Etc.](http://www.researchgate.net/profile/L-Lawver/publication/223727783_Cenozoic_plate_reconstruction_Etc./links/5414653c0cf274d4508b1b1d/Cenozoic_plate_reconstruction_Etc.pdf))

(Reconstructions of S China Sea region from 60 to 5 Ma. 2-3 stages of extension: (1) Late Cretaceous- Eocene NW-SE extension (proto-China Sea; probably consumed at Palawan Trough); (2) Late Eocene- E Miocene N-S extension. (3) post-Oligocene; probably NW-SE. Collision of N Palawan microcontinent with W Philippines block stopped opening of S China Sea at end of E Miocene. Spreading switched to Sulu Sea Basin in M Miocene but collision between Sulu Ridge and W Philippines at Mindanao halted opening of Sulu Sea at end M Miocene)

Lee, G.H., K. Lee & J.S. Watkins (2001)- Geologic evolution of the Cuu Long and Nam Con Son basins, offshore Southern Vietnam, South China Sea. *American Assoc. Petroleum Geol. (AAPG) Bull.* 85, 6, p. 1055-1082.

(Cuu Long and Nam Con Son basins off S Vietnam, initial rifting in Eocene- E Oligocene, followed by uplift and rotation of crustal blocks in Late Oligocene. Erosion of uplifted blocks marks transition from rifting to regional subsidence in Cuu Long Basin. Second rift phase in Nam Con Son Basin until Late Miocene. M-L Miocene

inversion in parts of Nam Con Son Basin. Cuu Long Basin oil-prone, with oil mainly in fractured basement highs; Nam Con Son Basin gas-prone, with gas in Miocene sands and Late Miocene carbonates)

Lei, J.P., S.H. Jiang; S.Z. Li, S. Gao, H.X. Zhang, G. Wang & F.Y. Zhao (2016)- Gravity anomaly in the southern South China Sea: a connection of Moho depth to the nature of the sedimentary basins' crust. In: Evolution of West Pacific Ocean, South China Sea and Indian Ocean, Geological Journal 51, Supplement S1, p. 244-262.

(On relationship between gravity-derived Moho depth and main sedimentary basins in southern S China Sea: crustal thickness of basins indicates transition from continental crust to transitional crust from N to S)

Li, B., Z. Jian, Q. Li, J. Tian & P. Wang (2005)- Paleooceanography of the South China Sea since the Middle Miocene: evidence from planktonic foraminifera. Marine Micropaleontology 54, p. 49-62.

(Late M Miocene- Pleistocene planktonic foraminifera at ODP Hole 1143, southern S China Sea, and age model for last 12 Ma. New ages for Top Globorotalia multicamerata (2.18 Ma), Base Sphaeroidinella dehiscens (3.6 Ma) and Base Globigerinoides conglobatus (6.6 Ma). Transition from Globorotalia siakensis-G. mayeri group to mixed-layer species in early Late Miocene (~9.6 Ma) reflects deepened upper water thermocline, possibly tied to closure of Indonesian seaway. Shoaling of thermocline in N after 3-2.5 Ma. Pleistocene microtektite layer at 42.8m (2cm) in Hole 1143, coinciding with Brunhes-Matuyama paleomagnetic boundary)

Li, B., J. Wang, B. Huang, Q. Li, Z. Jian, Q. Zhao, X. Su & P. Wang (2004)- South China Sea surface water evolution over the last 12 Ma: a south-north comparison from ODP sites 1143 and 1146. Paleooceanography 19, PA1009, p. 1-12.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2003PA000906/epdf>)

(Decrease in deep-dwelling planktonic foram species after ~10 Ma interpreted to reflect depression of upper water thermocline, corresponding to closure of Indonesian Seaway, and initial formation of W Pacific 'warm pool'. Associated with disappearance of Globoquadrina dehiscens at 9.8 Ma. Microtektite layer of 0.79 Ma at ODP Sites 1143 (42.8m) and 1146 (115.85m), approximates Brunhes-Matuyama paleomagnetic boundary and above small Gephyrocapsa acme of 1.01 Ma)

Li, B., Q. Zhao, M. Chen, Z. Jian & P. Wang (2001)- Late Quaternary evolution of planktonic foraminifera in the southern South China Sea and their paleoceanographic significance. Acta Micropalaeontologica Sinica 18, 1, p. 1-9.

Li, C.F., P.D. Clift, Z. Sun & H.C. Larsen (2019)- Starting a new ocean and stopping it. Oceanography 32, 1, p. 153-156.

(online at: https://tos.org/oceanography/assets/docs/32-1_li.pdf)

(Small marginal sea basins often short-lived and typically not older than several to tens of million years, but play critical roles in global plate tectonic cycles. Paper discusses recent achievements in S China Sea)

Li, C.F., J. Li, W. Ding, D. Franke, Y. Yao, H. Shi, X. Pang, Y. Cao, J. Lin, D.K. Kulhanek, T. Williams, R. Bao, A. Briais et al. (2015)- Seismic stratigraphy of the central South China Sea basin and implications for neotectonics. J. of Geophysical Research: Solid Earth 120, 3, p. 1377-1399.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/2014JB011686/epdf>)

Li, C.F., J. Lin, D.K. Kulhanek and the Expedition 349 Scientists (2015)- Expedition 349 summary. Proc. International Ocean Discovery Program (IODP) 349, College Station, TX, p. 1-43.

(online at: http://publications.iodp.org/proceedings/349/EXP_REPT/CHAPTERS/349_101.PDF)

(Summary of results of IODP 349 deep see drilling campaign in S China Sea. Five sites drilled, three recovered oceanic crust basalt basement near fossil spreading center. E Miocene (16-20 Ma) cessation age of spreading in both subbasins. At Site U1435 along continent/ocean boundary, ~33 Ma unconformity, with marine sediment above and littoral sandstones-mudstones below, likely related to continental breakup during initial opening of SCS. Onset of seafloor spreading therefore estimated to be at ~33 Ma. M-L Miocene (~8-13 Ma) volcanoclastic breccia suggesting 5 Myrs of seamount volcanism after cessation of seafloor spreading)

- Li, C.F., X. Shi, Z. Zhou, J. Li, J. Geng & B. Chen (2010)- Depths to the magnetic layer bottom in the South China Sea area and their tectonic implications. *Geophysical J. International* 182, 3, p. 1229-1247.
(*Depths to base of magnetic layer in S China Sea computed from total field magnetic anomalies. Most of central SCS ocean basin and northern continent-ocean transition zone significantly shallower magnetic base (~22 km; much larger than Moho depth) than surrounding continental block, where it is at ~34 km, close to Moho depth*)
- Li, C.F. & T.R. Song (2012)- Magnetic recording of the Cenozoic oceanic crustal accretion and evolution of the South China Sea basin. *Chinese Science Bull.* 57, 24, p. 3165-3181.
(online at: <http://link.springer.com/article/10.1007/s11434-012-5063-9>)
(*Estimates of oceanic crust age for S China Sea similar to Briaux et al. (1993): E sub-basin 32-16 Ma; SW sub-basin 27-16 Ma*)
- Li, C.F., P. Wang, D. Franke, J. Lin & J. Tian (2012)- Unlocking the opening processes of the South China Sea. *Scientific Drilling* 14, p. 55-59.
(online at: www.iodp.org/doc_download/3533-55-59sd14southchinaseapdf)
(*Results of 2012 workshop, recommending IODP drilling in S China Sea oceanic crust, ages of which are only guestimates from magnetic anomaly interpretations*)
- Li, C.F., X. Xu, J. Lin, Z. Sun, J. Zhu, Y. Yao, X. Zhao, Q. Liu, D.K. Kulhanek, J. Wang et al. (2014)- Ages and magnetic structures of the South China Sea constrained by deep tow magnetic surveys and IODP Expedition 349. *Geochem. Geophysics Geosystems* 15, p. 4958-4983.
(online at: <http://onlinelibrary.wiley.com/doi/10.1002/2014GC005567/epdf>)
(*Magnetic anomalies and IODP 349 cores show seafloor spreading started at ~33 Ma in NE S China Sea, but varied slightly by 1-2 Myr along N continent-ocean boundary. S-ward ridge jump of 20 km occurred at ~23.6 Ma in E Subbasin; coeval with onset of seafloor spreading in SW Subbasin, which propagated for ~400 km SW-ward from 23.6-21.5 Ma. End of seafloor spreading at 15 Ma in E Subbasin and 16 Ma in SW Subbasin*)
- Li, C.F., Z. Zhou, H. Hao, H. Chen, J. Wang, B. Chen & J. Wu (2008)- Late Mesozoic tectonic structure and evolution along the present-day northeastern South China Sea continental margin. *J. Asian Earth Sciences* 31, p. 546-561.
- Li, C.F., Z. Zhou, J. Li, B. Chen & J. Geng (2008)- Magnetic zoning and seismic structure of the South China Sea ocean basin. *Marine Geophysical Research* 29, p. 223-238.
- Li, J.B. (1997)- The rifting and collision of the South China Sea terrain system. In: Wang Pinxian & W.A. Berggren (eds.) *Proc. 30th International Geological Congress 13, Marine geology and palaeoceanography*, p. 33-46.
- Li, J.B., W. Ding, J. Gao, Z. Wu & Z.J. Ziyin (2011)- Cenozoic evolution model of the sea-floor spreading in South China Sea; new constraints from high resolution geophysical data. *Acta Geophysica Sinica* 54, 6, p. 894-906.
(*Revision of Cenozoic evolution model of S China Sea from new high resolution gravity- magnetic data. Two major sea-floor spreading episodes, separated by tectonic-sedimentary event near 25 Ma: (1) E and NW sub-basins from ~33.5- 25 Ma, forming oceanic crust with E-W or NEE-oriented magnetic anomalies; (2) Since 25 Ma sea-floor spreading continued with NW-SE-oriented spreading until 16.5 Ma, forming central E and SW sub-basins. NNW-trending transform fault separated E and SW sub-basins, with 95 km sinistral offset of spreading ridge. Before collision of Luzon arc with Eurasia Plate, S China Sea was a gulf-shape marginal sea opening to Pacific Ocean, resulting from W-ward propagation of spreading center into Sunda Continent*)
- Li, J.B., W.W. Ding, Z.Y. Wu, J. Zhang & C.Z. Dong (2012)- The propagation of seafloor spreading in the southwestern subbasin, South China Sea. *Chinese Science Bull.* 57, p. 3182-3191.
(online at: <http://csb.scichina.com:8080/kxtbe/EN/Y2012/V57/I24/3182>)

Li, K., S. Brune, Z. Erdos, D. Neuharth, G. Mohn & A. Glerum (2024)- From orogeny to rifting: the role of inherited structures during the formation of the South China Sea. *J. of Geophysical Research: Solid Earth* 129, 12, DOI:10.1029/2024JB029006, p. 1-27.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024JB029006>)

(Many of world's rifts and rifted margins developed within former orogens. S China Sea formed during E Oligocene- E Miocene rifting by utilizing Late Mesozoic (pre-100 Ma) Yanshanian orogenic structures, like thrust faults, thickened crust, and corresponding thermal weaknesses. Numerical forward model that reproduces rifted margin formation consistent with the available geological and geophysical observations of SCS)

Li, L., P.D. Clift & H.T. Nguyen (2013)- The sedimentary, magmatic and tectonic evolution of the southwestern South China Sea revealed by seismic stratigraphic analysis. *Marine Geophysical Research* 34, 3-4, p. 341-365.

(online at: http://www.geol.lsu.edu/pclift/pclift/Publications_files/2013_Li_etal_MGR.pdf)

(SW South China Sea area of continental crust frozen immediately before onset of seafloor spreading. Major continental block separated from shelf margin by basin of hyperextended crust. Oligocene-E Miocene rifting followed by mild compression and inversion prior to 16 Ma, linked to Dangerous Grounds block- Borneo collision. Seafloor spreading continued until ~16 Ma. Scattered Late Miocene and Pliocene volcanic seamounts (~5-10 km across) in or on edge of deeper basins, not linked to tectonic activity. Further inversion of off-shelf in Pliocene, with no brittle faulting, possibly part of wider pattern of magmatism in S China Sea. Prograding clinoforms from shelf edge in S in Pliocene, after 5.3 Ma. Bulk of sediment from Mekong River, with additional supply from Borneo and Malay Peninsula via Molengraaff River and predecessors)

Li, L., P.D. Clift & H.T. Nguyen (2014)- Non-uniform hyper-extension in advance of seafloor spreading on the Vietnam continental margin and the SW South China Sea. *Basin Research* 26, p. 106-134.

(SW S China Sea preserves propagating oceanic spreading center and associated continent-ocean transition at continental margin offshore SE Vietnam. Major normal faulting ceases after inversion event at ~16 Ma, main extension phase from ~28 Ma to 22-23 Ma. Depth-dependent extension required to explain depth of basins. Weak crust with high heatflow. Flow in ductile mid-lower crust responsible for much of subsidence before seafloor spreading, which extended ~300 km from tip of mid ocean ridge. Flow dominant towards spreading center prior to 16 Ma. Extension in Continent-Ocean transition postdates seafloor spreading. Less extended crustal fragments form banks offshore Sunda shelf, surrounded by hyperextended crust of COT)

Li, Q., Z. Jian & X. Su (2005)- Late Oligocene rapid transformations in the South China Sea. *Marine Micropaleontology* 54, 1-2, p. 5-25.

(ODP Site 1148 unconformities at Lower/Upper Oligocene and Oligocene-Miocene boundaries plus two others in Upper Oligocene, together erasing sediment record of ~3 Ma in period of active seafloor spreading. Initial breakup of SCS probably at 34-33 Ma. Expanded Lower Oligocene section resulted from rifting between 33-29 Ma. Mid-Oligocene unconformity at 28.5 Ma probably related to initial collision between Indonesia and Australia. Narrowed Indonesian seaway may have accounted for Late Oligocene warming and chalk deposition in northern SCS. Unconformities near Oligocene- Miocene boundary probably correspond to changes in rotation of blocks and seafloor; also first New Guinea terrane docking at N Australian craton)

Li, Q., P. Wang, Q. Zhao, L. Shao, G. Zhong, J. Tian, X. Cheng et al. (2006)- A 33 Ma lithostratigraphic record of tectonic and paleoceanographic evolution of the South China Sea. *Marine Geology* 230, p. 217-235.

(ODP Site 1148 sequence show six major steps of S China Sea geohistory over past 33 Ma. Rapid deposition characterized Early Oligocene (33- 28.5 Ma) rifting. Slow sedimentation signifies S-ward stable seafloor spreading (28.5- 23 Ma) to end of spreading (23-15 Ma). Five major dissolution events. Return of high sedimentation in late Pliocene- Pleistocene caused by intensified down-slope transport)

Li, Q., P. Wang, Q. Zhao, J. Tian, X. Cheng, Z. Jian, G. Zhong & M. Chen (2008)- Paleooceanography of the mid-Pleistocene South China Sea. *Quaternary Science Reviews* 27, p. 1217-1233.

Li, Q. & S. Wu (1990)- The age of the South China sea terrains rift-departing from South China continent. In: X. Jin et al. (eds.) Proc. Symposium Recent contributions to the geological history of the South China Sea, Hangzhou 1990, p. 101-107.

(Terrains in S China Sea (Nansha Islands, etc.) were part of SE China continent, and their rift-departing process dominated formation and evolution of S China Sea. Terrains rift-departed before E Eocene (inferred from age interpretation of manganese crust and section of Sampaguita 1 well on Reed Bank))

Li, Q., Q. Zhao, G. Zhong, Z. Jian, J. Tian et al. (2007)- Deepwater ventilation and stratification in the Neogene South China Sea. J. China University Geosciences 18, 2, p. 95-108.

(Three periods of deep water ventilation since Miocene in S China Sea, marked by red-brown sediment color: 21-17 Ma, 15-10 Ma, and 10-5 Ma. Pacific Bottom Water marker species rapidly increased since 6 Ma)

Li, Q., G. Zhong & J. Tian (2009)- Stratigraphy and sea level changes. In P. Wang & Q. Li (eds.) The South China Sea: paleoceanography and sedimentology. Developments in Paleoenvironmental Research 13, Springer Verlag, Chapter 3, p. 75-170.

(Review of Cenozoic biostratigraphy, lithostratigraphy and basins of South China Sea area)

Li, S., C. Lin, Q. Zhang, S. Yang & P. Wu (1989)- Episodic rifting of continental marginal basins and tectonic events since 10 Ma in the South China Sea. Chinese Science Bull. 44, 1, p. 10-23.

Li, R., (2023)- Genesis of island dolostones during rapid island subsidence: Example from the Xisha (Paracel) islands, South China Sea. Sedimentology 70, 6, p. 1785-1811.

(Well XK-1 (1268 m deep) on Shidau, Xisha (Paracel) islands, S China Sea, with thick carbonates over Jurassic metamorphic basement. Lower part composed of E Miocene Sanya Fm and M Miocene Meishan Fm, ~700 m thick, and formed of limestones and dolostones. Strata below numerous exposure surfaces with Fe-staining, biomoulds, cavities, caves and solution breccias. Dolostones with dolomite crystals, post-dating subaerial exposure, preferentially in strata with high porosities)

Li, X., G. Wei, L. Shao, Y. Liu, X. Liang, Z. Jian, M. Sun & P. Wang (2003)- Geochemical and Nd isotopic variations in sediments of the South China Sea; a response to Cenozoic tectonism in SE Asia. Earth Planetary Science Letters 211, p. 207-220.

(Variations in geochemistry and Nd isotopic in ODP Site 1148 sediments, S China Sea. Nd isotopes suggests pre-27 Ma sediments flowing into S China Sea dominantly from SW (Indochina-Sunda Shelf, possibly NW Borneo), post-23 Ma sediments N provenance (S China). Response to SE Asia plate reorganization at ~25 Ma)

Li, X.J., Z. Wang, Y.J. Yao, H.F. Gao, S. Zhu & Z.Y. Xu (2023)- Formation and evolution of the South China Sea since the Late Mesozoic: A review. China Geology 6, 1, p. 154-167.

(online at: <https://www.sciencedirect.com/science/article/pii/S2096519223008613>)

(Back-arc spreading- sinistral shear model proposed for formation of S China Sea marginal basin. Back-arc basin formed by N-ward(?) subduction of Proto-SCS and formation was triggered by left-lateral strike-slip motion due to N-ward drift of Philippine Sea Plate. Left-lateral strike-slip fault on W margin caused by India-Eurasian collision changed direction of SW Sub-basin's spreading axis from nearly E-W to NE-SW, and subduction retreat caused spreading ridge to jump S-ward)

Liang, D. & Z. Liu (1990)- The genesis of the South China Sea and its hydrocarbon-bearing basins. J. Petroleum Geology 13, 1, p. 59-70.

(Formation of S China Sea in two phases of spreading of continental margin of Asia: (1) NeoCathaysian (E Cretaceous-Early Tertiary) and (2) Nanhai (Late Oligocene-Early Miocene) tectonic systems. Identified 33 sedimentary basins, 4 basin types)

Liang, Y., M. Delescluse, Y. Qiu, M. Pubellier, N. Chamot-Rooke, J. Wang, X. Nie, L. Watremez et al. (2019)- Decollements, detachments, and rafts in the extended crust of Dangerous Ground, South China Sea: The role of inherited contacts. Tectonics 38, p. 1863-1883.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018TC005418>)

(Continental crust of Dangerous Ground in S China Sea moderately thinned, to 15 km. Subbasement reflectors interpreted as dismantled Mesozoic metamorphic unit in S part of study area. Rollover structure indicates reflective base of unit was decollement, where low-angle normal faults root and blocks rafted. Detachment reactivated inherited low-angle contact most probably related to Yanshanian belt. Etc.)

Liang, X., G. Wei, L. Shao, X. Li and R. Wang (2001)- Records of Toba eruptions in the South China Sea. Chemical characteristics of the glass shards from ODP 1143A. *Science in China, Ser. D, Earth Sciences*, 44, 10, p. 871-878.

(online at: <http://earth.scichina.com:8080/sciDe/fileup/PDF/01yd0871.pdf>)

(Three 2cm-thick layers of volcanic tephra from ODP 1143 Site in S China Sea dated as. 0.07, 0.8 and ~1.0 Ma by microbiostratigraphy, presumably from Toba eruption. Dominated by volcanic glass shards with median grain size of 70-75 µm)

Lin, A.T., A.B. Watts & S.P. Hesselbo (2003)- Cenozoic stratigraphy and subsidence history of the South China Sea margin in the Taiwan region. *Basin Research* 15, 4, p. 453-478.

(N margin of SCS in Taiwan region evolved from Paleogene rift to latest Miocene-Recent foreland basin, reflecting opening SCS and subsequent partial closure by Taiwan orogeny. Rifting (~58-37Ma) formed 4200 km wide extended zone. By ~37 Ma focus of rifting shifted to present-day continent-ocean boundary of S Taiwan, which led to seafloor spreading of SCS at ~30 Ma. Rift-drift transition (~37-30 Ma) coeval with uplift of previously rifted margin, leading to erosion and breakup unconformity. Oligocene uplift followed by rapid, early post-breakup subsidence (~30-18 Ma). Subsidence of inner margin thermally controlled subsidence, subsidence in outer shelf accompanied by faulting during ~30-21 Ma. During ~21-12.5 Ma entire experienced broad margin thermal subsidence. At ~12.5 Ma rifting resumed and ceased at ~6.5Ma due to overthrusting of Luzon volcanic arc. Taiwan orogeny created foreland basin by loading rifted margin)

Lin, J., Y. Xu, Z. Sun & Z. Zhou (2019)- Mantle upwelling beneath the South China Sea and links to surrounding subduction systems. *National Science Review (China)* 6, 5, p. 877-881.

(online at: <https://academic.oup.com/nsr/article/6/5/877/5555739>)

(Models proposing links between plate subduction and mantle upwelling in (northern) South China Sea)

Lin, Y.A., L. Colli, J. Wu & B.S.A. Schuberth (2020)- Where are the Proto-South China Sea slabs? SE Asian plate tectonics and mantle flow history from global mantle convection modeling. *J. of Geophysical Research: Solid Earth* 125, 12, e2020JB019758, p. 1-25.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2020JB019758>)

(Double-sided proto-S China Sea subduction combined with earlier Borneo rotations model uniquely reproduces subhorizontal slabs under southern South China Sea at 400-700 km depths and best fit seismic tomography. Smaller Philippine Sea (PS) plate with ~1,000-km-long restored Ryukyu slab was superior to very large PS plate. Our reconstructions predict that PSCS slabs now at <900 km depths under present-day Borneo, the SCS, the Sulu and Celebes seas, and S Philippines)

Liu, B., B. Xia, X. Li, M. Zhang, B. Niu, L. Zhong, Q. Jin & S. Ji (2006)- Southeastern extension of the Red River fault zone (RRFZ) and its tectonic evolution significance in western South China Sea. *Science in China D* 49, 8, p. 839-850.

(On SE-ward continuation Red River fault zone into S China Sea. RRFZ separates S China and Indochina block, then extends E along Yuedong fault offshore Vietnam, then continues S-ward and breaks off into two branches: Lupa fault (dies out beneath NW Borneo) and Tinjia fault (reaches Brunei-Sabah area))

Liu, C., P.D. Clift, R.W. Murray, J. Blusztajn, T. Ireland, S. Wan & W. Ding (2017)- Geochemical evidence for initiation of the modern Mekong delta in the southwestern South China Sea after 8 Ma. *Chemical Geology* 451, p. 38-54.

(Clay minerals from IODP Site U1433 and seismic data suggest onset of Mekong Delta in present location after 8 Ma, following avulsion from Gulf of Thailand)

Liu, C., D.F. Stockli, P.D. Clift, S. Wan, L.D. Stockli, T.W.Hofig & J.C. Schindlbeck-Belo (2022)- Geochronological and geochemical characterization of paleo-rivers deposits during rifting of the South China Sea. *Earth Planetary Science Letters* 584, 117427, p.
(*Paleogene syn-rift sediments in N South China Sea derived from East Cathaysia block*)

Liu, G., S. Wu, J. Gao, H. Zhang, X. Han, Y. Qin, L. Tian, W. Chen & X. Huang (2023)- Seismic architecture of Yongle isolated carbonate platform in Xisha Archipelago, South China Sea. *Frontiers in Earth Science* 11, p. 1-16.

(online at: <https://www.frontiersin.org/journals/earth-science/articles/10.3389/feart.2023.1100675/full>)

(*Yongle isolated carbonate platform in Xisha Archipelago (Paracel Islands) in NW S China Sea. Upper slope angles of platform >10°, up to ~32°, lower slope angles 0.5- 5°. Flat-topped, with aggradation and backstepping on platform margins.Started forming in E Miocene and drowned in Late Miocene-Quaternary. Magmatism and hydrothermal fluid flow pipes around Yongle Atoll active in 10.5–2.6 Ma. Platform built on pre-existing fault-bounded block, not volcano as suggested. Depth of basement likely 1400 m*)

Liu, H.L., G. Xie, Yan Pin, Y.C. Liu & H.B. Zheng (2007)- Tectonic implication of Mesozoic marine deposits in the Nansha Islands of the South China Sea. *Oceanologia et Limnologia Sinica* 38, 3, p. 272-278. (in Chinese)
(*Nansha Block (= Dangerous Grounds) in S part of S China Sea. Mesozoic stratigraphy from ocean drilling, dredging and seismic data. Triassic abyssal sediment in E; Jurassic shallow marine and deltaic facies, and Cretaceous.Mesozoic marine deposits reflect thinned continental margin in N part of Meso-Tethys*)

Liu, H.L., P. Yan, Y. Liu & H. Deng (2006)- Existence of Qiongnan suture zone on the north margin of South China Sea. *Chinese Science Bull.* 51, Supplement 2, p. 107-120.

(online at: <http://ir.gig.ac.cn:8080/bitstream/344008/13234/1/06204.pdf>)

(*'Qiongnan (S Hainan Island) suture zone' in N South China Sea represents Indosinian (Triassic) suture and is remnant of Qiongnan ocean basin, which is extension of main Paleo-Tethys ocean basin in S China Sea*)

Liu, H.L., P. Yan, B.Y. Zhang, Y. Sun, Y.Z. Zhang, L.S. Shu, X.L. Qiu & L.Z. Guo (2004)- Role of the Wan-Na fault system in the western Nansha Islands (Southern South China Sea). *J. Asian Earth Sciences* 23, p. 221-233.

(*Seismic data off Nansha (Spratly) Islands, southern S China Sea (SCS). Wan-Na Fault Zone is plate-bounding dextral strike-slip system, with major activity in Eocene- E Miocene. Strike-slip system pull-apart duplex created Wan'an basin*)

Liu, H.L., P. Yan, B.Y. Zhang, X.L. Qiu & B. Xia (2004)- Pre-Cenozoic basements of the South China Sea and eastern Tethyan realm. *Marine Geol. Quaternary Geology*, 24, 1, p. 15-29. (in Chinese)

Liu, H.L., H. Zheng, Y. Wang, Q. Lin, C. Wu, M. Zhao & Y. Du (2011)- Basement of the South China Sea area: tracing the Tethyan Realm. *Acta Geologica Sinica (English Ed.)* 85, 3, p. 637-655.

(*Basement of S China Sea (SCS) and adjacent areas six regions. Qiongnan (i.e. S Hainan) Suture Zone on N margin of S China Sea remnant of principal ocean basin of Paleo-Tethys. Meso-Tethys developed on S of S China Sea. Nansha Trough is remnant of N shelf of Meso-Tethys. Oceanic crust of Meso-Tethys subducted S-ward along S margin of Nansha Trough with subduction-pole opposite to those of Yarlung Zangbo-Mytkyina-Bago zone on W of S China Sea, and Meso-Tethyan suture zone in outer belt of Jurassic-E Cretaceous terrane group in SW Japan, on E of S China Sea*)

Liu, H.L., H. Zheng, Y.L. Wang, C.H. Wu, M.S. Zhao & Y.K. Du (2011)- Layer-block tectonics, a new concept of plate tectonics- an example from Nansha micro-plate, southern South China Sea. In: D. Closson (ed.) *Tectonics*, Intech, p. 251-272.

(online at: <http://cdn.intechopen.com/pdfs/14079/...>)

(*'Layer-block tectonics' interpretation of crustal layers evolution of continental Nansha microplate (= Luconia-Dangerous Ground-Palawan block at SE side of SCS oceanic basin), a Cenozoic micro-plate with Mesozoic marine strata, magmatic rock and metamorphic basement. It is surrounded by several large plate-edge basins, such as Wan'an (W Vanguard bank), Zengmu (= Luconia Shelf?) and Nansha (Borneo-Palawan) Trough, etc.)*)

Liu, J., R. Xiang, Z. Chen, M. Chen, W. Yan, L. Zhang & H. Chen (2013)- Sources, transport and deposition of surface sediments from the South China Sea. *Deep-Sea Research, I-Oceanographic Research Papers*, 71, p. 92-102.

Liu, S., Z. Liang, B. Zhang, H. Su, Z. Leu & M. Su (2022)- Carbonate contourite drifts in the southwest South China Sea: Sedimentary, paleoceanographic and economic implications. *Frontiers in Marine Science* 9, 946231, p. 1-16.

(online at: <https://www.frontiersin.org/articles/10.3389/fmars.2022.946231/full>)

(*Miocene shallow-water contourite depositional in SW S China Sea: six mounded drifts, distributed adjacent to carbonate reefs. Formed on protocontinental shelf (50-200 m depth) and shaped by wind-driven currents*)

Liu, Y., W. Zhan, J. Zhong & C. Lu (1995)- The neotectonic movement and geological hazards in the Nansha Islands. *Bull. Geological Society Malaysia* 37, p. 133-142.

(online at: www.gsm.org.my/products/702001-100956-PDF.pdf)

Liu, Z., Y. Zhao, C. Colin, K. Stattegger, M.G. Wiesner, C.A. Huh, Y. Zhang, X. Li, P. Sompongchaiyakul et al. (2016)- Source-to-sink transport processes of fluvial sediments in the South China Sea. *Earth-Science Reviews* 153, p. 238-273.

(*Review of modern fluvial sediment influx from all sides of S. China Sea and subsequent transport processes to continental shelf and abyssal basin, and effect of Late Quaternary glacial cycles. High diversity of clay mineralogical-geochemical compositions. Land-sea configuration dramatically changed during glacial conditions. In S clay minerals indicate intensive chemical weathering during interglacial periods and increased physical erosion during glacial periods. S-ward shift of Inter-tropical Convergence Zone at 16 ka caused increased sediment contribution from S China. Etc.*)

Lloyd, A.R. (1978)- Geological evolution of the South China Sea. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) 4 Conf.*, Singapore, p. 95-137.

(*Interpretation of SE Asia- South China Sea tectonics in terms of expanding earth. With Precambrian-Pleistocene SE Asia paleogeographic maps*)

Lo, Y.C., C.T. Chen, C.H. Lo & S.L. Chung (2020)- Ages of ophiolitic rocks along plate suture in Taiwan orogen: Fate of the South China Sea from subduction to collision. *Terrestrial Atmospheric Oceanic Sciences (TAO)* 31, 4, p. 383-402.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1678-2019061901toB>)

(*Ophiolites, blueschists and Lichi melange in Eastern Taiwan Ophiolite mark suture zone between Eurasian and Philippine Sea plates. Zircon U-Pb ages of ~15 Ma indicate South China Sea origin for ophiolitic materials in plate suture zone, since age of oceanic crust of Philippine Sea Plate near Taiwan is Eocene or older. Ages of Yuli meta-ophiolitic rocks might suggest blueschist metamorphic overprint at ~9 Ma*)

Lu, B.Q., G.Q. Xu, H.G. Wang, H.M. Zhao (2002)- Sea floor spreading recorded by drowning events of Cenozoic carbonate platforms in the South China Sea. *Chinese Journal of Geology* 37, 4, p. 405-414. (*in Chinese*)

(*S China Sea three major drowning events: late Early Miocene (17 Ma), early Late Miocene (10.0-8.2 Ma) and E Pliocene (3.4-3.0 Ma), indicating three major sea floor spreading events*)

Lu, C., S. Wu, Y. Yao & C.S. Fulthorpe (2013)- Development and controlling factors of Miocene carbonate platform in the Nam Con Son Basin, southwestern South China Sea. *Marine and Petroleum Geology* 45, B4, p. 55-68.

(*Miocene carbonate platforms on intrabasinal structural highs and along S margin of Nam Con Son Basin, SW S China Sea. Platforms initiated in late E Miocene and reached widest extent in M Miocene. Platform margins controlled by synsedimentary faults, associated with carbonate slope failure deposits and/or reef talus. Platform growth history 6 phases: start-up, second start-up, keep-up, exposure, renewal and drowning phases*)

Lu, Y., W. Li, S. Wu, B.T. Cronin, F. Lyu & B. Wang (2018)- Morphology, architecture and evolutionary processes of the Zhongjian Canyon between two carbonate platforms, South China Sea. Interpretation (SEG-AAPG) 6, 4, p. 1N-Y5.

(manuscript online at: https://www.researchgate.net/publication/326650881_Morphology_architecture_Etc)
(Large Zhongjian submarine canyon system developed between Xisha (Paracel) and Guangle carbonate platforms since M Miocene. ZJC resulted from NW-SE strike-slip fault activities during synrift and postrift stages)

Luan, X. & P. Lunt (2022)- A history of the latest and Neogene unconformities, offshore Palawan and the southern South China Sea. J. Asian Earth Sciences: X, 8, 100116, p. 1-13.

(online at: www.sciencedirect.com/science/article/pii/S2590056022000378)

(New age interpretations of Oligocene-Miocene unconformities offshore Palawan do not support widely cited idea of E Miocene subduction of Proto-South China Sea plate, followed by collision over plate suture. Weak expression of Base Miocene Unconformity (~24 Ma; distinct across N Borneo). No evidence for unconformity in later E Miocene (~17-15 Ma). Main mid-Neogene seismic unconformity dated at ~12-13 Ma (Red Unconformity of Hinz & Schluter (1985) equivalent to DRU of Sabah), which was when uplift of a foreland over-thrust system paused, and locally erosional surface was rapidly transgressed)

Ludmann, T., H.K. Wong & P. Wang (2001)- Plio-Quaternary sedimentation processes and neotectonics of the northern continental margin of the South China Sea. Marine Geology 172, p. 331-358.

(Seismic profiles on N continental margin of S China Sea permit show four Quaternary 4th order sequences, deposited during e past ~690 ky. Area off Hong Kong and Dongsha Islands two uplift episodes in past 5 Ma, at Miocene/Pliocene boundary and at end of lower M Pleistocene)

Luo, Z., R. Zhang & L. He (1981)- Tectonics and deposits of the Cenozoic era in the South China Sea. Proc. EAPI/CCOP Workshop, Energy 6, 11, p. 1093-1098.

Ly Truong Phuong (1997)- Lithofacies and depositional environments of the Oligocene sediments of the Cuu Long Basin, and their relationship to hydrocarbon potential. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conference, Indonesian Petroleum Association, Jakarta 1997, p. 531-538.

(Facies maps of Oligocene lagoonal, lacustrine to deltaic sediments of Cuu Long Basin, which was closed at time of Oligocene deposition)

Ma, Y., S. Wu, F. Lu, D. Dong, Q. Sun, Y. Lu & M. Gu (2011)- Seismic characteristics and development of the Xisha carbonate platforms, northern margin of the South China Sea. J. Asian Earth Sciences 40, p. 770-783.

(On seismic characteristics of Miocene- Recent Xisha (Paracel) carbonate platform area, which includes modern-day Xisha Atoll, on N continental margin of S China Sea)

Ma, Z.L., Q.Y. Li, X.Y. Liu, W. Luo, D.J. Zhang & Y.H. Zhu (2017)- Palaeoenvironmental significance of Miocene larger benthic foraminifera from the Xisha Islands, South China Sea. Palaeoworld 27, 1, p. 145-157.

(online at: <https://www.sciencedirect.com/science/article/pii/S1871174X1730029X>)

(Well XK-1 in Xisha (= Paracel) Islands, NW part of S China Sea, penetrated Miocene reef carbonate section with 66 species of larger foraminifera. Three assemblages: (1) 1256-1180m Spiroclypeus higginsi- Borelis pygmaeus (Te5, E Miocene); (2) 1031-577m Nephrolepidina- Miogypsina Assemblage (Tf, M Miocene), and 468-380m Cycloclypeus- Heterostegina Assemblage (Tg, Late Miocene). Facies backreef lagoon-shelf in E Miocene, normal-frontal reef in early M Miocene, backreef lagoon-shelf in later M Miocene, normal- frontal reef in early Late Miocene, and proximal forereef shelf in later Late Miocene)

Mai, H.A., Y.L. Chan, M.W. Yeh & T.Y. Lee (2017)- Tectonic implications of Mesozoic magmatism to initiation of Cenozoic basin development within the passive South China Sea margin. Int. J. Earth Sciences 107, 3, p. 1153-1174.

(S China Sea classic example of non-volcanic passive margin, situated within three tectonic plates. Reconstruction indicated SE margin of Asia had gone through two crustal thinning events (NW-SE extension in

Late Cretaceous and Paleogene). Sites for rifting development controlled by localized thermal weakening of magmatism. Interaction of two continental stretching events by Pacific followed by Neotethys subduction with local magmatic thermal weakening is cause for non-volcanic nature of SCS)

Matthews, S.J., A.J. Fraser, S. Lowe, S.P. Todd & F.J. Peel (1997)- Structure, stratigraphy, and petroleum geology of the SE Nam Con Son Basin, offshore Vietnam. In A.J. Fraser et al. (eds.) *Petroleum Geology of Southeast Asia*, Geological Society, London, Special Publ. 126, p. 89-106.

(online at: <https://citeseerx.ist.psu.edu/document>)

(SE Nam Con Son Basin, offshore Vietnam, experienced rift pulses in Paleogene- earliest Late Miocene in response to interaction of S China Sea rift propagation and regional transtensional shear. Mild contractional deformation in M Miocene, synchronous with inversion structures in W Natuna. Oldest dated Tertiary rocks are Late Oligocene fluvio-deltaic sediments. E-M Miocene non-marine to outer shelf clastics, thickest in N-S to NE-SW-trending half grabens. Regional truncational unconformity of late M Miocene age. Late Miocene deepening of depositional environments, with growth of carbonate build-ups on structural highs, progradation of Paleo-Mekong delta system and associated deep-marine submarine channel development)

Mazur, S., J.M. Whittaker, K. Wilson, M.G. Stewart, P. East, R. Bouatmani & P.J. Markwick (2009)- Application of plate reconstructions and 2D gravity modeling to quantify crustal stretching during continental break-up: a South China Sea case study. Proc. 33rd Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA09-G-017, p. 1-12.

Meng, L. & J. Zhang (2011)- Thermal structure about southwest sub-basin of South China Sea. *Earthquake Science* 24, 5, p. 427-436.

Meng, L. & J. Zhang (2014)- The magmatic activity mechanism of the fossil spreading center in the Southwest sub-basin, South China Sea. *Science China, Earth Sciences*, 57, 7, p. 1653-1663.

(After end of seafloor spreading, residual magmatic activity still exists in deep basin of S China Sea)

Meyer, L., D. Walley, J. Sutton & M. Schapper (2017)- Ca Voi Xanh Field, Block 118, Offshore Da Nang, Vietnam: exploration highlights and development challenges. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, Session 10, 1p. *(Abstract only)*

(Ca Voi Xanh field is largest gas discovery offshore Vietnam. Discovered in 2011 by 118-CVX-2X well in M Miocene Da Nang Carbonate, followed by two appraisal wells. Field lies along NW-SE trending Triton Horst structure. Gas with 30% CO₂, decreasing from N to S. Still technical (reservoir) and commercial challenges)

Miao, X.Q., X.L. Huang, W. Yan, F. Yang, W.F. Zhang, Y.X. Cai, Y. Yu & P.L. He (2021)- Late Triassic dacites from Well NK-1 in the Nansha Block: constraints on the Mesozoic tectonic evolution of the southern South China Sea margin. *Lithos* 398-399, 106337, p. 1-13.

(Late Triassic dacites (218-217 Ma) in well NK-1 in Nansha Block (Dangerous Grounds) in S China Sea formed in extensional setting during Paleo-Pacific plate subduction. Geochemical affinities with A-type granites; magma likely generated by partial melting of ancient crustal materials, in extensional setting at continental margin of S China Block. Palawan Block separated from SCB in Late Cretaceous)

Miao, X.Q., X.L. Huang, W. Yan, F. Yang, W.F. Zhang, Y. Yu, Y.X. Cai & S.Z. Zhu (2021)- Two episodes of Mesozoic mafic magmatism in the Nansha Block: Tectonic transition from continental arc to back-arc basin. *Lithos* 404-405, 106502, p. 1-14.

(Diorite and diabase samples from Well NK-1 in Nansha Block (Dangerous Grounds area of southern S China Sea). Early Jurassic diorites (~177 Ma) geochemically similar to continental arc basalt, related to subduction of Paleo-Pacific plate beneath SCB. Early Cretaceous diabbases (~124 Ma) compositionally similar to back-arc basin basalt, interpreted as coeval magmatism of nascent ocean of Proto-S China Sea, indicating that PSCS was spreading back-arc basin in E Cretaceous, associated with retreat of subducting Paleo-Pacific plate)

Morley, C.K. (2016)- Major unconformities/termination of extension events and associated surfaces in the South China Seas: review and implications for tectonic development. *J. Asian Earth Sciences* 120, p. 62-86.

(S China Seas continental rifting began in E basins in Paleocene, propagating W-wards to Vietnam margin in Late Eocene. Continental breakup around 32-28 Ma caused regional reduction in extensional activity. Basins in slope and deepwater N of spreading center reduced fault activity until 21-20 Ma. Propagation of oceanic crust W-ward between ~25-23 Ma. Termination of seafloor spreading between ~20.5-16 Ma. Dangerous Grounds area extension continued until ~16 Ma. End of seafloor spreading at ~20.5 Ma reflects loss of driving force as thinned continental crust entered NW Borneo subduction zone. Transitional period of ~5-7 my between onset of subduction of continental crust and final jamming of subduction zone (Deep Regional Unconformity). Last pulse of extension in W SCS ended at ~10.5 Ma. Escape tectonics not primary driving force for extension in S China Sea, although secondary role possible. Proto S China Sea development remains uncertain)

Morley, R.J., H.P. Morley, N. Bruder, G. Fraser, D. Riley, T. Pearce et al. (2023)- Chronostratigraphic, landscape and tectonic perspective of the Oligocene to late Eocene non-marine Cuu Long Basin, offshore Vietnam using integrated sequence biostratigraphy and chemostratigraphy. Proc.50th Southeast Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore 2023, p. (Abstract only?)

Morley, R.J., T. Swiecicki & Dung Thuy Thi Pham (2011)- A sequence stratigraphic framework for the Sunda region, based on integration of biostratigraphic lithological and seismic data from Nam Con Son Basin, Vietnam. Proc. 35th Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, IPA11-G-002, p. 1-22.

*(online at: www.researchgate.net/publication/280042535_A_sequence_stratigraphic_framework_for_ Etc.)
(Stratigraphic successions in Pattani, Malay, Penyu, W Natuna and Nam Con Son Basins many common features: Late Eocene- E Oligocene synrift followed by Late Oligocene and younger post-rift deposition. E-M Miocene variable degrees of inversion and also extension in Nam Con Son Basin, followed by Late Miocene and Plio-Pleistocene regional subsidence. Sequences closely parallel sequence biostratigraphic frameworks of W Natuna and Malay basins)*

Morley, R.J., T. Swiecicki & P. Restrepo Pace (2015)- Correlation across the South China Sea using VIM transgressive-regressive cycles. AAPG Workshop 'Tectonic evolution and sedimentation of South China Sea region', Kota Kinabalu, Search and Discovery Article 51109, p. 1-7. (Extended Abstract)

(online at: www.searchanddiscovery.com/documents/2015/51109morley/ndx_morley.pdf)

(Determination of age and environments of deposition in S China Sea region problematic due to sporadic occurrence of marine index microfossils in Late Eocene- Miocene extensional basins from Gulf of Thailand to Nam Con Son and Sarawak-Sabah. Proposed correlations across Vietnam- Indonesia- Malaysia basins using transgressive-regressive cycles deduced from palynomorph and benthonic foraminiferal abundances. Many cycles ~400 ka cyclicity, suggesting glacio-eustasy as driving mechanism. Six main unconformities: (1) M Oligocene (onset of S China Sea spreading); (2) basal Miocene (end of Proto-South China Sea subduction); (3) E Miocene at ~18 Ma (onset of second rifting phase in Nam Con Son Basin and offshore Sarawak); (4) M Miocene at ~11-12 Ma (end of Nam Con Son and offshore Sarawak rifting); (5) one or more Late Miocene with time gaps at ~9, 7.2 and 5.5 Ma; (6) E Pliocene at ~3.5 Ma and also near base Quaternary)

Murray, M.R. & S.L. Dorobek (2004)- Sediment supply, tectonic subsidence, and basin-filling patterns across the southwestern South China Sea during Pliocene to Recent time. In: P. Clift et al. (eds.) Continent-ocean interactions within East Asian marginal seas, American Geophysical Union (AGU), Geophysical Monograph Series 149, p. 235-253.

(Sediment flux to SW parts of S China Sea in Late Cenozoic reflects contributions from E Tibet, W Borneo, and smaller drainages of C Indochina, Vietnam, Malay Peninsula and W Indonesia. Updip basins (Malay, Cuu Long, W Natuna) became filled after Miocene inversion. Paleo-Mekong River and depositional system with probable headwaters on Malay Peninsula began supplying large volumes of sediment to N S China Sea in Late Miocene and Pliocene, respectively)

Nathan, S.A. & R.M. Leckie (2003)- Miocene planktonic foraminiferal biostratigraphy of sites 1143 and 1146. In: W.L. Prell, P. Wang et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 184, p. 1-43.

(online at: www-odp.tamu.edu/publications/184_SR/VOLUME/CHAPTERS/219.PDF)

(South China Sea Miocene planktonic foram biostratigraphy (N5-N19))

Ngo Thuong San, Nguyen Giao, Tran Le Dong & Hoang Phuoc Son (1997)- Pre-Tertiary Basement- the new objective for oil and gas exploration and production in the continental shelf of South Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conference, Indonesian Petroleum Association, Jakarta 1997, p. 461-465.

(Continental shelf of S Vietnam common granitic rocks of E Cretaceous-Late Jurassic age (97-178 Ma). Early phase granodiorite, late phase consists of granite. Fracture zones and weathering caused basement to become an important oil-bearing reservoir. Oil discoveries include Bach Ho, Rong, Ruby and Rang Dong)

Ngo Van Dinh (1997)- Distribution and origin of carbon dioxide in the Song Hong Basin of Offshore Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conference, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 511-513.

(Gas in wells in Miocene carbonates on Triton Horst in S part of Vietnam Song Hong Basin with 70-93% CO₂. Rel. little CO₂ in gas from N parts of basin. Deep faults, volcanic intrusions and thermodynamically induced mud flows in magmatically active S Song Hong Basin probable causes for CO₂ in shallow reservoirs)

Ngoc, P.B., T. Nghi, N.T. Tin, T.V. Tri, N.T. Tuyen, T.T. Dung & N.T.P. Thao (2017)- Petrographic Characteristics and depositional environment evolution of Middle Miocene sediments in the Thien Ung- Mang Cau structure of Nam Con Son Basin. Indonesian J. on Geoscience (IJOG) 4, 3, p. 143-157.

(online at: <https://ijog.geologi.esdm.go.id/index.php/IJOG/article/view/387/245>)

(M Miocene clastics and carbonates in wells of Thien Ung- Mang Cau structure in C area of Nam Con Son Basin, S China Sea)

Nguyen, C., R. Morley & Bui Viet Dung (2021)- Sequence biostratigraphy of the late Oligocene to Miocene succession in the northern Song Hong Basin, offshore Vietnam. Palaeogeogr. Palaeoclim. Palaeoecology 569. p.

(Song Hong Basin offshore N Vietnam Oligocene fluvio-lacustrine succession poor in marine microfossils and poorly dated. Palynology and sequence biostratigraphy displays multiple transgressive-regressive cycles, comparable with those reported from Cuu Long Basin and can be correlated. Sedimentation began during sequence 19, at ~29 Ma or slightly earlier. Deepest interval in Well A with abundant montane tree Alnus pollen (M Oligocene) suggesting intermontane basin setting. Etc.)

Nguyen Dinh Chuc, Mai Thanh Tan, Tran Van Xuan & Tran Nhu Huy (2019)- Oligocene combination/ stratigraphic traps and their reservoir quality in Cuu Long basin, offshore Vietnam. Petrovietnam Journal 2019, 6, p. 30-40.

(online at: <https://www.pvn.vn/DataStore/Documents/2019/TapchiDK/TC DK%20062019/Oligocene%20 combination.pdf>)

(Oil and gas in the Oligocene section of Cuu Long basin accumulated in both structural and stratigraphic traps. Stratigraphic traps evidenced in SE area of basin, some confirmed by drilling)

Nguyen Du Hung & Hung Van Le (2004)- Petroleum geology of Cuu Long Basin- offshore Vietnam. AAPG International Conference, Barcelona 2003, AAPG Search and Discovery Article 10062, p. 1-8.

(online at: www.searchanddiscovery.com/documents/2004/hung/images/hung.pdf)

(Cuu Long basin on S shelf of Vietnam formed during E Oligocene rifting. Late Oligocene- E Miocene inversion intensified fracturing of granite basement to become excellent reservoir. Five main oil fields produce mainly from basement (Bach Ho/ White Tiger, Rong, Rang Dong, Ruby and Su Tu Den). Basement rocks usually overlain directly by prolific and widespread Upper Oligocene source rocks and still main target)

Nguyen Huy Ngoc, S.B. Aziz & Nguyen Anh Duc (2014)- The application of seismic attributes for reservoir characterization in Pre-Tertiary fractured basement, Vietnam-Malaysia offshore. Interpretation (SEG-AAPG) 2, 1, p. SA57-SA66.

(Seismic attributes (amplitude, coherence, curvature, secondary derivative) help predict basement rock type and fracture attributes)

Nguyen Ngoc Khoi (2014)- Mineral resources potential of Vietnam and current state of mining activity. *Applied Environmental Research* 36, 1, p. 37-46.
(online at: www.thaiscience.info/journals/Article/APER/10905841.pdf)

Nguyen Nhu Trung (2012)- The gas hydrate potential in the South China Sea. *J. Petroleum Science Engineering* 88-89, p. 41-47.
(*Thickness of Gas hydrate stability zone (GHSZ) in S China Sea estimated to be ~225-365m*)

Nguyen N.S., Nguyen Q.T., Nguyen H.N., Nguyen V.T., Phan G.L., Nguyen T.L., Le T.V., Nguyen X.P. & Tran N.L. (2017)- Ham Rong Dong & Ky Lan discoveries- a new significance and opening up vast opportunities in the northern offshore part of Song Hong basin. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, Session 10*, p. 1-12.
(*Previous discoveries in Song Hong Basin off N Vietnam, marginal-subcommercial, and mainly in Miocene inversion clastics or fractured/karstified Pretertiary carbonate basement plays. Recent discoveries: (1) Ham Rong Dong gas-condensate in Oligocene clastics overlying basement high; (2) Ky Lan gas in E-M Miocene sands in 4-way-dip closure. Recent E well on V Island with ~500m Oligocene lacustrine source rock with TOC up to 9% and mainly Type I and II kerogen*)

Nguyen Quang Tuan & Tran Van Tri (2016)- Seismic interpretation of the Nam Con Son Basin and its implication for the tectonic evolution. *Indonesian J. on Geoscience (IJOG)* 3, 2, p. 127-137.
(online at: <https://ijog.geologi.esdm.go.id/index.php/IJOG/article/view/312/210>)
(*Nam Con Son Basin off Vietnam two extensional phases: (1) N-S extension, terminated at ~30 Ma, forming E-W trending grabens/half grabens with up to 5km of Eocene?- E Oligocene sediments; (2) graben reactivation during M Miocene NW-SE extension. Most faults inactive by U Miocene except N-S fault system active until recent. U Miocene -Recent post rift sequence associated with onshore uplift, causing increase in sediment supply to basin*)

Nguyen Quang Tuan, Bui Viet Dung, Nguyen Thanh Tung & Tran Van Tri (2016)- Depositional environment evolution of the Cenozoic Nam Con Son basin, offshore Vietnam. *Proc. 14th Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA XIV) and 45th Annual Conv. Indonesian Association Geologists (IAGI) (GIC 2016)*, Bandung, p. 562-564.

Nguyen, T.B.N., T.Q.C. Dang, W. Bac & X.H. Nguyen (2009)- A successful highlight of geological development for fractured granite reservoir. *Proc. 2nd Regional Conf. Interdisciplinary Research Natural Resources and Materials Engineering, Yogyakarta 2009*, p. 133-139.
(online at: http://lib.ugm.ac.id/digitasi/upload/3114_MU.12110031-nguyen.pdf)
(*White Tiger oil field is biggest of fractured granite and gneiss basement reservoirs on Vietnam continental shelf. Reservoir complicated structure, heterogeneous, high temperature and closure stress. Additional oil fields in fractured basement: Rang Dong, Phuong Dong, Ruby, Black Lion, Yellow Lion, Brown Lion, Yellow Tuna, Southern Dragon and Turtle*)

Nguyen Thi Tham, Nguyen Van Su (2016)- Neogene calcareous nannofossils from the Nam Con Son Basin, offshore Vietnam. *J. Nannoplankton Research*, London, 36, 2, p. 151-160.
(online at: [http://ina.tmsoc.org/JNR/online/36/Tham%20%20Su%202016%20JNR%2036-2%20Neogene%20Vietnam%20\[%C2%A7N2067\].pdf](http://ina.tmsoc.org/JNR/online/36/Tham%20%20Su%202016%20JNR%2036-2%20Neogene%20Vietnam%20[%C2%A7N2067].pdf))
(*Calcareous nannofossils from 60 wells in post-rift Neogene in Nam Con Son Basin, offshore Vietnam. Dua Fm spans NN2-NN4 (E Miocene), Thong-Mang Cau Fm NN5-NN7 (M Miocene), Nam Con Son Fm NN9-NN11 (Late Miocene) and Bien Dong Fm NN12-NN18 (Pliocene- Pleistocene)*)

Nguyen Trong Tin (1997)- Hydrocarbon trap styles of South Eastern Vietnam offshore basins. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum systems of SE Asia and Australasia Conference*, Indonesian Petroleum Association, Jakarta 1997, p. 515-520.

Nguyen Trong Tin & Nguyen Dinh Ty (1995)- Petroleum geology of the Nam Con Son Basin. Bull. Geological Society Malaysia, 37, p. 1-11.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1995a01.pdf>)

Nguyen, T.T.B., T. Tokunaga, N.R. Goulty, Hoang Phuoc Son & Mai Van Binh (2011)- Stress state in the Cuu Long and Nam Con Son basins, offshore Vietnam. Marine and Petroleum Geology 28, 5, p. 973-979.

(In situ stress data from petroleum wells suggest borderline normal/strike-slip stress regime in normally pressured sequences of Nam Con Son and Cuu Long basins)

Nguyen, V.G. & P.D. Rabinowitz (1999)- Gravity modeling of the Song Hong Basin, Offshore Vietnam. Proc. Offshore Technology Conference (OTC), Houston, 10745-MS, p. 1-10.

(Song Hong Basin, 200 x 600 km with up to 14 km of sediments. Gravity inversion and rift stretching models suggest basin is passive rift. Rift extension most probably linked to India- Eurasia collision)

Nielsen, L.H., A. Mathiesen, T. Bidstrup, O.V. Vejbaek, P.T. Dien & P.V. Tiem (1999)- Modelling of hydrocarbon generation in the Cenozoic Song Hong Basin, Vietnam: a highly prospective basin. J. Asian Earth Sciences 17, 1-2, p. 269-294.

(online at: http://www.ccop.or.th/pdf/icb/VIETNAM_PHU_QUOC/Nielsen_et_al_1999_JAES.pdf)

(Song Hong Basin on N part of Vietnamese shelf. Most likely source rocks (1) oil-prone Eocene-Lower Oligocene lacustrine mudstones and coals, (2) oil- and gas-prone M Miocene coal beds, (3) gas-prone Upper Oligocene-Lower Miocene coals, and (4) gas- and oil-prone Miocene marine mudstones. Modelling demonstrates that the two first-mentioned source rock units are especially important)

Nirrengarten, M., G. Mohn, N.J. Kusznir, F. Sapin, F. Despinos, M. Pubellier, S.P. Chang, H.C. Larsen & J.C. Ringenbach (2020)- Extension modes and breakup processes of the southeast China- Northwest Palawan conjugate rifted margins. Marine and Petroleum Geology 113, 104123, p. 1-19.

(open manuscript online at: <https://www.sciencedirect.com/science/article/pii/S0264817219305720>)

(Eocene-Oligocene S China Sea rifting initiated in heterogeneous lithosphere formed by Mesozoic Yenshanian orogeny. Gravity and joint inversion methods confirm lateral variation of basement densities across conjugate margins. Final rifting in late Eocene triggered decompression melting forming mid-ocean ridge type magmatism. Initial magmatic activity concomitant with continued extensional faulting of continental crust. Deformation not symmetrically distributed between conjugate margins during initiation of seafloor spreading, but evolved asymmetrically until stabilisation of the spreading ocean ridge around C10n)

Olson, C. (2001)- Timing and tectonic implications of basin inversion in the Nam Con Son basin and adjacent areas. M.S. Thesis, Texas A&M University, College Station, p. 1-352. (Unpublished)

(Nam Con Son Basin off SE Vietnam formed during Eocene?- Oligocene rifting. Following cessation of rifting at end Oligocene time W Sunda Shelf basins subjected to E-M Miocene inversions, progressing from W Natuna and W Nam Con Son into S Malay Basin. Most intense inversion in W Natuna Basin in E Miocene, with uplift of S Malay and W Natuna basins in M Miocene. Basin inversions attributed to collision-induced clockwise rotation of Borneo and attached, rigid Natuna Arch and Natuna Basement Ridge)

Parke, M.L., K.O. Emery, R. Szymankiewicz & L.M. Reynolds (1971)- Structural framework of the continental margin in the South China Sea. ECAFE CCOP, Technical Bulletin 4, p. 103-142.

(online at: <https://repository.unescap.org/handle/20.500.12870/5063>)

(Seismic and geomagnetic traverses in Gulf of Thailand, N Sunda Shelf and adjacent deep-sea show presence of three large sedimentary basins: Gulf of Thailand basin (from Bangkok to Singapore), Mekong and Brunei-Saigon basins. Deep-sea floor in NE contains abyssal plain and broad plateau dotted with seamounts, some of which capped with coral atolls. Prospects for oil and gas appear favorable)

Parke, M.L., K.O. Emery, R. Szymankiewicz & L.M. Reynolds (1971)- Structural framework of continental margin in South China Sea. American Assoc. Petroleum Geol. (AAPG) Bull. 55, 5, p. 723-751.

(Same paper as above. Early mega-regional seismic interpretation of Gulf of Thailand- North Sunda Shelf to N Borneo)

Pautot, G. & C. Rangin (1989)- Subduction of the South China Sea axial ridge below Luzon. *Earth Planetary Science Letters* 92, p. 57-69.

(Scarborough Seamount chain at axis of extinct S China Sea spreading center is being subducted obliquely along Manila Trench)

Pautot, G., C. Rangin, A. Briais, P. Tapponnier, P. Beuzart, G. Lericolais, X. Mathieu, J. Wu, S. Han, H. Li, Y. Lu & J. Zhao (1986)- Spreading directions in the central South China Sea. *Nature* 321, 6066, p. 150-154.

(S China Sea is 'Atlantic-type' marginal basin of late Tertiary age. Magnetic anomalies in E part consistent with seafloor spreading directed ~N-S. Dominant normal fault scarps, striking N50° E, implying NW-SE spreading, at least in 150-200 km-wide axial region)

Pautot, G., C. Rangin, A. Briais, J. Wu, S. Han, H. Li, Y. Lu & J. Zhao (1990)- The axial ridge of the South China Sea: a seabeam and geophysical survey. *Oceanologica Acta* 13, p. 129-143.

(Last stage of spreading in S China Sea basin oriented NW-SE and created oceanic crust transected by NW-SE transform faults. Alkalic lavas of Scarborough Seamount chain injected along relict spreading axis and dated at 11-6 Ma, probably emplaced after cessation of spreading. Alternative kinematic interpretations for evolution of SCS basin involve extrusion of Sundaland along large strike-slip faults in response to the India-Asia collision, or 20-30° CCW rotation of rift axis with general kinematic reorganization around 20 Ma)

Peng, X., C.F. Li, C. Shen, K. Li, Z. Zhao & X. Xie (2020)- Anomalous lower crustal structure and origin of magmatism in the southeastern margin of the South China Sea. *Marine and Petroleum Geology* 122, 104711, p.

(Seismic reflection profiles with gravity and magnetic data across Liyue (Reed) Bank and N Palawan basin show asymmetric distribution of lower crustal High-density/Velocity zones in conjugate margins. Anomalous hot asthenospheric mantle persisted during lithospheric thinning, resulting in magmatic underplating in uppermost mantle during early breakup)

Peng, X., C.F. Li, C. Shen, Y. Liu & H. Shi (2022)- Intra-basement structures and their implications for rifting of the northeastern South China Sea margin. *J. Asian Earth Sciences* 225, 105073, p.

Peng, X., C. Shen, L. Mei, Z. Zhao & X. Xie (2019)- Rift–drift transition in the Dangerous Grounds, South China Sea. *Marine Geophysical Research* 40, p. 163–183.

Pham, T.D., Mai H.D., Ta T.H., Nguyen V.S. & Nguyen T.T. (2022)- Distribution of larger benthic foraminifera from Miocene carbonates in the center and southeast of the Nam Con Son basin. *Petrovietnam Journal* 11, p. 19-32. *(in Vietnamese, with English Abstract)*

(online at: <https://pvj.com.vn/index.php/TCDK/article/view/906/787>)

(Study in C and SE Nam Con Son basin show frequent LBF in Miocene, especially in M Miocene (Tf Letter Stage), with disappearance of Miogypsina, Katacycloclypeus and Lepidocyclina spp. and Cycloclypeus. In Late Miocene (Tg), LBF not varied, mainly Amphistegina and Operculina)

Pham, T.D., Ta T.H., Mai H.D. & T. Nguyen (2023)- Stratigraphic significance of larger benthic foraminifera in Miocene carbonates from Nam Con Son Basin, Vietnam. *Stratigraphy and Geological Correlation* 31, 6, p. 676-699.

(online at: https://www.researchgate.net/publication/375677056_Stratigraphic_Significance_of_Larger_Benthic_Foraminifera_in_Miocene_Carbonates_from_Nam_Con_Son_Basin_Vietnam)

(30 species of Te5-Tg Letter Stages LBF in Miocene carbonate sediments in Nam Con Son Basin poorly documented. In E Miocene sparse LBF in Te5 (Miogypsina, Miogypsinoides, Eulepidina), then frequent in lower Tf1 (Lepidocyclina (N), Miogypsina globulina). In M Miocene with Miogypsina, Lepidocyclina (N), Cycloclypeus and Katacycloclypeus)

Pham Tuan Dung (2011)- Exploration and development of the Ca Ngu Vang field fracture basement reservoir. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2011, Singapore, Presentation 15, p. 1-30. *(Abstract + Presentation)*

(Ca Ngu Vang field offshore S Vietnam 2002 oil discovery with first oil in 2008 from Pre-Tertiary fractured granite reservoir and Lower Miocene sandstones)

Phong Van Phung, Anh Vu The & Tung Nguyen Thanh (2017)- The development of palaeokarst systems in the Middle Miocene carbonate reservoir, South Song Hong Basin. *Int. J. Applied Engineering Research* 12, 22, p. 12844-12851.

(online at: https://www.ripublication.com/ijaer17/ijaerv12n22_148.pdf)

(Numerous paleokarst features seen on offshore 3D seismic in M Miocene carbonate platform on Tri Ton high, S Song Hong Basin, Vietnam. Paleokarst networks beneath unconformity shows erosional topography, sinkholes, rivers/canyons and hills, revealing mature surface drainage system)

Pichot, T., M. Delescluse, N. Chamot-Rooke, M. Pubellier, Y. Qiu, F. Meresse, G. Sun et al. (2014)- Deep crustal structure of the conjugate margins of the SW South China Sea from wide-angle refraction seismic data. *Marine and Petroleum Geology* 58, p. 627-643.

(New 1000-km long wide-angle refraction seismic profile along conjugate margins of SW South China Sea used to derive 2D velocity model of crust and upper mantle. Most of continental crust deforms in brittle manner. Continent-Ocean Transitions narrow and slightly asymmetric ~60 km on N side and <30 km on S side. No direct indication for mantle exhumation. Moho interface remains rather flat over extended domain, suggesting decollement within ductile lower crust)

Pubellier, M., M. Aurelio & B. Sautter (2018)- The life of a marginal basin depicted in a structural map of the South China Sea. *Episodes* 41, 3, p. 139-142.

(online at: <http://www.episodes.org/view/2068>)

(CGMW 2017 1:3 M scale structure map shows location of rifting faults from normal to hyper-extended crust, oceanic crust and late involvement in convergent margin, reactivation of Mesozoic tectonostratigraphic setting (broad folds, granitic plutons) during rifting, and architecture of NW Borneo accretionary wedge. With copy of map)

Pubellier, M., M. Delescluse, D. Savva, D. Franke, F. Meresse, J.L. Auxietre, M. Aurelio, N. Chamot-Rooke, U. Nanni & L.S. Chan (2015)- Collapse and rifting in the South China Sea. AAPG Workshop 'Tectonic evolution and sedimentation of South China Sea region', Kota Kinabalu, Search and Discovery Article 30406, p. 1-28.

(Abstract + Presentation)

(online at: www.searchanddiscovery.com/documents/2015/30406pubellier/ndx_pubellier.pdf)

(S China Sea unusually long period of rifting. On upper plate of subduction zone in Mesozoic, then collapsed continental basin on edge of Yenshanian orogeny. Continental crust rifting from Paleocene- M Oligocene in E, continuing until M Miocene in SW. Sundaland rifting documented since E Eocene only. Jurassic and Cretaceous granites conditioned locations of extension. Morphology of sea floor reflects location of granites on which large reefal platforms developed. Some sub-basins extremely stretched crust (Phu Khanh, W Natuna, NW Palawan, Tainan) and upper mantle may be in contact with sediments. Early extension in Late Cretaceous - Paleocene (basement and Mesozoic granitoids exhumation), followed by E Eocene- M Miocene rifting (crust thinned to 12km over large areas by 'boudinage'). Extension continued after start of spreading and continued after regional MMU (15-12Ma). Structural configuration represents offshore 'Basin and Range'-style province)

Pubellier, M., N. Pinet & C. Rangin (1990)- Docking of the Philippine mobile belt against the Eurasian margin: closure of the South China Sea. In: X. Jin et al. (eds.) *Proc. Symposium Marine geology and geophysics of the South China Sea*, Hangzhou 1990, p. 71-82.

(online at: https://epic.awi.de/38705/2/south-china-sea_1990.pdf)

(Docking of Philippine Arc in late M Miocene in Luzon, Late Miocene (10 My) in Visayas (C Philippines) and Pliocene in Mindanao, and not yet completed in Molucca Sea. Docking rapidly followed by renewal of subduction along E edge of S China Sea, Sulu Sea and Celebes Sea, showing S-ward progression from 11 Ma in Manila Trench to 7 Ma in Negros Trench and Late Pliocene-Pleistocene in Celebes Sea. Subduction reversal from W subduction front (Manila, Negros and Sulu trenches) to Philippine Trench associated with beginning of

activity along Philippine Fault s.s. and begins in late Pliocene. Decoupling between Philippine plate and Eurasian plate now along Philippine Trench and Philippine fault system)

Pubellier, M., D. Savva, M. Aurelio, F. Sapin et al. (2016)- Structural map of the South China Sea. Commission for the Geological Map of the World (CGMW), France.

(online at: <https://www.cgm.org/en/product/structural-map-of-the-south-china-sea-2/>)

(Detailed 1:3M scale structural elements map of South China Sea regio (see also Pubellier et al., 2018))

Pubellier, M. & B. Sautter (2022)- Key structural elements around the East Vietnam Sea (South China Sea) and implications on reconstructions: towards a clarification. Vietnam J. Marine Science Technology 22, 3, p. 217-229.

(online at: <https://vjs.ac.vn/index.php/jmst/article/view/17435/2543254599>)

(Review of critical structural elements of S China Sea (and all of SE Asia), such as locations of magmatic activity and rifted basins from Cretaceous- Present. Cretaceous magmatic arc along Vietnam and China margins, seafloor spreading in Proto-S China Sea and Celebes Sea (developed within Mesozoic magmatic arc) from end-Cretaceous to Oligocene; SCS was latest basin to open within continental margin. Possible connection between Tethys Ocean and oceanic domain between Proto-S China Sea and coastal regions of China and Vietnam. Argo Block = SE Java-Meratus- SW Sulawesi. Etc.

Pugh, A. (2007)- Structural evolution of the Nam Con Son Basin: quantitative fault analysis applied to a 3-dimensional seismic dataset. Ph.D. Thesis University of Durham, p. 1-197.

(online at: <http://etheses.dur.ac.uk/2497/>)

(3-D seismic dataset from center of Nam Con Son Basin used to build fault/horizon model of E-M Miocene syn-rift sequence. Fault orientations reflect ~NW-SE regional extension direction and N-S trending basement fabric. Dextral transtension for Nam Con Son Basin synchronous with opening of S China Sea)

Pupilli, M. (1973)- Geological evolution of South China Sea area- tentative reconstruction from borderland geology and well data. Proc. 2nd Annual Conv. Indonesian Petroleum Association (IPA), Jakarta, p. 223-241.

(Reconstruction of Paleozoic-Mesozoic tectonic elements of W Indonesia-Malaysia-Thailand. M Cretaceous arc in S China Sea suggested by monzonites and granodiorites in wells N of Anambas Islands (110 Ma age at Gabus, 92.4 Ma at AF-1X, 86 Ma at Anambas). Terubuk-1 well TD in metamorphosed lavas of probable andesitic nature and M Jurassic K-Ar age of 169 ± 7 Ma, but could be equivalent of Late Triassic Serian volcanics of W Kalimantan. With SE Asia- W Indonesia tectonic elements maps for Lower Paleozoic, U Paleozoic, E-M Mesozoic, M-U Mesozoic and Tertiary)

Qian, Y. (1990)- Heat flow and age of crust of the South China Sea. In: B. Elishevitz (ed.) Proc. CCOP Heat flow workshop III, Bangkok 1988, United Nations ESCAP, CCOP, Technical Publication 21, p. 79-89.

(S China Sea divided into 5 heatflow zones. Age of crust calculated from thermal models as 15 Ma (SW), 17 Ma (C) and 22 Ma (N))

Qiu, N., Z. Sun, J. Lin, C.F. Li & X. Xu (2023)- Dating seafloor spreading of the southwest sub-basin in the South China Sea. Gondwana Research 120, p. 190-206.

(Spreading ages of SW sub-basin of South China Sea at SW tip of propagating seafloor spreading of SCS range from ~ 21 to 15 Ma, with average rate of 37 mm/yr. Spreading initially symmetric but later became asymmetric)

Rangin, C., J.F. Stephan & C. Muller (1985)- Middle Oligocene oceanic crust of the South China Sea, jammed into Mindoro Collision Zone, Philippines. Geology (GSA) 13, p. 425-428.

(Mindoro Island, S of Luzon is complex junction between Manila Trench and collision zone of N Palawan block with W Philippines mobile belt. M Oligocene ophiolites in suture coeval with oldest magnetic anomalies of S China Sea basin and are interpreted as fragments of S China Sea oceanic crust, now part of E-M Miocene boundary pile of terranes thrust above N Palawan block)

- Rangin, C., M. Klein, D. Roques, X. Le Pichon & L.V. Truong (1995)- The Red River fault system in the Tongking Gulf, Vietnam. *Tectonophysics* 243, p. 209-222.
(Continuation of Red River fault system in Tonkin Gulf studied with seismic and well data. Continuous left-lateral strike-slip SW of Vinh Minh fault between 30 Ma- 5.5 Ma, but offset probably not more than few 10s of km. No sign of post-5.5 Ma right-lateral motion. Prior to 30 Ma widespread extension in 100-km-wide zone, possibly related to left-lateral motion. 15.5-Ma unconformity separates transtensional from transpressional regime, coinciding with cessation of sea-floor spreading in S China Sea)
- Riley, D.A., M. Franzel, T.J. Pearce, Anh Nguyen, N. Bruder, G. Fraser et al. (2023)- Integrated stratigraphic and provenance of the Cuu Long Basin, offshore Vietnam. *Proc. 50th Southeast Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore 2023*, p. (Abstract only?)
- Roques, D. (1996)- Tectonique Cenozoïque de la marge centre Vietnam: implications pour l'ouverture de la Mer de Chine meridionale. *Doct. Thesis, Universitè Pierre et Marie Curie, Paris VI*, p. 1-430. *(Unpublished)*
('Cenozoic tectonics of the Central Vietnam margin: implications for the opening of the South China Sea')
- Roques, D., S.J. Matthews & C. Rangin (1997)- Constraints on strike-slip motion from seismic and gravity data along the Vietnam margin offshore Da Nang; implications for hydrocarbon prospectivity and opening of the East Vietnam Sea. In: A.J. Fraser et al. (eds.) *Petroleum geology of Southeast Asia*, Geological Society, London, Special Publ. 126, p. 341-353.
- Roques, D., C. Rangin & P. Huchon (1997)- Geometry and sense of motion along the Vietnam continental margin: onshore/offshore DaNang area. *Bull. Societe Geologique France* 168, p. 413-422.
- Roberts, D.G. (1988)- Basin evolution and hydrocarbon exploration in the South China Sea. In: H.C. Wagner et al. (eds.) *Petroleum Resources of China and related subjects*, Circum-Pacific Council for Energy & Mineral Resources, Earth Science Series, Houston, 10, p. 157-177.
(S China Sea is back-arc basin formed by rifting, spreading, and subduction in response to collision between Asian, Indian and W Pacific plates. Hydrocarbon exploration offshore China, Sarawak and in S China Sea discussed in context of basin evolution as shown from sequence analysis)
- Ru, K. & J.D. Pigott (1986)- Episodic rifting and subsidence in the South China Sea. *American Assoc. Petroleum Geol. (AAPG) Bull.* 70, p. 1136-1155.
(S China Sea experienced at least 3 stages of rifting and two intervening stages of sea-floor spreading since E Cretaceous. Rifting and associated thermal activities initiated in Late Cretaceous (NE-SW trend; with widespread volcanic activity in SE China, Natuna arch and in SW Borneo regional Late Cretaceous uplift), Late Eocene and late Early Miocene (E-W trends). Heatflow data suggest oceanic crust in SW subbasin older (55 Ma) than in NW (35-36 Ma) or E (32 Ma))
- Sattler, U., A. Immenhauser, W. Schlager & V. Zampetti (2009)- Drowning history of a Miocene carbonate platform (Zhujiang Formation, South China Sea). *Sedimentary Geology* 219, p. 318-331.
*(Zhujiang carbonate platform (BP Liuhua 11-1 field, 220 km SE of Hongkong) succession of facies types, suggesting deepening-upward trend 1) grain facies with miogypsinid/lepidocyclinid fauna in oligotrophic back-reef setting; 2) in situ corals in patch-reef facies in oligotrophic lagoon (<10m); 3) rhodoid facies, dominated by *Heterostegina* sp. and spirocypeids, possibly capped by subaerial exposure surface; 4) pelagic marine shales burying platform after drowning. No evidence for meteoric diagenesis at drowning unconformity on top of carbonate platform)*
- Sattler, U., V. Zampetti, W. Schlager & A. Immenhauser (2004)- Late leaching under deep burial conditions: a case study from the Miocene Zhujiang carbonate reservoir, South China Sea. *Marine and Petroleum Geology* 21, 8, p. 977-992.
(Zhujiang E Miocene carbonates reservoir in Liuhua 11-1 field three porous zones of ~20m intercalated with tight zones, parallel to bedding. Majority of pores late leaching in deep burial settings. Tight zones lack

porosity because of meteoric cementation prior to late leaching. Corrosive fluids migrated along bedding-parallel tight zone barriers and leached intervals in-between, emphasizing depositional pattern)

Savva, D., F. Meresse, M. Pubellier, N. Chamot-Rooke, L. Lavier, K. Wong Po, D. Franke, S. Steuer & F. Sapin (2013)- Seismic evidence of hyper-stretched crust and mantle exhumation offshore Vietnam. *Tectonophysics* 608, p. 72-83.

(Eocene-Recent Phu Khanh Basin opened during rifting of S China Sea, when continental crust ruptured along E-Vietnam Boundary Fault. Extreme crustal thinning and mantle uplift that sometimes places sediments in contact with Moho discontinuity mark central part of basin. Low-angle detachment fault separates several crustal blocks from Moho. Above mantle, upper and lower crusts form large crustal boudins. Three stages of extension: (1) rift sequence between tilted pre-rift basement and Oligocene (32 Ma); (2) Oligocene- Mid Miocene (15.5 Ma); (3) M Miocene- U Miocene (before 10.5 Ma). Two extension directions, N-S and NW-SE. Cessation of rifting not before 12-10.5 Ma)

Savva, D., M. Pubellier, D. Franke, N. Chamot-Rooke, F. Meresse, S. Steuer & J.L. Auxietre (2014)- Different expressions of rifting on the South China Sea margins. *Marine and Petroleum Geology* 58, B, p. 579-598.

(online at: www.researchgate.net/publication/273643778_Different_expressions_of_rifting_on_t_Etc)

(Different styles of rifting on continental margins of S China Sea. Inherited structures like granitic plutons or large folds condition geometry and location of normal faults and detachments. Evolution of rifting through time dependent of margins structure and thickness, and rifting migrated toward SW. Very shallow water depth or continental depositional environment characterize rifting until entire basin subsided in Late Miocene)

Schimanski, A. (2002)- Holocene sedimentation on the Vietnamese Shelf: from source to sink. *Doct. Dissertation Christian-Albrechts Universitat, Kiel*, p. 1-171.

(online at: <https://d-nb.info/972182144/34>)

(Holocene deposits on Vietnamese shelf of S China Sea since last deglacial sea level rise. Sediments from 2 major rivers (Red River, Mekong; mainly deposited in deltas) and numerous small mountainous rivers)

Schimanski, A. & K. Statteger (2005)- Deglacial and Holocene evolution of the Vietnam Shelf; stratigraphy, sediments and sea-level change. *Marine Geology* 214, 4, p. 365-387.

(Shallow high-resolution seismic and sediment cores on Vietnam Shelf analyzed to unravel post-glacial evolution. Southern Shelf sedimentation with abundant incised valley fills, cut into late Pleistocene land surface by Paleo-Mekong River during sea level lowstands and filled with transgressive deposits. Central Shelf narrow and conformable strata. Northern Shelf with paleo-Red River channels incised valleys)

Schluter, H.U., K. Hinz & M. Block (1996)- Tectono-stratigraphic terranes and detachment faulting of the South China Sea and Sulu Sea. *Marine Geology* 130, p. 39-78.

(5 main terranes in S China Sea, 4 in Sulu Sea. Dangerous Grounds, Reed Bank, Palawan- NW Borneo Trough and Palawan continental terranes developed on proto-China margin by simple shearing in Late Cretaceous- E Paleocene. Rift was abandoned and new W-ward propagating rift system developed N of Dangerous Grounds- Reed Bank from M Eocene- E Miocene together with seafloor spreading in S China Sea. Leading edge of S-drifting continental terranes collided with Late Cretaceous- E Eocene subduction complex of N-most terrane of proto-Sulu Sea. Continuous convergence, back-arc spreading of SE Sulu Sea terrane and anti-clockwise rotation of Borneo responsible for compression structures of Sulu Sea terranes, including formation of splinters of oceanic crust. NNW-SSE right-lateral systems cut across most terranes, presumably ceasing at 12-16 Ma)

Shao, L., L. Cao, X. Pang, T. Jiang, P. Qiao & M. Zhao (2015)- Detrital zircon provenance of the Paleogene syn-rift sediments in the northern South China Sea. *Geochem. Geophysics Geosystems* 17, 2, p. 255-269.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2015GC006113>)

(Zircon U-Pb geochronology of syn-rift sequences in northern S China Sea suggests significant intrabasinal provenances in addition to terrigenous supply from China margin in N. Dongsha Uplift considered to account for dominance of E Cretaceous zircons in Eocene samples. Episodic nature of rifting and erosion processes in early S China Sea cause of complex patterns in Paleogene provenance history)

Shao, L., L. Cao, P. Qiao, X. Zhang, Q. Li & D.J.J.van Hinsbergen (2017)- Cretaceous-Eocene provenance connections between the Palawan continental terrane and the northern South China Sea margin. *Earth Planetary Science Letters* 477, p. 97-107.

(Zircon U-Pb geochronology and heavy mineral analysis of Cretaceous and Eocene from northern S China Sea and Palawan continental terrane show similarities of Upper Cretaceous and Eocene, excluding possibility of latest Cretaceous drift of Palawan continental terrane in response to Proto-S China Sea opening. Zircon age signatures suggesting conjugate relationship between Palawan terrane and eastern Pearl River Mouth Basin and remained attached to S China margin until Oligocene oceanization of S China Sea)

Shao, L., A. Meng, Q. Li, P. Qiao, Y. Cui, L. Cao & S. Chen (2017)- Detrital zircon ages and elemental characteristics of the Eocene sequence in IODP Hole U1435A: implications for rifting and environmental changes before the opening of the South China Sea. *Marine Geology* 394, p. 39-51.

(Littoral M-L Eocene sandstone sequence in IODP Hole U1435A mainly composed of subangular quartz (70-80%) and K feldspar (10-15%), indicating proximal provenance of felsic rocks. Detrital zircon ages mainly Mesozoic (E Cretaceous peak at ~110 Ma, derived from China active continental margin arc). Some grains with ages between ~65- 38 Ma, indicating M-L Eocene deposition before opening of S China Sea)

Shi, X.B., X. Qiu, K. Xia & D. Zhou (2003)- Characteristics of surface heat flow in the South China Sea. *J. Asian Earth Sciences* 22, 3, p. 265-277.

(592 surface heatflow measurements in S China Sea. Oceanic basins, W part of S and W fault system high heat flow values. Heat flow in Nansha (Spratley) Islands ~60 mW/m² or higher, decreasing from NW to SE. Heat flow on E margin and E part of S margin lower, especially in Luzon Trough (av.<40 mW/m²). Values in SW subbasin lower than predicted from age of ocean floor)

Shi, X.B., Qiu X.L., Xia K.Y. & Zhou D. (2003)- Heat flow characteristics and its tectonic significance of South China Sea. *J. Tropical Oceanology* 22, 2, p. 63-73.

(Same as Shi et al. 2003, above?)

Shiau, L.J., P.S. Yu, K.Y. Wei, M. Yamamoto, T.Q. Lee, T.E. Fang & M.T. Chen (2008)- Sea surface temperature, productivity and terrestrial flux variations of the southeastern South China Sea over the past 800 000 years (MAGES MD972142). *Terrestrial Atmospheric Oceanic Sciences (TAO)* 19, 4, p. 363-376.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/769-2008194363images>)

Shoup, R.C. (1996)- Tertiary paleogeography of the East and South China Seas. In: C.A. Caughey et al. (eds.) *Proc. Int. Symposium Sequence stratigraphy in Southeast Asia*, Jakarta 1995, Indonesian Petroleum Association (IPA), p. 451-456.

(Paleogeographic maps for Late Cretaceous- E Paleocene, Late Paleocene- E Eocene, M Eocene, Late Eocene, Oligocene-E Miocene and Late Miocene of E and S China Seas)

Shyu, J.P., M.P. Chen, Y.T. Shieh & C.K. Huang (2001)- A Pleistocene paleoceanographic record from the north slope of the Spratly Islands, southern South China Sea. *Marine Micropaleontology* 42, p. 61-93.

(1.4 Ma paleoceanography history of offshore north-central Spratly islands, southern S China Sea)

Sibuet, J.C., Y.C. Yeh & C.S. Lee (2016)- Geodynamics of the South China Sea. *Tectonophysics* 692, B, p. 98-119.

(online at: <http://archimer.ifremer.fr/doc/00316/42686/42059.pdf>)

(Onset of seafloor spreading in S China Sea now established at 33 Ma. Chron 12 (32 Ma) is oldest chron identified. Crust of NE part of SCS N of chron C12 not oceanic but thinned continental crust intruded by volcanic elongated features emplaced at 17-22 Ma. End of SCS spreading either 15.5, 20.5 Ma or ?? Post-spreading magmatic activity (~13-3.5 Ma) masks spreading fabric. Bathymetric seafloor trends in C part of SCS, suggest extinct ridge axis trends N055°, with N145° transform faults. From Chron 10 until end of SCS opening, plate boundary between S South China Sea and EU plates jumped W-ward several times from Ulugan fault near Palawan to W limit of SW basin, explaining V-shape of SCS. Opening of SCS linked with N-ward subduction of proto-SCS whose suture is located S of Palawan and extends W in N Borneo)

Sibuet, J.C., M. Zhao, J. Wu & C.S. Lee (2021)- Geodynamic and plate kinematic context of South China Sea subduction during Okinawa trough opening and Taiwan orogeny. *Tectonophysics* 817, 229050, p. 1-19.
(manuscript online at: <https://archimer.ifremer.fr/doc/00721/83301/88314.pdf>)
(Unfolding of subducted Manila slab from seismic tomography helps unravel evolution of north S China Sea)

Simon, B., H.L. ten Haven & C. Cramez (1997)- The petroleum systems of the South Con Son Basin, offshore South Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum systems of SE Asia and Australasia Conf.*, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 467-479.
(S Con Son Basin off SE Vietnam is Oligocene rift with tectonic readjustment in M Miocene. Importance of lacustrine source rock considered to be minor compared to terrigenous source rock)

Song, T. & C.F. Li (2015)- Rifting to drifting transition of the Southwest subbasin of the South China Sea. *Marine Geophysical Research* 36, 2, p. 167-185.
(SW subbasin of S China Sea with very wide extended continental margins. Two major unconformities in conjugate margins: (1) breakup unconformity (BRU) at ~23 Ma (initial opening of NE S China Sea at ~33 Ma) (2) M Miocene unconformity erosional truncation. Local thick syn-rift and early spreading deposition beneath BRU only at seaward concave part of Continent- Ocean Boundary. End of S China Sea seafloor spreading is 15 Ma in E and SW subbasins)

Song, C.F. Li, S. Wu, Y. Yao & J. Gao (2019)- Extensional styles of the conjugate rifted margins of the South China Sea. *J. Asian Earth Sciences* 177, p. 117-128.
(In SCS, continental-oceanic crust transition zone narrower than in many other magma-poor margins, and coincides well positive-negative gravity boundary. Post-rifting/spreading volcanic bodies and igneous intrusions often complicate the structures. Cenozoic rifted basins often bounded by listric normal faults, the majority of which terminate at upper-lower crust interface (brittle-ductile transition boundary), suggesting lower crust was weak. Normal oceanic crust began to establish soon after crustal breakup)

Song, X.X., C.F. Li, Y. Yao & H. Shi (2017)- Magmatism in the evolution of the South China Sea: geophysical characterization. *Marine Geology* 394, p. 4-15.
(Most igneous emplacements in S China Sea margins after end of seafloor spreading, rare during rifting and spreading phases, supporting magma-poor margins before breakup of continental lithosphere. Post-spreading magmatic activities widespread in continental slope areas and central SCS, likely triggered by extension in relation to cooling and subsidence of oceanic and attenuated continental lithosphere. Possible total thermal contractional displacement up to 24 km)

Steinke, S., H.Y. Chiu, P.S. Yu, C.C. Shen, H. Erlenkeuser, L. Lowemark & M.T. Chen (2006)- On the influence of sea level and monsoon climate on the southern South China Sea freshwater budget over the last 22,000 years. *Quaternary Science Reviews* 25, p. 1475-1488.
(Changes in freshwater budget in S S China Sea over last 22,000 years from sediment core using Mg/Ca and O oxygen isotopes of planktonic foram *Globigerinoides ruber*. During Last Glacial Maximum higher freshwater contribution because closer to mouths of Baram, Rajang and N Sunda/ Molengraaff Rivers at that time)

Steinke, S., P.S. Yu, M. Kucera & M.T. Chen (2008)- No-analog planktonic foraminiferal faunas in the glacial southern South China Sea: implications for the magnitude of glacial cooling in the western Pacific warm pool. *Marine Micropaleontology* 66, p. 71-90.
(Planktonic foraminiferal abundances relatively unchanged in tropical S South China Sea during Last Glacial Maximum, except for relative high abundance of *Pulleniatina obliquiloculata* and *Neoglobobulimina pachyderma* (dextral) during glacials)

Steuer, S., D. Franke, F. Meresse, D. Savva, M. Pubellier & J.L. Auxietre (2014)- Oligocene-Miocene carbonates and their role for constraining the rifting and collision history of the Dangerous Grounds, South China Sea. *Marine and Petroleum Geology* 58B, p. 644-657

(Attenuated continental crust of Dangerous Grounds in SE part of S South China Sea affected by unconformities In NE Dangerous Grounds top of widespread Oligocene - E Miocene (18-20 Ma) carbonate platform. In SW Dangerous Grounds unconformity sealing tectonic activity known as 'M Miocene Unconformity', is of Early Miocene age. Luconia and S Dangerous Grounds sub-aerial during E Miocene, while Reed Bank, N Dangerous Grounds and parts of C Dangerous Grounds mostly submerged, except for some islands on W edge of Borneo-Palawan Trough (foreland basin, where flexural forebulge provided shallow marine conditions that promoted reef growth). Carbonate deposition migrated from Borneo-Palawan trough toward Dangerous Ground)

Strohmenger C.J., L. Meyer, L.A. Yose, D.S. Walley, M.Md. Yusoff, D.Y. Lyons, J. Sutton, J.M. Rivers, D. Carlo et al. (2019)- Reservoir characterization of an isolated Middle Miocene carbonate platform: Ca Voi Xanh field, offshore Vietnam. *J. Petroleum Geology* 43, 1, p. 5-26.

(online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/jpg.12747>)

(Ca Voi Xanh (CVX) gas field off Vietnam along E margin of southern Song Hong Basin. Reservoir rocks carbonates of M Miocene (Langhian and Serravallian) age, developed on isolated platform (~100 x 15 km) on Triton Horst structural high. Shallow water corals and foraminifera main faunal constituents of Langhian carbonates. Overlying Serravallian carbonates (main gas reservoir) dominated by deeper-water coralline red algae (rhodoliths) and large benthic foraminifera)

Su, D., X. Chen & Z. Liu (1995)- The gravity field and tectonics of the Nansha Islands (Dangerous Grounds). In: G.H. Teh (ed.) *Proc. AAPG-GSM International Conference Southeast Asian basins; oil and gas for the 21st century*, Kuala Lumpur 1994, *Bull. Geological Society Malaysia* 37, p. 117-123.

Gravity surveys of Nansha Islands in S part of S China Sea show three zones: (1) Zengmu (Sarawak) Basin, where gravity mostly controlled by sediment thickness; (2) Reed Bank Gravity High (highest gravity values in S China Sea), where gravity influenced mostly by deep crustal structure, and (3) Nansha (Palawan) Trough gravity low. Modelled crustal thickness ~25 km for Reed Bank, 20-25 km in reef areas, ~20 km in trough areas, and 17-20 km thick beneath Zengmu Basin)

Su, P., L. Lin, Y. Lv, J. Liang, Y. Sun, W. Zhang, H. He, B. Yan et al. (2022)- Potential and distribution of natural gas hydrate resources in the South China Sea. *J. Marine Science and Engineering* 10, 1364, p. 1-15.

(online at: <https://www.mdpi.com/2077-1312/10/10/1364>)

(Gas hydrates common in Cenozoic sedimentary basins in continental margins around S China Sea. Estimated gas hydrate potential resources expected value of 74.4 billion tons of oil equivalent in methane gas)

Su, X., R. Xiang, L. Yi, Y. Zhang, G. Qin & W. Yan (2024)- Neogene carbonate platform development in the southern South China Sea: Evidence from calcareous microfossils. *Palaeogeogr. Palaeoclim. Palaeoecology* 640, 112093, p. 1-12.

(online at: <https://www.sciencedirect.com/science/article/pii/S0031018224000828>)

(Fully-cored Well NK-1 through Meiji Atoll in center of Nansha Islands (= Dangerous Ground), off NW Sabah, developed on isolated volcanic cone of Late Triassic (218 Ma) dacites. Calcareous nannofossils and foraminifera show continuous earliest Miocene- Pleistocene succession. Combined with magnetostratigraphic data, bottom age of reef sequence of NK-1 is 23 ± 1 Ma. Three short hiatuses of 3.6-2.4 Ma, 11.1-10.0 Ma and 13.5-11.9 Ma, well correlated prominent exposure surfaces. Similar evolution history as other SCS carbonate platforms: Late Oligocene / E Miocene initiation, Early-M Miocene rapid growth, M-L Miocene erosion phase, Miocene-Pliocene stable development and Quaternary growth phase)

Su, X., Y. Xu & Q. Tu (2004)- Early Oligocene- Pleistocene calcareous nannofossil biostratigraphy of the Northern South China Sea (Leg 184, sites 1146-1148). In: W.L. Prell et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results*, 184, 224, p. 1-24.

(online at: www-odp.tamu.edu/publications/184_SR/VOLUME/CHAPTERS/224.PDF)

(Oligocene-Pleistocene sequences at Sites 1146 and 1148, northern South China Sea, subdivided into 4 Paleogene and 21 Neogene zones of Martini. Unconformity at Oligocene-Miocene transition, with upper Zone NP25 and lower Zone NN1 missing (missing time span ~1 My))

- Sun, W.D. (2016)- Initiation and evolution of the South China Sea: an overview. *Acta Geochimica* 35, 3, p 215-225.
(online at: http://english.gyig.cas.cn/pu/papers_CJG/201608/P020160809552862768935.pdf)
(Multiple models proposed for origin of S China Sea. Preferred model involves two-stage backarc extension, induced by N-ward subduction of Neotethys Plate, with normal subduction followed by ridge subduction/ flat subduction. First backarc extension responsible for formation of proto-SCS, second extension responsible for Shenhui event and ultimately formation of SCS)
- Sun, W.D., C.T. Lin, L.P. Zhang, R.Q.; Liao & Y.C. Li (2018)- The formation of the South China Sea resulted from the closure of the Neo-Tethys: a perspective from regional geology. *Acta Petrologica Sinica* 34, 12, p. 3467-3478.
(SCS formed during closure of Neo-Tethys Ocean, rather than extrusion of Indochina Peninsula induced by collision between Eurasian and Indian continents, as previously proposed. Neo-Tethys ridge subducted under Eurasian continent at ~100 -110 Ma, resulting in compression and adakites. S limb of ridge rolled back later, forming A-type granites of ~80Ma, commonly associated with tin deposits. Slab roll back resulted in extension and afterwards to normal subduction. SCS formed as result of back-arc extension during continued subduction of Neo-Tethys plate, eventually forming oceanic crust at ~33 Ma. Etc.)
- Sun, X., X. Li & H. Beug (1999)- Pollen distribution in hemipelagic surface sediments of the South China Sea and its relation to modern vegetation distribution. *Marine Geology* 156, p. 221-226.
(online at: http://users.clas.ufl.edu/krigbaum/6930/Sun_etal_MarineGeology_1999.pdf)
(Distribution of pollen in surface sediments of S China Sea in 28 samples from water depths of 329-4307m)
- Sun, X., Y. Luo & H. Chen (2003)- Deep-sea pollen research in China. *Chinese Science Bull.* 48, 20, p. 2155-2164.
(online at: www.scichina.com:8080/kxtbe/fileup/PDF/03ky2155.pdf)
(Study of pollen distributions in deep sea sediments of S China Sea and E China Sea (mainly Quaternary). Spectral analyses show Milankovich cyclicities in vegetation of surrounding land areas. Changes of herbs and pine pollen percentages in phase with $\delta^{18}O$ record. Not much detail)
- Sun, X., Y. Luo, F. Huang, J. Tian & P. Wang (2003)- Deep-sea pollen from the South China Sea: Pleistocene indicators of East Asian monsoon. *Marine Geology* 201, p. 97-118.
(High-resolution pollen record from northern S China Sea ODP Site 1144, covers last 1.03 My. High, varying proportions of *Pinus* and herb pollen, form base of 29 pollen zones, that are closely correlated to Oxygen Isotope Stages (MIS) 1-29. *Pinus* dominant zones correspond to interglacial periods, herb peaks relate to heavier $\delta^{18}O$ stages assigned to glacials. Exposed N continental shelf covered by grassland during glacials. Relatively high fern percentage with smaller amplitude in variations before 600 ka may suggest more stable humid conditions before intensification of winter monsoon. Microtektites at 386.4m, part of Australasian strewnfield, close to Brunhes/Matuyama boundary (780 ka). Milankovich cyclicity)
- Sun, Z., W. Ding, X. Zhao, N. Qiu, J. Lin & C.F. Li (2019)- The latest spreading periods of the South China Sea: new constraints from macrostructure analysis of IODP Expedition 349 cores and geophysical data. *J. of Geophysical Research: Solid Earth* 124, 10, p. 9980-9998.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019JB017584>)
(NE and N-S structures in basalt likely formed by seafloor spreading. NE trending structures formed first, followed by NS and finally WNW trending structures. Magnetic anomalies suggest latest relict ridge of East Subbasin coincides with EW trending seamount chain, etc. S China Sea may have experienced short period of NS-oriented spreading after earlier SE spreading. Latest NS spreading occurred at ~16-15 Ma)
- Sun, Z., Z. Zhong, M. Keep, D. Zhou, D. Cai, X. Li, S. Wua & J. Jiang (2009)- 3D analogue modeling of the South China Sea: a discussion on breakup pattern. *J. Asian Earth Sciences* 34, p. 544-556.
(Modeling of S China Sea spreading history, from ~31-16 Ma. Breakup unconformities at ~30 Ma in N, and 23 Ma in S, similar to Biais et al. dating)

- Sun, Z., D. Zhou, Z. Zhong, B. Xia, X. Qiu & J. Jiang (2006)- Research on the dynamics of the South China Sea opening: evidence from analogue modeling. *J. Science in China*, D 49, 10, p. 1053-1069.
(*S China Sea continental rifting and early spreading from 32- 26 Ma. From 24 Ma on, spreading in NW-SE direction and ceased spreading at ~15.5 Ma. Early opening accompanied by ~15° CW rotation, while SE sub-sea basin opened with SE extension. Existence of rigid massifs changed orientations of some faults and rift belt, and led to deformation concentrated around massifs. Rifting and drifting of SCS might be caused by slab pull from proto S China Sea subducting toward Borneo and/or mantle flow caused by India-Asia collision*)
- Sun, Z., D. Zhou, S. Wu, Z. Zhong, M. Keep, J. Jiang & H. Fan (2009)- Patterns and dynamics of rifting on passive continental margin from shelf to slope of the northern South China Sea: evidence from 3D analogue modeling. *J. of Earth Science (China)* 20, 1, p. 136-146.
- Swiecicki, T. & K. Maynard (2009)- Geology and sequence stratigraphy of Block 06/94, Nam Con Son basin, offshore Vietnam. *Proc. 2009 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore*, p. 1-17. (*Abstract + Presentation*)
(*Similarities and differences in tectonostratigraphic development of Cuu Long, Nam Con Son and W Natuna basins. W Natuna and Cuu Long Late Eocene/E Oligocene onset of rifting. All three basins with M Oligocene rifting, coincident with sea-floor spreading in S China Sea. Cuu Long Basin compressional reactivation of strike-slip faults in Late Oligocene; inversion of early grabens in W Natuna Basin in E, M and Late Miocene. Nam Con Son Basin with second period of M-L Miocene rifting following end of sea-floor spreading*)
- Tan, E. (2020)- Subduction of transitional crust at the Manila Trench and its geophysical implications. *J. Asian Earth Sciences* 187, 104100, p.
(*Subducting S China Sea crust at N Manila Trench categorized as transitional crust (rifted, thinned continental crust). Modeling predicts that, with such crust, normal fault earthquakes under accretionary prism would occur deeper and probably with larger magnitude. Normal fault earthquakes near trench outer rise usually <30 km deep worldwide, but at N Manila Trench common normal fault earthquakes around 40 km depth*)
- Tan, M.T. (1995)- Seismic stratigraphic studies of the continental shelf of Southern Vietnam. *J. Petroleum Geology* 18, 3, p. 345-354.
- Tang, Q. & C. Zheng (2013)- Crust and upper mantle structure and its tectonic implications in the South China Sea and adjacent regions. *J. Asian Earth Sciences* 62, p. 510-525.
(*3D S-velocity model for crust and upper mantle of S China Sea area shows sea basinal regions, island arc and continental regions. Crustal thickness (~15- >50 km and lithospheric thicknesses ~60- >140km, thinnest in S China Sea, thickest in E Tibet and Yangtze Blocks. Results show: (1) Mesozoic subduction zone along S China margin; (2) influence of Indochina extrusion along Red River Fault limited; (3) slab remnant of proto-S China Sea beneath Borneo. With plate reconstructions at 150, 40, 30, 20, and 15 Ma*)
- Tang, W., X.J. Xie, Y.B. Wang, L.Q. Xiong, J. Guo & X. Li (2024)- Evolution of Cenozoic sedimentary architecture in Central and Southern South China Sea basins. *J. of Palaeogeography*, Beijing, 13, 1, p. 35-53.
(*online at: <https://www.sciencedirect.com/science/article/pii/S2095383623001128>*)
(*Three types of Eocene- Recent sedimentary basins in C and southern South China Sea: foreland (in S-Brunei-Sabah and Zengmu)), strike-slip (in W), and rift (central rift basins, incl. Nansha and Palawan basins), with different sedimentary fill patterns*)
- Tang, X., L. Chen, S. Hua, S. Yang, G. Zhang, H. Shen, S. Rao & W. Li (2014)- Tectono-thermal evolution of the Reed Bank Basin, Southern South China Sea. *J. Asian Earth Sciences* 96, p. 344-352.
(*Reed Bank Basin in S margin of S China Sea two stages of Paleogene rifting (~65.5-40.4 Ma and ~40.4-28.4 Ma) recognized from tectonic subsidence rates. Corresponding phases of heating with average basal paleo-heat flow values at end of rifting events ~60 and ~66.3 mW/m². Thermal attenuation since ~28.4 Ma, with basal heat flow down to ~57.8-63.5 mW/m² at present*)

Taylor, B., (2025)- Reappraisal of the continental rifting and seafloor spreading that formed the South China Sea. *Geosciences* 15, 4, 152, p. 1-31.

(online at: <https://www.mdpi.com/2076-3263/15/4/152>)

(Detailed reappraisal of rifting and spreading of S China Sea (SCS). SCS rifted margins differ from Atlantic type, having higher strain rates, younger orogenic crust, and distributed syn-rift magmatism. Paleogene rifting and Late Oligocene- E Miocene seafloor spreading at 30–14 Ma split a Cretaceous Andean arc and forearc, producing >700 km of seafloor spreading in E and ~2000-km-wide rifted margin in West. Luconia Shoals– Dangerous Grounds- Reed Bank- N Palawan- SW Mindoro separated from China margin when SCS opened. Brittle faulting of upper crust was decoupled from lower ductile flow and magmatic intrusion, producing wide rifting. Sediments accumulated in inter-montane lakes. Spreading in E subbasin from during 30–24 Ma was at average 62 mm/yr, decreasing to 38.5 mm/yr after 23 Ma. Spreading reorganization was common as margin segments broke up to SW and spreading directions changed from ~N-S before 23 Ma to NW-SE after 17 Ma. Palawan ophiolite represent Cretaceous arc- forearc and Eocene forearc ophiolites, respectively, none representing proto-SCS Mesozoic oceanic crust, Etc.)

Taylor, B. & D.E. Hayes (1980)- The tectonic evolution of the South China Basin. In: D.E. Hayes (ed.) *The tectonic and geologic evolution of Southeast Asian Seas and Islands- 1*, American Geophysical Union (AGU), Geophysical Monograph 23, p. 89-104.

(Magnetics patterns in S China Sea suggests active seafloor spreading from M Oligocene- E Miocene (32-17 Ma). Magnetic lineations trend E-W; position of relict spreading center coincides closely with E-trending linear chain of seamounts near 15°N. N Palawan was most likely attached to Reed-Bank Block and China Margin before M Oligocene. Limited data suggest change in spreading fabric in SW corner of basin)

Taylor, B. & D.E. Hayes (1983)- Origin and history of the South China Sea Basin. In: D.E. Hayes (ed.) *The tectonic and geologic evolution of Southeast Asian seas and islands, 2*, American Geophysical Union (AGU), Geophysical Monograph 27, p. 23-56.

(New magnetic anomaly data date seafloor spreading in S China Sea as M Oligocene- E Miocene (32-17 Ma). Thick sediments (1-2.5 km) and rel. smooth oceanic basement characterize older parts of basin; thinner sediments (300m-1 km) and blocky basement fabric characterize younger central part of basin. Opening of basin moved microcontinental blocks (incl. N Palawan and Reed Bank) from Paleogene position adjacent to China mainland. Basin initially opened in N-S direction. Seafloor spreading in basin ended slightly before late M Miocene cessation of subduction at Palawan subduction zone to S)

Ten Haven, H.L. & J. Preston (1995)- Dai Hung oil field, offshore Southeast Vietnam: a case history of reservoir heterogeneity and mixed filling. In: J.O. Grimalt & C. Dorronsoro (eds.) *Organic geochemistry: developments and applications to energy, climate, environment and human history*, Proc. 17th Meeting Organic Geochemistry (AIGOA), San Sebastian, p. 332-335.

Tian, H., Z. Zhou, J. Lin, Y. Luo & F. Zhang (2024)- Deep mantle evolution of the South China Sea and its interaction with surrounding subduction systems. *Proc. 11th International Conference on Environmental and Engineering Geophysics, Journal of Physics: Conference Series* 2895, 012057, p. 1-8.

(online at: <https://iopscience.iop.org/article/10.1088/1742-6596/2895/1/012057/pdf>)

(3D geodynamic model that illustrates mantle evolution in SCS, showing how mantle upwelling in its N parts is connected to nearby subduction systems)

Tian, J., P. Wang, R. Chen & X. Cheng (2005)- Quaternary upper ocean thermal gradient variations in the South China Sea: implications for east Asian monsoon climate. *Paleoceanography* 20, PA4007, p. 1-8.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2004PA001115/epdf>)

Tian, Z., Wu Tang, P. Wang & H. Tang (2021)- Tectonic evolution and key geological issues of the Proto-South China Sea. *Acta Geologica Sinica (English Ed.)* 95, 1, p. 77-90.

(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/1755-6724.14644>)

(Proto-South China Sea may have been marginal sea or back-arc basin with Paleo-Pacific oceanic crust. Its oceanic crust now subducted in SE Asia since end- Cretaceous..Etc.)

Tjallingii, R., K. Stattegger, P. Stocchi, Y. Saito & A. Wetzel (2014)- Rapid flooding of the southern Vietnam shelf during the early to mid-Holocene. *J. Quaternary Science*, 29, 6, p. 581-588.
(*New Holocene sea-level record derived from coastal deposits of S Vietnam shelf covers deglacial sea-level history between 13-9 ka. Relatively constant rate of sea-level rise, shoreline retreat of >200 km*)

Tjallingii, R., K. Stattegger, A. Wetzel & Phung Van Phach (2010)- Infilling and flooding of the Mekong River incised valley during deglacial sea-level rise. *Quaternary Science Reviews* 29, p. 1432-1444.
(online at: <https://earth.unibas.ch/sedi/Publications%20pdf/Tjallingii%202010%20Mekong%20incised%20valley%20infill%20Quat%20Sci%20Rev%2029.pdf>)
(*Abrupt transition from fluvial mud to shallow marine carbonate sand deposition in incised-valley-fill from SE Vietnam shelf records Holocene postglacial transgression after 14 ka. Rapid aggradation of fluvial sediments at river mouth nearly completely filled Mekong incised valley prior to flooding between 13.0- 9.5 ka*)

Tran Dai Thang, Nguyen Anh Duc, Mai Thanh Ha & Tran Ngoc Lan (2015)- Geological characteristics and hydrocarbon potential of Nam Con Son Basin deep water. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2015, Singapore*, 10.1, p. 1-5. (*Extended Abstract + Presentation*)
(*Review of petroleum prospectivity of E part of Nam Con Son Basin, off S Vietnam. Two rift phases: Eocene- E Oligocene and late E Miocene- Middle Miocene*)

Tran Khac Tan & Nguyen Quang Bo (1997)- Geological modelling and reservoir properties of basement rocks of the South Vietnam continental shelf. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Petroleum systems of SE Asia and Australasia Conf., Indonesian Petroleum Association (IPA), Jakarta 1997*, p. 539-544.
(*Basement rocks underlying Cuu Long and Nam Con Son basins mainly granites- granodiorites, but also some metamorphic rocks*)

Tran Tuan Dung, Bui Cong Que & Nguyen Hong Phuong (2013)- Cenozoic basement structure of the South China Sea and adjacent areas by modeling and interpreting gravity data. *Russian J. Pacific Geology* 7, 4, p. 227-236.

Traynor, J.J. & C. Sladen (1997)- Seepage in Vietnam- onshore and offshore. *Marine and Petroleum Geology* 14, 4, p. 345-362.
(*Onshore and offshore hydrocarbon seeps along coast and offshore Vietnam linked to migration from Tertiary source rocks. Residual oil in outcrop in breached traps in Tertiary sections and in exhumed 'buried hill' traps in pre-Tertiary rocks in onshore Hanoi Basin. Active oil seepage on W margin of offshore Phu Khanh Basin through fractured granites at basin margin. Onshore gas seeps in S Vietnam. Sea bed seeps not common*)

Tri, Tri Van et al. (eds.) (2005)- Mineral resources of Viet Nam. *Vietnam Dept. Geology and Mineral Resources, Hanoi*, p. 1-214.

Tri, Tri Van & V. Khuc (eds.) (2012)- Geology and Earth resources of Vietnam. *Publ. House Science and Technology, Hanoi*, p. 1-646.

Wan, S., P.D. Clift, A. Li, T. Li & X. Yin (2010)- Geochemical records in the South China Sea: implications for East Asian summer monsoon evolution over the last 20 Ma. In: P.D. Clift et al. (eds.) *Monsoon evolution and tectonics- climate Linkage in Asia*, Geological Society, London, Special Publ. 342, p. 245-263.
(*Asian summer monsoon intensity has decreased gradually from maximum in E Miocene but Asian winter monsoon shows phased enhancement since 20 Ma*)

Wan, S., W.M. Kurschner, P.D. Clift, A. Li & T. Li (2009)- Extreme weathering/erosion during the Miocene climatic optimum: evidence from sediment record in the South China Sea. *Geophysical Research Letters* 36, L19706, doi:10.1029/2009GL040279, p. 1-5.

(Rapid increase in weathering erosion and sedimentation around S China Sea around E-M Miocene boundary, (17.2- 15 Ma) correlates closely with Miocene Climate optimum, suggests extreme continental weathering and erosion at time of high temperature and strong precipitation)

Wan, S., A. Li, P.D. Clift & H. Jiang (2006)- Development of the East Asian summer monsoon: evidence from the sediment record in the South China Sea since 8.5 Ma. *Palaeogeogr. Palaeoclim. Palaeoecology* 241, p. 139-159

(Abrupt decreases in terrigenous accumulation rate grain size, smectite content, etc. in ODP site 1143 at ~5.2 Ma suggests source of Mekong River-derived terrigenous sediment between 8.5-5.2 Ma was mainly from area of surface uplift and M-L Miocene basaltic volcanism in S Vietnam. After 5.2 Ma Vietnam tectonic activity ceased and terrigenous sediment at Site 1143 increasingly dominated by erosion within Tibetan Plateau)

Wang, F., W. Ding, H. Wang & Y. Wang (2025)- Impacts of tectonic-paleogeographic variations on Cenozoic sedimentary distribution in the Dangerous Grounds, South China Sea. *Science China Earth Sciences* 68, 11, p. 3523-3541.

(online at: <https://link.springer.com/article/10.1007/s11430-025-1692-2>)

(Dangerous Grounds is NE-SW oriented microplate in southern S China Sea, SW of Palawan block. Three stages during Cenozoic: (1) continental rifting before E Oligocene, (2) Oligocene (~33 Ma) breakup from S China and S-ward drift (33-16 Ma), and (3) M Miocene collision with Borneo. Sedimentary inputs shifted over time, with Paleocene-Eocene sediment mainly from N, Oligocene- E Miocene progressive increase from SW (Indochina- Malay Peninsulas) and since earliest M Miocene (16 Ma) from S, after collision with Borneo ('Sabah Orogeny'))

Wang, H., Q. Zhao, S. Wu, D. Wang & B. Wang (2018)- Post-rifting magmatism and the drowned reefs in the Xisha Archipelago domain. *J. of Ocean University of China* 17, p. 195-208.

(Fourteen isolated drowned reefs identified around Xisha Uplift (Paracel Islands) by multibeam and seismic data. Drowning processes of these reefs divided into three different stages. Three abrupt accelerated tectonic subsidence events in late Miocene, Pliocene and early Quaternary, closely related to thermal subsidence processes after three stages of post-rifting magmatism in M Miocene, E Pliocene and E Quaternary)

Wang, J., Q. Zhao, X. Cheng, R. Wang & P. Wang (2000)- Age estimation of the mid-Pleistocene microtektite event in the South China Sea: A case showing the complexity of the sea-land correlation. *Chinese Science Bull.* 45, p. 2277-2280.

(Stratigraphic position of M-Pleistocene microtektite layer estimated at 10-12 ka before Brunhes-Matuyama magnetic polarity reversal in deep sea cores from Indian Ocean, Sulu Sea, Celebes Sea and also in S China Sea, suggesting age of widespread Australasian meteorite impact is ~800-802 ka BP)

Wang, L., M. Sarnthein, H. Erlenkeuser, J. Grimalt, P. Grootes, S. Heilig, E. Ivanova, M. Kienast, C. Pelejero & U. Pflaumann (1999)- East Asian monsoon climate during the Late Pleistocene: high-resolution sediment records from the South China Sea. *Marine Geology* 156, p. 245-284.

(Sediment cores from S China Sea (SCS) with proxy records of past changes in East Asian monsoon climate on millennial to bidecadal time scales over last 220,000 years. Two different regimes of monsoon circulation in SCS over last two glacial cycles: (1) glacial stages with stable estuarine circulation and strong O₂-minimum layer via closure of Borneo sea strait; cool surface water during winter; large river input from emerged Sunda shelf; (2) Interglacials with strong inflow of warm water via Borneo sea strait, intense upwelling SE of Vietnam and continental wetness in China during summer; low seasonality)

Wang, L. & P. Wang (1990)- Late Quaternary paleoceanography of the South China Sea: glacial-interglacial contrasts in an enclosed basin. *Paleoceanography* 5, p. 77-90.

Wang, L., Z. Sun, Y. Yao, Z. Zhao, X. Li, J. Zhang, H. Zhuo & Z. Yang Zhen (2021)- Development characteristics of Nido carbonate platform and Its tectonic controls in the southeast of South China Sea margin. *Earth Science* 46, 3, p. 956-974. *(in Chinese, with English abstract)*

(online at: www.earth-science.net/en/article/doi/10.3799/dqkx.2021.009)

(Large Nido carbonate platform developed on highs of tilted fault block. Relative uplift caused by flexural forebulge in Late Oligocene-E Miocene. With seismic profiles)

Wang, P. & Q. Li (eds.) (2009)- The South China Sea: paleoceanography and sedimentology. Developments in Paleoenvironmental Research 13, Springer Verlag, p. 1-506.

(Extensive review of oceanography, stratigraphy, sedimentology and history of the present-day South China Sea)

Wang, P. & Q. Li (2009)- History of the South China Sea- a synthesis. In: P. Wang & Q. Li (eds.) The South China Sea: paleoceanography and sedimentology, Developments in Paleoenvironmental Research 13, Springer Verlag, p. 485-496.

(History of S China Sea three major stages: Early Paleogene pre-spreading rift stage (>37 Ma); (2) Late Eocene- E Miocene (37- 16 Ma) seafloor spreading phase, ending with collision of Nansha Plate and N Borneo; (3) post-spreading or closing stage since Middle-Late Miocene. Late Oligocene unconformity in many basins (~25-23 Ma) probably related to major ridge jump and extrusion of Indochina and associated with shift of main sediment source from SW (Indochina-Sundaland) to North (mainland China). Reduction in clastic influx lead to widespread carbonate deposition in E-M Miocene. Collision of Asian Plate with at E side of SCS and Luzon Arc started at ~6.5 Ma)

Wang, P.X., C.Y. Huang, J. Lin, Z.M. Jian & M. Zhao (2019)- The South China Sea is not a mini-Atlantic: plate-edge rifting vs intra-plate rifting. National Science Review (China) 6, 5, p. 902-913.

(online at: <https://academic.oup.com/nsr/article/6/5/902/5567450>)

(S China Sea plate-edge rift basin, while Atlantic Ocean is intra-plate rift basin. Intra-plate rifting occurred in Mesozoic and gave rise to large oceans. Plate-edge rifting mainly in mid-Cenozoic, mainly in W Pacific)

Wang, P.X., Q.Y. Li, J. Tian, Z.M. Jian, C.L. Liu, Li Li & W.T. Ma (2014)- Long-term cycles in the carbon reservoir of the Quaternary ocean: a perspective from the South China Sea. National Science Review (China) 1, 1, p. 119-143.

(In last million-year two major changes in climate regime: mid-Pleistocene transition, centered at 0.9 Ma and the mid-Brunhes event at ~0.4 Ma)

Wang, P.X., L. Wang, Y. Bian & Z. Jian (1995)- Late Quaternary paleoceanography of the South China Sea: surface circulation and carbonate cycles. Marine Geology 127, p. 145-165.

(On Quaternary glacial-interglacial variations in sea surface circulation and carbonate cycles in S China Sea)

Wang, R., A. Abelman, B. Li & Q. Zhao (2000)- Abrupt variations of the radiolarian fauna at Mid-Pleistocene climate transition in the South China Sea. Chinese Science Bull. 45, 10, p. 952-955.

(M Pleistocene changes in the radiolarian/foraminifera ratio, etc., related to global climate cooling of ~900 ka. Pronounced S-ward shift of North Equatorial Current led to lower sea-surface temperatures in S China Sea, with shift of tropical to subtropical radiolarian assemblages, increased radiolarian abundance, etc.)

Wang, Y.Y., Y.H. Zhao, W.W. Ding, P. Fang, & J.B. Li (2022)- Cenozoic propagated rifting in the Dangerous Grounds in response to the episodic seafloor spreading of the South China Sea. J. of Earth Science (China) 33, p. 1031-1046

Watts, K.J. (1997)- The Northern Nam Con Son Basin petroleum system, based on exploration data from Block 04-2 Vietnam. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum systems of SE Asia and Australasia Conference, Indonesian Petroleum Association (IPA), Jakarta 1997, p. 481-498.

Wei, W., C.Z. Liu, Y.F. Hou, C.L. Deng, W. Yan, X.H. Li, S.L. Chung & R.N. Mitchell (2022)- Discovery of a hidden Triassic arc in the Southern South China Sea: evidence for the breakaway of a ribbon continent with implications for the evolution of the Western Pacific margin. Terra Nova 34, p. 12-19.

(read online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/ter.12556>)

(Arc volcanic rocks below 998m of carbonate on Meiji Atoll dated as 218 Ma (Norian, Late Triassic) in S China Sea, in part of breakaway 'ribbon continental block' (possibly like Palawan, Mindoro, etc.) from S China Block in Oligocene. Supports existence of Late Triassic arc in S China Block, probably formed during Paleotethys subduction)

Wei, W., C.Z. Liu, R.N. Mitchell & W. Yan (2022)- Petrogenesis of dacites in a Triassic volcanic arc in the South China Sea: constraints from whole rock and mineral geochemistry. *Frontiers in Earth Science* 9, 780007, p. 1-17.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2021.780007/full>)

(Late Triassic dacites and minor basalts drilled at Meiji Atoll in E of Spratly Islands in S China Sea (SCS), part of Reed Bank-NE Palawan Block, and a rifted slice from active continental margin along Cathaysia Block, due to opening of SCS. Meiji dacites U-Pb ages 204-221 Ma and part of high-K calc-alkaline series in continental magmatic arc. Meiji dacites produced by partial melting of lower continental crust beneath S China block, triggered by underplating of mafic magmas as response to Paleo-Pacific (Panthalassa) subduction in Triassic. Meiji Atoll one of microblocks in SCS rifted from S China block. Paleomagnetic data suggest Meiji volcanics erupted at $\sim 16.2^\circ$ N, and experienced $4.1^\circ \pm 1.5^\circ$ post-eruption S-ward drift)

Wei, X., A. Ruan, M. Zhao, X. Qiu, Z. Wu & X. Niu (2015)- Shear wave velocity structure of Reed Bank, southern continental margin of the South China Sea. *Tectonophysics* 644-645, p. 151-160.

Wetzel, A., A. Feldens, D. Unverricht, K. Stattegger & R. Tjallingii (2021)- Late Pleistocene sea-level changes and the formation and fill of bent valleys incised into the shelf of the western South China Sea. *J. Asian Earth Sciences* 206, 104626, p. 1-12.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912020304193>)

(Mekong River and Red River ceated incised valleys into ancient coastal plains of exposed shelves of western S China Sea during times of lowered sea level. Seismic surveys and sediment cores of low-sinuosity deglacial valley fill. Oldest part of channel-bend fill exhibits shingled reflectors, suggesting lateral channel migration. Overlain by vertically stacked reflectors, of "fluvial-to-estuarine" mud)

White, J.M. & R.S. Wing (1978)- Structural development of the South China Sea with particular reference to Indonesia. *Proc. 7th Annual Conv. Indonesian Petroleum Association (IPA)*, Jakarta, p. 159-178.

Wiedicke, M.C. (1987)- Biostratigraphie, Mikrofazies und Diagenese Tertiärer Karbonate aus dem Sudchinesischen Meer (Dangerous Grounds-Palawan, Philippinen). *Facies* 16, 1, p. 195-302.

('Biostratigraphy, microfacies and diagenesis of Tertiary carbonates from the South China Sea'. Dangerous Grounds dredge samples compared to St Paul Limestone on Palawan and Nido Fm in wells on NW Palawan shelf. Most samples abundant Te5 (U Oligocene- Lower Miocene) larger foraminifera. Various shallow water facies. Carbonates represent drowned Oligocene-Miocene carbonate platform, now at water depths of 2400m. Carbonate stability ranking, from low to high stability: aragonitic skeletons (corals, bivalves), soritids, lepidocyclinids/ miogypsinids, Cyclocypeus, coralline algae, echinoderms, amphisteginids. Low Sr content points to 'marine' diagenesis)

Wirasantosa, S. (1992)- Cenozoic seismic stratigraphy and structure of the continental margin offshore Vietnam, South China Sea. Ph.D. Thesis Texas A&M University, p. 1-180.

Wong, H.K., T. Ludmann, C. Haft, A.M. Paulsen et al. (2003)- Quaternary sedimentation in the Molengraaff paleo-delta, Northern Sunda shelf (Southern South China sea). In: F.H. Sidi, D. Nummedal et al. (eds.) *Tropical deltas of Southeast Asia- sedimentology, stratigraphy and petroleum geology*, Society Economic Geologists (SEPM), Special Publ. 76, p. 201-216.

(Seven seismic units below postglacial unit are prograding shelf-margin lowstand wedges, deposited during forced regressions. Oldest unit may reach back to 570 ka. Outer Sunda shelf was delta plain of Molengraaff river system during last glacial)

Worden, R.H., M.J. Mayall & I.J. Evans (1997)- Predicting reservoir quality during exploration: lithic grains, porosity and permeability in Tertiary clastic rocks of the South China Sea Basin. In: A.J. Fraser et al. (eds.) *Petroleum Geology of Southeast Asia*, Geological Society, London, Special Publ. 126, p. 107-115.

(Tertiary sandstones in Gulf of Thailand, Malay and South China Sea basins rich in pelitic metamorphic rock fragments, weathered basic igneous rock fragments and micaceous rock fragments. Rapid loss of porosity with depth at rate commensurate with sandstones with 20-40% ductile grains. Low permeabilities at shallow depths relative to other hydrocarbon provinces which have lower ductile grain contents)

Wright, C.M. (2006)- Neogene stratigraphic relationships within the Nam Con Son Basin, offshore Vietnam resulting from tectonics, eustasy and sediment flux. Ph.D. Thesis, Texas A&M University, p. 1-115.

(online at: <http://oaktrust.library.tamu.edu/bitstream/handle/1969.1/ETD-TAMU-1128/WRIGHT-DISSERTATION.pdf?sequence=1>)

(Nine sequence boundaries and associated sequences are recognized on seismic along Late Miocene-Pleistocene shelf in E Nam Con Son Basin. Ages assigned to horizons by correlating sequence boundaries with published sea level curves. Two primary Pliocene-Recent sediment sources to SW S China Sea, probably paleo-Mekong Delta and fluviodeltaic system from Sunda Shelf, such as Molengraaff River)

Wu, J. (1988)- Cenozoic basins of the South China Sea. *Episodes* 11, 2, p. 91-96.

(online at: www.episodes.co.in/www/backissues/112/ARTICLES--91.pdf)

(37 Cenozoic sedimentary basins recognized in S China Sea, 18 of which with oil and gas. Grouped in 6 major depositional provinces. With small Eocene, Late Oligocene and M Miocene depositional facies maps)

Wu, J. (1994)- Evaluation and models of Cenozoic sedimentation in the South China Sea. *Tectonophysics* 235, p. 77-98.

(S China Sea marginal basin geologically complex and characterized by extensive distribution and complicated evolution of thick Cenozoic sediments. Cenozoic divided into eight sedimentary provinces. Line linking Taiwan and Natuna was sea-land boundary of S China Sea in early Cenozoic. Transgression cycle dominant W of this line, while regression prevails to E)

Wu, S., S. Yuan, G. Zhang, Y. Ma, L. Mi & N. Xu (2009)- Seismic characteristics of a reef carbonate reservoir and implications for hydrocarbon exploration in deepwater of the Qiongdongnan Basin, northern South China Sea. *Marine and Petroleum Geology* 26, 6, p. 817-823.

(Two areas of reef carbonate reservoirs in M Miocene in Qiongdongnan Basin, N S China Sea. Seismic character similar to LH11-1 reef reservoir in Dongsha Uplift and Island Reef of Salawati Basin, Indonesia)

Wu, S., Z. Yang, D. Wang, F. Lu, T. Ludmann, C. Fulthorpe & B. Wang (2014)- Architecture, development and geological control of the Xisha carbonate platforms, northwestern South China Sea. *Marine Geology* 350, p. 71-83.

(Architecture and evolution of isolated carbonate platforms on continental slope of N South China Sea. Xisha (Parecel) carbonate platforms initiated on Xisha Uplift, in E Miocene and remained active up to present)

Wu, S., X. Zhang, Z. Yang, T. Wu, J. Gao & D. Wang (2016)- Spatial and temporal evolution of Cenozoic carbonate platforms on the continental margins of the South China Sea: response to opening of the ocean basin. *Interpretation (SEG-AAPG)* 4, 3, p. SP1-SP19.

(online at: www.researchgate.net/publication/303776121_Spatial_and_temporal_evolution_of...etc.)

(Widespread and thick Cenozoic carbonate sequences along margins of S China Sea. Platforms developed during rifting and initiated on fault blocks of conjugate rift margins. Most platforms drowned after M Miocene. Malampaya Carbonate >600m thick, developed on Oligocene rifted horst block. Subsidence, tectonic tilting, faulting, and foreland bulge controlled drowned carbonate platforms. Tectonic evolution and relative sea-level fluctuations controlled depositional cycles of carbonate platforms. Carbonate platforms flourished in M Miocene due to stable tectonic conditions and shrank during Late Miocene due to rapid subsidence. Relative sea level exerted 2nd-order control on evolutionary trend of carbonate platforms and 3rd-order control on evolutionary periods in each stage)

Wu, X., X. Pang, H. Shi, M. Hen, J. Shen, X. Zhang & D. Hu (2009)- Deep structure and dynamics of passive continental margin from shelf to ocean of the Northern South China Sea. *J. of Earth Science (China)* 20, 1, p. 38-48.

(online at: www.earth-science.net/ejournal/paper/2009-1-04.pdf)

Xia, B., Y. Zhang, X.J. Cui, B.M Liu, J.H. Xie, S.L. Zhang & G. Lin (2006)- Understanding of the geological and geodynamic controls on the formation of the South China Sea: a numerical modelling approach. *J. Geodynamics* 42, p. 63-84.

Xia, K.Y. & D. Zhou (1993)- The geophysical characteristics and evolution of northern and southern margins of the South China Sea. In: G.H. Teh (ed.) *Proc. Symposium on tectonic framework and energy resources of the Western margin of the Pacific Basin, Kuala Lumpur 1992*, *Bull. Geological Society Malaysia* 33, p. 223-240.

Xia, K.Y., C.L. Huang, S.R. Jiang, Y.X. Zhang, D.Q. Su, S. Xia & Z. Chen (1994)- Comparison of the tectonics and geophysics of the major structural belts between the northern and southern continental margins of the South China Sea. *Tectonophysics* 235, p. 99-116.

(N margin of S China Sea is divergent margin, S margin (Palawan- Sabah- Sarawak) is convergent/collisional margin)

Xiao, M., Y.J. Yao, Y. Cai, H.N. Qiu, Y.G. Xu, X. Xu, Y.D. Jiang, Y.B. Li et al. (2019)- Evidence of Early Cretaceous lower arc crust delamination and its role in the opening of the South China Sea. *Gondwana Research* 76, p. 123-145.

(M Cretaceous (~Aptian) granitoids dredged from Xiaozhenzhu Rise geochemistry best explained by magma mixing between partial melts of delaminated lower arc crust and partial melts of metasomatized arc mantle wedge. New model proposes lower arc crust delamination of S China continental margin, generating tectonic weak zone essential for rifting of S China Sea)

Xie, X., R.D. Muller, S. Li, Z. Gong & B. Steinberger (2006)- Origin of anomalous subsidence along the Northern South China Sea margin and its relationship to dynamic topography. *Marine and Petroleum Geology* 23, p. 745-765.

(Cenozoic stratigraphic sections and wells from N South China Sea margin used to assess mechanisms contributing to Late Tertiary tectonic subsidence)

Xie, X., W. Tang, G. Zhang, Z. Zhao, S. Song, S. Liu, Y. Wang & J. Guo (2023)- The gradual subduction-collision evolution model of Proto-South China Sea and its control on oil and gas. *Acta Oceanologica Sinica (english Edition)* 42, 2, p. 123-137.

(Series of arc-shaped ophiolite belts and calcalkaline magmatic rocks in N Borneo gradually younger from W to W, reflecting subduction and collision of Proto-South China Sea (PSCS). Subduction accompanied by development of three accretion zones from S to N in Borneo: Kuching belt, Sibuluan belt and Miri belt. N Borneo overall three-layer structure: oceanic basement at bottom, Rajang-Crocker Gp deep-sea flysch and fluvio-delta and shallow marine molasse at top, recording subduction-collision-orogeny of PSCS. Tectonic events in S China Sea suggest "gradual" subduction-collision of PSCS. During Late Eocene- M Miocene, Zengmu, Nansha and Liyue-Palawan blocks (separated by West Baram Line and Balabac Fault) collided with Borneo and Kagayan Ridge successively from W to E, forming several foreland basin systems. PSCS subducted and closed from W to E. Continuous development of large deltas in SSCS created huge amount of oil and gas discoveries in SSCS. Differences in source rock macerals controlled oil- gas distribution pattern of 'nearshore oil and far-shore gas')

Xu, F., G. Zhang, W. Yan, J. Zhang & J. Yao (2022)- Subduction of the paleo-Pacific plate recorded by arc volcanism in the South China Sea margin. *Gondwana Research* 110, p. 58-72.

(Drill core from Mischief Reef at S margin of S China Sea with basalts and trachytes, dated at ~207- 216 Ma (~Norian; Late Triassic))

Xu, G.Q., S.H. Wu, L. Zhang, X.G. Li, H. Yi, L. Lei & X. Xu (2013)- Stratigraphic division and depositional processes for the Mesozoic basin in Northern South China Sea. *Marine Geophysical Research* 34, 3, p. 175-194. *(N China Sea margin Mesozoic section initial transgression in Late Triassic after Indosinian event, deepening to E Jurassic maximum flooding event. Followed by shallow marine M Jurassic, deep marine Late Jurassic- E Cretaceous, mainly non-marine deposition through Cretaceous. Volcanic episodes)*

Xu, H.H., H. Ma, H.B. Song & A.H. Chen (2011)- Eastern South China Sea basin expansion numerical simulation. *Chinese J. Geophysics* 54, 6, p. 956-966.

(online at: www.agu.org/wps/ChineseJGeo/54/06/xhh.pdf)

(Expansion of S China Sea in E Oligocene- E Miocene (oceanic crust age ~32-15.5 Ma) includes at least one ridge transition. Common large seamounts rise 3000-4000m high above seafloor; much of seamount magmatic activity may be younger than oceanic spreading. Simulation results indicate ridge jump is important process of S China Sea expansion. forming magma chamber between two ridges, creating more submarine volcanoes and higher terrain between ridges)

Xu, H., J. Sun, J. Liao, G. Dong, J. Liu, H. Song, Z. Wang, Z. Sun et al. (2012)- Bioherm petroleum reservoir types and features in main sedimentary basins of the South China Sea. *J. of Earth Science (China)* 23, 6, p. 828-841.

(In S China Sea Neogene organic reefs are reservoirs of largest oil- gas fields, incl. Liuhua 11-1 oilfield in N and large L gas field in S. In SE and S S China Sea organic reefs built up earlier than N. Liuhua oilfield in Pearl River Mouth basin is mainly red algal bindstone. Malampaya buildup in N Palawan basin rich in red algal bindstone and green algal reef segmented rock. In Xisha (Parecel) Islands mainly Miocene red algal framestone and green algal segmented rock)

Xu, H., Y. Zhu, G. Eberli, W. Luo, X. Zhao, Y. Cai, L. Ying, X. Liu et al. (2015)- Characteristics of porosity and permeability layer of fossil *Halimeda* reef mineral rock of Miocene in the Xisha Islands and its genetic model. *Acta Oceanologica Sinica* 34, 4, p. 74-83.

(Halimeda one of the major reef-building algae in M Miocene of Xisha, making good oil- gas reservoirs)

Xu, Y.G., J.X. Wei, H.N. Qiu, H.H. Zhang & X.L. Huang (2012)- Opening and evolution of the South China Sea constrained by studies on volcanic rocks: preliminary results and a research design. *Chinese Science Bull.* 57, 24, p. 3150-3164.

(online at: <https://link.springer.com/content/pdf/10.1007/s11434-011-4921-1.pdf>)

(South China Sea (SCS) characterized by abundant seamounts. Cenozoic volcanism in SCS and surroundings three stages: (1) pre-spreading (>32 Ma), syn-spreading (32-16 Ma), and post-spreading (<16 Ma). Etc.)

Yan, P., H. Deng, H. Liu, Z. Zhang & Y. Jiang (2006)- The temporal and spatial distribution of volcanism in the South China Sea region. *J. Asian Earth Sciences* 27, p. 647-659.

(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.455.1789&rep=rep1&type=pdf>)

(Very little Cenozoic volcanism associated with rifting and sea floor spreading in S China Sea. Large basement relief caused by extension formed major basins and continental-oceanic transitional zone in N margin reflects high crustal rigidity during rifting- drifting)

Yan, P. & H. Liu (2005)- Tectonic-stratigraphic division and blind fold structures in Nansha Waters, South China Sea. *J. Asian Earth Sciences* 24, 3, p. 337-348.

(Seismic data from Nansha waters (Spratley Islands; S margin South China Sea. Five tectonic belts: Palawan-Borneo Nappe (NW-thrust antclines of Neogene sediments), Nansha Trough (deep, undisturbed Neogene), Nanwei-Liyue Compressive Belt (Late Mesozoic paleo-anticlines overlain by undeformed sediments with Paleogene hiatus), Zheng'he Extensional Belt (Paleogene half-grabens, recent reactivation) and Circum-Southwest Subbasin Belt (Neogene draped on subsided fault blocks related to Late Oligocene-M Miocene seafloor spreading). Nansha Microcontinent Block is collision complex assembled in Late Mesozoic)

Yan, P., Y. Wang & H. Liu (2008)- Post-spreading transpressive faults in the South China Sea Basin. *Tectonophysics* 450, p. 70-78.

(S China Sea formed by Late Oligocene- M Miocene seafloor spreading. After cessation of spreading, compression due to NW-moving Taiwan-Luzon Arc causing strike-slip motion on E and W margins and basin-wide transpressive fault zones, and young volcanism)

Yan, P., D. Zhou & Z. Liu (2001)- A crustal structure profile across the northern margin of the South China Sea Basin. *Tectonophysics* 338, p. 1-21.

Yan, Q.S., P. Castillo, X. Shi, L.L. Wang, L. Liao & J. Ren (2015)- Geochemistry and petrogenesis of volcanic rocks from Daimao Seamount (South China Sea) and their tectonic implications. *Lithos* 218-219, p. 117-126.
(online at: <https://escholarship.org/content/qt7nd895c9/qt7nd895c9.pdf>)
(Daimao Seamount (16.6 Ma) formed 10 My after cessation of 17°N spreading center. Basaltic breccia clasts in volcanoclastics suggest Daimao and other SCS seamounts typical ocean island basalt composition and 'Dupal' isotopic signature. Daimao Seamount formed through submarine explosive basaltic volcanism at 16.6 Ma. Seamount subsided rapidly, with deposition of shallow-water, coral-bearing carbonates around summit)

Yan, Q.S. & X.F. Shi (2009)- Characteristics of volcanoclastic rocks from seamounts in the South China Sea and its geological implications. *Acta Petrologica Sinica* 25, 12, p. 3327-3334. *(in Chinese)*
(Volcanoclastic rocks from two seamounts in S China Sea alkali basalts)

Yan, Q., X.F. Shi & P. Castillo (2014)- The late Mesozoic-Cenozoic tectonic evolution of the South China Sea: a petrologic perspective. *J. Asian Earth Sciences* 85, p. 178-201.
(Late Mesozoic Yanshanian granitoids in (SE China), Pearl River Mouth Basin, micro-block in S China Sea (Zhongsha, Nansha, N Mindoro), continental shelf and Dalat zone in SE Vietnam and Schwaner Mountains in W Kalimantan mainly I-type granites, formed in continental arc tectonic setting (~159-70.5 Ma, av. 100 Ma). Early bimodal volcanism (60-43 Ma or 32 Ma) at N margin of SCS, followed by passive style volcanism during Cenozoic seafloor spreading (37 or 30-16 Ma) within SCS, post-spreading tholeiitic volcanism at 17-8 Ma (mantle plume?), followed by alkali series from 8 Ma- present in SCS region)

Yan, Q., X. Shi & N. Li (2011)- Oxygen and lead isotope characteristics of granitic rocks from the Nansha block (South China Sea): implications for their petrogenesis and tectonic affinity. *Island Arc* 20, 2, p. 150-159.
(Granitic samples dredged from NW margin of Nansha microblock in S China Sea emplaced between 157-127 Ma (Late Jurassic- E Cretaceous). Age and geochemistry similar to granites from Reed Bank and Yanshanian granites of E China. Isotope ratios tied to Mesozoic subduction zone in SE side of microblock, tectonically affiliated with Nanling-Hainan (S China) block)

Yan, Q., X. Shi, J. Liu, K. Wang & W. Bu (2010)- Petrology and geochemistry of Mesozoic granitic rocks from the Nansha micro-block, South China Sea: constraints on the basement nature. *J. Asian Earth Sciences* 37, p. 130-139.
(Nansha block one of several micro-blocks dispersed in S China Sea (Xisha-Zhongsha, Reed-NE Palawan block, etc.). Ages for granitic dredge samples of Nansha micro-block 159-127 Ma, comparable to Late Jurassic-E Cretaceous magmatic activity in N margin. Tonalitic and monzogranitic rock groups, related to calc-alkaline Pacific Plate subduction that existed across Taiwan, Palawan to S Vietnam)

Yan, Q.S., X.F. Shi, K.S. Wang, W.R. Bu & L. Xiao (2008)- Major element, trace element, and Sr, Nd and Pb isotope studies of Cenozoic basalts from the South China Sea. *Science in China, D: Earth Sciences*, 51, 4, p. 550-566.
(K-Ar ages of basalts from S China Sea basin 3.8- 7.9 Ma, suggesting intra-plate volcanism after cessation of spreading of S China Sea, comparable regions around SCS. Belong to alkali basalt series, similar to OIB-type basalt. Also geochemical constraints on Hainan mantle plume)

Yang, F., Z. Sun, Z. Zhou, Z. Wu, D. Gao & Q. Li (2013)- The evolution of the South China Sea basin in the Mesozoic-Cenozoic and its significance for oil and gas exploration: a review and overview. In: D. Gao (ed.) *Tectonics and sedimentation: implications for petroleum systems*, American Assoc. Petroleum Geol. (AAPG), Memoir 100, p. 397-418.

(Greater S China Sea Basin four evolutionary phases: (1) Late Triassic- M Jurassic divergent continental margin, (2) Late Jurassic- Eocene convergent intracontinental setting, (3) late Eocene- Miocene divergent continental margin, and (4) Pliocene- Present convergent continental margin setting. (SW Borneo shown as part of mainland SE Asia since Late Triassic or earlier))

Yang, S. & N. Fang (2015)- Geochemical variation of volcanic rocks from the South China Sea and neighboring land: implication for magmatic process and mantle structure. *Acta Oceanologica Sinica* 34, 12, p. 112-124.

(Geochemical study of Kon Tum plateau, Sanshui basin and Daimao seamount volcanic rocks. Basaltic lavas indicate not deep-rooted plume origin, but shallower mantle domain)

Yao, Y., H. Liu, C. Yang, B. Han, J. Tian, Z. Yin, J. Gong & Q. Xu (2012)- Characteristics and evolution of Cenozoic sediments in the Liyue Basin, SE South China Sea. *J. Asian Earth Sciences* 60, p. 114-129.

(Liyue Basin around Liyue Bank (= Reed Bank) on NE margin of Nansha Islands (= Spratly Islands. Sampaguita-1 well on Reed Bank shows breakup unconformity at ~30 Ma) between Late Eocene- E Oligocene marginal marine clastics to Late Oligocene (28 Ma) and younger bank carbonates, accompanied by reversal in clastic drainage from NW (China) to SE (Palawan) (or 30 Ma global sealevel drop unconformity?; Taylor 2025). Etc.))

Yao, Y., J. Zhang, M. Dong, R. Zhu, Z. Xu, X. Yang & H. Liu (2022)- Geodynamic characteristics in the southwest margin of South China Sea. *Frontiers in Earth Science*, 10, 832744, p. 1-16.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2022.832744/full>)

(Heatflow study around strike-slip fault system at SW margin of S China Sea, in transition zone between continental shelf and slope of SCS, which is important ocean-continent boundary. Fault zone bends to the SE into the Lupar Fault Zone and Tinja Fault Zone)

Ye, Q., L. Mei, H. Shi, G. Camanni, Y. Shu, J. Wu, L. Yu, P. Deng & G. Li (2018)- The Late Cretaceous tectonic evolution of the South China Sea area: an overview, and new perspectives from 3D seismic reflection data. *Earth-Science Reviews* 187, p. 186-204.

(Three Late Cretaceous fault systems in N South China Sea margin, superimposed on Late Jurassic to Early Cretaceous (162-102 Ma) arc-related granitoids. WNW-striking thrust system formed as a result of sinistral transpressional event at ~100 Ma, likely related to oblique convergence between Paleo-Pacific Ocean and Eurasia Plates. Second phase at ~100- 72 Ma extensional, with ENE-striking extensional faults and basins, interpreted as back-arc extension/slab roll back of Paleo-Pacific Plate, eventually leading to opening of Proto-S China Sea. Third phase compressional event in Late Cretaceous (~72- 66 Ma), responsible for ENE-striking thrust system. Post-Yanshanian compressional event interpreted to have developed in response to ridge push)

Yi, L., C. Deng, W. Yan, H. Wu, C. Zhang, W. Xu, X. Su, H. He & Z. Guo (2021)- Neogene-Quaternary magnetostratigraphy of the biogenic reef sequence of core NK-1 in Nansha Qundao, South China Sea. *Science Bulletin (China)* 66, 3, p. 200-203.

(Upper biogenic reefs in S China Sea, with ~1000 m thickness, initiated from terminal Oligocene- E Miocene, and continued to Recent(?))

Yu, H.S. (1994)- Structure, stratigraphy and basin subsidence of Tertiary basins along the Chinese southeastern continental margin. *Tectonophysics* 235, p. 56-76.

(Offshore Tertiary basins along broad shelf from Taiwan to Hainan Island with similar characteristics. Paleogene basins mainly NE-SW trending half-grabens and fault blocks)

Yu, X. & Z. Liu (2020)- Non-mantle-plume process caused the initial spreading of the South China Sea. *Nature Scientific Reports* 10, 8500, p. 1-10.

(online at: <https://www.nature.com/articles/s41598-020-65174-y.pdf>)

(Mantle plume processes are commonly thought to be dynamic mechanism for earliest S China Sea opening in E Oligocene, but chemistry of basal basalts similar to normal MORB elsewhere, contradicting plume model and suggesting link to subduction of the Pacific Plate)

Yu, X.Z., C. Xue, H. Shi, W. Zhu, Y. Liu & H. Yin (2017)- Expansion of the South China Sea basin: constraints from magnetic anomaly stripes, sea floor topography, satellite gravity and submarine geothermics. *Geoscience Frontiers* 8, 1, p. 151-162.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987116000050>)

(Model for Oligo-Miocene spreading in S China Sea basin. NW-SE expansion of SW subbasin later than N-S expansion of central basin; both expansions end at same time. Expansion of SW sub-basin similar to Japan Sea, likely caused by left-lateral strike slip on central fault zone in S China Sea)

Zampetti, V., U. Sattler & H. Braaksma (2005)- Well log and seismic character of Liuhua 11-1 Field, South China Sea; relationship between diagenesis and seismic reflections. *Sedimentary Geology* 175, p. 217-236.

(Seismic reflections in Miocene carbonate buildup of Liuhua 11-1 Field (220 km SE of Hongkong) image alternating tight and porous zones. Most porosity related to leaching in deep burial realm that postdates pressure solution, implying seismic reflections do not necessarily image depositional surfaces, although diagenetically induced porosity often follows primary depositional bedding)

Zeng, W., Z. Li, G. Wang & H. Huang (1996)- Global geoscience transect, Guangzhou-Palawan. In: G.P. & A.C. Salisbury (eds.) *Trans. 5th Circum-Pacific Energy and Mineral Resources Conference*, Honolulu 1990, Gulf Publishing, Houston, p. 421-442.

(Integrated geological-geophysical interpretation of NW-SE transect across South China Sea)

Zhang, C., S.M. Wu & X.L. Qiu (2007)- Formation of foreland basins in the South of the South China Sea. *Marine Geology & Quaternary Geology* 27, 1, p. 61-70. *(in Chinese with English Abstract)*

(Zhou 2009: Foreland basins in S SCS formed early in SW (Late Eocene) and later in NE (M Miocene), possibly indicating formation of subduction zone along S margin of SCS was from SW to NE)

Zhang, F., J. Lin, X. Zhang, W. Ding, T. Wang & J. Zhu (2020)- Asymmetry in oceanic crustal structure of the South China Sea basin and its implications on mantle geodynamics. *International Geology Review* 62, 7-8, p. 1-19.

(online at: <https://www.whoiedu/fileserverserver.do?id=261604&pt=2&p=68128>)

Zhang, G., H. Qu, S. Liu, X. Xie, Z. Zhao & H. Shen (2016)- Hydrocarbon accumulation in the deep waters of South China Sea controlled by the tectonic cycles of marginal sea basins. *Petroleum Research (Chinese Petrol. Soc.)* 1, 1, p. 39-52.

(online at: www.sciencedirect.com/science/article/pii/S2096249517300297)

(Two tectonic cycles of marginal sea basins in S China Sea: Palaeo-SCS and Neo-SCS. N part of SCS is rifted continental margin; Nansha Block is drifting rift basin. S part compound compressional basin on active margin; W part is shear-extensional basin on transform continental margin; E part is accretionary wedge at subduction continental margin. Deep-water basins mainly on continental slope and Nansha Block. Three sets of source rocks in N continental margin: Eocene terrestrial facies, E Oligocene transitional and late Oligocene marine facies. Main hydrocarbon reservoir types related to structural traps, deep water fans and reefs)

Zhang, G., W. Tang, X. Xie, Z.G. Zhao & Z. Zhao (2017)- Petroleum geological characteristics of two basin belts in southern continental margin in South China Sea. *Petroleum Exploration and Development (China)* 44, 6, p. 899-910.

(online at: <https://www.sciencedirect.com/science/article/pii/S1876380417301027>)

(South China Sea 3 tectonic stages: (1) development of Proto-SCS, (2) subduction of Proto-SCS and (3) development of Neo-SCS (rapid subsidence followed by shrinking). Southern and Northern Tertiary basins belts in southern continental margin (N Borneo). Main source rocks in S basin belt Miocene coal, nearshore marine (oil) and offshore (gas). In N basin belt, source rocks Eocene -Oligocene, gas-prone, highly mature, with reefs and faulted blocks as main traps)

Zhang, G. & M. Yang (1997)- Study of overthrust nappes and its geodynamic mechanism along the southeastern margin of Nansha Trough. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and*

tectonic evolution of Southeast Asia and the South Pacific (GEOTHA'97), Dept. Mineral Resources, Bangkok, 1, p. 327-336.

(SE margin of Nansha Trough foreland basin in S China Sea (= Palawan Trough) with common SE-to-NW directed thrust-nappe structuring along NW Borneo- Sabah margin. Two important detachment planes (re-interpretation of Hinz et al. 1985 seismic sections. Most nappe structures formed in E Pliocene)

Zhang, J. & J.B. Li (2011)- Gravity inversion and thermal modeling for the crust-mantle structure of the southwest subbasin in the South China Sea. Chinese J. Geophysics 54, 6, p. 907-920.

(online at: www.agu.org/wps/ChineseJGeo/54/06/zj.pdf)

Zhang, J., Z. Wu, Z. Shen, C. Dong, C. Wang & Y. Zhao (2010)- Seismic evidence for the crustal deformation and kinematic evolution of the Nansha Block, South China Sea. J. Asian Earth Sciences 203, 104536, p. 1-13.

(Seismic lines across central Nansha continental block display six sequence boundaries. Two structural domains: Hyper-stretched and Forebulge Domains. Main crustal extension of Nansha Block during Eocene and older syn-rift stage (~70%))

Zhang, J., M. Zhao, Z. Sun, L. Sun, M. Xu, H. Yang, Q. Wang, X. Pang, J. Zheng & Y. Yao (2023)- Large volume of magma involved in South China Sea rifting: implication for mantle breakup earlier than crust. Tectonophysics 853, 229801, p. 1-13.

(When continent is passively stretched under low stretching rate, crust breaks up earlier than lithospheric mantle when lower crust is strong. However, in northern Central SCS, lithospheric mantle breakup occurred at ~43-38 Ma, ~10 Myr earlier than crust (at ~31-29 Ma))

Zhang, L. (2008)- The finding of microtektites from ODP Site 1144 and its significance. Natural Sciences and Museums, Beijing, 4, p. 137-141. *(in Chinese)*

(ODP Site 1144 in northern S China Sea with >969 microtektites and 1543 fragments in 10 cm interval (386.17- 386.27 mcd). All microtektites entirely glassy, mostly spherical and oval in shape and with many bubbles. Composition within the range of Australasian tektites. Source crater probably further to NE and more closer to South China than previously predicted. Size of the crater estimated 50-140 km)

Zhang, L., J. Liu, Q. Zhao & C. Li (2003)- Physicochemical properties and the complicity of parent materials of microtektites from ODP Site 1144. Geology-Geochemistry 31, 2, p. 64-72. *(In Chinese)*

(ODP Site 1144 in northern C China Sea with many microtektites at depths 386.17-386.27 mcd. Shapes mostly spherical and oval, but also teardrops, saddles, buns, dumbbells, disk shapes and fragments. Major elements geochem suggest Australasian microtektites. Parent material may include clastic sediments)

Zhang, X., Z. Du, Z. Luan, X. Wang, S. Xi, B. Wang, L. Li, C. Lian & Jun Ya (2017)- In situ Raman detection of gas hydrates exposed on the seafloor of the South China Sea. Geochem. Geophysics Geosystems 18, 10, p. 3700-3713.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/2017GC006987/epdf>)

(Gas hydrates usually buried in sediments, but found exposed on seafloor of S China Sea at water depth of 1130m. Likely cold seep of thermogenic hydrocarbons)

Zhang, Y. (1995)- The characteristics of the magnetic anomaly and magnetosphere structure in the Nansha islands and surrounding areas. Bull. Geological Society Malaysia 37, p. 479-485.

(online at: www.gsm.org.my/products/702001-100933-PDF.pdf)

Zhang, Y., Y. Jiang et al. (2023)- Early Cenozoic paleontological assemblages and provenance evolution of the Lishui Sag, East China Sea. Acta Oceanologica Sinica 42, p. 113-122.

(Lishui Sag is Paleocene rift basin on SW margin in East China Sea Shelf, with thick marine and terrestrial sediments during Cenozoic. Sedimentary environment and provenance evolution of Lishui Sag during Paleocene rifting and Eocene, based on integration of detrital zircon U-Pb age spectra patterns with paleontological assemblages document significant differences in sediment sources between -E and W Lishui Sag)

Zhang, Z.G., Y.S. Du, L.F. Gao, N.Q. Fang, S.X. Yang, J. Liu & C.B. Song (2012)- The Late Mesozoic granodiorites from the southwest basin in the South China Sea and its tectonic implication. *J. of Earth Science (China)* 23, 3, p. 268-276.

(online at: <http://en.earth-science.net/PDF/20140514053633.pdf>)

(Granodiorite sample dredged from 3100m water depth at S margin of SW basin of S China Sea with 40Ar - 39Ar ages of biotites of 110.3 ± 0.5 Ma (Albian). Geochemistry suggest it may represent magmatism in arc or forearc setting)

Zhao, H., J. Deng, K. Li, Y. Di, J. Yu, J. Zhao & Y. Li (2002)- Cenozoic volcanism in South China Sea and its vicinity and South China Sea spreading. *J. of Earth Science (China)* 27, 3, p. 217-224.

(online at: <http://en.earth-science.net/WebPage/Article.aspx?id=123>)

Zhao, J., L. Zhang, X. Wang, J. Ge, M. Xu, W. Chen, M. Luo, Q. Liang, Q. Yu, S. Luo & W. Qie (2024)- Characteristics of paleontological communities in surface sediments of the southern South China Sea and their paleoclimatic and paleoenvironmental significance. *Hydrogeology and Environmental Geology* 35, p. 144-154.

(Distribution of modern foraminifera (mainly *Gs. sacculifer*, *Gr. menardii*, *Gs. ruber*), pollen and diatoms (rel. rare; *T. simonsenii*, *T. nitzschoides*, *T. longissima*) on southern SCS sea floor. Typical tropical marine)

Zhao, M., J.C. Sibuet & J. Wu (2019)- Intermingled fates of the South China Sea and Philippine Sea plate. *National Science Review (China)* 6, 5, p. 886-890.

(online at: <https://academic.oup.com/nsr/article/6/5/886/5542088>)

(About extent and nature of now subducted part of South China Sea, which extends 400-500 km E of Manila Trench by structurally restoring subducted Manila slab onto SCS block at time of end of seafloor spreading (between ~15-20 Ma))

Zhao, Q. (2005)- Late Cainozoic ostracod faunas and paleoenvironmental changes at ODP Site 1148, South China Sea. In: *Marine micropaleontology of the South China Sea*, *Marine Micropaleontology* 54, p. 27-47.

(Earliest Oligocene-Recent deep water ostracod faunas in northern S China Sea suggest spreading of SCS Basin predates Oligocene. Three ostracod assemblages recognized, reflecting paleodepth changes from upper bathyal (<1500m) in Early Oligocene, lower bathyal (1500- 2500m) in Late Oligocene- early M Miocene (26-14 Ma) to depth similar to present (>2500m) since late M Miocene- Present)

Zhao, Q., Z. Jian, B. Li, X. Cheng & P. Wang (1999)- Microtektites in the Middle Pleistocene deep-sea sediments of the South China Sea. *Science in China, D*, 42, p. 531-535.

(Common microtektites at 7.8- 8.1 m depth of core S095-17957-2, S China Sea. Microtektite layer near Brunhes/Matuyama magnetic reversal boundary ~0.78 Ma)

Zheng, H., X. Sun, P. Wang, W. Chen & J. Yue (2019)- Mesozoic tectonic evolution of the Proto-South China Sea: a perspective from radiolarian paleobiogeography. *J. Asian Earth Sciences* 179, p. 37-55.

(Proto-South China Sea represents subducted lithosphere that formerly occupied region of present-day S China Sea. During Triassic, PSCS was in Pacific- Tethys oceans transition zone. In E-M Jurassic well connected to Pacific Ocean and part of Paleo-Pacific slab. During Late Jurassic- E Cretaceous PSCS in semi-closed environment and part W-facing Andean-type subduction zone. In late Late Cretaceous in extensional setting)

Zhong, G., J. Geng, H.K. Wong, Z. Ma & N. Wu (2004)- A semi-quantitative method for the reconstruction of eustatic sea level history from seismic profiles and its application to the southern South China Sea. *Earth Planetary Science Letters* 223, p. 443-459.

(Eustatic sea level curve since Pliocene (5.3 Ma) derived from high-res seismic data from N Sunda Shelf/ South China Sea (SCS). 36 fourth order sea level cycles recognized with periods ranging from 0.08- 0.29 My)

Zhong, L.F., G.Q. Cai, A.A.P. Koppers, Y.G. Xu & B. Xia (2018)- $40\text{Ar}/39\text{Ar}$ dating of oceanic plagiogranite: constraints on the initiation of seafloor spreading in the South China Sea. *Lithos* 302-303, p. 421-426.

(Oceanic plagiogranite dredged from Penglai Seamount on 17°N fossil spreading center of East Sub-basin of SCS near Manila Trench. $^{40}\text{Ar}/^{39}\text{Ar}$ ages of 32.3 ± 0.5 Ma and 28.9 ± 1.9 Ma. Trace elements and isotopic composition similar to mid-oceanic ridge basalts. New geochronology demonstrates initial opening of S China Sea before 32 Ma (E Oligocene))

Zhou, D., H. Chen, S. Wu & H.S. Yu (2002)- Opening of the South China Sea by dextral splitting of the East Asian continental margin. *Acta Geologica Sinica* 76, 2, p. 180-190.

(Sea of Japan and S China Sea both West Pacific marginal seas with many common features, implying common origin. E Asian margin was split under the stress field of dextral transtension. Etc.)

Zhou, D., K. Ru & H.Z. Chen (1995)- Kinematics of Cenozoic extension on the South China Sea continental margin and its implications for the tectonic evolution of the region. *Tectonophysics* 251, p. 161-177.

(N South China Sea large Cenozoic sedimentary basins developed, characterized by episodic rifting, clockwise rotation of rifts, E-ward aging breakup unconformity and intensifying crustal extension to E. Maximum rifting N of maximum thermal subsidence, which was in turn N of seafloor opening. Nansha microcontinent in S of S China Sea dominated by compressional deformation. Asymmetric development of extensional structures around S China Sea Basin explained by Wernicke simple-shear model. Tectonic development of S China Sea consequence of interactions of three major plates: retreat of W Pacific subduction zone in Late Cretaceous, hard collision and impinging of India to Tibet since Late Eocene and fast N-ward subduction of Indian Ocean-Australian plate since late E Miocene)

Zhou, D., Z. Sun, H.Z. Chen, H.H. Xu, W.Y. Wang et al. (2008)- Mesozoic paleogeography and tectonic evolution of South China Sea and adjacent areas in the context of Tethyan and Paleo-Pacific interconnections. *The Island Arc* 17, 2, p. 186-207.

(online at: https://www.academia.edu/1231469/Mesozoic_paleogeography_and_tectonic_evolution_of_South_China_Sea) (Lithofacies maps of six Mesozoic time slices of S China Sea and SE Eurasian continent margin. In E Triassic, Paleotethys Ocean extended E to study area through Song Da passage. Then significant E-W differential evolution began. Late Triassic uplift of W area after collision between Indosinian and S China blocks. Transgression of Paleo-Pacific waters in E and SE formed 'E Guangdong-NW Borneo Sea'. E Jurassic marine transgression more pronounced, resulting in connection with Mesotethys Ocean to W. In M Jurassic, short-lived transgression in E Mesotethys with formation of 'Yunnan-Burma Sea'. Late Jurassic-E Cretaceous climax of subduction of Mesotethys and Paleo-Pacific towards Eurasian continent, leading to formation of 'Circum SE Asia Subduction-Accretion Zone' in M or Late Cretaceous. Evidence for newly recognized segment of this Mesozoic subduction-accretion zone under Cenozoic sediments in NE S China Sea)

Zhou, D., W. Wang, J. Wang, X. Pang, D. Cai & Z. Sun (2006)- Mesozoic subduction-accretion zone in northeastern South China Sea inferred from geophysical interpretations. *J. Science in China Series, D, Earth Sciences* 49, 5, p. 471-482.

(Segment of Mesozoic subduction-accretion zone inferred from gravity- magnetics across NE S China Sea at ~NE45° orientation. This fills gap of Great Late Mesozoic Circum SE Asia subduction-accretion Zone, which extended from Sumatra, Java, SE Kalimantan to N Palawan, and from Taiwan, Ryukyu to SW Japan)

Zhou, D. & B. Yao (2009)- Tectonics and sedimentary basins of the South China Sea: challenges and progresses. *J. of Earth Science (China Univ. Geosciences)* 20, 1, p. 1-12.

(online at: www.earth-science.net/ejournal/paper/2009-1-01.pdf)

(Introduction to special volume Tectonics and sedimentary basins of the South China Sea, with 19 papers. SCS has passive margin in N, convergent margin in S and E, and transform margin in W. Deepsea basin subdivided into sub-basins NW, E (central), and SW. Correlation of magnetic anomalies 11-5c in E subbasin indicates seafloor spreading from 30- 16 Ma. Wells on N SCS shelf commonly penetrate Late Cretaceous granites (70-105 Ma)

Zhou, Y., H. Liu, Q. Liu, Y. Yan, Y. Li, Y. Yao, Y. Li, W. Liu & R. Zhu (2021)- Early Cretaceous compressive structures in the Nansha block (Dangerous Grounds): implications for the late Mesozoic tectonic regime on the southern margin of the South China Sea. *J. Asian Earth Sciences* 222, 104963, p. 1-12.

(S and N-directed thrust nappes of Lower Cretaceous sequences in Liyue Bank (Reed Bank) and Nansha block (Dangerous Grounds) developed at S margin of S China Sea. Compressive structuring, accompanied by depositional environment changes from abyssal to continental, between 129 and 80 Ma, perhaps associated with collision between S China block and Luconia- Dangerous Grounds- Reed Bank block during subduction of Paleo-Pacific Ocean)

Zhu, M., S. Graham & T. MacHargue (2009)- The Red River Fault zone in the Yinggehai Basin, South China Sea. *Tectonophysics* 476, p. 397-417.

(Mapping of offshore part of Red River Fault in Yinggehai Basin. Two boundary faults and two basin-center faults mapped. Three deformation phases for offshore Red River Fault e: (1) sinistral movement from ~30-16 Ma, (2) slip reversal between 16-5.5 Ma, and (2) slow dextral movement after 5.5 Ma. Horizontal displacement of dextral movement ~10's of km. Before M Miocene, sinistral movement of Red River Fault likely linked to spreading of S China Sea ('continental extrusion'). After M Miocene, distributed shortening explains low rate of dextral accommodation of Red River Fault in response to continuing India-Asia collision)

Zhu, W. & Chao Lei (2013)- Refining the model of South China Sea's tectonic evolution: evidence from Yinggehai-Song Hong and Qiongdongnan Basins. *Marine Geophysical Research* 34, 3-4, p. 325-339.

Zhu, Y., X. Liu, R. Ma, W. Luo, X.Wang & S Xu (2016)- Early Miocene to Quaternary calcareous nannofossils from the biogenetic reef complexes and their significance of well XK1, Xisha Islands South China Sea. *Acta Palaeontologica Sinica* 55, p. 385-392.

(Nannofossil biostratigraphy of Neogene carbonate buildup in Paracel islands well XK1)

IX.8. The Philippines (General, Palawan, Luzon)

Relevance for Indonesia: Magmatic arcs of Halmahera, Sangihe Arc, North Sulawesi

Abrajano, T.A., J.D. Pasteris & G.C. Bacuta (1989)- Zambales ophiolite, Philippines I. Geology and petrology of the critical zone of the Acoje massif. *Tectonophysics* 168, p. 65-100.

(Acoje massif (northernmost massif of Zambales Ophiolite Complex) relatively intact fragments of Mesozoic oceanic lithosphere)

Abrajano, T.A., N.C. Sturchio, J.K. Bohlke, G.L. Lyon, R.J. Poreda & C.M. Stevens (1988)- Methane-hydrogen seeps, Zambales Ophiolite, Philippines: deep or shallow origin? *Chemical Geology* 71, p. 211-222.

(online at: https://www.researchgate.net/publication/236147536_Methane-hydrogen_gas_seeps_Zambales_Ophiolite_Philippines_Deep_or_shallow_origin)

(Isotopically anomalous CH₄-rich gas escapes at low rate from seeps in serpentinized ultramafic rock in Zambales Ophiolite, W Luzon. Gas mainly methane/CH₄ and H₂ (55 and 42%). $\delta^{13}\text{C}$ -value of CH₄ is -7.0‰, which is ~8‰ higher than highest published values for CH₄ in other natural gases, but similar to values attributed to mantle carbon. Carbon and He isotopic data consistent with derivation directly from reduced mantle, but could also have been produced during low-T serpentinization of ophiolite)

Abrajano, T.A., N.C. Sturchio, B.M.Kennedy, G.L. Lyon, K. Muehlenbachs & J.K. Bohlke (1990)- Geochemistry of reduced gas related to serpentinization of the Zambales Ophiolite. *Applied Geochemistry* 5, 5-6, p. 625-630.

(Methane-hydrogen gas seeps with mantle-like C and noble gas isotopes seep from partially serpentinized ultramafic rocks in Zambales ophiolite, Philippines. Gases products of periodotite hydration)

Acharya, H.K. (1980)- Seismic slip on the Philippine fault and its tectonic implications. *Geology (GSA)* 8, 1, p. 40-42.

(Philippine fault is major left-lateral strike-slip fault between two opposing subduction zones along Manila Trench and Philippine Trench. Rate of motion on fault comparable to slip of Philippine and Eurasian plates)

Acharya, H.K. & Y.P. Aggarwal (1980)- Seismicity and tectonics of the Philippine Islands. *J. of Geophysical Research* 85, B6, p. 3239-3250.

(Seismic and volcanic activity used to decipher tectonics of Philippines region. Active E-ward subduction of Eurasian plate along Manila trench near Luzon. Underthrusting of Eurasian plate may have occurred along all of W Philippines from Taiwan to Sulawesi. Subduction has ceased along sections where continental crust is present. Near E Philippines W-ward subduction of Philippine Sea plate)

Acosta, J.G. (2013)- Analysis of high amplitude anomalies of the Early-Middle Miocene Pagasa Formation, Southwest Palawan Basin, Philippines. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2013, Singapore*, p. 1-41. *(Presentation)*

(Offshore SW Palawan E Sabina Block with M Miocene Pagasa Fm deep-water sands above Nido Lst. High amplitude anomalies can not be tied to good quality reservoirs)

Adams, G.I. (1909)- Geological reconnaissance of the island of Leyte- with notes and observations on the adjacent smaller islands and southwestern Samar. *Philippine J. Science* 4, 5, p. 339-358.

(online at: <https://nla.gov.au:443/tarkine/nla.obj-8832482>)

Albrecht, A. & U. Knittel (1990)- The petrology of the K-rich alkaline rocks in the Palali Mountains (northern Luzon, Philippine island arc). *Neues Jahrbuch Mineralogie, Abhandlungen*, 161, 3, 255-286.

(E Miocene (25-17 Ma) K-rich syenitic- nepheline syenitic intrusive complex in N Luzon)

Alcantara, P.M. (1980)- Tertiary larger foraminifera from the Argao-Dalaguete region, southern Cebu Island, Philippines. In: H. Igo & H. Noda (eds.) *Professor Sabro Kanno Memorial Volume*, Ibaraki, p. 221-232.

Almasco, J.N. (1994)- Paleomagnetism of Palawan Island: implications for the opening of the South China Sea and for Philippine geology. Ph.D. Thesis, University of Illinois, Chicago, p. 1-272.

Almasco, J.N., K. Rodolfo, M. Fuller & G. Frost (2000)- Paleomagnetism of Palawan, Philippines. *J. Asian Earth Sciences* 18, 3, p. 369-389.

(online at: https://www.academia.edu/16339736/Paleomagnetism_of_Palawan_Philippines)

(*Paleomagnetic studies on Palawan and Busuanga. Cretaceous Espina Basalts of Calatiguas Ophiolite in S Palawan Block N-ward and rotated $66^{\circ}\pm 13^{\circ}$ CCW, suggesting obduction from S. Jurassic cherts and Cretaceous Guinlo Fm from Busuanga in N Palawan Block paleolatitude comparable to regions of pervasive Cretaceous remagnetization in S China borderland and may reflect similar remagnetization, consistent with N Palawan Block's proposed S China origin*)

Amato, F.L. (1965)- Stratigraphic paleontology in the Philippines. *The Philippine Geologist* (J. Geological Society of the Philippines) 19, 1, p. 1-24.

(*Eocene- Miocene 'Basic zonation' of planktonic forams presented for Philippines*)

Amisicaray, E.A. (1987)- Permian fusulinids and other microfossils from northwestern Palawan. In: Pre-Jurassic evolution of Eastern Asia, IGCP Project 224, Report 2, p. 85-104.

(*Lower part of Minilog Fm limestone blocks in Busuanga Island Late Jurassic accretionary prism contains Permian fusulinids Verbeekina verbeeki, Neoschwagerina megasphaerica and other N. spp., Nankinella orbicularia, Yabeina globosa, etc.*)

Amisicaray, E.A. & M.S. Nilayan (1986)- *Orbitolina* from Tuburan, Cebu. Philippines. Bureau of Mines and Geo-Sciences, 67, p. 1-14.

(*Tuburan Limestone of Cebu Island with E Cretaceous Orbitolina and Late Cretaceous rudists. Possibly allochthonous olistoliths within Kansi volcanics and clasts in younger sediments*)

Amisicaray, E.A. & F.P. Tumanda (1990)- Paleozoic and Mesozoic limestone of Calamian Island Group; its role in the tectonic development of the North Palawan Complex, Philippines. In: Pre Jurassic evolution of Eastern Asia, IGCP Project Report 224, Report 5, p. 81-95.

Amisicaray, E.A. & M.A. Zepeda (1990)- Southwestern Mindoro, part of the pre Tertiary North Palawan Complex (Philippines) and the role of the Jurassic Mansalay Formation on its evolution. In: K. Ichikawa (ed.) Pre Jurassic evolution of Eastern Asia, IGCP Project 224, Report 5, p. 97-109.

Andal, P.P. (1966)- A report on the discovery of fusulinids in The Philippines. *The Philippine Geologist* 20, 1, p. 14-22.

(*First report of M Permian fusulinid foraminifera (Schwagerina, Pseudofusulina) in limestone pebbles in Eocene conglomerate from Carabao Island, SW Mindoro (see also Koike et al. 1968)*)

Andal, D.R., J.S. Esguerra, W. Hashimoto, B.P. Reyes & T. Sato (1968)- The Jurassic Mansalay Formation, Southern Mindoro, Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 179-197.

(http://jurassic.ru/pdf/Andal%20et%20al.,1968_Amm_Philippines.pdf)

(*Mansalay Fm thick (few 1000s m, but intensely folded) shales- sandstones near Mansalay, SE Mindoro. Age M Callovian- Oxfordian, based on abundant perisphinctid ammonites and pelecypods, all Pacific-type species. Jurassic likely rests on metamorphic rocks, and overlain by Eocene limestone. U Oxfordian perisphinctid assemblage with Perisphinctes (Kranaosphinctes), Parawedekindia, Euaspidoceras, Taramelliceras, etc., comparable to Mefa Beds of Buru and Taliabu, E Indonesia (not sure? names not familiar; JTVG). Also faunal affinity with Japanese U Oxfordian. (part of N Palawan Terrane?; JTVG) (see also Sato et al. (2012)*)

Andal, E.S., S. Arai & G.P. Yumul (2005)- Complete mantle section of a slow-spreading ridge-derived ophiolite: an example from the Isabela ophiolite in the Philippines. *Island Arc* 14, 3, p. 272-294.

(online at: [www.academia.edu/15372710/Complete_mantle_section_of_a_slow_spreading_ridge_deriv Etc.](http://www.academia.edu/15372710/Complete_mantle_section_of_a_slow_spreading_ridge_deriv_Etc.))

(Isabela ophiolite complete ophiolite sequence along E coast of N Luzon, forming Cretaceous basement complex for NE Luzon block. At N end of trail of ophiolites along E margin of Philippine Mobile Belt. Petrological and mineral compositions suggest Isabela ophiolite of transitional subtype, with fertile lherzolites representing lower sections of mantle)

Antonio, L.R. (1972)- Geology and mineral resources of east Central Zamboanga Peninsula, Mindanao, Philippines. Philippines Bureau of Mines Report, Manilla, p. 1-87.

Aquino, K.A., C.A. Arcilla, C. Schardt & C.A.J. Tupaz (2022)- Mineralogical and geochemical characterization of the Sta. Cruz nickel laterite deposit, Zambales, Philippines. Minerals (MDPI) 12, 305, p. 15-24.
(online at: <https://www.mdpi.com/2075-163X/12/3/305/pdf-vor>)

Aquino, K.A., A. dC. Perez, C.M.M. Juego, Y.G.M. Tagle, J.A.M. Leong & E.A. Codillo (2025)- High hydrogen outgassing from an ophiolite-hosted seep in Zambales, Philippines. Int. J. Hydrogen Energy 105, p. 360-366.

(online at: https://www.researchgate.net/publication/388421423_High_hydrogen_outgassing_from_an_ophiolite-hosted_seep_in_Zambales_Philippines)
(Hydrogen flux from natural seeps and springs from ultramafic rocks of M Eocene Zambales ophiolite, W Luzon, Philippines, one of highest measured hydrogen degassing from ophiolites to date worldwide)

Arai, S. & M. Kida (2000)- Origin of fine-grained peridotite xenoliths from Iraya volcano of Batan Island, Philippines: deserpentinization or metasomatism at the wedge mantle beneath an incipient arc? Island Arc 9, 4, p. 458-471.

(Peridotite xenoliths from subarc mantle at Iraya volcano of Batan, Luzon arc mainly harzburgites. F-type peridotite characteristic of upper mantle of island arc, especially incipient arc)

Arai, S., S. Takada, K. Michibayashi & M. Kida (2004)- Petrology of peridotite xenoliths from Iraya Volcano, Philippines, and its implication for dynamic mantle-wedge processes. Journal of Petrology 45, 2, p. 369-389.

(online at: <https://academic.oup.com/petrology/article/45/2/369/1522080/Petrology-of-Peridotite-Xenoliths-from-Iraya>)

(Two types of peridotite xenoliths in calc-alkaline andesites from Iraya volcano, NE Batan: C-type (coarse) and F-type (fine; with transitional types). C-type harzburgites similar to arc-type harzburgite and may be from sub-arc lithospheric mantle, strained and deformed during oblique subduction of S China Sea Plate)

Arcilla, C.A. (1991)- Lithology, age, and structure of the Angat Ophiolite, Luzon, Philippine Islands. M.Sc. Thesis, University of Illinois, Chicago, p. 1-212. *(Unpublished)*

Arcilla, C.A. (1998)- Mantle dynamic implications of Philippine arc volcanism. Ph.D. Thesis, University of Illinois, Chicago, p. 1-248. *(Unpublished)*

(Geochem study of 32 Pliocene- Recent volcanic centers of Philippines)

Arcilla, C.A., C.S. Pascua & R. Alexander (2011)- Hyperalkaline groundwaters and tectonism in the Philippines: Significance to natural Carbon capture and sequestration. Proc. 10th Int. Conf. Greenhouse and Gas Control Technologies, Amsterdam 2010, Energy Procedia 4, p. 5093-5101

(online at: <https://www.sciencedirect.com/science/article/pii/S1876610211007636>)

(Review of Philippines ophiolite distribution and discussion of using ophiolites as CO₂ sink. Massive tufa deposits in stream in Zambales ophiolite, high flammable gas (H₂, CH₄) concentrations in groundwater, etc.)

Arcilla, C.A., H.B. Ruelo & J. Umbal (1989)- The Angat ophiolite, Luzon, Philippines: lithology, structure, and problems in age interpretation. Tectonophysics 168, p. 127-135.

(Angat ophiolite complex overlain by sediments with Cretaceous radiolarians. Structural deformation by strike slip faulting in E-M Miocene)

Arfai, J., D. Franke, C. Gaedicke, R. Lutz, M. Schnabel, S. Ladage, K. Berglar, M. Aurelio, J. Montano & N. Pellejera (2011)- Geological evolution of the West Luzon Basin (South China Sea, Philippines). *Marine Geophysical Research* 32, 3, p. 349-362.

(Seismic of offshore W Luzon forearc basin between Luzon island and outer arc high of W Luzon subduction zone. Basement, at ~6s TWT, dissected by normal faults, some inverted later. Five regional unconformities. Basin may be (partly) underlain by continental crust, affected by rifting during opening of S China Sea)

Armada, L.T., S.K. Hsu, C.B. Dimalanta, G.P. Yumul, W.B. Doo & Y.C. Yeh (2020)- Forearc structures and deformation along the Manila Trench. *J. Asian Earth Sciences*: X 4, 100036, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056020300128>)

(Manila Trench subduction zone tectonic structures vary from N to S, due to differences in nature of subducting oceanic lithosphere (i.e. seafloor relief related to seamounts and ridges, sediment supply, reactivated features and faults associated with S China Sea opening). N segment classified as accretionary margin, S segment mainly erosive. Seamounts and other seafloor spreading-related features in subducting slab induce slope steepening and vertical movement in frontal wedge and the forearc region.)

Arribas, A., J.W. Hedenquist, T. Itaya, T. Okada, R.A. Concepcion & J.S. Garcia (1995)- Contemporaneous formation of adjacent porphyry and epithermal Cu-Au deposits over 300ka in Northern Luzon, Philippines. *Geology (GSA)* 23, p. 337-340.

(Close spatial relation between porphyry Cu ($\pm$ Au) and high-sulfidation epithermal Cu-Au deposits throughout world. In N Luzon Lepanto epithermal Cu-Au deposit overlies Far Southeast (FSE) porphyry Cu-Au deposit, both world-class orebodies. Premineralization and postmineralization volcanism at 2.2–1.8 Ma and 1.2–0.9 Ma; hydrothermal system active from ~1.5 to ~1.2 Ma. Both epithermal and porphyry mineralization formed from probably linked evolving magmatic-hydrothermal system that was active for about 300 ka)

Aurelio, M.A. (1992)- Tectonics of the central segment of the Philippine Fault: structures, kinematics and geodynamic evolution. These Doct. Universite Paris 6, Universite Pierre et Marie Curie, T 92-22, Paris, p. 1-500. *(Unpublished)*

Aurelio, M.A. (1996)- A review of mechanisms of ophiolite emplacement: Philippine examples. *J. Geological Society of the Philippines* 51, 3-4, p. 87-90.

(Ophiolites originate from oceanic crust- mantle, formed by seafloor spreading at oceanic ridges or marginal sea basins. Presence over volcanic arcs or continental crusts requires mechanism that can explain emplacement of dense ophiolite onto lighter material. In convergent margin setting ophiolites ride over long and flat-lying thrust faults (nappes). Ophiolite presence along shear zones may also suggest role by strike-slip movements)

Aurelio, M.A. (2000)- Tectonics of the Philippines revisited. *J. Geological Society of the Philippines* 55, p. 119-183.

Aurelio, M.A. (2000)- Shear partitioning in the Philippines: constraints from Philippine Fault and global positioning system data. *Island Arc* 9, 4, p. 584-597.

(online at: https://www.researchgate.net/publication/229713486_Shear_partitioning_in_the_Philippines_Constraints_from_Philippine_Fault_and_global_positioning_system_data)

(Philippine Fault is major left-lateral structure in an island arc setting, accommodating component of oblique convergence between Philippine Sea Plate and Philippine archipelago. Formation of fault marks onset of new geodynamic regime in Philippine region around 4 Ma, when Philippine Sea Plate changed relative movement with respect to Eurasia from N-ward to a NW-ward motion)

Aurelio, M., E. Barrier, R. Gaulon & C. Rangin, C. (1997)- Deformation and stress states along the central segment of the Philippine Fault: implications to wrench fault tectonics. *J. Asian Earth Sciences* 15, 2-3, p. 107-119.

(online at: https://www.researchgate.net/publication/229353204_Deformation_and_stress_states_along_the_central_segment_of_the_Philippine_Fault_Implications_to_wrench_fault_tectonics)

(Deformation and states of stress along central segment of the 1200km long left-lateral Philippine Fault, from Bondoc Peninsula to Leyte Island do not always conform to predictions of classical wrench tectonics)

Aurelio M.A., E. Barrier, C. Rangin & C. Muller (1991)- The Philippine Fault in the late Cenozoic evolution of the Bondoc- Masbate- N. Leyte area, Central Philippines. *J. Southeast Asian Earth Sciences* 6, p. 221-238.

(online at: https://www.researchgate.net/publication/248551711_The_Philippine_Fault_in_the_Late_Cenozoic_tectonic_evolution_of_the_Bondoc-Masbate-N_Leyte_area_Central_Philippines)

(In Bondoc-Masbate-N Leyte region Philippine Fault is active left-lateral slip fault, dissects a region of three compressive (M Oligocene, end-Miocene collision between N Palawan Block and W edge Philippine Mobile Belt and final phase associated with Philippine Fault) and two tensional tectonic events (Late Oligocene- M Miocene and Plio-Pleistocene). Present configuration of Philippine Fault not older than M Pliocene)

Aurelio, M.A., M.T. Forbes, K.J.L. Taguibao, R.B. Savella, J.A. Bacud & D. Franke (2014)- Middle to Late Cenozoic tectonic events in south and central Palawan (Philippines) and their implications to the evolution of the south-eastern margin of South China Sea: evidence from onshore structural and offshore seismic data. *Marine and Petroleum Geology* 58, B, p. 658-673.

(online at: https://www.researchgate.net/publication/259512275_Middle_to_Late_Cenozoic_tectonic_events_in_south_and_central_Palawan_Philippines_and_their_implications_to_the_evolution_of_the_south-eastern)

(Cenozoic tectonic history of SE margin of S China Sea. S and C Palawan dominated by Mesozoic ophiolites, emplaced over syn-rift Eocene turbidites (Panas Fm). Thrusting sealed by E Miocene (~20 Ma) sediments, constraining younger age of ophiolite emplacement at end Oligocene (~23 Ma). Nido Carbonate underthrusting at end E Miocene (~16 Ma). Tectonic wedge built in M Miocene (~16-12 Ma), forming thrust-fold belt, truncated by M Miocene Unconformity. Continuous convergent regime affected SE margin of S China Sea between end Eocene- end M Miocene. Intensity of thrusting decreases to NE, from NW Borneo Trough area into offshore SW Palawan)

Aurelio, M.A. & R.E. Pena (eds.) (2010)- *Geology of the Philippines* (2nd Edition). Mines and Geosciences Bureau, Quezon City, p. 1-532.

(Revised textbook of Philippines geology. Part 1 discusses major geological features, incl. tectonics, major faults, sedimentary basins and present-day plate motions. Part 2 is discussion of stratigraphy and petrology based on stratigraphic groupings)

Aurelio, M.A., R.E. Pena & K.J.L. Taguibao (2013)- Sculpting the Philippine archipelago since the Cretaceous through rifting, oceanic spreading, subduction, obduction, collision and strike-slip faulting: Contribution to IGMA5000. *J. Asian Earth Sciences* 72, p. 102-107.

(Review paper. Philippine archipelago two tectono-stratigraphic blocks, Palawan-Mindoro Continental Block (PCB) and Philippine Mobile Belt (PMB). PCB originally part of Asian mainland that rifted away in Mesozoic and drifted during opening of S China Sea (SCS) in Oligocene. PMB developed mainly from island arcs and ophiolite terranes that started to form in Cretaceous. At present, PMB collides with PCB in Visayas)

Aurelio, M.A., C. Rangin, E. Barrier & C. Muller (1990)- Tectonique du segment central de la faille Philippine (Region de Bondoc-Masbate): un décrochement tres recent. *Comptes Rendus Academie Sciences, Paris*, 310 (II), p. 403-410.

('Tectonics of the central segment of the Philippine Fault (Bondoc-Masbate Region): a young strike-slip fault'. Central segment of Philippine Fault from Bondoc to Masbate is complex strike-slip fault with extensional and compressive features and events recorded in sediments since Oligocene)

Aurelio, M.A., W.F.W. Simons. R.L. Almeda and the EC-Philippines GPS Team (1998)- Present-day plate motions in the Philippines: Interpretation of GPS results of GEODYSSEA. In: P. Wilson & G.W. Michel (eds.) *The geodynamics of S and SE Asia (GEODYSSEA) Project*, GeoForschungsZentrum, Potsdam, Scientific Technical Report STR 98/14, p. 251-263.

(GPS results from E and SE parts of GEODYSSEA project suggestive of more complicated geodynamic settings for the Philippines, Halmahera, PNG, etc. than for western (Eurasia/Sundaland) part. Most of Philippine Mobile Belt stations moving WNW and NW relative to Palawan/ South China Sea.)

Aurelio, M.A., K.J.L. Taguibao, E.B. Cutiongco & T.S. Bacolcol (2010)- Tectonic inversion processes in Southern Luzon, Philippines. In: C.P. Lee et al. (eds.) 6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 32-33. *(Extended Abstract)*

(Marine seismic data offshore S Luzon)

Aurelio, M.A., K.J.L. Taguibao, E.B. Cutiongco, J.M. Foronda, Z.M. Calucin & M.T. Forbes (2013)- Structural evolution of Bondoc-Burias area (South Luzon, Philippines) from seismic data. J. Asian Earth Sciences 65, p. 75-85.

(online at: https://www.researchgate.net/publication/258794197_Structural_evolution_of_Bondoc-Burias_area_South_Luzon_Philippines_from_seismic_data)

(2-D offshore seismic profiles between Bondoc Peninsula and Burias Island, S Luzon, Philippines, show two distinct seismic sequences: lower sequence correlative to Late Oligocene- E Miocene limestone observed onshore in Bondoc Peninsula and Burias Island. Upper sequence, correlative to turbiditic and shallower marine clastic deposits widely exposed in Bondoc Peninsula, affected by thrust faulting and tight folding)

Aurelio, M.A., K.J.L. Taguibao, A.A. Morado, S. Steuer, M. Pubellier, M.T. Forbes & D. Franke (2015)- Twisted Nido Limestone: mark of a mid Tertiary bimodal deformation at the thinned SE edge of Sundaland. AAPG Geoscience Technology Workshop (GTW), Tectonic evolution and sedimentation of South China Sea region, Kota Kinabalu 2015, Sabah, AAPG Search and Discovery Article 90236, p. 1-4. *(Extended Abstract)*

(Area of Late Oligocene- E Miocene Nido Lst 1000 km long from W of Calamian Islands in N Palawan to NW Borneo Trough in S. Onland carbonate outcrops in Sabang, C Palawan. S of Sabang, carbonate thrust under tectonic wedges formed between Eocene and M Miocene. Accretionary wedges are overlain by Late Cretaceous ophiolites that began obducting in Eocene. Bimodal deformation of SE Sundaland as S China Sea opened. In S limestone at tail-end of subducting proto S China Sea, pulled down in direction of subduction (SE) and continued to underthrust as ophiolite obduction took place. N segment warping upwards in response to collision of rifted N Palawan continental block with W edge of Philippine arc)

Austria, B.S. & R.A. Reyes (1992)- Possibilities of W. Batangas Basin in Philippines South China Sea. Oil and Gas Journal 90, 23, p. 74-80.

Austria, R.S.P., L.T. Armada, N.E. Parcutela, C. B. Dimalanta, B.D. Payot, G.T.V. Valera, E.M.L. Reyes & G. P. Yumul Jr (2023)- The Macolod Corridor (Philippines). A passive rift compensated by ponded magmas? Tectonophysics 862, 229965, p.

(Macolod Corridor is one of Philippine island arc's most prominent extensional structures, but no prominent topographic depression and thinned crust)

Bachman, S.B., S.D. Lewis & W.J. Schweller (1983)- Evolution of a forearc basin, Central Luzon Valley, Philippines. American Assoc. Petroleum Geol. (AAPG) Bull. 67, 7, p. 1143-1162.

(Luzon C Valley with 14 km-thick forearc basin sequence, floored by oceanic crust on seaward (W) side and older accreted terranes on arc (E) side. Initial sedimentation on oceanic crust during E Tertiary N-ward translation and emplacement of crust as ophiolite. Basal sediments pelagic limestones and thin ash layers, overlain by turbidites from uplift and progressive dissection of ophiolite. Arc-derived sediments >8 km thick, shed into E side of basin in late Paleogene- Quaternary convergence along W margin of Luzon. By M Miocene, C Valley became continuous, elongate basin fringed by extensive shelf deposits. Nonmarine deposition began in central portions of basin in Pliocene. Late Miocene- Recent movement along Philippine fault zone caused uplift- folding of adjacent parts of basin. Hydrocarbon potential of C Valley not determined adequately)

Bacud, J., A. Moore & C.S. Lee, C. (1997)- Tectonic structure and petroleum potential of Tayabas Bay southeast Luzon, Philippines. J. Southeast Asian Earth Sciences 15, 2, p. 195-215.

(On AGSO/ PDE marine geological survey in Tayabas Bay. No wells drilled offshore; seismic data tied to onshore Bondoc Peninsula wells and stratigraphy. Geochemistry data confirm presence of mature source rocks)

in M Miocene Vigo Fm and/or Late Oligocene- E Miocene Panaon Lst, and hydrocarbon migration. Major N-NW-trending strike-slip fault. Oligo-Miocene reefal carbonate reservoirs believed to be present)

Bacuta, G.C. (1979)- Geology of some alpine-type chromite deposits in the Philippines. J. Geological Society of the Philippines 23, p. 44-81.

Bacuta, G.C., R.W. Kay, A.K. Gibbs & B.R. Lipin (1990)- Platinum-group element abundance and distribution in chromite deposits of the Acoje Block, Zambales Ophiolite Complex, Philippines. J. Geochemical Exploration 37, p. 113-145.

(Platinum-group elements (PGE) in ore-grade concentration in some chromite deposits related to ultramafic section of Acoje Block of Zambales Ophiolite Complex, Luzon. Deposits are of three types)

Balce, G.R., O.A. Crispin, C.M. Samaniego & C.R. Miranda (1981)- Metallogensis in the Philippines: Explanatory text for the CGMW metallogenic map of the Philippines. In: S Ishihara & A. Sasaki (eds) Metallogeny of Asia, Proc. International Symposium on Metallogeny of Asia, Tsukuba-Tokyo 1980, Geological Survey of Japan, Report 261, p. 125-148.

(online at: <https://www.gsj.jp/data/rep-gsj/No261.pdf>)

(Review of geology and metallogenic belts of the Philippines)

Balce, G.R., R.Y. Encina, A. Momongan & E. Lara (1980)- Geology of the Baguio District and its implications on the tectonic development of the Luzon Central Cordillera. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 265-287.

Balce, G.R., R.Y. Encina, A.L. Momongan & E.D. Lara (1980)- Geology of the Baguio district and its implications on the tectonic development of Luzon Central Cordillera. In: T. Kobayashi et al. (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 265-287.

(Luzon C Cordillera is N-S ridge midway between opposite-dipping subduction zones (Manila trench, N extension of Philippine Trench). Oldest rocks Eocene- E Miocene Pugo Fm volcanoclastics with limestone)

Balce, G.R. & F.B. Esguerra (1972)- "Kuroko-type" ore deposits in Sulat Area, eastern Samar, Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 28, 1, p. 1-30.

Balce, G.R., A.L. Magpantay & A.S. Zanoria (1979)- Tectonic scenarios of the Philippines and northern Indonesian region. Proc. ESCAP CCOP-IOC Working Group Meeting on the Geology and tectonics of Eastern Indonesia, Bandung, Geological Research Development Centre (GRDC), Bandung, p. 9-14.

(First ophiolite zonation of the Philippines, from W to E: (1) Palawan; (2) western Luzon-Panay-Zamboanga-Sulu; (3) Masbate-Leyte- C Mindanao; and (4) Isabela-Bicol-Samar-E Mindanao)

Balce, G.R. & A.S. Zanoria (1982)- Geology and tectonics of the Luzon-Marianas region. Philippine SEATAR Committee Special Publ. 1, p. 1-243

Ballesteros, M. & P. Robinson (2012)- Insights into the petroleum potential of the Western Philippines from new regional seismic data. AAPG Int. Convention Exh., Singapore 2012, Search and Discovery Article 10471, p. 1-6.

(online at: www.searchanddiscovery.com/documents/2012/10471ballesteros/ndx_ballesteros.pdf)

Balmater, H., D. Eslava, K. Queano, C. Dimalanta, N. Ramos, B. Payot & G. Yumul (2015)- Samar ophiolitic complex, central Philippines: fragment of a Mesozoic basin at the junction of eastern Neo-Tethys and Panthalassa. Proc. 4th Int. Symposium International Geosciences Program (IGCP) Project 589, Bangkok 2015, p. 4. *(Abstract only)*

(online at: <http://igcp589.cags.ac.cn/4th%20Symposium/Abstract%20volume.pdf>)

(Samar Ophiolitic Complex, exposed in eastern C Philippines, and part of Jurassic- Cretaceous ophiolitic belt that serves as basement to most E Philippines islands. Paleomagnetic studies on upper crust of ophiolite suggests paleolatitude of $-14^{\circ} \pm 6^{\circ}$. This, and results from E Indonesia evidence that ophiolites preserved along

W and S margins of Philippine Sea Plate are remnants of Mesozoic oceanic basin E of eastern Neo-Tethys and W of Panthalassa. Cretaceous and Cenozoic intra-oceanic arcs associated with this basin part of the Amami-Daito region, E Philippines, E Indonesia and N New Guinea, and were separated by Eocene opening of PSP)

Balmater, H.G., P.C. Manalo, D.V. Faustino-Eslava, K.L. Queano, C.B. Dimalanta, J.M.R. Guotana, N.T. Ramos, B.D. Payot & G.P. Yumul (2015)- Paleomagnetism of the Samar Ophiolite: implications for the Cretaceous sub-equatorial position of the Philippine island arc. *Tectonophysics* 664, p. 214-224.

(Samar Ophiolite complete suite at Samar island in E part of C Philippines. K-Ar ages of ~100 and 98 Ma (~Cenomanian). Paleomagnetic data suggest ophiolite formed at paleolatitude of $14^{\circ}\text{S} \pm 6^{\circ}$, i.e. several degrees S of three other Mesozoic ophiolites of Philippine Mobile Belt. PMB ophiolites in E and C Philippines share common age, geochemistry and paleolatitude with Halmahera Ophiolite, suggesting origin at Mesozoic supra-subduction zone that extended from few degrees N of Equator to $\sim 15^{\circ}\text{S}$)

Bandy, O.L. (1963)- Cenozoic planktonic foraminiferal zonation and basinal development in Philippines. *American Assoc. Petroleum Geol. (AAPG) Bull.* 47, 9, p. 1733-1745.

(also in J. Geological Society of the Philippines 16, 2 (1962))

(Planktonic foraminifera zonation Late Oligocene-Pliocene of Central Valley, Luzon, and S Iloilo, Panay, is similar to that recognized in other tropical areas of world. Late Oligocene-Early Miocene commenced with shelf-type conditions and orbitoidal facies, changing upward into increasingly deeper-water bathyal facies. In Late Miocene Central Valley paralic facies, in Iloilo deep basinal conditions until M Pliocene)

Barretto, J.A.L., C.B. Dimalanta & G.P. Yumul (2000)- Gravity variations along the Southeast Bohol Ophiolite Complex (SEBOC), Central Philippines: implications on ophiolite emplacement. *Island Arc* 9, 4, p. 575-583.

(Basement complex of Bohol Island consists of SE Bohol Ophiolite Complex, Cansiwang Melange and Alicia Schist. SEBOC is complete, but dismembered ophiolite with outcrops generally trending NE-SW and dipping NW. SEBOC thrusts onto Cansiwang Melange, which is thrusts onto Alicia Schist. Orientation of Bouguer highs suggests thrusting direction of ophiolite units was to SW, not to SE)

Barrientos, M.A., J.A. Gabo-Ratio, T. Yamada, K. Jabagat, A.M Francisco & K. Yonezu (2024)- Co, Sc, and Ni enrichment in the Cagdianao nickel laterite deposit, Dinagat Islands, Philippines. *Proc. Int. Conference Geological Engineering and Geosciences, Yogyakarta 2023, IOP Conference Series: Earth and Environmental Science* 1373, p. 012041, p. 1-11.

(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1373/1/012041/pdf>)

(Cagdianao nickel laterite deposit derived from weathering of harzburgite-dominated ultramafics of Late Cretaceous (84 Ma) Dinagat Ophiolite Complex in Dinagat Island, Surigao Del Norte, Philippines. Main commodity is Ni, while Co, Sc, and REEs are by-products. Ni more enriched in Mg-rich saprolite zone; Co and Sc more enriched in Fe-rich limonite horizon)

Barrier, E., M. Aurelio, C. Muller, M. Pubellier, R. Quebral & C. Rangin (1990)- La faille philippine; un exemple de grand décrochement actif a l'arriere d'une zone de subduction. *Comptes Rendus Academie Sciences, Paris*, 311 (II), p. 181-188.

('The Philippine Fault: an example of large active displacement behind a subduction zone')

Barrier, E., P. Huchon & M. Aurelio (1991)- The Philippine fault: a key for Philippines kinematics. *Geology (GSA)* 19, p. 32-35.

(Motion between Philippine Sea plate and Eurasia is distributed on two boundaries: Philippine Trench and Philippine fault. Geologic data from Visayas provide age of 2 to 4 Ma for fault, in good agreement with beginning of subduction in Philippine Trench. Origin of Philippine fault is flip of subduction from W to E after locking of convergence to W by collision of Philippine mobile belt with Eurasian margin)

Bassoulet, J.P. (1983)- Jurassic microfossils from The Philippines. *CCOP, Technical Bulletin* 16, p. 31-38.

(online at: <https://repository.unescap.org/items/72341977-4dbb-441d-962f-088707385870>)

(Late Jurassic foraminifera and algae from samples collected by Fontaine from Ili Island and Cayatong. Ili Lst with typical Tethyan Late Jurassic forams Pseudocyclammina lituus and Nautiloculina oolithica and dasyclad algae Salpingoporella pygmaea (also known from Bau Limestone of W Sarawak and from Sumatra))

Bau, M. & U. Knittel (1993)- Significance of slab-derived partial melts and aqueous fluids for the genesis of tholeiitic and calc-alkaline island-arc basalts: Evidence from Mt. Arayat, Philippines. *Chemical Geology* 105, p. 233-251.

(online at: https://www.academia.edu/30814568/Significance_of_slab_derived_partial_melts_and_aqueous_fluids_for_the_genesis_of_tholeiitic_and_calc_alkaline_island_arc_basalts_Evidence_from_Mt_Arayat_Etc.)
(Inactive Mount Arayat stratovolcano located behind volcanic front of Bataan segment of Taiwan-Luzon Arc in Central Valley of Luzon. Volcanism in this arc-segment results from subduction of S China Sea Basin crust along Manila Trench. Quaternary eruption products pyroclastics and porphyritic basalt and andesite lavas of high-K calc-alkaline affinity)

Bautista, B.C., M.L. Bautista, K. Oike, F.T. Wu & R.S. Punongbayan (2001)- A new insight on the geometry of subducting slabs in northern Luzon, Philippines. *Tectonophysics* 339, p. 279-310.

(Earthquake focal mechanisms used to model geometry of Eurasian plate subducted slab beneath N Manila Trench. Model suggests collision and partial subduction of buoyant plateau at around 20°N to explain sharp bend in trench line and shallow dip of subducted slab. Tear in slab evidenced by gap in strain energy release and change in dip. Gap in seismicity may be subducted extinct, but still hot mid-oceanic ridge. High heatflow along extinct MOR. Subducted part of MOR may serve as weakest zone where tear could be localized)

Beauvais, L. (1983)- Jurassic Cnidaria from the Philippines and Sumatra. CCOP, Technical Bulletin 16, p. 39-76.

(online at: <https://repository.unescap.org/items/72341977-4dbb-441d-962f-088707385870>)

(Brief descriptions of U Jurassic corals and stromatoporoids from W Sumatra and M and U Jurassic corals from reefal limestones in Philippines. Upper Jurassic Ili Lst from Calamian Islands with Oxfordian-Kimmeridgian stromatoporoids (Cladocoropsis mirabilis, C. memoria-naumanni), sponges (Ptychochaetetes ponticus) and corals (Stylina limbata, Pseudocoenia brevissepta, etc. Also M Jurassic (Bathonan?) corals from Bongabong River area, Mindoro)

Becker, G.F. (1901)- Report on the geology of the Philippine Islands. U.S. Geological Survey (USGS), 21st Annual Report 1899-1900, III, Washington, p. 1-128.

(online at: <https://pubs.usgs.gov/unnumbered/70159131/report.pdf>)

(First? comprehensive review of early knowledge of Philippines geology and mineral resources (coal, gold, copper, lead, iron). Petroleum has been discovered, but not exploited. With appendix on Tertiary fossils (mainly molluscs) by K. Martin)

Bellon, H. & G.P. Yumul (2000)- Mio-Pliocene magmatism in the Baguio Mining District (Luzon, Philippines): age clues to its geodynamic setting. *Comptes Rendus Academie Sciences, Paris, IIA*, 331, 4, p. 295-302.

(Baguio Mining District in C Cordillera of Luzon evolved from Eocene marginal basin to Eo-Oligocene island arc setting above W-dipping subduction zone. E-ward subduction after polarity reversal in E Miocene (~17-19 Ma). Late Miocene- Quaternary magmatism and tectonics led to gold and copper mineralization, mainly at 4-2 Ma. Pugo Metavolcanics Fm unconformably overlain by Zigzag Fm with minor E Oligocene limestone units with Eulepidina and Nummulites)

Bellon, H. & G.P. Yumul (2001)- Miocene to Quaternary adakites and related rocks in Western Philippine arc sequences. *Comptes Rendus Academie Sciences, Paris, Ila*, 333, 6, p. 343-350.

(online at: www.academia.edu/24640576/Miocene_to_Quaternary_adakites_and_related_rocks_in_West_Etc.)
(Numerous Miocene- Quaternary adakites among calc-alkaline magmatism of W Philippines. Associated with three geodynamic settings: subduction, rifting and collision (Palawan indentation). Slab, lower crust and sediment melting, coupled with assimilation-fractional crystallization, and mantle metasomatism by magmatic liquids responsible for generation of these rocks. Adakite-gold-copper relationship makes these areas good metallogenic exploration targets)

Berger, B.R., R.W. Henley, H.A. Lowers & M.J. Pribil (2014)- The Lepanto Cu-Au deposit, Philippines; a fossil hyperacidic volcanic lake complex. *J. Volcanology Geothermal Research* 271, p. 70-82.
(*The ~2 Ma high-sulfidation Lepanto copper-gold deposit in Mankayan district was associated with hyperacidic volcanic lake complex*)

Besana, G.M. & M. Ando (2005)- The Central Philippine Fault Zone: location of great earthquakes, slow events, and creep activity. *Earth Planets and Space* 57, p. 987-994.
(online at: www.terrapub.co.jp/journals/EPS/pdf/2005/5710/57100987.pdf)

Beyer, H.O. (1940)- Philippine tektites and the tektite problem in general. *Contr. Society Research on Meteorites* 2, 6, p. 157-163.
(online at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1945-5100.1940.tb00306.x/pdf>)
(*Philippines hosts world's largest known deposits of tektites. Part of Indo-Malaysianite great shower in mid-Pleistocene time. Largest known tektites in SE Luzon (Bikol Peninsula) up to 1070g and >4 inches in diameter, but average weight for region only 15-20 g*)

Billedo, E. (1994)- *Geologie de la Sierra Madre septentrionale et de l'archipel de Polillo (ceinture mobile Est Philippine): implications geodynamiques*. Doct. Thesis Universite de Nice- Sophia Antipolis, p. 1-215.
(Unpublished)
(*'Geology of the Northern Sierra Madre and the Polillo group of Islands (Eastern Philippine mobile belt): geodynamic implications'. Study of two regions in E Philippine Mobile Belt: (1) N Sierra Madre and (2) Polillo Archipelago in S. Five tectonic events distinguished in Late Cretaceous- Miocene. E Philippine composed of 3 zones: (1) Mesozoic ophiolitic basement (Casiguran Ophiolite, with 92 Ma radiometric age for amphibolite), (2) U Cretaceous pelagic limestones in pillow basalts with Globotruncana stuarti, etc. (also Aptian- Albian radiolarian cherts; see Queano, Ali et al. 2013), and (3) Eocene and Oligocene arc volcanics. Cenozoic history dominated by subduction with highly oblique convergence*)

Billedo, E., J.F. Stephan, J. Delteil, H. Bellon, F. Sajona & G. Feraud (1996)- The Pre-Tertiary ophiolitic complex of Northeastern Luzon and the Polillo Group of islands, Philippines. *J. Geological Society of the Philippines* 51, p. 95-114.
(*N Sierra Madre area of NE Luzon with outcrops of basement complex, composed of three rock assemblages: (1) Jurassic?- E Cretaceous ophiolitic units (metamorphic Dibut Bay meta-ophiolite and non-metamorphic Casiguran ophiolitic belt); (2) Late Cretaceous metamorphosed volcanic arc (Lubingan Fm and Dalugan Metamorphics; (3) Late Cretaceous volcanic complex (Dibuakag VC). In Polillo Islands oldest rock units ultramafics and related metamorphics, correlatable with Dibut Bay Meta-ophiolite in NE Luzon and Lagonoy meta-ophiolite found in Caramoan Peninsula dated as Late Jurassic- E Cretaceous and are metamorphic equivalent of Casiguran Ophiolitic Belt. Ophiolitic units in fault contact with Eocene magmatic arc and both unconformably overlain by Late Oligocene- M Miocene clastics*)

Bina, C.R., H. Čizkova & P.F. Chen (2020)- Evolution of subduction dip angles and seismic stress patterns during arc-continent collision: Modeling Mindoro Island. *Earth Planetary Science Letters* 533, 116054, p.
(*Dynamic model of temporal development of arc-continent collision, with attention to evolution of slab dip angles and stress fields, based on Mindoro Island and S Manila Trench (incoming Palawan continental fragment and overriding Philippine Mobile Belt)*)

Bird, P.R., N.A. Quinton, M.N. Beeston & C.S. Bristow (1992)- Mindoro Island, a rifted microcontinent in collision with the Philippines volcanic arc: basin evolution and hydrocarbon potential. AAPG International Conference, Sydney 1992, Search and Discovery Article 91015 (Abstract only)
(*Mindoro Island is E-most part of Palawan-Mindoro microcontinent that rifted from S China margin in Early Oligocene. Sea floor spreading carried Mindoro S until Late Miocene collision with Philippines Arc began. Structural history 4 phases: (1) syn-rift, E Eocene- M Oligocene; (2) drift, Late Oligocene- M Miocene; (3) collision, M-L Miocene; (4) transpression, latest Miocene- Present*)

Bird, P.R., N.A. Quinton, M.N. Beeston & C.S. Bristow (1993)- Mindoro: a rifted micro continent in collision with the Philippines volcanic arc; basin evolution and hydrocarbon potential. In: B.K. Tan et al. (eds.) Proc. 7th Conf. Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 449-468.

(Mindoro Island is easternmost part of Palawan-Mindoro microcontinent that rifted from S China margin in latest Eocene-E Oligocene. Sea floor spreading carried Mindoro S-ward until Late Miocene, when collision with Philippines Arc in E, and other terranes to S began. Syn- and post-rift sedimentary sequences contain prospective source and reservoir intervals. Several oil seeps on Mindoro Island)

Biswas, B. (1986)- Frontier seismic geologic techniques and the exploration of the Miocene reefs in offshore Palawan, Philippines. J. Southeast Asian Earth Sciences 1, 4, p. 191-204.

(Mapping of porosity distribution and oil-water contact in and around the Tara and Libro Lower Miocene patch reefs of offshore Palawan. Maximum hydrocarbon fill in frontal line of traps near shelf-slope break, in lowest structural position and progressive dwindling of fill in structurally higher updip positions)

Bloomer, S.H. & R.L. Fisher (1988)- Arc volcanic rocks characterize the landward slope of the Philippine Trench off northeastern Mindanao. J. of Geophysical Research 93, B10, p. 11961-11973.

(Dredge hauls from landward flanks (9300-3600m) of Philippine Trench NE of Mindanao with plagioclase-clinopyroxene pyritic basalt, basaltic andesite, and andesite, with small amounts of diabase, identical to arc volcanic rocks from SE and NE Mindanao (Samar-E Mindanao arc, which collided with C Mindanao-Sangihe island arc in late Oligocene/ E Miocene and part of E margin of Samar-E Mindanao arc. After collision Philippine Trench initiated adjacent to arc massif; no evidence of accretion of subducted Philippine Sea crust)

Bomasang, R., F.K. Bandelon & D.M. Casupang (1987)- Der Kohlebergbau auf den Philippinen. Glueckauf 123, 14, p. 881-886.

('Coal mining in The Philippines')

Bosum, W., J.C. Fernandez, E.G. Kind & C.F. Theodoro (1972)- Aeromagnetic survey of the Palawan- Sulu offshore area of the Philippines. United Nations ECAFE, CCOP, Technical Bulletin 6, p. 141-160.

(online at: <https://repository.unescap.org/handle/20.500.12870/5064>)

Branson, D.M., P.J. Newman, M. Scherer, P.J. Stalder & R.G. Villafuerte (1997)- Hydrocarbon habitat of the NW Palawan Basin, Philippines. In: J.V.C. Howes & R.A. Noble (eds.) Proc. Petroleum Systems of SE Asia and Australasia Conf., Indonesian Petroleum Association (IPA), Jakarta 1997, p. 815-828.

(NW Palawan Basin offshore exploration started in 1970's with drilling of Oligo-Miocene Nido Limestone build-ups in shallow water Nido Shelf part of basin, resulting in few small oil discoveries (Nido, Matinloc). Wells in deeper water W of Nido Shelf discovered mostly gas. With exception of Malampaya/Camago (3.4 Tcf gas) exploration results away from Nido Shelf have been disappointing, with few economic discoveries. Typing of oils in NW Palawan Basin identified three separate families, mainly from marine carbonate or marl source rock, probably of Eocene-Lower Miocene age, deposited in restricted rift half grabens and/or isolated restricted intrashelf basins in post-rift carbonate sequence)

Braxton, D.P. (2007)- Boyongan and Bayugo porphyry copper-gold deposits, NE Mindanao, Philippines: geology, geochemistry, and tectonic evolution. Ph.D. Thesis University of Tasmania, p. 1-277.

(online at: <https://eprints.utas.edu.au/18070/1/Whole-Braxton-thesis.pdf>)

(Recently discovered Boyongan and Bayugo porphyry copper-gold deposits part of emerging belt of M Pliocene intrusion-centered gold-rich deposits. Formed in association with composite diorite complex; U-Pb zircon ages from ~2.3- 2.1 Ma)

Braxton, D.P., D.R. Cooke, J. Dunlap, M. Norman, P. Reiners, H. Stein & P. Waters (2012)- From crucible to graben in 2.3 Ma: a high-resolution geochronological study of porphyry life cycles, Boyongan-Bayugo copper-gold deposits, Philippines. Geology (GSA) 40, 5, p. 471-474.

(online at: https://instruct.uwo.ca/earth-sci/fieldlog/Min_Deposits/471.full.pdf)

(Boyongan and Bayugo porphyry copper-gold deposits of NE Mindanao geologically short life cycles: Late Pliocene emplacement (2.3-2.1 Ma) at 1.2-2.0 km depth, then exhumed, deeply weathered (600m thick) and buried. E-M Pleistocene supergene event followed period of rapid uplift and exhumation in NE Mindanao (2.5 km/Ma). Subsequent rapid subsidence (≥ 0.34 km/Ma) attributed to M Pleistocene shift from transpressional to present-day transtensional setting in NE Mindanao)

Braxton, D.P., D.R. Cooke, A.M. Ignacio, R.O. Rye & J. Waters (2009)- Ultra-deep oxidation and exotic copper formation at the Late Pliocene Boyongan and Bayugo porphyry copper-gold deposits, Surigao, Philippines: geology, mineralogy, paleoaltimetry, and their implications for geologic, physiographic, and tectonic controls. *Economic Geology* 104, 3, p. 333-349.

(Late Pliocene-age Boyongan and Bayugo porphyry copper-gold deposits intrusion-centered gold-rich deposits in NE Mindanao. Exhumation and weathering led to porphyry oxidation profile of 600m at Boyongan and 30-70m at adjacent Bayugo. Etc.)

Braxton; D.P, D.R. Cooke; A.M. Ignacio & P.J. Waters (2018)- Geology of the Boyongan and Bayugo porphyry Cu-Au deposits: an emerging porphyry district in Northeast Mindanao, Philippines. *Economic Geology* 113, 1, p. 83-131.

(Boyongan and Bayugo porphyry Cu-Au mineral deposits part of emerging belt of intrusion-centered Au-rich Cu mineral deposits in Surigao district of NE Mindanao, Philippines. Mineral deposits formed in E Pleistocene (2.3-2.1 Ma), in association with diorite complex containing at least 12 discrete intrusive stages. Repeated cycles transpired rapidly, between 2.3-2.1 Ma. Exhumation and weathering led to development of 600m thick oxidation profile at Boyongan and 30–70m oxidation profile at Bayugo. Mineral deposits formed in association with composite diorite complex containing at least 12 discrete intrusive stages)

Bristow, C.S. & P.R. Bird (1994)- Sedimentology of the Semirara Formation in Semirara Island: implications for the Miocene sedimentation and tectonics of South Philippines. In: G.H. Teh (ed.) *Proc. Symposium Tectonic framework and energy resources of the western margin of the Pacific Basin*, Kuala Lumpur 1992, Bull. Geological Society Malaysia 33, p. 21-32.

(online at: www.gsm.org.my/products/702001-101024-PDF.pdf)

(400m of Miocene sediments on Semirara Island S of Mindoro (W side of Philippines arc) exposed in coal mine at Unong, deposited in small rift basin, subsequently inverted)

Brown, G.F. (1950)- Summary of the geology of the Malangas Sibuguey coalfield, Zambeanga Province, Mindanao. *Philippine J. Science* 79, 2, p. 155-163.

Brownlee, D.N. & M.W. Longman (1981)- Depositional history of a Lower Miocene pinnacle reef, Nido B oilfield, The Philippines. In: E.D. Gomez et al. (eds.) *Proc. 4th International Coral Reef Symposium*, Manila, 1, p. 619-625.

(First commercial oil production in Philippines is from two Lower Miocene pinnacle reef complexes (Nido A and Nido B fields) in S China Sea ~50 km NW of Palawan. Reefs depth ~2073m, relief ~150-200m, and encased in Lower Miocene shales. Nido B-1 well near center of build-up with packstones- grainstones of benthic foraminifera and fragments of red algae and corals (back-reef sand flat). Nido B-2 cores with abundant corals, encrusting red algae (part of reef framework). Cores from Nido B-3A on edge of buildup shaly micrites rich in planktonic foraminifera, with lithoclast-intraclast packstones (proximal reef talus). Most porosity in back-reef sands is vuggy, moldic; in reef framework and proximal talus mainly in fractures)

Bryner, L. (1968)- Notes on the geology of the porphyry copper deposits of the Philippines. *Mineral Engineering Magazine* 19, 3, p. 12-23.

Bryner, L. (1969)- Ore deposits of the Philippines- an introduction to their geology. *Economic Geology* 64, 6, p. 644-666.

(Ore deposits in Philippines genetically related to Mesozoic- Tertiary magmatism and tectonism in Mobile Belt. Deposits considered here (a) chromite (two largest deposits Masinloc and Acoje in belts of peridotitic rock of Zambales ultramafic complex of W Luzon); (b) massive pyritic (Bagacay, Barlo, Hixbar; associated with

Tertiary volcanic activity); (c) pyrometasomatic (Larap, Thanksgiving); (d) porphyry copper (8 or more deposits, associated with porphyritic dacite and andesite facies of diorite complexes near orogenic axis of archipelago; main copper mineral chalcopyrite), and (e) gold-bearing veins (enargite-luzonite-telluride deposit at Lepanto, quartz-telluride-gold of Baguio district, etc., related to centers of explosive volcanic activity)

Buchsel, P., M. Kerntke, F. Wolcke & G. Hillmer M. (1991)- Geologic development of Cebu Island/ Central Philippines- Group report. Mitteilungen Geologisch-Palaontologisch Institut, Universitat Hamburg 71, p. 53-60. *(Block diagrams illustrating (Jurassic-) E Cretaceous to Miocene evolution of Cebu Island, C Philippines. Aptian-Albian island arc with associated carbonate platforms with caprinid rudists, etc.)*

Buena, A.E., B.R.B. Villaplaza, B.D. Payot, J.A.S. Gabo-Ratio, N.T. Ramos, D.V. Faustino-Eslava et al. (2019)- An evolving subduction-related magmatic system in the Masara Gold District, Eastern Mindanao, Philippines. J. Asian Earth Sciences: X, 1, 100007, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056019300039>)

(Masara Gold District in E Mindanao mineralization hosted in Eocene- Plio-Pleistocene andesitic rocks and diorites. Eocene magmatic suite tholeiitic, Miocene diorite and subvolcanic andesite pulses calc-alkaline Adakitic rocks emplaced in Late Miocene and Plio-Pleistocene. Mineralization in several Oligocene-Pliocene events. Epithermal gold mineralization in Masara closely related to Late Miocene magmatic rocks)

Bureau of Energy Development/ Robertson Research (1986)- Sedimentary basins of the Philippines: their geology and hydrocarbon potential. Manila. Multi-client study, 12 vols. *(Unpublished)*

Bureau of Energy Development/ Robertson Research (1986)- Sedimentary basins of the Philippines, their geology and hydrocarbon potential, 2: Luzon Basins. Multi-client study, BED, Taguig City, p. 1-436. *(Unpublished)*

Bureau of Energy Development/ Robertson Research (1986)- Sedimentary basins of the Philippines, their geology and hydrocarbon potential, 3: Basins of Visayas and Mindanao. Multi-client study, BED, Taguig City, p. 1-305. *(Unpublished)*

Bureau of Mines and Geosciences (1972)- Geology and stratigraphy of some sedimentary basins in the Philippines. Proc. 4th Symposium on the Development and Petroleum Research in Asian and Far East Mineral and Resources Development Series, 41, Manila, p. 445-451.

Bureau of Mines and Geo-Sciences (1981)- Geology and mineral resources of the Philippines, 1, Geology, Bureau of Mines and Geo-Sciences, Manila, p. 1-406.

(First textbook of Philippines geology since Corby (1951), by staff of Bureau of Mines and Geo-Sciences. See also Second edition by Mines and Geosciences Bureau (2010))

Bureau of Mines Philippines (1986)- Geology and mineral resources of the Philippines, 2, Mineral resources. Bureau of Mines and Geo-sciences, Manila, p.

Caagusan, N.L. (1966)- Petrography of the metamorphic rocks of Northern Mindoro. Bull. Inst. Philippine Geology 1, p. 22-46.

Caagusan, N.L. (1978)- Source material, compaction history and hydrocarbon occurrence in the Cagayan Valley Basin, Luzon, Philippines. Proc. Offshore South East Asia Conference 1978, Singapore, SE Asia Petroleum Exploration Society (SEAPEX), p. 1-20.

(Cagayan Basin is 250 x 80km post-Oligocene trough in NE Luzon. Rapid deposition of turbiditic marine sediments. Organic matter mainly high-humic, land-derived material)

Caagusan, N.L. (1980)- Stratigraphy and evolution of the Cagayan Valley Basin, Luzon, Philippines. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 163-182.

(Cagayan Valley basin is post-Oligocene sedimentary Trough in NE Luzon. M Miocene limestone buildups main hydrocarbon exploration targets)

Caagusan, N.L. (1990)- Eocene Oligocene sandstone in buried hill play, Mindoro Basin, The Philippines. In: CCOP/WRGA Play modelling exercise 1989-1990, United Nations ESCAP, CCOP, Technical Publication 23, p. 87-96.

(Description and hydrocarbon assessment of conceptual play in U Eocene- Lower Oligocene sandstones draped over Eocene tilted fault blocks on S and E Mindoro island, W Philippines)

Callow, K.J. (1967)- The geology of the Thanksgiving mine, Baguio district, Mountain Province, Philippines. Economic Geology 62, p. 472-481.

(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.922.822&rep=rep1&type=pdf>)

(Thanksgiving mine in Baguio District, N Luzon, small sulfide orebodies mined since 1957 for gold, silver, zinc, copper, lead, sulfur and cadmium content. Ore as veins and pods along contacts between diorite porphyry dikes and E-M Miocene Mirador limestone)

Canto, A.P.B., J.T. Padrones, R.A.B. Concepcion, A.D.C. Perez, R.A. Tamayo., C.B. Dimalanta, D.V. Faustino-Eslava, K.L. Queano & G.P. Yumul (2012)- Geology of northwestern Mindoro and its offshore islands: Implications for terrane accretion in west Central Philippines. J. Asian Earth Sciences 61, p. 78-87.

(NW Mindoro Island two terranes: Amnay Ophiolite and Halcon Metamorphic terrane, separated by SW-verging thrust faults. Components of older Mangyan Ophiolitic Complex occur as disrupted bodies in Halcon Metamorphics schists. Late Eocene Lasala Fm has continent-derived character. Accretion of Cretaceous Mangyan Ophiolitic Complex marks collision between Cretaceous oceanic lithosphere and mainland Asia, considered to be protolith of Halcon Metamorphics. Subsequent collision led to amalgamation of Amnay Ophiolite suite to metamorphosed terrane)

Cao, L., L. Shao, P. Qiao, Y. Cui, G. Zhang & X. Zhang (2020)- Formation and paleogeographic evolution of the Palawan continental terrane along the Southeast Asian margin revealed by detrital fingerprints. Geological Society of America (GSA) Bull. 133, 5-6, p. 1167-1193.

(Detrital fingerprints of Mesozoic- Cenozoic strata from Palawan Island and basins of N South China Sea. Provenance shifts suggest Palawan continental terrane evolved from accretionary complex in Jurassic to rifted margin in E Cenozoic and to microcontinent in mid-Cenozoic. Terrane interpreted to be at NE South China Sea margin from Mesozoic until Oligocene spreading of South China Sea)

Cao, M.J., N. Evans, P. Hollings, D.R. Cooke, B.I.A. McInnes, K.Z. Qin & G.M. Li (2018)- Phenocryst zonation in porphyry-related rocks of the Baguio District, Philippines: evidence for magmatic and metallogenic processes. Journal of Petrology 59, 5, p. 825-848.

(online at: <https://academic.oup.com/petrology/article/59/5/825/4996227>)

(Baguio district of N Luzon world-class mineral province with many porphyry Cu and epithermal Au deposits spatially related to Pliocene pre-ore Liw-Liw Creek basaltic dikes (3.6- 4.7 Ma) and syn-ore plagioclase-hornblende diorite porphyry (2.8- 3.0 Ma). Studies of phenocrysts have potential to elucidate role of magmatic process in formation of porphyry systems)

Cao, M.J., P. Hollings, D.R. Cooke, N.J. Evans, B.I.A. McInnes, K.Z. Qin, G.M. Li, G. Sweet & M. Baker (2018)- Physicochemical processes in the magma chamber under the Black Mountain porphyry Cu-Au deposit, Philippines: insights from mineral chemistry and implications for mineralization. Economic Geology 113, 1, p. 63-82.

(Black Mountain porphyry Cu-Au deposit in Baguio district, N Luzon, associated with Late Miocene- Pliocene intrusive rocks. Amphibole in felsic rocks aged ~6.4- 2.8 Ma suggest long-lived and hot felsic magma chamber. Large-scale mafic magma recharge (particularly at ~2.8 Ma), likely introduced ore-forming metals to felsic magma chamber, contributing to Cu-Au mineralization)

Cardwell, R.K., B.L. Isacks & D.E. Karig (1980)- The spatial distribution of earthquakes, focal mechanism solutions and subducted lithosphere in the Philippine and Northeastern Indonesian islands. In: D.E. Hayes (ed.)

The tectonic and geologic evolution of Southeast Asian Seas and Islands- I. American Geophysical Union (AGU), Geophysical Monograph 23, p. 1-35.

(Incl. data on geometry of 'double-dipping' Moluccas Sea subduction)

Carozzi, A.V. (1995)- Depositional models and reservoir properties of Miocene reefs, Visayan Islands, Philippines. *J. Petroleum Geology* 18, 1, p. 29-48.

(Update of earlier depositional-diagenetic models for Miocene reefs in Visayan Islands. Reefs began to develop in E Miocene (Eulepidina, Nephrolepidina, Spiroclypeus, Austrotrillina). Reefs reached final and maximum development in M or M-L Miocene (Miogypsina indonesiensis, Lepidocyclina ferrerioi, Katacycloclypeus). Not much specific on localities, thickness, fauna, etc.)

Carozzi, A.V., M.V. Reyes & V.P. Ocampo (1976)- Microfacies and microfossils of the Miocene reef carbonates of the Philippines. *Philippines Oil Dev. Co., Manila, Special Publ. 1*, p. 1-80.

Casulla, M.A.A., H. Mizunaga, T. Tanaka & C.B. Dimalanta (2022)- Imaging crustal features and Moho depths through enhancements and inversion of gravity data from the Philippine island arc system. *Progress in Earth and Planetary Science* 9, 16, p. 1-20.

(online at: <https://progearthplanetsci.springeropen.com/track/pdf/10.1186/s40645-022-00473-8.pdf>)

(Inversion of gravity data shows negative isostatic anomalies at thick sedimentary basins, moderate signatures (0-80 mGal) at metamorphic belts, very high-gravity anomalies (>80 mGal) at ophiolitic basement rocks. C Philippines with continental affinity was distinguished from regions with oceanic affinity)

Cena, S.V., S.G. Lastimosa & N.D. Miro (1967)- Investigation of the composition of two Philippine petroleum. *The Philippine Geologist (J. Geological Society of the Philippines)* 22, 3, p.

(No commercial production of petroleum in onshore Philippines, but seeps are widely distributed throughout islands. Report of chemical composition of two samples of oil, from Quezon Province and Mindoro Oriental)

Chang, Z., J. Hedenquist, N.C. White, D. Cooke, M. Roach et al. (2011)- Exploration tools for linked porphyry and epithermal deposits: example from the Mankayan intrusion-centered Cu-Au District, Luzon, Philippines. *Economic Geology* 106, p. 1365-1398.

(Mankayan mineral district of N Luzon several significant ore deposits within area of ~25 km², including Far Southeast porphyry Cu-Au deposit, Lepanto high sulfidation epithermal Cu-Au deposit, Victoria intermediate sulfidation epithermal Au-Ag vein deposit, Teresa epithermal Au-Ag vein deposit, Guinaoang porphyry Cu-Au deposit, and Buaki and Palidan porphyry Cu-Au prospects, all formed between ~2Ma- 3 Ma)

Chen, P.F., E.A. Olavere, C.W. Wang, B.C. Bautista, R.U. Solidum & W.T. Liang (2015)- Seismotectonics of Mindoro, Philippines. *Tectonophysics* 640-641, p. 70-79.

(Mindoro Island is where Palawan Continental Block indented into Philippine Mobile Belt in E Miocene and where Manila Trench terminates after collision ceased. Seismotectonics suggest slab dips steepen, following decrease in convergence rates from Manila Trench offshore NW Mindoro to onshore SW Mindoro, initiating at ~200 km and propagating upwards. Down-dip extensional stress patterns suggest steepening of slab angles due to negative buoyancy of slab. C and S Mindoro Romblon group and NW Panay mainly characterized by sporadic strike-slip shallow earthquakes)

Chen, W.H., Y. Yan, A. Carter, C.Y. Huang, C.Y., G.P. Yumul, C.B. Dimalanta, J.A.S. Gabo-Ratio et al. (2021)- Stratigraphy and provenance of the Paleogene syn-rift sediments in Central-Southern Palawan: paleogeographic significance for the South China Margin. *Tectonics* 40, 9, e2021TC006753, p. 1-27.

(online at: https://www.researchgate.net/publication/353962046_Stratigraphy_and_Provenance_of_the_Paleogene_Syn-Rift_Sediments_in_Central-Southern_Palawan_Paleogeographic_Significance_for_the_South_China_Etc.)

(Palawan microcontinent separated from S China margin during opening of S China Sea. Biostratigraphy and provenance of syn-rift sedimentary rocks of Panas-Pandian Fm in C-S Palawan. Micropaleontological evidence indicates M Eocene-earliest Oligocene (48-33 Ma) age. Oldest age of post-rift Nido Lst (~32 Ma). Breakup unconformity on Palawan 33-32 Ma. Trace fossils and foraminifera from Panas-Pandian Fm indicate

middle bathyal- abyssal environment on continental slope of S China margin. Zircon ages suggest provenance of Panas-Pandian Fm from local Mesozoic basement and interior Cathaysia Block)

Chen, W.H., Y. Yan, A. Carter, P.D. Clift, C.Y. Huang, G.P. Yumul, C.B. Dimalanta, J. Aira et al. (2024)- Evolution of arc-continent collision in the southeastern margin of the South China Sea: insight from the Isugod Basin in Central-Southern Palawan. *Tectonics* 43, 6, e2023TC008078, p. 1-31.

(manuscript online at: https://eprints.bbk.ac.uk/id/eprint/53622/1/972552_2_merged_1713792098.pdf)

(Syn-collisional sediments in Isugod Basin in C-S Palawan arc-continent collision zone between Palawan microcontinental block and Cagayan Ridge, near SE margin of the S China Sea. Syn-collisional sediments Late Miocene in age (11.5–5.6 Ma), indicating rapid subsidence during initiation of basin. Sediments derived from M Eocene- E Oligocene Panas-Pandian Fm on Palawan wedge and Late Eocene C Palawan Ophiolite. Results suggest emergence of orogenic wedge and obducted forearc Palawan ophiolite by ~11.5 Ma, but collision initiation also constrained to ~18 Ma, based on drowning of Nido carbonate platform in foreland). Etc.)

Cheng, Y. (1989)- Upper Paleozoic and Lower Mesozoic radiolarian assemblages from the Busuanga Islands, North Palawan Block, Philippines. *Bull. National Museum Natural Science, Taiwan, Special Publ. 1*, p. 129-175.

(online at: <https://libknowledge.nmns.edu.tw/nmns/upload/bulletin/000000007/209000c/198909-129.pdf>)

Ribbon chert successions on Busuanga and Uson Islands (Calamian islands, part of N Palawan block, formerly part of E Asian margin) with abundant radiolaria. Six assemblages, three Permian in age and three of Triassic age: Albaillella cf. levis-Latentifustula cf. similicutis, Follicucullus cf. scholasticus-Triplanospongos cf. musashiensis, Neoalbaillella cf. optima, Pesudoheliodiscus sp. F and Betraccium deweveri Assemblage. Twenty-nine U Paleozoic albaillellids and stauraxon polycystins species, 64 Triassic (Ladinian-Norian) species)

Cheng, Y. (1992)- Upper Jurassic Pantanelliidae (Pantanelliinae Pessagno, 1977 and Vallupinae Pessagno and MacLeod, 1987) from the Busuanga Islands, Philippines. *Bull. National Museum Natural Science, Taiwan, 3*, p. 1-49.

(online at: <http://web2.nmns.edu.tw/PubLib/Library/research/199205-1.pdf>)

(Diverse radiolarian faunas from bedded chert of Liminangcong Chert of Busuanga Island, N Palawan Block. Including low-latitude Vallupus group uppermost Liminangcong Chert. Six new species of Mesovallupus, nine of Protovallupus, and one of Vallupus, tentatively assigned to upper Tithonian)

Christian, L.B. (1964)- Post-Oligocene tectonic history of the Cagayan Basin, Philippines. *The Philippine Geologist (J. Geological Society of the Philippines)* 18, 4, p. 114-147.

(Folds of Cagayan Valley, N Luzon, interpreted as gravity structures which slid off M Pleistocene Central Cordillera. Beneath and around edges of N-striking M Miocene-Recent Cagayan Basin are remnants of NE-trending E Miocene basin, parallel to Palawan-Visayan-Sulu system which still prevails W of Philippine Rift. Similar relict NE trends in pre-M Miocene rocks of C Luzon and S Mindoro, suggesting NE grain more general in Philippines prior to M Miocene)

Claveria, R.J. (2008)- Mineral paragenesis of the Lepanto copper and gold and the Victoria gold deposits, Mankayan Mineral District, Philippines. *Resource Geology* 51, 2, p. 97-106.

(Principal ore minerals of Plio-Pleistocene Lepanto epithermal copper-gold mineralization in N Luzon include enargite and luzonite, with tennantite-tetrahedrite, chalcopyrite, sphalerite, galena, etc. Principal ore minerals of Victoria gold deposit sphalerite, galena, chalcopyrite, tetrahedrite and native gold/electrum. Etc.)

Claveria, R.J. & H.H. Fischer (1991)- Characterization of the chromite pods and lenses associated with the Ulugan Bay peridotite, Palawan. *J. Geological Society of the Philippines* 46, 3-4, p. 21-34.

(Chromitite pods and lenses in Ulugan Bay area occur as concordant and discordant bodies with respect to metamorphic banding in peridotite)

Concepcion, R., C. Dimalanta, G. Yumul, D. Faustino-Eslava, K. Queano, R. Tamayo & A. Imai. (2012)- Petrography, geochemistry, and tectonics of a rifted fragment of mainland Asia: evidence from the Lasala Formation, Mindoro Island. *Philippines Int. J. Earth Sciences (Geologische Rundschau)* 101, 1, p. 273-290.
(online at: http://basin.earth.ncu.edu.tw/download/courses/seminar_MSc/2012/1115_2_2.pdf)

(NW Mindoro Jurassic Halcon metamorphics, formed as result of arc-continent collision, overlain by Late Eocene Lasala Fm sandstones, shales, basalt flows, minor limestones (with Late Eocene Pellatispira) and conglomerates. Lasala clastics quartzose, mainly of continental, passive margin derivation. Suggests Mindoro is fragment of Mainland Asia similar to Palawan and Busuanga prior to 45 Ma opening of S China Sea)

Cooke, D. R. & M.S. Bloom (1990)- Epithermal and subjacent porphyry mineralization, Acupan, Baguio District, Philippines: a fluid-inclusion and paragenetic study. *J. Geochemical Exploration*, 35, p. 297-340.

Cooke, D.R., C.L. Deyell, P.J., Waters, R.I. Gonzales & K. Zaw (2011)- Evidence for magmatic-hydrothermal fluids and ore-forming processes in epithermal and porphyry deposits of the Baguio district, Philippines. *Economic Geology* 106, 8, p. 1399-1424.

(Baguio district with array of epithermal, porphyry and skarn deposits. Magmatism and mineralization occurred in response to subduction of S China Sea plate and Scarborough Ridge beneath N Luzon over past 3 My. Rapid uplift and exhumation resulted in epithermal veins overprinting porphyry Cu-Au deposits)

Cooke, D.R. & D.C. McPhail (2001)- Epithermal Au-Ag-Te mineralization, Acupan, Baguio district, Philippines: numerical simulations of mineral deposition. *Economic Geology* 96, p. 109-131.

Cooke, D.R., D.C. McPhail & M.S. Bloom (1996)- Epithermal gold mineralization, Acupan, Baguio district, Philippines: geology, mineralization, alteration and the thermochemical environment of ore deposition. *Economic Geology* 91, p. 243-272.

(Large gold-rich adularia-sericite-style epithermal vein system formed at 0.65 Ma at Acupan, Baguio district, Philippines, during period of high K magmatism)

Corby, G.W., R.M. Kleinpell, W.P. Popenoe, R. Merchant et al. (1951)- Geology and oil possibilities of the Philippines. *Philippine Bureau of Mines, Technical Bull.* 21, Manila, p. 1-363 + Plates volume

(Classic textbook describing geology and oil-gas seeps and wells of Philippines (not including Palawan, Mindanao). With brief review of oil producing areas in Netherlands East Indies. Numerous oil-gas seeps found throughout Philippines, but no commercial production yet. Tertiary sediment thickness in basins in Philippines <5000m, whereas in Netherlands Indies petroleum-producing basins thickness may be up to 7-9km. With cross-sections of main onshore basins)

Cosico, R., F. Gramann & H. Porth (1989)- Larger foraminifera from the Visaya Basin and adjacent areas of the Philippines (Eocene through Miocene). In: H. Porth & C.H. von Daniels (eds.) *On the geology and hydrocarbon prospects of the Visayan Basin, Philippines*, *Geologisches Jahrbuch* B70, p. 147-205.

(35 species of larger foraminifera, incl. Eocene Pellatispira madaraszii, Discocyclus and-Alveolina, Oligocene Nummulites fichteli and Lepidocyclina formosa, Miocene (Te- Lower Tf) Spiroclypeus margaritatus, Miogypsina polymorpha, etc.)

Crespin, I. (1956)- Notes on a *Lepidocyclina*- bearing rock from Cebu, Philippines. In: *Papers on Tertiary micropalaeontology*, Bureau Mineral Resources Geology Geophysics, Canberra, Report 25, p. 43-46.

(online at: www.ga.gov.au/products-services/legacy-publications/reports.html)

(Thin, large (up to 60mm), E Miocene (upper Te) Lepidocyclina (Eulepidina) badjirraensis Crespin from Magalambac, Mantalongan, Cebu, similar to specimens from type locality at Cape Range, Exmouth Gulf, NW Australia. Associated with Cycloclypeus eidae Miogypsina cf. kotoi, Lepidocyclina (N) borneensis)

Crispin, O.A. & H. Fuchimoto (1980)- K-Ar dating of some Philippine rocks. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 93-100.

(Results of K-Ar age dating of 66 samples from Philippines, ranging from Cretaceous- Miocene. Results often do not fit with associated stratigraphic/ paleontological data)

Cruz, J.R.S., M.R.R. Letargo & C.L. Samaniego (1989)- Petrography and chemistry of high-Mg, biotite-rich, pillow lavas from southwestern Panay, Philippines. *Tectonophysics* 168, 1, p. 137-149.

(Pillow basalts as lenses within Sewaragan Fm of SW Panay. Sewaragan Formation within a forearc region related to M Miocene, E-directed subduction along N-ward continuation of Negros Trench. Rock is potassic basalt with unusually high Mg and low Ti, and name Panayite is proposed)

Daleon, B.A. (1971)- A review of oil exploration drilling in the Philippines (1895-1971). Third Symposium Mineral Resources Development, Section VII, Manila 1971, p.

Dancer, N. (2003)- Reservoir characterisation of the Malampaya Field, a carbonate reefal build-up in the Philippines. Proc. 2003 SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference, Singapore, p. 1-36. *(Abstract+ Presentation)*

(Malampaya Field Oligo-Miocene carbonate reservoir with high porosity and large variation in permeability at depth of ~3000m TVDSS. Gas column 650m, oil rim 56m (API 29.4°). In-place reserves ~4.1 TCF gas and 300 MMBO. Porosity affected by diagenesis: (1) early cementation of flanks decreased porosity, meteoric leaching of lagoon increased porosity; (2) late stage burial decreased porosity with cementation along faults, porosity increased by late leaching by mixing of burial fluids and pore waters)

David, P.P. (1980)- Foraminiferal biostratigraphy of well Lagao No. 1, Sultan Sa Barongis, North Cotabato, Philippines. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 111-118.

(Entire 3657' drilled in Lagao 1 well, Cotabato Basin, SW Mindanao, of (Late) Pliocene-Pleistocene age. With Globorotalia truncatulinoides and Gr. tosaensis in Nicaan Fm shales from 2210' to TD)

David, P.P. & H. Fontaine (1987)- Eocene limestone offshore Northeast Palawan Island, Philippines. Proc. 22nd Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Guangzhou 1985, 2, p. 341-345.

(Small islands off NE Palawan mainly composed of radiolarite and limestone with some ultrabasic rocks. Pabellion and Apulit small islands with steeply dipping E-M Eocene grey-black limestone with common Distichoplax biserialis algae, Nummulites, Discocyclus and Asteroocyclus. Pellatispira, reported by Grey (1954), was not found again)

David, P.P. & H. Fontaine (1989)- Eocene limestone offshore Northeast Palawan Island, Philippines. Proc. 24th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bangkok 1987, 2, p. 130-134.

(Same paper as above)

David, S.D. (1994)- Geologie du Sud-Est de Luzon- contributions a l'etude geodynamique ante-Neogene de la Ceinture Mobile Est Philippine. Doct. Thesis Universite de Nice-Sophia Antipolis, Nice, p. 1-352.

('Geology of SE Luzon- contributions to the pre-Neogene geodynamics of the East Philippine Mobile Belt')

David, S.D., J.F. Stephan, J. Delteil, H. Bellon & F.G. Sajona (1996)- Geology, geochemistry, geochronology and structures of the ophiolites in Southeastern Luzon, Philippines. *J. Geological Society of the Philippines* 51, p. 115-129.

(Ophiolites identified in W Caramoan Peninsula (Lagonoy Ophiolite) and in Cagraray, Batan and Rapu-Rapu islands. Exposures characterized by imbricated ultramafic rocks, gabbros, basalt flows with pillow structures and volcanoclastics. These are unconformably overlain by Late Cretaceous volcanic arc sequence. K-Ar dating of gabbro near Lagonoy yielded age of ~113 Ma (Aptian-Albian). On Rapu-Rapu diorite cutting ultramafic rocks dated as 77 Ma. Ophiolite sequences generally trend NE-SW, dipping to SW. Metamorphism and strike-slip faulting on ophiolites and overlying Late Cretaceous volcanic arc sequence sealed by M Eocene

nummulitic limestone. Ophiolites in SE Luzon are pre-Late Cretaceous in age, probably formed in intra - arc oceanic setting and emplaced during pre-M Eocene)

David, S., J.F. Stephan, J. Delteil, C. Muller & J. Butterlin (1994)- The Tabgon Flysch and Ragas Point Olistostrome in the Caramoan Peninsula: nature, age, structures and their tectonic implications. J. Geological Society of the Philippines 49, 1, p. 41-63.

(Flysch and matrix of overlying olistostrome sequence in E part of Caramoan Peninsula yielded latest M Eocene- earliest Late Eocene (zones NP17- NP18) nannofossils. Olistostrome with blocks of late Bartonian-E Lutetian limestones and nummulitic conglomerates as youngest olistoliths. Rocks represent important tectonic episode during M-L Eocene, probably corresponding to change in motion of Pacific Plate in M Eocene, which resulted in left lateral strike-slip faulting in E Philippine Mobile Belt)

David, S., J.F. Stephan, J. Delteil, C. Muller, J. Butterlin, H. Bellon & E. Billedo (1997)- Geology and tectonic history of Southeastern Luzon, Philippines. J. Asian Earth Sciences 15, 4-5, p. 435-452.

(SE Luzon in E Philippine Mobile Belt. Three units limited by two NW-SE trending strike-slip faults. N-C unit is M- early Late Cretaceous volcanic arc unconformably overlain by M-L Eocene volcanic arc, followed by E Oligocene intrusives. Median Unit underlain by Late Cretaceous volcanic arc. W unit is pre-Late Cretaceous ophiolitic suite unconformably overlain by Late Cretaceous volcanic arc sequence and M Eocene limestones. Units overlain by Late Oligocene- Pliocene carbonate and clastic sequence)

De Boer, J., L.A. Odom, P.C. Ragland, F.G. Snider & N.R. Tilford (1980)- The Bataan orogene: eastward subduction, tectonic rotations and volcanism in the Western Pacific (Philippines). Tectonophysics 67, p. 251-282.

(Philippine mobile belt crustal fragment between two subduction systems of opposite polarity. Eastern (Philippine-Quezon) system probably originated in Eocene during NW-SW spreading of W Philippine basin. Western (Manila-Bataan) system originated in Oligocene by spreading of S China Sea basin. Arcs migrated E from Miocene-Present, changing composition from tholeiitic via calc-alkaline to shoshonitic. C Luzon rotating counterclockwise due to differential spreading in S China Sea basin)

Defant, M.J., J. De Boer & D. Oles (1988)- The western Central Luzon arc, two arcs divided by rifting? Tectonophysics 145, p. 305-317.

(W Central Luzon arc complex zone of volcanism. Volcanoes of N (Bataan) segment of arc along two semi-parallel lineaments. N segment cut off from S extension of arc by NE-SW 'cross arc' zone of volcanism, the Macolod Corridor. Volcanoes of S (Mindoro) segment of arc along two parallel lineaments)

Defant, M.J., R.C. Maury, J.L. Joron, M.D. Feigenson, J. Leterrier et al. (1989)- The geochemistry and tectonic setting of the northern section of the Luzon arc (Philippines and Taiwan). Tectonophysics 183, p. 187-205.

(Luzon Arc with Miocene (10 Ma) - Recent volcanism associated with E-ward subduction along Manila Trench for 1200 km, from Taiwan south to Mindoro. Volcanism clearly subduction-related with calc-alkaline affinities. Earliest phase of volcanism tholeiitic, mid-oceanic-ridge basalt-like)

Defant, M.J., R.C. Maury, E.M. Ripley, M.D. Feigenson & D. Jacques (1991)- An example of island-arc petrogenesis: geochemistry and petrology of the Southern Luzon Arc, Philippines. Journal of Petrology 32, 3, p. 455-500.

(Luzon arc volcanism associated with E-ward subduction of S China Sea floor along Manila Trench. Volcanic rocks typical arc phenocryst mineralogies: olivine, clinopyroxene, plagioclase and titanomagnetite in mafic rocks and clinopyroxene, plagioclase, orthopyroxene, titanomagnetite, amphibole in more felsic samples. Rocks range from basalts to rhyolites and show typical calc-alkaline features. Continental crustal material seems to play significant role, particularly in Macolod Corridor and Mindoro segment)

De Guzman, R.A. (1975)- Geotectonic development of Southern Mindoro geosyncline. The Philippine Geologist (J. Geological Society of the Philippines) 29, 4, p. 1-19.

(S Mindoro geosyncline two major domains: Paleogene Eugeosynclinal and Neogene Miogeosynclinal)

- De Leon, M.M. & P.J. Militante-Macias (1992)- Calcareous nannofossil biostratigraphy of the western part of Tarlac Province Central Luzon Basin. *J. Geological Society of the Philippines* 47, 1-2, p.
(*Calcareous nannofossils from outcrops of deep marine Aksitero, Moriones, Malinta and Tarlac Fms in W part of Tarlac Province, C Luzon. Represent 11 zones of 'standard' U Oligocene- U Miocene nannofossil zonation*)
- De Los Santos, V.C. & F.D. Spencer (1968)- Geology and resources of central Polillo Island, Quezon. *Philippines Bureau of Mines, Special Project Series Publ. 15, Coal*, p. 1-57.
(*Hashimoto 1982: Includes record of Late Eocene Nummulites- Discocyclina- Pellatispira larger foram fauna in Babacolan Lst overlies meta-volcanic facies in area of Polillo coalfield. Also Late Oligocene Eulepidina- Spiroclypeus without Miogypsina from coal-bearing Burdeos Fm and E-M Miocene Austrorillina- Miogypsina thecidaeformis from overlying Langoyen Lst*)
- Deng, J.H., X.Y. Yang, H. Qi, Z.F. Zhang, A.S. Mastoi, A.E.G. Berador & W. Sun (2019)- Early Cretaceous adakite from the Atlas porphyry Cu-Au deposit in Cebu Island, Central Philippines: partial melting of subducted oceanic crust. *Ore Geology Reviews* 110, 102937, p. 1-20.
(*Two E Cretaceous adakitic intrusions known from Philippines: Lutopan Diorite and adjacent Kansu diorites in Cebu Island. Lutopan Diorite is ore-forming intrusion of giant Atlas porphyry Cu-Au deposit, the only Cretaceous porphyry deposit in Philippines. Zircon U-Pb ages of Lutopan/Carmen diorites 109-107 Ma, identical to Kansu diorite in N. Both formed in intra-oceanic island arc settings by partial melting of subducted oceanic crust*)
- Deng, J.H., X.Y. Yang, Z.F. Zhang, L. Duan, A.S. Mastoi & H.Q. Liu (2020)- An overview on the origin of adakites/adakitic rocks and related porphyry Cu-Au mineralization, Northern Luzon, Philippines. *Ore Geology Reviews* 124, 103610, p. 1-23.
(*Philippine island arc famous for large porphyry and epithermal Cu-Au deposits and associated Cenozoic adakites/adakitic rocks. N Luzon one of most Cu-Au enriched areas in Philippines, with Late-Oligocene-Pleistocene porphyry and epithermal Cu-Au deposits in C Cordillera and S-most Cagayan Valley Basin*)
- Deng, J.H., X.Y. Yang, H. Qi, Z.F. Zhang, A.S. Mastoi & W. Sun (2017)- Early Cretaceous high-Mg adakites associated with Cu-Au mineralization in the Cebu Island, Central Philippines: implication for partial melting of the Paleo-Pacific Plate. *Ore Geology Reviews* 88, p. 251-269.
(*E Cretaceous arc volcanics and diorites associated with large porphyry deposit in Cebu Island, C Philippines. Zircon U-Pb age of diorites ~110 Ma, close to formation age of Lutopan diorites in Atlas porphyry Cu-Au deposit. Successive generation of arc volcanics and adakites in Cebu Island responses to subduction and rollback of Paleo-Pacific Plate to proto-Philippine Sea Plate in E Cretaceous*)
- Deng, J.H., X.Y. Yang, Z.F. Zhang & M. Santosh (2015)- Early Cretaceous arc volcanic suite in Cebu Island, Central Philippines and its implications on paleo-Pacific plate subduction: constraints from geochemistry, zircon U-Pb geochronology and Lu-Hf isotopes. *Lithos* 230, p. 166-179.
(*online at: <http://icpms.ustc.edu.cn/laicpms/publications/2015-DengJH-lithos.pdf>*)
(*E Cretaceous arc volcanic suite in Cebu Island of C Philippines with basalt, andesite, etc. (previously viewed as parts of ophiolite complexes). With zircon grains of ~126 and ~119 Ma (Aptian). Detrital zircons from river sand peak at ~118 Ma. Similar to E Cretaceous arc basalts in Amami Plateau in N and E Halmahera in S. Zircon Hf isotopes imply E Cretaceous subduction of Paleo-Pacific plate. Part of single subduction zone along S, W, N margin of W Philippine Basin before opening of Philippine Sea Plate*)
- Deng, J.H., X.Y. Yang, R.E. Zartman, H. Qi, L.P. Zhang, H. Liu, Z.F. Zhang, A.S. Mastoi, A.E.G. Berador & W.D. Sun (2020)- Early Cretaceous transformation from Pacific to Neo-Tethys subduction in the SW Pacific Ocean: Constraints from Pb-Sr-Nd-Hf isotopes of the Philippine arc. *Geochimica Cosmochimica Acta* 285, p. 21-40.
(*W-ward subduction of Pacific plate interacted with N-ward subduction of Eastern Neo-Tethys in E Cretaceous. Subduction polarities between these two plates in E Cretaceous not well constrained. Proto-Philippine arc suggested to have originated at Pacific- Neo-Tethys intersection in SW Pacific in latest Jurassic- E Cretaceous. 126-118 Ma Kansu island arc volcanics have Pacific-type Pb isotopes. Post-110 Ma Lutopan adakitic diorites*)

have Indian-type Pb isotopes, indicating subsequent subduction of Indian-type oceanic slab. Transformation from SW-ward Pacific subduction to NE-ward subduction of eastern Neo-Tethys plate in SW Pacific Ocean occurred at ~110 Ma (Albian), due to abrupt change in direction of Pacific plate)

Dickerson, R.E. (1922)- Review of Philippine paleontology. Philippine J. Science, Manila, 20, p. 195-229.
(online at: <https://ia700802.us.archive.org/8/items/mobot31753002580576/mobot31753002580576.pdf>)
(Paper describing economic uses of paleontology, and review of Mesozoic and Cenozoic fossils in Philippines. Mesozoic limited to ?Jurassic cherts on Panay with radiolaria *Cenosphaera affinis* and *Dictyomitra tenuis*. Cenozoic limited to Oligocene- Recent sediments, with fossils (mainly molluscs) at numerous localities)

Dickerson, R.E. (1924)- Tertiary paleogeography of The Philippines. Philippine J. Science, Manila, 25, 1, p. 11-50.
(Philippines sediments limited to chert of questionable Jurassic age, overlain by Miocene- Recent sediments and volcanics (incorrect: Cretaceous- Paleogene sediments also present; JTVG). With broad paleogeographic maps)

Diegor, W.G., P.C. Momongan & E.J. Mamaril-Diegor (1996)- The ophiolitic basement complex of Cebu. J. Geological Society of the Philippines, Manila, 51, 1-2, p. 48-60
(Cebu probably developed over oceanic crust. Cansi Volcanics (basic pillow lavas), Tunlob Schist, serpentinite diapirs (cold intrusion during wrench tectonics), Pandan Fm (incl. pillow basalt flow overlain by thin bedded cherts) all suggest ophiolitic affinity. Cansi Fm volcanism apparently began to pour over oceanic crust that may have previously been emplaced perhaps during E Cretaceous)

Dimalanta, C.B., D.V. Faustino-Eslava, J.A.S. Gabo-Ratio, E.J. Marquez, J.T. Padrones, B.D. Payot et al. (2020)- Characterization of the Proto-Philippine Sea Plate: evidence from the emplaced oceanic lithospheric fragments along eastern Philippines. Geoscience Frontiers 11, 1, p. 3-21.
(online at: www.sciencedirect.com/science/article/pii/S1674987119300349)
(Proto-Philippine Sea Plate proposed by several authors to account for origin of Mesozoic supra-subduction ophiolites along Philippine archipelago and Halmahera. Nearly all crust-mantle sequences along E Philippines share Early to Late Cretaceous ages, and geochemical signatures reflect mid-oceanic ridge and supra-subduction signatures. Probably near-equatorial Mesozoic supra-subduction zone origin and likely fragments of Mesozoic Proto-Philippine Sea Plate)

Dimalanta, C.B., D.V. Faustino-Eslava, J.T. Padrones, K.L. Queano, R.A.B. Concepcion & S. Suzuki (2018)- Cathaysian slivers in the Philippine island arc: geochronologic and geochemical evidence from sedimentary formations of the west Central Philippines. Australian J. Earth Sciences 65, 1, p. 93-108.
(Clastic units from W Central Philippines (Mindoro, Panay and Palawan) likely from sources of Cathaysian origin. U-Pb dating peaks at 185-140 Ma, 140-120 Ma and 112-90 Ma, chronicling Yanshanian magmatic events. Same formations also older intercept at 1.9-1.85 Ga, likely corresponding to orogenic episode in late Paleoproterozoic Cathaysian block. Also rel. strong continental chemical signature)

Dimalanta, C.B., E.G.L. Ramos, G.P. Yumul & H. Bellon (2009)- New features from the Romblon Island Group: key to understanding the arc-continent collision in Central Philippines. Tectonophysics 479, p. 120-129.
(Complete ophiolite sequence and melange in Romblon Island Group, C Philippines. Tablas, Romblon and Sibuyan Islands built on amalgamated crust and mantle rocks. Jurassic- Cretaceous age of formation and late E Miocene age of emplacement suggested for Sibuyan Ophiolite Complex. Emplacement of facilitated through displacements along E-verging thrust faults developed consequent to E Miocene arc-continent collision in C Philippines. K-Ar isotopic ages of 12 Ma for some metamorphic rocks in area)

Dimalanta, C.B., R.C. Salapare, D.V. Faustino-Eslava, N.T. Ramos, K.L. Queano, G.P. Yumul & T.F. Yang (2015)- Post-emplacement history of the Zambales Ophiolite complex: insights from petrography, geochronology and geochemistry of Neogene clastic rocks. J. Asian Earth Sciences 105, p. 215-227.
(Zambales Ophiolite Complex in Luzon made up of two blocks: (1) M Jurassic- E Cretaceous Acoje Block-San Antonio Massif of island arc tholeiite composition and (2) Eocene Coto Block-Cabangan Massif of transitional

mid-ocean ridge basalt-island arc tholeiite affinity. Ophiolitic bodies overlain by Miocene- Pliocene sediments with varying quantities of ophiolitic and arc volcanic detritus)

Dimalanta, C.B., L.O. Suerte, G.P. Yumul, R.A. Tamayo & E.G.L. Ramos (2006)- A Cretaceous supra-subduction oceanic basin source for Central Philippine ophiolitic basement complexes: geological and geophysical constraints. *Geosciences Journal* 10, 3, p. 305-320.

(online at: www.geosciences-journal.org/home/journal/...)

(C Philippines several Cretaceous oceanic ophiolite complexes. Antique Ophiolite along W side associated with blueschists, suggesting tectonic erosion accompanied subduction during emplacement. Ophiolites younger to E, indicating convergence accentuated by trench jumping. Oceanic lithosphere fragments in C Philippines probably derived from single Cretaceous ocean basin)

Dimalanta, C. & G. Yumul (2003)- Magmatic and amagmatic contributions to crustal growth of an island-arc system. The Philippine example. *International Geology Review* 45, 10, p. 922-935.

(Numerous volcanoes and ophiolite/ophiolitic complexes attests to significant role of arc magmatism and oceanic lithosphere emplacement to crustal growth in Philippines. Arc magmatism contributed more to crustal growth in Philippines than ophiolite emplacement)

Dimalanta, C.B. & G.P. Yumul (2004)- Crustal thickening in an active margin setting (Philippines): The whys and the hows. *Episodes* 27, 4, p. 260-264.

(online at: www.episodes.co.in/www/backissues/274/260-264%20Philippine.pdf)

(Significant portion of Philippine archipelago characterized by crust with thickness of ~25-30 km. Two zones with thicker crust (30-65 km): Luzon Central Cordillera and Bicol-Negros-Panay-Central Mindanao regions)

Dimalanta, C.B. & G.P. Yumul (2006)- Magmatic and amagmatic contributions to crustal growth in the Philippine island arc system: comparison of the Cretaceous and post-Cretaceous periods. *Geosciences Journal* 10, 3, p. 321-329.

Dimalanta, C. & G. Yumul (2008)- Crustal thickness and adakite occurrence in the Philippines: is there a relationship? *Island Arc* 17, 4, p. 421-431.

(Adakites may form in variety of tectonic settings: partial melting of subducted young, hot oceanic slabs, oblique subduction, low-angle or flat subduction, or slab-tearing. Miocene-Recent adakites in Philippines may have not have formed through subduction of young oceanic crust, but are function of thickened crust)

Dimalanta, C. & G. Yumul (2015)- Understanding arc-continent collision and crustal growth: geochemistry of Philippine sedimentary rock sequences. *ASEAN Engineering J. (UTM)*, C, 2, 2, p. 40-53.

(online at: http://seed-net.org/wp-content/uploads/2015/12/Invited-Paper_UNDERSTANDING-ARC-CONTINENT-COLLISION-AND-CRUSTAL-GROWTH-GEOCHEMISTRY-OF-PHILIPPINE.pdf)

(Geochemistry of clastic rocks from Palawan, Buruanga and NW Mindoro confirms source from continental fragment. Sediments from Baguio (Klondyke, Amlang, Cataguintangan) geochemical signatures consistent with derivation from mafic igneous rocks in oceanic island arc setting)

Dimalanta, C.B., G.P. Yumul & A. Imai (2013)- Geodynamic evolution of the Baguio Mineral District: unlocking the Cenozoic record from clastic rocks. *J. Asian Earth Sciences* 65, p. 118-130.

(Sediments in Baguio Mineral District reflect change in sediment provenance from quartz-rich in Oligocene to quartz-deficit in Miocene)

Ding, W., L. Qin, X. Feng, C. Wu, G. Wu, Y. Diao, S. Yin, C. Yang, J. Gao & J. Li (2022)- A new perspective on the continent-ocean boundary of Palawan continental block identified with geophysical data. *Tectonophysics* 826, 229239, p. .

Disini, A.F., B.M. Robertson & R.J.R. Claveria (1998)- The Mankayan Mineral District, Luzon, Philippines. In: I.M. Porter (Ed.), *Porphyry and hydrothermal copper and gold deposits: a global perspective*, PGC Publishing, Adelaide, p. 75-86.

(online at: https://portergeo.com.au/full_text/Disini_etal_Mankayan_Philippines-PGC_Publishing.pdf)
(Mankayan Mineral District in N Luzon hosts three world class copper and gold orebodies, all within Lepanto Consolidated Mining Co. property: Enargite gold deposit, Far Southeast porphyry copper deposit and newly discovered Victoria gold deposit (possibly all parts of single hydrothermal system). All Pliocene and younger mineralization and hosted in volcanics and volcanoclastics)

Divis, A.F. (1980)- The petrology and tectonics of Recent volcanism in the Central Philippine Islands. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian seas and islands, American Geophysical Union (AGU), Geophysical Monograph 23, p. 127-144.

Divis, A.F. (1983)- The geology and geochemistry of Philippine porphyry copper deposits. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian seas and islands- II, American Geophysical Union (AGU), Geophysical Monograph 27, p. 173-216.

(Three-four major episodes of porphyry intrusion in Philippines, with >40 potential deposits reported and nine are or have been in production. Good correlation with periods of increased subduction rates)

Domingo, B.B. & W.F. Domasig (1996)- Co'O mine, a case history of gold exploration and mining in the Philippines. In: G.P. & A.C. Salisbury (eds.) Transactions 5th Circum-Pacific Energy and Mineral Resources Conference, Hawaii 1990, Circum-Pacific Council for Energy and Mineral Resources, Houston, p. 199-206.

(Co'O gold deposit on E Mindanao Ridge in S Philippines, associated with Late Pliocene arc volcanics(?))

Domingo, R.M.A. (1989)- Facies and diagenetic aspects of a Miocene carbonate sequence, Santan A- 1XA well, Visayas, Philippines. In: H. Porth & C.H. von Daniels (eds.) On the geology and hydrocarbon prospects of the Visayan Basin, Philippines, Geologisches Jahrbuch B70, p. 277-302.

(Santan A-1XA well penetrated ~2500' of M-U Miocene carbonates (lower Tf- upper Tf). Core from top of carbonate rich in coral rubble. Diagenesis includes early freshwater leaching, followed by cementation)

Doo, W.B., S.K. Hsu & L. Armada (2015)- Philippine Island arc system tectonic features inferred from magnetic data analysis. Terrestrial Atmospheric Oceanic Sciences (TAO) 26, 6, p. 679-686.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1359-2015051104tc>)

(Positive magnetization distribution coincides closely with magmatic arcs. Philippine Fault main tectonic boundary, separating high/ low magnetization areas. Etc.)

Douville, H. (1911)- Les foraminifères dans le Tertiaire des Philippines. Philippine J. Science D, 6, 2, p. 53-80.

(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1911/PJS_Vol_6D_No2_Apr_1911.pdf)

('The foraminifera in the Tertiary of the Philippines'. Larger foraminifera from samples collected by M. Warren D. Smith. Mainly Miocene *Lepidocyclina* species, *Miogyopsina*, also small Oligocene *Nummulites*)

Dreher, S.T., C.G. Macpherson, D.G. Pearson & J.P. Davidson (2005)- Re-Os isotope studies of Mindanao adakites: implications for sources of metals and melts. Geology (GSA) 33, 12, p. 957-960.

(Osmium isotopic data for adakite samples from Mindanao conflict with slab-melting model. Os ratios inconsistent with partial melting of ~50 Ma Philippine Sea lithosphere, but similar to young mid-oceanic-ridge basalts and normal arc rocks, consistent with mantle source)

DuFrane, S.A., Y. Asmerom, S.B. Mukasa, J.D. Morris & B.M. Dreyer (2006)- Subduction and melting processes inferred from U-Series, Sr-Nd-Pb isotope, and trace element data, Bicol and Bataan arcs, Philippines. Geochimica Cosmochimica Acta 70, 13, p. 3401-3420.

(online at: https://www.academia.edu/12908440/Subduction_and_melting_processes_inferred_from_U_Series_Sr_Nd_Pb_isotope_and_trace_element_data_Bicol_and_Bataan_arcs_Philippines)

(Two principal volcanic arcs on Luzon, developed over opposite-dipping subduction zones: Bataan Arc in W; (South China Sea Plate subduction at Manila Trench; Late Oligocene- M Miocene?) and Bicol Arc in E; (Philippine Sea Plate subduction at Philippine trench; rel. short-lived), Isotope and trace element data suggest transfer of subducted sediment to mantle wedge is limited)

Duquesnoy, T., E. Barrier, M. Kasser, M. Aurelio, R. Gaulon, R.S. Punongbayan & C. Rangin (1994)- Detection of creep along the Philippine Fault: First results of geodetic measurements on Leyte Island, central Philippine. *Geophysical Research Letters* 21, 11, p. 975-978.

(online at: https://www.researchgate.net/publication/251434914_Detection_of_creep_along_the_Philippine_Fault_First_results_of_geodetic_measurements_on_Leyte_Island_central_Philippine)

(GPS measurements in 1991 and 1993 in C part of Philippine Fault on Leyte island suggest mean slip rate of 26 ± 10 mm/yr at azimuth of $\sim N130^\circ E$., consistent with tectonic and kinematic data)

Durkee, E.F. (1992)- Oil, geology, and changing concepts in the SW Philippines (Palawan and the Sulu Sea). In: 9th SEAPEX Offshore Southeast Asia Conf. (OFFSEA 92), Singapore 1992, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 10, OSEA 92217, p. 75-96.

(Brief overview of Philippines basins and discoveries. SW Philippines offshore Palawan oil-gas producing trend in Oligocene- Lower Miocene limestone reefs (Nido, Malampaya, Matinloc) and overlying deep water turbiditic sequences (Galoc, W Linapacan))

Durkee, E.F. (1993)- Oil, geology, and changing concepts in the SW Philippines (Palawan and the Sulu Sea). Proc. Conf. Tectonic framework and energy resources of the western margin of the Pacific Basin, Kuala Lumpur 1992, Bull. Geological Society Malaysia 33, p. 241-262.

(online at: www.gsm.org.my/products/702001-101009-PDF.pdf)

(same as Durkee 1992, above)

Durkee, E.F. (2001)- With Malampaya producing, here are other Philippines exploration targets. Oil and Gas Journal 99, 47, p. 46-50.

(Shell-operated Malampaya gas field producing since September 2001. Two important areas for gas exploration Reed Bank and S Tanon Strait. Other possible areas Crescent, Santa Monica, N Coron, Amity, Cherry and Hippo. Possibility of oil leg under gas accumulation at Malampaya)

Durkee, E.F. & S.L. Pederson (1961)- Geology of northern Luzon, Philippines. American Assoc. Petroleum Geol. (AAPG) Bull. 45, p. 137-168.

(Luzon Cagayan Valley intermontane basin sediments accumulated in Miocene- Pliocene. E Miocene limestones, marine Miocene, marine- brackish U Miocene-Pliocene to fluvial U Pliocene-Pleistocene)

Dycoco, J.M.A., B.D. Payot, G.T.V. Valera, F.A.C. Labis, J.A. Pasco, A.D.C. Perez & K. Tani (2021)- Juxtaposition of Cenozoic and Mesozoic ophiolites in Palawan island, Philippines: new insights on the evolution of the Proto-South China Sea. *Tectonophysics* 819, 3-4, 229085, p. 1-19.

(Remnants of consumed Mesozoic proto-South China Sea plate that once existed between S China-Eurasian margin and Borneo believed to be emplaced as ophiolitic lithologies in Palawan, Zambales (Philippines) and Borneo. Cretaceous (S Palawan ophiolite; olivine gabbro U-Pb dated ~ 100 -103 Ma) and Eocene (C Palawan Ophiolite with 40 Ma plagiogranite) ophiolitic lithologies exposed in C and S parts of Palawan island, and are similar to Darvel Bay and Telupid ophiolites in N Borneo)

Easton, W.H. & M.M. Melendres (1963)- First Paleozoic fossil from Philippine archipelago. American Assoc. Petroleum Geol. (AAPG) Bull. 47, 11, p. 1871-1873.

(Paleozoic cyathopsid coral (*Gshelia?* or *Caninia*) in cobble from Late Tertiary conglomerate at Punso, SE Mindoro. Coral probably of M-U Carboniferous age and first Paleozoic fossil derived from basement rocks)

Elveta, M., R.I. Villones, C.V. de Jesus, A.R. Natividad, L.A. Rollan & A.C. Duroy (1990)- Mineralization at the Kelly gold mine, Baguio District, Philippines: fluid-inclusion and wall-rock alteration studies. *J. Geochemical Exploration* 35, 1-3, p. 341-362.

(Gold-quartz veins at Baco-Kelly Mine indicate the existence of two types of hydrothermal fluids. High-sulfidation system possibly linked to porphyry copper-gold mineralization at depth)

Encarnacion, J.P. (1994)- Geochronological, geochemical and geological constraints on models of ophiolite generation and ARC growth: Evidence from the northern Philippines. Ph.D. Thesis University of Michigan, p. 1-132.

(On Eocene Zambales and Angat ophiolites of S Sierra Madre, Luzon. Zircon U-Pb ages from tonalite and plagiogranite of Zambales ophiolite ~44-45 Ma (M Eocene), Angat Ophiolite ~48 Ma, suggesting parts of a single plate, probably originated in backarc setting. Overlain by Eocene volcanic arc. Also Palawan Ophiolite which was obducted onto microcontinental fragment rifted from SE China)

Encarnacion, J. (2004)- Multiple ophiolite generation preserved in the northern Philippines and the growth of an island arc complex. *Tectonophysics* 392, p. 103-130.

(online at: www.academia.edu/9623554/Multiple_ophiolite_generation_preserved_in_the_northern_Phi Etc.) (Oceanic arcs grow through addition of subduction-generated magmas, but in N Philippines also major contribution from repeated oceanic crust generation with subsequent preservation of basic-ultrabasic units in arc complex. At least five episodes of oceanic crust generation represented in N Philippines by ophiolitic sequences and recent intra-arc seafloor spreading. Ages pre-(?)Jurassic- Quaternary. Most ophiolites generated as back-arc, fore-arc, or intra-arc crust within Philippine arc complex)

Encarnacion, J. (2004)- Northern Philippine ophiolites: modern analogues to Precambrian ophiolites? In: T.M. Kusky (ed.) *Precambrian ophiolites and related rocks*, Elsevier Developments in Precambrian Geology 13, p. 615-626.

(N Philippines has ~150 My history of multiple, overlapping periods of oceanic crust generation, arc volcanism and deformation. At least five ophiolite complexes. Sedimentary basins probably floored by oceanic crust are dominated by immature sediments and volcanoclastics, locally up to 10 km thick. Entire arc-ophiolite complex being accreted to Eurasia since Miocene)

Encarnacion, J., E.J. Essene, S.B. Mukasa & C.H. Hall (1995)- High-pressure and -temperature subophiolitic kyanite-garnet amphibolites generated during initiation of Mid-Tertiary subduction, Palawan, Philippines. *Journal of Petrology* 36, 6, p. 1481-1503.

(Metamorphic rocks near base of pre-M Eocene ophiolite in C Palawan record conditions of ophiolite emplacement onto rifted SE margin of China (Palawan Block). Radiometric ages all around 34 Ma (~Eo-Oligocene boundary). P-T conditions and regional geology suggest metamorphism at depth >30 km in subduction zone. Rapid cooling and exhumation after peak metamorphic conditions in earliest Oligocene)

Encarnacion, J.P. & S.B. Mukasa (1997)- Age and geochemistry of an 'anorogenic' crustal melt and implications for I-type granite petrogenesis. *Lithos* 42, p. 1-13.

(Capoas I-type biotite granite of Late M Miocene age (zircons 15 ± 3 Ma, monazites ~13.4 Ma) at W side of N Palawan Continental Terrane. Intruded into Permian-Jurassic sedimentary rocks of N Palawan Continental Terrane (fragment of Mesozoic Andean margin of SE China that was separated from mainland during Late Oligocene- E Miocene opening of S China Sea). Composed mainly of older continental crust; probably calc-alkaline source rocks of Mesozoic Andean-type margin of S China that underwent partial melting in late M Miocene time in 'anorogenic' setting)

Encarnacion, J., S.B. Mukasa & C.A. Evans (1999)- Subduction components and the generation of arc-like melts in the Zambales ophiolite, Philippines: Pb, Sr and Nd isotopic constraints. *Chemical Geology* 156, p. 343-357.

(online at: https://www.academia.edu/26491769/Subduction_components_and_the_generation_of_arc_like_melts_in_the_Zambales_ophiolite_Philippines_Pb_Sr_and_Nd_isotopic_constraints) (On M Eocene arc-like island arc tholeiites and minor boninitic rocks in Zambales Ophiolite Complex of C Luzon, which are less than ~1 Ma younger (44.2 Ma) than MORB-like sections (45.1 Ma))

Encarnacion, J.P., S.B. Mukasa & E.J. Obille (1993)- Zircon U-Pb geochronology of the Zambales and Angat ophiolites, Luzon, Philippines: evidence for an Eocene arc-back arc pair. *J. of Geophysical Research: Solid Earth* 98, B11, p. 19991-20004.

(online at: https://www.researchgate.net/publication/248793800_Zircon_UPb_Geochronology_of_the_Zambales_and_Angat_Ophiolites_Luzon_Philippines_Evidence_for_an_Eocene_Arc-Back_Arc_Pair)
(Two basement terranes exposed on Luzon: Zambales ophiolite in W and Angat ophiolite in E, separated by 10 km thick and 100 km wide sedimentary basin. Zircon ages from plagiogranites in Zambales ophiolite ~45 Ma (M Eocene), in agreement with Late Eocene age of overlying Aksitero Fm. Zircons from Angat Ophiolite 48 Ma, younger than Late Cretaceous age based on radiolarian fauna from melange sequence SSE of main ophiolite. Small age difference between Zambales and Angat ophiolites suggests common origin. Zambales-Angat ophiolite represents preserved Eocene back-arc basin, formed behind Eocene arc, within Cretaceous oceanic basement, therefore not allochthonous terranes)

Endo, R. (1968)- Fossil algae from Mindoro Oriental Province, Mindoro Island, the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 211-219.

(Algae from conglomeratic beds near Mansalay Fm (probably Jurassic) at Agbahag Point, Mindoro Oriental. Incl. *Archaeolithoporella hidensis*, *Vermiporella nipponica* (= *Vermiporella sumatrana* Pia 1937?; JTvG), *Macroporella*, etc. Most species known from Permian of Japan, suggesting Permian pebbles reworked into Jurassic sediments)

Esguerra, F.B. (1961)- Geochemistry and mineralogy of the Surigao nickeliferous laterites, Mindanao, Philippines. *The Philippine Geologist* 15, p. 1-26.

Evans, C.A., G. Casteneda & H. Franco (1991)- Geochemical complexities preserved in the volcanic rocks of the Zambales Ophiolite, Philippines. *J. of Geophysical Research: Solid Earth* 96, B10, p. 16251-16262

(online at: https://www.academia.edu/26637405/Geochemical_complexities_preserved_in_the_volcanic_rocks_of_the_Zambales_Ophiolite_Philippines)

(Geochemical characteristics of volcanic rocks from Zambales Ophiolite, Luzon, indicate oceanic crust now preserved in ophiolite generated in oceanic subduction zone environment. Volcanic rocks magnesian basalt (including MOR Basalt, island arc tholeiite, and boninite-like lavas) to andesite and dacite and have trace elements suggesting derivation from heterogeneous mantle source). Paleomagnetic studies suggest Zambales Ophiolite formed as oceanic crust in vicinity of present-day Celebes Sea)

Fan, J., S.G. Wu & G. Spence (2015)- Tomographic evidence for a slab tear induced by fossil ridge subduction at Manila Trench, South China Sea. *International Geology Review* 57, 5-8, p. 998-1013.

(online at: https://www.researchgate.net/publication/271621809_Tomographic_evidence_for_a_slab_tear_induced_by_fossil_ridge_subduction_at_Manila_Trench_South_China_Sea)

(Tomography of high-velocity subducted slab of S China Sea beneath Manila Trench. Angle of slab varies along trench: at ~16° N slab dips at 24° ~32° for 20-250 km depth. A ~17.5° slabs near vertical from 70-700 km depth, at 20° N from horizontal abruptly to near vertical to 500 km depth. Steepening may indicate slab tear, coincident with axis of fossil ridge in SCS slab at ~17° N. Low-velocity zones above 300 km may represent the formation of slab window. Slab tear could explain volcanic gap and geochemical difference between Miocene and Quaternary volcanoes in Luzon Arc, and distribution of adakites and related porphyry Cu-Au deposits in Luzon area. Initial time of ridge subduction possibly started at ~8 Ma)

Fan, J. & D. Zhao (2018)- Evolution of the southern segment of the Philippine Trench: constraints from seismic tomography. *Geochem. Geophysics Geosystems* 19, 11, p. 4612-4627.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018GC007685>)

(Tomographic model shows Philippine Sea slab subducted down to depths of 450-600 km with overturned dip along S segment of Philippine Trench, indicating subduction of Philippine Sea Plate along S Philippine Trench started at 20-25 Ma, contemporaneous with Sangihe Trench. Initiation resulted from Palawan-Philippines collision at ~10 Ma. Subduction completion of Molucca Sea slab propagated from S to N at ~5 Ma, presumably resulting in subduction reorganization of Philippine Sea Plate along S Philippine Trench and subduction initiation of PSP along N Philippine Trench)

Fan, J. & D. Zhao (2019)- P-wave anisotropic tomography of the central and southern Philippines. *Physics Earth Planetary Interiors* 286, p. 154-164.

Fan, J., D. Zhao & D. Dong (2016)- Subduction of a buoyant plateau at the Manila Trench: tomographic evidence and geodynamic implications. *Geochem. Geophysics Geosystems* 17, 2, p. 571-586.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1002/2015GC006201>)

(P-wave tomography shows changes in dip angle of subducted Eurasian Plate from N to S along N Manila Trench/ Luzon Arc, consistent with partial subduction of buoyant plateau. Slab tears along edges of plateau in subducted plate and subducted lithosphere may be absent below 250 km at ~19°N and ~21°N. Subducted plate at ~21°N steeper than at ~19°N. May explain ~5 km separation of W and E volcanic chains in Luzon Arc at ~18°N, converging N-ward. Low-velocity zone at 20-200 km beneath Manila Accretionary Prism at ~22°N, suggesting subduction may stop there. Taiwan Orogeny may originate from subduction of buoyant plateau)

Fan, J., D. Zhao, D. Dong & G. Zhang (2017)- P-wave tomography of subduction zones around the central Philippines and its geodynamic implications. *J. Asian Earth Sciences* 146, p. 76-89.

(Tomographic data show subducted S China Sea slab under S segment of Manila Trench steepens and tears, resulting in migration of active volcanism in Macolod Corridor, due to between Palawan block- Philippine Mobile Belt collision. Subduction of Philippine Sea Plate along Philippine Trench started at 10-12°N or S of 12°N from at least ~10 Ma. High-velocity anomaly near mantle transition zone interpreted as subducted Proto S China Sea slab, sinking deeper SE-ward, suggesting Palawan block collision younging from S to N (see also Wu & Suppe 2017))

Faure, M. & K. Ishida (1990)- The mid-Upper Jurassic olistostrome of the West Philippines: a distinctive key-marker for the North Palawan block. *J. Southeast Asian Earth Sciences* 4, 1, p. 61-67.

(online at: https://www.academia.edu/72879245/The_Mid_Upper_Jurassic_olistostrome_of_the_west_Philippines_a_distinctive_key_marker_for_the_North_Palawan_block)

(N Palawan island mainly chaotic mix of turbidites, slumps, pebbly mudstone, sandstone and olistostrome, with exotic blocks of Permian- Triassic chert and limestone, M-U Jurassic limestone, acidic lava and volcanoclastic rocks. Callovian- Lower Kimmeridgian radiolarians in mudstone matrix. Olistostrome with exotic blocks overlain by Late Cretaceous-Eocene turbidites. Similar olistostrome at Calamian, Mindoro, Panay and Carabao islands (other authors view this as Jurassic accretionary complex?; JTvG))

Faure, M., Y. Marchadier & C. Rangin (1989)- Pre-Eocene synmetamorphic structure in the Mindoro-Romblon-Palawan area, West Philippines, and implications for the history of Southeast Asia. *Tectonics* 8, 5, p. 963-979.

(online at: <https://insu.hal.science/insu-00716213/document>)

(Pre-Eocene 'basement' in Mindoro-Lubang area with: (1) pre-Eocene olistostrome; (2) ophiolitic nappe; (3) schistose sequence (pelites, sandstones, etc.); and (4) gneissic unit. Ophiolite and schistose sequence two thrust sheets of oceanic origin thrust upon gneissic unit considered part of continental basement called W Philippines Block. Mindoro metamorphics not younger than Eocene and probably not older than late Paleozoic)

Faustino-Eslava, D.V., A.d.C. Perez, K.L. Queano, R.C. Salapare, J.T. Padrones, C.B. Dimalanta, G.P. Yumul, N.T. Ramos, B.D. Payot & P.M. Operio (2013)- Low-latitude paleoceans in the Philippines. In: 2nd Int. Symposium International Geoscience Programme (IGCP) Project 589, Borocay, Philippines, p. 102-103.

(Abstract) (online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)

(Fragments of ancient oceanic crusts along entire Philippine Archipelago. Paleomagnetic data from ophiolites and associated formations in Luzon and C Philippines suggest older rocks formed closer to equatorial paleolatitudes: Cretaceous Mangyan meta-ophiolite (Mindoro; ~2.4°S- 1.3°N) and Cretaceous-Eocene Chico River pillow basalts (Luzon; ~6°N). Pillow basalts of Oligocene Amnay Ophiolite in Mindoro ~10°N. Oligo-Miocene-Pliocene rocks of Luzon close to original deposition (e.g. Moriones and Sta. Cruz Fms; ~15°N)

Faustino-Eslava, D.V., H. Shibuya, C.B. Dimalanta, G.P. Yumul & J.T. Macuroy (2021)- Persistent shallow magnetic inclination in the past 5 million years with implications for regional tectonics in the Philippines. *J. Asian Earth Sciences*: X, 5, 100048, p. 1-9.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056021000050?via%3Dihub>)

(Geomagnetic field derived from 1 ka to 4.3 Ma volcanic rocks in Luzon with shallow inclination anomalies between ~8° to 14° shallower than GAD model. VGP scatter comparable to near-equatorial regions incl. Java)

Faustino, D.V., G.P. Yumul, J.V. De Jesus, C.B. Dimalanta, J.C. Aitchison, M.F. Zhou, R.A. Tamayo & M.M. De Leon (2003)- Geology of southeast Bohol, Central Philippines: accretion and sedimentation in a marginal basin. *Australian J. Earth Sciences* 50, p. 571-583.

*(online at: www.academia.edu/6370868/Geology_of_southeast_Bohol_central_Philippines_Accretion_Etc.)
(SE Bohol composed of Cretaceous basement complex with Alicia Schist, overthrust by Cansiwang melange, structurally overlain by SE Bohol Ophiolite Complex. Overlain unconformably by ~2000m thick Lower Miocene- Pleistocene carbonate and clastic sediments and igneous units. Accretionary prism beneath ophiolite complex and presence of boninites suggest SE Bohol Ophiolite Complex emplaced in forearc setting. It formed in E Cretaceous in suprasubduction zone environment related to SE-facing arc)*

Faustino, D.V., G.P. Yumul, C.B. Dimalanta, J.V. De Jesus, M.F. Zhou, J.C. Aitchison & R.A. Tamayo (2006)- Volcanic-hypabyssal rock geochemistry of a subduction-related marginal basin ophiolite: Southeast Bohol Ophiolite-Cansiwang melange complex, Central Philippines. *Geosciences Journal* 10, 3, p. 291-303.

(E Cretaceous SE Bohol Ophiolite- Cansiwang Melange Complex and Alicia Schist form basement of SE Bohol Island. Four discrete groups in volcanic and ophiolite-melange complex: boninitic rocks, enriched and normal mid-ocean ridge basalts and high-magnesian andesites. Geochemical diversity best explained by supra-subduction zone environment of formation. Formation of Cansiwang Melange concurrent with ophiolite emplacement by subduction-accretion along forearc margin, which was later jammed into inactivity with entry of Alicia Schist that most likely was oceanic bathymetric high)

Fernandez, H.E. & F.V. Damasco (1979)- Gold deposition in the Baguio gold district and its relationship to regional geology. *Economic Geology* 74, p. 1852-1868.

(Baguio gold district on Luzon Island mined since early 1900s. Gold preferentially in pre-Miocene rocks, N-S zone, 8 km wide, 10s of km long, bounded by intrusive belt to E and volcanic belt to W. Etc.)

Fernandez, M.V., A.P. Sevilla & S. David (1994)- Notes on the Cretaceous carbonates in Catanduanes Island and Caramoan Peninsula, Philippines. *J. Geological Society of the Philippines* 49, 4, p. 241-261.

*(Cretaceous rocks of Catanduanes Island and Caramoan Peninsula contain (1) Aptian- Cenomanian shallow water carbonates with *Orbitolina texana* and *Orbitolina cf. conoidea*; (2) Late Campanian- E Maastrichtian pelagic wackestones with *Globotruncana*, etc.; and (3) Late Maastrichtian *Lepidorbitoides (Asterorbis)* sp. in shallow marine packstones with rudists (also *Orbitoides*, *Omphalocyclus*, *Sulcoperculina*; Matsumaru, 2017) (possibly reworked in M-U Eocene olistostrome?; JTvG))*

Fernando, A.G.S., A.R.C. Fernandez, Y. Maac-Aguilar, T. Kase & Y. Kurihara (2013)- Report on the occurrence of Late Oligocene calcareous nannofossils from southeastern Negros Island (Negros Oriental). *J. Geological Society of the Philippines*, p. 4-11.

(online at: https://www.researchgate.net/profile/Allan-Gil-Fernando/publication/317248845_Report_on_the_Occ_Etc.)

Fernando, A.G.S., C.Y. Magtoto, J.D.S. Guballa & A.M. Peleo-Alampay (2016)- Calcareous nannofossils from Cretaceous units in Catanduanes Island. *Bull. National Museum Natural Science, Ser. C*, 42, p. 35-47.

*(online at: http://www.kahaku.go.jp/research/publication/geology/download/42/BNMNS_C42_35-47.pdf)
(Cretaceous outcrops in Catanduanes Island, E Philippines with two distinct nannofossil assemblages: UC10-UC12 zones (Coniacian-Santonian) and Campanian-Maastrichtian. Previously unmapped black mudstone in N Catanduanes UC5c subzone (Cenomanian-Turonian boundary; possibly oceanic anoxic event 2 (OAE2))*

Fernando, A.G.S., A.M. Peleo-Alampay, E.M. Francisco, E.J. Crisologo, M.E. Collado & F.P. Siringan (2007)- Calcareous nannofossils from the Opol Formation, Bukidnon Province (Northern Mindanao), *J. Geological Society of the Philippines* 63, 1-2, p. 39-50.

*(Opol Fm of N Mindanao with Late Miocene- E Pliocene calcareous nannofossil assemblages of zones NN11-NN15, based on occurrence of *Discoaster quinquerramus*, *D. berggrenii*, *Reticulofenestra pseudumbilica*, etc.)*

Fernando, A.G.S., A. Raymund, C. Fernandez, Y. Maac-Aguilar, Y. Kurihara & T. Kase (2008)- Late Miocene calcareous nannofossils from Danao Basin, Bohol (Visayan Basin), Philippines. Bull. National Science Museum, Tokyo, C34, p. 27-38.

(online at: <http://ci.nii.ac.jp/naid/110007342096/en>)

(Shallow marine, mollusk-bearing clastics in Danao basin of C Bohol with *Discoaster quinquerramus* and *D. berggrenii*, suggestive of NN11, Late Miocene. Cooler oceanographic conditions suggested for Late Miocene in Visayan Basin)

Fernando, A.G.S., D.N. Tanguan, A.R.C. Fernandez, E.S. Lucero, J.A. Manzano, M.G.B. Collantes & L.S.J. Manzano (2013)- Calcareous nannofossil biostratigraphy of Indahag Limestone (Western Misamis Oriental, Northern Mindanao). J. Geological Society of the Philippines 64, p. 12-21.

(Pliocene calcareous nannofossils from Indahag Lst (NN15-NN17), N Mindanao)

Figuerola, A.J.T., J.A.S. Gabo-Ratio, P.C. Manalo, R. Takahashi, H. Sato & A.B. Ramos (2022)- Breccia and vein mineralization of the Balatoc Diatreme, Acupan gold deposit, Baguio Mineral District: An example of a diatreme-hosted epithermal deposit in the Philippines. Ore Geology Reviews 144, 104826, p. 1-15.

(online at: www.sciencedirect.com/science/article/pii/S0169136822001342)

(Large Acupan epithermal gold deposit in vein orebodies hosted by Plio-Pleistocene Virac Granodiorite and in NE by volcanic-pipe breccia of Balatoc Diatreme. Diatreme volcanism age estimated at 1.0 Ma. Five paragenetic stages identified for orebodies)

Florendo, F.F. (1981)- Preliminary report on the geology, geotectonic development and mineralization of western Panay. Proc. 8th Pacific Science Congress (U.S. National Research Council) 2, p. 482-502.

Florendo, F.F. (1994)- Tertiary arc rifting in northern Luzon, Philippines. Tectonics 13, 3, p. 623-640.

(online at: https://www.academia.edu/81851357/Tertiary_arc_rifting_in_northern_Luzon_Philippines)

(N Luzon Terrane one of largest arc terranes in Philippines. Late Eocene island arc system formed above subducting W Philippine plate. Bifurcating Late Eocene- Late Oligocene magmatic arcs separated by Cagayan basin, formed by Late Oligocene- E Miocene intra-arc rifting, with oceanic crust formed at SW end. Arc rifting may be manifestation of extensional tectonism that affected most of SE Asia in Late Oligocene- E Miocene, during which South China Sea and SE Sulu basins formed. Subsequent to arc rifting, subduction of S China plate along Manila Trench, starting at ~15 Ma)

Florendo, F.F. & J.W. Hawkins (1992)- Comparison of the geochemistry of volcanic rocks of the Zambales Ophiolite, northern Luzon, Philippines: implications for tectonic setting. Acta Geologica Taiwanica, Science Reports National Taiwan University, 30, p. 172-176.

Fontaine H. (1979)- Note on the geology of the Calamian Islands, North Palawan, Philippines. United Nations, ECAFE, CCOP Newsletter 6, 2, p. 40-47.

(Same paper as Fontaine (1990). Reconnaissance of geology of Calamian islands, W Philippines, between Mindoro and Palawan Islands)

Fontaine (1990)- Note on the geology of the Calamian Islands, North Palawan, Philippines. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 247-256.

(Reprint of Fontaine (1979) paper. Reconnaissance of geology of Calamian islands, W Philippines, between Mindoro and Palawan Islands. Widespread M Triassic? radiolarian chert. Presence of Rhaetian- Lower Jurassic limestones based on foraminifera described in Fontaine, Beauvais et al. 1979))

Fontaine, H. (1990)- Note on the Jurassic in the Philippines. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, CCOP, Technical Publication 20, p. 257-260.

(Reprint of Fontaine (1978), CCOP Newsletter 5(3). Brief note on Jurassic rocks in Mansalay area of S Mindoro, with Callovian- Oxfordian ammonites (see also Hashimoto & Sato 1967, 1968). Mention of oil seeps in Jurassic region of Mindoro)

Fontaine, H., L. Beauvais, C. Poumont & D. Vachard (1979)- Donnees nouvelles sur le Mesozoique de l'Ouest des Philippines. Decouverte de Rhetien marin. Compte Rendu Sommaire Seances Societe Geologique France 1979, 3, p. 117-121.

(*'New data on the Mesozoic of Western Philippines; discovery of marine Rhaetian'. Discoveries of M Jurassic limestone with corals (simple forms, Montlivaltiidae) on SE Mindoro. On Calamian islands, W Philippines: Busuanga with thick Upper Triassic siliceous clastics with radiolaria, on Malajon reefal limestone with massive corals (incl. Thaumaporella) and Rhaetian foraminifera like Involutina, Triasina cf. hantkeni, etc.)*)

Fontaine, H., P. David & N.D. Tien (1983)- A note on the northwest Panay- Tablas area. CCOP Newsletter 10, p. 8-13.

(*NW Panay- Carbao and Tablas islands part of continental 'Palawan Block'. Includes (1) pre-Permian meta-clastics; (2) upper M Permian limestone with fusulinids (Neoschwagerina haydeni), smaller forams (Tuberitina, Pachyploia, Pseudoendothyra, etc.) and dasyclad algae (Mizzia velebitana); (3) E-M Triassic radiolarites) (see also reprint, below)*)

Fontaine, H., P. David & N.D. Tien (1990)- A note on the northwest Panay- Tablas area. In: H. Fontaine (ed.) Ten years of CCOP research on the Pre-Tertiary of East Asia, United Nations ESCAP, United Nations ESCAP, CCOP, Technical Publication 20, p. 261-268.

(Reprint of Fontaine et al. 1983)

Fontaine, H., N.D. Tien & D. Vachard (1986)- Discovery of Permian limestone south of Tara Island in the Calamian Islands, Philippines. In: H. Fontaine (ed.) The Permian of Southeast Asia, United Nations ESCAP, CCOP, Technical Bulletin 18, p. 161-167.

(online at: <https://repository.unescap.org/items/312125a5-1653-453e-97d7-3adb1899913d>)

(*Permian limestones in NE part of Calamian islands, Philippines. Malemglemeg and Botulan Islands Late Murgabian-Midian age wackestone with forams-algae, incl. Tubiphytes and fusulinids. Getche island oolitic grainstone may be Permian or Triassic*)

Forbes, M.T., C.B. Mapaye & J.A. Bacud (2011)- Structural characterization of offshore Southwest Palawan, Philippines using the most recent 2D/3D seismic data. Proc. 2011 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, 16, p. 1-25. (Abstract + Presentation)

(*Improved seismic imaging allows identification of 4 major structures, Eocene half-graben with thick synrift deposits, varying deformational styles in fold-thrust belt, duplication of Oligo-Miocene Nido Lst reservoir, etc.*)

Foronda, J. (1994)- Sequence stratigraphy of an Oligocene-Miocene mixed siliciclastic carbonate system, Visayan Basin, Central Cebu (Philippines). Doct. Thesis, Friedrich-Wilhelms-Universitat, Bonn, Germany, Bonner Geowissenschaftliche Schriften 11, p. 1-152. (Unpublished)

Foronda, J. (1996)- Depositional systems and coal cyclothems in the Upper Malubog Formation (Lower Miocene), Cebu, Central Philippines. In: C.A.Caughey et al. (eds.) Proc. Symposium on Sequence Stratigraphy in SE Asia, Jakarta 1995, Indonesian Petroleum Association (IPA), p. 465-476.

(*U Malubog Fm in C Cebu spans Lower Miocene NN2- NN3 nannoplankton zones. Thickness at least 620m. Composed of interbedded mudstones, siltstones, sandstones, minor carbonates and conglomerates. Represents single depositional sequence with shelf margin, transgressive, and highstand systems tracts. Coals cap two topmost deltaic cycles. During transgressive phase a retrograding barrier island system developed on top of deltaic deposits. Top of sequence is angular unconformity which represents NN4 hiatus in Visayan Basin*)

Foronda, J.M., J.A. Bacud & C.F. Bastero (2007)- New potential plays in the syn-rift sequences in Offshore Palawan. Proc. 2007 SE Asia Petroleum Exploration Society (SEAPEX) Conference, Singapore, p. 1-28. (Abstract + Presentation)

(Paleogene 'syn-rift' sequences off NW Palawan mainly marine deposits. M Oligocene unconformity in S China Sea Basin separates Syn-Rift from widespread Nido Lst platform carbonates. Exploration targets Nido Lst buildups and fractured platform carbonates and overlying Pagasa Fm turbidites. Outboard highs where most wells have been drilled, syn-rift low net/gross, giving perceived lack of reservoir sands. Potential lowstand plays basin floor fans, leveed channels and incised valley fills. Basin floor fan may reach several km along dip. Leveed channel complex irregular and discontinuous reflections with occasional channels almost 1 km wide. Incised valley fills typically >2.5 km wide. Exploration risks for syn-rift plays include lack of local condensed section above basin floor fans to serve as seal and drilling sand-poor fill in leveed channels and incised valleys)

Foronda, J.M. & W. Schoell (1987)- Microfacies types of Binangonan Formation, Antipolo-Teresa, Rizal Province. The Philippine Geologist (J. Geological Society of the Philippines), 41, p. 40-78.

(U Oligocene- Lw Miocene Binangonan Fm carbonates grade up from proximal turbidites into reef buildup and reef-associated carbonates. Basin margin facies mainly planktonic forams. Foreslope facies mainly floatstones and packstones. Main organic buildups comprised of boundstones, and minor packstones/ grainstones)

Forster, H., D. Oles, U. Knittel, M.J Defant & R.C Torres (1990)- The Macolod Corridor: a rift crossing the Philippine island arc. Tectonophysics 183, p. 265-271. (online at:

https://www.academia.edu/30814575/The_Macolod_Corridor_A_rift_crossing_the_Philippine_island_arc)

(Macolod Corridor in SW Luzon is 40 km wide zone of active Quaternary volcanism which crosses island in NE-SW direction. Probably pull-apart zone formed by NW-SE oriented shearing)

Forster, M.A., R. Armstrong, B. Kohn, G.S. Lister, M.A. Cottam & S. Suggate (2015)- Highly retentive core domains in K-feldspar and their implications for 40Ar/39Ar thermochronology illustrated by determining the cooling curve for the Capoas Granite, Palawan, The Philippines. Australian J. Earth Sciences 62, p. 883-902.

(K-feldspar from Late Miocene Capoas Granite on NW Palawan with retentive diffusion domains that are closed to argon diffusion at near-solidus temperatures during cooling. High closure T from Capoas Granite K-feldspar consistent with coincidence of 40Ar/39Ar ages with U-Pb zircon ages at $\sim 13.5 \pm 0.2$ Ma. Cooling rate then accelerated, but slowed by ~ 12 Ma, then once again accelerated at ~ 11 Ma)

Fournier, F. (2004)- Evolution de l'edifice carbonate du champ de gaz de Malampaya, Tertiaire, offshore Palawan, Philippines. Implications pour la caracterisation du reservoir. Thesis University of Provence, p. 1-208. (Unpublished)

('Evolution of the carbonate buildup of the Malampaya gas field, Tertiary, offshore Palawan, Philippines; implicatons for reservoir characterization'. Malampaya gas field in 850-1200m of water, within Late Eocene- E Miocene shallow-water carbonates. Carbonate system initially developed on crest of tilted block during rifting of S China Sea. High-frequency subaerially exposed cycles in inner-shelf (time scale 10-100ka))

Fournier, F. & J. Borgomano (2007)- Geological significance of seismic reflections and imaging of the reservoir architecture in the Malampaya gas field (Philippines). American Assoc. Petroleum Geol. (AAPG) Bull. 91, 2, p. 235-258.

(North Palawan 1989 Malampaya oil-gas discovery in U Eocene- Lower Miocene carbonate buildup. Porosity distribution mainly controlled by meteoric diagenesis)

Fournier, F., J. Borgomano & L.F. Montaggioni (2005)- Development patterns and controlling factors of Tertiary carbonate buildups: insights from high-resolution 3D seismic and well data in the Malampaya gas field (Offshore Palawan, Philippines). Sedimentary Geology 175, p. 189-215.

(Malampaya buildup off NW Palawan internal carbonate platform architecture. Carbonate system initiated in Late Eocene (Pellatispira) as attached shelf influenced by clastic input. Late Eocene- E Oligocene syn-depositional extensional tectonics (E tilting and block faulting) favoured development of small buildups on highs. After E-ward reef progradation, aggrading shelf developed in Late Oligocene- E Miocene. Demise of buildup in late E Miocene from increase in subsidence and/or nutrient input. Eustasy, oceanographic conditions and type of carbonate producers played subordinate role in buildup development and demise)

Fournier, F., L. Montaggioni & J. Borgomano (2004)- Paleoenvironments and high-frequency cyclicity from Cenozoic south-east Asian shallow-water carbonates: a case study from the Oligo-Miocene buildups on Malampaya (offshore Palawan, Philippines). *Marine and Petroleum Geology* 21, p. 1-21.
(Malampaya- Camago oil-gas field in Nido carbonate buildup of Late Oligocene- E Miocene age (basal part of Nido Lst Late Eocene in age). Microfacies assemblages described. High-frequency cyclicity recognized of 3-10m thick shallowing-upward cycles, often capped by paleosol, probably reflecting Milankovic scale sea level fluctuations)

Fournier, F., T. Teillet, A. Licht, J. Borgomano & L. Montaggioni (2024)- Eocene-Oligocene large-scale circulation of the East Asian summer monsoon recorded in neritic carbonates of the proto-South China Sea. *Palaeogeogr. Palaeoclim. Palaeoecology* 633, 111883, p. 1-17.
(manuscript online at: <https://hal.science/hal-04274237/document>)
(Malampaya carbonate field/ buildup in NW Palawan Block, Philippines. Base of the carbonate section quartz-bearing, of Late Eocene age (Tb letter stage, with Pellatispira and Discocyclina). Overlain by set of thick (>125 m), E Oligocene (E Rupelian; with Nummulites, Halkyardia, Borelis pygmaeus) aggrading Halimeda bioherms. Interpreted to form in nutrient-rich areas subject to upwelling currents and reflect presence of strong coastal jet in Proto-South China Sea, as seen today during the summer monsoonal season. East Asian Monsoon large-scale circulation possibly active as early as Late Eocene in Proto-South China Sea. Evidence for upwelling currents vanishes in late E Oligocene)

Francisco, F.U. (1953)- The Pre-Tertiary rocks of Buruanga Peninsula, Panay Island, Philippines. *Proc. 8th Pacific Science Congress* 2, p. 482-498.
(Buruanga Peninsula of Panay, is uplifted crustal block composed of Mesozoic? Buruanga metamorphic complex, intruded by quartz diorites (probably also pre-Tertiary) in SE, and capped by Tertiary volcanic and sedimentary rocks (now viewed as part of Palawan- Mindoro terrane; JTvG))

Francisco, F.U. (1966)- A review and assessment of oil exploration in the Philippines, 1. Petroleum Division, Philippine Bureau of Mines, p. 1-193.

Francisco, F.U. (1975)- A review of oil exploration and stratigraphy of sedimentary basins of the Philippines, 2. Petroleum Division, Philippine Bureau of Mines, p. 1-95.

Fraser, A.R. & E.B. Guazon (1994)- Geology and petroleum potential of Northeast Palawan Shelf. Australian Geological Survey Organisation (AGSO), Canberra, Record 1994/41, Part 3, p. 1-47.
(online at: https://d28rz98at9flks.cloudfront.net/14753/Rec1994_041.pdf)

Fuller, M., R. Haston & J. Almasco (1989)- Paleomagnetism of the Zambales ophiolite, Luzon, northern Philippines. *Tectonophysics* 168, p. 171-203.
(Paleomagnetic data suggest CCW rotation and N-ward translation of Zambales ophiolite since Eocene)

Fuller, M., R. Haston & E. Schmidtke (1989)- Paleomagnetism in SE Asia: sinistral shear between Philippine Sea Plate and Asia. In: C. Kissel and C. Laj (eds.) *Paleomagnetic rotations and continental deformation*, Kluwer Academic Publishers, p. 411-430.
(Paleomagnetic data from Philippine Sea Plate indicate CW rotation since Oligocene. Sinistral shear zone between Philippine Sea Plate and Asia (incl. Philippines))

Fuller, M., R. McCabe, I.S. Williams, J. Almasco, R.Y. Encina, A.S. Zanolis & J.A. Wolfe (1983)- Paleomagnetism of Luzon. In: D.E. Hayes (ed.) *The tectonic and geologic evolution of Southeast Asian Seas and Islands- II*, American Geophysical Union (AGU), Geophysical Monograph 27, p. 79-94.
(Paleomag of 50 Cenozoic sites in N Philippines. No distinguishable rotations in past 5 My. E-M Miocene results reveal CW rotation of ~20°, but no detectable N-S translation. Eocene sites from Zambales ophiolite and overlying sediments indicate formation at equatorial latitudes. Tectonic model for past 17 My invokes NW motion of Philippine Sea Plate and pinning of N Philippines at S margin by collision with Calamian continental

fragment. Continued advance of leading edge of Philippine Sea Plate causes CCW rotation of Luzon and Manila trench, until N end of trench pinned by collision with Taiwan)

Gabo, J.A.S., C.B. Dimalanta, M.G.S. Asio, K.L. Queano, G.P. Yumul & A. Imai (2009)- Geology and geochemistry of the clastic sequences from Northwestern Panay (Philippines): implications for provenance and geotectonic setting. *Tectonophysics* 479, p. 111-119.

(Whole-rock geochem of clastic sequences in NW Panay show different compositions for Buruanga Peninsula (continental margin provenance; part of Palawan Microcontinental Block) and Antique Range (oceanic island arc provenance; Philippine Mobile Belt))

Gabo-Ratio, J.A., A.E. Buena, B.R.B. Villaplaza, B.D. Payot, C.B. Dimalanta, K.L. Queano, E.S. Andal & G.P. Yumul Jr. (2020)- Epithermal mineralization of the Bonanza-Sandy vein system, Masara Gold District, Mindanao, Philippines. *J. Asian Earth Sciences*: X, 4, 100041, p. 1-13.

(online at: www.sciencedirect.com/science/article/pii/S2590056020300177)

(E Pliocene Bonanza-Sandy epithermal veins in Masara Gold District in SE Mindanao)

Gabo-Ratio, J.A.S., K.D. Jabagat, O.B. Soberano, K. Yonezu & Y.H. Lee (2022)- Geochemistry and geochronology of intrusive units in the Suyoc epithermal deposit: Constraints on magma fertility in the Mankayan Mineral District, Philippines. *Proc. 13th AUN/SEED-Net Regional Conference Geological and Geo-Resource Engineering (RCGEOE), Yogyakarta 2021, IOP Conference Series: Earth and Environmental Science* 1071, 012021, p. 1-6.

(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1071/1/012021>)

(Mankayan Mineral District in N Luzon part of Taiwan-Luzon volcanic arc. With Far SE porphyry copper, Lepanto, Victoria, and Teresa epithermal deposits and Suyoc epithermal prospect. Three batholite units in Suyoc, formed in subduction setting, incl. Late Eocene tonalite (37.2 ± 4.7 Ma) and hornblende quartz diorite (3.2 ± 0.8 Ma (M Pliocene). Pliocene hydrothermal mineralization attributed to hornblende qz diorite)

Galgana, G., M. Hamburger, R. McCaffrey, E. Corpuz & Q. Chen (2007)- Analysis of crustal deformation of Luzon Island, Philippines using geodetic observations and earthquake focal mechanisms. *Tectonophysics* 432, p. 63-87.

(GPS velocities from Luzon and focal mechanism used to constrain tectonic deformation in plate boundary zone between Philippine Sea Plate and Eurasia (Sundaland block). Luzon is tectonically active plate boundary zone, comprising six mobile elastic tectonic blocks between two active subduction zones. Philippine Fault and associated intra-arc faults accommodate much of trench-parallel component of relative plate motion)

Gallagher, J.J. (1986)- Philippine Islands: a tectonic railroad siding. In: M.T. Halbouty (ed.) *Future petroleum provinces of the world*, American Assoc. Petroleum Geol. (AAPG), Memoir 40, p. 515-527.

(Philippine islands mix of continental and oceanic crust fragments. Carbonate and clastic sediments of main terranes currently deforming by strike-slip, subduction and extension. Complex tectonic history potentially limits size of hydrocarbon accumulations. With plate tectonic reconstructions M Jurassic- Recent: Mesozoic subduction complex, Late Cretaceous- E Eocene rift and strike slip, E Oligocene- M Miocene drift, M Miocene collision between Cuyo tectonic element and subduction complex to S, Late Miocene and younger accretion)

Gallagher, J.J. (1987)- Philippine microplate tectonics and hydrocarbon exploration. In: M.K. Horn (ed.) *Trans. 4th Circum-Pacific Energy and Mineral Resources Conference*, Singapore 1986, p. 103-119.

(Similar to Gallagher (1986) paper. Early carbonate and clastic stratigraphic traps developed during Mesozoic and Early Cenozoic rifting. Hydrocarbons generated in deep rift basins and migrated to early traps during rifting and drifting. Later Cenozoic compressional activity may have destroyed some traps. With plate tectonic reconstructions Late Triassic- Recent)

Gan, R.M. & F. Rillera (1984)- Lower Miocene carbonates in West Palawan. In: *Joint ASCOPE/CCOP Workshop on the hydrocarbon occurrence in carbonate rocks*, Surabaya 1982, ASEAN ASCOPE Technical Paper 2, Jakarta, p. 433-444.

(On E Miocene Nido Limestone in Palawan area. North Palawan metamorphic complex, dated as M Devonian, unconformably overlain by Permian shelfal limestones. M Permian fusulinid limestone (found on S Mindoro, Calamian Islands, Carabao, NW Palawan, etc., Lower?-Middle Triassic radiolarian cherts, Jurassic clastics and limestones, etc.)

Garrison, R.E., E. Espiritu, L.J. Horan & L.E. Mack (1979)- Petrology, sedimentology, and diagenesis of hemipelagic limestone and tuffaceous turbidities in the Aksitero Formation, Central Luzon, Philippines. U.S. Geological Survey (USGS) Professional Paper 1112, p. 1-16.

(online at: <https://pubs.usgs.gov/pp/1112/report.pdf>)

(Aksitero Fm of C Luzon is U Eocene- Lower Oligocene sequence of hemipelagic limestone with thin tuffaceous turbidites, overlying Zambales ophiolitic basement complex. Limestone mainly planktonic foraminifera and calcareous nannofossils, with up to 30% volcanoclastic debris. Hydrocarbons migrated into tuffaceous layers early during diagenesis but subsequently flushed out and only bitumen coatings remain. Deposition of Aksitero Fm probably at >1000m water depth in subsiding basin adjacent to active island arc system)

Geary, E.E., T.M. Harrison & M. Heizler (1988)- Diverse ages and origins of basement complexes, Luzon, Philippines. *Geology (GSA)* 16, 4, p. 341-344.

(⁴⁰Ar/³⁹Ar ages from two basement complexes in SE Luzon document first occurrences of pre-Late Cretaceous age rocks in E Philippines: Late Jurassic (Caramoan complex) to E Cretaceous and E Miocene (Camarines Norte- Calaguas Islands complex). Philippine Archipelago amalgamation of allochthonous Mesozoic and Cenozoic island-arc, ocean-basin and continental fragments assembled during Tertiary)

Geary, E.E. & R.W. Kay (1989)- Identification of an Early Cretaceous ophiolite in the Camarines Norte-Calaguas Islands basement complex, eastern Luzon, Philippines. *Tectonophysics* 168, p. 109-126.

(Pre-Late Cretaceous ophiolite assemblage underlies much of metamorphic basement of E part of Camarines Norte-Calaguas Islands, SE Luzon. Ophiolite lithologies harzburgites, gabbros, pillow lavas, etc., structurally disrupted by W-ward directed thrusting. Minimum age of 100 Ma inferred from Ar/Ar analyses of amphibolites associated with gabbros)

Geary, E.E., R.W. Kay, J.C. Reynolds & S.M. Kay (1989)- Geochemistry of mafic rocks from the Coto Block, Zambales ophiolite, Philippines: trace element evidence for two stages of crustal growth. *Tectonophysics* 168, p. 43-63.

(Coto Block portion of Zambales ophiolite two-stage crustal history: (1) dominantly N-MORB type ocean crust formation at large or back-arc basin spreading center; (2) soon thereafter chemically modified by incipient island arc magmatism, most probably in proto-forearc setting)

Gervasio, F.C. (1966)- A study of the tectonics of the Philippine Archipelago. *The Philippine Geologist (J. Geological Society of the Philippines)* 20, 2, p. 51-75.

Gervasio, F.C. (1966)- The age and nature of orogenesis of the Philippines. *The Philippine Geologist (J. Geological Society of the Philippines)* 20, 4, p. 121-140.

Gervasio, F.C. (1967)- Age and nature of orogenesis of the Philippines. *Tectonophysics* 4, p. 379-402.

(Same paper as Gervasio (1966) above. Orogenesis of Philippines two geotectonic cycles: 'Variscan' Late Paleozoic folding and 'Alpine'. Early Mesozoic sedimentation cycle terminated by orogenic phase at close of Jurassic)

Gervasio, F.C. (1968)- Age and nature of orogenesis of the Philippines. United Nations ECAFE, CCOP, Technical Bulletin 1, p. 113-128.

(online at: <https://repository.unescap.org/handle/20.500.12870/5060>)

(Same paper as Gervasio (1967) above)

Gervasio, F.C. (1971)- Geotectonic development of the Philippines. *The Philippine Geologist (J. Geological Society of the Philippines)* 25, 1, p. 18-38.

(Geotectonic development of Philippines two long-term and several short-term cycles of crustal reorganization from Paleozoic to Recent)

Gervasio, F.C. (1971)- Ore deposits of the Philippines Mobile Belt. The Philippine Geologist (J. Geological Society of the Philippines) 25, 3, p.

Gervasio, F.C. (1973)- Ore deposits of the Philippines Mobile Belt. In: N.H. Fisher (ed.) Metallic provinces and mineral deposits in the Southwest Pacific, Bureau Mineral Resources Geology Geophysics, Bull. 141, p. 191-207.

Gervasio, F.C. (1973)- Geotectonic development of the Philippines. In: P.J. Coleman (ed.) The Western Pacific: island arcs, marginal seas, geochemistry, Western Australia University Press, p. 307-324.

Gibaga, C.R.L., C.A. Arcilla & Nguyen Hoang (2020)- Volcanic rocks from the Central and Southern Palawan Ophiolites, Philippines: tectonic and mantle heterogeneity constraints. J. Asian Earth Sciences: X, 4, 100038, p. 1-17.

(online at: www.sciencedirect.com/science/article/pii/S2590056020300141)

(Two ophiolites on Palawan: C Palawan Ophiolite (CPO) and S Palawan Ophiolite (SPO). CPO lavas back-arc basin basalt (BABB) affinities; SPO rocks diverse, incl. boninitic andesites, MORB-like lavas, etc. CPO Late Eocene back-arc basin fragments formed in proto-South China Sea. SPO subduction initiation origin and formed in Sundaland-Eurasian margin in E Cretaceous. Both ophiolites emplaced on Palawan Continental Terrane (PCT) due to collision of PCT with Borneo and Cagayan Ridge)

Giese, U., U. Knittel & U. Kramm (1986)- The Paracale intrusion: geologic setting and petrogenesis of a trondhjemitic intrusion in the Philippine island arc. J. Southeast Asian Earth Sciences 1, 4, p. 235-245.

(online at: www.researchgate.net/publication/223865947_The_Paracale_Intrusion_geologic_setting_Etc.)

(Paracale (~M Miocene) tonalite/trondhjemitic (granodiorite) intrusion hosted by and part of Mesozoic ultramafic complex, exposed on N shore of Camarines Norte (S Luzon). Trondhjemites may have formed by partial melting of tholeiitic materials under high water pressure. Magma may have been intruded as semi-solid plagioclase cumulate which resulted in pronounced flow lamination of rocks)

Gong, Lin, P. Hollings, Y. Zhang, J. Tian, D. Li, A.E. Berador & H. Chen. (2021)- Contribution of an Eastern Indochina-derived fragment to the formation of island arc systems in the Philippine Mobile Belt. Geological Society of America (GSA) Bull. 133, 9-10, p. 1979-1995.

(Philippine Mobile Belt complex plate boundary with multiple terranes. Cretaceous-Miocene arc magmatic rocks from Cebu and Bohol with U-Pb zircons showing crystallization ages of Cretaceous (ca. 120-90 Ma), M Eocene- E Oligocene (ca. 43-30 Ma), and M Miocene (ca. 14 Ma). Also common inherited Permian-Triassic zircon xenocrysts clustering at ~250 Ma and negative $\epsilon\text{Hf}(t)$ values similar to coeval rocks in E Indochina. Eastern Indochina-derived continental fragment involved in formation of arcs in Cebu and Bohol)

Gonzales A.G. (1959)- Geology and genesis of the Lepanto copper-gold deposit, Mankayan, Mountain Province, Philippines, PhD. Dissertation, Stanford University, California, p. 1-204. *(Unpublished)*

Gonzales, A.S. (1956)- Geology of the Lepanto copper mine, Mankayan, Mountain Province. In: A.R. Kinkel et al. (eds.) Copper deposits of the Philippines, Special Projects Series, Publication 16, p. 17-30.

Gonzales, B.A. (1960)- Planktonic foraminifera from the Lubuagan, Callao and Cabagan Formation exposed along the Cabagan River, Eastern Isabela. The Philippine Geologist (J. Geological Society of the Philippines) 14, 4, p. 106-130.

Gonzales, B.A. (1961)- Revisions on the correlation of some of the units in the Indonesian Letter Classification as used in the Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 15, 4, p. 170-179.

- Gonzales, B.A. (1962)- Foraminiferal zonation of SVOC Faire no. 1 well, Cagayan, Luzon. J. Geological Society of the Philippines 16, 4, p.
(Stanvac Faire 1 well in Cagayan Valley seven M Miocene- Pleistocene foraminiferal zones and three formations. Repetition of beds occurs at 8530' indicated by recurrence of Late Miocene (Tf3) species)
- Gonzales, B.A. (1969)- Development and status of paleontological research in the Philippines. United Nations ECAFE, CCOP, Technical Bulletin 2, p. 87-95.
(online at: <https://repository.unescap.org/items/de2c7815-b3ab-4b39-9394-f9e4621cc4e1>)
- Gonzales, B.A. (1969)- Development and status of micropaleontological research in the Philippines. J. Geological Society of the Philippines 23, 4, p. 183-195.
(Same paper as above)
- Gonzales, B.A., S.G. Martin & E.P. Espiritu (1978)- Philippines; onshore stratigraphy of the Philippine Tertiary basins. In: Stratigraphic correlation between sedimentary basins of the ESCAP region V, ESCAP Atlas of stratigraphy I: Burma, Malaysia, Thailand, Indonesia, Philippines, UN Mineral Resources Development Series 44, p. 33-44.
(online at: <https://www.unescap.org/kp/1978/stratigraphic-correlation-between-sedimentary-basins-escap-region-vol-v-escap-atlas>)
- Grey, R.R. (1956)- Eocene in the Philippines. Proc. Eighth Pacific Science Congress, Quezon City 1953, 2, p. 503-514.
(Eocene in Philippines very limited, and unconformable on Pre-Tertiary rocks. Hashimoto 1969: Occurrences of larger forams Discocyclina, Pellatispira, Nummulites, etc.)
- Grey, R.R. (1967)- Time-stratigraphic correlation of Tertiary rocks in the Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 21, 1, p. 1-20.
- Grotsch, J. & C. Mercadier (1999)- Integrated 3-D reservoir modelling based on 3-D seismic: the Tertiary Malampaya and Camago buildups, offshore Palawan, Philippines. American Assoc. Petroleum Geol. (AAPG) Bull. 83, 11, p. 1703-1728.
(On complex complex sedimentary geometries, diagenesis, etc. of Oligocene- E Miocene Malampaya and Camago reefal buildups, offshore NW Palawan. Thickest Nido Lst in area 700m thick. Distribution of reefal Nido Lst facies mainly controlled by underlying NE-SW trending, extensional basement faults. Buildups started in Oligocene (but also report Eocene Discocyclina; JTvG) and drowned in E Burdigalian. Porosity development in buildups predominantly early diagenetic (cementation and leaching during repeated subaerial exposure)
- Guballa, J.D.S. & A.G.S. Fernando (2015)- Calcareous nannofossil biostratigraphic study of the Pugo River section of Amlang Formation in the Luzon Central Valley Basin, Philippines. Bull. National Museum Natural Science, Tokyo, Ser. C, 41, p. 53-59
(online at: www.kahaku.go.jp/research/publication/geology/download/41/L_BNMNS_C41_53-59.pdf)
- Guotana, J.M.R., B.D. Payot, C.B. Dimalanta, N.T. Ramos, D.V. Faustino-Eslava, K.L. Queano & G.P. Yumul (2016)- Petrological and geochemical characteristics of the ultramafic section of the Samar Ophiolite: Implications on the origins of the ophiolites in Samar and Leyte, Philippines. In: Development of the Asian Tethyan Realm: genesis, process and outcomes, 5th Int. Symposium International Geoscience Program (IGCP) Project 589, Yangon, p. 25-30. *(Extended Abstract; see also full paper in Guotana et al. (2028))*
(online at: <http://igcp589.cags.ac.cn/5th%20Symposium/Abstract%20Volume.pdf>)
(late Early- early Late Cretaceous Samar Ophiolite part of Cretaceous belt of ophiolites and ophiolitic complexes along E Philippines. Peridotites, gabbros and massive flow and pillow lavas at S Samar Island represent mantle and crustal sections of Samar Ophiolite, with chemistry comparable to supra-subduction zone peridotites. Ophiolites also exposed in Leyte Island W of Samar (Tacloban and Malitbog Ophiolite Complexes), but strong affinity with abyssal peridotites)

Guotana, J.M.R., B.D. Payot, C.B. Dimalanta, N.T. Ramos, D.V. Faustino-Eslava, K.L. Queano & G.P. Yumul (2017)- Arc and backarc geochemical signatures of the proto-Philippine Sea Plate: insights from the petrography and geochemistry of the Samar Ophiolite volcanic section. *J. Asian Earth Sciences* 142, p. 77-92. (ms online at: www.academia.edu/114174551/Arc_and_backarc_geochemical_signatures_of_the_prot_Etc.) (Remnants of Cretaceous lithosphere of arc affinities at peripheries of W Philippine Basin: Amami Plateau, E Halmahera Ophiolite and SSZ ophiolites along E margin of Philippine archipelago (incl. early Late Cretaceous Samar Ophiolite in C Philippines with strong subduction-related influences and formation in island arc setting. Other similar-age ophiolites along E margin (N of Samar) weak to almost mid-oceanic ridge characteristics)

Guotana, J.M.R., B.D. Payot, C.B. Dimalanta, N.T. Ramos, D.V. Faustino-Eslava, K.L. Queano & G.P. Yumul (2018)- Petrological and geochemical characteristics of the Samar Ophiolite ultramafic section: implications on the origins of the ophiolites in Samar and Leyte islands, Philippines. *International Geology Review* 60, 4, p. 401-417.

(On Samar, Tacloban and Malitbog Cretaceous ophiolite complexes on Samar and Leyte islands, E Central Philippines. Samar Ophiolite complete crust-mantle sequence with supra-subduction zone peridotites. Etc.)

Gutierrez, F.I. & P.J. Militante Matias (1991)- Oligo-Miocene events in the Binangonan Formation, Rizal Province, Philippines. *J. Geological Society of the Philippines* 46, p.

(Teresa Tuffaceous Siltstone Mb of Binangonan Fm interbedded limestone with earliest Miocene *Spiroclypeus*, *Miogypsina*, etc. and tuffaceous siltstones rich in planktonic forams (*Globigerinoides* *Globoquadrina*, *Catapsydrax*, etc.), suggesting contemporaneous transfer of larger foraminifera from shallow to deeper waters)

Hamburger M., R. Cardwell & B. Isacks (1983)- Seismotectonics of the northern Philippine Island Arc. In: D.E. Hayes (ed.) *The tectonics and geologic evolution of southeast Asian seas and islands II*, American Geophysical Union (AGU) Monograph 27, p. 1-22.

Hargreaves, T.J. et al. (1992)- The geology of the Caluit discovery NW Palawan, Philippines. *Philippine Exploration Conference*, Manila, p. 1-13.

Hashimoto, W. (1969)- Paleontology of the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 6, p. 293-329.

(Review of Carboniferous- Pliocene fossils assemblages from Philippines. Oldest rocks from Mansalay region on S Mindoro: (1) Permian limestones with fusulinids and algae in Eocene conglomerate; (2) Jurassic with ammonoids *Macrocephalites* aff. *keeuwensis*, *Perisphinctes taliabuticus*, *Oppelia*, *Phylloceras*, also bivalve *Trigonia mindoroensis*, *Inoceramus galoi*, etc. (also Andal 1968). Cretaceous with larger foram *Orbitolina* on Cebu, *Globotruncana* marls overlain by Eocene limestones in Samaloc area, etc.)

Hashimoto, W. (1975)- Larger Foraminifera from the Philippines. Part IV. Larger Foraminifera from the Mountain Province. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 127-139.

Hashimoto, W. (1980)- On the fundamental structural units of the Philippine basement and the extension to the neighbouring countries. In: T. Kobayashi, R. Toriyama et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 303-317.

(Review of Philippines geology- stratigraphy. Oldest unit is Palawan orogenic belt with partly metamorphosed Carboniferous- Permian - E Triassic rocks and Jurassic Mansalay Fm; extends into Semitau metamorphic belt of Borneo? Next older unit Sulu Orogenic Belt)

Hashimoto, W. (1981)- Two types of Tertiary oil basins in the Philippines. *Proc. 4th Regional Conference Geology, Mineral and Energy Resources of SE Asia (GEOSEA IV)*, Manila 1981, p. 277-286.

Hashimoto, W. (1981)- Geologic development of the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 22, p. 83-170.

Hashimoto, W. (1981)- Supplementary notes on the geological development of the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 22, p. 171-190.

Hashimoto, W. (1982)- Palaeontology of The Philippines, Supplement I. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 24, p. 129-166.
(Continuation of Hashimoto (1969) list. Rel. extensive review of paleontological papers from The Philippines published from 1969-1981 plus additions to the pre-1969 list)

Hashimoto, W., P.M. Alcantara, N. Aoki, G.R. Balce & P.P. David (1978)- *Nummulites* from the Lubingan crystalline schist of Bongabon, Nueva Ecija and their significance on the geologic development of the Philippines. *Proc. of the Japan Academy, Series B*, 54, 1, p. 1-4.
(online at: https://www.jstage.jst.go.jp/article/pjab1977/54/1/54_1_1/_pdf)
(*Nummulites* limestone as float and interbedded green schists NW of Dingalan in E Luzon. Presumably of Early Eocene age)

Hashimoto, W., N. Aoki, P.P. David, G.R. Balce & P.M. Alcantara (1978)- Discovery of *Nummulites* from the Lubingan crystalline schist exposed east of Bongabon, Nueva Ecija, Philippines and its significance on the geologic development of the Philippines. In: *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 19, p. 57-63.
(Same paper as above)

Hashimoto, W. & G.R. Balce (1975)- A new correlation scheme for the Philippine Cenozoic formations. In: H. Ujiie & T. Saito (eds.) *Proc. 1st International Congress Pacific Neogene stratigraphy*, Tokyo 1976, p. 119-132.
(Larger foram range chart and Philippines formations correlation table)

Hashimoto, W., S. Kanno, T. Takayama, Y. Makino, P.D. David, P.M. Alcantara et al. (1983)- Discovery of *Vicarya*-yielding places in the Baguio District, Philippines, and its geohistorical significance. *Proc. of the Japan Academy, Series B*, 59, 6, p. 149-152.
(online at: www.jstage.jst.go.jp/article/pjab1977/59/6/59_6_149/_pdf/-char/en)
(Occurrences of Miocene index gastropod *Vicarya* in Zigzag/ Mirador Limestone, previously dated by larger foraminifera as zone Te5-Tf1 (E-M Miocene))

Hashimoto, W., N. Kitamura, G.R. Balce, K. Matsumaru, K. Kurihara & E.Z. Aliate (1979)- Larger foraminifera from the Philippines. X. Stratigraphic and faunal breaks between the Maybangain and Kinabuan Formations in the Tanay region. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 20, p. 143-157.
(Tanai- Daraitan section E of Manila shows U Cretaceous Kinabuan Fm Globotruncana mudstones, unconformably overlain by Paleogene Mayabangain Fm sediments, with parts of Maastrichtian- E Paleocene missing. Masungit Lst Mb with 11 E-M Eocene (zone Ta2) larger foram species, incl. *Asterocyclina* spp., *Fasciolites bosci*, *F. javana*, *Orbitolites*, *Nummulites perforatus*, *N. burdigalensis* and other *N. spp.*, *Assilina spira* (N.B.: no Late Eocene *Pellatispira-Spirochypeus* limestone observed in region))

Hashimoto, W. & K. Matsumaru (1975)- Larger foraminifera from the Philippines. Part III. Limestone from eastern coastal ranges of north and central Luzon. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 16, p. 117-125.

Hashimoto W. & K. Matsumaru (1977)- Larger foraminifera from the Philippines; Part V: Larger foraminifera from Cenozoic limestones in the Mansalay vicinity, Oriental Mindoro, with an appendix An orbitoid-bearing limestone from Barahid, Bongabong. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 18, p. 59-76.

Hashimoto W. & K. Matsumaru (1978)- Larger foraminifera from the Philippines, VI: Larger Foraminifera found from the Pinugay Hill Limestone, Tanay, Rizal, Central Luzon. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 65-72.
(*Paleocene limestone 35km SE of Manila, rel. unique in SE Asia, with Distichoplax biserialis, Ranikothalia, Assilina and ?Discocyclina. Also possible reworked U Cretaceous Lepidorbitoides or Pseudorbitoides and Omphalocyclus* ((Lunt & Allan, 2004, Matsumaru, 2017))

Hashimoto W. & K. Matsumaru (1978)- Larger foraminifera from the Philippines, VII: Larger foraminifera from the Lutak Hill Limestone, Pandan Valley, central Cebu. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 73-80.

Hashimoto W. & K. Matsumaru (1978)- Larger foraminifera from the Philippines, VIII: Larger Foraminifera from Central Samar. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 81-88.
(*Three Miocene species*)

Hashimoto, W. & K. Matsumaru (1978)- Larger foraminifera from the Philippines. IX. Larger foraminifera found from the Zigzag limestone, south of Boguio, Benguest, Luzon, Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 89-96.
(*Five species of lower Middle Miocene*)

Hashimoto, W. & K. Matsumaru (1981)- Larger foraminifera from the Philippines. Part XI. 1. On the Coal Harbor Limestone, Cagraray Island, Batan Island Group, Albay Province. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 56-62.

Hashimoto, W. & K. Matsumaru (1981)- Larger foraminifera from the Philippines. Part XII. Eocene limestone from southeastern Luzon. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 63-73.

Hashimoto, W. & K. Matsumaru (1981)- Geological significance of the discovery of *Nummulites fichteli* (Michelotti) from the Sagada Plateau, Bontoc, Mountain Province, Northern Luzon, Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 75-82.
(*Discovery of generally rare E Oligocene (zone Td) reticulate Nummulites fichteli in N Luzon, in thin limestones in volcanoclastic Sagada Fm. Associated with Lepidocyclina (Eulepidina) and Cycloclypeus cf. oppenoorthi*)

Hashimoto, W. & K. Matsumaru (1982)- Larger foraminifera from the Philippines. Part XIV. On some larger Foraminifera-bearing rocks from Palawan. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 24, p. 39-44.
(*Three outcrop samples from Palawan with M-L Miocene larger foraminifera (Lepidocyclina (Multilepidina) luxurians). No stratigraphic context*)

Hashimoto, W. & K. Matsumaru (1984)- Mesozoic and Cenozoic larger Foraminifera of the Philippines and references to those found from Borneo by the APRSA's palaeontological reconnaissance. In: T. Kobayashi, R. Toriyama & W. Hashimoto (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 25, p. 147-166.
(*Review of Cretaceous (Orbitolina) and Tertiary larger foraminifera occurrences in The Philippines*)

Hashimoto, W., K. Matsumaru & P.M. Alcantara (1982)- Larger foraminifera from the Philippines. Part XIII. Larger foraminifera from the Trankalan Limestone and the Escalante (Toboso) Formation, West of Lanao River Valley, northeastern Occidental Negros. In: T. Kobayashi et al. (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 24, p. 31-38.

(Trankalan Lst with Late Oligocene Te2-3- Te4 larger foraminifera (Lepidocyclina, Spiroclypeus, Miogypsinoides companatus, etc., Escalante Fm with Early Miocene Te4-Te5 forams (inc. Miogypsina))

Hashimoto, W., K. Matsumaru & H. Fuchimoto (1980)- Consideration on the stratigraphy of the Caraballo Range, Northern Luzon: larger foraminiferal ranges on the Cenozoic of the Philippines. In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 119-134.

(Caraballo Range of NE Luzon with larger foram-bearing limestones of different ages: low-metamorphic Lubingan Fm 'basement' with Eocene Nummulites Lst (= ~M Eocene metamorphism?). Mamparang Fm volcanics with Oligocene Eulepidina. Unconformably overlain by latest Oligocene- E Miocene (Te) Santa Fe Lst with Miogypsinoides, Spiroclypeus, Eulepidina, etc., late E Miocene (Tf1) Natbang Fm)

Hashimoto, W., K. Matsumaru & K. Kurihara (1977)- Larger foraminifera from the Philippines. Part V. Larger Foraminifera from Cenozoic limestones in the Mansalay vicinity, Oriental Mindoro, with appendix "An orbitoid-bearing limestone from Barahid, Bongabong". In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 18, p. 59-76.

Hashimoto, W., K. Matsumaru & K. Kurihara (1978)- Larger foraminifera from the Philippines. Part VI. Larger foraminifera found from the Pinugay Hill Limestone, Tanay, Rizal, Central Luzon. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 65-72.

(Cosico et al. 1989: occ. Late Cretaceous Lepidorbitoides, Omphalocyclus and Paleocene Ranikothalia, Distichoplax, Assilina on Luzon)

Hashimoto, W., K. Matsumaru & K. Kurihara (1978)- Larger foraminifera from the Philippines. Part VII. Larger Foraminifera found from the Lutak Hill Limestone, Pandan Valley, Central Cebu, Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 19, p. 73-80.

Hashimoto, W., K. Matsumaru, K. Kurihara, P.P. David & G.R. Balce (1977)- Larger foraminiferal assemblages useful for the correlation of the Cenozoic marine sediments in the mobile belt of the Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 18, p. 103-124.

(Range charts, etc.) showing occurrences of 137 species of larger forams between Paleocene- Miocene, and correlation with planktonic foram zonation)

Hashimoto, W., K. Matsumaru & M. Sugaya (1982)- Larger Foraminifera from the Philippines. Part XI. On the Coal Harbor Limestone, Cagraray Island, Batan Island Group, Albay Province. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 22, p. 55-62.

(Five U Oligocene- M Miocene species of larger forams)

Hashimoto, W. & T. Sato (1968)- Contribution to the geology of Mindoro and neighboring islands, The Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and palaeontology of Southeast Asia, University of Tokyo Press, 5, p. 192-210.

(Mindoro and neighboring islands key area for early geologic history of Philippines, with crystalline schists, and folded Triassic, Jurassic and Eocene sediments. M-U Jurassic Mansalay Fm with conglomerates with clasts of metamorphics and Permian fusulinid limestones. Thick Eocene clastics (>1000m) on N Mindoro, with Nummulites and Biplanispira?.)

Hashimoto, W. & T. Sato (1973)- Geological structure of North Palawan and its bearing on the geological history of the Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University Tokyo Press, 13, p. 145-161.

(N Palawan (mainly Malampaya Sound) low-metamorphic M Permian (with black fusulinid limestones, incl. Neoschwagerina, Verbeekina, Parafusulina) - M Triassic sediments, intensely folded, with NNW-SSE fold axes. In S Mindoro similar rocks unformably overlain by M and U Jurassic)

- Hayami, I. (1968)- Some Jurassic bivalves from Mindoro. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 5, p. 173-185.
(*Descriptions of 8 species of U Callovian- Oxfordian bivalves from dark grey mudstones of Mansalay Fm on Mansalay Island (part of Palawan Block, incl. Inoceramus cf. galoi, Aulacomyella, Plagiostoma, Astarte, Rutitrigonia, Myophorella, etc.)*)
- Hayasaka, I. (1943)- On the Jurassic formation of the Philippines; with a note on *Trigonia*. *Taiwan Tigaku Kizi*, 14, p. 1-12.
(*in Japanese, with English summary. Arkell 1956: Jurassic ammonites in shales of SE Mindoro Island, incl. Arietites, Oppelia, Macrocephalites, Peltoceras, Perisphinctes. Also bivalve Trigonia mindoroensis (see also Andal et al. 1968, Jurassic Mansalay Fm, ammonites interpreted as U Oxfordian in age)*)
- Hayes, D.E. & S.D. Lewis (1984)- A geophysical study of the Manila trench, Luzon, Philippines. 1- Crustal structure, gravity and regional tectonic evolution. *J. of Geophysical Research: Solid Earth* 89, B11, p. 9171-9195.
(*Manila Trench subduction zone is active convergent plate margin between S China Sea and N Philippines. With associated volcanic arc, E-dipping Benioff zone beneath Luzon, and well-developed fore arc basin system. Luzon Trough fore arc basins up to 4.5 km of Cenozoic sediments. Accretionary prism seaward of fore arc basin system. Uplifted Zambales ophiolite forms landward side of fore arc basin. Average convergence at Manila Trench 10-20 mm/yr and may be slowing in N due to collision of Taiwan with Eurasia (see also Lewis and Hayes 1989)*)
- Hayes, D.E. & S.D. Lewis (1985)- Structure and tectonics of the Manila trench system, Western Luzon, Philippines. *Energy* 10, p. 263-279.
(*Manila Trench active subduction zone W of Luzon is plate margin between S China Sea and N Philippines, with E-dipping Benioff zone beneath Luzon, accretionary prism of turbidite sediments, forearc basin with up to 4.5 km of Cenozoic sediments and volcanic arc. Subduction may have been active since Late Oligocene- E Miocene, synchronous with cessation of Paleogene subduction along E Luzon and similar to age of uplift and tilting of Zambales ophiolite. Trench strata folded and faulted at base of trench slope; major decollement usually near boundary between pelagic sediments and overlying turbidite sediments. Uplifted Zambales ophiolite forms landward side of forearc basin. Uplift of forearc basins only near intersection of relict spreading center of S China Sea plate)*)
- Hayes, D.E. & W.J. Ludwig (1967)- The Manila Trench and West Luzon Trough- II. Gravity and magnetism measurements. *Deep Sea Research* 14, 5, p. 545-560.
(*Manila Trench and W Luzon Troughs W of the Philippine Island Arc at Luzon with free-air gravity anomalies of -80 mgal and -145 mgal respectively. Magnetic anomalies cannot be correlated over appreciable distances and are much smaller E of the trench than W of it (see also companion paper of Ludwig et al. 1967)*)
- Hedenquist, J.W., A. Arribas & M. Aoki (2017)- Zonation of sulfate and sulfide minerals and isotopic composition in the Far Southeast Porphyry and Lepanto epithermal Cu-Au deposits, Philippines. *Resource Geology* 67, 2, p. 174-196.
(*online at: <http://onlinelibrary.wiley.com/doi/10.1111/rge.12127/epdf>*)
(*On Far Southeast (FSE) porphyry system and adjacent Lepanto Lepanto Cu-Au high-sulfidation deposit of Mankayan mineral district of N Luzon. Age of mineralization ~1.3-1.4 Ma*)
- Hedenquist, J.W., A. Arribas & T.J. Reynolds (1998)- Evolution of an intrusion-centred hydrothermal system; Far Southeast- Lepanto porphyry and epithermal Cu-Au deposits, Philippines. *Economic Geology* 93, 4, p. 373-404.
(*E Pleistocene Lepanto high-sulfidation epithermal Cu-Au deposit is superadjacent to Far Southeast porphyry Cu-Au ore body. Quartz diorite porphyry dikes intruded Miocene basement rocks of metavolcanic and volcanoclastic rocks to 300-m elevation. Intrusions postdate Pliocene volcanic breccia and dacite porphyry that host much of the epithermal ore (these two systems are commonly linked)*)

Heide, F. (1938)- Über Tektite von den Philippinen. Zentralblatt Mineralogie Geologie Palaontologie, A, p. 289-293.

('About tektites from the Philippines')

Hillmer, G. (ed.) (1991)- Central Philippines: mapping, mining, modern reefs. Mitteilungen Geologisch-Palaontologisch Institut Universität Hamburg 71, p. 1-506.

Hinz, K., E.H.K. Kempter & H.U. Schluter (1985)- The southern Palawan-Balabac area: an accreted or non-accreted terrane? Proc. 3rd Conference of Asean Council on Petroleum (ASCOPE), Kuala Lumpur, 2, p. 48-72.
(Palawan Trough not underlain by SW-subducting oceanic plate from which sediments were scraped off in pre-M Miocene time, as Hamilton (1979) a.o. suggested, but by N Palawan continental terrane, which underlies Palawan Trough, the W shelf of Palawan and NW Borneo. Strongly deformed and ophiolite-bearing equivalents of Cretaceous Chert-Spilite and Paleogene Crocker Fms of S and C Palawan were overthrust in pre-M Miocene time onto N Palawan continental terrane)

Hinz, K. & H.U. Schluter (1985)- Geology of the Dangerous grounds, South China Sea, and the continental margin off southwest Palawan: results of SONNE cruises SO-23 and SO-27. Energy 10, 3-4, p. 297-315.
(Seismic, magnetic and gravity data along 51 profiles in SE S China Sea (Dangerous Grounds, Palawan Trough). Five regional unconformities: Miocene-Pliocene, M Miocene (end of S China Sea seafloor spreading), Lower Miocene (often top of carbonate platforms), M-U Oligocene (rift-drift transition S China Sea) and Cretaceous-Paleocene (onset of rifting). Dangerous Grounds and parts of Palawan Trough underlain by stretched continental crust. Oldest rocks sampled in Dangerous Grounds U Triassic- Jurassic. U Oligocene- Lw Miocene carbonate platform from Dangerous Grounds E under Palawan Trough and Palawan shelf. C and S Palawan part of microcontinent with Dangerous Grounds/Reed Bank, N Palawan and Calamian block. E edge of carbonate platform overthrust from S by chaotically deformed sediments, suggesting Palawan Trough not ancient subduction trench, but loading of overthrust wedge)

Hock, M. & G. Friedrich (1985)- Structural features of ophiolitic chromitites in the Zambales Range, Luzon, Philippines. Mineralium Deposita 20, p. 290-301.
(Chromitite-bearing peridotites of Zambales mafic-ultramafic complex form lowermost level of Zambales ophiolite, which exposes complete ophiolitic sequence. Chromitites close to peridotite/gabbro transition zone)

Hock, M., G. Friedrich, W.L. Pluger & A. Wichowski (1986)- Refractory- and metallurgical-type chromite ores, Zambales ophiolite, Luzon, Philippines. Mineralium Deposita 21, 3, p. 190-199.
(Zambales ophiolite the major source of chromite ore in Philippines. Chromitites are concordant cumulates associated with distinct chromitite-bearing sequences within mantle peridotites. Refractory and metallurgical chromite deposits spatially separated and related to different lithologic associations)

Hollings, P., D.R. Cooke, P.J. Waters & B. Cousens (2011)- Igneous geochemistry of mineralized rocks of the Baguio District, Philippines: implications for tectonic evolution and the genesis of porphyry-style mineralization. Economic Geology 106, 8, p. 1317-1333.
*(online at: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.827.8817&rep=rep1&type=pdf>)
(Baguio district large copper-gold province in epithermal, porphyry, and skarn deposits that formed in last 3.5 My. Pliocene and Pleistocene igneous rocks associated with mineralization are intermediate- felsic low-medium K intrusions (contaminated by young arc crust), and mafic-intermediate, medium K-shoshonitic hornblende-phyric dikes (primitive mantle-derived melts). Philippine arc currently sandwiched between two active subduction zones)*

Hollings, P., G. Sweet, M. Baker, D.R. Cooke & R. Friedman (2013)- Tectonomagmatic controls on porphyry mineralization: geochemical evidence from the Black Mountain porphyry system, Philippines. In: M. Colpron et al. (eds.) Tectonics, metallogeny, and discovery: the North American Cordillera and similar accretionary settings, Society of Economic Geologists, Special Publ. 17, p. 301-335.
(Black Mountain SE Cu-Au porphyry system of Baguio district, N Luzon, two orebodies, associated with 6 intrusive phases between ~4.7- 2.8 Ma. Porphyry mineralization interpreted to have formed as result of

underplating of felsic magma chamber by mafic magma, from mantle recharge related to subduction of aseismic Scarborough Ridge)

Hollings, P., R. Wolfe, D.R. Cooke & P.J. Waters (2011)- Geochemistry of Tertiary igneous rocks of Northern Luzon, Philippines: evidence for a back-arc setting for alkalic porphyry copper-gold deposits and a case for slab roll-back? *Economic Geology and Bull. Soc. Economic Geology*, 106, 8, p. 1257-1277.
(*On Late Oligocene- E Miocene volcanic rocks in C Cordillera Range and Cagayan Valley of N Luzon*)

Holloway, N.H. (1981)- The North Palawan block, Philippines: its relation to the Asian mainland and its role in the evolution of the South China Sea. *Bull. Geological Society Malaysia* 14, p. 19-58.
(*online at: www.gsm.org.my/products/702001-101199-PDF.pdf*)
(*Mindoro, N Palawan and Reed Bank in SW Philippines comprise the Palawan Block continental fragment. Permian-Paleogene rocks with 4 pre-Neogene unconformities suggest original pre-drift position against S China mainland. Tectonic history: (1) Jurassic-Cretaceous convergent continental margin; (2) Late Cretaceous inception of Philippine island arc system; (3) CCW rotation of arc from Late Eocene onwards; (4) Paleocene-M Miocene opening of South China Sea; (5) E-M Miocene collision with Palawan subduction system*)

Holloway, N.H. (1982)- North Palawan Block, Philippines- its relation to Asian mainland and role in evolution of South China Sea. *American Assoc. Petroleum Geol. (AAPG) Bull.* 66, 9, p. 1355-1383.
(*Same as Holloway (1981). See also critique of Wolfe (1984)*)

Hsu, S.K., W.N. Wu, L.K. Lin, S.Y. Wang, Y.C. Yeh, L.T. Armada, C.B. Dimalanta et al. (2025)- Segmentation of the Manila subduction zone and slab tearing beneath the Philippine mobile belt. *J. Asian Earth Sciences* 292, 106720, p.
(*Four ~NW-SE trending fault zones off W Luzon, interpreted as branch faults of NW prolongation of onshore Philippine Fault Zone, segmented Manila subduction zone. Manila subducting slab beneath C Luzon has been torn, as revealed by seismic tomography and seismicity: Northern subducted slab dips 40°E, while southern slab dips 80°E. Segmentation of Manila subduction zone along NW-SE trending principal PFZ could be due to SE-ward collision of Palawan microcontinental block against Philippine mobile belt near Mindoro. Etc.*)

Ignacio, E.E. & H.G. Oesterle (1994)- Philippines/ Philippinen. In: H. Kulke (ed.) *Regional petroleum geology of the world*, I, Borntraeger, Berlin, p. 795-806.
(*Brief reviews of Philippines oil-gas basins: onshore Luzon (6) and Visayan and Mindanao (4); offshore S Palawan- SW Sulu Sea and NW Palawan- Reed Bank. First oil well in 1896. First commercial oil discovery Nido field off NW Palawan in 1976, followed by Cadlao, Matinlik, W Linapacan, all in E Miocene limestones*)

Ilao, K.A., C.K. Morley & M.A. Aurelio (2018)- 3D seismic investigation of the structural and stratigraphic characteristics of the Pagasa Wedge, Southwest Palawan Basin, Philippines, and their tectonic implications. *J. Asian Earth Sciences* 154, p. 213-237.
(*Pagasa Wedge poorly imaged deepwater orogenic wedge, variously interpreted as accretionary prism, former accretionary prism modified by thrusting onto thinned continental margin, and gravity-driven fold-thrust bel., Here tied to underthrusting of Dangerous Grounds Block. At least external part of wedge dominated by mass transport complexes. Accretionary prism stage (Oligocene) of C Palawan Ophiolite with N-vergent deformation. Deep Regional Unconformity (~17 Ma) likely indicates time when underthrusting/obduction ceased in Palawan. Pagasa Wedge is late-stage product of convergence history. Dominant NW transport of structures in wedge possibly related to gravity-driven structures responding to uplift of NE-SW Dangerous Grounds margin in M Miocene (related to slab breakoff?)*)

Imai, A. (2000)- Mineral paragenesis, fluid inclusions and sulfur isotope systematics of the Lepanto-Far Southeast porphyry Cu-Au deposit, Mankayan, Benguet, Philippines. *Resource Geology* 50, p. 151-168.

Imai, A. (2002)- Metallogenesis of porphyry Cu deposits of the Western Luzon Arc, Philippines: K-Ar ages, SO₃ contents of microphenocrystic apatite and significance of intrusive rocks. *Resource Geology* 52, 2, p. 147-161.

(W Luzon arc has been generating porphyry Cu mineralization associated with intermediate-silicic magmatism related to E-ward subduction since Miocene. K–Ar ages of porphyry Cu deposits in W Luzon arc: Lobo-Boneng (10.5 Ma), Santo Nino (9.5Ma), Black Mountain (2.1 Ma), Dizon (2.5 Ma) and Taysan (7.3 Ma))

Imai, A. (2005)- Evolution of hydrothermal system at the Dizon porphyry Cu-Au deposit, Zambales, Philippines. *Resource Geology* 55, 2, p. 73-90.

(Dizon deposit Au-rich porphyry Cu deposits in W Luzon arc. K-Ar age of diorite porphyry 2.5 ± 0.2 Ma)

Irving, E.M. (1950)- Review of Philippine basement geology and its problems. *Philippine J. Science* 79, 3, p. 267-307.

Irving, E.M. (1952)- Geological history and petroleum possibilities of the Philippines. *American Assoc. Petroleum Geol. (AAPG) Bull.* 36, 3, p. 437-476.

(Geology if The Philippines is complex, with relatively small Neogene basins. Certain areas may possess reasonably attractive petroleum possibilities, although exploratory efforts to date have been negative)

Irving, E.M. (1953)- A geologic map (biostratigraphic-lithologic) of The Philippines, scale 1:125,000. Philippine Bureau of Mines and US Geological Survey, Manilla.

Ishida, K., S. Suzuki, C. Dimalanta & G.P. Yumul (2011)- Radiolarian dating of ophiolites and the overlying turbidites in the Philippine Mobile Belt, Northern Luzon Island. In: *GEOCON 2011, 24th Annual Geol. Conv. Geological Society Philippines*, 2p. *(Abstract only)*

(Zambales Ophiolite Complex chert blocks in serpentinites with Tethyan Late Jurassic- E Cretaceous radiolarians. Montalban Ophiolitic Complex Kinabuan Fm sediment cover topped by radiolarian-bearing bathyal limestone with Santonian- E Maastrichtian planktonic foraminifera; Turonian age suggested by radiolarians and pelagic forams. N Sierra Madre at NW Dingalan red chert blocks in ophiolitic basic tuff phyllite dated as Late Jurassic- E Cretaceous)

Ishida, K., S. Suzuki, C. Dimalanta, G. Yumul & R. Pena (2013)- Radiolarian dating of ophiolite-cover turbidites in Rizal, southern Sierra Madre, central Luzon Island. In: *2nd Int. Symposium International Geoscience Programme (IGP) Project 589, Borocay Island, Philippines*, p. 13-15. *(Abstract)*

(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)

(Radiolarian dating of turbiditic carapace of Montalban Ophiolitic Complex in S Sierra Madre, Rizal area. M-U Maybangain Fm turbidites of M Eocene age with Podocyrts, etc. Paleocene radiolarians in similar volcanoclastic turbidites on pillow lava, tentatively distinguished as Alas Asin Unit. Montalban Ophiolitic Complex basalts overlain by Turonian- Coniacian turbidites, then Santonian- E Maastrichtian bathyal limestones. Sedimentation of volcanoclastic turbidites in Paleocene- M Eocene. Masungi Lst with M Paleocene- M Eocene larger foraminifera encountered as olistolithic slumps in Maybangain Fm turbidites)

Ishida, K., S. Suzuki, C. Dimalanta, G.P. Yumul, K. Queano, D. Faustino-Eslava et al. (2012)- Recent progress in radiolarian research for ophiolites and the overlying turbidites, Philippine Mobile Belt, Northern Luzon Island. *Proc. First Int. Symposium of IGCP-589, Xi'an, China 2012, Acta Geoscientica Sinica* 33, Supplement 1, p. 29-31. *(Extended Abstract)*

(online at: <http://igcp589.cags.ac.cn/pdf/15-ISHIDA%20et%20al%20LuzonRad.pdf>)

(Basement of Philippine Mobile Belt mainly ophiolites, overlain by Paleogene- Miocene turbidites in C Luzon. Chert blocks part of sedimentary carapace of Acoje Block of Zambales Ophiolite Complex (ZOC), with M Jurassic- E Cretaceous radiolaria, much older than previously assigned Eocene age of Zambales Ophiolite Complex. Coto block of ZOC formed in Eocene. Late Mesozoic radiolaria from ZOC characterized by Archaeodictyomitra, Pseudodictyomitra, Xitus, Triactoma and Tetraditryma, which are common in Tethyan pelagic environment)

Ishida, K., S. Suzuki, C. Dimalanta, G.P. Yumul, L.R. Zamoras, M. Faure et al. (2015)- Discovery of Triassic microfossils from the Buruanga Peninsula, Panai Island, North Palawan Block, Philippines. *Natural Science Research, University Tokushima* 29, 2, p. 5-20.

(online at: <http://web.ias.tokushima-u.ac.jp/bulletin/nat/nat29-2-1.pdf>)

*(Buruanga Peninsula of NW Panai Island is part of N Palawan Block. Contains common M and Late Triassic pelagic carbonates, earlier assigned to Jurassic and associated with basalts and cherts, contain late Anisian and late Norian conodonts and radiolarians (conodont zones *Gladigondolella tethydis*- *Paragondolella excelsa*). Bedded-chert units with radiolaria ranging from lower Ladinian to M Jurassic)*

Ishida, K., S. Suzuki, G.P. Yumul & C.B. Dimalanta (2008)- New micropaleontological evidence for the Dingalan Formation, Central East Luzon, Philippine Mobile Belt. Proc. Int. Symposium Geoscience resources and environments of Asian terranes (GREAT 2008), 4th IGCP 516 and 5th APSEG, Bangkok, p. 192-194.

(online at: <https://library.dmr.go.th/elib/cgi-bin/opac.exe?op=mmvw&db=Main&skin=S&mmid=13562&bid=18278>)

(Radiolarians from Dingalan Fm, Central E Luzon (deposited in early stage of island arc development), suggestive of M Eocene age and <30° low paleolatitude)

Ishida, K., S. Suzuki, G.P. Yumul & C.B. Dimalanta (2011)- Middle Eocene low-paleolatitude radiolarian evidence for the Cabog Formation, Central East Luzon, Philippine Mobile Belt. Gondwana Research 19, 1, p. 61-70.

(online at: www.academia.edu/30775588/Middle_Eocene_low_paleolatitude_radiolarian_evidence_for_the_Cabog_Formation_Central_East_Luzon_Philippine_Mobile_Belt)

*(Cabog Fm chert- siliceous shale distal turbidites exposed along S Dingalan Bay, C-E Luzon, with M Eocene radiolaria of *D. mongolfieri* Zone/ *T. triacantha* Zone, and with low paleolatitude affinity. Represents first depositional stage in early arc setting)*

Ishijima, W. (1950)- On several kinds of calcareous algae in the Binangonan Limestone, Philippines. J. Geological Society Japan, 656, 657, p. 331-338.

(online at: https://www.jstage.jst.go.jp/article/geosoc1893/56/657/56_657_331/_pdf/-char/ja)

*(Binangonan Limestone on Luzon island first mentioned by Von Richthofen as (Eocene) Nummulites limestone, but proved to be Latest Oligocene- E Miocene (Aquitanian?) Eulepidina and Spiroclypeus. Calcareous algae abundant articulated *Corallina*, spp., *Lithoporella* and *Mesophyllum*)*

Ishijima, W. (1969)- Tertiary and Pleistocene algae from Mindoro, The Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 6, p. 277-291.

*(Descriptions of mainly Eocene and Pleistocene calcareous algae from S part of Mindoro Island, with *Archaeolithothamnium*, *Lithothamnium*, *Mesophyllum*, *Lithophyllum*, *Lithoporella*, *Amphiroa*, *Corallina*, *Jania*, etc. Eocene samples associated with larger forams *Pellatispira*, *Biplanispira*, *Nummulites*, *Discocyclina*)*

Ishijima, W. & W. Hashimoto (1969)- Discovery of *Distichoplax biserialis* Dietrich in Upper Eocene limestone lenses exposed in the valley of the Mangamnan River, Marinduque Island, The Philippines. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 7, p. 87-92.

*(Occurrence of characteristic algae *Distichoplax biserialis* in Eocene limestone on Marinduque Island, associated with *Pellatispira*, *Discocyclina*, *Nummulites*, *Assilina*?. Previously reported from S Palawan, Cebu and Bicol by Villavicencio and Andal (1964), where associated with Paleocene foraminifera)*

Ishiwada, Y. (1971)- Analysis of petroleum source rocks from the Philippines. United Nations ECAFE, CCOP, Technical Bulletin 4, p. 83-92.

(online at: <https://repository.unescap.org/handle/20.500.12870/5063>)

(Summary of geochemical analyses of 60 outcrop samples from Luzon, Mindoro and Panay. Not very useful)

Isozaki, Y., E.A. Amisarcay & A. Rillon (1987)- Permian, Triassic and Jurassic bedded radiolarian cherts in North Palawan Block, Philippines: evidence of Late Mesozoic subduction-accretion. J. Geological Society of the Philippines 41, p. 79-93.

(Paper also in Pre-Jurassic evolution of eastern Asia, Report IGCP Project 224, no. 3, p. 99-115). In Philippines, pre-Tertiary rocks mostly in SW part (N Palawan Block). Bedded radiolarian cherts have M-L

Permian, M Triassic E Jurassic and Late Jurassic ages. Presence of Late Jurassic chert necessitates revision of tectono-sedimentary history of N Palawan Block)

Isozaki, Y., E.A. Amiscaray & A. Rillon (1988)- Permian, Triassic and Jurassic bedded radiolarian cherts in North Palawan Block, Philippines: evidence of Late Mesozoic subduction-accretion. In: K. Ichikawa (ed.) IGGP Project 224, Pre-Jurassic evolution of Eastern Asia, Report 3, p. 99-115.
(same paper as Isozaki et al. 1987)

Iwasaki, Y. (1970)- A Miocene molluscan fauna in The Philippines. Trans. Proc. Paleontological Society Japan, N.S., 77, p. 205-228.
(online at: www.palaeo-soc-japan.jp/download/TPPSJ/TPPSJ_NS77.pdf)
(Mollusc fauna from E Miocene lower Gumaca Fm (unconformable on basement) in Pitogo area, Tayabas Isthmus, SE Luzon, With 36 species, incl. gastropod *Vicarya callosa*, *Anadara multiformis*, *Joannisiella cumingi*, *Strombus tjilonganensis*, *Paphia exarata*, etc. Similar to faunas from Japan and W Java)

Jabagat, K.D., J.A. Gabo-Ratio, K.L. Queano, K. Yonezu, C.B. Dimalanta, Y.H. Lee & G.P. Yumul (2020)- Petrogenetic constraints on magma fertility in the Baguio Mineral District, Philippines: probing the mineralization potential of the igneous host rocks in the Sangilo epithermal deposit. Ore Geology Reviews 125, 103703, p.
(Baguio Mineral District porphyry Cu $\pm$ Au deposition and associated epithermal mineralization attributed to Pliocene magmatism. E-M Miocene calc-alkaline magmatism considered barren of mineralization)

Javelosa, R.S. (1994)- Active Quaternary environments in the Philippine Mobile belt. Ph.D. Thesis Int. Training Centre for Aerial Survey (ITC), Enschede, p. 1-179. (Unpublished)

Jego, S., R.C. Maury, M. Polve, G.P. Yumul, H. Bellon, R.A. Tamayo & J. Cotten (2005)- Geochemistry of adakites from the Philippines: constraints on their origins. Resource Geology 55, p. 163-187.
(online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1751-3928.2005.tb00239.x>)
(Late Miocene-Quaternary magmatic rocks with compositions within adakitic field (using Sr/Y ratios versus Y contents), found in four subduction zones: Manila Trench (Batan, Luzon), Negros and Sulu Trenches (Negros and W Mindano), Cotobato Trench (S Mindanao) and Philippine Trench (E Mindanao). Lavas from C Mindanao overlie deep remnants of Molucca Sea Plate, emplaced in post-collision setting. Model for genesis of 'typical adakites' is ~20% partial melting of subducted altered oceanic metabasalts converted to eclogite)

John, T.U. (1963)- Geology and mineral deposits of East-Central Balabac Island, Palawan Province, Philippines. Economic Geology 58, p. 107-130.
(Balabac Island part of W Luzon Arc, which continues into Kinabalu Range of N Borneo. East-central Balabac Oldest rocks steeply dipping, isoclinally folded and thrust U Cretaceous- Lower Eocene chert-spilite Fm, dominated by submarine lava flows, also shales and bedded radiolarian cherts. Associated with ultramafics and copper mineralization. Overlain by less-deformed Miocene Balabac Sst, and Pliocene sandstone and mudstone without economic mineralization. Structural trends similar to nearby Kudat Peninsula in N Borneo. Lorraine Orebody is massive pyrite-chalcopyrite replacement deposit in bedded cherts near Espina Point)

John, T.U. (1963)- Geology and mineral deposits of East-Central Balabac Island, Palawan Province, Philippines. J. Geological Society of the Philippines 17, 1, p.
(Same as above)

Jurgan, H. & R.M.A. Domingo (1989)- Younger Tertiary limestone formations in the Visayan Basin, Philippines. In: H. Porth & C.H. von Daniels (eds.) On the geology and hydrocarbon prospects of the Visayan Basin, Philippines, Geologisches Jahrbuch B70, p. 207-275.
(Outcrop study of M Oligocene- M Miocene carbonates on Cebu, Negros, Masbate, Leyte and Bohol)

Kanno, S., W. Hashimoto, N. Aoki, H. Noda & P.M. Alcantara (1980)- Stratigraphic horizons and geologic ages of the Philippine *Vicarya* (Gastropoda). In: T. Kobayashi, R. Toriyama et al. (eds.) Symposium on the

geology and paleontology of SE Asia, Tsukuba 1978, Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 21, p. 135-161.

(Tertiary gastropod Vicarya widely distributed in Indo-Pacific, incl. M-U Miocene of Philippines. V. callosa widely distributed in E-M Miocene (Te5- Tf3) of Philippines. (In Java, Indonesia viewed as Preangerian/ Tf2-3 marker species by Oostingh 1938)

Kanno, S., S. O'Hara & N.L. Caagusan (1982)- Molluscan fauna from the Tartaro Formation (Upper Miocene) of Central Luzon, Philippines. In: T. Kobayashi et al. (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 24, p. 51-128.

(Late Miocene- E Pliocene bivalve and gastropod molluscs from Madlum River, San Miguel, C Luzon. Mainly shallow and marginal marine taxa)

Karasawa, H., H. Kato, T. Kase, Y. Maac-Aguilar, M. Kurihara, H. Hayashi & K. Hagino (2008)- Neogene and Quaternary ghost shrimps and crabs (Crustacea: Decapoda) from the Philippines. Bull. National Science Museum, Tokyo, C34, p. 51-67.

(online at: <http://ci.nii.ac.jp/naid/110007342090/en>)

Karig, D.E. (1975)- Basin genesis in the Philippine Sea. In: Initial Reports Deep Sea Drilling Project (DSDP) 31, p. 857-879.

(online at: www.deepseadrilling.org/31/volume/dsdp31_42.pdf)

(Philippine plate marginal basins opened rapidly during height of volcanic pulses along associated arc system. Mariana Trough opening at rates up to 10 cm/yr or more during last 2-3 My. Combined Parece Vela-Shikoku basin opened from ~25 to 18 Ma at 10 cm/yr. W Philippine Basin extension from ~45-37 Ma)

Karig, D.E. (1983)- Temporal relationships between back arc basin formation and arc volcanism with special reference to the Philippine Sea. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian seas and islands- II. American Geophysical Union (AGU), Geophysical Monograph 27, p. 318-325.

(Back arc basin formation in Philippine Sea previously linked to minima in intensity of arc volcanism, but worldwide study of last 5 My and re-evaluation of PS data suggest pulses of spreading and volcanism nearly synchronous)

Karig, D.E. (1983)- Accreted terranes in the northern part of the Philippine archipelago. Tectonics 2, 2, p. 211-232.

(Philippine Archipelago complex array of ophiolites, continental fragments and island arc elements, from W to E: Neogene accretionary prism of W Luzon Arc, Eocene Zambales ophiolite (E-dipping, 70° CCW rotation, exhumed in earliest Miocene). Late Cretaceous Angat ophiolite overlain by Maastrichtian- Eocene arc volcanic turbidites, and formed West of a Cretaceous- Early Tertiary subduction system along E coast of Luzon. Late Cretaceous- E Paleogene volcanic arc built on older East Luzon metamorphic belt. To S, W Luzon terranes juxtaposed against Mindoro metamorphic basement block, which is colliding with N Palawan microcontinent)

Karig, D.E., D.R. Sarewitz & G.D. Haeck (1986)- Role of strike-slip faulting in the evolution of allochthonous terranes in the Philippines. Geology (GSA) 14, p. 852-855.

(In N Philippines, allochthonous terranes originated primarily within upper plate arc system, were translated along it by strike-slip faults, and 'emplaced' by cessation of that slip. Some originally vertical strike-slip boundaries may have evolved into shallow-dipping 'sutures marked by fold and thrust systems)

Karl, H.V. & U. Staesche (2006)- Fossile Riesen-Landschildkroten von den Philippinen und ihre paläogeographische Bedeutung. 1-A160, p. 171-197.

(online at: www.researchgate.net/profile/Hans-Volker-Karl/publication/260382701_Fossile_Riesen-Lan_Etc.) ('Giant fossil land tortoises from the Philippines and their paleogeographic significance'. First record of E Pleistocene giant land tortoises, from Tres Hermanas site in Luzon. Assigned to genus Manouria, with new species M. sondaari n. sp. Associated with dwarf Stegodon molars, reflecting Pleistocene island fauna)

- Karrer, F.W. (1878)- Die Foraminiferen der Tertiären Thone von Luzon. In: R. Ritter von Drasche (Ed.), *Fragmente zu einer Geologie der Insel Luzon (Philippinen)*, Karl Gerold's Sohn, Vienna, p. 76-99.
(online at: www.books.google.com/books Etc.)
(*'The foraminifera of the Tertiary clays of Luzon (Philippines)'. Classic study on Tertiary deep marine benthic foraminifera of Luzon island by Austrian geologist-paleontologist Felix Karrer*)
- Keenan, T.E., J. Encarnacion, R. Buchwaldt, D. Fernandez, J. Mattinson, C. Rasoazanamparanye & P.B. Luetkemeyer (2016)- Rapid conversion of an oceanic spreading center to a subduction zone inferred from high-precision geochronology. *Proc. National Academy of Sciences USA* 113, 47, p. E7359-E7366.
(online at: www.pnas.org/content/113/47/E7359.full.pdf)
(*Study of initiation of subduction zones at spreading centers. In W Philippines oceanic crust was less than ~1 My old when it was underthrust and metamorphosed at onset of young, short-lived subduction in Palawan. Differences between ages of upper plate (Palawan ophiolite; 35.2 Ma), subducting plate (protoliths of oceanic? sole), and metamorphism (~34.2 Ma) of sole less than ~1 My. Young and positively buoyant, but weak, lithosphere was preferred site for subduction nucleation*)
- Kerntke, M. (1991)- Zur geotektonischen Entwicklung der Visayas/ Philippinen und ihres sudost-asiatischen Rahmens. *Mitteilungen Geologisch-Paläontologisch Institut, Universität Hamburg* 71, p. 61-92.
(*'On the geotectonic development of the Visayas, Philippines and its SE Asian setting'*)
- Kerntke, M. (1992)- Petrographische, geochemische und geochronologische Untersuchungen der Porphyry-Kupferlagerstätte Atlas Mining auf der Insel Cebu (Philippinen). *Doct. Dissertation Universität Hamburg*, p. 1-300.
- Kerntke, M., M. Tarkian & A. Baumann (1991)- Geochemie und Geochronologie der Magmatite von Lutopan und Talamban, Cebu/ Philippinen. *Mitteilungen Geologisch-Paläontologisch Institut, Universität Hamburg* 71, p. 93-120.
(*'Geochemistry and geochronology of the magmatic rocks of Lutopan and Talamban, Cebu, Philippines'. First zircon U/Pb determination in Philippines shows age of 109 ± 2 Ma for Biga porphyries, Lutopan, which agrees with new Rb/Sr ages of 103.5- 106.5 Ma (Albian)*)
- Keston, S. (1981)- Geological relationship between Reed Bank and offshore western Palawan, Philippines. *Proc. 4th Regional Conference Geology, Minerals and Energy Resources of SE Asia (GEOSEA)*, Manila 1981, p. 829-834.
- Kiel, S., Y.M. Aguilar & T. Kase (2020)- Mollusks from Pliocene and Pleistocene seep deposits in Leyte, Philippines. *Acta Palaeontologica Polonica* 65, p. 589-627.
(online at: <https://www.app.pan.pl/archive/published/app65/app007562020.pdf>)
(*Molluscs from four Plio-Pleistocene methane seep deposits in Visayan back-arc basin, NW Leyte Island, include 30 species of chemosymbiotic bivalves and 14 species of gastropods. Twelve of bivalve species belong to chemosymbiotic bivalve family Lucinidae. Etc.*)
- Kiel, S., A.G.S. Fernando, C.Y. Magtoto & T. Kase (2022)- Mollusks from Miocene hydrocarbon-seep deposits in the Ilocos-Central Luzon Basin, Luzon Island, Philippines. *Acta Palaeontologica Polonica*, 67, 4, p. 917-947.
(online at: <https://www.app.pan.pl/archive/published/app67/app009772022.pdf>)
(*35 molluscan species from Late Miocene hydrocarbon seep carbonates at Pangasinan in Amlang Fm in Ilocos C Luzon Basin, Philippines. Bivalves 19 species mainly chemosymbiotic families (solemyids, bathymodiolins, thyasirids, lucinids, and vesicomyids). Gastropods not abundant, 16 species, including one species restricted to seep deposits. Seep fauna similar to Neogene seep faunas in other (sub-)tropical areas*)
- Kiessling, W. & E. Flügel (2000)- Late Paleozoic and Late Triassic limestones from North Palawan Block (Philippines): microfacies and paleogeographical implications. *Facies* 43, p. 39-78.
(*Permian- Carboniferous limestones in El Nido area. Paglugaban Fm with M Carboniferous fusulinids (Pseudofusulinella). Permian Minilog Fm Guadalupian fusulinids (Verbeekina verbeeki, Colania douvillei,*

Parafusulina, Neoschwagerina) and dasycladacean wacke-packstones with Permocalculus, Shamovella (=Tubiphytes) and Mizzia velebitana and colonial coral Waagenophyllum. Busuanga Island Late Triassic (Rhaetian) limestones in reef and platform facies with Triasina hantkeni, etc., similar to E Sulawesi, Banda Basin, Malay Peninsula, Malay Basin, etc. (also Sambosan seamount reefs, SW Japan; Peybernes 2016). Carbonates formed on seamounts surrounded by deep water radiolarian cherts (now in Jurassic- E Cretaceous accretionary complex?). With Golonka Permian-Triassic plate reconstructions. Permian-Triassic carbonates contradict close paleogeographic connection between N Palawan Block collided with S China Block in Late Cretaceous (then separated again with S China Sea opening))

Kintanar (1976)- Petroleum geology of the Philippines. Proc. 2nd Geol. Conv. and 1st Symposium Geology and Mineral Resources of the Philippines, GPS, Manila, 1, p. 401-432.

Kleinpell, R.M. (1957)- Notes on Cenozoic correlations and geologic history in the Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 12, 1, p. 1-15.

Knittel, U. (1983)- Age of the Cordon Syenite Complex and its implication on the Mid-Tertiary history of North Luzon. The Philippine Geologist (J. Geological Society of the Philippines) 37, 2, p. 22-31.

Knittel, U. (1985)- Contribution to the petrography and geochemistry of the Polillo Intrusion Polillo Island, Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 39, 4, p. 14-26.
(online at: https://www.researchgate.net/publication/260081264_Contributions_to_the_petrography_and_geochemistry_of_the_Polillo_Intrusion_Polillo_Island_Philippines)
(Intrusion exposed in the southern part of Polillo Island E of Luzon composed of potassic tonalites, granodiorites, quartz monzonites and alaskites. Rb-Sr- cooling age of 34.4+/-1.2 Ma, suggesting part of the large batholiths that intruded mountain ranges of N and C Luzon in Mid-Tertiary)

Knittel, U. (1987)- The Cordon Syenite Complex: an undersaturated potassic igneous center in the Philippine island arc. Neues Jahrbuch Mineralogie, Abhandlungen, 157, 1, p. 57-80.
(online at: https://www.researchgate.net/publication/306939499_The_Cordon_syenite_complex_an_undersaturated_potassic_igneous_center_in_the_Philippine_island_arc)
(Mid-Tertiary (~25 Ma) syenitic potassic complex in fracture zone at W margin of Cagayan basin, central North Luzon)

Knittel, U. (2011)- 83 Ma rhyolite from Mindoro- evidence for Late Yanshanian magmatism in the Palawan continental terrane (Philippines). Island Arc 20, p. 138-146.
(online at: www.academia.edu/12298522/83_Ma_rhyolite_from_Mindoro_evidence_for_Late_Yanshanian_magmatism_in_the_Palawan_Continental_Terrane_Philippines_)
(Low-grade meta-rhyolite with age of 83 Ma documents Late Cretaceous magmatism in N Mindoro Island, at NE edge of Palawan Continental Terrane which rifted from SE China in Oligocene. Rhyolite volcanism widespread in SE China in Cretaceous. Provides further evidence that NE Mindoro is indeed part of Palawan Continental Terrane, not part of Philippine Mobile Belt to E)

Knittel, U. & A. Cundari (1990)- Mineralogical evidence for the derivation of metaluminous, potassic rocks from peralkaline precursors: The Cordon Syenite Complex (Philippines). Mineralogy and Petrology 41, p. 163-183.
(online at: https://www.researchgate.net/profile/Ulrich-Knittel/publication/248022465_Mineralogische_Etc_)
(K-rich volcanics from Cordon Syenite Complex at margin of Cagayan Basin, N Luzon, Philippine island arc. Emplaced at ~25 Ma. Suggest that potassic leucite tephrite suites may be derived from peralkaline liquids by alkali loss)

Knittel, U. & U. Daniels (1987)- Sr-isotopic composition of marbles from the Puerto Galera area (Mindoro, Philippines); additional evidence for a Paleozoic age of a metamorphic complex in the Philippine island arc. Geology (GSA) 15, p. 136-138.

(Sr-isotopic composition of marbles from metamorphic complex of Puerto Galera area, NE Mindoro, compatible with either Tertiary or Paleozoic age. Late Paleozoic age most likely, implying metamorphic complex not part of basement of Philippine arc, but is accreted terrane)

Knittel, U. & M.J. Defant (1988)- Sr isotopic and trace element variations in Oligocene to Recent igneous rocks from the Philippine island arc: evidence for recent enrichment in the sub-Philippine mantle. *Earth Planetary Science Letters* 87, p. 87-99.

(online at: https://www.researchgate.net/publication/248410910_Sr_isotopic_and_trace_element_variations_in_Oligocene_to_recent_igneous_rocks_from_the_Philippine_island_arc_evidence_for_recent_enrichment)
(Oligocene- Miocene plutonic rocks from Philippine island arc and Pliocene-Recent Bicol volcanic chain of S Luzon have Sr isotopic ratios of 0.7035-0.7039 (controlled by fluids from subducting Philippine Sea plate basalt). Volcanics erupted in past 5 Ma in C Luzon, Marinduque and Mindoro have higher radiogenic Sr (0.7042-0.7054; controlled by fluids from subducted S China Sea crust))

Knittel, U., M.J. Defant & I. Raczek (1988)- Recent enrichment in the source region of arc magmas from Luzon island, Philippines: Sr and Nd isotopic evidence. *Geology (GSA)* 16, p. 73-76.

(Luzon wedged between E- and W-directed subducting slabs. W-ward subduction resulted in pre-Miocene igneous rocks from N Luzon typical of intra-oceanic arcs. Pliocene-Holocene volcanoes generated by E-ward subduction along W coast (Bataan- Mindoro arc) and reflect larger amounts of sediment available for subduction in S China Sea (slivers of continental Mindoro-N Palawan terrane apparently carried down to mantle depths after collision with arc in Miocene)

Knittel, U., C.H. Hung, T.F. Yang & Y. Iizuka (2010)- Permian arc magmatism in Mindoro, the Philippines: an early Indosinian event in the Palawan continental terrane. *Tectonophysics* 493, p. 113-117.

(online at: <https://pdfs.semanticscholar.org/f035/70ff0c9fb93c8e998273eb5e47e4b2af13594.pdf>)
(Dating of zircons from metamorphic complex of NE Mindoro (= Palawan Continental Terrane) reveal episode of M-L Permian (250-270 Ma) magmatism, suggesting they are part of rifted margin of SE China rather than oceanic arc-dominated Philippine Mobile Belt. Magmatic episode here coincides with arc magmatism in Hainan (China), expanding known extent of that continental arc along SE margin of S China)

Knittel, U., A.G. Trudu, W. Winter, T.F. Yang & C.M. Gray (1995)- Volcanism above a subducted extinct spreading center: a reconnaissance study of the North Luzon Segment of the Taiwan-Luzon volcanic arc (Philippines). *J. Southeast Asian Earth Sciences* 11, p. 95-109.

(online at: <http://ntur.lib.ntu.edu.tw/bitstream/246246/172505/1/02.pdf>)
(Ridge system of S China Sea, extinct since ~17 Ma, now subducting below C part of Taiwan-Luzon volcanic arc. Buoyancy of crust of ridge system may be responsible for high elevation of arc. Volcanism in this part of arc characterized by small volumes of intermediate-felsic magma)

Knittel, U., M. Walia, S. Suzuki, C.B. Dimalanta, R. Tamayo, T.F. Yang & G.P. Yumul (2017)- Diverse protolith ages for the Mindoro and Romblon Metamorphics (Philippines): evidence from single zircon U-Pb dating. *Island Arc* 26, 1, e12160, p.

(Metamorphic complexes exposed in NE part of Palawan Continental Terrane considered to be rifted parts of Asian margin. Mindoro and Romblon Metamorphics with protoliths of variable age: Late Carboniferous-Late Permian in NE Mindoro; Eocene or younger in NW Mindoro; Miocene at S margin of Mindoro metamorphics (detrital zircon ages 22-56 Ma); and Cretaceous or later on Tablas (zircons as young as 112 Ma). Presence of non-metamorphic sediments of Late Eocene- E Oligocene age in Mindoro (Lasala Fm) suggests metamorphism of sediments of Mindoro result of Palawan terrane collision in Late Miocene (similarities in age spectra of zircons from Eocene-Miocene metamorphics with Eocene - E Miocene Lasala Fm))

Kobayashi, T. (1957)- A trigonian faunule from Mindoro in the Philippine islands. *J. Faculty of Science, University of Tokyo, Section 2*, 10, 3, p. 351-365.

(online at: http://umdb.um.u-tokyo.ac.jp/DKoseibu/pdf/Ref_0151_.pdf)

(Two Jurassic ammonite zones on SE coast of Mindoro: Callovian(?) with Macrocephalites and Oppelia and Oxfordian(?) black shale with perisphinctids (also described by Sato 1961;JTvG). Also probably latest Jurassic age Trigonina- Myophorella mollusc fauna from Agama River)

Koike, T., W. Hashimoto & T. Sato (1968)- Fusulinid-bearing limestone pebbles found in the Agbahag conglomerate, Mansalay, Oriental Mindoro, Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 4, p. 198-210.

(M Eocene conglomerate at Agbahag Point on SE Mindoro Island contains Permian fusulinid limestone pebbles. With 13 species, incl. Pseudofusulina fusiformis, P. krafftii, Misellina claudiae, Pseudodoliolina, Neoschwagerina cf simplex, Schubertella giraudi, Yangchienia compressa. Age ~Kungurian, late E Permian)

Kolb, J. & S. Hagemann (2009)- Structural control of low-sulfidation epithermal gold mineralization in the Rosario-Bunawan district, East Mindanao Ridge, Philippines. *Mineralium Deposita* 44, 7, p. 795-815.

(online at: www.researchgate.net/publication/226921199_Structural_control_of_low-sulfidation Etc.)

(Epithermal gold mineralization in Rosario-Bunawan district, Mindanao. Co-O mine confined to narrow (0.2-4m) low-sulfidation quartz–chalcedony–calcite veins in volcanic and volcanoclastic wall rocks)

Kotaka, T. & H. Noda (1977)- Additional notes on the Miocene Pitogo Fauna of the Bondoc Peninsula, the Philippines Part 1. Systematic description of Pelecypoda. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 18, p. 133-148.

Kotaka, T. & H. Noda (1982)- Additional notes on the Miocene Pitogo Fauna of the Bondoc Peninsula, the Philippines Part 2. Gastropod fossils and stratigraphic significance of the fauna. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 23, p. 91-99.

(Late Miocene gastropod assemblages with Turritella)

Ku, C.Y. & S.K. Hsu (2009)- Crustal structure and deformation at the northern Manila Trench between Taiwan and Luzon islands. *Tectonophysics* 466, p. 229-240.

(Philippine Sea Plate overrides Eurasian Plate along E-dipping Manila Trench between Taiwan and Luzon islands. From S to N plate convergence gradually evolves from normal subduction of S China Sea lithosphere to initial collision of Taiwan orogen. Accretionary prism dramatically wider toward Taiwan. Subducting crust in the N Manila Trench area three zones: normal fault zone (where crust starts to bend and induces gravity sliding of upper sedimentary layers), proto-thrust zone and thrust zone (with blind thrust faults along location of pre-existing normal faults)

Kucera, J. (2015)- Diatreme breccia-hosted epithermal gold deposit at Ridge Mountain, Eastern Mindanao, Philippines. *Proc. PACRIM 2015 Congress, Hongkong, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, Publ. Ser. 2/2015, p. 587-592. (Extended Abstract)*

Lagmay, A.M F.A., Z. Ben-Avraham & A. Nur (2008)- The role of the Benham Rise in the geodynamic evolution of the Philippines. *GEOCON 2008 Reports*, Geological Society of the Philippines, p. 1-12

(online at: https://www.academia.edu/126089464/The_role_of_the_Benham_Rise_in_the_geodynamic_evolution_of_the_Philippines)

(Collision of W Pacific Benham Rise oceanic plateau with East Luzon in E Miocene locked up Philippine Trench and led to flipping of subduction from West to East-directed. Movement along Philippine Trench reinitiated during Pliocene when Asia-derived Palawan-Mindoro Block collided with Philippines in W. Temporal break in subduction along Philippine Trench from E Miocene to Pliocene manifested as detached slab in Benioff zone prog.biles between 5° to 10° latitude)

Lagmay, A.M.F.A., M.L.G. Tejada, R.E. Pena, M.A. Aurelio, B. Davy, S. David E. Billedo (2009)- New definition of Philippine Plate boundaries and implications to the Philippine Mobile Belt. *J. Geological Society of the Philippines* 64, 1, p. 17-30.

(online at: www.academia.edu/download/51256269/New_Definition_of_Philippine_Plate_Bound20170108-13651-10xrx.pdf)

(GPS-based revision of present-day active plate boundaries surrounding Philippine Mobile Belt (= zone of deformation between surrounding major plates: Philippine Sea, Eurasian (Sunda Block) and Indo-Australian Plates. Only Palawan and Mindoro are part of Eurasian Plate). Now does not include E portion of North Luzon, which is decoupled and moves N with Philippine Sea Plate, Etc.)

Lai, Y.M., M.F. Chu, W.S. Chen, W.Y. Shao, H.Y. Lee & S.L. Chung (2018)- Zircon U-Pb and Hf isotopic constraints on the magmatic evolution of the Northern Luzon Arc. *Terrestrial Atmospheric Oceanic Sciences (TAO)* 29, 2, p. 149-186.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1567-2017082901tt>)

(Northern Luzon Arc between Coastal Range of Taiwan and volcanic islands between Taiwan and Luzon Island. Magmatism in Coastal Range started at ~15 Ma, most active at ~9 Ma, and ceased at ~4.2 Ma. Old continental zircons show Cathaysian-type ages, suggesting existence of accreted micro-continent or continental fragment. N Luzon Arc may have started colliding with the Eurasian continental margin at ~6 Ma)

Lallemand, S., M. Popoff, J.P. Cadet, B. Deffontaines, A.G. Bader, M. Pubellier & C. Rangin (1998)- The junction between the central and southern Philippine Trench. *J. of Geophysical Research* 103, B1, p. 933-950.

Lee, C.S., N.D. Trinidad & M.C. Galloway (1993)- A preliminary result of the Ragay Gulf survey in the Philippines. In: G.H. Teh (ed.) *Proc. Symposium on tectonic framework and energy resources of the Western margin of the Pacific Basin*, Kuala Lumpur 1992, *Bull. Geological Society Malaysia* 33, p. 289-301.

(Seismic and geochemical sniffer surveys by AGSO on NE Palawan shelf- Cuyo Platform and SE Luzon Ragay Gulf- Tayabas Bay. Ragay Bay data indicate presence of significant hydrocarbon source rocks)

Lee, C.S., M.C. Galloway, J.B. Willcox, A.R. Fraser, A.M.G. Moore, J.R.L. Aposto, N.D. Trinidad, R.P. Abando, D.V. Panganiban & E.B. Guazon (1994)- Geology and petroleum potential of Ragay Gulf. *Australian Geological Survey Organisation (AGSO), Canberra, Record 1994/41, Part 1*, p. 1-42.

(online at: https://d28rz98at9flks.cloudfront.net/14753/Rec1994_041.pdf)

Leith, A. (1938)- The geology of the Baguio gold district. *Philippines Dept. Agriculture, Technical Bull.* 9, p. 1-91.

(Baguio gold district in NW highlands of Luzon is foremost gold-producing district in the Philippines)

Lewis, S.D. (1997)- Philippines. In: *Encyclopedia of European and Asian regional geology*, Chapter 78, Springer, p. 591-604

Lewis, S.D. & D.E. Hayes (1983)- The tectonics of northward propagating subduction along eastern Luzon, Philippines islands. In: D.E. Hayes (ed.) *The tectonic and geologic evolution of SE Asian seas and islands 2*, American Geophysical Union (AGU) *Geophysical Monograph* 27, p. 57-78.

Lewis, S.D. & D.E. Hayes (1984)- A geophysical study of Manila trench Luzon, Philippines. 2. Forearc basin structural and stratigraphic evolution. *J. of Geophysical Research: Solid Earth* 89, B11, p. 9196-9214.

(Sediment distribution in Manila Trench subduction zone W of Luzon exerts strong influence on tectonic evolution of accretionary prism and fore arc basins. Up to 2600m of turbidites from uplifted collision zone of Taiwan overlie thin hemipelagic sediment layer and oceanic basement in N part of Manila Trench. Size of accretionary prism varies with thickness of turbidite sediments within trench. Thickness of >200m of trench turbidites probably required before accretion and uplift become dominant process in fore arc region)

Lewis, S.D. & D.E. Hayes (1985)- Forearc basin development along Western Luzon, Philippines. *Energy* 10, 3, p. 281-296.

(Seismic data show up to 2600m of Neogene turbiditic sediments over thin pelagic-hemipelagic sediments and oceanic basement in N part of Manila Trench, W of Luzon. Forearc basin system of Manila Trench receives sediment through submarine canyons incised into W Luzon continental slope. Size of accretionary prism varies along strike and correlates with thickness of turbidite sediments in trench)

- Lewis, S.D. & D.E. Hayes (1989)- Plate convergence and deformation, North Luzon Ridge, Philippines. *Tectonophysics* 168, p. 221-237.
(*Marine geophysical and earthquake data indicate N Luzon Ridge (volcano-capped bathymetric ridge system between Luzon and Taiwan) presently undergoing deformation in response to relative motion between Asian and Philippine Sea plates*)
- Li, F., Z. Sun, D. Hu & Z. Wang (2013)- Crustal structure and deformation associated with seamount subduction at the North Manila Trench represented by analog and gravity modeling. *Marine Geophysical Research* 34, 3, p. 393-406.
(*Study of deformation in the accretionary wedge associated with subducted seamounts in N Manila Trench*)
- Liu, H.Q., G.P. Yumul, C.B. Dimalanta, K. Queano, X.P. Xia, T.P. Peng, J.B. Lan, Y.G. Xu et al. (2020)- Western Northern Luzon isotopic evidence of transition from Proto-South China Sea to South China Sea fossil ridge subduction. *Tectonics* 39, 2, e2019TC005639, p. 1-21.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019TC005639>)
(*Oligo-Pleistocene arc magmatism from western N Luzon. Oligo-Miocene (~26.8–15.6 Ma) Central Cordillera diorite complex consistent with mantle metasomatism by fluids/melts from pelagic sediments. Mio-Pleistocene samples (<~9 Ma) consistent with mantle metasomatism by fluids/melts from Scarborough seamount basalts, subducted beneath N Luzon with S China Sea fossil ridge. Taiwan-Luzon magmatism mirrors transition from Proto-S China Sea to S China Sea fossil ridge subduction beneath W Northern Luzon at ~9 Ma*)
- Liu, W.N., C.F. Li, J. Li, D. Fairhead & Z. Zhou (2014)- Deep structures of the Palawan and Sulu Sea and their implications for opening of the South China Sea. *Marine and Petroleum Geology* 58, B, p. 721-735.
(online at: http://earthjay.com/earthquakes/20170408_phillippines/Liu_Li%20et%20al._MPG_2014.pdf)
(*Palawan Continental Block defined by quiet magnetic anomalies, etc. Continent-ocean transition zone between Palawan Block and S China Sea characterized by hyper-extended continental crust intruded with magmatic bodies. NW Sulu Sea interpreted as relict oceanic slice; spreading of SE Sulu Sea started in Late Eocene- E Oligocene due to subduction of Proto S China Sea and ended in M Miocene by obduction of NW Sulu Sea onto Palawan Continental Block*)
- Lloyd, R.M. (1996)- Criteria for successful exploration of Miocene reef production in the Philippines. In: G.P. & A.C. Salisbury (eds.) *Trans. 5th Circum-Pacific Energy and Mineral Resources Conference*, Honolulu 1990, Gulf Publishing, Houston, p. 537-541.
(*Many well-defined carbonate buildups drilled in Philippines, but with only moderate success. Main reasons for failure are absence of competent drape seal over buildups and lack of direct access to mature source rocks*)
- Longman, M.W. (1980)- Carbonate petrology of the Nido B-3A core, offshore Palawan, Philippines. *American Assoc. Petroleum Geol. (AAPG), Carbonate core workshop*, 1980, p. 161-183.
(*On carbonates from first commercial oil field in Philippines, in Lower Miocene atoll-like buildup. Upper part of Nido B carbonate buildup with larger forams Eulepidina, Mioypsina and Spiroclypeus (=upper Te). Overlying shale seal with planktonic forams including Globigerinoides sicanus, suggests late Early Miocene age. Core from margin of buildup in rel. tight fore-reef talus facies, with carbonate intraclast packstones with shaly matrix with planktonic foraminifera. Most primary porosity filled by marine calcite. Locally secondary vuggy porosity and hairline fractures*)
- Longman, M.W. (1982)- Fracture porosity in reef talus of a Miocene pinnacle-reef reservoir, Nido B Field, the Philippines. In: P.O. Roehl & P.W. Choquette (eds.) *Carbonate Petroleum Reservoirs*, Springer, New York, p. 549-560.
(*Core of Nido B oil field off Palawan shows: 1) fore-reef talus susceptible to extensive marine cementation, 2) small fractures can form significant reservoir capable of producing >10 000 BO/D; and 3) when associated with interbedded shales, fore-reef talus susceptible to extensive fracturing by either overpressured fluids or flexure due to compaction*)
- Loudon, A.G. (1976)- Marcopper porphyry copper deposit, Philippines. *Economic Geology* 71, p. 721-732.

(Marcopper porphyry copper deposit on Marinduque island, 180 km S of Manila. Mineralization related to intermediate intrusives, on W margin of M Miocene quartz diorite stock, with most copper mineralization within granodiorite porphyry phase)

Loudon, A.G. (1981)- Marcopper porphyry copper deposit, Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 35, 2, p. 1-23.

(Marcopper porphyry copper near center of island of Marinduque. Mineralization related to M Miocene quartz diorite in Eocene- Oligocene metasediment)

Ludwig, W.J. (1970)- The Manila Trench and West Luzon Trough- III. Seismic-refraction measurements. Deep Sea Research 17, 3, p. 553-562.

(Seismic refraction profiles W of Luzon in S China Sea show E edge of S China Sea Basin has velocity-structure similar to normal oceanic crust, but thickness of main crustal layer 3 only half of normal thickness, and Moho-discontinuity shallower than normal by ~2-3 km. W Luzon Trough (fore-arc basin) with ~4 km of sediment)

Ludwig, W.J., D.E. Hayes & J.I. Ewing (1967)- The Manila Trench and West Luzon Trough- I. Bathymetry and sediment distribution. Deep Sea Research 14, p. 533-544.

Macpherson, C.G. (2008)- Lithosphere erosion and crustal growth in island arcs: insights from the nascent East Philippine margin. Geology (GSA) 36, 4, p. 311-314.

(manuscript online at: <https://dro.dur.ac.uk/14882/1/14882.pdf>)

(Philippine Trench marks nascent plate margin where subduction initiation is propagating from N to S. Magma compositions in E Philippine Arc record thinning of arc lithosphere as it is eroded from below. Lithosphere thicker beneath S part of arc, causing basaltic magma to stall and fractionate garnet at high pressure. In mature N section, basaltic magma differentiates at shallower levels, at pressures where garnet is not stable)

Macpherson, C.G., S.T. Dreher & M.F. Thirlwall (2006)- Adakites without slab melting: high pressure differentiation of island arc magma, Mindanao, the Philippines. Earth Planetary Science Letters 243, p. 581-593.

(online at: https://www.geo.mtu.edu/EHazz/ConvergentPlatesClass/macpherson/macpherson_etal_2006.pdf)

(Pleistocene magmatic rocks from Surigao Peninsula, E Mindanao, with typical adakitic traits, but Sr and Nd Nd ratios do not support melting of subducted Philippine Sea Plate; rather resemble Pliocene arc lavas generated in same subduction zone. This suggests that any subduction zone has potential to produce adakitic magma if basalt crystallises at sufficient depth)

Madrid, A.P. (1985)- Deep-water hydrocarbon exploration in The Philippines. Energy 10, 3-4, p. 493-504.

(Deep-water drilling in Philippines began in 1979, 10 wells drilled over next three years. Primary targets Miocene reef limestones. Hydrocarbons of offshore areas >200m water depth include commercial oil discovery and non-commercial gas discovery in Lower Miocene turbidite sands and gas discovery in Lower Miocene reefal limestone off NW Palawan)

Maglalang, E.J.M., L.T. Armada, M.C. Santos, K.F. Sayen, C.B. Dimalanta, S.K. Hsu & G.P. Yumul Jr. (2023)- Bottom simulating reflectors in the Manila Trench forearc and its implications on the occurrence of gas hydrates in the region. Marine and Petroleum Geology 158, A, 106538, 1-14.

(Possible gas hydrates off W Luzon Island suggested by bottom simulating reflectors in seismic reflection datasets. Prevalence of BSRs on frontal wedge seaward of N Luzon Trough and in W Luzon Trough basin fill)

Maglambayan, V.B., D. Ishiyama, T. Mizuta, A. Imai & Y. Ishikawa (1998)- Geology, mineralogy, and formation environment of the disseminated gold-silver telluride Bulawan Deposit, Negros Occidental, Philippines. Resource Geology 48, 2, p. 87-104.

(Bulawan Au-Ag-Te deposit in porphyry copper belt of SW Negros Island, hosted in Miocene dacitic hydrothermal breccia pipes)

Maglambayan, V.B., S. Montes, K. Hipol, M. Mamitag, R.P. Pineda, R. Rodolfo, N. Oliveros & A. Sy (2008)- Carlin-type gold prospects in Surigao del Norte, Mindanao Island, Philippines: their geology and mineralization potential. *Resource Geology* 55, 3, p. 145-154.

(online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/j.1751-3928.2005.tb00237.x>)

(Three Carlin type-like gold deposits on NE Mindanao in jasperoid lenses in marl of M Miocene Mabuhay Fm)

Magpantay, A.L., U.M. Palaganas, E.A. De Luna, J.L. Perez & E.C. del Rosario (1979)- Geology and mineral resources of Zambales Province. Philippines Bureau of Mines Report Inv. 95, p. 1-68.

Majima, R., T. Kase, S. Kawagata, Y.M. Aguilar, K. Hagino & M. Maeda (2007)- Fossil cold-seep assemblages from Leyte Island, Philippines. *J. of Geography (Chigaku Zasshi)* 116, 5, p. 643-652.

(online at: https://www.jstage.jst.go.jp/article/jgeography1889/116/5/116_5_643/_pdf)

(In Japanese, with English Abstract. Fossilized chemosynthetic U Miocene- Lw Pliocene mollusc seep assemblages along coastal area of Tabango and Villaba, NW Leyte. Up to 5m big indurated carbonate blocks with beautifully preserved, large vesicomyid, lucinid, thyasirid and mytilid bivalves. No fossil illustrations)

Malihan, T.D. (1987)- The gold-rich Dizon porphyry copper mine in the western Central Luzon Island, Philippines: its geology and tectonic setting. In: E. Brennan (ed.) *Proc. Pacific Rim Congress 1987, Gold Coast, Australasian Institute of Mining and Metallurgy (AusIMM), Parkville*, p. 303-307.

Malihan, T.D., R.A.L. Flores & H.B. Ruelo (2015)- Philippine vein-type deposits: Key concepts, parameters and some examples in mineral resource/ore reserve estimation. *J. Geological Society of the Philippines* 70, p. 3-37

Manalo, P.C., C.B. Dimalanta, D.V. Faustino-Eslava, B.D. Payot, N.T. Ramos, K.L. Queano, A. Perez & G.P. Yumul (2015)- Geochemical and geophysical characteristics of the Balud Ophiolitic Complex (BOC), Masbate Island, Philippines: implications for its generation, evolution and emplacement. *Terrestrial Atmospheric Oceanic Sciences (TAO)* 26, 6, p. 687-700.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geophysics/item/1360-geochemical-and-...>)

(E Cretaceous Balud Ophiolitic Complex on island of Masbate in C Philippines, with only upper crustal section exposed. Pillow basalts transitional mid-oceanic ridge basalt- island arc tholeiitic compositions. Low Bouguer gravity anomaly values suggest highly dismembered nature, as thin crustal slivers)

Manalo, P.C., C.B. Dimalanta, D.V. Faustino-Eslava, N.T. Ramos, K.L. Queano & G.P. Yumul (2015)- Crustal thickness variation from a continental to an island arc terrane: clues from the gravity signatures of the Central Philippines. *J. Asian Earth Sciences* 104, p. 205-214.

(Significant differences in gravity anomalies between Palawan Microcontinental Block and Philippine Mobile Belt, with islands of Palawan Block (Mindoro, Tablas, Romblon, Sibuyan, W Panay) registering lower Bouguer anomalies. Crustal thickness thickest (~32 km) in areas with ophiolitic units emplaced during arc-continent collision. Relatively thin crust (~21 km) in collision zone coincides with areas attenuated by intra-arc rifting)

Manalo, P., C. Dimalanta, N. Ramos, D. Faustino-Eslava, K. Queano & G. Yumul (2016)- Magnetic signatures and Curie surface trend across an arc-continent collision zone: an example from Central Philippines. *Surveys in Geophysics* 37, 3, p. 557-578.

(In C Philippines striking differences between magnetic signatures of islands with continental affinity (negative magnetic anomalies) and island arc terranes (positive anomalies over Philippine Mobile Belt). Linear features in magnetic anomaly map coincide with Philippine Fault and its splays. Deepest point of magnetic crust is under Mindoro at 32 km. Curie surface shallows to E and is 21 km deep between Sibuyan and Masbate, and 18 km deep at junction of Buruanga Peninsula and Panay Island (boundary of the arc-continent collision, with obduction of mantle rocks over continental basement. Coincidence of magnetic boundary and density boundary supports compositional boundary that reflects the crust- mantle interface)

Manalo, P.C., A. Imai, L.L. Subang, M.C. de los Santos, K. Yanagi, R. Takahashi & N.J.F. Blamey (2018)- Mineralization of the Northwest quartz-pyrite-gold veins: Implications for multiple mineralization events at Lepanto, Mankayan Mineral District, Northern Luzon, Philippines. *Economic Geology* 113, 7, p. 1609-1626.

Mapaye, C.B., J.A. Bacud & R.B. Savella (2017)- Miocene clastic play in South West Palawan: a new playground for hydrocarbon exploration. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2017, Singapore, Session 3*, p. 1-37. (*Abstract + Presentation*
(*Underexplored SW Palawan Basin clastic play in northern extension of active petroleum system in Sabah ('farm-in brochure')*))

Marchadier, Y. & C. Rangin (1989)- Passage subduction-collision et tectoniques superposees a l'extremite meridionale de la fosse de Manille (Mindoro-Tablas, Philippines). *Comptes Rendus Academie Sciences, Paris*, 308, 2, p. 1715-1720.
(*'Transition between subduction and collision, and superposed tectonics at the southern end of the Manila Trench, Mindoro-Tablas: the Philippines'*)

Marchadier, Y. & C. Rangin (1990)- Polyphase tectonics at the southern tip of Manila trench, Mindoro-Tablas islands, Philippines. *Tectonophysics* 183, p. 273-287.
(*S termination of Manila trench in S China Sea continental margin in Mindoro marked by complex polyphase tectonic fabric. Onshore S Mindoro with transpressive tectonic regime, active at least since Late Pliocene, overprinting collision of E Miocene volcanic arc with S China Sea continental margin (San Jose platform). Arc overlies metamorphic basement and Eocene clastics, probably drifted block of S China Sea continental margin*)

Marini, J.C., C. Chauvel & R. Maury (2005)- Hf isotope compositions of northern Luzon arc lavas suggest involvement of pelagic sediments in their source. *Contributions to Mineralogy and Petrology* 149, p. 216-232.

Mariotto, F.P. & A. Tibaldi (2003)- Do transcurrent faults guide volcano growth? The case of NW Bicol Volcanic Arc, Luzon, Philippines. *Terra Nova* 15, 3, p. 204-212.
(*In NW Bicol Volcanic Arc (Luzon) Quaternary Labo and Caayunan volcanoes aligned with NW-striking transcurrent Philippine Fault System*)

Marquez, E.J., J.C. Aitchison & L.R. Zamoras (2006)- Upper Permian to Middle Jurassic radiolarian assemblages of Busuanga and surrounding islands, Palawan, Philippines. In: *Radiolaria- siliceous plankton through time, Eclogae Geologicae Helvetiae* 99, Suppl. 1, p. 101-125.
(*online at: <http://dx.doi.org/10.5169/seals-169257>*)
(*N Palawan Block regarded as S-most continuation of Late Mesozoic Busuanga accretionary complex, part of ocean plate stratigraphy now in Jurassic-age subduction complex which developed along length of E Asian margin. Radiolarians record Late Permian-Late Jurassic pelagic deposition on oceanic plate, with subduction of plate starting by E Cretaceous. U Permian- M Jurassic radiolarians from 13 localities*)

Martin, K. (1899)- Ueber tertiare Fossilien von den Philippinen. *Sammlungen Geologischen Reichs-Museums Leiden*, ser. 1, 5, 3, p. 52-69.
(*online at: www.repository.naturalis.nl/document/552417*)
(*'On Tertiary fossils from The Philippines'. Many of Tertiary fossils in Semper collection from Philippines similar to Java, incl. Miocene gastropod Vicarya callosa, etc. Also in English as appendix in Becker (1901), p. 129-139*)

Masse, J.P., M. Villeneuve, F. Tumanda, C. Quiel & W. Diegor (1996)- Plate-formes carbonates a orbitolines et rudistes du Cretace inferieur dans l'ile de Cebu (Philippines). *Comptes Rendus Academie Sciences, Paris*, Ser. 2a, 322, p. 973-980.
(*'Lower Cretaceous carbonate platforms with orbitolinids and rudists on Cebu Island, Philippines'. Orbitolinid forams Mesorbitolina texana and Neorbitolinopsis conulus and rudist (similar to Pachytraga= Praecaprotina) limestones associated with island-arc volcanoclastics formerly ascribed to Lower Aptian, now assigned to Late*

Albian, based on orbitolinids and calcareous algae with Mediterranean or Caribbean affinity (see also Rodrigo & Schlagintweit 2022, who favor latest Aptian age?))

Mathisen, M.E. (1984)- Diagenesis of Plio-Pleistocene nonmarine sandstones, Cagayan Basin, Philippines: early development of secondary porosity in volcanic sandstones. In: D.A. MacDonald et al. (eds.) *Clastic Diagenesis*, American Assoc. Petroleum Geol. (AAPG), Memoir 37, p. 177-193.

(Plio-Pleistocene non-marine volcanic sandstones of Cagayan basin significantly altered by early dissolution and cementation. Fluvial sandstones buried to 400-900m only slightly compacted, but with significant authigenic pore-lining clay and zeolites. Early dissolution of plagioclase, heavy minerals and volcanic fragments in nearly all samples, dissolving up to half framework grains and increasing porosity to 40%)

Mathisen, M.E. & C.F. Vondra (1983)- The fluvial and pyroclastic deposits of the Cagayan basin, northern Luzon, Philippines: an example of non-marine volcanoclastic sedimentation in an interarc basin. *Sedimentology* 30, p. 369-392.

(Cagayan basin interarc basin of N Luzon 250km long and 80 km wide, contains 900m thick Plio-Pleistocene fluvial and pyroclastic deposits)

Matsukawa, M., S.V. Sendon, F.T. Mateer, T. Sato & I. Obata (2012)- Early Cretaceous ammonite fauna of Catanduanes Island, Philippines. *Cretaceous Research* 37, p. 261-271.

(Nine Aptian- E Albian ammonoid species from Yop Fm, SW side of Catanduanes Island, E of Luzon. Faunas resemble assemblages from E side of Japan. Were in warm current regime. Ammonite-bearing rocks possibility exotic blocks embedded in chaotic sediments (like Orbitolina-bearing limestone in same area))

Matsumaru, K. (1974)- Larger foraminifera from East Mindanao, the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 14, p. 101-115.

(E Mindanao Cretaceous andesites and sediments, unconformably overlain by Tertiary clastics and carbonates. Larger foram assemblages Early Oligocene (Tcd/ with Nummulites fichteli and Borelis pygmaeus) and Miocene (Te1-4, Te5 and Tf1-2))

Matsumaru, K. (2011)- A new definition of the Letter Stages in the Philippine Archipelago. *Stratigraphy* 8, 4, p. 237-252.

(M Paleocene- Recent Letter Stages for Philippines re-defined in terms of 17 larger foram assemblage zones)

Matsumaru, K. (2017)- Larger foraminifera from the Philippine Archipelago: Part 1, Late Cretaceous to Middle Eocene. *Micropaleontology* 63, 2-4, p. 77-148.

(online at: <https://sucra.repo.nii.ac.jp/record/18668/files/A3000445.pdf>)

(Extensive review of Philippines larger foraminifera. 192 Cretaceous- Recent larger foraminifera species from 265 samples from 15 islands of Philippine Archipelago, including 19 new species and 8 new genera. With Campanian-Maastrichtian Lepidorbitoides spp., Pseudorbitoides, Omphalocyclus. E-M Eocene Ta1 and Ta2 assemblages, etc.)

Matsumaru, K. (2017)- Larger foraminifera from the Philippine Archipelago: Part 2, Late Eocene to Quaternary. *Micropaleontology* 63, 2-4, p. 149-253.

(online at: <https://sucra.repo.nii.ac.jp/record/18668/files/A3000445.pdf>)

(Continuation of paper above. Incl. Eocene (Tb) limestones with Pellatispira spp., Biplanispira, Nummulites, Discocyclus, Asterochylina, Spirochylus granulatus (= S. vermicularis Tan 19137), etc. from N Luzon, Catanduanes and Mindoro. Several new genera and species. No Lacazinella anywhere)

Matsumaru, K. & B.M. Barcelona (1982)- Tertiary stratigraphy of the Tayabas Isthmus and central part of Bondoc Peninsula, Luzon, the Philippines and larger foraminifera. In: T. Kobayashi & R. Toriyama (eds.) *Geology and palaeontology of Southeast Asia*, University of Tokyo Press, 23, p. 77-90.

Maury, R.C., F.G. Sajona, M. Pubellier, H. Bellon & M.J. Defant (1996)- Fusion de la croûte océanique dans les zones de subduction/ collision récentes: l'exemple de Mindanao, Philippines. Bull. Société Géologique France 167, p. 579-595.

(Fusion of oceanic crust in recent subduction/ collision zones: example of Mindanao, Philippines'. Adakites)

Maury, R.C., M.J. Defant, H. Bellon, D. Jacques, J.L. Joron, F. McDermott & P. Vidal (1998)- Temporal geochemical trends in northern Luzon arc lavas (Philippines); implications on metasomatic processes in the island arc mantle. Bull. Société Géologique France 169, p. 69-80.

(Neogene and Quaternary lavas from N Luzon arc (Batan, Babuyan de Claro, Camiguin, Calayan islands) display temporal increases in incompatible elements including Cs, Rb, Ba, K, La, Ce, Th, U, Ta, Hf and Zr from volcanoes >3 Ma to younger ones, suggesting hydrous fluids are not only metasomatic agents operating in mantle wedge but slab-derived melts (adakitic magmas) may also be involved)

McCabe, R., J. Almasco & W. Diegor (1983)- Geologic and paleomagnetic evidence for a possible Miocene collision in western Panay, Central Philippines. Geology (GSA) 10, p. 325-329.

(Palawan metamorphic terrane, represented by Paleozoic basement on NW tip of Panay, collided with remainder of island between Late Oligocene and M Miocene. Evidence for collision is (1) juxtaposition of old melange terrane against metamorphosed Paleozoic continental sediments similar to Palawan island, and (2) Miocene thrusting in melange terrane oriented parallel to suture. Paleomagnetic studies show Panay island rotated 20° CW since E Miocene, whereas N Philippines rotated CCW, consistent with collision of Philippine arc with NE-converging Palawan block)

McCabe, R., J.N. Almasco & G. Yumul (1985)- Terranes of the Central Philippines. In: D.G. Howell (ed.) Tectonostratigraphic terranes of the Circum Pacific Region, Circum-Pacific Council Energy and Mineral Resources, Earth Science Series, p. 421-436.

(Philippine Archipelago is collection of volcanic arcs, ophiolite fragments and rifted continental blocks, welded together by Late Miocene. Five terranes in C Philippines: (1) C Philippine arc terrane with Lower Cretaceous-Recent island arc debris; (2) Mindoro-Panay disrupted terrane, related to Miocene collision between Philippine arc and N Palawan continental terrane; (3) N Palawan continental terrane with late Paleozoic and Mesozoic continental-derived sequences overlain by Cenozoic marine sediments; (4) S Palawan disrupted terrane and (5) Sulu-Zamboanga disrupted terrane. Two additional terranes classified as suspect: (1) East Luzon-Samar-Mindanao disrupted terrane and (2) Cagayan arc terrane, a volcanic ridge in central part of Sulu Sea, composed of Miocene volcanics and limestones)

McCabe, R., E. Kikawa, J.T. Cole, A.J. Malicse, P. Baldauf, J. Yumul & J. Almasco (1987)- Paleomagnetic results from Luzon and the Central Philippines. J. of Geophysical Research 92, B1, p. 555-580.

(Plio-Pleistocene paleomagnetic data show no rotation, suggesting terranes that make up Philippine Arc behaved as single unit in past 5 My. Late Miocene sites two groups: W Luzon ~20° of CW rotation; Bicol region, Negros, Marinduque, and Mindanao not rotated. E Neogene results also two populations: Marinduque large CCW rotation, Panay, Cebu and Mindanao CW rotation. E Neogene data consistent with M-L Miocene collision of Palawan Continental Terrane and C Philippine Arc. Dikes of possible Oligocene age from Zambales Ophiolite rotated ~60° CW. VGP of Mindoro displaced S-ward from Late Jurassic VGP of S China, suggesting post-Jurassic S-ward migration of Mindoro)

McDermott, F., M.J. Defant, C.J. Hawkesworth, R.C. Maury & J.L. Joron (1993)- Isotope and trace element evidence for three component mixing in the genesis of the North Luzon lavas (Philippines). Contributions to Mineralogy and Petrology 113, p. 9-23.

(Post-3Ma volcanics from N Luzon arc exhibit systematic variations in $^{87}\text{Sr}/^{86}\text{Sr}$, $^{143}\text{Nd}/^{144}\text{Nd}$ and $^{208}\text{Pb}/^{206}\text{Pb}$ along arc over ~500 km. Reflect varying contributions from mantle wedge, slab-derived hydrous fluid, and isotopically enriched subducted S China Sea terrigenous sediment)

McGuinness, D. & J. Branson (1989)- Deep-water reservoir appraisal in the Philippines: an innovative extended test. Australian Petroleum Exploration Assoc. (APEA) Journal 40, p. 24-32.

McMurtrie, G., R. Jason, C. Lambert & J. Pattillo (2011)- Deepwater potential the NW Palawan Basin, Philippines. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference, Singapore 2011, Presentation 17, p. 1-24. (*Abstract +Presentation*)

(*Undrilled deep water NW of Palawan Island. Present-day shallow-water reservoir fairways like Nido Limestone, extend into deepwater. Outboard half grabens with potential source rocks modeled to be oil-mature. Seabed coring indicates widespread thermogenic microseepage. Inversion structures, gas chimneys, etc.*)

Mediodia, D., A. Castro, M. Tablizo, D. Policarpio, J. Calvelo, J.P. Baguio, A. Borja, C.H. Lin & A.G. Fernando (2024)- Paleoichthyology in the Philippines: a review of Cenozoic fish fossils with insights on its current status and future opportunities. *Geobios* 88-89, p. 163-174.

(*Review of Oligocene-Pleistocene fish fossils reported from three sedimentary basins in the Philippines, Cagayan Valley Basin, Ilocos-Central Luzon Basin and Visayan Sea Basin*)

Meresse, F.;D. Savva, M. Pubellier, S. Steuer, D. Franke, F. Cordey, C. Muller et al. (2012)- Late tectonic uplift of an inverted oceanic basin in South East Asia: the case of Palawan Island (western Philippines). EGU General Assembly, Vienna 2012, p. 11644. (*Abstract Only*)

(*Palawan island bounded by two marginal basins (S China Sea to N, Sulu Sea to S) composed of remnants of inverted Proto-South China Sea basin, thrust onto margin of continental terrane which rifted away from Chinese- Vietnamese margin. Island consists of: (1) Palawan wedge (deformed Cretaceous- Tertiary slope to ocean deposits; (2) ophiolite bodies on top of wedge, comprising Albian ribbon cherts, likely relicts of subducted Proto S China Sea; (3) central and southern parts of island large wavelength antiform of NE-SW trend, sealed by E Pliocene marls unit; (4) necking zones bordered by N-S trending transform faults)*)

Metrich, N., P. Schiano, R. Clocchiatti & R.C Maury (1999)- Transfer of sulfur in subduction settings: an example from Batan Island (Luzon volcanic arc, Philippines). *Earth Planetary Science Letters* 167, p. 1-14.

Middleton, C., A. Buenavista, B. Rohrlach, J. Gonzalez, L. Subang & G. Moreno (2004)- A geological review of the Tampakan copper-gold deposit, southern Mindanao, Philippines. Proc. PACRIM 2004 Conference, Adelaide 2004, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, p. 173-187.

(*online at: www.academia.edu/48388452/A_Geological_Review_of_the_Tampakan_Copper_Etc.*)

(*Pliocene Tampakan copper-gold deposit on SE Mindanao major high-sulfidation epithermal deposit superimposed on an underlying porphyry copper system. Hosted by subaerial andesitic flows of eroded Pliocene andesitic volcanic complex. Four volcanic cycles/ centres that sequentially developed and eroded*)

Midea, W.P., K. Hattori & G.T.V. Valera (2021)- Igneous rocks related to porphyry Cu-Au mineralization at the Dizon mine, Philippines. *Resource Geology* 71, 4, p. 392-408.

(*Dizon Au-rich porphyry Cu deposit hosted by diorite and andesite porphyry intrusions, dated at ~2.5 Ma. Subduction of the Scarborough Seamount caused compressive regime in overlying plate, which likely contributed to favourable tectonic conditions for mineralization*)

Militante-Matias, P.J. (1995)- *Orbitolina*-bearing rocks of Philippines. Proc. 15th International Symposium Kyungpook National University, p. 257-264.

(*On Early Cretaceous Tethyan larger foram Orbitolina in Philippines*)

Militante-Matias, P.J., M.M. de Leon & E.J. Marquez (2000)- Cretaceous environments of the Philippines. In: H. Okada & N.J. Mateer (eds.) *Cretaceous environments of Asia, Developments in Palaeontology and Stratigraphy* 17, Elsevier, p. 181-200.

(*Cretaceous rocks in Philippines exposed in several areas in C Philippines and Palawan. Composed of metamorphic basement rocks, crust-mantle sequences (Ophiolites?) and magmatic-volcanic arc complexes, generally capped by deep water pelagic cherts and limestones. Late Cretaceous more common shallow marine, locally with Orbitolina, rudists, etc., all suggesting tropical environments. Cretaceous sediments and volcanics often unconformably overlain by Eocene*)

- Milsom, J., J.R. Ali & K.L. Queano (2006)- Peculiar geometry of northern Luzon, Philippines: implications for regional tectonics of new gravity and paleomagnetic data. *Tectonics* 25, p. 1-14.
(online at: https://www.academia.edu/49955298/Peculiar_geometry_of_northern_Luzon_Philippines_Implications_for_regional_tectonics_of_new_gravity_and_paleomagnetic_data)
(*N termination of Philippine Archipelago remarkably abrupt. Paleomagnetic data favor possibility that during Paleogene Central Cordillera and Sierra Madre were combined as parts of arc at S margin of Philippine Sea. Sicalao Ridge interpreted as rift margin feature, created during detachment of Luzon from continental Sundaland. With plate reconstructions 45-20 Ma*)
- Milsom, J., J. Barretto, N. Aguda, D. Bringas, R. Ho & J. Aitchison (2009)- The gravity fields of Palawan and New Caledonia: insights into the subsurface geometries of ophiolites. *J. Geological Society, London*, 166, p. 985-988.
(*Palawan and New Caledonia similar ophiolites, both emplaced during arc-microcontinent collision and both ended subduction and also ended oceanic spreading that displaced microcontinent. Gravity data suggest both ophiolites derived from root zones just offshore on both islands, resting on basal surfaces that change abruptly in depth by up to 5 km. Geometries of thrust sheets are as important to understanding emplacement histories as exposure patterns*)
- Minerals Fuels Division, Bureau of Mines, Manila (1976)- A review of oil exploration and stratigraphy of the sedimentary basins of the Philippines. United Nations ESCAP, CCOP, Technical Bulletin 10, p. 55-102.
(online at: <https://repository.unescap.org/items/3fed6ccc-980f-4f02-bd20-c389a39a4f76>)
- Miranda, F.E. (1975)- Data on Philippine mineral resources. Bureau of Mines, Republic of the Philippines, Manila, Information Circular 22, p. 1-60.
- Mitchell, A.G.H. & G.R. Balce (1990)- Geological features of some epithermal gold systems, Philippines. *J. Geochemical Exploration* 35, p. 241-296.
(*Philippines islands contain numerous epithermal gold deposits, mainly in Cenozoic and locally Cretaceous arc systems, built on ophiolite and metamorphic basement rocks. Epithermal gold deposits mostly Pliocene, along axes of volcanic arcs*)
- Mitchell, A.H.G., F. Hernandez & A.P. de la Cruz (1986)- Cenozoic evolution of the Philippine archipelago. *J. Southeast Asian Earth Sciences* 1, 1, p. 3-22.
(*Late Cretaceous or earliest Tertiary detachment of ophiolite, W-ward subduction and subsequent accretion of arc and continental fragments to E Philippines was followed by mid-Miocene collision of this arc with SE-facing Sulu-Masbate arc. Ophiolites in Zambales, Mindoro, Panay and Palawan interpreted as remnants of single slab of Paleocene oceanic lithosphere, emplaced onto Asian margin during collision starting in Late Eocene. Continued convergence during Late Oligocene- E Miocene opening of S China Sea. E-ward subduction of S China Sea basin in Manila Trench resulted in Pliocene collision in Taiwan. Late Eocene collision accompanied by back-thrusting which initiated NW subduction of Celebes Sea in Sulu Arc. SE Sulu Sea and N extension through Panay opened in Oligocene by back-arc spreading behind Sulu Arc. Panay segment of Sea closed by Pliocene collision, following E-ward subduction in Negros Trench*)
- Mitchell, A.G.H. & T.M. Leach (1991)- Epithermal gold in the Philippines: island arc metallogenesis, geothermal systems and geology. Academic Press, London, p. 1-457.
(*Comprehensive account of Philippine gold deposits and geology*)
- Mitchell, A.G.H. & T.M. Leach (1991)- Outline of Philippine geology. In: Epithermal gold in the Philippines: island arc metallogenesis, geothermal systems and geology, Academic Press, London, p. 14-53.
- Moore, A.M.G. & J. Bacud (1994)- Geology and petroleum potential of Tayabas Bay. Australian Geological Survey Organization (AGSO), Canberra, Record 1994/41, Part 2, p. 1-42.
(online at: https://d28rz98at9flks.cloudfront.net/14753/Rec1994_041.pdf)

Morado, A.A. & J.P.M. Micu (2015)- Revisiting the petroleum prospectivity of the shallow water portion of NW Palawan, Philippines. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2015, Singapore, 7.4, p. 1-26. (*Extended Abstract + Presentation*)
(*NW Palawan area still considered to be attractive area for hydrocarbon exploration*)

Morishita, T., E.S. Andal, S. Arai & Y. Ishida (2006)- Podiform chromitites in the lherzolite-dominant mantle section of the Isabela ophiolite, the Philippines. Island Arc 15, p. 84-101.
(*online at: www.academia.edu/4655867/Podiform_chromitites_in_the_lherzolite_dominant_mantle_Etc*)
(*Isabela ophiolite in E Luzon complete ophiolite sequence with lherzolite-dominated mantle section, probably formed at slow-spreading mid-ocean ridge, later intruded by arc magmatism in response to change in tectonic setting during its obduction at convergent margin. Several podiform chromitites. Large chromitites in relatively depleted harzburgite hosts*)

Motegi, M. (1975)- Mineralization of the Philippines: a geohistorical review. The Philippine Geologist (J. Geological Society of the Philippines) 29, 4, p.
(*also in Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 15, p. 393-417*)
(*Eight Philippines mineralization periods: 1) Cretaceous-Paleogene eugeosynclinal basaltic volcanism forming bedded (strata-bound) ore deposits, 2) Paleogene diorite intrusives forming porphyry copper deposits, 3) Paleogene ultramatics forming chromite-nickel deposits, 4) Eocene-Oligocene diorites forming metasomatic iron deposits; 5) Post-Oligocene submarine acidic volcanism forming Kuroko-type ore deposits, 6) Miocene diorite intrusives forming many porphyry copper deposits and skarn type deposits, 7) Pliocene energite-luzonite deposits, and 8) Quaternary native copper mineralizations*)

Motegi, M. (1977)- Porphyry copper deposits in Philippines- their tectonic setting and present status of development. Mining Geology 27, p. 221-230.

Mou, D.C. & D.F. Collins (1996)- Camago No. 1, a gas and condensate discovery along the deepwater Lower Miocene reef trend, NW Palawan offshore, Philippines. In: G.P. & A.C. Salisbury (eds.) Trans. 5th Circum-Pacific Energy and Mineral Resources Conference, Honolulu 1990, Gulf Publishing, Houston, p. 556-569.
(*Camago 1 tested new deep water productive Lower Miocene pinnacle reef trend off NW Palawan, outboard of Nido- Pandan- Matinloc shelf margin. Gross wet gas column 655m. Flowed 24.6 MMCF and 809 B/ day*)

Muller, C., H. Jurgan & H. Porth (1989)- Paleogeographic outlines of the Visayan Basin. In: H. Porth & C.H. von Daniels (eds.) On the geology and hydrocarbon prospects of the Visayan Basin, Philippines, Geologisches Jahrbuch B70, p. 303-315.
(*Visayan Basin in tectonically active region since Oligocene, resulting in rapid changes in sedimentary conditions. Predominantly clastic sediments, episodes of volcanic activity, carbonate buildups along shelf edges and on structural highs, etc.*)

Muller, C. & C.H. von Daniels (1989)- Stratigraphical and paleoenvironmental studies (Oligocene-Quaternary) in the Visaya Basin, Philippines. Newsletters on Stratigraphy 10, 1, p. 2-64.
(*Biostratigraphic- paleoenvironmental results from Visayan Basin, from calcareous nannoplankton and foraminifera. With geological evolution of basin from M Oligocene-Pleistocene*)

Muller, C., C.H. von Daniels, P. Cepek, F. Gramann et al. (1989)- Biostratigraphy and paleoenvironmental studies in the Tertiary of the Visayan basin, Philippines. In: H. Porth & C.H. von Daniels (eds.) On the geology and hydrocarbon prospects of the Visayan Basin, Philippines. Geologisches Jahrbuch B70, p. 89-145.

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(*online at: www.gsm.org.my/products/702001-101355-PDF.pdf*)
(*Manila Trench- W Taiwan Foldbelt is anomalous W-facing island arc segment of W Pacific, postulated to be young, E- dipping subduction zone which flipped in Pliocene from W-dipping position on E side of Luzon and Taiwan, where it probably formed continuous subduction zone with Ryukyu and Philippine Trenches*)

Musper, K.A.F.R. (1937)- Das Erdol und seine Verwandten in den Philippinen. De Ingenieur in Nederlandsch-Indie (IV) 4, 8, p. IV.141- IV.157.

(online at: <https://www.stichtingblauwelijn.nl/assets/files/1937-08.pdf>)

('Oil and its relatives in the Phillipines'. Review of occurrences of oil and bitumens in The Philippines. Oil known from surface seeps since late 1800s, first shallow discovery in 1896. Rel. active oil exploration in early 1900s after American takeover)

Nakajima, T., S. Sueoka, M. Nagata, B.P. Kohn, N.T. Ramos, H. Tsutsumi & T. Tagami (2023)- First report of geo- and thermochronological results from the Cordillera Central, Luzon, Philippines. Earth Planets and Space 75, 176, p. 1-11.

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(Five diorites from Cordillera Central, Luzon, with zircon U-Pb and fission track ages from ~ 32.5 to 6.1 Ma, indicating intermittent Cenozoic magmatism. Rapid exhumation of Cordillera Central during Quaternary resulted from block-like uplift of entire mountain range)

Navarro, F.A., L.M. Ostrea, A.G. Lasam, J.P.M. Micu & E.C. Jacobsen (1992)- The Octon discovery. Proc. 9th SEAPEX Offshore Southeast Asia Conference (OFFSEA 92), Singapore 1992, SE Asia Petroleum Exploration Society (SEAPEX) 10, p. 207-231.

(Octon 1 1990 gas discovery in NW Palawan province in E Miocene turbiditic sandstones of Galoc Clastic Unit)

Neuhaus, D., J. Borgomano, J.C. Jauffred, C. Mercadier, S. Olotu & J. Grottsch (2004)- Quantitative seismic reservoir characterization of an Oligocene- Miocene carbonate build-up, Malampaya Field, Philippines. In: G. Eberli et al. (eds.) Seismic imaging of carbonate reservoirs and systems, American Assoc. Petroleum Geol. (AAPG), Memoir 81, p. 169-184.

(Complex reservoir architecture of Malampaya carbonate buildup offshore Palawan, Philippines, initially controlled by rugged clastic basement morphology, which was overgrown by atoll structures in Oligocene and E Miocene. Additional factors are frequent and high-amplitude relative sea level fluctuations, ocean currents, and prevailing wind directions. Primary depositional reservoir-quality distribution overprinted by diagenetic events, primarily as result of repeated platform-top exposure and submarine cementation)

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(online at: <https://www.frontiersin.org/articles/10.3389/feart.2023.1213498/full>)

(Tomographic images indicate contrasting velocity structures across Philippine Fault on Luzon to depth of 60 km, suggesting Philippine Fault may be lithospheric structure that displaces both crust and upper mantle. Also indications of low-velocity slab windows from depth of 40 km, interpreted as sites of slab tearing)

Nilayan-Tan, M. (1985)- Larger foraminifera from St. Paul's Limestone, Northern Palawan. Bureau of Mines and Geosciences, Manila, p. 1-25. (Unpublished)

(Oligocene-E Miocene 'Nido Limestone 'on Palawan, incl. E Oligocene limestones with Nummulites fabianii (= N. intermedius))

Noda, H. (1979)- Some Neogene Arcids from the Philippines. In: T. Kobayashi et al. (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 20, p. 159-176.

(Mainly systematic description of Miocene- Pliocene bivalves of Arca group from Bondoc Peninsula area, E Philippines. Miocene Anadara spp. from Batan Island associated with Vicarya callosa)

Novero, M.J., K.J. Sangalang, J.A. Gabo-Ratio, C. Dimalanta, B. Payot, M.Y.R. Garcia, J.A.V. Amoroso et al. (2024)- Unlocking clues on the provenance of the Zigzag Formation in Mountain Province, Northern Luzon, Philippines using sedimentary geochemistry. Proc. Int. Conference Geological Engineering and Geosciences, Yogyakarta 2023, IOP Conference Series: Earth and Environmental Science 1373, p. 012069, p. 1-10.
(online at: <https://iopscience.iop.org/article/10.1088/1755-1315/1373/1/012069/pdf>)

(Late Oligocene- E Miocene Zigzag Fm siliciclastics in SW Mountain Province, N Luzon represent first-cycle sediment from mafic source (likely oceanic island arc rocks, i.e. Cretaceous- Eocene Lepanto Metavolcanics))

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(Analyses of heavy mineral assemblages in 43 sandstone samples from Miocene of Iloilo Basin, S Panay Island. Dominated by hornblende, pyroxene, magnetite and biotite, derived from andesite and schist sources)

Olfindo, V.S.V., B.D. Payot, G.T.V. Valera & S. Arai (2020)- Petrogenesis of heterogeneous mantle peridotites with Ni-rich olivine from the Pujada Ophiolite, Philippines. J. Asian Earth Sciences 4, 1, 100039, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056020300153>) (withdrawn)

(On areas of Ni-enrichment of mantle section of Pujada Ophiolite, Philippines, which is believed to be N-most extension of Molucca Sea collision complex at SE tip of Mindanao island)

Olfindo, V.S.V., B.D. Payot, G.T.V. Valera, E.G. Gadot, B.R.B. Villaplaza, K. Tani, C.B. Dimalanta & G.P. Yumul (2019)- Petrographic and geochemical characterization of the crustal section of the Pujada Ophiolite, southeastern Mindanao, Philippines: insights to the tectonic evolution of the northern Molucca Sea Collision Complex. Proc. GEOSEA XV Congress, Hanoi 2018, J. Asian Earth Sciences 184, p. 103994, p. 1-12.

(Molucca Sea Collision Complex (MSCC) preserves interaction between Eurasian, Philippine Sea and subducted Molucca Sea Plates. Pujada Ophiolite exposed in SE Mindanao, remnant of oceanic lithosphere with backarc affinity, with Late Cretaceous (90 Ma) zircon ages from gabbros. Pujada Ophiolite trapped fragment of Proto-Molucca Sea Plate that was thrust onto Halmahera Arc, possibly during waning stages of collision between Sangihe and Halmahera Arcs)

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(Thin larval bivalve shells occur in E Norian radiolarian chert in Liminangcong Fm of Malampaya Sound Gp, part of Late Jurassic to Early Cretaceous subduction-related accretionary complex in N Palawan Block. 'Bivalve chert' accumulated in open-ocean realm of Panthalassa Ocean. Possibly halobiid bivalves with planktonic larval mode of life)

Orberger, B. & J. Alleweldt (1994)- Contribution to the petrogenesis of the platinum palladium-bearing black dunites of the Acoje block, Zambales ophiolite, Philippines: selenium and sulfur-contents, clinopyroxenes, initial weathering. J. Southeast Asian Earth Sciences 9, 3, p. 229-239.

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(Black serpentinites, hosting the Ni-Cu sulfide, platinum and palladium mineralisation in Acoje ophiolite block, in contact with chromitite concentrations)

Orberger, B., G. Friedrich & E. Woermann (1988)- Platinum-group element mineralization in the ultramafic sequence of the Acoje ophiolite block, Zambales, Philippines. In: H.M. Prichard et al. (eds.) Proc. Geo-Platinum 87 Conference, Elsevier, p. 361-380.

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Orberger, B., G. Friedrich & E. Woermann (1994)- Contribution to the petrogenesis of the platinum palladium-bearing black dunites of the Acoje block, Zambales ophiolite, Philippines: selenium and sulfur-contents, clinopyroxenes, initial weathering. *J. Southeast Asian Earth Sciences* 9, 3, p. 229-239.

(Black serpentinites with Ni-Cu sulfide, platinum and palladium mineralisation in Acoje ophiolite compared to non-mineralised green serpentinites. Study confirms magmatic character of Ni-Cu-sulfide mineralisation)

Ozawa, A., T. Tagami, E.L. Listanco, C.B. Arpa & M. Sudo (2004)- Initiation and propagation of subduction along the Philippine Trench: evidence from the temporal and spatial distribution of volcanoes. *J. Asian Earth Sciences* 23, p. 105-111.

(Initiation of subduction along Philippine Trench likely propagated from N to S: ~6.6 Ma in Bicol and ~3.5 Ma in Leyte and its vicinity, consistent S-ward propagation of subduction along Philippine Trench from ~8 Ma)

Pablico, E.F. & C.S. Lee (1994)- Geology and petroleum potential of Cuyo Platform. Australian Geological Survey Organisation (AGSO), Canberra, Record 1994/41, Part 4, p. 1-22.

(online at: https://d28rz98at9flks.cloudfront.net/14753/Rec1994_041.pdf)

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(Cenozoic sediments of S Samar Island in E Philippines record unroofing history of old arc terrane. Late Oligocene- E Miocene Daram Fm common chert and volcanic fragments, late M Miocene- E Pliocene Catbalogan Fm mainly ultramafic components. Daram Fm eroded crustal portions of ophiolite, Catbalogan Fm represents later exhumation and erosion of ultramafic section. Oceanic island arc setting proposed for both formations)

Padrones, J.T., A. Imai & R. Takahashi (2017)- Geochemical behavior of Rare Earth Elements in weathered granitic rocks in Northern Palawan, Philippines. In: 5th Asia Africa Mineral Resources Conf., Quezon City, Philippines 2015, *Resource Geology* 67, 3, p. 231-253.

(online at: <https://onlinelibrary.wiley.com/toc/17513928/2017/67/3>)

(Two geochemically similar plutons investigated for potential for placer-type LREE deposits on Palawan Block in Philippines: M Miocene Kapoas pluton (13.2 Ma) and Late Cretaceous Daroctan Granite (= Late Yanshanian of SE China))

Padrones, J.T., K. Tani, Y. Tsutsumi & A. Imai (2017)- Imprints of Late Mesozoic tectono-magmatic events on Palawan Continental Block in northern Palawan, Philippines. *J. Asian Earth Sciences* 142, p. 56-76.

(Late Cretaceous Daroctan Granite intruded Mesozoic melange in N-most Palawan Island. Monazite U-Th-Pb dating yielded Late Cretaceous age, similar to some Mesozoic granites surrounding S China Sea. Maximum ages of sediments and semi-schist Jurassic-E Cretaceous, with Late Cretaceous maximum age of deposition for meta-sediments. Palawan block accreted units possibly located at margin of continent-ocean collision in Mesozoic and eventually broke off from SE Eurasian margin)

Paguican, E.M., P. Grosse, G.N. Fabbro & M. Kervyn (2021)- Morphometric classification and spatial distribution of Philippine volcanoes. *J. Volcanology Geothermal Research* 418, 107251, p. 1-18.

(online at: www.sciencedirect.com/journal/journal-of-volcanology-and-geothermal-research/vol/418/suppl/C)

(Philippine Island Arc 731 volcanic edifices, grouped in 4 types: small flat cones, small steep cones, large cones, and massifs. Largest volcanoes in Negros, N and S Mindanao, E Philippines and W Luzon, coinciding with thickened crust of Bicol-Negros-Panay, C Mindanao, and C Luzon regions. Trend towards more silicic compositions from small to large cones. Distribution and alignment of edifices within volcanic fields influenced by regional and local stress fields and pre-existing structures)

Palmer, S.E. (1984)- Effect of water washing on C15+ hydrocarbon fraction of oils from NW Palawan. *American Assoc. Petroleum Geol. (AAPG) Bull.* 68, 2, p. 137-149.

(On geochemical changes in C15+ hydrocarbon fraction of crude oil from water-washed carbonate reservoir in Cities Service wells Tara-1 and Libro-1, offshore NW Palawan)

Parra-Avila, L.A., J. Hammerli, A.I.S. Kemp, B. Rohrlach, R. Loucks, Y. Lu, I.S. Williams et al. (2022)- The long-lived fertility signature of Cu-Au porphyry systems: insights from apatite and zircon at Tampakan, Philippines. *Contributions to Mineralogy and Petrology* 177, 2, 18, p.

(Tampakan, in S-C Mindanao Cordillera, one of world's youngest (Pliocene) and best-preserved world-class Cu-(Au) porphyry systems. Intrusions directly associated with mineralization contain apatite with elevated Cl and S concentrations compared to pre- and post- mineralization igneous events)

Partridge, A.D. (1994)- Palynological analysis of San Francisco 1 and Katumbo Creek-1, Bondoc sub-basin, Luzon Island. Australian Geological Survey Organisation (AGSO), Record 1994/41, Appendix 6, p. 1-25.

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(NW Luzon deformed Dos Hermanos tectonic melange composed mainly of ultramafic-mafic clasts in sheared serpentinite matrix)

Pasco, J.A., B.D. Payot, G.T.V. Valera, J.M.A. Dycoco, F.A.C. Labis, A. Tamura & T. Morishita (2023)- From rifting to emplacement: variable mantle melting preserved in the central Palawan Ophiolite peridotites, Philippines. *International Geology Review* 65, 22, p. 3466-3485.

(Petrological and geochemical signatures of C Palawan Ophiolite peridotites record transition of supra-subduction zone from back-arc spreading, incipient subduction, to obduction of ancient oceanic lithosphere)

Pautot, G. & C. Rangin (1989)- Subduction of the South China Sea axial ridge below Luzon (Philippines). *Earth Planetary Science Letters* 92, p. 57-69.

(Scarborough Seamount chain at axis of extinct S China Sea spreading center subducted obliquely along Manila Trench. Fabric of ridge characterized by N60°E trending normal faults and N130°E transform faults. Ridge can be traced into forearc area, result of underplating of ridge fragments accreted to upper plate)

Payot, B.D., S. Arai, A. Tamura, S. Ishimaru & R.A. Tamayo (2009)- Unusual ultradepleted dunite from Sibuyan Island (The Philippines): a residue for ultra-depleted MORB? *J. Mineralogical and Petrological Sciences* 104, p. 383-388.

Payot, B.D., S. Ishimaru, A. Tamura, C.B. Dimalanta, G.P. Yumul Jr & S. Arai (2021)- Remarkably fresh abyssal peridotites from Sibuyan island, Romblon Island Group, Philippines: markers of young arc-continent collision. *J. Asian Earth Sciences*: X, 5, 100051, p. 1-12.

(Remarkably fresh abyssal peridotites comprise Sibuyan Ultramafics in C Philippines, reflecting rapid uplift and emplacement. Ultramafics represent arc-continent collision in W Philippines)

Payot, B.D., S. Arai, R.A. Tamayo & G.P. Yumul (2009)- What underlies the Philippine island arc? Clues from the Calaton Hill, Tablas island, Romblon (Central Philippines). *J. Asian Earth Sciences* 36, p. 371-389.

(High-T metamorphic/ plutonic complex in Calaton Hill, Tablas island representative of lower crust underlying Philippine island arc)

Payot, B.D., S. Jago, R.C. Maury, M. Polve, M. Gregoire, G. Ceuleneer, R.A. Tamayo, G.P. Yumul, H. Bellon & J. Cotten (2007)- The oceanic substratum of Northern Luzon: Evidence from xenoliths within Monglo adakite (The Philippines). *Island Arc* 16, 2, p. 276-290.

(online at: [www.academia.edu/21739773/The_oceanic_substratum_of_Northern_Luzon_Eviden Etc.](http://www.academia.edu/21739773/The_oceanic_substratum_of_Northern_Luzon_Eviden_Etc.))

(A 8.65 Ma adakitic intrusive sheet near Monglo in Baguio District of N Luzon contains ultramafic and mafic xenoliths. One amphibolite xenolith with K-Ar age of 115.6 Ma (Barremian). Carried by ascending adakitic magmas from Lower Cretaceous ophiolitic complex at depth)

Pena, R.E. (1998)- Further notes on the stratigraphy of Baguio District. J. Geological Society of the Philippines 53, 3-4, p. 141-157.

Pena, R. (1996)- On recent interpretations on the ophiolites of Central Luzon and ophiolite associations in northern Luzon. J. Geological Society of the Philippines 51, 1-2, p. 37-47.

(Discussion of recent papers on ophiolites of Luzon by Encarnacion et al. (1993; proposing contemporaneous Eocene arc-back arc pair origin for Zambales and Angat ophiolites) and Florendo (1994; postulating Late Oligocene-Early Miocene intra-arc rifting in N Luzon that led to formation of oceanic crust represented by Itogon Ophiolite. Earlier studies clearly indicate Late Eocene sediment cover of Zambales ophiolite was deposited in deep open ocean, far from terrestrial/ arc sources. Cretaceous (Turonian-(Coniacian) dating of Angat Ophiolite well established by paleontologic dating of sedimentary cover. Etc.)

Pena, R.E. (2008)- Lexicon of Philippine Stratigraphy, 2008. Geological Society Philippines, Manila, p. 1-364.

Pena, R.E. & M.V. Reyes (1970)- Sedimentological study of a section of the 'Upper Zig-Zag Formation' along Bued River, Tuba, Benguet. J. Geological Society of the Philippines 24, 1, p. 1-19.

(Sediments below M Miocene Kennon Lst mainly fluvial conglomerates, derived from volcanic terrain)

Perez, A. d.C., D.V. Faustino-Eslava, G.P. Yumul, C.B. Dimalanta, R.A. Tamayo, T.F. Yang & M.F. Zhou (2013)- Enriched and depleted characters of the Amnay Ophiolite upper crustal section and the regionally heterogeneous nature of the South China Sea mantle. J. Asian Earth Sciences 65, p. 107-117.

(Volcanic section of M Oligocene Amnay Ophiolite in Mindoro, Philippines previously shown to be of normalid-oceanic ridge basalt (NMORB) composition. Also enriched mantle component)

Perez, A., S. Umino, G.P. Yumul & O. Ishizuka (2018)- Boninite and boninite-series volcanics in northern Zambales ophiolite: doubly vergent subduction initiation along Philippine Sea plate margins. Solid Earth (EGU) 9, p. 713-733.

(online at: <https://www.solid-earth.net/9/713/2018/se-9-713-2018.pdf>)

(Boninites are high-magnesium andesites that are key component of subduction-initiation suites, and is predominant in W Pacific forearc terranes. New discovery of boninite in Acoje Block of M Eocene (~44 Ma) Zambales ophiolite of W Luzon. Paleolatitudes place juvenile arc of N Zambales ophiolite in W margin of Philippine Sea plate, possibly in doubly vergent subduction initiation setting)

Philippines Bureau of Mines (1976)- A review of exploration and stratigraphy of sedimentary basins of the Philippines. UN Econ. Comm. Asia Far East (ECAFE), CCOP, Technical Bull. 10, p. 55-102.

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Pinet, N. & J.F. Stephan (1990)- The Philippine wrench fault system in the Ilocos Foothills, northwestern Luzon, Philippines. Tectonophysics 183, 1, p. 207-224.

(On Luzon Philippine Fault runs parallel to Philippine archipelago for >1300 km, and is active, left-lateral, strike-slip fault which forms a braided system. In Ilocos Foothills faults pattern results from two major tectonic episodes:(1) late M- Late Miocene episode Abra River strike-slip faulting; (2) The Pliocene(?)- Quaternary strike-slip activity propagating W-ward from Abra River Fault to Vigan-Aggao wrench fault)

Polve, M., R.C. Maury, S. Jago, H. Bellon, A. Margoum, G.P. Yumul, B.D. Payot, R.A. Tamayo & J. Cotten (2007)- Temporal geochemical evolution of Neogene magmatism in the Baguio gold-copper mining district (Northern Luzon, Philippines). Resource Geology 57, 2, p. 197-218.

(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/j.1751-3928.2007.00017.x>)

(Baguio porphyry copper-epithermal gold province in N Luzon, associated with E Miocene- Quaternary calc-alkaline and adakitic intrusions. Three magmatic pulses: E Miocene (21.2-18.7 Ma; related to W-dipping subduction of W Philippine Basin), M-L Miocene (15.3-8 Ma; subduction of S China Sea along Manila Trench)

and Pliocene-Quaternary (3-1 Ma). Quiescence period, from 8-3 Ma possible consequence of docking of Zambales ophiolitic terrane to N Luzon)

Popenoe, W.P. & R.M. Kleinpell (1978)- Age and stratigraphic significance for Lyellian correlation of the fauna of the Vigo Formation, Luzon, Philippines. Occasional Papers California Academy of Sciences 129, p. 1-73.

(online at: <http://archive.org/details/occasionalpapers129cali.pdf>)

(On Miocene molluscs and foraminifera from Vigo Group, Bondoc Peninsula, and comparisons with faunas and zonations from Indonesia)

Porth, H. (1989)- On the petroleum prospects of the Visayan Basin, Philippines. In: H. Porth & C.H. von Daniels (eds.) (1989)- On the geology and hydrocarbon prospects of the Visayan Basin, Philippines. Geologisches Jahrbuch B70, p. 385-406.

(Numerous oil seeps known from Cebu, NW Leyte and NE Negros islands. First oil exploration well in Visayan Basin drilled at oil seep near Toledo, Cebu. 208 wells drilled by 1980 in Visayan region, some with oil and gas shows or minor production, but no commercial oil or gas discoveries yet. Offshore basins up to 5-6 km of Tertiary sediments. Sandstones commonly rich in volcanoclastics, with poor permeability. Main reservoir potential in Miocene carbonate buildups)

Porth, H. & C.H. von Daniels (eds.) (1989)- On the geology and hydrocarbon prospects of the Visayan Basin, Philippines. Geologisches Jahrbuch B70, 428p.

(Collection of papers from German- Philippine co-operation project on geology, stratigraphy, biostratigraphy of the Visayan islands, C Philippines)

Porth, H., C. Muller & C.H. von Daniels (1989)- The sedimentary formations of the Visayan region. In: H. Porth & C.H. von Daniels (eds.) (1989)- On the geology and hydrocarbon prospects of the Visayan Basin, Philippines. Geologisches Jahrbuch B70, p. 29-87.

(Visayan basin Basement folded, low metamorphic Cretaceous volcanics and sediments, incl. Aptian-Albian Orbitolina limestone. Overlain by rare M-L Eocene limestone, M Oligocene limestone and widespread Late Oligocene-Recent sediments. Three phases of uplift-erosion: E-M Miocene boundary, M-L Miocene boundary, Late Pliocene)

Pratt, W.E. (1915)- Petroleum and residual bitumens in Leyte. Philippine J. Science, A, 10, 4, p. 241-279.

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Pratt, W.E. (1915)- On the occurrence of petroleum in the provinces of Cebu. Philippine J. Science, A, 10, 4, p. 281-287.

(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1915/PJS_Vol_10A_No4_Jul_1915.pdf)

(Several oil seeps and a few shallow wells in late 1800s, but limited commercial prospectivity)

Pratt, W.E. (1915)- The persistence of Philippine coal beds. Philippine J. Science, A, 10, 5, p. 289-301.

(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1915/PJS_Vol_10A_No5_Sep_1915.pdf)

(Coal was discovered in Cebu in 1827, and within 30 years most of more important Philippine coalfields became known. Despite encouragement from Spanish and American governments, no coal being produced at this time, largely because of discontinuous nature of coal seams)

Pratt, W.E. (1923)- Possible petroleum reserves of Philippine Islands. Transactions American Institute Mining Metallurgical Petroleum Engineers (AIME) 68, 1, p. 1091-1096.

(online at: <https://hi.booksc.org/book/55949350/d1a094>)

(Philippines produced no oil commercially, but oil is known to be present at various places in the islands. Attempts to produce oil commercially failed, but no intelligent, persistent exploration has been carried out)

Pratt, W.E. & W.D. Smith (1913)- The geology and petroleum resources of the southern part of Bondoc Peninsula, Tayabas Province, P.I. Philippine J. Science, A, 8, 5, p. 301-376.

(online at: <http://ia600202.us.archive.org/21/items/philippinejourna81913phil/philippinejourna81913phil.pdf>)

Pratt, W.E. & W.D. Smith (1913)- Petroleum on Bondoc Peninsula, Tayabas Province, Philippines. In: The mineral resources of the Philippine islands for the year 1912. The Bureau of Science, Manila, p. 49-57.

(Light oil proven present in seeps and shallow wells on Bondoc Peninsula, not in commercial quantities. Miocene Globigerina-rich Vigo Shale may be source of oil)

Pubellier, M., B. Deffontaines, R. Quebral & C. Rangin (1994)- Drainage network analysis and tectonics of Mindanao, southern Philippines. *Geomorphology* 9, p. 325-342.

(online at: www.academia.edu/5211605/Drainage_network_analysis_and_tectonics_of_Mindanao_southern_Philippines)
(Mindanao, S Philippines, is site of arc-continent collision which began in Late Pliocene. Tectonic features not easily detectable due to cover of Pleistocene- Holocene sediments and volcanics. Study of drainage pattern in Agusan-Davao and Cotabato Basins compared with other data enables a correlation of distant seismic lines)

Pubellier, M., R. Quebral, M. Aurelio & C. Rangin (1996)- Docking and post-docking escape tectonics in the southern Philippines. In: R. Hall & D. Blundell (eds.) *Tectonic evolution of Southeast Asia*, Geol. Soc, London, Special Publ. 106, p. 511-523.

(online at: https://www.researchgate.net/publication/249549431_Docking_and_post-docking_tectonics_in_the_southern_Philippines)

(Philippine archipelago structure results from juxtaposition of volcanic belt against Eurasian margin fragments and associated marginal basins. Docking compression began in early Late Miocene. Post-docking began in E Pleistocene, in N Mindanao represented by paired subduction zone and strike-slip fault)

Pubellier, M., R.D. Quebral, B. Deffontaines & C. Rangin (1993)- Neotectonic map of Mindanao Island Philippines (1:800,000). Explanatory notes, p. 1-22.

Pubellier, M., R. Quebral, C. Rangin, B. Deffontaines, C. Muller & J. Butterlin (1991)- The Mindanao collision zone: a soft collision event within a continuous Neogene strike-slip setting. *J. Southeast Asian Earth Sciences* 6, p. 239-248.

(online at: http://www.academia.edu/5211612/The_Mindanao_collision_zone_a_soft_collision_event_within_a_continuous_Neogene_strike_slip_setting)

(Two volcanic belts presently juxtaposed on Mindanao in S Philippines. To S collision still active in Molucca Sea zone of doubly verging subduction. Philippine Fault is neotectonic feature. Mindanao two composite terranes (1) W: Eurasian margin continental terrane (N-ward extension of Sangihe arc; Kudarat Plateau and Zamboanga Peninsula; (2) E: oceanic terrane (Philippine Mobile Belt- Halmahera arc). Since Late Pliocene- both terranes affected by NNE and E-W compression)

Queano, K.L. (2005)- Upper Miocene to Lower Pliocene Sigaboy Formation turbidites, on the Pujada Peninsula, Mindanao, Philippines: internal structures, composition, depositional elements and reservoir characteristics. *J. Asian Earth Sciences* 25, p. 387-402.

(Turbidites of U Miocene- Lw Pliocene Sigaboy Fm on Pujada Peninsula, SE Mindanao, overlie ophiolite. Channelized and unchannelized submarine fan deposits, derived from Sangihe arc and its uplifted outer arc ridge (now Pujada Peninsula), following initial subduction of Snellius Plateau- Halmahera Arc in Mindanao (latest M Miocene) and prior to initiation of Philippine Trench (<5 Ma). Porosity very low, rarely >5%.)

Queano, K., J. Ali, J. Aitchison, G. Yumul, M. Pubellier & C. Dimalanta (2008)- Geochemistry of Cretaceous to Eocene ophiolitic rocks of the Central Cordillera: implications for Mesozoic-Early Cenozoic evolution of the Northern Philippines. *International Geology Review* 50, 4, p. 407-421.

(Central Cordillera in N Philippines underlain mainly by Cretaceous- Eocene ophiolitic basement, with supra-subduction signature and generated in back-arc setting. Relationships similar to Cretaceous- Eocene Lepanto Metavolcanics and Pugo Fm, comprising ophiolitic basement in S portions of range, suggesting C Cordillera floored by common volcanic basement)

Queano, K.L., J.R. Ali, J. Milsom, J.C. Aitchison & M. Pubellier (2007)- North Luzon and the Philippine Sea plate motion model: insights following paleomagnetic, structural, and age-dating investigations. *J. of Geophysical Research: Solid Earth* 112, B05101, p. 1-44.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2006JB004506>)

(Paleomagnetic data from N Luzon show combination of major plate and local rotations in CW and CCW directions. Inclination data suggest N Luzon traveled as part of Philippine Sea Plate for most of Eocene-Pliocene history. N Luzon is placed on W edge of Philippine Sea Plate, just W of where Benham Plateau formed at ~40 Ma. Substantial N-ward migration since start of Neogene, with earlier interval stretching back to equatorial latitudes in mid-E Cretaceous. Post-15 Ma motion of plate involved indentation of Palawan microcontinent into W side of Philippine Archipelago)

Queano, K.L., J.R. Ali, M. Pubellier, G.P. Yumul & C.B. Dimalanta (2009)- Reconstructing the Mesozoic-early Cenozoic evolution of northern Philippines: clues from palaeomagnetic studies on the ophiolitic basement of the Central Cordillera. *Geophysical J. International* 178, 3, p. 1317-1326.

(First paleomagnetic data from Cretaceous Eocene ophiolitic basement (pillow basalts, diabase dykes) in C Cordillera on N Luzon suggest ophiolitic rocks formed at subequatorial latitudes ($6.3^{\circ}\text{N} \pm 3.1^{\circ}$), close to where island was during E Cenozoic. These rocks could be relicts of proto-Philippine Sea Plate)

Queano, K.L., C.B. Dimalanta, G.P. Yumul, D.V. Faustino-Eslava, E.J. Marquez, N.T. Ramos, K. Ishida et al. (2012)- The Zambales Ophiolite Complex, Philippines revisited: implications for its Tethyan origin. *Proc. First Int. Symposium of IGCP-589, Xi'an, China 2012, Acta Geoscientica Sinica* 33, Suppl. 1, p. 58. (Abstract)

(Zambales Ophiolite Complex needs to be deconstructed into M Jurassic- Lower Cretaceous Acoje Ophiolite and Eocene Coto Ophiolite)

Queano, K.L., C.B. Dimalanta, G.P. Yumul, E.J. Marquez, D.V. Faustino-Eslava, S. Suzuki & K. Ishida (2017)- Stratigraphic units overlying the Zambales Ophiolite Complex (ZOC) in Luzon, (Philippines): tectonostratigraphic significance and regional implications. *J. Asian Earth Sciences* 142, p. 20-31.

(Zambales Ophiolite Complex on W Luzon several massifs. Coto Block overlain by clastic sediments previously dated as Eocene, with similar ages obtained from diabase, granodiorites, etc., suggesting Eocene age for ZOC. Radiolarian cherts in E-M Miocene clastics, derived from Acoje Block of ZOC, suggest Late Jurassic- E Cretaceous age)

Queano, K.L., E.J. Marquez, J.C. Aitchison & J.R. Ali (2013)- Radiolarian biostratigraphic data from the Casiguran Ophiolite, northern Sierra Madre, Luzon, Philippines: stratigraphic and tectonic implications. *J. Asian Earth Sciences* 65, p. 131-142.

(online at: https://www.academia.edu/12710140/Radiolarian_biostratigraphic_data_from_the_Casiguran_Ophiolite_Northern_Sierra_Madre_Luzon_Philippines_Stratigraphic_and_tectonic_implications)

(Cherts- limestones overlying dismembered Casiguran Ophiolite, E Luzon, with Lower Cretaceous radiolarian assemblages (U Barremian- Aptian/Albian; incl. several 'Tan Sin Hok species'). Results older than U Cretaceous range previously reported in area, providing additional evidence for Mesozoic oceanic substratum upon which Luzon and neighboring regions of Philippine archipelago were likely built. Age closely resembles ages of ophiolite in SE Luzon, oceanic crust of Huatung Basin E of Taiwan and ophiolites in E Indonesia)

Queano, K.L., E.J. Marquez, C.B. Dimalanta J.C. Aitchison, J.R. Ali & G.P. Yumul (2017)- Mesozoic radiolarian faunas from the northwest Ilocos region, Luzon, Philippines and their tectonic significance. *Island Arc* 26, 4, e12195, p. 1-10.

(Dos Hermanos melange in NW Ilocos Norte, NW Luzon, with peridotites and metamorphic rocks blocks in sheared sandy matrix. Thrust onto the Eocene Bangui Fm turbidite succession and capped by U Miocene Pasuquin Limestone. With uppermost Jurassic- Lower Cretaceous radiolarian assemblages in deep marine bedded chert blocks (incl. many 'Tan Sin Hok species'. Tectonic melanges in C Philippines attributed E-M Miocene arc-continent collision involving Philippine Mobile Belt and Palawan Microcontinental Block)

Queano, K.L., G.P. Yumul, E.J. Marquez, J.A. Gabo-Ratio, B.D. Payot & C.B. Dimalanta (2020)- Consumed tectonic plates in Southeast Asia: Markers from the Mesozoic to early Cenozoic stratigraphic units in the northern and central Philippines. *J. Asian Earth Sciences*: X, 4, 100033, p. 1-20.

(online at: <https://www.sciencedirect.com/journal/journal-of-asian-earth-sciences-x/vol/4/suppl/C>)

(Revised tectonic reconstruction model for Philippines/ SE Asia. Subduction zone (proto-East Luzon Trough) separating Benham Plateau and Philippine arc explains spatial distribution of Eocene arc-related formations and Mesozoic ophiolite materials with accretionary complex E of Luzon at ~40 Ma. Mesozoicophiolitic complexes that line E Philippine arc (and ophiolitic and pelagic limestone and chert fragments included in arc-derived Eocene formations in Luzon) could very well be traces of the now consumed East Asia Sea-proto-Philippine Sea Plate. Palawan Microcontinental Block (with Mindoro island and Romblon Island in C Philippines, positioned at railing edge of proto-South China Sea. Cebu, Bohol and Negros islands in C Philippines were at leading oceanic edge of Indo-Australian Plate during E Cenozoic. Etc.)

Quebral R., M. Pubellier & C. Rangin (1996)- The onset of movement on the Philippine fault in eastern Mindanao: a transition from a collision to strike slip environment. *Tectonics* 15, 4, p. 713-726.

(Evolution of Philippine fault in E Mindanao from zone of active arc-arc collision to strike-slip environment. Diachronous unconformity along Philippine Fault marking end of collision-related deformation reflects S-ward propagating nature of collision and provides limits on age of initiation of Philippine Fault)

Querubin, C.L. & G.P. Yumul (2001)- Stratigraphic correlation of the Malusok volcanogenic massive sulfide deposits, Southern Mindanao, Philippines. *J. Resource Geology* 51, 2, p. 135-144.

(Volcanogenic massive to semi-massive sulfide lenses in Main and SE Malusok areas confined within single stratigraphic interval)

Parcutela, N.E., R.S.P. Austria, C.B. Dimalanta, L.T. Armada & G.P. Yumul Jr (2022)- Arc-crustal compression and its effects on the underlying mantle geometry as elucidated from the potential field signatures of the buckled Cretaceous Cebu lithosphere, Philippines. *Tectonophysics* 831, 5, 229341, p.

(Cretaceous Cebu arc is under compression due to M Miocene impingement of the Palawan micro-continental Block to Philippine Mobile Belt. Lithospheric buckling of island arc crust accounts for topographic and Moho undulations in Visayan Basin)

Pasteris, J.D. (1996)- Mount Pinatubo volcano and 'negative' porphyry copper deposits. *Geology (GSA)* 24,12, p. 1075-1078.

(On cause of large amounts of SO₂ released during 1991 eruption of Mt Pinatubo in the Philippines, typical, leaving behind a "negative" or S-depleted zone where a porphyry copper deposit could have formed)

Ragland P.C. & M.J. Defant (1983)- Silica standardization: a discriminant technique applied to a volcanic arc system. *Earth Planetary Science Letters* 64, 3, p. 387-395

(A chemical method to distinguish andesitic magma types in tholeiitic, calc-alkaline and shoshonitic island-arc sequence in W Luzon, the Philippines)

Rammlair, D. (1993)- The evolution of the Philippine Archipelago in time and space: a plate-tectonic model. *Geologisches Jahrbuch* B81, p. 3-48.

(Philippines Archipelago complex jumble of continental fragments, Neogene sedimentary basins, magmatic arcs and accreted terranes of various ages. Ophiolites imbricated with rocks of sedimentary and metamorphic origin. Etc.)

Rammlair, D., H. Raschka & L. Steiner (1987)- Systematics of chromitite occurrences in Central Palawan, Philippines. *Mineralium Depositae* 22, 3, p. 190-197.

(Chromitite occurrences in C Palawan ophiolite classified into four groups)

Ramos, S.G., J.B. Rosell, A.M. de Guzman & A.P. Revilla (2003)- Sedimentological and biostratigraphic details of well Fuga-1, Babuyan Channel, Philippines. In: B. Ratanasthien et al. (eds.) *Pacific Neogene*

- paleoenvironments and their evolution, 8th Int. Congress on Pacific Neogene Stratigraphy, Chiang Mai, 2003, p.
- (Fuga-1 well drilled to 5892' on Fuga island, Babuyan Channel, to test gas potential of M Miocene Sicalao Limestone. Encountered E Miocene- Pleistocene neritic-bathyal clastics. Carbonates at N17-Tf3 boundary at 1970' and within the Middle Miocene sequence at 3290'-4500'. E Miocene (NN1-NN4) clastics from 4500' to 5892' consist of basaltic hyaloclastite and volcanic conglomerate in the upper part and fine-grained clastics in the lower section. Top Late Miocene- E Pliocene sedimentation influenced by episodic andesitic volcanism)*
- Rangin, C. (1991)- The Philippine Mobile Belt: a complex plate boundary. J. Southeast Asian Earth Sciences 6, p. 307-318.
- (Philippine archipelago is product of Late Cenozoic oblique collision of Philippine Sea Plate with thinned margin of Eurasia. Philippine Mobile Belt mainly composed of Philippine arc (Paleogene volcanic arc belonging to Philippine Sea Plate) and crustal fragments belonging to Eurasian Plate)*
- Rangin, C., C. Muller & H. Porth (1989)- Neogene geodynamic evolution of the Visayan region. In: H. Porth & C.H. von Daniels (eds.) (1989)- On the geology and hydrocarbon prospects of the Visayan Basin, Philippines. Geologisches Jahrbuch B70, p. 7-27.
- Rangin, C. & M. Pubellier (1990)- Subduction and accretion of oceanic fragments along the Eurasian margin: southern Japan- Philippine region. Some constraints for continental growth. In: J. Aubouin & J. Bourgois (eds.) Tectonics of Circum Pacific Continental margins, VSP Int. Publ., Utrecht, p. 139-164.
- Rangin, C., J.F. Stephan, R. Blanchet, D. Baladad, P. Bouysee et al. (1988)- Seabeam survey at the southern end of the Manila trench. Transition between subduction and collision processes, offshore Mindoro Island, Philippines. Tectonophysics 146, p. 261-278.
- (S tip of the Manila trench subduction-collision transition zone. Where oceanic crust is subducted, simple accretionary prism-fore arc basin pattern is developed. Where continental margin is subducted, intraplate deformation is randomly distributed across fore arc area which is fragmented into various crustal microblocks)*
- Rangin, C., J.F. Stephan, J. Butterlin, H. Bellon, C. Muller, J. Chorowicz & D. Baladad (1991)- Collision neogene d'arcs volcaniques dans le centre des Philippines: stratigraphie et structures de la chaine d'Antique (ile de Panay). Bull. Societe Geologique France 162, 3, p. 465-477.
- (Neogene volcanic arc collision in C Philippines: stratigraphy and structures of the Antique Range, Panay'. Antique Range of W Panay is boundary between Eurasia and Philippine Sea plates, and represents Neogene accretion of intra-oceanic arc terrane to continental margin previously affected by rifting and spreading)*
- Rangin, C., J.F. Stephan & C. Muller (1985)- Middle Oligocene oceanic crust of the South China Sea, jammed into Mindoro Collision Zone, Philippines. Geology (GSA) 13, p. 425-428.
- (Mindoro Island is between Manila Trench and collision zone of N Palawan block with W Philippines mobile belt. M Oligocene ophiolites in suture part of terranes thrust above N Palawan block at E-M Miocene boundary. Ophiolites interpreted as fragments of S China Sea oceanic crust between two continental blocks)*
- Ranneft, T.S.M., R.M.J. Hopkins, A.J. Froelich & J.W. Gwinn (1960)- Reconnaissance geology and oil possibilities of Mindanao. American Assoc. Petroleum Geol. (AAPG) Bull. 4, p. 529-568.
- (Structural features in E Mindanao strongly influenced by active Philippine rift. W and C Mindanao reflect merging of diverse tectonic and volcanic trends. Two major sedimentary basins: Agusan-Davao Trough and Cotabato basin with 6000-15000' of mostly Miocene- Pliocene deep marine strata, both with possibilities for commercial hydrocarbon accumulations. Eocene limestone in Agusan-Davao Trough, contemporaneous with volcanism and intrusion in W Mindanao.)*
- Raschka, H., E. Nacario, D. Rammlmair, C. Samonte & L. Steiner (1985)- Geology of the ophiolite of Central Palawan Island, Philippines. Ofioliti B10, 2-3, p. 375-390.
- (C Palawan Island with ophiolitic rocks over ~100 km in SW-NE direction. Ophiolite suite of basal tectonized peridotite, grading upward to foliated gabbro to pillow basalts with associated cherts. Sheeted dyke complex*

missing. Ophiolite overlain by Late Cretaceous-Oligocene flysch-type sediments (radiolarian ages?), covered by younger shallow water sediments. Intensely foliated rocks of mainly basaltic origin at peridotite contacts towards flysch (metamorphosed in amphibolite and greenschist facies, with K/Ar ages of ~40 Ma))

Rehm, S.K. (2003)- The Miocene carbonates in time and space on- and offshore SW Palawan, Philippines. Ph.D. Dissertation, Christian-Albrechts Universität, Kiel, Germany, p. 1-242.

(online at: https://oceanrep.geomar.de/id/eprint/31073/1/Rehm_Diss.pdf)

(Late Early- Middle Miocene carbonates on Palawan compared to equivalent deposits offshore. Laterally extensive platform carbonates unconformably overlie Cretaceous- Lower Tertiary clastics. Some isolated reefal buildups formed on top of platform during M Miocene drowning. Carbonate thickness ~650-1000m, displaying overall deepening-upward facies. Carbonates covered by Late Miocene-Recent prograding clastics)

Reyes, M.V. (1977)- Cenozoic reef developments in the Visayas, Philippine Islands. Proc. First ASCOPE Conference, Jakarta, 1, p. 253-261.

Reyes, M.V. & E.P. Ordonez (1970)- Philippine Cretaceous smaller foraminifera. The Philippine Geologist (J. Geological Society of the Philippines) 24, 2, p. 1-67.

Reyes, P.J.D., M.A.V. Bornas, D. Dominey-Howes, A.C. Pidlaon, C.R. Magill & R.U. Solidum (2018)- A synthesis and review of historical eruptions at Taal Volcano, Southern Luzon, Philippines Earth-Science Reviews 177, B6, p. 565-588.

(Taal Volcano in S Luzon is second most active in the Philippines. Oldest known historic event at AD 1572 Four mapped ignimbrite deposits. Etc.)

Reyes, R.A. (1979)- Hydrocarbon distribution and carbon isotope variations in the surface petroleum occurrences and potential source rocks in Northwest Leyte. The Philippine Geologist (J. Geological Society of the Philippines) 33, 1, p. 1-33.

(Analyses of surface seeps and potential source rocks in NW peninsula of Leyte suggest: (1) land-derived organic matter contributed strongly to potential source of Taog, Tagnocot, Bata Fms (2) bitumen in Bata Fm sandstone not autochthonous and migrated from prolific source rock (3) surface hydrocarbon occurrences originated from common source, possibly from mature Taog Fm)

Reynolds, N.A., R. Ayres, R.N. McLean & G. Maude (2015)- The Mabilo copper-gold-iron deposit- a new skarn discovery in The Philippines. Proc. PACRIM 2015 Congress, Hongkong, Australasian Institute of Mining and Metallurgy (AusIMM), Melbourne, Publ. Series 2/2015, p. 431-437.

(Mabilo skarn deposit in S of Pacarale mineral district in Luzon, 200km ESE of Manila. Mineralized skarn replaces dipping Tumbaga Fm Eocene limestone/ volcanics in aureole of Miocene quartz-diorite intrusion)

Ribeiro, J.M., R.C. Maury & M. Gregoire (2016)- Are adakites slab melts or high-pressure fractionated mantle melts? Journal of Petrology 57, 5, p. 839-862.

(Adakites are unusual felsic igneous rocks commonly associated with asthenospheric slab window opening or fast subduction of young (<25 Ma) oceanic plate that may allow slab melting at shallow depths (in forearc settings). Incl. examples from Philippines)

Rillera, F.G. & E.F. Durkee (1996)- Hydrocarbon potential of Manila Bay and adjacent areas. The Australian Petroleum Exploration Assoc. (APPEA) J. 36, 1, p. 293-321.

(First ever exploratory well in Manila Bay part of C Luzon Basin, Philippines, drilled in 1995. Failed to reach its main objective and was not tested. Over-pressured, potentially gas-bearing Late Miocene-Pliocene carbonate reservoir between 1995- 2210 m)

Ringenbach, J.C. (1992)- La Faille Philippine et les chaines en decroche ment associees (center et nord de Luzon): Evolution Cenozoique et cinematique des deformations quaternaires. Ph.D. Thesis University de Nice Sophia Antipolis, p.

(‘The Philippine Fault and associated strike-slip belts (C and N Luzon): Cenozoic evolution and kinematics of Quaternary deformations’).

Ringenbach, J.C., N. Pinet, J.F. Stephan & J. Delteil (1993)- Structural variety and tectonic evolution of strike slip basins related to the Philippine fault system, northern Luzon, Philippines. *Tectonics* 12, 1, p. 187-204.

(N part of Philippine fault zone in Luzon complex system of left-lateral strike-slip faults, with strike-slip basins along main splays of fault zone. Those located along N striking cordilleran faults formed in late E Pliocene-Pleistocene time when Philippine fault initiated. Structural setting result of E Miocene collision between Benham Rise and E margin of Luzon, and subsequent inception of NW striking strand of Philippine fault)

Roberts, M. (1983)- Seismic example of complex faulting from NW shelf of Palawan. In A.W. Bally (ed.) *Seismic expression of structural styles*, American Assoc. Petroleum Geol. (AAPG), *Studies in Geology* 15, 3, 4.2, p. 18-24.

(N Palawan-Calamian block separated from S China by N-S seafloor spreading beginning in M Oligocene. Spreading in ceased in E Miocene, but tectonism on NW shelf of NPC block continued into latest Miocene. Subsidence of at least outer shelf area in late E Miocene, synchronous with cessation of sea floor spreading, followed by M and L Miocene uplifts. Late Miocene events marked by high-angle basement faulting, here interpreted as wrench and reverse faulting, possibly resulting from collision between NPC block and main Philippine arc in SW Luzon-Mindoro-Panay region. Parts of crust of Mindoro and Panay may have been continuous with NPC block crust. Reed Bank and Dangerous Ground areas W and SW of NPC block, also thought to have separated from China (and Indochina) by sea-floor spreading, but drift not well documented)

Rodrigo, J.D., J.A.S. Gabo-Ratio, K.L. Queano, A.G.S. Fernando, L.P. de Silva, K. Yonezu & Y. Zhang (2020)- Geochemistry of the Late Cretaceous Pandan Formation in Cebu Island, Central Philippines: Sediment contributions from the Australian plate margin during the Mesozoic. *The Depositional Record* 6, 2, p. 309-330.

(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1002/dep2.103>)

(Late Cretaceous Pandan Fm in Cebu Island one of oldest sedimentary units in C Philippines. Petrography indicates significant contribution from mafic sources with additional inputs from felsic rocks, siliciclastics, and metamorphics. Geochem suggests formation in oceanic island arc to active margin/collision zone, modeled to be located at oceanic leading edge of Australia. Rapid uplift and erosion of arc and older allochthonous blocks led to rapid deposition of Pandan Fm in Late Cretaceous at subequatorial region)

Rodrigo, J. & F. Schlagintweit (2022)- The Lower Cretaceous Tuburan Limestone of Cebu Island, Philippines: microfacies, micropalaeontology, biostratigraphy, and palaeogeographic perspectives. *Carnets de Geologie* 22, 14, p. 661-679.

(online at: <http://paleopolis.rediris.es/cg/22/14/CG2214.pdf>)

(Latest Aptian- ?earliest Albian orbitolinid-bearing shallow water limestone blocks (Tuburan Lst) in volcanic series from Cebu Island (known since 1950's). With Mesorbitolina texana, M. birmanica, Palaeodictyoconus actinostoma, Neorbitolinopsis conica, Paracoskinolina sp., algae Salingoporella, etc. Microfacies suggest platform margin setting. Tuburan Lst from Cebu remnants of former carbonate cover of guyot that originated as volcanic island in W-C Pacific, now incorporated into subduction zone accretionary wedge)

Rodriguez, K. & N. Hodgson (2024)- Beyond pinnacle reef plays: Targeting de-risked coarse clastic plays East of Palawan, Philippines. *Proc. GESGB-SEAPEX Asia Pacific Conference, Exploring Asia Pacific's Energy Future*, London 2024, p. 28 *(Abstract + Ppt presentation, 16p.)*

(On hydrocarbon potential of Miocene clastics in rift basin E of Palawan rift basin)

Roeder, D. (1977)- Philippine arc system- collision or flipped subduction zone? *Geology* 5, p. 203-206.

(Between Taiwan and Molucca strait, an arc-arc collision migrating southward between Late Oligocene and E or M-Pliocene time was followed by renewed subduction at former sites of arc-associated wrenching. Possibly triggered by polarity changes along strike of collision, post-collisional trenches offset and of opposed polarity)

Rohrlach, B.D. (2002)- Tectonic evolution, petrochemistry, geochronology and palaeohydrology of the Tampakan porphyry and high sulphidation epithermal Cu-Au deposit Mindanao, Philippines. Ph.D. Thesis, Australian National University (ANU), Canberra, p. 1-499.

(online at: <https://openresearch-repository.anu.edu.au/handle/1885/110491>)

(Study of Pliocene Tampakan Cu-Au deposits on Mindanao)

Rohrlach, B. & R.R. Loucks (2005)- Multi-million-year cyclic ramp-up of volatiles in a lower crustal magma reservoir trapped below the Tampakan copper-gold deposit by Mio-Pliocene crustal compression in the southern Philippines. In: T.M. Porter (ed.) Super porphyry copper & gold deposits- a global perspective, 2, PCG Publishing, Adelaide, p. 369-407.

(online at: www.academia.edu/48388455/Multi_million_year_cyclic_ramp_up_of_volatiles_in_a_lower_Etc.)
(Porphyry copper and high-sulphidation epithermal copper-gold ore deposits spatially and temporally clustered in arc segments that underwent crustal shortening during magmatic differentiation. In ductile lower crust or uppermost mantle, geodynamically induced horizontal compression inhibits propagation of subvertical dikes and can keep buoyant magmas trapped in sheet-like subhorizontal chambers. Etc.)

Rohrlach, B., A. Madera & R. Watt (1999)- Geology, alteration and mineralisation of the Tampakan copper deposit. Proc. 4th Pacific Rim Congress (PACRIM '99), Bali 1999, Australasian Institute of Mining and Metallurgy (AusIMM), p. 517-525.

(Tampakan mineral deposit is telescoped high-sulphidation-epithermal/ porphyry deposit. Host units on W flank of deeply dissected, probable Pliocene age, andesitic stratovolcano in NW Sangihe Arc in S Mindanao. Discovered in 1992)

Roque, V.P., B.P. Reyes & B.A. Gonzales (1972)- Report on the comparative stratigraphy of the east and west sides of the mid-Luzon Central Valley, Philippines. Mineral Engineering Magazine, September 1972, p. 11-51.

Rossmann, D.L., G.C. Castaneda & G.C. Bacuta (1989)- Geology of the Zambales ophiolite, Luzon, Philippines. Tectonophysics 168, p. 1-22.

(Zambales ophiolite complex of W Luzon. Age established by limiting strata is Late Eocene. Ophiolitic rocks exposed by uplift; ultramafic part exposed to erosion in earliest Miocene or Late Oligocene)

Royce, A., B. Tizon, J. Aira, S. Gabo-Ratio, P. Manalo, R. Takahashi, M.Y.R. D. Garcia & J.A.V.D. Amoroso (2024)- Characteristics of the Kematu epithermal gold deposit at Tboli, Mindanao, Philippines. Resource Geology 74, 1, e12339, p.

(Kematu Au-Ag epithermal deposit in Tboli area, S Cotabato, Mindanao, spatially and genetically linked to volcanism of Parker Volcanic Complex of Pliocene- Holocene age)

Rutland, R.W.R. (1967)- A tectonic study of part of the Philippine Fault Zone. J. Geological Society, London, 123, p. 293-323.

(Philippine Fault Zone trends N40°W is major strike-slip fault comparable to San Andreas fault. In SE Luzon, low-grade metamorphic rocks, of probable pre-Tertiary age, occur on NE side of Rift. Two main episodes of faulting: (1) Late Miocene on northerly faults and (2) Plio-Pleistocene on NW faults. Structural relations argue against major post-Miocene strike-slip movements)

Rutland, R.W.R. & M.R. Walter (1974)- Philippine Archipelago. In: A.M. Spencer (ed.) Mesozoic-Cenozoic orogenic belts, Geological Society, London, Special Publ. 4, p. 491-500.

(Brief review of Philippines geology. Cretaceous-Tertiary orogen of the Philippines forms link between mobile regions of Taiwan to N and Sulawesi/W Irian to S. Basement of belt is Carboniferous -Permian ophiolitic rocks and flysch metamorphosed to amphibolite facies. Overlying basement are Triassic conglomerates and Jurassic greywackes and shales, locally with spilites. These were folded at end Jurassic and are overlain by Cretaceous)

Sajona, F., H. Bellon, R.C. Maury, M. Pubellier, J. Cotton & C. Rangin (1994)- Magmatic response to abrupt changes in geodynamic settings: Pliocene-Quaternary calc-alkaline and Nb-enriched lavas from Mindanao (Philippines). Tectonophysics 237, p. 47-72.

Sajona, F.G., H. Bellon, R.C. Maury, M. Pubellier, R.D. Quebral, J. Cotton et al. (1997)- Tertiary and Quaternary magmatism in Mindanao and Leyte (Philippines): geochronology, geochemistry and tectonic setting. *J. Asian Earth Sciences* 15, 2-3, p. 121-153.

(online at: www.academia.edu/download/49398835/s0743-9547_2897_2900002-020161006-2245-1cjbv0y.pdf)
(Several volcanic sectors in Leyte, Daguma and Mindanao. Composition of Tertiary-Recent arc magmatism linked to tectonic settings and used to refine reconstruction of tectonic history of Philippine archipelago. Identification of adakites used to date timings of subduction initiations and arc polarity reversals. In Daguma area (S Mindanao) Oligocene (30 Ma) arc tholeiitic diorites intrude older arc sequences. Miocene (17-7.7 Ma) calc-alkaline andesites with minor adakites at 18 Ma. Calc-alkaline volcanic substratum of Pliocene-Recent volcanoes (1.8 Ma -present) 8-6 Ma old. C Mindanao, Miocene andesites (20, 16 Ma), Pliocene (2.5 Ma) calc-alkaline volcanism and Quaternary lavas (1 Ma- present))

Sajona, F.G., E. Izawa, Y. Motomura, A. Imai, H. Sakakibara & K. Watanabe (2002)- Victoria carbonate-base metal gold deposit and its significance in the Mankayan Mineral District, Luzon, Philippines. *Resource Geology* 52, 4, p. 315-328.

(Victoria low-sulfidation epithermal carbonate-base metal gold deposit discovered in 1995 in N Luzon, just S of high-sulfidation copper-gold orebody (Lepanto enargite deposit) and porphyry copper-gold orebody (Far Southeast (FSE) deposit). Radiometric dating of Victoria mineralization 1.6- 1.1 Ma (E Pleistocene). Etc.)

Sajona, F.G. & R.C. Maury (1998)- Association of adakites with gold and copper mineralization in the Philippines. *Comptes Rendus Academie Sciences, Paris, IIA*, 326, 1, p. 27-34.

(Adakites are intermediate- acidic volcanic and plutonic rocks derived from partial melting of subducted oceanic crust when subducting slab is young (<20 Ma) and hot, at start and end of subduction. In Philippines most porphyry Cu and epithermal Au deposits related with these and related magmas (Nb-enriched basalts and adakite-linked andesites). E Luzon arc is example of adakite-Cu-Au area underthrust by young crust)

Sajona, F.G., R.C. Maury, H. Bellon, J. Cotton & M. Defant (1996)- High field strength element enrichment of Pliocene-Pleistocene island arc basalts, Zamboanga Peninsula, western Mindanao (Philippines). *Journal of Petrology* 37, p. 693-726.

Sajona, F.G., R. Maury, H. Bellon, J. Cotton, M. Defant & M. Pubellier (1993)- Initiation of subduction and the generation of slab melts in western and eastern Mindanao, Philippines. *Geology (GSA)* 21, p. 1007-1010.

(Adakite in E and W Mindanao Island, with low heavy rare earth elements, high Sr/Y ratios, etc., considered to be result of melting of young subducted oceanic crust, leaving eclogite residue. Pliocene-Quaternary adakites from W Mindanao probably from melting of Miocene Sulu Sea crust, currently subducting under Zamboanga. In E Mindanao, Pliocene-Quaternary adakites mark trace of Philippine fault. Underlying Philippine Sea crust of Eocene age cannot melt under normal subduction thermal conditions, but thermal models indicate melting at start of subduction can occur. Subduction of Philippine Sea plate began at 3-4 Ma beneath E Mindanao)

Sajona, F.G., R. Maury, G. Prouteau, J. Cotton, P. Schiano, H. Bellon & L. Fontaine (2000)- Slab melt as metasomatic agent in island arc magma mantle sources, Negros and Batan (Philippines). *The Island Arc* 9, p. 472-486.

(online at: https://www.academia.edu/17290247/Slab_melt_as_metasomatic_agent_in_island_arc_magma_mantle_sources_Negros_and_Batan_Philippines_)

(Associations of adakites with 'normal' island arc lavas and transitional adakites recognized lavas of Batan and Negros in N and C Philippines. Batan lavas related to subduction of M Miocene portion of South China Sea basin along Manila trench (ages ~ 1.1 Ma). Negros adakite (~2 Ma and younger) from almost aseismic subduction of M Miocene Sulu Sea crust along Negros trench. Etc.)

Sajona, F.G., R.C. Maury, M. Pubellier, J. Leterrier, H. Bellon & J. Cotton (2000)- Magmatic source enrichment by slab-derived melts in a young post-collision setting, central Mindanao (Philippines). *Lithos* 54, p. 173-206.

(C Mindanao was place of Pliocene (4-5 Ma) arc- arc collision event followed by basaltic to dacitic magmatism starting at 2.3 Ma. Lavas calc-alkaline to shoshonitic, including adakites and Nb-enriched basalts. Chemistry attributed to interaction of slab-derived melts, i.e., adakites, with arc mantle)

Salapare, R.C., C.B. Dimalanta, N.T. Ramos, T. Noelynna, P.C. Manalo, D.V. Faustino-Eslava, K.L. Queano & G. Yumul (2015)- Upper crustal structure beneath the Zambales Ophiolite Complex, Luzon, Philippines inferred from integrated gravity, magnetic and geological data. *Geophysical J. International* 201, 3, p. 1522-1533.

(Zambales Ophiolite Complex in W Luzon, exposure of emplaced crust-upper mantle ophiolitic sequences. Two juxtaposed blocks: (1) Acoje Block (NW; M Jurassic- E Cretaceous; island arc tholeiite composition) with low Bouguer gravity (<135 mGal) and magnetic (<69 nT) anomalies and (2) Coto Block (SE; Eocene; transitional mid-oceanic ridge-basalt/island arc composition) with high Bouguer gravity (>150 mGal) and magnetic (>110 nT) anomalies. Blocks separated by Lewis Fault Zone, with right lateral and vertical displacements)

Saldivar-Sali, A. et al. (1983)- Geology of offshore NW Palawan. *Oil and Gas Journal*, Nov 30, 1983, p. 119-128.

Saldivar-Sali, A., N.L. Caagusan & R.S. Rieza (1981)- Paleogene petroleum possibilities in the Philippines. In: M.J. Valencia (ed.) *Proc. EAPI/CCOP Workshop*, Honolulu 1980, Energy 6, 11, p. 1207-1224.

(online at: www.academia.edu/download/66579891/0360-5442_2881_2990033-520210423-6862-1r4ogkc.pdf)
(Older Paleogene section is most probable source rock for hydrocarbons produced from Lower Miocene carbonates in Philippines. Paleogene sandstone also probably cleaner (less volcanic) than Neogene sandstones. With Cretaceous- Recent stratigraphic section of Reed Bank well Sampaguita 1, S China Sea)

Saldivar-Sali, A., A.P. Madrid, R.A. Reyes & L.G. Flower (1987)- Tectonic setting and petroleum possibilities of Philippine sedimentary basins. In: M.K. Horn (ed.) *Trans. 4th Circum Pacific Energy Mineral Resources Conf.*, Singapore 1986, p. 223-242.

(Philippines consist of island arc systems, microcontinental plates and 13 associated sedimentary basins. Basins classified as forearc, backarc (associated with arcs) and rift basins (associated with microcontinents). Numerous potential hydrocarbon plays. With Paleogene- Miocene paleogeographic maps and paleotectonic schematic profiles)

Saldivar-Sali, A., H.G. Oesterle & D.N. Brownlee (1981)- The geology of offshore Northwest Palawan, Philippines. *Proc. 2nd Asean Council on Petroleum (ASCOPE) Conf. Exhib.*, Manila 1999, p. 99-123.

Saldivar-Sali, A., J. Suppe & R.E. Bischke (1996)- A Middle Miocene reconstruction of the Philippines and its consequences concerning petroleum exploration. In: G.P. & A.C. Salisbury (eds.) *Trans. 5th Circum-Pacific Energy and Mineral Resources Conference*, Honolulu 1990, Gulf Publishing, Houston, p. 617-625.

(Middle Miocene reconstruction of Philippines. Continental Palawan-Mindoro blocks collided with Visaya Islands (also with contain continental affinities) in ~M Miocene, uplifting C Mindoro and deforming basement and sediments along line from N Luzon to Negros. Oligo-Miocene volcanic arc formed during subduction along ancestral Manila trench. Etc.)

Sales, A.O., E.C. Jacobsen, A.A. Morado, J.J. Benavidez, F.A. Navarro & A.E. Lim (1997)- The petroleum potential of deepwater northwest Palawan block GSEC 66. *J. Asian Earth Sciences* 15, p. 217-240.

Samaniego, R.M. (1964)- The occurrence of *Globorotalia velascoensis* in the Philippines. *The Philippine Geologist* (J. Geological Society of the Philippines) 18, 3, p. 65-74.

(First record of Paleocene planktonic foraminifera in S Palawan)

Sano, S.I., Y. Iba, P.W. Skelton, J.P. Masse, Y.M. Aguilar & T. Kase (2014)- The evolution of canaliculate rudists in the light of a new canaliculate polyconitid rudist from the Albian of the Central Pacific. *Palaeontology* 57, 5, p. 951-962.

(online at:

(New polyconitid rudist Magallanesia canaliculata of probable Late Albian age from Pulangbato, C Cebu Island, Philippines and Takuyo-Daini Seamount, now in NW Pacific. It is similar to Praecaprotina Yabe and Nagao, 1926, a Japanese- C Pacific endemic genus of late Aptian- E Albian age. Cebu rudists few genera of polyconitids and a requieniid in 10m thick limestone in volcanoclastic sequence (not melange))

Santos, G. (1974)- Mineral distribution and geological features of the Philippines. In: W. Petrascheck (ed.) Metallogenic and geochemical provinces, Symposium Leoben 1972, Osterreichische Akademie Wissenschaften, Vienna, Springer Verlag, p. 89-105.

(Philippine mineral deposits divided into two main groups: (1)'frontal arc suite': nickel, laterite, chromite and cupriferous massive sulfide, associated with ultrabasic and basic volcanics and subordinate intermediate intrusive-metamorphic (schist) rocks; (2) 'third arc suite': mainly gold-bearing copper sulfides with pyrite and minor magnetite and molybdenite, related to intermediate intrusives and volcanics. Sulu Sea Basin may have formed as result of extensional rifting of part of frontal arc)

Santos, R.A. (1997)- Chromite and platinum group mineralization in arc-related ophiolites: constraints from Palawan and Dinagat Ophiolite Complexes, Philippines. Ph.D. Thesis, University of Tokyo, p. 1-193.
(Unpublished)

Santos-Ynigo, L. & F.B. Esguerra (1961)- Geology and geochemistry of the nickeliferous laterites of Nonoc and adjacent islands, Surigao Province, Philippines. Philippines Bureau of Mines, Manila, Special Project Series, Publ. 18; 90 p.

Sarewitz, D. & D.E. Karig (1986)- Processes of allochthonous terranes evolution in Mindoro Island, Philippines. Tectonics 5, 4, p. 525-552.

(Two tectonostratigraphic terranes on Mindoro Island, with unclear relationships: (1) N Palawan block rifted off S China in Oligocene, and comprises most of shallow S end of S China Sea. E part includes M-L Jurassic Mansalay Fm (NW dipping) and Eocene- E Oligocene Caguray Fm quartz-rich clastics and limestone, thick Lumintao complex mid-Oligocene submarine rift basalts and U Oligocene-Miocene graben fill deposits. (2) Mindoro block, with lower greenschist facies metamorphic basement (protoliths submarine arc volcanics?) with tectonic slices of serpentinite, overlain by U Cretaceous and U Eocene strata, recording several episodes of intense deformation of Mesozoic and Tertiary age. Mindoro Suture steeply dipping faults with serpentinitized ultramafic rock, amphibolite, and rocks derived from both bounding terranes, probably mid-Tertiary transcurrent faulting. W side of C Philippine archipelago was left-lateral transform boundary)

Sarewitz, D.R. & D.E. Karig (1986)- Geologic evolution of western Mindoro Island and the Mindoro suture zone, Philippines. J. Southeast Asian Earth Sciences 1, p. 117-141.

(Two tectonostratigraphic terranes on Mindoro Island: N Palawan and Mindoro blocks, separated by steeply-dipping Mindoro Suture Zone. N Palawan block is continental fragment rifted off Eurasia when S China Basin opened in mid Tertiary, with evidence of crustal stretching starting in Late Eocene or earlier. Large volumes of basalt extruded in mid Oligocene. Mindoro block with pre-upper Cretaceous Mindoro Metamorphic basement. Mindoro Suture Zone active in Late Paleogene- E Neogene. Numerous large bodies of serpentinitized ultramafic rock along suture. Interpreted as strike-slip boundary, juxtaposing Mindoro and N Palawan blocks in M-L Miocene. Subsequent latest Miocene and younger W-vergent thrust faulting between Mindoro Suture Zone and Manila Trench)

Sarewitz, D.R. & S.D. Lewis (1991)- The Marinduque intra-arc basin, Philippines: Basin genesis and in situ ophiolite development in a strike-slip setting. Geological Society of America (GSA) Bull. 103, 5, p. 597-614.

(Marinduque marine intra-arc basin in N-C Philippine volcanic arc system. Rhombic in shape, with long axis trending N-NW, with ENE trending volcanic ridge dividing it into two depocenters. Magnetic anomalies parallel to central volcanic ridge indicate it formed by extension in N-S direction by process analogous to sea-floor spreading. Marinduque basin is composite pull-apart basin whose floor is in part composed of oceanic-type crust. Evolution of central volcanic ridge presents actualistic model for development and emplacement of ophiolites in island-arc setting. Overall history of Marinduque basin suggests strike-slip processes may play important role in origin of intra-arc basins)

Sato, T. (1961)- Les ammonites oxfordiennes de l'île de Mindoro. Japanese J. Geology and Geography 32, 1, p. 141-143.

('The Oxfordian ammonites of Mindoro Island'. Incl. Parawedekindia arduennensis, Pseudopeltoceras from thick (but intensely folded) interbedded sandstone-shales in Mansalay area of SE Mindoro. First ammonites described from Philippines (see also Sato et al. 2012))

Sato, T., T. Kase, Y. Shigeta, R.S.P. De Ocampo, P.A. Ong, Y.M. Aguilar & W. Mago (2012)- Newly collected Jurassic ammonites from the Mansalay Formation, Mindoro Island, Philippines. Bull. National Museum Natural Science, Taiwan, Ser. C, 38, p. 63-73.

(online at: <https://www.kahaku.go.jp/english/research/researcher/papers/123551.pdf>)

(Four species of Jurassic ammonite from Mansalay area in SE Mindoro Island, Philippines: Physodoceras cf. gortanii and Perisphinctes (Liosphinctes) sp. from Amaga River valley near Mansalay, and P. (L.) cf. laevipickeringius and an unidentifiable perisphinctid from Colasi Point. Assemblage indicative of M Oxfordian age and close affinity with Tethys-Pacific faunas)

Sato, T. & Y. Seki (1972)- Finding of lawsonite-bearing rock as a pebble in a Jurassic conglomerate bed in the southeastern part of Mindoro Island, Philippines. Proc. of the Japan Academy 48, 7, p. 495-499.

(online at: https://www.jstage.jst.go.jp/article/pjab1945/48/7/48_7_495/_pdf)

(Lawsonite-bearing metavolcanic rock pebble in conglomerate in M Jurassic Mansalay Fm in SE Mindoro reflects pre-M Jurassic high-P metamorphism. Associated pebbles volcanics, schists, red chert, slate and Permian fusulinid-bearing limestones (Mindoro probably fragment of mainland E/ SE Asia, like Palawan and Busuanga; JTVG))

Schweller, W.J. & D.E. Karig (1982)- Emplacement of the Zambales Ophiolite into the West Luzon margin. In: J.L. Watkins & C.L. Drake (eds.) Studies in continental margin geology, American Assoc. Petroleum Geol. (AAPG), Memoir 34, p. 441-454.

(Zambales Ophiolite >10 km thick igneous sequence, formed in Late Eocene. It is a large fragment of oceanic crust, uplifted several km without being obducted onto continental margin. 120m of Late Eocene- Oligocene pelagic limestone on ophiolite changes to ophiolite- derived clastics in E Miocene)

Schweller, W.J., D.E. Karig & S.B. Bachman (1983)- Original setting and emplacement history of the Zambales Ophiolite, Luzon, Philippines, from stratigraphic evidence. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian seas and islands- II, American Geophysical Union (AGU), Geophysical Monograph 27, p. 124-138.

(Oldest sediments above Zambales ophiolite U Eocene pelagic limestone. M-Late Oligocene increasing dilution of limestone pelagic limestone with volcanoclastic turbidites. Thick Lower Miocene sandstone changes from volcanoclastic to ophiolitic composition over few Myrs, indicating rapid ophiolite uplift)

Schweller, W.J., P.H. Roth, D.E. Karig & S.B. Bachman (1984)- Sedimentation history and biostratigraphy of ophiolite-related Tertiary sediments, Luzon, Philippines. Geological Society of America (GSA) Bull. 95, 1, p. 1333-1342.

(Late Eocene- E Oligocene pelagic limestone of Lower Aksitero Fm caps volcanic complex of Zambales Ophiolite. U Aksitero Fm with volcanoclastic sandy turbidites in M-U Oligocene. Lower Miocene Moriones Fm clastics characteristic of deep-sea fans with debris of serpentine and other ultramafic components. Zambales deeply eroded by E Miocene and probably first emerged above sea level in M-L Oligocene, only 10 to 15 My after it formed as new ocean crust. Zambales Ophiolite originally part of marginal basin, not island arc)

Sevillo, D., J.F. Stephan, J. Delteil, C. Muller, J. Butterlin, H. Bellon & E. Billeto (1997)- Geology and tectonic history of Southeastern Luzon, Philippines. J. Asian Earth Sciences 15, p. 435-452.

(SE Luzon part of E Philippine Mobile Belt. Three major units limited by NW-SE left-lateral strike-slip faults. North-central Catanduanes Structural Unit characterized by M- early Late Cretaceous volcanic arc sequence unconformably overlain by M- L Eocene arc sequence, followed by E Oligocene intrusives. Median Structural Unit underlain by Late Cretaceous volcanic arc sequence followed by two chaotic sequences from end

Cretaceous- Paleocene and latest Middle Eocene-earliest Late Eocene. W Caramoan Structural Unit pre-Late Cretaceous ophiolitic suite unconformably overlain by Late Cretaceous volcanic arc sequence and M Eocene limestones. All units overlain by Late Oligocene to Pliocene carbonate and detrital sequence. Polyphase left-lateral strike-slip faulting recorded from end of Cretaceous to Early-Late Oligocene boundary. Faults probably represent traces of Proto-Philippine Fault System in SE Luzon)

Shao, W.Y., S.L. Chung, W.S. Chen (2014)- Zircon U-Pb age determination of volcanic eruptions in Lutao and Lanyu in the Northern Luzon magmatic arc. *Terrestrial Atmospheric Oceanic Sciences (TAO)* 25, 2, p. 149-187.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1205>)

(First zircon U-Pb ages of volcanic rocks and sands from Lutao and Lanyu, two islets off SE Taiwan in N Luzon arc. Lutao andesites zircon average age of 1.3 Ma. Lanyu volcanics zircon mean age of 2.6 Ma. Volcanic samples from both islets various amounts of older inherited zircons (main age peaks at ~150 Ma and ~1.9 and ~2.5 Ga, consistent with "hidden" continental crust involved in genesis of N Luzon magmatic arc)

Shao, W.Y., S.L. Chung, W.S. Chen, H.Y. Lee & L.W. Xie (2015)- Old continental zircons from a young oceanic arc, eastern Taiwan: implications for Luzon subduction initiation and Asian accretionary orogeny. *Geology (GSA)* 43, 6, p. 479-482.

(Chimei igneous complex in Coastal Range of E Taiwan is N part of intra-oceanic Luzon arc that accreted onto Eurasian continental margin since ~5 Ma. Magmatic zircons with mean Pb/U age of ~9 Ma probably of emplacement age. Inherited older zircons with ages clustering at ~14 Ma, ~218 Ma (largest peak) and older ages of ~726, ~1863 and ~2522 Ma suggest Cathaysia-type sources, attributed to continental fragment that split off Eurasian margin by opening of S China Sea, then drifted and accreted to W Philippine Sea plate before Luzon subduction initiation. Shows importance of ribbon continents in Asian orogenesis)

Sheldon, R.A. (1973)- Stratigraphy and petroleum prospects of Southwestern Cebu, Philippines. *American Assoc. Petroleum Geol. (AAPG) Bull.*, p. 1343-1347.

(First recorded indication of oil in Philippines well was near Toledo, Cebu, in 1896 in folded Lower Miocene sediments. Since that time sporadic and unsuccessful efforts to discover commercial accumulations of oil throughout Philippines. 51 wells drilled in Toledo-Cletom area, 23 of which reported shows of oil or gas. Hydrocarbons present in Miocene clastics of SW Cebu, but basin structure rel. complex and relatively cool (?). Crude oils paraffinic with a pour-point 75-100°F and API gravity of 38-44°)

Sherlock, R.L. & T.J. Barrett (2003)- Geology and volcanic stratigraphy of the Canatuan and Malusok volcanogenic massive sulfide deposits, southwestern Mindanao, Philippines. *Mineralium Deposita* 39, 1, p. 1-20.

Sherlock, R.L., T.J. Barrett & P.D. Lewis (2003)- Geological setting of the Rapu Rapu gold-rich volcanogenic massive sulfide deposits, Albay Province, Philippines. *Mineralium Deposita* 38, 7, p. 813-830.

(Gold-rich Fe-Cu-Zn volcanogenic massive sulfide deposits hosted by dacitic volcanic rocks of probable Jurassic age on E Rapu Rapu Island, off SE Luzon, at S end of NW-trending Eastern Regional metamorphic complex)

Shi, H., T. Li, R. Sun, G. Zhang, R. Zhang & X. Kang (2021)- Insights from the P Wave travel time tomography in the upper mantle beneath the Central Philippines. *Remote Sensing (MDPI)* 13, 13, 2449, p. 1-17.

(online at: <https://www.mdpi.com/2072-4292/13/13/2449>)

(Tomographic model imaging steeply subducting high velocity anomalies along Manila trench in S China Sea. Gradual change of subduction angle and shallowing of subduction depth from N to S indicates cessation of SCS spreading from N to S, also implying that N part of SCS opened earlier than S part. Subduction of Philippine Sea plate exhibited between 14° N and 9° N. Subduction of Sulu Sea on W side of PS plate. High velocity anomalies in mantle transition zone between 14° N and 9° N, identified as proto-SCS (PSCS) slabs and paleo-Pacific (PP) plate. It extends location of paleo-suture of PSCS-PP eastward from Borneo to Philippines)

- Shuto, T. (1969)- Neogene gastropods from Panay Island, the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 6, p. 1-250.
(136 species of *Miocene- Pleistocene gastropods from E margin of Iloilo Basin, SE Panay Island*)
- Shuto, T. (1969)- Neogene gastropods from Panay Island, the Philippines. *Contributions to the Geology and Palaeontology of Southeast Asia*, LXVIII. *Memoirs Faculty of Science, Kyushu University*, ser. D., Geol. 19, 1, p. 1-250.
(online at: https://catalog.lib.kyushu-u.ac.jp/opac_download_md/1543678/19_01_p001.pdf)
(Same paper as Shuto (1969), above. *E margin of Iloilo Basin, Panay Island with 136 species of Miocene-Pleistocene shallow marine gastropods. Lyellian percentage method used for conclusion of M Miocene-Pliocene age and correlations to biostratigraphic standards of Martin and Oostingh in Indonesia*)
- Shuto, T. (1971)- Neogene bivalves from Panay Island, the Philippines: *Contributions to the Geology and Palaeontology of Southeast Asia*, CVII. *Memoirs Faculty of Science, Kyushu University*, ser. D, Geol., 21, 1, p. 1-73.
(online at: https://catalog.lib.kyushu-u.ac.jp/opac_download_md/1544087/21_01_p001.pdf)
(*Shallow arine bivalve molluscs from Neogene of eastern Iloilo Basin, SE Panay: 49 species, 7 new (taxonomic descriptions only, for information of localities, ages, facies, see Shuto (1969) companion paper*)
- Shuto, T. (1982)- Miocene molluscs from the Macasilao and Paghu Mayan Formations, Negros Island, the Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 23, p. 101-135.
- Sibuet, J.C. & S.K. Hsu (1997)- Geodynamics of the Taiwan arc-arc collision. *Tectonophysics* 274, p. 221-251.
(*Luzon arc entered into collision with subduction zone in Late Miocene. With Miocene-Recent plate reconstructions of greater South China Sea area*)
- Sibuet, J.C. & S.K. Hsu (2004)- How was Taiwan created? *Tectonophysics* 379, p. 159-181.
- Sillitoe, R.H. & C.A. Angeles (1985)- Geological characteristics and evolution of a gold-rich porphyry copper deposit at Guinaoang, Luzon, Philippines. *Proc. Asian Mining '85 Conference*, London, Institute Mining Metallurgy, p. 15-26.
(*Guinaoang gold-rich porphyry copper deposit in N Luzon, tied to steeply-dipping quartz diorite porphyry stock intruding Mesozoic biotite schist basement, with copper and gold veins in andesitic volcanic rocks. Etc.*),
- Sillitoe, R.H., C.A. Angeles, G.M. Comia, E.C. Antioquia & R.B. Abeya (1990)- An acid-sulphate-type lode gold deposit at Nalesbitan, Luzon, Philippines. *J. Geochemical Exploration* 35, p. 387-411.
(*Nalesbitan lode gold deposit on Bicol peninsula of SE Luzon, Philippines is of acid-sulphate type, with ~15 tonnes of Au. Mineralization hosted by Pliocene andesitic volcanic rocks transected by NW-striking sinistral strike-slip fault zone*)
- Sillitoe, R.H. & I.M. Gappe (1984)- Philippine porphyry copper deposits: geologic setting and characteristics. *UNDP Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas*, CCOP, Technical Publication 14, p. 1-89.
(*Comprehensive review of 48 porphyry Cu-Au deposits in Philippines*)
- Smith, W.D. (1906)- *Orbitoides* from the Binangonan Limestone (with some notes on early connections between Formosa, The Philippines and Java). *Philippine J. Science* 1, 2, p. 203-209.
(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1906/PJS_Vol_1_No2_Feb_1906.pdf)
(*Description of Orbitoides richthofeni n.sp. from Binangonan Peninsula (= Late Oligocene- E Miocene Lepidocyclina (Eulepidina); JTvG*)
- Smith, W.D. (1908)- The mineral resources of the Philippine islands, with a statement of the production of commercial mineral products during the year 1907. *The Bureau of Science, Manila*, p. 1-39.

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(Early review of geological and paleontological studies in Philippines)

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(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1915/PJS_Vol_10A_No3_May_1915.pdf)

Smith, W.D. (1922)- Geological reconnaissance of the Pidatan Oil Field, Cotabato Province, Mindanao. Philippine J. Science 20,1, p. 23-44.

(online at: https://philjournalsci.dost.gov.ph/images/pdf_upload/pjs1922/PJS_Vol_20_No1_Jan_1922.pdf)
(1921 reconnaissance survey of folded and faulted Miocene-Recent sediments and structure around small Pidatan oil seep in N Cotabato Province, Mindanao. With andesite-basalt intrusives)

Smith, W.D. (1925)- Geology and mineral resources of the Philippine islands. Bureau of Mines, Manila, Publ. 19, p. 1-529.

(online at: <https://ia800308.us.archive.org/19/items/acw7735.0019.001.umich.edu/acw7735.0019.001.umich.edu.pdf>)

Smith, W.D. (1925)- The geological structure of the Philippine Archipelago. Verhandelingen Geologisch-Mijnbouwkundig Genootschap Nederland Kolonien, Geologische Serie 8 (Gedenkboek Verbeek, memorial volume), p. 461-480.

(online at: <https://books.google.com/books?id=Yy0RAAAIAAJ&pg>)

Smoczyk, G.M., G.P. Hayes, M.W. Hamburger, H.M. Benz, A. Villasenor & K.P. Furlong (2013)- Seismicity of the Earth 1900-2012, Philippine Sea Plate and vicinity: U.S. Geological Survey, Reston, VA, Open-File Report 2010-1083-M.

(online at: <https://pubs.usgs.gov/publication/ofr20101083M>)

(Earthquake distribution around Philippine sea Plate, which is bordered by Pacific, Eurasia and Sunda plates. All borders zones of plate convergence)

Soberano, O.B., J.A.S. Gabo-Ratio, K.L. Queano, C.B. Dimalanta, G.P. Yumul, E.S. Andal et al. (2021)- Mineral chemistry, fluid inclusion and stable isotope studies of the Suyoc epithermal veins: Insights to Au-Cu mineralization in southern Mankayan Mineral District, Philippines. Ore Geology Reviews 131, 104035, p.

(Suyoc prospect epithermal vein-type mineralization located at S part of Mankayan Mineral District, N Luzon. Hosted in volcanoclastic rocks and conglomerate of Late Oligocene to Early Miocene Balili Fm and M-L Miocene Suyoc Conglomerate)

(Manuscript online at: <http://eprints.gla.ac.uk/233883/2/233883.pdf>)

Sofer, Z. (1985)- An unusual occurrence of light hydrocarbon gases in a well offshore Northeast Palawan Island, the Philippines. Precambrian Research 30, 3, p. 179-188.

Sonntag, I., R. Kerrich & S.G. Hagemann (2011)- The geochemistry of host arc volcanic rocks to the Co-O epithermal gold deposit, Eastern Mindanao, Philippines. *Lithos* 127, p. 564-580.

(Mindanao island in S Philippines comprises suture zone between Eurasian and Philippine plates (Philippine Mobile Belt). E Mindanao Philippine Mobile Belt outcrops mainly Eocene- Pliocene arc volcanics and sediments. Co-O epithermal Au deposit hosted in Oligocene volcanic series)

Sonntag, I., C. Laukamp & S.G. Hagemann (2012)- Low potassium hydrothermal alteration in low sulfidation epithermal systems as detected by IRS and XRD: an example from the Co-O mine, Eastern Mindanao, Philippines. *Ore Geology Reviews* 45, p. 47-60.

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(online at: <https://oaktrust.library.tamu.edu/bitstreams/fdeda67a-8291-4046-b37e-787a2759a786/download>)

(Seismic examples of Middle-Late Miocene carbonate buildups off SW Palawan)

Stephan, J.F., R. Blanchet, C. Rangin, B. Pelletier, J. Letouzey & C. Muller (1986)- Geodynamic evolution of the Taiwan-Luzon-Mindoro belt since the Late Eocene. *Tectonophysics* 125, p. 245-268.

(Geodynamic evolution of boundary between Eurasia and Philippine Sea plates from Eocene- Recent. Major geodynamic events (1) opening of S China Sea in Lower Oligocene, contemporaneous with obduction of Zambales and Angat ophiolites on Luzon; (2) subduction of Mesozoic? oceanic basin along proto-Manila trench from U Oligocene- Lower Miocene; (3) obduction of S China Sea oceanic crust onto Chinese and Reed Bank- Calamian passive margins in M Miocene (14-15 Ma) related to major kinematic reorganization (end of opening of SCS); (4) beginning of collision between Luzon microblock and two margins of SCS in U Miocene (~7 Ma). Collision still active in Taiwan whereas it stopped in Mindoro in Pliocene)

Stephan, J.F., R. Blanchet, C. Rangin, B. Pelletier, J. Letouzey & C. Muller (1986)- Geodynamic evolution of the Taiwan-Luzon-Mindoro belt since the Late Eocene. *Memoir Geological Society China* 7, p. 69-90.

(online at: <http://twgeoref.moeacgs.gov.tw/star/1986/19860301/0069.pdf>)

(Same paper as Stephan et al. (1986) above)

Stephan, J.F. & C. Rangin (1984)- Superimposed collision episode in the northeastern part of the Sulu Sea from Middle Miocene to Present, Panay Island, Central Philippines. In: *Symposium on Geodynamics of the Eurasian-Philippines Plate boundary*, p. 69. *(Abstract only?)*

Steuer, S., D. Franke, F. Meresse, D. Savva, M. Pubellier & L. Auxietre (2012)- Time constraints on the evolution of Southern and Central Palawan Island from correlation of Miocene limestone formations. AAPG International Conference Exh., Singapore 2012, Search and Discovery Article 50772, p. 1-18.

(online at: www.searchanddiscovery.com/documents/2012/50772steuer/ndx_steuer.pdf)

(Palawan offshore wedge is continuation of Palawan fold-thrust belt and ties Borneo-Palawan Trench to Dangerous Grounds and to Palawan Island. Development of wedge constrained by ages of overlying Tabon Lst (U Miocene- Lower Pliocene; ~9-4 Ma) and underlying E-M Miocene Nido Lst: wedge deformation started in upper M Miocene (~12 Ma) and continued to W until latest Miocene- E Pliocene (~5 Ma). S and C Palawan formed in second pulse of compression and uplift in Late Pliocene)

Steuer, S., D. Franke, F. Meresse, D. Savva, M. Pubellier, J.L. Auxietre & M. Aurelio (2013)- Time constraints on the evolution of Southern Palawan Island, Philippines from onshore and offshore correlation of Miocene limestones. *J. Asian Earth Sciences* 76, p. 412-427.

(online at: [www.researchgate.net/publication/236011887_Time_constraints_on_the_evolution Etc.](http://www.researchgate.net/publication/236011887_Time_constraints_on_the_evolution_Etc))

(Timing of deformation of S and C Palawan Island fold- thrust belt and adjacent offshore wedge constrained by ages of E Miocene Nido Limestone (pre-deformation) and overlying Late Miocene- E Pliocene Tabon Lst (post-deformation))

Stoll, W.C. (1958)- Geology and petrology of the Masinloc chromite deposit, Zambales, Luzon, Philippine Islands. Geological Society of America (GSA) Bull. 69, p. 419-448.

(Masinloc mine at Goto, Zambales, Luzon, is world's largest producer of refractory-grade chrome ore. Ore occurs with other chromite deposits in layered ultramafic complex, overlapped by Miocene sediments. Ultramafics composed of gneissose norite, olivine gabbro, massive saxonite serpentine and dunite serpentine)

Suerte, L.O., A. Imai & S. Nishihara (2009)- Geochemical characteristics of intrusive rocks, Southeastern Mindanao, Philippines; implication to metallogenesis of porphyry copper-gold deposits. Resource Geology 59, 3, p. 244-262.

(Intrusive rocks associated with porphyry copper deposits in SE Mindanao include biotite and hornblende-bearing diorite porphyry (Kingking deposit) and other diorite porphyry and quartz diorite in other areas in SE Mindanao. They are adakitic in Sr/Y-Y diagram, but not in La/Yb-Yb diagram. Oligocene-Miocene diorite intrusive complex associated with porphyry-type copper-gold mineralization)

Suerte, L.O., S. Nishihara, A. Imai, K. Watanabe, G.P. Yumul & V.B. Maglambayan (2007)- Occurrence of ore minerals and fluid inclusion study on the Kingking porphyry copper-gold deposit, Eastern Mindanao, Philippines. Resource Geology 57, 2, p. 219-229.

(online at: <https://onlinelibrary.wiley.com/doi/full/10.1111/j.1751-3928.2007.00018.x>)

(Kingking is gold-rich porphyry copper deposit and S-most deposit of E Mindanao mineralized belt. It is underlain by Cretaceous-Paleogene sedimentary and volcanic rocks, intruded by mineralized Miocene diorite porphyries and by barren Miocene- Pliocene dacite and diorite porphyries)

Suerte, L.O. & J.O. Suerte (2013)- Development of the Asian Tethyan Realm: genesis, process and outcomes. Proc. Second Int. Symposium International Geoscience Program (IGPP) 589, Field Guidebook, p. 1-21.

(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Field%20Guidebook.pdf>)

Suerte, L.O., G.P. Yumul, R.A. Tamayo, C.B. Dimalanta, M.F. Zhou, R.C. Maury, M. Polve & C.L. Balce (2005)- Geology, geochemistry and U-Pb SHRIMP age of the Tacloban Ophiolite Complex, Leyte Island (Central Philippines): implications for the existence and extent of the Proto-Philippine Sea Plate. Resource Geology 55, 3, p. 207-216.

(Age and origin of oceanic basement of C Philippines ophiolitic massifs debated. Tacloban Ophiolite Complex NW-SE trending massif in NE Leyte Island, with U-Pb ages of zircons in gabbro of ~145 and 125 Ma (E Cretaceous). Overlain by several 10's m of Cretaceous red siliceous pelagic Palanog Sediments, unconformably overlain by Miocene-Pliocene marine sediments and Pleistocene volcanoclastics. Ophiolite suite of subduction-related origin, generated in marginal basin, with Late Miocene minimum age of emplacement. E Cretaceous age limits possible progenitor of ophiolite to proto-Philippine Sea Plate)

Suggate, S.M., M.A. Cottam, R. Hall, I. Sevastjanova, M.A. Forster, L.T. White, R.A. Armstrong, A. Carter & E. Mojares (2014)- South China continental margin signature for sandstones and granites from Palawan, Philippines. Gondwana Research 26, 2, p. 475-491.

(online at: http://searg.rhul.ac.uk/pubs/suggate_etal_2014%20Palawan.pdf)

(N Palawan Continental Terrane metasediments derived mainly from granitic and metamorphic rocks of continental character, with zircons indicating Late Cretaceous maximum depositional age and S China origin. S Palawan Terrane Miocene sandstones similar heavy mineral assemblages. Also similar to Lower Miocene Kudat Fm sandstones of N Borneo, suggesting short-lived episode of sediment transport from Palawan to Borneo in E Miocene following arc-continent collision. U-Pb dating of zircons show Central Palawan granite is Eocene (42 Ma). Capoas granite 13.8- 13.5 Ma. Inherited zircon ages from Capoas granite imply melting of continental crust from S China margin and Cenozoic rift-related and arc material)

Suppe, J. (1988)- Tectonics of arc-continent collision on both sides of the South China Sea: Taiwan and Mindoro. *Acta Geologica Taiwanica* 26, p. 1-18.

(online at: https://www.researchgate.net/publication/292279299_Tectonics_of_arc-continent_collision_on_both_sides_of_the_South_China_Sea_Taiwan_and_Mindoro)
(On Miocene-Recent collisions of Philippine-Taiwan island arc system with China and its rifted margins)

Suzuki, S., D. Asiedu, S. Takemura, G.P. Yumul. & S.D. David (2001)- Composition of sandstones from the Cretaceous to Eocene successions in Central Palawan, Philippines. *J. Geological Society of the Philippines* 56, p. 31-42.

Suzuki, S., K. Ishida, G.P. Yumul & C. Dimalanta & (2011)- Age and correlation of basement geology of Aurora, Rizal and Zambales areas, Luzon, Philippines. In: GEOCON 2011, 24th Annual Geological Convention Geological Society Philippines, 2p. (*Abstract + Presentation*)
(online at: <http://rwg-tag.bravehost.com/Conferences/geocon/ppt/1100-1120%20Suzuki.pdf>)

Suzuki, S., R.E. Pena, T.A. Tam, G.P. Yumul, C.B. Dimalanta, M. Usui & K. Ishida (2017)- Development of the Philippine Mobile Belt in northern Luzon from Eocene to Pliocene. *J. Asian Earth Sciences* 142, p. 32-44.
(online at: www.academia.edu/35342156/Development_of_the_Philippine_Mobile_Belt_in_northern_Luzon Etc.)
(N Luzon in central part of Philippine Mobile Belt with pre-Paleocene ophiolite, Eocene sediments, Eocene-Oligocene igneous complex and late Oligocene-E Pliocene sediments. PMB: (1) M Eocene primitive island arc; (2) Late Oligocene- E Miocene volcanic island arc; (3) M Miocene- Pliocene mafic volcanic island arc)

Suzuki, S., S. Takemura, G.P. Yumul, D.D. Sevillo & D.K. Asiedu (2000)- Composition and provenance of the Upper Cretaceous to Eocene sandstones in Central Palawan, Philippines: constraints on the tectonic development of Palawan. *The Island Arc* 9, 4, p. 611-626.
(online at: https://www.academia.edu/30775590/Composition_and_provenance_of_the_Upper_Cretaceous_to_Eocene_sandstones_in_Central_Palawan_Philippines_Constraints_on_the_tectonic_development_of_Palawan Etc.)
(U Cretaceous- Eocene turbiditic sandstones from C Palawan common quartz, acidic volcanics, K-feldspar and granitic rock fragments. Derived from continental source region, probably continental margin of S China)

Suzuki, S., G.P. Yumul, C.B. Dimalanta, R.E. Pena, T. Tam & K. Ishida (2013)- Sandstone composition of the upper Cretaceous to Neogene successions of the Philippine Mobile Belt and the Palawan Continental Block. *Proc. 2nd Int. Symposium International Geoscience Programme (IGP) Project 589, Borocay Island*, p. 28-31. (*Abstract*)
(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)
(Sandstone compositions of Philippine Mobile Belt suggest it formed in Eocene as primitive basaltic volcanic arc and developed to basaltic-andesitic arc in Oligocene-Pliocene time. Sandstones from U Cretaceous in Palawan Continental Block rich in quartz and felsic volcanic rock fragments, suggesting PCB was part of continent and supports idea that PCB collided with PMB to form Philippine Archipelago)

Sweet, G. (2012)- Magmatic evolution and alteration geochemistry of the Black Mountain Southeast porphyry copper-gold deposit, Baguio mineral district Luzon, Philippines. M.Sc. Thesis, Lakehead University, Thunder Bay, Ontario, Canada, p. 1-188 + Appendices.
(online at: <https://knowledgecommons.lakeheadu.ca/handle/2453/275>)
(Black Mountain SE deposit 6 km SW of Baguio City, conforms to porphyry model. Two ore bodies, Main and SE. Onset of mineralization at start of Pliocene, concurrent with ascension of hybrid mafic magma (multiple hypotheses proposed for shift in magma type (see also Hollings et al., 2013))

Taguibao, K.J.L. & R. Takahashi (2018)- Whole-rock geochemistry of host rocks and K/Ar Age of hydrothermal mineral of the Co-O epithermal gold deposit, Mindanao, Philippines. *Open Journal of Geology* 8, p. 383-398.
(online at: https://file.scirp.org/pdf/OJG_2018041215444466.pdf)
(Co-O epithermal gold deposit located along Pliocene-Quaternary calc-alkaline magmatic zone at E Mindanao. Intermediate sulfidation epithermal Au quartz vein type, hosted in Eocene- Oligocene island arc

basaltic-andesitic volcanics and volcanoclastic rocks. K/Ar ages of hydrothermal minerals ~28.6 Ma (Late Oligocene) and ~31.7 Ma (E Oligocene))

Takanyagi, Y., T. Takayama & M. Oda (1977)- Notes on the Late Cenozoic planktonic foraminifera and calcareous nannofossils from Panay, Philippines. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 18, p. 77-86.

Takizawa, S., W. Hashimoto, K. Matsumaru, T. Sato, Y. Arakawa, F. Miranda & S.V. Sendon (1996)- Lower-middle Paleogene olistostrome and geological structure of lower grade metamorphic rocks of the Caramoan Peninsula, Camarines Sur, The Philippines. In: H. Noda & K. Sashida (eds.) *Prof. Hisayoshi Igo Commemorative volume on Geology and Paleontology of Japan and SE Asia*, Gakujyutsu Tosho Insatsu, Tokyo, p. 193-199.

Tamayo, R.A., P.Y. Graciano, R.C. Maury, H. Bellon, J. Cotten, M. Polve T. Juteau & C. Querubin (2000)- Complex origin for the south-western Zamboanga metamorphic basement complex, western Mindanao, Philippines. *The Island Arc* 9, p. 638-652.

(N portion of SW Zamboanga metamorphic basement complex, W Mindanao, amphibolites with relict textures from cumulate gabbro protoliths and with magmatic arc-related signature. Unconformably overlain by metasedimentary quartz-muscovite-feldspar-kyanite schist of continental basement origin. Metamorphism at T 550-700°C and P of 5-9 kbar. K-Ar ages of metamorphic event 24.6, 22.2 and 21.2± 1.2 Ma. Results in agreement with plate tectonic models describing SW Zamboanga metamorphic basement as continental terrane with slivers of magmatic arc crust)

Tamayo, R.A., R.C. Maury, G.P. Yumul, M. Polve, J. Cotten, C.B. Dimalanta & F.O. Olaguera (2004)- Subduction-related magmatic imprint of most Philippine ophiolites: implications on the early geodynamic evolution of the Philippine archipelago. *Bull. Societe Geologique France* 175, 5, p. 443-460.

(Basement complexes of Philippines at least 20 ophiolitic complexes, with volcanic sequences similar to MORB, transitional MORB-island arc tholeiites and arc volcanic rocks originating from modern Pacific-type oceans, back-arc basins and island arcs. Most volcanic sequences in Philippine ophiolites formed in subduction settings. Associated gabbros and peridotites tie to supra-subduction zone environments. Early geodynamic evolution of Philippines dominated by opening and closing of oceanic basins, providing substratum of Cretaceous -Recent volcanic arcs)

Tamayo, R.A., G.P. Yumul, R.C. Maury, M. Polve, M. Cotton & M. Bohn (2001)- Petrochemical investigation of the Antique Ophiolite (Philippines): implications on volcanogenic massive sulfide and podiform chromitite deposits. *Resource Geology* 51, p. 145-164.

(Antique Ophiolite of W Panay in E Miocene suture zone between Philippine Mobile Belt and 'Eurasian' N Palawan Block, E of Sulu Sea/ Negros Trench. Includes dismembered fragments of basaltic sequence, sheeted dikes, gabbros, mafic-ultramafic rock sequences and serpentinites, mostly as clasts and blocks within serpentinites. Ophiolite probably represents mix of oceanic ridge and fore-arc crust fragments. Overlying basal conglomerate of M Miocene age, suggesting exhumation no later than M Miocene. Volcanic rock chemistry intermediate between MORB and island arc basalt. Volcanogenic massive sulfide-copper deposits occur near the contact between pillow basalts and overlying sediments or interbedded with sediments)

Tamesis, E.V. (1981)- Hydrocarbon potential of Philippine basins. In: M.J. Valencia (ed.) *Proc. EAPI/CCOP Workshop*, Honolulu 1980, *Energy* 6, 11, p. 1181-1206.

(First oil exploration well in Philippines in 1896 in Visayan Region, Cebu Island. Since then >367 exploratory wells drilled in 12 basins. First commercial oil discovery 1976 Nido field off Palawan. Philippine sedimentary basins in complexly deformed zone between Philippine Sea Plate and Eurasian Plate. Main plays pursued are Oligocene- M Miocene carbonate buildups. Clastic reservoir plays in structural traps not encouraging due to rapid facies changes and low permeabilities of sands, mostly derived from volcanic detritus)

Tamesis, E.V., R.A. Lorentz, R.V. Pascual & E.M. Dizon (1982)- Stratigraphy and geologic structures of the Central Valley Basin, Luzon, Philippines. In: Geology and Tectonics of the Luzon-Marianas Region, Proc. CCOP-IOC-SEATAR Workshop, Philippines 1981, Manila, p. 83-118.

Tamesis, E.V., E.V. Manalac, C.A. Reyes & L.M. Ote (1973)- Late Tertiary geological history of the continental shelf off northwestern Palawan, Philippines. In: B.K. Tan (ed.) Proc. Regional Conference on the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geological Society Malaysia 6, p. 165-176.
(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1973012.pdf>)

Tangunan, D.N., A.M. Peleo-Alampay, J.B. Abuda, L.A.T. Mambuay, C.R.A. Ramos, A.G.S. Fernando et al. (2014)- Post-collision deposition of Balanga Formation in Northwest Mindoro, Philippines. *Stratigraphy* 11, 3-4, p. 235-243.
(*Calcareous nannofossils from Balanga Fm calcareous sedimentary sequence in Mamburao, NW Mindoro (Palawan Block). Late Pliocene- E Pleistocene age (NN14- NN19; 1 to ~1.7- 4.1 Ma), formed after E-M Miocene collision of Palawan-Mindoro Block with Philippine Mobile Belt*)

Tangunan, D.N., A.G.S. Fernando & C.A. Arcilla (2013)- Occurrence of Cretaceous calcareous nannofossils from Codon Formation, Catanduanes, Philippines. *J. Geological Society of the Philippines* 64, p. 35-39.
(*Cretaceous calcareous nannofossils from limestone units of Codon Fm in Codon Point, SW Catanduanes. Occurrence of M. prinsii suggests Late Maastrichtian age (in N Catanduanes also Yop Fm with mid-Cretaceous Orbitolina)*)

Tangunan, D.N., R.J.M. Antonio, A.R.C.Fernandez, A.C. Balota, M.L.C. Abad, A.M. Peleo-Alampay & A.G.S.F. Fernando (2013)- The Catbalogan Formation (Northern Samar, Philippines): new age data from calcareous nannofossils. *J. Geological Society of the Philippines* 64, p. 40-47.
(*Catbalogan Fm clastics in N Samar late E Miocene- early Late Miocene calcareous nannofossils (NN4- NN9)*)

Tejada, M.L.G., M. Lagmay, M. Aurelio, R. Pena, R., R. Wood & B. Davy (2008)- Benham Rise: a Large Igneous Province accreted to Luzon. *GEOCON 2008 Reports*, Geological Society of the Philippines, p. 1-8.
(online at: https://www.researchgate.net/publication/328686231_Benham_Rise_A_Large_Igneous_Province_Accreted_to_Luzon)
(*Benham Rise seamount is Large Igneous Province (LIP), formed by voluminous outpouring of basalt above hotspot near Central Basin spreading center in W Philippine Basin. Elevation of 2000-3500 m above surrounding seafloor and thickness of 15-18 km. Geochemical composition similar to other large plateaus, but different from deep ocean floor of West Philippine Basin and Atlantic and Pacific oceans. Greater than normal crustal thickness and buoyancy led to its accretion with Philippine landmass at E Luzon since ~20 Ma, which clogged trench and flipped subduction from E side to W side of Luzon.*)

Teodosio, N.R. (1987)- An overview of coal deposits in the Philippines. *ESCAP Series on Coal*, Bangkok, 5, p. 142-150.

Teves, J.S. (1953)- The pre-Tertiary geology of southern Oriental Mindoro. *The Philippine Geologist* 8, 1, p. 1-36.

Teves, J.S. (1955)- Philippine structural history and relation with neighboring areas. *The Philippine Geologist* 9, 2, p. 18-41.
(*Philippine Archipelago structural lines are mainly N-S trending extensions of mainly E-W structures of Indonesia. Major structural development in mid-Tertiary*)

Teves, J.S. (1957)- Philippines. In: *Lexique Stratigraphique International*, Congress Geol. Int., Commission de Stratigraphie, Paris, III, Asie 5, p. 1-167.
(*Stratigraphic lexicon of The Philippines. Alphabetical listing and descriptions of stratigraphic units. With correlation chart of Tertiary- Quaternary formations. Updated in 2008*)

Tian, J., Y. Zhang, L. Gong, D.G. Francisco & A.E. Berador (2021)- Genesis, geochemical evolution and metallogenic implications of magnetite: Perspective from the giant Cretaceous Atlas porphyry Cu-Au deposit (Cebu, Philippines). *Ore Geology Reviews* 133, 104084, p. 1-12.

(Large mid-Cretaceous Atlas porphyry Cu-Au deposit in central Cebu Island with four generations of magnetite, consistent with two mineralization styles: (1) high fO₂ magnetite mineralization and (2) subsequent Cu-Au mineralization. Mineralization linked to Lutopan quartz diorite porphyry (zircon age ~108-110. Ma))

Tsai, C.H., J.B.H. Shyu, S.L. Chung, N.T. Ramos & H.Y. Lee.(2019)- Detrital zircon record from major rivers of Luzon Island: implications for Cenozoic continental growth in SE Asia.*J. Geological Society, London*, 176, p. 727-735.

(online at: https://www.researchgate.net/publication/332692259_Detrital_zircon_record_from_major_rivers_of_Luzon_Island_Implications_for_Cenozoic_continental_growth_in_Southeast_Asia)

(Detrital zircons from major rivers of Luzon Island, with U-Pb ages mainly <50 Ma ((45-39 Ma, 35-28 Ma, 23-12 Ma magmatic groups, most <0.5 Ma). Sample from central Sierra Madre with zircons with age clusters at 110-70 and 180-140, supporting presence of Mesozoic basement rocks in area (Mindanao Terrane ?). Pre-Cenozoic continental materials played insignificant roles in construction of Luzon, which consists mainly of juvenile terrane where substantial continental crustal growth occurred only in Cenozoic)

Tsutsumi, H. & J.S. Perez (2013)- Large-scale active fault map of the Philippine fault based on aerial photograph interpretation. *Active Fault Research* 39, p. 29-37.

(online at: https://www.jstage.jst.go.jp/article/afr/2013/39/2013_29/_pdf/-char/en)

(Philippine Fault ~1250-km-long, active left-lateral strike-slip fault, extending NNW, parallel to Philippine archipelago. New map of surface trace of fault. In C Luzon and Mindanao PF well segmented, with large (M≥7) earthquakes. In Masbate and Leyte Islands more continuous with moderate earthquakes)

Tuazon Vinarao, C. (2016)- Reservoir potential of the syn-rift succession in Northwest Palawan, Philippines. *Bull. Earth Sciences Thailand (BEST)* 8, 2, p. 13-24.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246729/167714>)

(Malajon-1 well on Palawan island, drilled on inverted rift anticline in 1988, encountered gas shows in Middle-Late Eocene syn-rift section. Offshore NW Palawan Basin has syn-rift deposits of ?Late Cretaceous- E Oligocene age, initially started at SE Eurasian margin in Late Cretaceous, from which Palawan separated during opening of S China Sea)

Tumanda, F.P. (1991)- Permian to Jurassic radiolarian biostratigraphy of Busuanga Island, Palawan, Philippines. *Doct. Science Dissertation, University of Tsukuba*, 988, p. 1-270.

(see also Marquez et al. 2009)

Tumanda, F.P. (1991)- Radiolarian biostratigraphy in central Busuanga Island, Palawan, Philippines. *J. Geological Society of the Philippines* 46, p. 49-104.

(Permian-Jurassic radiolarian biostratigraphy (see also Marquez et al. 2006))

Tumanda, F.P. (1994)- Permian radiolarian from Busuanga Island, Palawan, Philippines. *J. Geological Society of the Philippines* 49, p. 119-193.

(Permian radiolarians in chert from five sections in C Busuanga Island suggest four Permian interval zones: Follicucullus monacanthus (late Early Permian), Follicucullus scholasticus (early Late Permian) Latentifistula similitutis (middle Late Permian), and Neoalibaillella ornithoformis (late Late Permian))

Tumanda, F.P., T. Sato & K. Sashida (1990)- Preliminary late Permian radiolarian biostratigraphy of Busuanga Island, Palawan, Philippines. *Annual Report, Institute of Geoscience, University of Tsukuba* 16, p. 39-45.

(Radiolaria from Permian sections in N Mabintangin River, C Busuanga Island)

Tumanda-Mateer, F., K. Sashida & H. Igo (1996)- Some Jurassic radiolarians from Busuanga Island, Calamian Island Group, Palawan, Philippines. In: H. Noda & K. Sashida (eds.) *Professor H. Igo Commemorative volume on Geology and Paleontology of Japan and Southeast Asia*, Gakujyutsu Tosho Insatsu, Tokyo, p. 165-191.

(see also Yeh and Cheng (1996), etc.)

Tupaz, C.A.J., Y. Watanabe, K. Sanematsu, T. Echigo, C. Arcilla & C. Ferrer (2020)- Ni-Co mineralization in the Intex laterite deposit, Mindoro, Philippines. *Minerals* (MDPI) 10, p. 1-33,
(online at: <https://www.mdpi.com/2075-163X/10/7/579>)

(Laterite deposit in Mindoro derived from weathering of ultramafic rocks under tropical climate)

Tupaz, C.A.J., Y. Watanabe, K. Sanematsu, T. Takuya Echigo (2020)- Mineralogy and geochemistry of the Berong Ni-Co laterite deposit, Palawan, Philippines. *Ore Geology Reviews* 125, 103986, p. 1-20.

(Intense weathering of serpentinized peridotite of Cretaceous-Eocene Palawan Ophiolite Complex resulted in formation of Berong Ni-Co laterite deposit in Palawan)

Ujie, H. & T. Samata (1973)- Pliocene- Upper Miocene planktonic foraminiferal faunas Northern Mindanao, Philippines. In: T. Kobayasi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 13, p. 129-144.

(Planktonic foraminifera spanning zones upper N17- lower N21 in Opol Fm of N Mindanao)

United Nations Development Programme (1987)- *Geology and mineralization in the Baguio area, Northern Luzon*. UNDP Technical Report 5, p. 1-82.

Valera, G.T.V., T. Kawakami & B.D. Payot (2022)- The slab-mantle wedge interface of an incipient subduction zone: Insights from the P-T-D evolution and petrological characteristics of the Dalrymple Amphibolite, Palawan Ophiolite, Philippines. *J. Metamorphic Geology* 40, 4, p. 717-749.

(manuscript online at: <https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/269179/1/jmg.12644.pdf>)

(Petrological characteristics and P-T-D history of Dalrymple Amphibolite in Palawan Island, Philippines, below peridotites of (Eocene?) C Palawan Ophiolite. Dalrymple Amphibolite is predominantly high-grade metamafic blocks with minor metasedimentary units surrounded by highly sheared hybridized matrix. Atypical of metamorphic soles and are more akin to high-T melange formed during incipient subduction. Deformation started before sequence reached peak metamorphic conditions at ~45 km)

Valera, G.T.V., T. Kawakami & B.D. Payot (2022)- Mixing, fluid infiltration, leaching, and deformation (MILD) processes on the slab-mantle wedge interface at high T and P conditions: Records from the Dalrymple Amphibolite, Philippines. *Chemical Geology* 604, 120941, p.

(Metamafic blocks of the Dalrymple Amphibolite in block-in-matrix melange below C Palawan Ophiolite represent basalt to gabbro section of oceanic lithosphere of subducting slab)

Vargas, E.P., D.N. Tanguan, A.M. Peleo-Alampay, J.B. Abuda, L.A.T. Mambuay, C.R.A. Ramos, A.G.S. Fernando, C.B. Dimalanta, D.V. Faustino-Eslava & C.S. Pascua (2014)- Post-collision deposition of Balanga Formation in northwest Mindoro, Philippines: calcareous nannofossil evidence. *Stratigraphy* 11, 3-4, p. 235-243.

(Calcareous sedimentary sequence exposed in Mamburao foraminifera-rich mudstones and sandstones with nannofossils of Late Pliocene- E Pleistocene age (~1.67 to 4.13 Ma). Formed after Miocene collision of Palawan-Mindoro Block with Philippine Mobile Belt)

Villaplaza, B.R.B., A.E. Buena, N.A.D. Pacle, B.D. Payot, J.A.S. Gabo-Ratio, N.T. Ramos et al. (2017)- Alteration and lithogeochemistry in the Masara gold District, Eastern Mindanao, Philippines, as tools for exploration targeting. *Ore Geology Reviews* 91, p. 530-540.

(Intermediate-low sulfidation epithermal gold deposit in Masara, E Mindanao, associated with diorite porphyry of Late Miocene Lamingag Intrusive Complex. Five major alteration zones, at least two mineralizing events)

Villavicencio, M.L. & P.P. Andal (1964)- *Distichoplax biserialis* Dietrich in the Philippines. *The Philippine Geologist* (J. Geological Society of the Philippines) 18, 4, p. 103-113.

(First report of Paleocene- Lower(?) Eocene (Ta) index algal genus Distichoplax biserialis from Philippines. In S Palawan associated with Discocyclus, Miscellaneous and small Paleocene foraminifera. Also found in Cebu and Bicol)

Vogel, T., T. Flood, L. Patino, M. Wilmot, R. Maximo, C. Arpa, C. Arcilla & J. Stimac (2006)- Geochemistry of silicic magmas in the Macolod Corridor, SW Luzon, Philippines: evidence of distinct, mantle-derived, crustal sources for silicic magmas. *Contributions to Mineralogy and Petrology* 151, 3, p. 267-281.

(Silicic volcanic deposits relatively abundant in Macolod Corridor, SW Luzon. Possibly from partial melting of mantle-derived, moderate to K-rich calc-alkaline magmas that ponded and crystallized in mid-crust)

Von Richthofen, F. (1862)- *Über das Vorkommen von Nummulitenformation auf Japan und den Philippinen.* *Zeitschrift Deutschen Geologischen Gesellschaft* 14, 7, p. 357-360

(online at: https://www.zobodat.at/pdf/Z-dtsch-Geol-Ges_14_0357-0360.pdf)

(‘On the occurrence of Nummulites Formations on Japan and the Philippines’, by famous German geologist Ferdinand Freiherr (‘Baron’) von Richthofen. (Paleo-Eocene?) carbonates with Nummulites from Binangonan and other localities near Manila (Luzon) and on Cebu, possibly also at Zamboanga, SW Mindanao. No figures (however: forams later identified as latest Oligocene- E Miocene (Aquitania?) with Eulepidina formosensis and Spiroclypeus. by Yabe and Hanzawa (in Ishijima (1950); JTVG)

Walia, M. & U. Knittel (2018)- Hf isotopes from Palawan Continental Terrane, Philippines-clues to the evolution of sediment sources. *Terrestrial Atmospheric Oceanic Sciences (TAO)* 29, 5, p. 523-534.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/1591>)

(Detrital zircons in meta-sediments from Palawan, Mindoro, Tablas, and Buruanga Peninsula of Panay Island in C Philippines provide evidence for provenance from N part of Cathaysia Block, SE China. Now part of Palawan Continental Terrane, rifted from SE China during S China Sea opening Zircons with ages of 80- 93, 245- 270 and 400- 465 Ma with higher $\epsilon_{\text{Hf}}(T)$ than zircons from mainland SE China implying greater contributions from the mantle. Zircons in PCT likely not transported far from interior SE Chinese cratons)

Walia, M., U. Knittel, S. Suzuki, S.L. Chung, R.E. Pena & T.F. Yang (2013)- No Paleozoic metamorphics in Palawan (the Philippines)? Evidence from single grain U-Pb dating of detrital zircons. *J. Asian Earth Sciences* 52, p. 134-145.

(online at: www.academia.edu/12298658/No_Paleozoic_metamorphics_in_Palawan_the_Philippines_Evidence_from_single_grain_U_Pb_dating_of_detrital_zircons)

(Palawan Continental Terrane is fragment of margin of SE China that drifted S as result of Cenozoic opening of S China Sea. Presence of non-metamorphic Permian and Triassic sediments in N of island suggested Paleozoic age for metamorphics. Detrital zircons as young as 80-98 Ma in all metamorphic units, suggesting Late Cretaceous or younger age, so Caramay Schist not basement for rest of units in C Palawan. Zircon ages two major peaks, at ~115 Ma and 1.8 Ga. Source of zircons N part of Cathaysia Block, S China)

Walia, M., R. Pena & U. Knittel (2024)- U-Pb geochronology of the Baguio Area, a major mining district in Northern Luzon (Philippines). *Island Arc* 33, e12535, p. 1-15.

(online at: <https://onlinelibrary.wiley.com/doi/epdf/10.1111/iar.12535>)

(Baguio mining district, at S end of Central Cordillera of N Luzon, one of major gold- copper mining districts in Philippines and SE Asia. U-Pb zircon ages for arc-magmatic rocks (above E-ward subduction of S China Sea seafloor) probably started in late Oligocene or E Miocene. Detrital zircons from sediment of main formations in district show main magmatic pulses at ~1, ~3, ~16 and ~20 Ma. Oldest zircon age 27.3 ± 1.6 Ma. Absence of older zircons suggests N Luzon formed as intra-oceanic arc, underlain by pre-Eocene (Lower Cretaceous age?; Payot et al., 2007) ophiolite. M Miocene ages thought to represent Pugo Fm (lowermost unit; thought to be Cretaceous-Eocene in age), most likely date magmatic rocks that intruded Pugo Fm)

Walia, M., T.F. Yang, U. Knittel, T.K. Liu, C.H. Lo, S.L. Chung, L.S. Teng, C.B. Dimalanta, G.P. Yumul & W.M. Yuan (2013)- Cenozoic tectonics in the Buruanga Peninsula, Panay Island, Central Philippines, as constrained by U-Pb, $^{40}\text{Ar}/^{39}\text{Ar}$ and fission track thermochronometers. *Tectonophysics* 582, p. 205-220.

(Buruanga Peninsula at westernmost Panay Island is part of Palawan Continental Terrane, formerly attached to SE China. Collided with Philippine Mobile Belt. Paleoproterozoic and Permian zircon U-Pb ages from Saboncogon Fm emphasize derivation from SE China. Zircon and AFT ages of 51 Ma and 16 Ma constrain exhumation age. Age data suggest tectonic events at ~14 Ma, ~11-12 Ma and ~7-8 Ma, following intrusive activity at ~18 Ma (Patria-Diorite). Collision started at ~14-15 Ma and ended before 8 Ma)

Walston, V.A. & H. Oesterle (1992)- Geology of the West Linapacan 'A' Field, Offshore Palawan, Philippines. In: 9th Offshore Southeast Asia Conference, Singapore 1992, Proc. SE Asia Petroleum Exploration Society (SEAPEX) 10, OSEA 92171, p. 67-74.

(West Linapacan A field 1990 discovery off N tip Palawan Structure is large wrench fault-related anticline. Hydrocarbons in Lower Miocene Galoc Fm deep water sands and underlying fractured deep water Linapacan Limestone, which is rich in planktonic foraminifera (zones N4-N6). Oil API gravity 28.5°, sulfur content 2.6%. Recoverable reserves ~100 MBO (but cumulative production 1992-1996 only 8.6 MBO, then shut-in; JTvG))

Walther, H.W., H. Forster, W. Harre, H. Kreuzer, H. Lenz, P. Muller & H. Raschka (1981)- Early Cretaceous porphyry copper mineralization on Cebu island, Philippines, dated with K/Ar and Rb/Sr methods. Geologisches Jahrbuch D48, p. 21-35.

(K/Ar dates on biotites from Tapian mine, Marinduque (21 Ma) and Sipalay mine, Negros Occidental (30 Ma) in agreement with geological knowledge. On Cebu Island Atlas porphyry-Cu mineralization dated by K/Ar and Rb/Sr methods as late Early Cretaceous (~108 Ma= Albian), probably related to conformity between E Cretaceous Cansi Fm and overlying Pandan Fm)

Waters, P.J., D.R. Cooke, R.I. Gonzales & D. Phillips (2011)- Porphyry and epithermal deposits and ⁴⁰Ar/³⁹Ar geochronology of the Baguio District, Philippines. Economic Geology and Bull. Soc. Economic Geol. 106, 8, p. 1335-1363.

(Baguio district in C Cordillera of N Luzon numerous Pliocene-Pleistocene porphyry copper-gold, epithermal gold-silver and skarn gold-lead-zinc deposits. District floored by Cretaceous-Eocene metavolcanic and metasediments, overlain by E Miocene-Pliocene sediments and volcanics. Arc magmatism related to E-directed subduction of S China Sea plate along Manila Trench produced major E Miocene batholith (Ar/Ar ages ~20-23 Ma). Porphyry copper-gold and skarn deposits formed in Late Pliocene- Pleistocene (~ 3.1-2.8 Ma, 1.5 Ma, 1.1 Ma and 0.5 Ma). Mineralization in district triggered by E-directed subduction of Scarborough Ridge, causing decrease in subduction angle. Fertile magmas emplaced into transtensional strike-slip relay basins)

Wehner, H. (1989)- Organic-geochemical studies in Visayan Basin, Philippines. In: H. Porth & C.H. von Daniels (eds.) On the geology and hydrocarbon prospects of the Visayan Basin, Philippines, Geologisches Jahrbuch B70, p. 317-348.

(Geochemical analyses of Tertiary sediments and oils from seeps and wells of Visayan islands)

Weller, A. & K. Davies (2019)- The underexplored East Palawan Basin. GEO Expro, May 2019, p. 50-54.

(online at: <https://www.searcher seismic.com/wp-content/uploads/2020/01/GEO-ExPro-Foldout-v16-n2-Philippines.pdf>)

(Underexplored E Palawan Oligocene- E Miocene rift basin (4 wells in 1970s- early 1980s and Shell (2010) Silangan 1 well, which targeted M Miocene turbidite play)

Withjack, E.M. (1985)- Analysis of naturally fractured reservoirs with bottomwater drive: Nido A and B fields, offshore Northwest Palawan, Philippines. J. Petroleum Technology 37, 8, p. 1481-1490.

(Computer simulations of influence of reservoir characteristics on performance of naturally fractured reservoirs with bottom water drive in Nido A and B fields off Palawan, Philippines)

Williams, H.H. (1997)- Play concepts- Northwest Palawan, Philippines. J. Asian Earth Sciences 15, p. 251-273.
(NW Palawan offshore with 4 proven exploration plays: (1) pinnacle reefs on Nido carbonate platforms (Nido, Matinloc, Cadlao); (2) seaward horst block reef fairway with large pinnacle reefs (Malampaya-Camago trend); (3) E Miocene Galoc Clastics turbidites (Octon, Galoc); and (4) four-way dip closures (W Linapacan, Octon).

Recent discovery at Calauit Field shows potential exploration play in deep-water Nido Lst turbidites. To date, only economically productive play has been Nido Lst reefs)

Williams, H., E.N. Reyes & R.T. Eubank (1992)- Geochemistry of Palawan oils, Philippines: source implications. In: Offshore South East Asia Conference 1992, Proc. 9th SE Asia Petroleum Exploration Society (SEAPEX), Singapore, p. 115-129.

(Palawan non-waxy oils traditionally interpreted as marine sourced. Oils from recent Calauit fields characteristics of non-marine algal source)

Willis, B. (1937)- Geologic observations in the Philippines Islands. National Research Council of the Philippines Bull. 13, p. 1-127.

Willis, B. (1939)- The Philippine Archipelago: an illustration of continental growth. Proc. 6th Pacific Science Congress, California, 1, p. 185-200.

Wolcke, F. (1991)- Geologische und hydrogeologische Untersuchungen im Gebiet nordlich von Cebu City (Philippinen). Mitteilungen Geologisch-Palaontologisch Institut, Universitat Hamburg 71, p. 121-241.

(‘Geological and hydrogeological investigations in the area north of Cebu city, Philippines’)

Wolcke, F. & J. Scholz (1988)- Über die palaeobiogeographische Bedeutung eines Vorkommens caprinider Rudisten aus der Unterkreide von Cebu (Philippinen). Mitteilungen Geologisch-Palaontologisch Institut, Universitat Hamburg 67, p. 121-133.

(‘On the paleobiogeographic significance of an occurrence of caprinid rudists from the Lower Cretaceous of Cebu, Philippines’). Rudists from Barremian-Aptian Pandan Fm reefal limestones in volcanoclastic succession, Pulanbato area, Central Cebu (?Amphitriscoelus sp., ?Polyconites sp.), associated with larger foram Palorbitolina lenticularis (now believed to be seamount fauna of Albian age; Skelton et al. 2013))

Wolfart, R., P. Cepek, F. Gramann, E. Kemper & H. Porth (1986)- Stratigraphy of Palawan Island. Newsletters on Stratigraphy 16, p. 19-48.

(North Palawan: Miniloc Lst with Late Permian fusulinids and E-M Triassic conodonts. Liminangcong Fm rich radiolarian assemblages with M Triassic and M Jurassic ages. Overlying Coron Lst Fm with Girvanella, forams Hemigordius and Triasina and pelecypod Paramegalodus suggests Late Triassic (Rhaetian) age. S-C Palawan: sedimentary succession rel. young; Late Cretaceous/ ?earliest Tertiary ‘Espina Fm’ chert- shale, oldest rock unit in South/Central Palawan)

Wolfe, J.A. (1972)- Potassium-Argon dating in the Philippines. The Philippine Geologist (J. Geological Society of the Philippines) 26, 2, p. 11-22.

(K-Ar dating on Philippine igneous rocks suggest oldest diorite intrusion cycle was at ~60 Ma ago (end-Paleocene). Datings of andesites and diorites scattered through Eocene-Miocene with peak of ~9 Ma)

Wolfe, J.A. (1981)- Philippine geochronology. The Philippine Geologist (J. Geological Society of the Philippines), 35, 1, p. 1-35.

Wolfe, J.A. (1983)- Origin of the Philippines by accumulation of allochthons. The Philippine Geologist (J. Geological Society of the Philippines) 37, 3, p. 17-33.

Wolfe, J.A. (1984)- North Palawan Block, Philippines- its relation to Asian mainland and role in evolution of South China Sea: Discussion. American Assoc. Petroleum Geol. (AAPG) Bull. 68, 7, p. 914-915.

(Critique of Holloway (1982). Philippines thought to have nucleated around Cretaceous fragments as result of formation of E-facing trench near present location of Luzon at ~50 Ma. Archipelago accumulated as allochthons in ‘eddy’ between 3300 km W-ward and 3300 km N-ward motion of ocean plates. Igneous activity welded islands together, and sediment has been shed into intervening basins)

- Wolfe, J.A. (1988)- Arc magmatism and mineralization in North Luzon and its relationship to subduction at the East Luzon and North Manila Trenches. *J. Southeast Asian Earth Sciences* 2, 2, p. 79-93.
(*Oligocene phase of subduction on E Luzon Trench coincided with opening of S China Sea and both activities ceased when spreading of S China Sea ceased. Period of porphyry copper mineralization in graben at Baguio from 8-10 Ma relates to Manila Trench on W side of Luzon, with igneous activity starting at ~15 Ma*)
- Wolfe, J.A. & S. Self (1983)- Structural lineaments and Neogene volcanism in southwestern Luzon. In: D. Hayes (ed.) *The tectonics and geological evolution of Southeast Asian seas and islands* 2, American Geophysical Union (AGU), Monograph 27, p. 157-172.
- Wolfe, R.C. (2001)- Geology of the Dipidipio region and paragneiss of the Dinkidi Cu-Au porphyry deposit. Ph.D. Thesis, University of Tasmania, p. 1-200.
(online at: http://eprints.utas.edu.au/11283/2/Wolfe_-Whole.pdf)
(*Dinkidi Cu-Au porphyry deposit in N Luzon, Philippines. Hosted within Late Oligocene- E Miocene multi phase intrusive Didipio Igneous Complex, formed during alkaline magmatism related to Late Oligocene rifting event that formed Cagayan Valley Basin, and to final stages of W-directed subduction along E Luzon trench*)
- Wu, W.N., C.L. Lo & J.Y. Lin (2017)- Spatial variations of the crustal stress field in the Philippine region from inversion of earthquake focal mechanisms and their tectonic implications. *J. Asian Earth Sciences* 142, p. 109-118.
- Yabe, H. (1919)- Notes on a *Lepidocyclina*-limestone from Cebu. *Science Reports Tohoku Imperial University*, 2nd ser. (Geol.), 5, 2, p. 1-15.
(online at: <http://ir.library.tohoku.ac.jp/re/bitstream/10097/30169/1/KJ00004176245.pdf>)
(*Late Oligocene- E Miocene Lepidocyclina-Lithothamnium limestone above coal-bearing series of Cebu coalfield, at Pauting Botow near city of Cebu. With common Lepidocyclina (Eulepidina) formosa and other spp., L. (Nephrolepidina) angulosa, Spiroclypeus margaritatus, etc.*)
- Yabe, H. & S. Hanzawa (1925)- Notes on some Tertiary foraminiferous rocks of the Philippines. *Science Reports Tohoku Imperial University*, 2nd Ser. (Geol.), 7, 4, p. 97-109.
(online at: <http://ir.library.tohoku.ac.jp/re/bitstream/10097/30184/1/KJ00004177562.pdf>)
(*Miocene lepidocyclinids in rocks collected by Dickerson*)
- Yabe, H. & S. Hanzawa (1929)- Tertiary foraminiferous rocks of the Philippines. *Science Reports Tohoku Imperial University*, 2nd Ser. (Geol.), 11, 3, p. 1-54.
(online at: <http://ir.library.tohoku.ac.jp/re/handle/10097/30209>)
(*Eocene and younger limestone samples collected by Dickerson from various Philippines islands*))
- Yan, Y., D. Yao, Z. Tian, C. Huang, W. Chen, M. Santosh, G.P. Yumul, C.B. Dimalanta & Z. Li (2018)- Zircon U-Pb chronology and Hf Isotope from the Palawan-Mindoro Block, Philippines: implication to provenance and tectonic evolution of the South China Sea. *Tectonics* 37, 4, p. 1063-1076.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2017TC004942>)
(*Palawan-Mindoro Block drifted from mainland Asia with Oligo-Miocene spreading of S China Sea. U-Pb age and Hf isotopic data on detrital zircon grains from Eocene-Miocene sediments in Palawan-Mindoro Block show four major age groups (80-120, 160-180, 1600-2100 and 2200-2700 Ma). Eocene samples from Palawan-Mindoro similar to Taiwan, suggesting P-M Block still attached to South China margin in Eocene. Different zircons in Miocene samples reflect S-ward drifting of Palawan-Mindoro Block at or before that time*)
- Yang, T.F., T. Lee, C.H. Chen, S.N. Cheng, U. Knittel, R.S. Punongbayan & A. Rasdas (1996)- A double island arc between Taiwan and Luzon: consequence of ridge subduction. *Tectonophysics* 258, p. 85-101.
(*Taiwan-Luzon Arc between Taiwan and Luzon double arc structure: two volcanic chains separated by 50 km N of Luzon (18°N), and converge near 20°N. Islets in W chain older and mainly Miocene- Pliocene volcanics; E chain mainly Quaternary active volcanoes. Double arc structure where Benioff zone suddenly changes, and possibly tectonic manifestation of subduction of Scarborough Seamount Chain, the extinct mid-ocean ridge of S*

China Sea. When ridge reached subduction zone at 5-4 Ma, its buoyancy temporarily interrupted subduction, caused regional uplift and massive reef formation in W chain. When subduction started again, dip angle became shallower in response to buoyancy of downgoing ridge, leading to E-ward shift of volcanic front)

Yeh, K.Y. (1990)- Taxonomic studies of Triassic radiolaria from Busuanga Island, Philippines. Bull. National Museum Natural Science, Taiwan, 2, p. 1-63.

(online at: <http://web2.nmns.edu.tw/PubLib/Library/research/199012-1.pdf>)

(Liminangcong Fm bedded chert on SE Busuanga Island often with rich M-U Triassic radiolaria. Three assemblages: Ladinian Busuanga cheni, Carnian Trialatus megacornutus and Upper Norian Livarella sp. assemblages (part of continuous L Permian- Jurassic deep sea series with radiolaria; part of convergent margin of SE Asia that stretches from Japan to Borneo)

Yeh, K.Y. (1992)- Triassic radiolaria from Uson Island, Philippines. Bull. National Museum Natural Science, Taiwan, 3, p. 51-91.

(online at: <http://web2.nmns.edu.tw/PubLib/Library/research/199205-51.pdf>)

(Late Ladinian- E Rhaetian radiolaria from bedded chert on S Uson island, just S of Busuanga Island. Cherts lithologically similar to those from Busuanga island and believed to be part of Late Permian-Jurassic Liminangcong cherts of N Palawan Block)

Yeh, K.Y. & Y.N. Cheng (1996)- An Upper Triassic (Rhaetian) radiolarian assemblage from Busuanga Island, Philippines. Bull. National Museum Natural Science, Taiwan, 7, p. 1-43.

(E Rhaetian radiolarian faunas from red chert on Busuanga Island, NW Philippines, closely resemble Rhaetian radiolaria from Japan)

Yeh, K.Y. & Y.N. Cheng (1996)- Jurassic radiolarians from the Northwest Coast of Busuanga Island, North Palawan Block, Philippines. Micropaleontology 42, 2, p. 93-124.

(M Jurassic (Aalenian) radiolarians from Liminangcong red ribbon chert in Palawan olistostrome (part of Late Permian-Late Jurassic ocean plate stratigraphy at edge of N Palawan block). 56 species, with multicystid nassellarians (Praeparvicingula, H suum, Elodium). Similar to C and SW Japan. Presence of common Praeparvicingula and abundant pantanellids indicates N Tethyan or S Tethyan assemblage (~22-30°N or S)

Yeh, K.Y. & Y.N. Cheng (1998)- Radiolarians from the Lower Jurassic of the Busuanga Island, Philippines. Bull. National Museum Natural Science, Taiwan, 11, p. 1-65.

(online at: <https://libknowledge.nmns.edu.tw/nmns/upload/bulletin/000000105/209000c/199812-1.pdf>)

(Lower Jurassic (E Sinemurian) radiolarians from Liminangcong Chert on Busuanga Island, NE part of Palawan Block)

Yokoyama, K., Y. Tsutsumi, T. Kase K.L. Queano & M.A. Yolanda (2012)- Provenance study of Jurassic to Early Cretaceous sandstones from the Palawan Microcontinental Block, Philippines. Mem. Nat. Museum Natural Science, Tokyo, 48, p. 177-199.

(online at: <http://www.kahaku.go.jp/research/publication/memoir/download/48/4811.pdf>)

(Palawan microcontinental block in Philippines separated from SW coast of Asian continent during opening of S China Sea in Oligocene-Miocene times. Jurassic- E Cretaceous sandstones from Palawan block (Busuanga, Mindoro, Panay islands) with bimodal age distribution of detrital monazites: 140-260 Ma and 1800-2000 Ma. Pattern unlike SE China Sea or Indochina Peninsula, but similar to Korean Peninsula and in Zhejiang Province in E China. Jurassic- E Cretaceous sandstones of Palawan area deposited on E side of present-day Taiwan?)

Yoshida, K., N. Pulido & E. Fukuyama (2016)- Unusual stress rotations within the Philippines possibly caused by slip heterogeneity along the Philippine fault. J. of Geophysical Research: Solid Earth 121, 3, p. 2020-2036.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2015JB012275>)

Yu, M., Y. Yi, C. Huang, H. Liu, X. Zhang, Q. Lan, W. Chen & K. Qian (2015)- Philippine ophiolites and their tectonic significance. Marine Geology Quaternary Geology (China) 35, 6, p. 53-71. *(in Chinese, with English summary)*

(online at: <http://jhydz.com.cn/article/doi/10.16562/j.cnki.0256-1492.2015.06.006>)

(more than 20 SSZ-types of ophiolitic complexes in Philippine archipelago. Most are late Mesozoic in age; Eocene complexes Coto Ophiolite in Zambales, Angat Ophiolite in southern Sierra Madre, Central Cordillera basement and Palawan ophiolites; Oligocene Amnay Ophiolite in Mindoro Island. Two distinct belts: the Philippine Mobile Belt Ophiolites and Philippine micro-Continent Ophiolites. Etc. Late Mesozoic ophiolites of Palawan microcontinent and Darvel Bay Ophiolite of NE Borneo share same origin from Proto-South China Sea. Eocene-Oligocene ophiolites of Palawan microcontinent sourced from Proto-South China Sea subduction-related Cenozoic marginal sea basins such as Sulu Sea and South China Sea. Meratus Ophiolite in SW Borneo and Balantak Ophiolite in E Sulawesi formed by subduction of Neo-Tethys Ocean beneath Borneo)

Yu, S.B, Y.J. Hsu, T. Bacolcol, C.C. Yang, Y.Ch. Tsai & R. Solidum (2013)- Present-day crustal deformation along the Philippine Fault in Luzon, Philippines. *J. Asian Earth Sciences* 65, p. 64-74.

(Left-lateral Philippine Fault results from oblique convergence between Philippine Sea Plate and Sunda Block/Eurasian Plate, transecting Philippine archipelago from NW corner of Luzon to SE end of Mindanao for about 1200 km. GPS results show horizontal velocities with respect to Sunda Block gradually decrease from N to S along W Luzon at rates of 85-49 mm/yr in WNW direction)

Yumul, G.P. (1993)- Angat Ophiolitic Complex, Luzon, Philippines: a Cretaceous dismembered marginal basin ophiolitic complex. In: B.K. Tan et al. (eds.) *Proc. 7th Conf. Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 529-537.

(Geochemistry of Angat Ophiolite Complex suggests formation in environment with both Mid-Ocean Ridge Basalt and Island Arc tholeiite signatures, probably in marginal basin setting)

Yumul, G.P. (1994)- A Cretaceous to Paleocene- Eocene South China Sea Basin origin for the Zambales Ophiolite Complex, Luzon, Philippines? *Island Arc* 3, 1, p. 35-47.

(Eocene Zambales Ophiolite Complex with transitional mid-ocean ridge basalt/ island arc tholeiite characteristics, formed in subduction-related marginal basin. Geophysical evidence suggests SW sub-basin of S China Sea Basin is probably Cretaceous to Paleocene-Eocene in age; Zambales Ophiolite Complex could have come from this sub-basin)

Yumul, G.P. (1994)- A marginal basin crust basement for the Baguio Mining District, Luzon, Philippines. *J. Geological Society of the Philippines* 49, p. 79-87.

Yumul, G.P. (1994)- The Acoje Block platiniferous dunite horizon, Zambales Ophiolite Complex, Philippines: melt type and associated geochemical controls. *Resource Geology* 51, 2, p. 165-174.

(Zambales Eocene-age supra-subduction zone ophiolite complex made up of mid-ocean ridge-related Coto block and island arc-related Acoje block. Platinum-group elements in Acoje block in nickel sulfides and chromitite deposits of high-MgO basalt to boninitic magmas. Main platiniferous zone in Acoje block transition zone dunite)

Yumul, G.P. (2003)- The Cretaceous Southeast Bohol ophiolite complex, Central Philippines: a highly disaggregated supra-subduction zone ophiolite. *J. Asian Earth Sciences* 21, 8, p. 957-965.

(SE Bohol (NW of Mindanao) Ophiolite Complex complete ophiolite sequence with pelagic chert cap yielding E Cretaceous age. Basement is Cretaceous-Paleogene Alicia Schist. Peridotite suite dominated by harzburgite with rare lherzolite and dunite pods. Includes sheeted dike complex and preponderance of sheet flows over pillow lavas in volcanic section. Geochemical affinities transitional between Mid-Ocean Ridge basalt and island arc tholeiite, suggesting formation in subduction-related marginal basin. Formed in a fast-spreading center, emplaced as forearc ophiolite)

Yumul, G.P. (2007)- Westward younging disposition of Philippine ophiolites and its implication for arc evolution. *Island Arc* 16, 2, p. 306-317.

(Philippine island arc system made up of 2 main blocks: Philippine Mobile Belt and Palawan microcontinental block in W. Ophiolites in Mobile Belt younging W-ward, resulting from CW rotation of Philippine arc system during NW-ward translation in Eocene, resulting in W boundary collision with Sundaland-Eurasian margin,

causing accretion of ophiolites/ melanges along W side. New zonation with four belts: (1) Late Cretaceous ophiolite complexes/ metamorphic soles along E Philippines; (2) Cretaceous dismembered ultramafic-mafic complexes/ melanges exposed W of E Philippines; (3) Cretaceous- Eocene to Oligocene ophiolites, emplaced between Philippine Mobile Belt and Sundaland-Eurasian margin; (4) ophiolite complexes emplaced along continental margins (Palawan and Zamboanga-Sulu). Whole Philippine Mobile Belt, except strike-slip fault bounded Luzon Eocene Zambales ophiolite complex, may be underlain by Cretaceous proto-Philippine Sea Plate fragments)

Yumul, G.P., Jr., L.T. Armada, J.A.S. Gabo-Ratio, C.B. Dimalanta & R.S.P. Austria (2020)- Subduction with arrested volcanism: compressional regime in volcanic arc gap formation along east Mindanao, Philippines. *J. Asian Earth Sciences*: X, 4, 100030, p. 1-13.

(E part of Philippine island arc system, from Bicol Peninsula-Leyte island to Pacific Cordillera of E Mindanao overriding plate of subducting W Philippine- Palau oceanic plates. Young volcanic centers (<7 Ma to present) well-developed in Bicol- Leyte island but not in Pacific Cordillera, which is under compressional regime from Miocene- Present, consistent with hinge advance character of Philippine Trench. Compressional regime inhibited extrusion of lavas and may also partly account for presence of porphyry copper deposits in Mindanao)

Yumul, G.P. & G.R. Balce (2003)- Supra-subduction zone ophiolites as favorable hosts for chromitite, platinum and massive sulfide deposits. *J. Southeast Asian Earth Sciences* 10, p. 65-97.

(Supra-subduction zone ophiolites, as exemplified by Zambales Ophiolite Complex, Philippines, host extensive chromitite, volcanic-hosted massive sulfide deposits and, to a lesser degree, platinum-group minerals. Mid-ocean ridge basalt ophiolites almost barren of economic mineral deposits. Marginal basins more easily emplaced than large, open sea oceanic basin ophiolites which are usually subducted)

Yumul, G.P., G.R. Balce & R.T. Datuin (1993)- Ophiolites and ophiolitic complexes in the Philippines as viable exploration targets. *J. Geological Society of the Philippines* 48, p. 35-54.

(Twenty ophiolitic complexes in Philippines. Ultramafic-mafic complexes with complete oceanic crust-mantle sequences classified as Tethyan, incomplete dismembered ones grouped as Cordilleran. Majority of Philippine ophiolitic complexes are supra- subduction zone (SSZ) ophiolites, exhibiting subduction related affinity. Most of economically viable chromitite, massive nickel- copper sulfides and platinum group minerals hosted by these SSZ ophiolites)

Yumul, G.P., G.R. Balce, C. Dimalanta & R.T. Datuin (1997)- Distribution, geochemistry and mineralization potentials of Philippine ophiolite and ophiolitic sequences. *Ophioliti* 22, p. 47-56.

(Philippines ophiolites range from complete oceanic crust-mantle sequences (Tethyan type) to incomplete dismembered ones (Cordilleran type). Majority subduction-related. With viable chromitite, volcanic/ ultramafic-hosted massive nickel-copper sulfide and platinum-group mineral deposits. Subduction-related ophiolitic sequences better exploration targets for metallic mineral deposits than mid-ocean ridge ophiolites)

Yumul, G.P., W.W. Brown, C.B. Dimalanta, C.A. Ausa, D.V. Faustino-Eslava, B.D. Payot, N.T. Ramos, A.N.L. Lizada et al. (2017)- Adakitic rocks in the Masara gold-silver mine, Compostela Valley, Mindanao, Philippines: different places, varying mechanisms? *J. Asian Earth Sciences* 142, p. 45-55.

(Fractional crystallization most viable mechanism for generation of adakitic rocks in Masara gold-silver mine in E Mindanao. Occurrence of adakitic rocks does not necessarily indicate presence of mineralization)

Yumul, G.P., R.T. Datuin & J.C. Manipon (1990)- Geology and geochemistry of the Cabangan- San Antonio massifs, Zambales Ophiolite Complex, Philippines: tectonically juxtaposed marginal basin island arc terranes. *J. Geological Society of the Philippines* 45, p. 69-100.

(San Antonio part of Zambales Ophiolite complex with arc-like geochemistry)

Yumul, G.P., J.V. De Jesus & F.A. Jimenez (2001)- Collision boundaries along the Western Philippine Archipelago. *Gondwana Research* 4, p. 837-838. *(Extended Abstract)*

(Philippines island arc system interaction of two plates, Sundaland in W, Philippine Sea Plate in E. Part of Sundaland (S China Sea) subducts along Manila Trench since E Miocene, ocean floor in C-S Philippines (SE

Sulu Sea, Celebes Sea) goes down along Negros-Cotabato Trench. Philippine Sea plate subducts obliquely along Philippine Trench since ~5 Ma))

Yumul, G.P. & C.B. Dimalanta (1997)- Geology of the southern Zambales ophiolite complex (Philippines): juxtaposed terranes of diverse origin. *J. Southeast Asian Earth Sciences* 15, p. 413-421.
(*Eocene Zambales Ophiolite Complex three massifs, generated in subduction-related marginal basin*)

Yumul, G.P., C.B. Dimalanta, J. Aira, S. Gabo-Ratio, K.L. Queano, L.T. Armada, J.T. Padrones et al. (2020)- Mesozoic rock suites along western Philippines: Exposed proto-South China Sea fragments? *J. Asian Earth Sciences*: X, 4, 100031, p. 1-21.

(online at: <https://www.sciencedirect.com/journal/journal-of-asian-earth-sciences-x/vol/4/suppl/C>)

(*Ancient oceanic crust must have existed during Mesozoic E of mainland Asia ('proto-South China Sea' crust), based on tectonic reconstructions of subducted slabs in lower mantle and exposed oceanic lithospheric fragments in Philippines and Borneo. Along W Philippines numerous Mesozoic ophiolites, not genetically associated with surrounding Paleogene-Neogene ocean basins. Oceanic lithospheric fragments, associated melanges and sedimentary rocks in region are likely exhumed slivers of proto-S China Sea ocean plate*)

Yumul, G.P., C.B. Dimalanta, H. Bellon, D.V. Faustino, J.V. De Jesus et al. (2000)- Adakitic lavas in the Central Luzon back-arc region, Philippines: lower crust partial melting products? *Island Arc* 9, 4, p. 499-512.

(online at: www.academia.edu/6370861/Adakitic_lavas_in_the_Central_Luzon_back_arc_region_Philippines Etc.)

(*Volcanism in back-arc region of C Luzon, behind Manila Trench, characterized by fewer and smaller volume volcanic centers than forearc side volcanic arc rocks. Back-arc side volcanics include basalts, andesites and dacites with adakite-like geochemical characteristics, most probably formed by partial melting of garnet-bearing amphibolitic lower crust. Adakitic lavas not necessarily arc-trench gap region slab melts*)

Yumul, G.P., C.B. Dimalanta, J.V. De Jesus, D.V. Faustino, E.J. Marquez, J.L. Barretto, K.L. Queano & F.A. Jimenez (1999)- Geochemistry of arc volcanic rocks in Central Luzon, Philippines. In: G.H. Teh (ed.) *Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98)*, Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 77-84.

(online at: www.gsm.org.my/products/702001-100832-PDF.pdf)

(*C Luzon volcanoes in two volcanic chains: W and E Volcanic Chains. W Chains include volcanics generated in forearc and main volcanic arc regions with respect to Manila Trench, E Chains extruded on back arc side. Across- and along-arc variation, with adakites and adakitic rocks in forearc, main volcanic arc and back-arc region. All siliceous rocks exhibit island arc affinity*)

Yumul, G.P., C.B. Dimalanta, J.V. De Jesus, D.V. Faustino, E.J. Marquez, J.L. Barretto, R.A. Tamayo, K.L. Queano & F.A. Jimenez (1999)- Subic Bay fault zone: its role in the geologic history of the Zambales Ophiolite Complex, Philippines. In: G.H. Teh (ed.) *Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98)*, Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 85-94.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1999009.pdf>)

Yumul, G.P., C.B. Dimalanta, D.V. Faustino & J.V. De Jesus (1998)- Translation and docking of an arc terrane: geological and geochemical evidence from the southern Zambales Ophiolite Complex, Philippines. *Tectonophysics* 293, p. 255-272.

(*Zambales Ophiolite Complex three massifs: Masinloc, Cabangan and San Antonio. San Antonio is rifted terrane from Acoje block, translated S to present position through W Luzon Shear- Subic Bay Fault Zone*)

Yumul, G.P., C.B. Dimalanta, J.A.S. Gabo-Ratio, L.T. Armada, K.L. Queano & K.D. Jabagat (2020)- Mineralization parameters and exploration targeting for gold-copper deposits in the Baguio (Luzon) and Pacific Cordillera (Mindanao) Mineral Districts, Philippines: a review. *J. Asian Earth Sciences* 191, 104232, p.

(*Baguio Mineral District in Luzon with several world-class epithermal gold- porphyry copper deposits. Ridge subduction (Scarborough seamount) resulting in flat subduction and transpressional regime possibly related to gold- porphyry copper deposits. Always associated with subduction processes*)

Yumul, G.P., C.B. Dimalanta & F.T. Jumawan (2000)- Geology of the southern Zambales Ophiolite Complex, Luzon, Philippines. *Island Arc* 9, 4, p. 542-555.

(Zambales Ophiolite Complex attained present-day configuration through juxtaposition of arc terrane (San Antonio massif) to back-arc crust (Cabangan massif). Massifs separated by left-lateral strike-slip fault)

Yumul, G.P., C.B. Dimalanta, V.B. Maglambayan & E.J. Marquez (2008)- Tectonic setting of a composite terrane: a review of the Philippine island arc system. *Geosciences Journal* 12, 1, p. 7-17.

(online at: www.academia.edu/8384600/Geosciences_Journal?email_work_card=view-paper)

(Modern review of Philippines tectonic evolution, as result of interplay of arc magmatism, ophiolite accretion, ocean basin closure and other tectonic processes, related to interaction of four major plates: Sundaland, Philippine Mobile Belt, Philippine Sea and Indo-Australian plate. Collision zones system characterized by involvement of oceanic bathymetric highs (seamounts, spreading ridge, submerged continental fragment). Philippine Fault Zone major strike-slip fault traversing entire archipelago)

Yumul, G.P., C.B. Dimalanta, V.B. Maglambayan & R.A. Tamayo (2003)- Mineralization controls in island arc settings: insights from Philippine metallic deposits. *Gondwana Research* 6, p. 767-776.

(Review of gold-copper, volcanogenic massive sulfide and ultramafic-hosted deposits in Philippines)

Yumul, G.P., C.B. Dimalanta, E.J. Marquez & K.L. Queano (2009)- Onland signatures of the Palawan microcontinental block and Philippine mobile belt collision and crustal growth process: a review. *J. Asian Earth Sciences* 34, 5, p. 610-623.

(Collision of Palawan microcontinent with Philippine mobile belt multiple events with several fragments. Late Early-early M Miocene age (20-16 Ma) for major collision between Palawan indenter and Philippine mobile belt. Collision boundary from N Mindoro through Central mountain range swinging E of Sibuyan Island, along Buruanga Peninsula and E side of Antique Ophiolite Complex before connecting with Negros Trench)

Yumul, G.P., C.B. Dimalanta, R.C. Salapare, K.L. Queano, K.L., D.V. Faustino-Eslava, E.J. Marquez, N.T. Ramos, B.D. Payot et al. (2020)- Slab rollback and microcontinent subduction in the evolution of the Zambales Ophiolite Complex (Philippines): a review. *Geoscience Frontiers* 11, p. 23-36.

(online at: www.sciencedirect.com/science/article/pii/S1674987119300283)

(New radiolarian ages show island arc Acoje block of Zambales Ophiolite Complex possibly of Late Jurassic- E Cretaceous age. Radiometric dating of plutonic and volcanic-hypabyssal rocks yielded M Eocene ages. Zambales Ophiolite Complex possibly (1) evolved from Mesozoic arc (Acoje block) that split to form Cenozoic back-arc basin (Coto block), etc.)

Yumul, G.P., C.B. Dimalanta, T.A. Tam & E.G.L. Ramos (2008)- Baguio Mineral District: an oceanic arc witness to the geological evolution of northern Luzon, Philippines. *Island Arc* 17, 4, p. 432-442.

(online at: https://www.academia.edu/30819985/Baguio_Mineral_District_An_oceanic_arc_witness_to_the_geological_evolution_of_northern_Luzon_Philippines)

(Baguio gold-copper mining district rocks evidence evolution from subduction-related marginal oceanic basin to volcanic island arc setting. E- M Miocene arc polarity reversal from E (termination of subduction along proto-E Luzon Trough) to W (initiation of subduction along Manila Trench))

Yumul, G.P., C.B. Dimalanta & R.A. Tamayo (2005)- Indenter-tectonics in the Philippines: example from the Palawan microcontinental block- Philippine Mobile Belt collision. *Resource Geology* 55, 3, p. 189-198.

(Aseismic Palawan microcontinental block collided with Philippine Mobile Belt since E Miocene. Tectonic microblocks N (Luzon) and S (W Visayas Block) of collision front rotated in opposite senses. Rotation converted adjacent strike-slip faults to subduction zones (Manila and Negros Trenches))

Yumul, G.P., C.B. Dimalanta, R.A. Tamayo & J.A.L. Barretto (2000)- Contrasting morphological trends of islands in Central Philippines: speculation on their origin. *The Island Arc* 9, 4, p. 627-637.

(Palawan microcontinental block collided with Philippine Mobile Belt, resulting in CCW rotation of Mindoro-Marinduque and CW rotation of Panay. Collision also caused CW rotation of NE Negros, Cebu, NW Masbate and Bohol (W Visayan block), resulting into present-day NE-SW trend. SE Sulu Sea sub-basin is inferred to

Yumul, G.P., G.P. Yumul, K.L. Queano, J.T. Padrones, C.B. Dimalanta & E.A. Andale (2000)- Adakitic Paracale Granodiorite in southeastern Luzon, Philippines: a peek at a Proto-Philippine Sea Plate-related magmatic arc. *J. Asian Earth Sciences*: X, 4, 100035, p. 1-16.

(online at: <https://www.sciencedirect.com/science/article/pii/S2590056020300116>)

(Eocene? or E-M Miocene Paracale Granodiorite intruded into Jurassic-Cretaceous ophiolitic suite in Bicol Peninsula of SE Luzon. PG is earliest adakitic magmatism of proto-Philippine Sea Plate subduction)

Yumul, G.P., M.F. Zhou, R.A. Tamayo, R.C. Maury, D.V. Faustino, F.O. Olaguera & J. Cotton (2001)- Onramping of a cold oceanic lithosphere in a forearc setting, the Southeast Bohol Ophiolite Complex, Central Philippines. *International Geology Review* 43, p. 850-866.

(E Cretaceous ophiolite complex on SE Bohol island formed in subduction-related marginal basin. Negative Nb, Zr, and Ti anomalies, suggest island-arc affinity. Ophiolite thrust on top of Cansiwang tectonic melange, which is thrust over Alicia Schist (metamorphosed oceanic crust sliver of chlorite, amphibolite and quartz-sericite schist). Serpentinite between ophiolite and Alicia Schist indicates amphibolite schists not emplacement-related metamorphic sole of ophiolite. Crust-mantle sequence emplaced at relatively low T (<500°C). Onramping of SE Bohol Ophiolite Complex as forearc ophiolite, followed by collision and suturing with Alicia Schist in Late Cretaceous. Ophiolite may represent fragment of Cretaceous proto-Philippine Sea plate)

Zamoras, L.R. (2000)- Jurassic-Early Cretaceous accretionary complex in the Calamian Islands, North Palawan Block (Philippines). Ph.D. Thesis, Niigata University, Japan, p. 1-120. *(Unpublished)*

(Study of part of Jurassic- E Cretaceous 'East Asian subduction zone' on SE margin of Indochina and S China blocks, now NE part of Palawan Block (Late Permian- Late Jurassic/E Cretaceous deep marine sediments of NNW-traveling Izanagi oceanic plate, imbricated in Jurassic- Cretaceous)

Zamoras, L.R. (2013)- Accretion and post-accretion tectonics of the North Palawan Block. *Proc. 2nd Int. Symposium International Geoscience Programme (IGP) Project 589, Borocay Island*, p. 19-20. *(Abstract)*

(online at: <http://igcp589.cags.ac.cn/2nd%20Symposium/Abstract%20volume.pdf>)

(N Palawan Block 4 episodes: M Permian- Jurassic oceanic plate travel, with deposition of chert and clastics; (2) M-Jurassic- E Cretaceous accretion of chert-clastic sequences at E Asian continental margin during Paleo-Pacific subduction; (3) M Oligocene- E Miocene opening of S China Sea, resulting in S-ward movement of N Palawan Block; (4) M Miocene collision between N Palawan Block and Philippine Island Arc)

Zamoras, L.R. & A. Matsuoka (2000)- Early Late Jurassic radiolarians from the clastic unit in Busuanga Island, North Palawan, Philippines. *Science Reports, Niigata University, E (Geology)*, 15, p. 91-109.

(online at: https://niigata-u.repo.nii.ac.jp/record/6883/files/15_91-109.pdf)

(At least 60 species of radiolarians in siliceous mudstone of Tulbuan Plain, Busuanga Island. Assemblages dominated by smaller nassellarians. Abundance of Stylocapsa(?) spiralis indicates zone JR6 of Matsuoka (1995). Associated occurrence of Stylocapsa tecta, Dicolocapsa conoformis, Guexella nudata, etc., narrows age down to lower part of zone, of Late Callovian or E Oxfordian age (see also Marquez et al. 2006; JTVG))

Zamoras, L.R. & A. Matsuoka (2001)- Malampaya Sound Group: a Jurassic-Early Cretaceous accretionary complex in Busuanga Island, North Palawan Block (Philippines). *J. Geological Society Japan*, 107, 5, p. 316-336.

(online at: https://www.jstage.jst.go.jp/article/geosoc1893/107/5/107_5_316/_pdf-char/en)

(Busuanga Island accretionary complex, collectively called Malampaya Sound Gp, with M Permian- Jurassic radiolarian cherts, M Jurassic- E Cretaceous clastics and various-age limestones, with minor melange bodies. Incl. M Permian limestone with fusulinids (Verbeekina verbeeki, Neoschwagerina spp.) and U Jurassic limestone with Cladocoropsis mirabilis, Pseudocyclammina lituus, Salpingoporella. Rocks are off scraped sedimentary deposits from subducted oceanic plate, imbricated during Jurassic- E Cretaceous accretion. Transition from chert to siliceous mudstone to terrigenous clastics indicates change from open ocean to subduction zone sedimentation, and is younging to N)

Zamoras, L.R. & A. Matsuoka (2004)- Accretion and postaccretion tectonics of the Calamian Islands, North Palawan Block (Philippines). *Island Arc* 13, p. 506-519.

(online at: www.academia.edu/7568424/Accretion_and_postaccretion_tectonics_of_the_Calamian_I_Etc.)
(Accretionary complex of N Palawan block with U Paleozoic-Mesozoic sequences of chert (Liminangcong Fm), clastics (Jurassic-Cretaceous Guinlo Fm) and limestones. Three accretionary belts on Busuanga Island (all with N-dipping beds, steepest in N; extent of complex ~22-25 km): (1) N Busuanga Belt (M Jurassic; with Permian- Aalenian pelagic sediments and Bathonian- Callovian clastics), (2) M Busuanga Belt (Late Jurassic; with M Permian- Bajocian cherts, overlain by Bathonian- Oxfordian clastics) and (3) S Busuanga Belt (E Cretaceous; with Triassic- Jurassic cherts, U Tithonian sandstones). Age progression reflects facies changes by gradual plate movement from remote oceanic environment towards subduction zone. Limestone blocks that formed over seamounts became juxtaposed with chert-clastic sequence during accretion. In Late Cretaceous accretion-subduction along E Asian margin subsided. M Oligocene seafloor spreading disconnected N Palawan block from Asian mainland, which then migrated S. Collision between N Palawan block and Philippine Island Arc in M Miocene generated megafold structure in Calamian Islands as result of CW turn of accretionary belts in E Calamian from NE-SW to NW-SE)

Zamoras, L.R., M.G.A. Montes, K.L. Queano, E.J. Marquez, C.B. Dimalanta, J.A.S. Gabo & G.P. Yumul (2008)- Buruanga Peninsula and Antique Range: two contrasting terranes in Northwest Panay, Philippines, featuring an arc- continent collision zone. *Island Arc* 17, 4, p. 443-457.

(online at: www.academia.edu/7568427/Buruanga_peninsula_and_Antique_Range_Two_contrasting_terranes_in_Northwest_Panay_Philippines_featuring_an_arc_continent_collision_zone)

(Buruanga Peninsula of NW Panay with Jurassic pelagic rocks as part of ocean plate stratigraphy of N Palawan terrane. Differ from Antique Range M Miocene basaltic to andesitic pyroclastic and lava flow deposits with reefal limestone and arkosic sandstone of Philippine Mobile Belt (see also Ishida et al. 2015; Jurassic pelagics= M-L Triassic?; JTvG))

Zhang, P.F., M.F. Zhou & G.P. Yumul Jr. (2020)- Coexistence of high-Al and high-Cr chromite orebodies in the Acoje block of the Zambales ophiolite, Philippines: Evidence for subduction initiation. *Ore Geology Reviews* 126, 103739, p. 1-10.

(Acoje block of the Eocene Zambales ophiolite (SW Luzon, NW Philippines) is fragment of forearc lithosphere in W Pacific and hosts a world-class ophiolitic chromite deposit. Upper mantle sequence ~10 km thick and mainly made of harzburgites.)

Zhang, P.F., M.F. Zhou, G.P. Yumul Jr. & C.Y. Wanh (2021)-Geodynamic setting of high-Cr chromite mineralization in nascent subduction zones: Li isotopic and REE constraints from the Zambales ophiolite, Philippines. *Lithos* 384–385, 105975, p.

(Acoje block of Zambales ophiolite, Luzon, NW Philippines is remnant of forearc lithosphere, formed during Eocene subduction initiation W Pacific Ocean. Common high-Cr chromitites in uppermost part of mantle sequence and overlying dunitic Moho transition zone. Upward changes suggest transition from MORB to boninitic affinity. High-Cr chromitites derived from mantle sources modified by slab fluids. Partial melting in mantle sources triggered by heating of previously hydrated Cpx-rich harzburgites during slab rollback and subsequent asthenospheric upwelling. Etc.)

Zhu, J., Z. Sun, H. Kopp, X. Qiu, H. Xu, S. Li & W. Zhan (2013)- Segmentation of the Manila subduction system from migrated multichannel seismics and wedge taper analysis. *Marine Geophysical Research* 34, 3-4, p. 379-391.

(Manila subduction system three segments: (1) N Luzon, (2) seamount chain segment and (3) Luzon segment)

IX.9. South Philippines (Celebes Sea, Sulu Sea, Sandakan)

Relevance for Indonesia: geology adjacent to North Borneo margin, North Makassar Straits, North Sulawesi, Sangihe Arc.

Abando, R.P. & G.H. Ansay (2002)- Sulu Sea- East Palawan Basins: frontier basin case study. Coord. Committee Geoscience Programs in East and SE Asia (CCOP), p. 1-15.

(at: www.ccop.or.th/projects/PPM/Case_Study_Phillipines_files/SuluSeaBasin.pdf)

(Discussion of petroleum potential in Sulu Sea (Sandakan sub-basin) and East Palawan Basin (Balabac and Bancauan subbasins))

Andrews, J.E. (1980)- Morphologic evidence for Celebes and Sulu marginal basins: constraints from ODP Leg 124. *Geology (GSA)* 8, p. 140-143.

Beddoes, L.R. (1976)- The Balabac Sub-Basin, Southwestern Sulu Sea, Philippines. Offshore South East Asia Conference 1976, Singapore, SE Asia Petroleum Expl. Soc. (SEAPEX), Paper 15, p. 1-22.

(Balabac sub-basin rel. small wrench-faulted M Miocene- E Pliocene depression in NW Sulu Sea, with up to 7000m of sediments. Underlain by E Miocene deep-water shale (probably deformed Rajang Gp; Hutchison 2005), acting as 'acoustic basement'. Overlain by Late Pliocene- Recent shallow water carbonates)

Beiersdorf, H. (1993)- Tectonic and sedimentary processes at the submarine Antique Ridge and the accretionary wedge of Negros (Sulu Sea, Philippines): results of an underwater television and photographic survey by R/V Sonne. *The Island Arc* 2, 3, p. 116-125.

(Numerous Neogene/Quaternary marl outcrops of submarine Antique Ridge and S Negros accretionary complexes (Sulu Sea, Philippines) formed by oversteepening of slope by collision with Cagayan Ridge and Cuyo Platform and by erosion)

Beiersdorf, H., W. Bach, G. Delisle, E. Faber, P. Gerling, K. Hinz et al. (1997)- Age and possible modes of formation of the Celebes Sea basement, and thermal regimes within the accretionary complexes off SW Mindanao and N Sulawesi. In: P. Dheeradilok et al. (eds.) *Proc. Int. Conference Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Dept. Mineral Resources, Bangkok, 1, p. 369-387.

(E Celebes Sea floor generated by seafloor spreading. Crustal age of 43 Ma at ODP Sites 767 and 770 places chron 20 along latitude 5°30' N. Celebes Sea crust moved over hotspot along E-W path, still active around 40 Ma (seamount chain near latitude 3°N). New anomaly pattern places central seafloor spreading anomaly at 4°N, created possibly at 39 Ma (chron 18). Positive magnetic anomalies N and S of chron 20 identified as chron 21 and provide highest age of E Celebes Sea crust (~48 Ma), with spreading rate of 4 cm/yr. Cessation of seafloor spreading between 34-40 Ma. Central seafloor anomaly obscured by NW-trending wrench fault. Possible large crustal splinter of oceanic crust in accretionary prism off Mindanao. Locally high methane concentrations at lower slope off Sulawesi)

Bell, R.M. & R.G.C. Jessop (1974)- Exploration and geology of the west Sulu Sea, Philippines. *The Australian Petroleum Exploration Assoc. (APPEA) J.* 14, 1, p. 21-28.

(West Sulu Basin in W part of Sulu Sea. Minor M-L Miocene inversion and wrench structures in Sandakan and Bancauan basins)

Bellon, H. & C. Rangin (1991)- Geochemistry and isotopic dating of Cenozoic volcanic arc sequences around the Celebes and Sulu Seas. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results*, 124, p. 321-338

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_23.pdf)

(K-Ar ages >50 igneous rocks from onshore Philippines, Sabah and N Sulawesi. Onshore ages 32- near 0 Ma. Two types of island arcs: those related to progressive closing of Celebes and Sulu marginal basins and those belonging to Philippine Sea Plate. Sulu Sea/ Cagayan Ridge volcanics E-M Miocene, 13.8- 21 Ma)

Belviso, S., P. Jean-Baptiste, B.C. Nguyen, L. Merlivat & L. Labeyrie (1987)- Deep methane maxima and ^3He anomalies across the Pacific entrance to the Celebes Basin. *Geochimica Cosmochimica Acta* 51, 10, p. 2673-2680

(Several methane seeps along flanks of two S Mindanao submarine ridges (Sangihe and Talaud East-Mindanao), at 2000-3000 meter depth. Isotopic ratio of added $\delta^3\text{He}$ indicates input of hydrothermal fluids, both mantle and crustal/ sedimentary components. Methane anomalies partially associated with ^3He excess, comparable to observed in spreading axis hydrothermal fields. Also major methane anomaly few 10's of km from Sangihe Ridge with no ^3He enrichment, that could originate largely from shallow sedimentary layers)

Berner, U. & P. Bertrand (1991)- Light hydrocarbons in sediments of the Sulu Sea basin (Site 768); genetic characterization by molecular and stable isotope composition. *Proc. Ocean Drilling Program (ODP), Scientific Results* 124, p. 227-231.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_16.pdf)

(Gases and interstitial waters from ODP Site 768 in Sulu Trench/Philippines points in-situ generation of methane down to sub-bottom depth of ~720m. Below this depth hydrogen isotope data indicate migration of light hydrocarbons into sediments. Occurrence of propane-pentane coincides with vertical distribution of mature organic matter. Gases in this zone of mixed microbial and thermal origin)

Bertrand, P., U. Berner & E. Lallier-Verges (1991)- Organic sedimentation in Celebes and Sulu basins: type of organic matter and evaluation of organic carbon accumulation rates. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP) 124, Scientific Results*, p. 217-225.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_15.pdf)

(Organic matter in wells of ODP sites 767 (Celebes Sea) and Site 768 (Sulu Sea) mainly of terrestrial origin with the highest TOC in M Miocene turbiditic sequences that reflect major compressive event between Philippine Mobile Belt and Palawan, Cagayan, and Sulu Ridges. Eocene and Lower Miocene in Celebes Sea low TOC and only highly degraded terrestrial particles, suggesting poor preservation conditions for organic carbon during open-ocean phase of Celebes Basin. Better preservation in younger sediments)

Bertrand, P., E. Lallier-Verges, F. Laggoun-De Farge, M. Pubeller, U. Berner, M. von Breymann & A. Desprairies (1996)- Organic sedimentation response to tectonic and paleogeographic influences in Celebes and Sulu basins, West Pacific (ODP Leg 124). In: G.P. & A.C. Salisbury (eds.) *Trans. 5th Circum-Pacific Energy and Mineral Resources Conference, Honolulu 1990, Gulf Publishing, Houston*, p. 23-29.

(In Celebes (Site 767) and Sulu Sea (Site 768) sediments organic matter mainly of terrestrial origin, with highest concentrations and accumulation rates in M Miocene turbiditic sequences; autochthonous marine amorphous organic material more common in younger sediments. Massive turbiditic inputs related to major compressive event between Philippine Arc and Palawan/Cagayan/ Sulu ridges in M-L Miocene times. Thermal maturities indicates much higher paleogeothermal gradient in Sulu than in Celebes Sea)

Betzler, C., A.J. Nederbragt & G.J. Nichols (1991)- Significance of turbidites at Site 767 (Celebes Sea) and Site 768 (Sulu Sea). In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results*, 124, p. 431-446.

(online at: www-odp.tamu.edu/Publications/124_SR/VOLUME/CHAPTERS/sr124_32.pdf)

(Mio-Pliocene turbidites deposition in Celebes- Sulu Sulu Seas tied to eustatic and tectonic events. Three types of source of siliciclastics in Celebes Sea Site 767: (1) dominated by mature quartz and quartz-lithic clasts with abundant plant debris, probably reworked shallow marine/continental environment with abundant vegetation; (2) change in source area indicated by paucity of quartz in upper system B and relative abundance of chert and other rock fragments (Sabah?); (3) clastic source from volcanic terrain. Also carbonate turbidites)

Burton, C.K. (1986)- Geological evolution of the Southern Philippines. In: G.H. Teh & S. Paramanathan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V), Kuala Lumpur 1984*, 1, *Bull. Geological Society Malaysia* 19, p. 87-102.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1986008.pdf>)

(Philippines is collage of geologic terranes of disparate origin, with at least one continental fragment)

- Cadenas Martinez, P. & C.R. Ranero (2024)- Structure and tectonic evolution of the NW Sulu Sea Basin (SE Asia). *J. of Geophysical Research: Solid Earth* 129, 3, e2022JB026180, p.
(Reinterpretation of tectonic structure, seismic stratigraphy and evolution of NW Sulu Sea from reprocessed 2D reflection profiles. Marginal sea resulting from Paleogene extension and subsequent Neogene contraction due to convergence between Palawan-Philippine blocks. Syn-orogenic depocenters calibrated to M Miocene (possibly E Miocene); rift-related depocenters uncalibrated but tentatively dated Paleogene- Lower Miocene)
- Castillo, P.R., P.E. Janney & R. Solidum (1999)- Petrology and geochemistry of Camiguin Island, southern Philippines: insights into the source of adakite and other lavas in a complex arc tectonic setting. *Contributions to Mineralogy and Petrology* 134, 1, p. 33-51.
(Some young Camiguin high-silica lavas similar to high-silica lavas from Mindanao, formerly identified as 'adakites', derived from direct melting of subducted basaltic crust (but Mindanao adakites not pure slab melts))
- Castillo, P.R., S.J. Rigby & R.U. Solidum (2007)- Origin of high field strength element enrichment in volcanic arcs: geochemical evidence from the Sulu Arc, southern Philippines. *Lithos* 97, 3, p. 271-288.
(Lavas from active Sulu Arc, S Philippines, enriched in high field strength elements (HFSE), not typical volcanic arc geochemical signature. May be from metasomatism of mantle wedge peridotites by melts derived from subducting oceanic lithosphere, through formation of amphibole, etc. From subduction of Sulu Sea crust)
- Castillo, P.R., R.U. Solidum & R.S. Punongbayan (2002)- Origin of high field strength element enrichment in the Sulu Arc, Southern Philippines, revisited. *Geology (GSA)* 30, p. 707-710.
(HFSE enrichment in Sulu Arc lavas unlikely sourced from subducted Sulu Sea basaltic crust, but from melting of geochemically enriched component in mantle wedge)
- Delegation of the Philippines (1975)- Micropalaeontologic investigation of the sedimentary sequence penetrated by the Sulu Sea A-1 well, Southern Philippines. *Proc. 12th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Tokyo 1975*, 40, p. 203-208.
(online at: <https://repository.unescap.org/server/api/core/bitstreams/5b5b4d51-1dd6-443a-8f5f-4fb6187c3158/content>)
(Sulu A-1 well, drilled in 1972- 1973 in West Sulu Sea (Bancauan) Basin, 75 miles SE of Balabac island. TD 8540'. All marine sediments ranging in age from latest Oligocene N8) to Late Miocene-Pliocene) latest Oligocene)
- Delegation of the Philippines (1975)- Micropalaeontologic investigation of the sedimentary sequence penetrated by the Sulu Sea B-1 well, Southern Philippines. *Proc. 12th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Tokyo 1975*, 40, p. 209-213.
(online at: <https://repository.unescap.org/server/api/core/bitstreams/5b5b4d51-1dd6-443a-8f5f-4fb6187c3158/content>)
(Sulu B-1 well drilled in 1973 in West Sulu Sea (Bancauan) Basin, 65 km NW of Cagayan Sulu Island. TD 7287'. All marine sediments ranging in age from latest E Miocene (zone N3) to Plio-Pleistocene))
- Desprairies, A., M. Riviere & M. Pubellier (1991)- Diagenetic evolution of Neogene volcanic ashes (Celebes and Sulu Seas). In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results*, 124, p. 489-503.
(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_36.pdf)
(Forty Late Miocene (8 Ma) - Pleistocene ash layers in Celebes and Sulu Seas Sites 767, 768, 769. Replacement of volcanic glass by smectite-phillipsite in tephra layers dated at 3.5-4 Ma. Also M Eocene to E Miocene ash beds in brownish pelagic claystones from Celebes Sea Site 767. In M Miocene no volcanic activity)
- Durkee, E.F. (1993)- Oil, geology and changing concepts in the southwest Philippines (Palawan and the Sulu Sea). In: G.H. Teh (ed.) *Proc. Symposium Tectonic framework and energy resources of the Western margin of the Pacific Basin, 1992, Kuala Lumpur 1992*, Bull. Geological Society Malaysia, Special Publ. 33, p. 241-262.
(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1993018.pdf>)

(Review of oil-gas potential in S Philippines. Palawan shelf Oligocene- E Miocene reef play with proven discoveries in NW. Sulu Sea basins Balabac, Bancau and Sandakan in SE poorly explored)

Fitch, F.H. (1963)- Geological relationship between the Philippines and Borneo. *Philippine Geologist* (J. Geological Society of the Philippines) 17, 2, p. 41-47.

(Two major geosynclines from Cretaceous to mid-Tertiary: (1) NW Borneo geosyncline, probably extending NE-ward between Palawan island and Sulu deep rather than in Panay or Negritos; (2) Philippine geosyncline, probably extending SE in E Kalimantan)

Fontaine, H., A.A. Amiscaray & J.R. Sta. Cruz (1987)- Note on the Cuyo Archipelago, Sulu Sea, Philippines. *Proc. 22nd Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP)*, Guangzhou 1985, 2, p. 333-339.

(Cuyo Archipelago in N part Sulu Sea formed by Pre-Tertiary metamorphosed limestones and radiolarite, intruded by M Miocene (15 Ma) diorite. Locally overlain by Quaternary basalts)

Futalan, K., A. Mitchell, K. Amos & G. Backe (2012)- Seismic facies analysis and structural interpretation of the Sandakan sub-basin, Sulu Sea, Philippines. *AAPG Int. Conv. Exhib.*, Singapore 2012, Search and Discovery Article 30254, p. 1-18.

(online at: www.searchanddiscovery.com/documents/2012/30254futalan/ndx_futalan.pdf)

(Summary of seismic facies mapping work in Sandakan Sub-basin. Basin evolved from Late-Middle Miocene actively prograding fluvio-deltaic system, mainly fed by Kinabatangan River in Borneo, to Pliocene-Pleistocene shelfal carbonate environment)

Graves, J.E. & D.A. Swauger (1997)- Petroleum systems of the Sandakan Basin, Philippines. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Int. Conf. Petroleum Systems SE Asia & Australia*, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 799-813.

(Geochemical analyses reveal mid-Miocene mixed oil-gas prone marginal marine mudstones. Distribution of hydrocarbon indicators on seismic suggests marginal marine source, along with migration-bounding listric normal faults, limit significant hydrocarbon entrapment to distal delta complex. Extensive Miocene uplift, erosion, and redistribution of Eocene-Oligocene Crocker Fm siliciclastics account for most of Sandakan Basin fill. Stacked 5-30 m thick sandstone reservoirs, with expected 20-25% porosity and 200-500 mD perm at target depths. Structures include normal faults, shale diapirs and ridges, and distal toe-of-slope compressional folds and thrusts, all probably formed in response to rapid sedimentation rates (1m/1000 yrs)).

Hinz, K. & M. Block (1990)- Summary of geophysical data from the Sulu and Celebes Seas. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Initial Reports*, 124, p. 87-92.

(online at: www-odp.tamu.edu/publications/124_IR/VOLUME/CHAPTERS/ir124_05.pdf)

(Brief report on geophysical site survey for ODP Leg 124 wells. With seismic line showing thrusting of crustal sliver in Sulu Trench inner wall)

Hinz, K., M. Block, H.R. Kudrass & H. Meyer (1991)- Structural elements of the Sulu Sea, Philippines. *Geologisches Jahrbuch A* 127, p. 483-506.

(Structure and tectonic history of Sulu Sea marginal oceanic basin between Sabah in SW and Philippines in NE, from seismic and ODP 124 well data. SE Sulu Sea basin underlain by Late Oligocene- E Miocene oceanic crust, now being subducted under Sulu Ridge (remnant part of Borneo Microplate). NW Sulu basin older, and part of N Borneo- Sulu collisional belt with occurrences of E Cretaceous-age ophiolites)

Hsu, V., H. Shibuya & D.L. Merrill (1991)- Paleomagnetic study of deep-sea sediments from the Cagayan Ridge in the Sulu Sea: results of Leg 124. In: E.A. Silver, C. Rangin et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results* 124, p. 511-516.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_38.pdf)

(Sulu Sea Cagayan Ridge is volcanic arc that became inactive around 18 Ma. Soft sediment cover shows no noticeable rotation/ migration in paleomag data for last 9 My, suggesting spreading of Sulu Sea backarc basin did not cause rotation. Nearby Philippine Islands and Celebes Sea did have CCW rotation in their history)

Huang, Z., F.M. Gradstein & K.E. Loudon (1991)- Subsidence and sedimentation analysis of marginal basins: Celebes Sea and Sulu Sea, Leg 124, Sites 767 and 768. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results, 124, p. 399-408.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_30.pdf)

(Celebes Sea Site 767: Basalts from normal MORB (mid-ocean ridge basalt), overlain by M Eocene oceanic reddish brown claystones. Sulu Sea ODP Site 768: intra-arc or back arc E Miocene age basalt transitional between MORB and island-arc tholeites, overlain by thin E Miocene oceanic brown/red claystone, then ~200m of pumice-rich marine tuffs, overlain by ~800m M Miocene- Recent pelagic sediments)

Hutchison, C.S. (1992)- The Southeast Sulu Sea, a Neogene marginal basin with outcropping extensions in Sabah. Bull. Geological Society Malaysia 32, p. 89-108.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1992017.pdf>)

(Sulu Sea marginal basin resulting from E Miocene intra-arc rifting. Sabah ophiolite complex predates late early Miocene opening of Sulu Sea basin and represents Lower Cretaceous ocean floor on which arc was built)

Hutchison, C.S. (ed.), R. Sukanto, A.P. Madrid & C.S. Hutchison et al. (1995)- Studies in East Asian tectonics and resources (SEATAR), Crustal transect VIII, South China-Sulu-Sulawesi-Maluku-Philippine seas. Geological Research Development Centre (GRDC), Bandung, Special Publ. 20, p. 1-45.

Jezek, P.A., D.J. Whitford & J.B. Gill (1981)- Geochemistry of recent lavas from the Sangihe-Sulawesi arc, Indonesia. In: A.J. Barber & S. Wiryosujono (eds.) Geology and tectonics of Eastern Indonesia, Proc. CCOP-IOC SEATAR Working Group Meeting, Bandung 1979, Geological Research Development Centre (GRDC), Bandung, Special Publ. 2, p. 383-389.

John, T.U. (1963)- Geology and mineral deposits of East- Central Balabac island, Palawan Province, Philippines. Economic Geology 58, 1, p. 107-130.

(Balabac Island SW of Palawan (SW-most island of Philippines), comprises Upper Cretaceous- Lower Eocene chert-spilite formation, highly deformed with serpentinite masses, and Miocene Balabac sandstone. Structural trends similar to nearby N Borneo Kudat Peninsula. Lorraine pyrite-chalcopyrite ore body in bedded cherts near Espina Point)

Jong, J. & K. Futralan (2015)- Structural interpretation, seismic facies analysis and depositional model of offshore Sandakan Sub-Basin. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2015), EAGE, Kuala Lumpur, p. 443-447.

(Sandakan sub-basin in Sulu Sea off NE Sabah relatively under-explored. Paleogeography of Sandakan sub-basin evolved from active fluvio-deltaic progradation setting in late E Miocene- early Late Miocene to shelfal marine deposition in Pliocene)

Kaminski, M.A. & Z. Huang (1991)- Biostratigraphy of Eocene to Oligocene deep water agglutinated foraminifers in the red clays from Site 767, Celebes Sea. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 171-180.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_12.pdf)

(Deep water agglutinated benthic foraminifera in Celebes Sea ODP site 767 similar to assemblages in Carpathians and Atlantic Ocean. Three zones/ assemblages: (1) Paratrochamminoides- Hormosina ovulum assemblage: tubular genera and Spiroplectammina spectabilis; Early Eocene; (2) Reophax elongatus; latest E Eocene- E Oligocene and (3) low diversity assemblage of long-ranging forms, including Rhizammina, Reophax, Glomospira and Reticulophragmium amplexans; ?Oligocene. Basal assemblage probably Early Eocene age, suggesting underlying oceanic crust E Eocene age or older)

King D.W. & D.J. Morton (1987)- Sentry Bank Reef—a case history. Exploration Geophysics 18, 1-2, p. 115-120.

(Seismic study of Sentry Bank Reef complex in Sandakan Basin in southern Sulu Sea, ~40 km off NE coast of Sabah. Undrilled M Miocene pinnacle reef on volcanic pedestal, encased in Miocene shale)

Koaler, F.C., D. Almogela, P. Estupigan, N.F. Exon, M. Hartmann, P.J. Muller & M.J. Whiticar (1979)- The Sulu Sea Basin: R.V. Valdivia cruise report and preliminary results. CCOP Newsletter 6, 1, p. 43-52.

Kopp, C., E.R. Flueh & S. Neben (1999)- Rupture and accretion of the Celebes Sea crust related to the North-Sulawesi subduction: combined interpretation of reflection and refraction seismic measurements. J. Geodynamics 27, p. 309-325.

(New seismic suggests N Sulawesi accretionary wedge entirely sedimentary. Celebes Sea typical oceanic crust, but thickens from 7 to 12 km below accretionary wedge)

Krause, D.C. (1966)- Tectonics, marine geology, and bathymetry of the Celebes Sea- Sulu Sea region. Geological Society of America (GSA) Bull. 77, p. 813-818.

(Rel. dated paleobathymetry maps Celebes Sea and surrounding seas)

Ku, Y.P., C.H. Chen, S.R. Song, Y. Iizuka & J.S. Shen (2009)- Late Quaternary explosive volcanic activities of the Mindanao-Molucca Sea collision zone in the Western Pacific as inferred from marine tephrostratigraphy in the Celebes Sea. Terrestrial Atmospheric Oceanic Sciences (TAO) 20, 4, p. 587-605.

(online at: <http://tao.cgu.org.tw/index.php/articles/archive/geology/item/860-2008073001tt>)

(Long piston core from E Celebes Sea basin provides high resolution 350 kyr marine tephrostratigraphy: 65 tephra layers, probably from volcanoes in Mindanao-Molucca Sea collision zone (S Philippine, Sangehi Arc, Halmahera Arc). Declining trend of explosive volcanism after ~180 ka, Late M Pleistocene. Shoshonitic volcanism in C Mindanao became extinct at ~151 ka, much younger than reported)

Ku, Y.P., C.H. Chen, S.R. Song, Y. Iizuka & J.S. Shen (2009)- A 2 Ma record of explosive volcanism in southwestern Luzon: implications for the timing of subducted slab steepening. Geochem. Geophysics Geosystems 10, 6, Q06017, p. 1-20.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2009GC002486>)

(Two periods of explosive volcanic activity from Macolod Corridor in SW Luzon: (1) prior to 1.35-1.98 Ma, and (2) 0.48 Ma- Present. Large explosive eruptions migrated SW-wards. Period of relative quiescence represents adjustment of subducted slab by steepening, which began around 1.34 Ma)

Kudrass, H.R., P. Muller, H. Kreuzer & W. Weiss (1990)- Volcanic rocks and Tertiary carbonates dredged from the Cagayan Ridge and the Southwest Sulu Sea, Philippines. In: C. Rangin et al. (eds.) Proc. Ocean Drilling Program (ODP), Initial Reports 124, p. 93-100.

(online at: www-odp.tamu.edu/Publications/124_IR/VOLUME/CHAPTERS/ir124_06.pdf)

*(Dredged calkalkaline rocks suggest Cagayan Ridge originated as volcanic arc. K-Ar dates of basaltic rocks from N end of Ridge suggest volcanic activity at ~10-20 Ma. Shallow-water carbonates dredged from N end of Ridge at 1600-3800m depth with foraminifera *Lepidocyclina*, *Cycloclypeus*, indicating E-M Miocene age)*

Kudrass, H.R., M. Wiedicke, P. Cepek, H. Kreuzer & P. Muller (1986)- Mesozoic and Cainozoic rocks dredged from the South China Sea (Reed Bank area) and Sulu Sea and their significance for plate-tectonic reconstructions. Marine and Petroleum Geology 3, 1, p. 19-30.

(Dredging and coring in S China Sea and Sulu Sea. Late Triassic deltaic sandstones with plant remains are oldest sediments recovered. Late Jurassic/Early Cretaceous metamorphism indicated by schists on NW flanks Reed Bank. These rocks, with gabbro, diorite, dacite, rhyolite and siliceous shale prove Dangerous Grounds and Reed Bank underlain by continental fragment. During seafloor spreading in S China Sea Late Oligocene- E Miocene carbonate platform developed on this SW-drifting continental fragment, which subsided in M Miocene. M Miocene andesite and E-M Miocene reefal carbonates recovered from Cagayan Ridge in Sulu Sea)

Lai, C.K., X.P. Xia, R. Hall, S. Meffre, B. Tsikouras, M.I.R. Balangue-Tarriela, A. Idrus, E. Ifandi & N. Norazme (2021)- Cenozoic evolution of the Sulu Sea arc-basin system: an overview. Tectonics 40, e2020TC006630, p. 1-26.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020TC006630>)

(After Palawan Continental Terrane accretion, Sulu Sea backarc basin opened by Celebes Sea subduction (~21 Ma) and rollback (17-9 Ma). North Borneo underwent intraplate extension and magmatism after ~9 Ma, and Sulu Sea subducted along Sulu-Negros trench from ~4 Ma)

Lewis, S.D. (1991)- Geophysical setting of the Sulu and Celebes Seas. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results, 124, p. 65-73.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_05.pdf)

(Celebes Sea oceanic basement mainly Middle Eocene age; Sulu Sea younger, late E to early M Miocene. No clear magnetic patterns over Sulu Sea crust)

Masclé, A. & P.A. Biscarrat (1978)- The Sulu Sea: a marginal basin in Southeast Asia. In: J.S. Watkins, L. Montadert & P.W. Dickerson (eds.) Geological and geophysical investigations of the continental margins. American Assoc. Petroleum Geol. (AAPG), Memoir 29, p. 373-381.

(Sulu Sea marginal sea with two basin types: (1) Outer Sulu Sea basin, formed inside old Palawan island arc; (2) Inner Sulu Sea basin with oceanic crust. It is fringed to SE and E by active margin, the remains of larger Tertiary active margin which extended along W side of Philippines from Luzon to Negros and perhaps from Sulu Archipelago to NE part of Sabah)

Metzger, E.J. & H.E. Hurlburt (1996)- Coupled dynamics of the South China Sea, the Sulu Sea and the Pacific Ocean. J. of Geophysical Research 101, p. 12331-12352.

(Modeling of water circulation in S China Sea, Sulu Sea, and area around Philippine Islands)

Mubandi, A.S.S., Y.S. Djajadihardja & B.M. Ganie (1999)- Petrogenesis of basic igneous rock of the Celebes Sea Basement. In: I. Busono & H. Alam (eds.) Developments in Indonesian tectonics and structural geology, Proc. 28th Annual Conv. Indonesian Association Geologists (IAGI), Jakarta, 1, p. 113-120.

(online at: <https://www.iagi.or.id/web/digital/63/11.pdf>)

(Basaltic rocks dredged from NE and SE Celebes Sea seamounts by German-Indonesian SONNE 98 cruise have characteristics of ocean island tholeiite (ocean floor basalt). Middle Eocene radiometric age (44.9 ± 1.5 Ma))

Muller, C.M. (1991)- Biostratigraphy and geological evolution of the Sulu Sea and surrounding area. Proc. Ocean Drilling Program (ODP), Scientific Results, 124, p. 121-131.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_09.pdf)

(Biostratigraphic and lithologic data from Leg 124 in Sulu Sea, placed in context of surrounding areas: Palawan, N Borneo and Zamboanga Peninsula. Main events: (1) M Eocene emplacement of ophiolites in Palawan and Sabah; (2) opening of S China Sea since late Oligocene, linked to subduction of proto China Sea; (3) opening of Sulu Sea since E Miocene, (4) cessation of volcanic arc activity in Sulu Sea in early M Miocene (nannofossil zone NN5), possibly related to collision of Cagayan volcanic arc with drifted Chinese continental margin, and ending spreading in S China Sea; (5) subduction of oceanic crust of SE Sulu Sea Basin to S probably since latest Miocene and initiation of Sulu volcanic arc. Includes geological cross-sections from N Borneo to Sulu Sea)

Murauchi, S., W.J. Ludwig, N. Den, H. Hotta, T. Asanuma, T. Yoshii, A. Kubotera & K. Hagiwara (1973)- Structure of the Sulu Sea and the Celebes Sea. J. of Geophysical Research 78, 17, p. 3437-3447.

(Seismic refraction profile through Sulu Sea and Celebes Sea marginal basins. NW part of Sulu Sea basin part of Palawan-Calamianes archipelago ridge that subsided. Deeper SE part of Sulu Sea basin and Celebes Sea basin oceanic crust. Sulu archipelago ridge characteristic of island arc, upon which sedimentation has produced flat sea floor in most places)

Murray, C. (2015)- Deepwater Sandakan Basin, Philippines: exploration of a new gas frontier. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2015, Singapore, 7.3, p. 1-6. *(Extended Abstract)*

(Sandakan Basin prospective, under-explored deep water basin in SW Sulu Sea, sharing similarities with other circum-Borneo Basins, where oil and gas fields discovered in Late Miocene turbidite reservoirs outboard of major delta systems, sourced from terrestrially derived kerogens)

- Nagasaka, K., J. Francheteau & T. Kishii (1970)- Terrestrial heat flow in the Celebes and Sulu Seas. *Marine Geophysical Research* 1, p. 99-103.
(Two heat flow measurements in Celebes Sea and three in Sulu Sea show mean values of 2.0 $\mu\text{cal}/\text{cm}^2 \text{ sec}$, higher than overall mean heat flow of oceans and close to mean value for marginal seas. Celebes Sea values (1.5) cooler than Sulu Sea (2.2- 2.6 $\text{mcal}/\text{cm sec}^\circ\text{C}$)
- Nederbragt, A.J. (1991)- Distribution and preservation of Cenozoic planktonic foraminifers from the Celebes and Sulu seas, Leg 124. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 124*, p. 159-170.
(Celebes Sea sites 770 and 767 M Eocene- Recent pelagic carbonates and marls on late M Eocene mid-oceanic ridge basalts. Sulu Sea late E Miocene- Recent sediment, with pelagic carbonates only in Late Pliocene and Pleistocene, suggesting falls in carbonate compensation depths at $\sim 3.5 \text{ Ma}$, 2.4 Ma , 1.6 Ma , etc.)
- Nichols, G., C. Betzler, G. Brass, Z. Huang, B. Linsley, D. Merril, C. Muller et al. (1990)- Depositional history of the Sulu Sea from ODP Sites 768, 769 and 771. *Geophysical Research Letters* 17, 11, p. 2065-2068.
(ODP Site 768 in SE sub-basin and Sites 769 and 771 on flanks of Cagayan Ridge. Sulu Basin originated in late E Miocene ($\sim 18.8 \text{ Ma}$) in backarc setting. Cagayan Ridge was site of E- early M Miocene arc volcanism with thick andesitic to basaltic volcanoclastics. Basin center E Miocene pelagic sequence interrupted by rhyolitic-dacitic pyroclastic flows. M-L Miocene sedimentation more continental, with thick quartz-rich turbidites. Decrease in supply from arc and continental sources and Late Pliocene change in carbonate compensation depth resulted in Late Pliocene- Pleistocene pelagic carbonate deposition)
- Nichols, G. & R. Hall (1999)- History of the Celebes Sea basin based on its stratigraphic and sedimentological record. *J. Asian Earth Sciences* 17, 1, p. 47-59.
(online at: http://searg.rhul.ac.uk/pubs/nichols_hall_1999%20Celebes%20Sea.pdf)
(Oceanic Celebes Sea Basin between N Borneo and N Sulawesi opened in M Eocene (50-37 Ma), formed by spreading behind N-dipping subduction zone accommodating N-ward movement of Indian Ocean Plate. Sites 767 and 770 basement basalt with MORB affinity, overlain by late M Eocene pelagic mudstones, followed by condensed pelagic sequence (90m in 20 Ma) below CCD until E Miocene. M-L Miocene quartz-rich turbidites probably from E Borneo, peaking at $\sim 10 \text{ Ma}$, caused by collision events on island. Clastic supply ended in Late Miocene, as S-ward subduction of Celebes Sea oceanic crust beneath N arm of Sulawesi began)
- Oda, H., H. Shibuya & V. Hsu (2000)- Palaeomagnetic records of the Brunhes/Matuyama polarity transition from ODP Leg 124 (Celebes and Sulu seas). *Geophysical J. International* 142, p. 319-338.
(Paleomagnetic records of Brunhes/Matuyama geomagnetic polarity transition (0.78 Ma) in deep-sea sediment cores of ODP Leg 124 in Celebes and Sulu seas. Microtektite layer at Site 769A with sharp magnetic intensity peak, pegged at 789.5 ka)
- Oke, B., J. Keall, P. Carroll, R. Noble & T. Setzer (2004)- Zebra Prospect- reading between the stripes. In: R.A. Noble et al. (eds.) *Proc. Deepwater and Frontier Exploration in Asia & Australia Symposium*, Jakarta, Indonesian Petroleum Association (IPA), DFE04- OR-048, p. 1-13.
(Sandakan Basin off N Borneo Pliocene seismic amplitude anomalies corresponded to uneconomic, thin, gas-bearing, very fine sand-silt units)
- Oppo, D.W., B.K. Linsley, Y. Rosenthal, S. Dannenmann & L. Beaufort (2003)- Orbital and suborbital climate variability in the Sulu Sea, western tropical Pacific. *Geochem. Geophysics Geosystems* 4, 1, 1003, p. 1-20.
(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2001GC000260/epdf>)
(Planktonic $\delta 18\text{O}$ from sediment core MD97-2141 in Sulu Sea reveals that for past 400 kyr, $\delta 18\text{O}$ variability on orbital timescales similar to that caused by changes in ice volume alone)
- Pederson, S.L. (1996)- Hydrocarbon potential, Southwest Sulu Sea, Philippines. In: G.P. & A.C. Salisbury (eds.) *Trans. 5th Circum-Pacific Energy and Mineral Resources Conference*, Honolulu 1990, Gulf Publishing, Houston, p. 587-594.

(SW Sulu Sea in Philippine Territorial waters three Tertiary subbasin, from NW to SE: Balabac, Bancau and Sandakan. Gas-condensate tested in Sabah sector of Sandakan basin at Nympha Norde 1. Oil and gas in Superior 333-1 well in Philippine sector of Sandakan subbasin)

Poblete, R.G. & A.A. Morado (1999)- The NW Sulu Sea Basin, Philippines: an attractive frontier area for petroleum exploration. Proc. Palawan 99 Conference, p. 1-12.

Pouclet, A., M. Pubellier & P. Spadea (1991)- Volcanic ash from Celebes and Sulu Sea basins off the Philippines (Leg 124): petrography and geochemistry. In: E.A. Silver et al., Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 467-487.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_35.pdf)

(Volcanic material in deep-sea sediments Late Oligocene (32, 25 Ma) in Celebes Sea and E Miocene (18, 10 Ma) in Sulu Sea. Late E Miocene Sulu Sea tuffs from Cagayan arc, early Late Miocene ashes from Sulu arc. All ash compositions calc-alkaline and arc-related. E Pliocene activity in Celebes and Sulu Seas from new Sangihe arc and from Sulu, Zamboanga and Negros arcs. Late Pliocene- E Pleistocene renewal of activity in Sangihe-Cotabato and Sulu and Negros arcs. Last volcanic pulse in late Pleistocene)

Pubellier, M., P. Spadea, A. Pouclet, R. Solidum, A. Desprairies & H. Cambray (1991)- Correlations of tephras in Celebes and Sulu Sea basins; constraints on geodynamics. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 459-465.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_34.pdf)

(In Eocene and Oligocene Celebes Basin recorded activity of large volcanic arc that could be Philippine or more likely Sunda arc. W Philippine Basin decrease of ash component in E Oligocene, with no volcanic activity until latest Miocene except pyroclastic flows on flank of Cagayan Ridge and Sulu Basin. Volcanic series known in Philippines and on Sabah in E Miocene (21-17 Ma) and M Miocene (15-11 Ma) may not have produced explosive volcanism. E Pliocene basaltic tephras may tie to volcanic ridges of N Zamboanga. Pleistocene renewal of volcanic activity from two different magmatic series compatible with incipient volcanism along Cotabato Trench and with basaltic plateaus of Central cordillera of Mindanao. New geodynamic framework consistent with new subduction along Philippine Trench around 4 Ma)

Rabinowitz, P.D., F.H. Syed & R. McCabe (1998)- Gravity studies across the Sulu Arc. Proc. Offshore Technology Conference (OTC), Houston 1998, 1, 8891-MS, p. 647-656.

(Should be Sulu arc. Three models proposed for tectonic origin of Sulu and Celebes Seas basins: (1) trapped fragments of oceanic plate, (2) back-arc spreading, and (3) rifting from SE Asia margin. Basins are separated by shallow partly emerged Sulu volcanic Ridge extending from W Mindano to NE Borneo. Gravity observations across Sulu Arc and adjacent basinal structures consistent with subduction zones along both flanks of Sulu Arc and also that extinct spreading centers exist in both Sulu and Celebes Seas)

Rangin, C. (1989)- The Sulu Sea, a back-arc basin setting within a Neogene collision zone. Tectonophysics 161, p. 119-141.

(SE Sulu Sea small oceanic basin that opened in M Miocene in back-arc setting along Sundaland margin during subduction of Celebes Sea plate beneath Sulu arc. Back-arc extension post-dates early M Miocene compression. Progressive, still incomplete closing of basin, initiated in Late Miocene, result of collision of exotic terranes with Sundaland margin, which also induced flipping of the Sulu subduction zone. Evolution of Sulu Sea modern example of how young oceanic crust can be incorporated in orogenic belt. Nice geologic cross-sections)

Rangin, C. (1991)- Southeast Asian marginal basins (South China, Sulu and Celebes Seas): new data and interpretations. United Nations ESCAP, CCOP, Technical Publication 24, 25th Anniversary Volume, p. 156-174.

(Celebes and S China Seas rifted from Asian continental margin in Paleogene. Proto-South China Sea, now completely subducted, probably had same origin. Paleogene was period of intense stretching of Eurasian margin and opening of marginal basins, Neogene corresponds to progressive subduction of these oceanic basins)

- Rangin, C. & E.A. Silver (1991)- Geological setting of the Celebes and Sulu Sea. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Initial Reports, 124, p. 35-42.
(online at: www-odp.tamu.edu/Publications/124_IR/VOLUME/CHAPTERS/ir124_03.pdf)
(Celebes and Sulu Seas are deep restricted basins between Borneo and Philippine Archipelago. They are part of succession of trending NE subparallel oceanic basins. Separating basins from S China to Banda are ridges such as Cagayan Ridge, Palawan and Sulu archipelagos, arms of Sulawesi, and Sula platform)
- Rangin, C. & E.A. Silver (1991)- Neogene tectonic evolution of the Celebes-Sulu basins: new insights from Leg 124 drilling. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), College Station, TX, Scientific Results 124, p. 51-63.
(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_04.pdf)
(Synthetic cross section from S China Sea to Sulawesi, and correlation of major magmatic and tectonic events. Basins and their margins (Celebes-Sulu block) collided with rifted margin of China (Reed Bank) around 16 Ma. Submarine pyroclastics emplacement coincided with this collision. Sulu Basin probably opened in back-arc position for Cagayan volcanic arc in Early Miocene. Incipient closing of Sulu and Celebes basins still active)
- Rangin, C., E. Silver and Leg 124 Team (1989)- Forages dans les bassins marginaux du SE Asiatique: resultats preliminaires du leg 124 (Ocean Drilling Program), Comptes Rendus Academie Sciences, Paris, Ser. II, 309, 12, p. 1333-1339.
(Wells in the marginal basins of SE Asia: preliminary results of ODP Leg 124'. ODP Leg 124 determined ages of Sulu Sea (E Miocene or E-M Miocene boundary) and Celebes Sea (M Eocene). Both basins record significant and synchronous influx of quartz-rich terrigenous material at end of M Miocene, in response to major compressive tectonic event corresponding to closure of these SE Asian marginal basins (see also Rangin and Silver 1991)
- Rangin, C., E. Silver, M.T. von Breymann et al. (eds.) (1991)- Volume 124 Scientific Results. Proc. Ocean Drilling Program (ODP), Initial Reports, 124, College Station, Tx, p. 1-552.
(online at: www-odp.tamu.edu/publications/124_SR/124TOC.HTM)
(Scientific results from wells and studies of ODP Leg 124 in Sulu and Celebes Seas)
- Roeser, H.A. (1991)- Age of the crust of the Southeast Sulu Sea basin based on magnetic anomalies and age determined at Site 768. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 339-343.
(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_24.pdf)
(Age of Sulu Sea oceanic crust at ODP site 768 about 17-15 Ma. Magnetic anomalies rel. weak and not parallel to Palawan/ Cagayan Ridge/ Sulu Archipelago, but suggest N-S spreading direction. Sulu Sea probably started to open at 30-35 Ma (E. Oligocene= too early?; JTvG). Spreading continued until 10 Ma (Late Miocene). Most oceanic crust already subducted)
- Scherer, R.P. (1991)- Radiolarians of the Celebes Sea, Leg 124, Sites 767 and 770. In: E.A. Silver, C. Rangin et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 345-357.
(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_25.pdf)
(Celebes Sea ODP Sites 767 and 770 brown clays over basalt at both sites contain radiolarians of late M Eocene Podocyrtes chalaris Zone. No Late Eocene radiolarians due to probable hiatus or condensed section. Oligocene represented by Theocyrtis tuberosa and Dorsacanthus zones. Pelagic sedimentation until E Miocene, when sedimentation became strongly influenced by continentally derived material)
- Scherer, R.P. (1991)- Miocene radiolarians of the Sulu Sea, Leg 124. In: E.A. Silver, C. Rangin et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 359-368.
(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_26.pdf)
(Radiolarians generally rare in ODP Leg 124 sediments from Sulu Sea)
- Schluter, H.U., M. Block, K. Hinz, S. Neben, D. Seidel & Y. Djajadihardja (2001)- Neogene sediment thickness and Miocene basin-floor fan systems of the Celebes Sea. Marine and Petroleum Geology 18, 7, p. 849-861.

(M Miocene turbidites correlated from ODP site 767 throughout Celebes Sea basin study area. Differences in thickness and distribution indicate two source areas: (1) M Miocene fans of C and S Celebes Sea basin controlled by paleo-Tarakan Delta system, tectonic events and basin floor morphology; (2) area along S Sulu Arc sourced from Mindanao. Correlations suggest post-M Miocene to pre-Pliocene age for Cotabato Trench accretionary wedge and Plio-Pleistocene age for N Sulawesi subduction wedge)

Schluter, H.U., K. Hinz & M. Block (1996)- Tectono-stratigraphic terranes and detachment faulting of the South China Sea and Sulu Sea. *Marine Geology* 130, p. 39-78.

(Five main tectono-stratigraphic terranes defined for S China Sea and four for Sulu Sea. Dangerous Grounds, Reed Bank, Palawan-NW Borneo Trough and Palawan Island continental terranes, developed on proto-China margin by simple shearing in Late Cretaceous-E Paleocene)

Schneider, D.A., D.V. Kent & G.A. Mello (1992)- A detailed chronology of the Australasian impact event, the Brunhes-Matuyama geomagnetic polarity reversal, and global climate change. *Earth Planetary Science Letters* 111, p. 395-405.

(Australasian microtektite peak layers in Sulu Sea ODP Holes 767B (49.63 mbsf) and 769A (61.31 mbsf))

Scibiorski, J., J. Jong, J. Rosser, P. Boss & B. Cassie (2009)- Prospectivity and exploration challenges of SC41 deepwater Sandakan Basin, South Sulu Sea. *Proc. SE Asia Petroleum Exploration Society (SEAPEX) Exploration Conference 2009, Singapore*, p. 1-38. *(Abstract + Presentation)*

(Sandakan Basin off NE Sabah mainly in Philippine waters. Under-explored Tertiary sag basin with up to 6 km of Miocene -Pliocene deltaic and deepwater sediments. Previous exploration in basin focused on shallow water deltaic and carbonate plays; failure attributed to seal failure due to high sand content and cross fault leakage)

Serri, G., P. Spadea, L. Beccaluva, L. Civetta, M. Coltorti et al. (1991)- Petrology of igneous rocks from the Celebes Sea basement. In: E.A. Silver, C. Rangin et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 124*, p. 271-296.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_20.pdf)

(ODP Site 770 basaltic basement below M Eocene radiolarian-bearing red clays drilled mainly pillow lavas and pillow breccias, intercalated with massive amygdaloidal lavas. Two dolerite sills also recognized. All rocks studied show effect of low-temperature seafloor alteration, causing almost total replacement of olivine and glass. Textural and mineralogical features and crystallization sequences analogous to primitive or weakly fractionated mid-ocean-ridge basalts (MORBs). No detectable influence of subduction-related component)

Shibuya, H., V. Hsu, D. Merrill & ODP Leg 124 scientists (1989)- Paleomagnetic results of ODP Leg 124, Celebes and Sulu Seas. *AGU Fall Meeting 1989, Abstracts, EOS 70, 43*, p. 1365. *(Abstract)*

Shibuya H, D.L. Merill, V. Hsu & Leg 124 party (1991)- Paleogene counterclockwise rotation of the Celebes Sea-orientation of ODP cores utilizing the secondary magnetization. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 124*, p. 519-523.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_39.pdf)

(Paleomag work suggesting Celebes Sea Site 770 rotated up to 60° CCW between M Eocene and Late Oligocene. No rotation indicated after Late Oligocene)

Shyu, J.P., D. Merrill, V. Hsu, M.A. Kaminski, C.M. Muller, A.J. Nederbragt et al. (1991)- Biostratigraphic and magnetostratigraphic synthesis of the Celebes and Sulu Seas. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 124*, p. 11-35.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_02.pdf)

(Summary of ODP Leg 124 late M Eocene- Quaternary biostratigraphic and paleomagnetic studies)

Shyu, J.P. & C.M. Mueller (1991)- Calcareous nannofossil biostratigraphy of the Celebes and Sulu Seas. In: E.A. Silver et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 124*, p. 133-159.

(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_10.pdf)

(Sites 767 and 771 in Celebes Sea post-Oligocene sediments below carbonate compensation depth (CCD) and calcareous nannofossils recovered only from turbidites. From late M Eocene to Late Oligocene Site 771 was above CCD and accumulated pelagic clay. Highest occurrence of Chiasmolithus grandis just above basement and indicates late M Eocene age for Celebes Sea Basin crust. In SE Sulu Basin nannofossils preserved only in post- early M Miocene. Base Gephyrocapsa oceanica s.l. closest datum to top Olduvai paleomagnetic event and most suitable biohorizon for approximating Pliocene-Pleistocene boundary in Celebes and Sulu Seas)

Silver, E.A. & C. Rangin (1989)- Celebes and Sulu marginal basins: constraints from ODP Leg 124. EOS Transactions, AGU, 70, 43, p. 1365.

(Sites 767 and 770 in Celebes basin recovered M Eocene radiolarian red clay above MORB-type basaltic basement. Paleomag shows little change in latitude throughout its history. Site 768 in Sulu basin drilled 1271m, including 222m of basaltic basement, transitional between MORB and arc tholeiite. Late E or early M Miocene brown claystone above and below 200m of rhyolitic pyroclastic deposits. Sites 769 and 771 on Cagayan ridge M Miocene and younger pelagic sediments above andesitic- basaltic tuffs, indicating cessation of Cagayan arc volcanism close to time of formation of Sulu basin. Both basins abundant terrigenous turbidites in M Miocene, with quartz sands and wood fragments, indicating a major collision event in Borneo or Philippines)

Silver, E.A. & C. Rangin (1991)- Leg 124 tectonic synthesis. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 3-9.

(online at: www-odp.tamu.edu/Publications/124_SR/VOLUME/CHAPTERS/sr124_01.pdf)

(Plate tectonic setting of M Eocene Celebes Sea oceanic crust ambiguous, but do not favor origin as fragment of Indian Ocean or W Philippine Sea plates. We cannot exclude origin as fragment of mostly subducted Molucca Sea Plate or basin rifted from edge of E Asian mainland. Sulu Sea likely to formed by back-arc spreading behind Cagayan Ridge in E Miocene. Cessation of spreading in Sulu Sea and volcanic activity on Cagayan Ridge were coeval, possibly related to collision between Palawan and Cagayan ridges)

Silver, E.A. & C. Rangin (1991)- Development of the Celebes Basin in the context of Western Pacific marginal basin history. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 39-49.

(online at: www-odp.tamu.edu/Publications/124_SR/VOLUME/CHAPTERS/sr124_03.pdf)

(Celebes Sea marginal basin origin still uncertain. Little paleomagnetic evidence of latitudinal change. Clay minerals no change from red to green claystones. Eocene-Oligocene sediments indicate open ocean origin for early basin history. If formed by rifting of edge of SE Asia, it did so without terrigenous input and allowed free interchange with ocean waters. Celebes Sea presently subducting, as are many W Pacific marginal basins)

Silver, E.A. & C. Rangin (1996)- Origin and history of the Sulu and Celebes basins: ODP Leg 124. In: G.P. & A.C. Salisbury (eds.) Trans. 5th Circum-Pacific Energy and Mineral Resources Conference, Honolulu 1990, Gulf Publishing, Houston, p. 51-60.

(Celebes basin formed in M Eocene time in environment protected from terrigenous sedimentation (red clay deposition until E Miocene. Gradually increasing influx of terrigenous sediments to high sedimentation rates in late M Miocene. Basement rocks MORB tholeiites, including pillow basalts, sheet flows, and sills. SE Sulu basin formed in intra-arc environment (200m of rhyolitic dacitic tuffs above basement in radiolarian brown claystone section. Activity in adjacent Cagayan arc ceased shortly after the opening of Sulu Sea. Both basins high rates of terrigenous turbidites in M Miocene, correlative with tectonism in Sabah and possibly Philippines)

Smith R.B., G.W. Betzler, G.W. Brass, Z. Huang et al. and Leg 124 Scientific Party (1990)- Depositional history of the Celebes Sea from ODP Sites 767 and 770. Geophysical Research Letters 17, 11, p. 2065-2068.

(Sites 767 and 770 in N Celebes Sea reached late M Eocene basaltic basement. From late M Eocene to Early Miocene pelagic sedimentation prevailed with little influence from continental or volcanic arc sources. First major continental influence in M Miocene time as thick sequence of quartzose turbidites on basin floor, possibly in response to M Miocene orogeny in N Borneo. Late Miocene arc volcanism began to contribute hemipelagic sediments and ash layers and remained dominant sediment to present. Celebes Sea now surrounded by volcanic arcs, but absence of volcanoclastics in Eocene- E Miocene suggests basin did not form by back-arc spreading)

Smith R.B., M. von Breymann & Z. Huang (1991)- Site backtracking and the Eocene- Oligocene calcite compensation depth in the Celebes Sea. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling program (ODP), Scientific Results 124, p. 447-457.

(online at: www-odp.tamu.edu/publications/124_sr/volume/chapters/sr124_33.pdf)

(Oceanic crust at Sites 767 and 770 in N Celebes Sea overlain by Eocene-Oligocene pelagic sediments. Brown clay accumulated below the calcite compensation depth (CCD) at deeper Site 767 throughout this time interval. Shallower Site 770 brief episode of non-calcareous clay deposition in earliest Oligocene, indicating abrupt lowering of the CCD by 500m, synchronous with drop in CCD in Pacific and Atlantic Oceans, showing open deep-water connections between Celebes Sea and Pacific or Indian Oceans in Eocene-Oligocene)

Smith, T.E., C.H. Huang & F.G. Sajona (1991)- Geochemistry and petrogenesis of basalts from Holes 767C, 770B and 770C, Celebes Sea. In: E.A. Silver, C. Rangin et al. (eds.) Proc. Ocean Drilling program (ODP), Scientific Results 124, p. 311-320.

(online at: www-odp.tamu.edu/Publications/124_SR/VOLUME/CHAPTERS/sr124_22.pdf)

(Compositionally Celebes Sea basalts very similar to normal mid-ocean ridge basalts. Celebes Sea interpreted as fragment of basement of Jurassic Argo abyssal plain trapped during Eocene (most unlikely; JTvG)).

Solidum, R.U., P.R. Castillo & J.W. Hawkins (2003)- Geochemistry of lavas from Negros Arc, west central Philippines: Insights into the contribution from the subducting slab. *Geochem. Geophysics Geosystems* 4, 10, 9008, p. 1-26.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2003GC000513>)

(Negros Arc in W-C Philippines six Pliocene-Quaternary stratovolcanoes, associated with SE-ward subduction of SE Sulu Sea Basin. Calc-alkaline to slightly shoshonitic basalts to dacites, exhibiting typical arc compositional signatures)

Spadea, P., L. Beccaluva, L. Civetta, M. Coltorti, J. Dostal, F. Sajona, G. Serri, C. Vaccaro & O. Zeda O (1991)- Petrology of basic igneous rocks from the floor of the Sulu Sea. In: E.A. Silver, C. Rangin et al. (eds.) Proc. Ocean Drilling program (ODP), Scientific Results 124, p. 251-269.

(online at: https://www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_19.pdf)

(Sulu Sea basement rocks, cored for ~220m beneath late E Miocene pelagic sediments, consist of pillow basalts, dolerite microgabbro. Basalts and dolerites suffered seawater alteration (secondary fill of cracks and amygdaloidal textures by carbonate, zeolites, and clay minerals) and low-grade greenschist facies oceanic metamorphism (chlorite, serpentine, etc.). E Miocene oceanic crust creation in Sulu Basin (Site 768) from basaltic MORB-like mantle sources, modified by subduction-related geochemical components)

Spadea, P., M. D'Antonio & M.F. Thirlwall (2004)- Source characteristics of the basement rocks from the Sulu and Celebes Basins (Western Pacific): chemical and isotopic evidence. *Contributions to Mineralogy and Petrology* 123, 2, p. 159-176.

(online at: https://www.researchgate.net/publication/225821011_Source_characteristics_of_the_basement_rocks_from_the_Sulu_and_Celebes_Basins_Western_Pacific_Chemical_and_isotopic_evidence)

(Sulu Basin developed ~18 Ma as backarc basin, associated with Cagayan Ridge Arc. Celebes Sea Basin formed ~43 Ma, subsequently developing as open ocean until M Miocene. In both basins late M Miocene collision and Late Miocene onset of volcanic activity on adjacent arcs. Sulu and Celebes Sea Basins basalts isotopically similar to depleted Indian Ocean MORB, and distinct from E Pacific Rise MORB. Signature possibly inherited by Indian Ocean mantle during rupture of Gondwanaland, when fragments of this mantle may have migrated to position of Celebes, Sulu and Cagayan sources)

Szarek, R., H. Nomaki & H. Kitazato (2007)- Living deep-sea benthic foraminifera from the warm and oxygen-depleted environment of the Sulu Sea. *Deep Sea Research*, II, 54, p. 145-176

(Sulu Sea is semi-enclosed oceanic basin with warm (~10°C) and oxygen depleted deep waters. Samples from water depths 534-4635m. Foraminifera assemblages above 3000m dominated by Angulogerina, bolivinids (Bolivina pacifica, B. spathulata) and uvigerinids (U. auberiana, Neouvigerina ampullacea). Below 3000m foram faunas mainly agglutinants (Spiroplectammina, Ammoscalaria, Reophax). Most living foraminifera in top

2cm of sediment, except Valvulineria and Globobulimina pacifica. Tubular arenaceous tubular forams (e.g. Hyperammina, Rhabdammina, Rhizammina) common at all sites)

Tamesis, E.V. (1990)- Petroleum geology of the Sulu Sea Basin, Philippines. Proc. 8th Offshore South East Asia Conference, SE Asia Petroleum Exploration Society (SEAPEX), Singapore, 9, p. 45-54.
(Sulu Sea several NE trending sub-basins (NW and SW Sulu) and three W Sulu small basins on Sabah shelf (Balabac, Bancauan, Sandakan). W Sulu Sea 21 wells. Basins inception in Late Paleogene, followed by Neogene subsidence. Miocene- Pliocene fluvio-deltaics with oil and gas shows and Pliocene regional marine transgression with Late Pliocene- Pleistocene carbonate deposition)

Trinidad, N.D. & R.T. Barcelona (1999)- Notes on the geology and hydrocarbon potential of the Sibutu block, southern Philippines. Proc. Palawan'99 Int. Conference Tectonics, stratigraphy and petroleum and mineral systems of Palawan, Borneo and surrounding areas, Palawan Island, Philippines, p. 1-8.

Van der Kaars, W.A. (1991)- Palynological aspects of Site 767 in the Celebes Sea. In: E.A. Silver et al. (eds.) Proc. Ocean Drilling Program (ODP), Scientific Results 124, p. 369-374.
(online at: www-odp.tamu.edu/publications/124_SR/VOLUME/CHAPTERS/sr124_27.pdf)
(Palynological study of ODP Site 767 in Celebes Sea indicates presence of extensive wetlands in surrounding area during Middle and Late Miocene. At start of Late Pleistocene montane vegetation expanded, probably due to tectonic upheaval)

Walker, T.R., A.F. Williams, D. Wong, M. Kadir, A. Khair & R.H.F. Wong (1992)- Hydrocarbon potential of the southern Sandakan Basin, Eastern Sabah, Malaysia. AAPG International Conference, Sydney 1992, Search and Discovery Article 91015. *(Abstract only)*
(Sandakan Basin is largest of three basins in SW Sulu Sea, with up to 6-8 km of Lower Miocene -Recent sediments. Complex history involving Paleogene arc tectonism and subbasin formation punctuated by obduction and transpressional events. Deltaic sedimentation with outer shelf reef growth characterized Neogene. Reservoir and intra-formational seals are ubiquitous. Source rocks are deltaics, similar to Baram and Mahakam Deltas. 15 exploration wells, 11 of these invalid tests. Similarities in stratigraphic and structural style between Baram Delta and Sandakan Basin suggest significant hydrocarbon potential)

Wang, S. & G. Zhang (2022)- Geochemical constraints on mantle source nature and recycling of subducted sediments in the Sulu sea. Geosystems and Geoenvironment 1, 100005, p. 1-9.
(online at: www.sciencedirect.com/science/article/pii/S2772883821000054)
(Sulu Sea marginal spreading basin in triple junction of Euro-Asia/Indian/Pacific plates. Seafloor basalts at ODP Site U768 in SE Sulu Sea transitional between mid-ocean ridge basalts (MORBs) and island arc basalts (IABs). Subduction-modified depleted mantle source indicated by high Th/Yb ratios. Subducted pelagic sediments contributed to origin of Indian-type mantle of SE Sulu Sea)

Weissel, J.K. (1980)- Evidence for Eocene oceanic crust in the Celebes Basin. In: D.E. Hayes (ed.) The tectonic and geologic evolution of Southeast Asian Seas and Islands- I. American Geophysical Union (AGU), Geophysical Monograph 23, p. 37-47.
(Celebes Sea magnetic lineations striking N65°E mapped as anomalies 18-20, suggesting oceanic crust is of Eocene age. Magnetic anomaly shapes suggests little net change in latitude since Eocene. Intermediate heatflow of 1.58 HFU average corresponds to age of 51 Ma)

Yang, Y., X Xie, Y. He & H. Chen (2024)- Opening and closure of the Sulu Sea: revealed by its peripheral subduction and collision processes. J. Marine Science and Engineering 12, 1456, p. 1-29.
(online at: <https://www.mdpi.com/2077-1312/12/8/1456>)
(Sulu Sea small marginal sea in W Pacific, in convergence of Eurasian, Pacific and India-Australian plates. NE Sulu Sea underwent Neogene extension and contraction due to subduction and collision along its N margin. SE Sulu Sea M Miocene extension from NW to SE, then subducted along SE margins of Sulu Sea. Different margins of Sulu Sea showed asynchronous subduction and collision processes. N margins of Sulu Sea three subduction-collision zones, from W to E: (1) Sabah-Nansha block collision in NE Borneo since E Miocene, (2) followed by

SW Palawan-Cagayan arc collision in SW Palawan Island since M Miocene, and (3) NW Palawan-Mindoro arc collision since Late Miocene with further oblique subduction of Philippine Sea Plate. SE margins two subduction zones: (1) SE Sulu Sea subducted S-ward beneath Celebes Sea since M Miocene, followed by (2) SE-ward subduction beneath Philippine Sea Plate since Pliocene)

IX.10. Tethyan terranes in India-Asia collision zone (Yunnan- Lhasa (Tibet), Tethyan Himalaya/ N India)

Relevance for Indonesia: many similarities of Late Triassic-Cretaceous “Tethyan” stratigraphies, faunas and tectonic events, from Tibet to Eastern Indonesia and New Guinea;

The Tibetan Plateau contains a record of opening and closing of the Paleotethys (Jinsha suture), Mesotethys (Bangong-Nujiang suture) and Neotethys (Indus-Yarlung Tsangpo suture) oceans. The area is generally better exposed, has been the subject of more modern geological studies, and is less affected by post-collisional break-up processes than Indonesia.

- Middle-Late Jurassic Spiti black shales from Tethyan Himalayas in North India-Nepal and S Tibet, representing the marine Jurassic North Gondwana- South Neotethys margin, with macrofossils (ammonites, belemnites, bivalve molluscs) that are remarkably similar to age-equivalent faunas from Roti-Timor, Sula islands, Misool, Birds Head and the Papuan Central Range.
- The Jurassic-Cretaceous intra-oceanic Kohistan-Ladakh island arc in NW Himalayas may continue into West Sumatra (Woylea Terranes?) and South Sumatra (Saling series of the Gumai Mountains?)
- The 1000s of km long Cretaceous Gangdese magmatic arc in Tibet, etc., representing Cretaceous subduction under the northern margin of the Neotethys, can be followed to West and South Sumatra and possibly further East?

This chapter IV.3 documents the complexities of the growth of the Tibet- Himalayan region, which was a highly complex process involving multiple Mesozoic- Early Cenozoic collisions of several Gondwana-derived terranes with the southern margin of Asia. The principal continental blocks were North and South Qiangtang, Lhasa and India. Multiple continental margin and intra-oceanic magmatic arcs mark episodes of subduction of various stages of the Tethyan Ocean complex, while multiple zones of highly deformed Ocean Plate Stratigraphy mark remnants of successive Paleotethys Mesotethys and Neotethys oceans that opened along the northern margin of Gondwana, as well as short-lived marginal basins.

The nature of rocks and fossils as well as the timing of arc magmatism, ophiolite obduction, etc. in the complex India-Asia collage are often reminiscent of the ‘Tethysides’ parts of Indonesia, i.e. the western, southern and eastern Sundaland margins from West Sumatra to SE Kalimantan and Sulawesi, and may thus serve as analogs for Tethyan Mesozoic accretions to Sundaland, which have been relatively difficult to unravel (much of which has been obscured by Cenozoic rifting, dispersals of Sundaland margin terranes like Sumba and ‘allochthonous’ Timor, and widespread arc magmatism), and hampered by a shortage of cutting-edge isotopic and biostratigraphic age constraints in Indonesia.

Aitchison, J.C., J.R. Ali & A.M. Davis (2007)- When and where did India and Asia collide? *J. of Geophysical Research: Solid Earth* 112, B5, B05423, p. 1-19.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2006JB004706>)

(Abrupt slowdown in rate of convergence between India and Asia around 55 Ma widely regarded as indicating beginning of collision, but new field evidence from Tibet and reassessment of published data suggest continent-continent collision began around Eocene-Oligocene boundary (~34 Ma). Older age relects collision of N Indian continental margin with intraoceanic island arc system in Paleocene)

Aitchison, J.C., Badengzhu, A.M. Davis, J. Liu, H. Luo, J.G. Malpas, I.R.C. McDermid, H. Wu, S.V. Ziabrev & M.F. Zhou (2000)- Remnants of a Cretaceous intra-oceanic subduction system within the Yarlung-Zangbo suture (southern Tibet). *Earth Planetary Science Letters* 183, 1-2, p. 231-244.

(Investigations along Yarlung-Zangbo suture zone in S Tibet reveal presence of now fragmented remnants of S-facing (=N-dipping) intra-oceanic subduction system, which developed in Tethys in Cretaceous. Associated arc, forearc ophiolite and subduction complex were emplaced onto leading edge of India at end of Cretaceous)

Aitchison, J.C. & A.M. Davis (2004)- Evidence for the multiphase nature of the India-Asia collision from the Yarlung Tsangpo suture zone, Tibet. In: J. Malpas et al. (eds.) *Aspects of the tectonic evolution of China*, Geological Society, London, Special Publ. 226, p. 217-234.

(online at: https://www.researchgate.net/publication/236002188_Evidence_for_the_multiphase_nature_of_the_India-Asia_collision_from_the_Yarlung_Tsangpo_suture_zone_Tibet)
(India-Asia collision complicated, with earliest Eocene arc-continent collision along N edge of India, and main continent-continent collision at or after mid-Oligocene)

Aitchison, J.C., A.M. Davis, A.V. Abrajevich, J.R. Ali, Badengzhu, J. Liu, H. Luo, I.R.C. McDermid & S.Y. Zhiabrev (2003)- Stratigraphic and sedimentological constraints on the age and tectonic evolution of the Neotethyan ophiolites along the Yarlung Tsangpo suture zone, Tibet. In: Y. Dilek & P.T. Robinson (eds.) *Ophiolites in Earth history*, Geological Society, London Special Publ. 218, p. 147-164.

(online at: https://www.researchgate.net/publication/234047155_Stratigraphic_and_sedimentological_constraints_on_the_age_and_tectonic_evolution_of_the_Neotethyan_ophiolites_along_the_Yarlung_Tsangpo_suture_zone_Tibet)
(Ophiolitic rocks along Yarlung-Tsangpo suture in S Tibet remnants of many 1000s of km of now-subducted Neotethys ocean between India and Eurasia (Lhasa terrane). Portions of M Jurassic and M Cretaceous intra-oceanic island arcs recognized. Ophiolitic massifs along suture thrust S-wards post-Eocene onto N India margin. Oldest oceanic sediments above one ophiolite = Barremian age. Late Jurassic- E Cretaceous? ocean-floor development)

Aitchison, J.C., I.R.C. McDermid, J.R. Ali, A.M. Davis & S.Y. Zhiabrev (2007)- Shoshonites in Southern Tibet record Late Jurassic rifting of a Tethyan intraoceanic island arc. *Journal of Geology* 115, 2, p. 197-213.

(online at: www.researchgate.net/publication/234040142_Shoshonites_in_Southern_Tibet_Record_Late_Etc)
(Zedong terrane in Yarlung Tsangpo suture dominated by Late Jurassic shoshonitic volcanic rocks, formed in oceanic volcanic island arc setting, built on a basement of oceanic crust. Shoshonites overlie pillowed island arc tholeiites with red ribbon-bedded radiolarian cherts, with radiolaria of late M Jurassic (Bathonian- lower Callovian) age)

An, W., X. Hu & E. Garzanti (2018)- Discovery of Upper Cretaceous Neo-Tethyan trench deposits in south Tibet (Luogangcuo Formation). *Lithosphere* 10, 3, p. 446-459.

(online at: <https://pubs.geoscienceworld.org/gsa/lithosphere/article/10/3/446/529823/Discovery-of-Upper-Cretaceous-Neo-Tethyan-trench>)

(U Cretaceous (~88-81 Ma) Luogangcuo Fm in Xiukang Neotethys melange in S Tibet deposited in trench environment on a deep-sea fan fed from Lhasa block through submarine canyon. Chert and subordinate sandstone and limestone clasts in conglomerate beds indicate recycling from Neo-Tethyan subduction complex during episodes of gravitational failure. Turbiditic sandstones sourced from Gangdese magmatic arc and central Lhasa terrane. Detrital volumes from active Asian margin increased markedly at ~88 Ma as result of uplift of C Lhasa, leading to deltaic progradation, filling of Xigaze forearc basin, and bypassing of sediments funneled via canyons across subduction complex to reach Luogangcuo trench basin at abyssal depths)

An, X., H. Xu, K. He, L. Xia, Y. Du, J. Ding, T. Yuan, G. Liu & H. Zheng (2023)- Onset of the late Paleozoic glaciation in the Lhasa terrane, Southern Tibet. *Global and Planetary Change* 225, 104139, p.

(Basal glacial deposits in Xainza area of Lhasa terrane, S Tibet, with conodonts in carbonate above basal glacial bed. Presence of *Declinognathodus intermedius* indicates initiation of Late Paleozoic glaciation in Lhasa terrane in Bashkirian time (Late Carboniferous). Ice movement direction suggested by imbricated megaclasts from NNE to SSW, suggesting Bashkirian glaciation in Lhasa terrane was separate from mainland Australia (?))

Andjic, G., R. Zhou, T.N. Jonell & J.C. Aitchison (2022)- A single Dras-Kohistan-Ladakh Arc revealed by volcanoclastic records. *Geochem. Geophysics Geosystems* 23I, 3, e2021GC010042, p. 1-22.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021GC010042>)
(Provenance data from deep-water volcanoclastic rocks of Indus Suture Zone in Ladakh provide new constraints on Mesozoic tectonic evolution of Dras and Kohistan-Ladakh arcs, which show similar detrital zircon age distributions. Most likely scenario is Jurassic arc formed above a S-dipping intra-oceanic (Neotethys) subduction zone, which accreted to Eurasia in E Cretaceous, after which it evolved above a N-dipping subduction zone)

Audley-Charles, M. (1984)- Cold Gondwana, warm Tethys and the Tibetan Lhasa block. *Nature* 310, p. 465-466.

Bai, J.W., J.J. Fan, Y.J. Hao, B.C. Zhang & S.L. Sun (2024)- Late Jurassic–Early Cretaceous Rebangco ophiolite, Tibet: constraints on the Meso-Tethys Ocean tectonic evolution. *J. Asian Earth Sciences* 268, 106173, p.

(Age of cumulate gabbro in Rebangco ophiolite in Shiquanhe-Namco-Jiali Ophiolite in C Tibet ~ 152 Ma (Late Jurassic; zircons). Zircon U-Pb age of diabase intrusion in Rebangco ophiolite ~122 Ma (~Barremian-Aptian). Rebangco ophiolite may have formed in oceanic back-arc basin setting (reflect S-ward subduction of Mesotethys under N margin of Lhasa Block)

Baxter, A.T., J.C. Aitchison, J.R. Ali, J. Sik-Lap Chan & G.H.N. Chan (2016)- Detrital chrome spinel evidence for a Neotethyan intra-oceanic island arc collision with India in the Paleocene. *J. Asian Earth Sciences* 128, p. 90-104.

(online at: https://www.researchgate.net/publication/307963849_Detrital_chrome_spinel_evidence_for_a_Neotethyan_intra-oceanic_island_arc_collision_with_India_in_the_Paleocene)

(Intra-oceanic island arc (IOIA) existed within Neotethys Ocean before India-Eurasia collision (Since ~E-M Jurassic? through Cretaceous). E Cretaceous rifting of IOIA caused slab rollback, with formation of ophiolites. Detrital chrome spinels from S Tibet (Sangdanlin) and NW India (Ladakh) similar geochemical values and with supra-subduction zone, forearc peridotite signature, and also overlapping with chrome spinels from Spongtag Ophiolite in NW India and Sangsang Ophiolite in S Tibet (which formed in IOIA setting). This is strong evidence for emplacement of IOIA onto Indian margin, at end-Paleocene (Thanetian) in S Tibet and E Eocene in NW India (= also maximum age of India-Eurasia intercontinental collision)

Baxter, A.T., J.C. Aitchison, J.R. Ali & S.V. Zyabrev (2010)- Early Cretaceous radiolarians from the Spongtag massif, Ladakh, NW India: implications for Neo-Tethyan evolution. *J. Geological Society, London*, 167, p. 511-517.

(online at: https://www.researchgate.net/publication/234038898_Early_Cretaceous_radiolarians_from_the_Spongtag_massif_Ladakh_NW_India_implications_for_Neo-Tethyan_evolution)

(Discovery of E Cretaceous (mid-Valanginian- mid-Aptian) radiolaria from ribbon-bedded cherts in Spongtag massif, a relict of Neotethyan suprasubduction-zone ophiolitic rocks and related arc volcanics, 30 km S of Indus suture in Ladakh, NW India. Provide new constraints on evolution of Neotethyan intra-oceanic island arc system, which was long-lived (Jurassic- Cretaceous; 165-85 Ma) and more continuous than commonly considered)

Baxter, A.T., J.C. Aitchison & S.V. Zyabrev (2009)- Radiolarian age constraints on Mesotethyan Ocean evolution, and their implications for development of the Bangong-Nujiang suture, Tibet. *J. Geological Society, London*, 166, 4, p. 689-694.

(online at: https://www.researchgate.net/publication/234817865_Radiolarian_age_constraints_on_Mesotethyan_ocean_evolution_and_their_implications_for_development_of_the_Bangong-Nujiang_suture_Tibet)

(Radiolarian-bearing deep-marine chert or siliceous mudstone blocks in Lagkor Tso ophiolitic melange in Bangong-Nujiang suture, C Tibet, range in age from early M Jurassic- E Cretaceous (late Hauterivian- E Aptian; 131-121 Ma). Closure of Mesotethys between Qiangtang and Lhasa terranes accompanied by melange formation and followed by widespread deposition of shallow-marine late Aptian-Albian orbitolinid limestones)

Bhat, I.M. & T. Ahmad (2021)- Evolution of the Ladakh magmatic arc. *J. Geological Society India* 97, p. 980-984.

(online at: https://www.researchgate.net/publication/354408191_Evolution_of_the_Ladakh_Magmatic_Arc)

((Kohistan-)Ladakh magmatic arc~160 Ma history from Neotethys subduction initiation to intra-oceanic arc collision to final continent-continent collision. Compositional of Ladakh magmatic arc reflects directional maturity from mafic magmatism to S to more acidic magmatism towards N, indicating N dipping subduction. Three distinct time periods; (1) 160 -80 Ma (Late Jurassic- Cretaceous) intra-oceanic island arc complex with mainly mafic magmatism, (2) 80- 50 Ma, magmatism shifts to felsic composition, involving Indian continental margin (Kohistan-Ladakh batholit) and 3) 35- 18 Ma, post-collisional dykes. First collision between intra-

oceanic arc and S margin of Asia during mid-late-Cretaceous along Shyok Suture Zone. Accreted IOIA + Asian plate margin collided with N margin of Indian plate in Late Eocene ~40 Ma along Indus Suture)

Bhat, I.M., H. Chauhan, R.A. Dar & T. Ahmad (2023)- Ladakh Himalayan Ophiolites (LHO): a geological heritage of Northwestern India. *Geoheritage* 15, 1, p. 1-17.

(online at: https://www.researchgate.net/publication/366127564_Ladakh_Himalayan_Ophiolites_LHO_A_Geological_Heritage_of_Northwestern_India)

(Ladakh Himalayan Ophiolites remnants of E part of Neo-Tethys Ocean, obducted discontinuously along Indus Suture Zone and incorporated on Indian continental margin, in Ladakh region, along S margin of Dras magmatic arc complex: (1) Dras-Thasgam-Suru Valley-Shergol dismembered ophiolitic slices and (2) Nidar-Spongtag ophiolitic complexes (and to E, also Xigaze ophiolite of Tibet, etc.)

Cao, Y., Q. Xu, X. Tan & S. Kershaw (2025)- Regional unconformities dating closure of the Paleo-Tethys Ocean in the late Anisian (Middle Triassic). *Geological Society of America (GSA) Bull.* 137, 7-8, p. 3495-3511.

(online at: https://www.researchgate.net/publication/389731456_Regional_unconformities_dating_closure_of_the_Paleo-Tethys_Ocean_in_the_late_Anisian_Middle_Triassic)

(Regional Kaixinling unconformity in N Qiangtang terrane 243–239 Ma spans Anisian-Ladinian. Detrital zircons peak ages above and below of 256 Ma and 302 Ma, indicating provenance mainly from northern magmatic arc. Unconformity marks transition from Jinshajiang oceanic subduction-related retroarc foreland basin to collision-related intracontinental foreland basin in North Qiangtang, thus, marking closure of Jinshajiang Ocean at 243 Ma. Diachronous suturing of Paleotethys Ocean branches from Ailaoshan Ocean in E in Triassic to Jinshajiang Ocean in M Triassic)

Catlos, E.J., E.C. Pease, M. Brookfield, R. Bhutani, K. Pande & A.K. Schmitt (2018)- Nature, age and emplacement of the Spongtag ophiolite, Ladakh, NW India. *J. Geological Society, London*, 176, p. 284-305.

(online at: <https://www.lyellcollection.org/doi/epub/10.1144/jgs2018-085>)

(Spongtag ophiolite (Ladakh, NW India) formed within mid-ocean ridge-type spreading centre in Neotethyan Ocean, possibly from Late Triassic to Jurassic. By E Cretaceous, ridge experienced increasing influence of subduction beneath Spongtag oceanic lithosphere owing to subduction polarity reversal. Latest obduction occurred between ~64.3 and 43 Ma, in accordance with 56.7 ± 5.2 Ma whole-rock $^{40}\text{Ar}/^{39}\text{Ar}$ ages)

Chatterjee, S. & S. Bajpai (2016)- India's northward drift from Gondwana to Asia during the Late Cretaceous-Eocene. *Proc. Indian National Science Academy* 82, 3, Special Issue, p. 479-487.

(online at: <https://insajournals.in/insaj/index.php/proceedings/article/view/225/125>)

(Brief version of Chatterjee et al. 2017)

Chatterjee, S., C.R. Scotese & S. Bajpai (2017)- The restless Indian plate and its epic voyage from Gondwana to Asia: its tectonic, paleoclimatic, and paleobiogeographic evolution. *Geological Society of America (GSA), Special Paper* 529, p. 1-147.

(Review of tectonic evolution of India plate since breakup of Gondwana in Late Jurassic, partial isolation in E Cretaceous, collision with Kohistan-Ladakh arc at ~80 Ma (= continuation of Woyla Arc of W Sumatra?), Cretaceous- Paleogene boundary Shiva impact and Deccan volcanism. In Late Cretaceous (~67 Ma), Indian plate motion acceleration between two transform faults that facilitated N-ward movement, etc.)

Chen, D., H. Luo, X. Wang, Bo Xu & A. Matsuoka (2019)- Late Anisian radiolarian assemblages from the Yarlung-Tsangpo suture zone in the Jinlu area, Zedong, southern Tibet: implications for the evolution of Neotethys. *Island Arc* 28, 4, e12302, p.

(Abundant M Triassic radiolaria from bedded cherts exposed in melange complex of E part of Yarlung-Tsangpo suture zone. S Tibet, representing fragmented remnants of Neotethys oceanic sediments, and oldest radiolarian record reported from within Yarlung-Tsangpo Suture Zone. Two new middle Late Anisian radiolarian assemblages (Oertlispongos inaequispinosus and Triassocampe deweveri))

Chen, Y., Z. Zhang, R.M. Palin, Z. Tian, H. Xiang, X. Dong, H. Ding, S. Qin & Y. Li (2021)- Late Triassic orogenic assembly of the Tibetan Plateau: constraints from magmatism and metamorphism in the East Lhasa Terrane. *Journal of Petrology* 62, 6, egab032, p. 1-23.

(online at: <https://academic.oup.com/petrology/article/62/6/egab032/6218777>)

(Zircon U-Pb dating of cogenetic peraluminous S-type granites and metamorphic rocks (gneiss and schist) from the Motuo-Bomi-Chayu region of E Lhasa terrane record Late Triassic magmatic (216-206 Ma) and metamorphic (209-198 Ma) episodes. Granites derived from a Paleoproterozoic crustal source and formed by crustal anatexis of metasediments during collisional orogeny and crustal thickening. Rocks were buried to lower-crustal depths, then exhumed to surface in collisional orogenic setting. Records Late Triassic (~Norian) collision between N and S Lhasa terranes, and closure of Paleotethys Ocean in this part of Asia)

Chen, Z.Y., P. Mannik, C.Y. Wang, X. Fang, T.E. Chen, X. Ma & Z.D. Zhang (2020)- Silurian conodont biostratigraphy of the Laojianshan section, Baoshan, Yunnan Province, SW China. *Geological Journal (China)* 55, 9, 6427e6441, p.

(Open marine Silurian conodonts from Baoshan, Yunnan (Sibumasu terrane)

Cheng, J., Y. Li, X. Li, S. Xiao, S. Li; W. Bi, Z. He; X. Ma, Z. Li & R. Zhou (2024)- Radiolarian-based stratigraphic reconstruction along the western Yarlung-Tsangpo suture zone, southern Tibet, and its implication for Neo-Tethyan late-stage evolution. *Geological Society of America (GSA) Bull.* 137, 3-4, p. 961-985.

(Late Jurassic- E Cretaceous and Late Paleocene radiolarian assemblages identified in Jiangmuna melange and adjacent Tethyan Himalayan sediments along W Yarlung-Tsangpo suture in S Tibet. Jiangmuna melange represents E Jurassic-Late Cretaceous ocean plate materials originally accumulated in different parts of Neo-Tethyan domain, which subducted N-ward beneath Zhongba microterranes during Late Cretaceous. Radiolarian assemblages showing that deep-water sedimentation persisted along N margin of Indian plate until at least Late Paleocene. Neo-Tethys Ocean existed at least from E Jurassic to Late Paleocene. Neotethyan closing in two subduction-accretion systems along S margins of Lhasa block and Zhongba microterranes, prior to two-stage India-Eurasia collision)

Cheng, X., B. Wei, N. Jiang, Y. Zhou, V.A. Kravchinsky, Q. Chen, I. Xing, D. Zhang, T. Li et al. (2023)- Evolution of the North Qiangtang Block in the late Paleozoic: Paleomagnetism and its tectonic implications. *Geological Society of America (GSA) Bull.* 136, 1-2, p. 707-724.

(online at: https://www.researchgate.net/publication/371997783_Evolution_of_the_North_Qiangtang_Block_in_the_late_Paleozoic_Paleomagnetism_and_its_tectonic_implications)

(Paleomagnetic results from M Permian limestones and U Permian volcanics of N Qiangtang Block in central Tibet suggest block was located at ~24°S for long time before M Permian, started to drift rapidly N in M Permian, and reached ~8.4°S in Late Permian. NQB continued rapid N drift during Triassic until merging with S margin of Eurasia in Late Triassic. NQB likely ribbon-like continental archipelago within Paleo-Tethys Ocean during early-late Paleozoic. Cimmerian continent (incl. S Qiangtang Block) rifted away from N Gondwana and drifted N to ~22°S in M Permian, then collided with NQB, resulting in rapid N-ward movement of NQB and formation of Longmuco-Shuanghu suture between NQB and SQB)

Chung, S.L., M.F. Chu, Y. Zhang, Y. Xie, C.H. Lo, T.Y. Lee, C.Y. Lan, X. Li, Q. Zhang & Y. Wang (2005)- Tibetan tectonic evolution inferred from spatial and temporal variations in post-collisional magmatism. *Earth-Science Reviews* 68, p. 173-196.

(online at: https://www.academia.edu/12522174/Tibetan_tectonic_evolution_inferred_from_spatial_and_temporal_variations_in_post_collisional_magmatism)

(India-Asia collision started in E Tertiary, terminating Gangdese arc magmatism in Lhasa terrane. After collision, widespread potassium-rich lavas and subordinate sodium-rich basalts from 50-30 Ma in Qiangtang terrane of N Tibet. Subsequent post-collisional magmatism migrated S-wards, producing ultrapotassic and adakitic lavas between ~26 and 10 Ma in Lhasa terrane. Potassic volcanism renewed to N and become extensive and semicontinuous since ~13 Ma in W Qiangtang and Songpan-Ganze terranes. Suggested geodynamic evolution model includes rollback and breakoff of subducted Neo-Tethyan slab, followed by removal of thickened Lhasa lithospheric root (at ~26 Ma))

Cui, X., H. Luo, J.C. Aitchison & Xin Li (2021)- Middle Jurassic radiolarians and chert geochemistry, Dajiweng ophiolite, SW Tibet: Implications for Neotethyan Ocean evolution. *J. Asian Earth Sciences* 221, 104947, p.
(*Well-preserved, diverse M Jurassic (U Bajocian- Lower Bathonian) radiolarian assemblages from bedded cherts associated with basalts of Dajiweng ophiolite in N sub-belt of Neotethyan W Yarlung-Tsangpo suture zone (oldest known radiolaria from this setting)*).

Cui, X., H. Luo, J.C. Aitchison, Xin Li & P. Fang (2021)- Early Cretaceous radiolarians and chert geochemistry from western Yarlung Tsangpo suture zone in Jiangyema section, Purang county, SW Tibet. *Cretaceous Research* 125, 104840, p.
(*E Cretaceous radiolarians from bedded chert in W Yarlung Tsangpo suture zone in Jiangyema section, SW Tibet. Two radiolarian zones: Cecrops septemporatus zone and Aurisaturnalis carinatus zone (Hauterivian-Barremian). Represent pelagic part of Neotethyan Ocean floor that subducted beneath supra-subduction zone (SSZ) ophiolites W part of YTSZ (= Indian Plate- Eurasia collision zone (see also Zhong et al., 2017))*

Cui, X., Y. Zhang, X. Li, J.C. Aitchison, M.Fu Zhou, Q. Zeng, Q. Ren & H.Luo (2025)- Upper Jurassic radiolarian assemblages and chert geochemistry of the Shiquanhe ophiolite, NW Tibet: Implications for the evolution of the Meso-Tethyan ocean. *Gondwana Research* 143, p. 166-184.
(*U Jurassic (Tithonian) radiolarian assemblages from bedded cherts in Shiquanhe ophiolite in W Shiquanhe-Namuco ophiolitic melange zone in Bangong-Nujiang Suture Zone (Mesotethys suture). Highly diverse, with 83 species/51 genera. Cherts suggest deposition in mature oceanic basin, close to continental margin*)

Cui, Y., Y. Wang, R. Zhou, Y. Wang, T. Ubide, X. Qian, C. Wang & X. Wang (2024)- Spatio-temporal evolution of the Paleo-Tethys in western Yunnan: Insights from mafic rocks in the Lancang tectonic belt. *Lithos* 488-489, 107830, p.
(*Sanjiang orogenic belt in SE Tibetan Plateau provides record of the Paleotethys tectonic evolution (northern extension of Sukhotai terrane, between Sibumasu(Baoshan) and Simao blocks. Carboniferous-Permian E-dipping Paleotethys subduction feeds Lincang Arc 252-200 Ma Triassic magmatism). Permian backarc basin forming between Lincang Arc and Simao. Etc.)*

Dai, J., C. Wang, J. Hourigan, Z. Li & G. Zhuang (2013)- Exhumation history of the Gangdese Batholith, Southern Tibetan Plateau: evidence from apatite and zircon (U-Th)/He thermochronology. *Journal of Geology* 121, 2, p. 155-172.
(online at: https://www.researchgate.net/publication/236020401_Exhumation_History_of_the_Gangdese_Batholith_Southern_Tibetan_Plateau_Evidence_from_Apatite_and_Zircon_U-ThHe_Thermochronology)
(*Apatite and zircon thermochronology suggests exhumation of Gangdese Batholith in three periods of accelerated exhumation: (1) ~140-46 Ma; slow, Cretaceous- Eocene, tied to both N-ward subduction of Neo-Tethys and collision between Lhasa and Qiangtang blocks; (2) ~22-18 Ma; dynamic uplift following lithospheric delamination of Gangdese Thrust; (3) ~11-8 Ma; rapid exhumation, tied to incision of Yarlung Zangbo gorge or N-S normal faulting (??)*)

Dai, J., C. Wang & Z. Li (2012)- Relicts of the Early Cretaceous seamounts in the central-western Yarlung Zangbo Suture Zone, southern Tibet. *J. Asian Earth Sciences* 53, p. 25-37.
(*Zhongba mafic rocks in W part of YZSZ dated at ~126 Ma. Interpreted as parts of seamounts within Neo-Tethys during E Cretaceous (late-stage magmatic activity above intra-oceanic supra-subduction zone in Neo-Tethys)*

Dai, Z., Z. Yang, G. Li, Y. Xie, L. Dong, K. Gao & H. Cao (2023)- Partial melting of amphibolitic lower crust and subsequent melt-crystal separation for generation of the Early Eocene magmatism in eastern Himalaya. *Frontiers in Earth Science* 10.1104197, p. 1-22
(online at: <https://www.frontiersin.org/articles/10.3389/feart.2022.1104197/full>)
(*In southern Qinghai-Tibet Plateau, S of Lhasa Terrane, Liemai two-mica granite generated at ~ 43 Ma (M Eocene), similar to adjacent Yardoi, Dala and Quedang adakitic two-mica granites, etc. (part of 2000km long ~E Eocene E-W leucogranite belt). Underplating of basaltic magmas triggered by slab breakoff of Neo-Tethyan oceanic lithosphere most possible mechanism to induce partial melting of thickened (~50 km) amphibolitic lower crust in Himalaya orogen to generate granites with adakitic signatures)*

Deng, J., Q. Wang, G. Li, C. Li & C. Wang (2013)- Tethys tectonic evolution and its bearing on the distribution of important mineral deposits in the Sanjiang region, SW China. *Gondwana Research* 26, p. 419-437.

(online at: http://www.cugb.edu.cn/uploadCms/file/20600/papers_upload/20141011142419767420.pdf)

(Sanjiang region in SE Tibet Plateau and NW Yunnan formed by amalgamation of Gondwana-derived continental blocks and arc terranes from Paleozoic-Mesozoic. E Paleozoic ophiolites (473-439 Ma) in Changning-Menglian belt indicate existence of Proto-Tethys ocean. Proto-Tethys succeeded in E Devonian by Paleo-Tethys. Changning-Menglian main ocean existed from M Devonian- M-Triassic. E-ward subduction of oceanic plate from E Permian to E Triassic formed >1500 km arc terrane from Yunnan to E Tibet. Numerous Late Triassic S-type granite plutons (230-219 Ma), produced W-Sn deposits. E-ward oceanic subduction of Mesotethys (Late Permian- M Cretaceous) produced E Cretaceous granitoids with skarn-type Pb-Zn and Sn-Fe deposits in Baoshan and Tengchong blocks. Neo-Tethys subduction (Late Cretaceous~50 Ma) beneath Tengchong block formed S-type granitoids with skarn-type and greisen-type Sn-W deposits. Etc.)

Dewey, J.F., R. M. Shackleton & Y. Sun (1988)- The tectonic evolution of the Tibetan Plateau. *Philosophical Transactions Royal Society London, A*, 327, 1594, p. 379-413.

(Tibetan Plateau consists of terranes accreted successively to Eurasia. From N to S: (1) Songban Ganzi Terrane, accreted to the Kunlun (Tarim-North China Terrane) along Kunlun-Qinling Suture during late Permian; (2) Qiangtang, accreted to Songban-Ganzi along Jinsha Suture in late Triassic-earliest Jurassic, (3) Lhasa Terrane to Qiangtang along Banggong Suture in late Jurassic and (4) Peninsular India to Lhasa Terrane along Zangbo Suture in M Eocene. Terranes 2-4 underlain by Precambrian continental crust at least one billion years old. Qiangtang and Lhasa came from Gondwanaland. Substantial S-ward ophiolite obduction across Lhasa Terrane from Banggong Suture in late Jurassic and from Zangbo Suture in latest Cretaceous-earliest Paleocene. Paleomagnetic data suggest successive wide Paleotethyan oceans during late Paleozoic and E Mesozoic, and Neotethys which was at least 6000 km wide during M Cretaceous. Thickening of Tibetan crust to almost double the normal thickness occurred by N-migrating N-S shortening and vertical stretching during M-Eocene to earliest Miocene indentation of Asia by India; Neogene strata almost flat-lying. Etc.)

Ding, L., P. Kapp & X.Wan (2005)- Paleocene-Eocene record of ophiolite obduction and initial India-Asia collision, south central Tibet. *Tectonics* 24, 3, TC3001, p. 1-18.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2004TC001729>)

Duan, L., Q.R. Meng, N. Christie-Blick & G.L. Wu (2017)- New insights on the Triassic tectonic development of South China from the detrital zircon provenance of Nanpanjiang turbidites. *Geological Society of America (GSA) Bull.*, p. 1-11.

(Triassic turbidites of Nanpanjiang basin reflect collision between S China and Indochina blocks. Turbidite system filled primarily from E to W. U-Pb ages and Hf isotope data for detrital zircons from M Triassic turbidites suggest provenance not from collisional orogen, but from poorly preserved arc at convergent plate boundary of S China. Zircon ages clusters: ~250-300 Ma, 350-400 Ma, 400-550 Ma, 900-1050 Ma and ~1600-1950 Ma. Andean-type (Paleo-Pacific subduction) Cathaysian margin of S China probable source for much of sediment of S China block. New model for Triassic tectonic evolution of S China)

Duan, L., Q.R. Meng, G.L. Wu & S.X. Ma (2012)- Detrital zircon evidence for the linkage of the South China block with Gondwanaland in early Palaeozoic time. *Geological Magazine* 149, 6, p. 1124-1131.

(Detrital zircons from Lower Devonian sections in S China block dominant Grenvillian and Pan-African populations, similar to E Paleozoic from Gondwana, Tethyan Himalaya and WAustralia. Hf isotopes indicate contributions of juvenile crust at 1.6 Ga and 2.5 Ga. S China block was integral part of E Gondwana in E Paleozoic, not continental block in Paleo-Pacific or fragment of Laurentia)

Dupont-Nivet, G., S. Dai, X. Fang, W. Krijgsman, V. Erens, M. Reitsma & C.G. Langereis (2008)- Timing and distribution of tectonic rotations in the northeastern Tibetan Plateau. In: B.C. Burchfiel & E. Wang (eds.) *Investigations into the tectonics of the Tibetan Plateau*, Geological Society of America (GSA), Special Paper 444, p. 73-87.

(online at: https://www.researchgate.net/publication/46705664_Timing_and_distribution_of_tectonic_rotations_in_the_northeastern_Tibetan_Plateau)

(Paleomagnetic data from Xining Basin at NE margin of Tibetan Plateau show ~25° of CW rotation relative to stable Eurasian continent at ~41 Ma (late M Eocene), establishing existence of widespread deformation at this time. Also Mid-Miocene phase of CW rotations, between 17 and 11 Ma)

Dupont-Nivet, G., W. Krijgsman, C.G. Langereis, H.A. Abels, S. Dai & X. Fang (2007)- Tibetan plateau aridification linked to global cooling at the Eocene-Oligocene transition. *Nature* 445, 7128, p. 635-638.

(online at: https://www.researchgate.net/publication/6516636_Tibetan_Plateau_aridification_linked_to_global_cooling_at_the_Eocene-Oligocene_transition)

(Continental aridification and intensification of monsoons in Asia often attributed to Tibetan plateau uplift and land-sea redistributions associated with India-Asia collision. Eocene-Oligocene transition is abrupt cooling step associated with onset of glaciation in Antarctica at 34 Ma. Magnetostratigraphy and cyclostratigraphy show aridification (palynology and disappearance of playa lake deposits in Xining, NE Tibetan plateau) precisely at time of Eocene-Oligocene transition, suggesting aridification and cooling in continental Asia as recorded by paleontological (palynology, mammals sizes) and palaeoenvironmental changes is associated with the Eocene-Oligocene transition)

Fan, J.J., C. Li, M. Wang, Y.M. Liu & C.M. Xie (2017)- Remnants of a Late Triassic ocean island in the Gufeng area, northern Tibet: implications for the opening and early evolution of the Bangong-Nujiang Tethyan Ocean. *J. Asian Earth Sciences* 135, p. 35-50.

(Late Triassic Gufeng ocean island (basaltic basement with Norian oceanic cover sequence) formed within Bangong-Nujiang Tethyan Ocean (Mesotethys) suggesting western BNTD developed as mature ocean by Late Triassic (227-209 Ma))

Fan, J.J., C. Li, M. Wang, C.M. Xie & W. Xu (2015)- Features, provenance, and tectonic significance of Carboniferous- Permian glacial marine diamictites in the Southern Qiangtang-Baoshan block, Tibetan Plateau. *Gondwana Research* 28, 4, p. 1530-1542.

(Edge of S Qiangtang- Baoshan block, Tibetan Plateau, with glacial marine diamictite in Gangmaco-Dabure area. Four distinct Carboniferous- E Permian glacial cycles. Gravel assemblages of diamictites similar to rock assemblages of Indian Gondwana basement. Detrital zircons from matrix of glacial marine diamictite similar between S Qiangtang-Baoshan block, Lhasa block, Tethys Himalaya and India-Nepal areas, with peak ages mainly at 576, 788, 1026, 1512 and 2518 Ma. Provenance of diamictite Indian Gondwana. Diamictites deposited on passive continental margin)

Fan, J.J., C. Li, M. Wang, C.M. Xie, Y.M. Liu, J.X. Xu & J.W. Chen (2016)- Remnants of late Permian–Middle Triassic ocean islands in northern Tibet: implications for the late-stage evolution of the Paleo-Tethys Ocean. *Gondwana Research* 44, 4, p. 7-21.

(open manuscript online at: <https://www.sciencedirect.com/science/article/am/pii/S1342937X1630418X>)

(Newly discovered Tianquan(TQ) and Dabure (DB) fragments of ocean islands in W segment of Longmuco-Shuanghu-Lancangjiang suture zone between N and S Qiangtang blocks, N Tibet, are typical seamounts in Paleotethys ocean basin. Basalts-andesites of TQ with zircons with U-Pb ages of 246-254 Ma (late Permian- E Triassic); DB zircon ages 242-246 Ma (M Triassic). Youngest ages of ophiolites in suture zone E Permian. LSLSZ ocean basin closed in Triassic (debated whether Middle or, more likely, early Late Triassic; possibly diachronous along 2800km length in China)

Fan, J.J., Y. Niu, Y.M. Liu & Y.J. Hao (2021)- Timing of closure of the Meso-Tethys Ocean: Constraints from remnants of a 141-135 Ma ocean island within the Bangong-Nujiang Suture zone, Tibetan Plateau. *Geological Society of America (GSA) Bull.* 133, 9-10, p. 1875-1889.

(online at: www.researchgate.net/publication/348229723_Timing_of_closure_of_the_Meso-Tethys_Ocean_Constraints_from_remnants_of_a_141-135_Ma_ocean_island_within_the_Bangong-Nujiang_Suture_Etc.)

(Zhonggang igneous-sedimentary rocks in middle segment of Bangong-Nujiang (S Qiantang- Lhasa) suture zone remnants of E Cretaceous (141-135 Ma; ~Valanginian) oceanic island arc within Meso-Tethys Ocean. Thick ocean island basalt basement (>2 km), covered by limestone interbedded with basalt and tuff, trachyandesite,

chert, and poorly sorted limestone and basalt conglomerate. Terrigenous detritus absent. Typical exotic blocks-in-matrix structure between Zhonggang igneous-sedimentary rocks and surrounding flysch deposits)

Fan, J.J., Y. Niu, A.B. Luo, C.M. Xie, Y.J. Hao & Hai-Yong Liu (2021)- Timing of the Meso-Tethys Ocean opening: Evidence from Permian sedimentary provenance changes in the South Qiangtang Terrane, Tibetan Plateau. *Palaeogeogr. Palaeoclim. Palaeoecology* 567, 110265, p. 1-11. (manuscript online at: https://www.researchgate.net/publication/348778988_Timing_of_the_Meso-Tethys_Ocean_opening_Ev_Etc.) (Meso-Tethys Ocean represented by Bangong-Nujiang Suture on C Tibetan Plateau. Qiangtang Terrane to N with carbonate-dominated Permian section and with significant change in sedimentary provenance at 280-260 Ma, possibly reflecting 300-279 Ma early rift magmatism at N India margin. Subsequent 280-260 Ma provenance change interpreted as later rift stage, together establishing complete E-M Permian (300-260 Ma) rifting process that marks opening of Mesotethys Ocean)

Fan, J.J., B.C. Zhang, Y. Niu, A.B. Luo & Y.J. Hao (2023)- Tracing the sedimentary response to the rifting and opening of the Meso-Tethys Ocean. *Sedimentology* 71, 1, p. 1-22. (online at: https://www.researchgate.net/publication/348778988_Timing_of_the_Meso-Tethys_Ocean_opening_Ev_Etc.) (Carboniferous-Permian stratigraphy in W Lhasa Terrane (Tibetan Plateau), indicates deposition at stable passive margin of N Gondwana in 300-273 Ma (~ E Permian Lagar (with glacial marine diamictites) and Anjie Fms;). However, in 273-252 Ma (M-L Permian Xiala Fm; with fusulinid limestones and *Ipciphyllum* near top) deposition in active margin? setting with intense magmatic activity (zircon age paks ~265-272 Ma). Similar E-M Permian changes in depositional setting also identified in S Qiangtang, Baoshan and Oman. These widespread changes at E-M Permian boundary, with rift-related pyroclastic magmatism, represent continental rifting-ocean opening associated with diachronous opening of Mesotethys Ocean (Tibet: Bangong-Nujiang Suture))

Fan, J.J., B.C. Zhang, Y. Niu, A.B. Luo & Y.J. Hao (2023)- Resolving the nature and evolution of the Bangong-Nujiang Tethyan Ocean: New perspectives from the intraplate oceanic-island fragments preserved in Northern Tibet. *Geological Society of America (GSA) Bull.* 136, 3-4, p. 1379-1394. (online at: https://www.researchgate.net/publication/372960084_Resolving_the_nature_and_evolution_of_the_Bangong-Nujiang_Tethyan_Ocean_New_perspectives_from_the_intraplate_oceanic-island_fragments_Etc.) (Nature and tectonic evolution of Bangong-Nujiang Tethyan Ocean (= Mesotethys; JTvG) remain unresolved. Five intraplate oceanic island fragments preserved in Bangong-Nujiang Suture Zone of N Tibet. (1) Oldest is of Late Permian- Triassic age, with underlying oceanic lithosphere of Late Permian or older age, indicating time of early development of BNTO basin. (2) four Triassic intraplate oceanic-island fragments of oceanic-island basalts erupted onto thick mature oceanic lithosphere; (3) Late Jurassic-E Cretaceous ages. Provide evidence that BNTO was broad oceanic basin between Cimmeria and Gondwana during Permian- E Cretaceous and experienced complex evolution over at least 160 My)

Fan, J.J., B.C. Zhang, J.B. Zhou, Y. Niu, S.L. Sun, Y.P. Lv, Y. Wang & Y.J. Hao (2024)- The Meso-Tethys Ocean: The nature, extension and spatial-temporal evolution. *Earth-Science Reviews* 255, 104839, p. (Meso-Tethys is massive tectonic zone divided into three segments: (1) central segment (Bangong-Nujiang Suture Zone on Tibetan Plateau and Shyok Suture Zone in S Pamir Mountains), (Permian-Cretaceous). (2) E segment includes Shan Boundary in SE Asia. Meso-Tethys Ocean four stages: (1) E Permian rifting and opening stage; (2) M Permian-Triassic seafloor spreading; (3) Late Triassic-Jurassic convergence; and (4) Late Jurassic-E Cretaceous diachronous closure. Meso-Tethys Ocean E-W length of >8000 km and maximum N-S width of ~5000 km during Late Triassic. Etc.)

Fan, S., L. Ding, M.A. Murphy, W. Yao & An Yin (2017)- Late Paleozoic and Mesozoic evolution of the Lhasa Terrane in the Xainza area of southern Tibet. *Tectonophysics* 721, p. 415-434. (online at: <http://www2.ess.ucla.edu/~yin/05-Publications/papers/165-Fan%20etal-2017-Tectonophysics.pdf>) (Shiquanhe-Namu Co Melange Zone (SNMZ) S of Bangong-Nujiang suture zone (BNSZ; N-dipping) between Lhasa and Qiantang terranes support interpretation that SNMZ is (S-dipping) Late Jurassic-Early Cretaceous suture zone within Lhasa block (separating N and C Lhasa terranes) that resulted from closure of small Jurassic ocean basin. E Cretaceous igneous rocks in N Lhasa interpreted to result from subduction of ocean lithosphere along SNMZ and its later delamination)

Fan, W., Y. Wang, Y. Zhang, Y. Zhang, F. Jourdan, J. Zi & H. Liu (2015)- Paleotethyan subduction process revealed from Triassic blueschists in the Lancang tectonic belt of Southwest China. *Tectonophysics* 662, p. 95-108.

(Subduction of Paleotethys Ocean and subsequent continental collision recorded in blueschists in Lancang SE Paleotethyan belt in SW China. Sui blueschists zircon U-Pb age of 260 ± 4 Ma and glaucophane formed during prograde metamorphism with $40\text{Ar}/39\text{Ar}$ plateau age of 242 ± 5 Ma (M Trias). Protolith formed at 260 Ma and originated from basaltic seamount. Basaltic rocks subducted down to 30-35 km under Lincang arc to form epidote blueschists at ~242 Ma. Blueschists subsequently transported to shallower crustal levels in response to continuous underthrust of subducted slab and continent-continent collision in M-L Triassic)

Fan, X., X. Li, F. Mattern, Z. Wei & C. Zheng (2024)- Paleoseamounts in Yarlung Zangbo suture zone reveal dynamic processes of the Early Cretaceous Neo-Tethys lithosphere. *Geological Society of America (GSA) Bull.* 137, 1-2, p. 682-701.

(Seamounts trapped in Yarlung Zangbo suture zone in Zhongba area of Xizang, S China. Pillow basalts overlain by radiolarian-bearing sediments of (early) Early Cretaceous age. Seamount sequences record multiple episodes of quick subsidence and uplift)

Fan, X., X. Li, F. Mattern, Z. Wei, C. Zheng, J. Wang & M. Zhou (2023)- Lithofacies, geochemistry, and sequences of basalt and carbonate rocks of a Middle Permian composite seamount (central Yarlung Zangbo Suture Zone, Tibet): implications to the incipient opening of the Neo-Tethys Ocean. *Lithos* 448-449, 107175, p. 1-16.

(M Permian (Guadalupian) paleo-seamount in Buma area, central Yarlung Zangbo Neotethys suture zone, with basaltic basement and carbonate cap (with crinoids, bryozoans). This suggests incipient opening of eastern Neo-Tethys (Lhasa block separation) could have taken place before Guadalupian time?)

Fang, D.R., J. Zhang, K.I. Hisada, G.H.Wang & D. Li. (2020)- Geological anatomy of the Upper Triassic sequence in southeastern Tibet: implications for tectonic evolution of the eastern Himalayan Orogen. *Geological Journal* 55, p. 6607-6624.

(Upper Triassic rocks of Tethyan Himalayan Sequence in Shannan area, SE Tibet (S of Yarlung-Tsangpo suture zone), part of fold-thrust belt of Himalayan Orogen, not accretionary melange within YTSZ)

Fang, N.Q., Q. Feng, S. Zhang & X. Wang (1998)- Paleo-Tethys evolution recorded in the Changning-Menglian Belt, western Yunnan. *Comptes Rendus Academie Sciences, Paris, Sciences de la Terre*, 326, p. 275-282.

(Changning-Menglian belt of W Yunnan is ~400km long, 60 km wide remnant of Paleo-Tethyan archipelago. With E Devonian- M-L Triassic volcano-sedimentary record, incl. flysch, radiolarites, MORB basalts, seamount carbonates. Flanked by Cathaysian Lincang-Simao massif in E (M-L Devonian paleolatitude ~38-43°S) and Gondwanan Gengma-Baoshan massif in W (Devonian paleolatitude ~0-4.5°S; with Permo-Carboniferous moraine deposits))

Fang, Wu (1989)- Paleozoic paleomagnetism of the South China block and the Shan Thai block: The composite nature of Southeast Asia. Ph.D. Thesis, University of Michigan, p. 1-165.

(Paleomag of Paleozoic samples from E Yunnan (S China Block) and W Yunnan (N end of Shan-Tai Block). Contrasting paleolatitudes for Devonian samples: equatorial position for E Yunnan, of ~40° for W Yunnan, which probably was part of Gondwana supercontinent)

Feng, J., H. Yao, L. Chen & W. Wang (2021)- Massive lithospheric delamination in southeastern Tibet facilitating continental extrusion. *National Science Review* 9, 4, nwab174, p. 1-10.

(online at: <https://academic.oup.com/nsr/article/9/4/nwab174/6369358>)

(Significant left-lateral movement along Ailao Shan-Red River fault accommodated substantial amount of Late Eocene- E Miocene India-Asia convergence. Seismic evidence for massive lithospheric delamination in SE Tibet (massive foundered lithosphere now near bottom of mantle transition zone beneath SE Tibet, presumably formed shortly after onset of hard collision and activation of continental extrusion, in E Oligocene)

Fu, H., X. Hu, E.M. Crouch, W. An, J. Wang & E. Garzanti (2018)- Upper Cretaceous trench deposits of the Neo-Tethyan subduction zone: Jiachala Formation from Yarlung Zangbo suture zone in Tibet, China. *Science China Earth Sciences* 61, 9, p. 1204-1220.

(online at: https://es.nju.edu.cn/_upload/article/files/01/b4/a58f3a9a45208702f8465f9257f4/a620787c-47de-46ed-8b4a-573416727add.pdf)

(Jiachala Fm lithofeldspatho-quartzose volcanoclastic turbidites fed largely from Gangdese arc and C Lhasa deposited during Late Cretaceous (~88-84 Ma) in trench formed along S edge of Asia during subduction of Neo-Tethyan oceanic lithosphere)

Fu, X., J. Wang, H. Wei, X. Feng, S. Zeng, Y. Zeng & Y. Nie (2022)- Detrital zircons of the Devonian-Permian sandstones in the Qiangtang terrane, Tibet: implication for Qiangtang rifting from Gondwana and uplift history of the Central Uplift. *J. Asian Earth Sciences* 239, 105392, p.

(Zircon U-Pb ages of Devonian-Permian sedimentary rocks exposed in C Qiangtang. Devonian-Carboniferous strata generally similar, with two age peaks at 520-700 Ma and 900-1000 Ma, indicating Gondwana affinity and still part of Gondwana supercontinent until E Permian. Breakup time of Qiangtang terrane from Gondwana is ~288 Ma, characterized by drastic provenance change in E Permian. Final closure of Paleo-Tethys Ocean and its branch caused uplift of Central Uplift at Middle-early Late Triassic)

Fursich, F.T., M. Alberti, D.K. Pandey, K. Chaskar & S. Bhosale (2021)- Facies analysis and palaeoecology of the Jurassic Spiti Shale Formation in the Spiti area, Northern India. *J. of Palaeogeography* 10, 4, p. 438-462.

(online at: <https://www.sciencedirect.com/science/article/pii/S2095383621000018>)

(Mid-Jurassic (Callovian) to E Cretaceous (Berriasian) black 'deep shelf' low-oxygen marine Spiti Shale, deposited at N India sector of N Gondwana passive margin, at SE margin of Neotethys Ocean, now widely distributed over 2000 km as folded beds in Tethys Himalaya from E Pakistan to N India, Nepal and S Tibet. Thickness estimates mainly between ~100-300m. Bathonian ferruginous oolitic bioclastic siltstone at base, and E-M Jurassic Tagling Fm carbonate platform below it. With fossils reminiscent of E Indonesia (New Guinea Central Range, Misool, Sula Islands), incl. ammonites (Macrocephalites, Mayaites), belemnites (Belemnites gerardi) and molluscs Retroceramus haasti, Malayomaorica, Bositra, Australobuchia, etc. Most of formation interpreted as anoxic marine facies. Spiti area most likely situated at paleolatitude of 20-40° S)

Fursich, F.T., M. Alberti, D.K. Pandey & W.S. Ayoub-Hannaa (2022)- Jurassic bivalves from the Spiti area of the Himalayas, northern India. *Zitteliana* 96, p. 153-178

(online at: <https://zitteliana.pensoft.net/article/87253/>)

(Six bivalve taxa from Bathonian- E Callovian Ferruginous Oolite Fm and 24 taxa from Callovian- earliest Cretaceous Spiti Shale Fm at SE margin of Neotethys in Spiti and Zaskar areas in 'Tethyan Himalayas'. Low-diversity bivalve faunas At base common Bositra, Palaeonucula; higher up Retroceramus haasti, Australobuchia, Malayomaorica? (Assemblages reminiscent of Misool; see Hasibuan 1998; JTvG))

Garzanti E. (1999)- Stratigraphy and sedimentary history of the Nepal Tethys Himalayan passive margin. In: Upreti B.N. & P. Le Fort (eds.), *Advances on the Geology of the Himalaya- Focus on Nepal*. *J. Asian Earth Sciences* 17, 5-6, p. 805-827.

Garzanti, E. (2026)- The stratigraphy of the Tethys Himalaya. *Italian Journal of Geosciences* 145, 1, p. 74-96.

(online at: <https://www.italianjournalofgeosciences.it/fulltext/1237/the-stratigraphy-of-the-tethys-himalaya.pdf>)

(Review of Late Neoproterozoic- Eocene evolution of northern India continental margin. Incl. Late Carboniferous- earliest Permian glacial diamictites, associated with rifting. Also Late Triassic major extension, with quartz and volcanic detritus (rift or arc?), Jurassic mature passive margin stage with characteristic E Jurassic Lithothys horizons, widespread U Bathonian- M Callovian Ferruginous Oolite Formation, Late Jurassic organic-rich black shales, incl., ammonoid-rich black mudrocks of Spiti Shale with Belemnopsis gerardi beds in lower part. Etc. Paleo-Eocene collision stage. E Eocene or earlier final closing of Neotethys (Spontang / Yarlung-Tsangpo ophiolites obduction, etc.),)

Gehrels, G., P. Kapp, P. DeCelles, A. Pullen, R. Blakey, A. Weislogel, L. Ding, J. Guynn et al. (2011)- Detrital zircon geochronology of pre-Tertiary strata in the Tibetan-Himalayan orogen. *Tectonics* 30, 5, TC5016, p. 1-27.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2011TC002868>)

Gong, N., H. Qi, J. Li, G.L. Yuan, G.H. Wang, X. Liang & Z.B. Liu (2023)- A Late Jurassic magmatic flare-up triggered by break-off of the Bangong-Nujiang Meso-Tethyan slab: insights from Jurassic arc magmatism in South Qiangtang, Central Tibet. *Lithos* 438-439, 107009, p.

(Arc magmatism in S Qiangtang terrane caused by N-ward subduction of Bangong-Nujiang Ocean. Prominent high-flux event in Late Jurassic (~155 Ma), with typical adakitic characters. Trench-ward migration of arc magmatism from ~170-155 Ma, implying slab-roll back, likely combined with slab-window formation)

Guillot, S., & A. Replumaz (2013)- Importance of continental subductions for the growth of the Tibetan Plateau. *Bull. Societe Geologique France* 184, 3, p. 199-223.

(online at: https://www.researchgate.net/publication/259340341_Importance_of_continental_subductions_for_the_growth_of_the_Tibetan_Plateau)

Guillot, S., & A. Replumaz (2013)- Continental subductions and Tibetan plateau growth. *J. Nepal Geological Society* 46, p. 69-74.

(online at: <https://www.nepjol.info/index.php/JNGS/article/view/31585>)

(Same paper as Guillot & Replumaz (2013), above))

Guilmette, C., D. J.J. van Hinsbergen, M.A. Smit, A. Godet, F. Fournier-Roy, J.P. Butler, M. Maffione et al. (2023)- Formation of the Xigaze Metamorphic Sole under Tibetan continental lithosphere reveals generic characteristics of subduction initiation. *Nature Communications Earth & Environment* 4, 339, p. 1-9.

(online at: <https://www.nature.com/articles/s43247-023-01007-w>)

(Granulite-bearing sole of Xigaze ophiolite in S Tibet, whose oceanic crust formed at ~130 Ma through continental forearc extension. Sole metamorphism was ongoing by 144 Ma, implying that N-directed subduction began at least 14 million years before oceanic forearc spreading. Upper plate at time of subduction initiation was continental, not oceanic)

He, Q., X. Lang, X. Wang, Y. Deng, F. Xie, J.M. Scott & Y. Lou (2022)- Volcanic and sedimentary rocks reveal the Paleozoic tectonic evolution of the Lhasa Terrane, Tibet. *International Geology Review* 65, 14, p. 1-23.

(online at: www.researchgate.net/publication/364319157_Volcanic_and_sedimentary_rocks_reveal_Etc.)

(C Lhasa Terrane preserves record of opening, subduction, and closure of Paleo-Tethys Ocean. N margin of Gondwana was passive in Late Ordovician. In E Carboniferous, back-arc basin formed on this N margin due to subduction of Paleo-Tethys Ocean (under N Gondwana margin). In Late Carboniferous, Sumdo Paleo-Tethys Ocean opened (separating N and C Lhasa from S Lhasa-Australia), and S edge of C Lhasa Terrane became passive margin. In E Permian, Sumdo Paleo-Tethys Ocean began N-ward subduction and formed arc volcanic rocks on C Lhasa Terrane)

He, Z., X. Li, Y. Li, A. Matsuoka, H. Luo, X. Cui & J. Cheng (2024)- Evolution of the Neo-Tethys traced by Late Triassic to Early Cretaceous marine remnants in the eastern segment of the Yarlung-Tsangpo suture zone, southern Tibet. *J. Asian Earth Sciences* 265, 106090, p.

(Siliceous melanges in Yarlung-Tsangpo suture zone in Tibet preserve significant information of Neotethys and subduction-accretion processes. Radiolarian biostratigraphy identified Carnian-Norian (Late Triassic) black cherts, Aalenian-Bathonian (M Jurassic) red cherts and Berriasian (Early Cretaceous) siliceous mudstones. All are elements of Neo-Tethys Ocean ocean plate stratigraphy from Late Triassic- E Cretaceous.)

Hebert, R., R. Bezard, C. Guilmette, J. Dostal, C.S. Wang & Z.F. Liu (2012)- The Indus- Yarlung Zangbo ophiolites from Nanga Parbat to Namche Barwa syntaxes, southern Tibet: First synthesis of petrology, geochemistry, and geochronology with incidences on geodynamic reconstructions of Neo-Tethys. *Gondwana*

Research 22, p. 377-397. (online at: www.academia.edu/14291125/The_Indus_Yarlung_Zangbo_IYZ_ophiolites_from_Nanga_Parbat_to_Etc.)
(Yarlung Zangbo SZ youngest suture zone on Tibet Plateau (Neotethys): assemblage of sedimentary, metamorphic and igneous rocks created during India-Eurasia collision. Ages of various lithologies Jurassic- M Miocene, with some Permian and Devonian exotic blocks in melange zone. Ophiolites two age groups: Luobusa, Zedang and Kiogar Jurassic-Lower Cretaceous; all others Lower Cretaceous age. Ophiolite sequences might have evolved for >70 My from initial genesis to obduction around 70-90 Ma. All formed in suprasubduction zone, mainly in arc and back-arc. Most ophiolites created in short-lived (30 My) basins, close to Eurasian continental margin)

Hebert, R., F. Hugt, C. Wang & Z. Liu (2003)- Yarlung Zangbo ophiolites (Southern Tibet) revisited: geodynamic implications from the mineral record. In: Y. Dilek & P.T. Robinson (eds.) *Ophiolites in Earth history*, Geological Society, London, Special Publ. 218, p. 165-190.
 (online at: https://www.academia.edu/17392252/Ophiolites_in_Earth_History)
(Yarlung Zangbo suture zone ophiolites in S Tibet (Neotethys suture) collage of heterogeneous massifs. Mantle sections consist of harzburgite and lherzolite, cut by gabbroic to diabasic intrusions. Crustal plutonic sections dunite, wehrlite and gabbro, generally thin or absent. Polybaric exhumation steps from at least 50 km depth. Ophiolitic massifs generated in a suprasubduction zone (arc or back-arc) environment)

Hennig, D., B. Lehmann, D. Frei, B. Belyatsky, X.F. Zhao, A.R. Cabral, P.S. Zeng, M.F. Zhou & K. Schmidt (2009)- Early Permian seafloor to continental arc magmatism in the eastern Paleo-Tethys: U-Pb age and Nd-Sr isotope data from the southern Lancangjiang zone, Yunnan, China. *Lithos* 113, 3/4, p. 408-422.
(SW Yunnan complex geological evolution of Paleo-Tethys and Eurasia-Gondwana collision at end of Paleozoic. S Lancangjiang zone at Laos border gabbros with U-Pb zircon age of 292 Ma, indicative of E Permian sea-floor spreading. Also arc-like andesites and granodiorite intrusions with zircon ages of 284-282 Ma. Point to Permian subduction of oceanic crust between Lincang Block and Lanping-Simao Block. M Triassic Lincang granite (239 Ma) batholith marks closure of Paleo-Tethys. Nd-model ages from 1.7- 2.1 Ga point to Paleoproterozoic basement, probably fragment of Yangtze Block)

Hu, P.Y., Q.G. Zhai, G.C. Zhao, J. Wang, Y. Tang, Z.C. Zhu & H. Wu (2019)- The North Lhasa terrane in Tibet was attached with the Gondwana before it was drafted away in Jurassic: Evidence from detrital zircon studies. *J. Asian Earth Sci.* 185, 104055, p. 1-11.
(Detrital zircons from Cambrian metasedimentary rocks in N Lhasa terrane with age peaks at ~505, 548, 926, and 1104 Ma, and interpreted as Gondwanan sources, probably in collisional setting related to Cambrian accretion of microcontinents along Gondwanan proto-Tethyan margin. Carboniferous-Late Triassic sediments in N Lhasa terrane similar Precambrian- Cambrian zircon age and $\epsilon\text{Hf}(t)$ distributions, but different age distributions in Late Jurassic-E Cretaceous sedimentary rocks in N Lhasa terrane. Suggests N-ward drift of N Lhasa terrane occurred in Jurassic)

Hu, W.L., Q. Wang, J.H. Yang, L.L. Hao, J. Wang, Y. Qi, Z.Y. Yang & P. Sun (2023)- Growth of the continental crust induced by slab rollback in subduction zones: Evidence from Middle Jurassic arc andesites in central Tibet. *Gondwana Research* 117, p. 8-22.
(Middle Jurassic (169-164 Ma). andesites from Jiaqiong area of Bangong-Nujiang (Mesotethys) suture zone in Central Tibet, here interpreted as arc magmatism triggered by rollback of BNT oceanic slab (elsewhere as Mesotethys intra-oceanic arc?- JTvG))

Hu, X., W. An, E. Garzanti & Q. Liu (2020)- Recognition of trench basins in collision orogens: Insights from the Yarlung Zangbo suture zone in southern Tibet. *Science China Earth Sciences* 63, 12, p. 2017-2028.
 (online at: <https://www.sciengine.com/SCES/doi/10.1007/s11430-019-9687-x;JSESSIONID=e4030f65-3495-4e1e-bc40-b7519375bf7c>)
(Several trench-fill deposits identified from Yarlung Zangbo suture in S Tibet. Two types: (1) developed during subduction of Neotethyan oceanic slab in Cretaceous on subducting oceanic crust and later accreted as tectonic slices into subduction complex (e.g., the Jiachala, Rongmawa, and Luogangcuo Fms), and (2) developed during initial stage of India-Asia collision in Paleogene deposited unconformably on continental margin of subducting

Indian plate and then involved in subduction complex during continental collision (e.g., Sangdanlin-Zheya Fms). Typical lithologies of trench fills: abyssal chert, siliceous shale, turbidites, debris flows and slump deposits without carbonate. Detritus in these basins mainly from uplifted terrane in upper plate)

Hu, X., A. Ma, W. Xue, E. Garzanti, Y. Cao, S.M. Li, G. Sun & W. Lai (2022)- Exploring a lost ocean in the Tibetan Plateau: birth, growth, and demise of the Bangong-Nujiang Ocean. *Earth-Science Reviews* 229, 104031, p. 1-28.

(online at: https://es.nju.edu.cn/_upload/article/files/9b/44/6c47ad75473b9de6e9a6336491d2/cda07ee3-e4f2-4c3a-b32e-5c3556ce63e0.pdf)

(Review of Bangong-Nujiang suture zone and adjacent areas on Tibetan Plateau. Rifting between S Qiangtang and Lhasa blocks took place in E-M Permian. Still narrow ocean in Late Permian. Rapid Triassic N-ward drift of S Qiangtang and active sea-floor-spreading in Bangong-Nujiang Ocean, which reached a maximum N-S width of ~4000 km in about 50 Myrs. In E Jurassic (~190-180 Ma), Bangong-Nujiang oceanic lithosphere began to subduct N-ward, until closing its N branch (Dongqiao-Amdo ocean) in latest M Jurassic (166-163 Ma), when Amdo and Dongkacuo microcontinents in suture zone collided with S Qiangtang. Southern oceanic branch (Beila-Nagqu ocean) closed in latest Jurassic (150-145 Ma; onset of Lhasa and Qiangtang blocks collision). Widespread E Cretaceous (140-120 Ma) syncollisional arc-type magmatism in collisional zone. In earliest Late Cretaceous complete demise of seaways and the transition to continental red beds along suture zone)

Hu, Y.L., Z.B. Liu, G. Wang, J. Gao, Y. Song & D. Li (2020)- Study of molasse within the middle segment of the Bangong-Nujiang suture zone, central Tibet: Constraints of ocean-continent transform. *Geological Journal* 55, 10, p. 6625-6641.

(online at: https://www.researchgate.net/publication/340459871_Study_of_molasse_within_the_middle_segment_of_the_Bangong-Nujiang_suture_zone_central_Tibet_Constraints_of_ocean-continent_transform)

(Bangong-Nujiang (Mesotethys) suture zone between Lhasa and South Qiangtang terranes. Non-marine molasse deposits of Jingzhushan Fm record terrane (post-)collision. Youngest detrital zircon ages (max. depositional ages) of molasse ~78 Ma (Campanian). Mixed sources. Ocean-continent transition of middle segment of Bangong-Nujiang Ocean completed in late Early Cretaceous (~115 Ma, Aptian-Albian boundary)

Huang, F., J. Xu, Y. Zeng, J. Chen, B. Wang, H. Yu, L. Chen, W. Huang, & R. Tan (2017)- Slab breakoff of the Neo-Tethys Ocean in the Lhasa Terrane inferred from contemporaneous melting of the mantle and crust. *Geochem. Geophysics Geosystems* 18, p. 4074-4095.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1002/2017GC007039>)

(In Daju area, S Lhasa subterrane, mafic dikes and granitoids are contemporaneous at ~57 Ma. Mafic dikes represent asthenosphere-derived melts, granitoids from juvenile lower crust. Together with abrupt decrease in convergence rate between India and Asia, surface uplift and sedimentation cessation in S Lhasa, the synchronous mafic dikes and granitoids best explained by initial stage of Neo-Tethyan slab breakoff. Slab breakoff concept also explains onset of magmatic “flare-up” and crustal growth after 57 Ma)

Huang, H. & X. Jin (2014)- Paleoclimatic implications of Permian fusulinids and carbonates from the Baoshan Block, southwestern China. In: R. Rocha et al. (eds.) *Strati 2013- First International Congress on Stratigraphy*, At the cutting edge of stratigraphy, Springer, p. 1105-1108.

(Permian fusulinids of Baoshan Block (= part of 'Sibumasu Group') lower generic diversity than coeval tropical assemblages. Dominant elements change from mainly eurytopic genera in E Permian/Sakmarian grainstones (>30°S; Pseudofusulina, Eoparafusulina) to warmer water algal-foram limestones in M Permian Murghabian (with Schwagerina, Eopolydiexodina) and Midian (with Sumatrina, Verbeekina))

Huang, H., X. Jin, Y. Shi, H. Wang, J. Zheng & Pu Zong (2020)- Fusulinid-bearing oolites from the Tengchong Block in western Yunnan, SW China: Early Permian warming signal in the eastern peri-Gondwana. *J. Asian Earth Sciences* 193, 104307, p. 1-11.

(Oolitic carbonates from lower Dadongchang Fm (above diamictite-bearing formation) in N Tengchong Block yield low-diversity fusulinid assemblage with Eoparafusulina tschernyschewi group, Monodiexodina wanneri, etc. Assemblage correlates to late Sakmarian- Artinskian fusulinids widespread among Cimmerian blocks in peri-Gondwana. Interpreted to indicate temperate-water environment in aftermath of Late Paleozoic glaciation.

Oolites never recorded before from E Permian of any E Cimmerian block. Appearance of oolites ascribed to post-glacial warming pulse of sea-surface T)

Huang, H., X. Jin, Y. Shi & X. Yang (2022)- Distribution pattern of Middle Permian fusulinids in the Lhasa Block, Tibet and their paleogeographic implications. *Palaeogeogr. Palaeoclim. Palaeoecology* 586, 110780, p. 1-11.

(online at: <https://www.sciencedirect.com/science/article/pii/S0031018221005654>)

(M Permian fusulinids from Luobadui Fm in Lhasa block include *Lepidolina multiseptata*, *Colania ozawai*, *Verbeekina cf. tenuispira*, *V. americana*, etc., indicative of Midian age. Two assemblages: (1) with verbeekinids and neoschwagerinids; (2) dominated by Nankinella and Chusenella. Fusulinids of Lhasa Block closely affiliated with those of adjacent S Qiangtang (=Cimmerian Province, with smaller foraminifer *Shanita*). Lhasa Block also resembles Cathaysian S China (verbeekinids and neoschwagerinids, *Lepidolina*). Lhasa Block more diversified M Permian fusulinids than E Cimmerian (*Sibumasu*, ETC.) blocks; possibly located near S Qiantang Block, at lower paleolatitudes than E Cimmerian blocks during M Permian)

Huang, H., X. Jin, Y. Shi, J. Zheng & Z. Yan (2023)- New fusulinid assemblages from the Changning-Menglian Belt in western Yunnan, China and their paleogeographic implications. *J. Asian Earth Sciences* 256, 105807, p. (Changning-Menglian Belt in W Yunnan preserves remnants of Paleotethys Ocean, including limestones of possible seamount origin. Abundant fusulinids. New fusulinid collections of Late Carboniferous- Artinskian (E Permian) age, grouped into *Triticites* abundance zone, *Sphaeroschwagerina sphaerica* range zone, *Eoparafusulina* interval zone and *Chalaroschwagerina solita* range zone. Distinct Cathaysian affinity indicated by dominance of *Triticites* in Late Carboniferous and E Permian with *Sphaeroschwagerina*, *Eoparafusulina* and *Chalaroschwagerina*. Fusulinids probably colonized marine environments far from mid-latitude peri-Gondwana region, while detached from equatorial S China (seamount atolls in Paleotethys Ocean)

Huang;W.Q., J.Y. Pan, P. Ni, J.G. Zhou, T. Shui, H. Chen, M.S. Fan & J.M. Cui (2024)- Recognition of Neogene tin mineralization in the Southeast Asian tin belt. *Geological Society of America (GSA) Bull.* 136, 11-12, p. 5300-5312.

(Yunling tin deposit in W Yunnan, China, with U-Pb cassiterite ages of 21-19 Ma, much younger than other SE Asia tin mineralizations associated with collisions of the Paleo-, Meso- and Neo-Tethys slabs. Around 40 Ma, (late M Eocene) notable transition in tectonic regime of SE Tibet, with Neotethys subduction giving way to lateral extrusion of Indochina block along major strike-slip faults. E Miocene Sn mineralization at Yunling may be genetically connected to extensive delamination of lithosphere in SE Tibet, which led to upwelling and decompression partial melting of asthenosphere, providing plausible explanation for high T required for release of Sn from biotite-dehydration melting of sedimentary protolith)

Jadoon, U.F., Q. Zhao, B. Huang, Z. Yi, M.W. Azeem, H. Lu & S.A. Shah (2024)- A review of paleomagnetic constraints on the India-Asia collision: Paradoxes and perspectives. *Earth-Science Reviews* 248, 104628, p. 1-24.

(Paleomagnetic studies of Cretaceous-Paleocene rocks from Lhasa and Tethyan Himalaya terranes)

Ji, W.Q., F.Y. Wu, S.L. Chung, X.C. Wang, C.Z. Liu, Q.L. Li, Z.C. Liu et al. (2016)- Eocene Neo-Tethyan slab breakoff constrained by 45 Ma oceanic island basalt-type magmatism in southern Tibet. *Geology (GSA)* 44, 4, p. 283-286.

(manuscript online at: <https://espace.curtin.edu.au/handle/20.500.11937/16966>)

(Eocene Langshan gabbros at Gyangze from E segment of Tethyan Himalaya in S Tibet, dated at ~45 Ma. With geochemical characteristics similar to those of HIMU-type oceanic island basalt. Negligible crustal contamination, combined with relevant studies along Indus-Yarlung suture zone, best explained by sudden detachment of subducted Neo-Tethyan slab at great depth. Breakoff model may account for coeval short-lived magmatism and subsequent termination of Gangdese arc magmatism in S Tibet, and for abrupt slowdown (~45 Ma) of Indo-Asia convergence)

Jian, X., A. Weislogel & A. Pullen (2019)- Triassic sedimentary filling and closure of the Eastern Paleo-Tethys Ocean: new insights from detrital zircon geochronology of Songpan-Ganzi, Yidun, and West Qinling flysch in Eastern Tibet. *Tectonics* 38, 2, p. 767-787.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018TC005300>)

(Triassic flysch in Songpan-Ganzi Complex, E Tibet, is rich record of tectonism during closure of E Paleo-Tethys Ocean. M-U Triassic detrital zircon ages five main populations: 240–310 Ma; 400–480 Ma; 750–1,000 Ma; 1,700–2,000 Ma; and 2,300–2,600 Ma (sourced from N). E Paleo-Tethys probably closed by M Triassic)

Jiao, X., T. Yang, W. Bian, S. Wang, J. Ma, W. Peng, S. Zhang, H. Wu & H. Li (2023)- Middle Jurassic paleolatitude of the Tethyan Himalaya: new insights into the evolution of the Neo-Tethys Ocean. *J. of Geophysical Research: Solid Earth* 128, 5, e2023JB026659, p. 1-23.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2023JB026659>)

(Paleomagnetic results from M Jurassic (~175–173 Ma) Lanongla Fm limestones in Nyalam area of Tethyan Himalayas suggest paleolatitude of $32 \pm 3^\circ\text{S}$. Comparison data from Lhasa terrane suggests Neo-Tethys Ocean had latitudinal width of $3,500 \pm 1,000$ km at ~174 Ma (E-M Jurassic boundary), reached its greatest width of $7,000 \pm 1,000$ km at ~137 Ma (earliest Cretaceous), with spreading rate of ~10.4 cm/year during ~174-137 Ma)

Jin, S., X. Sun, X. Jing, Z. Zhang, X. Zhang & Z. Yang (2023)- A smaller Greater India and a Middle-Early Eocene collision with Asia. *Geophysical Research Letters* 50, e2022GL101372, p. 1-10.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2022GL101372>)

(Paleomagnetic data from Paleocene limestone of Zongpu Fm in Tingri, S Tibet (Tethyan Himalaya; TH), suggest TH was located at ~4°S at ~60 Ma, implying it was part of Greater India and that TH did not break off from India. This left ~2000 km Neo-Tethys Ocean, challenging prevailing hypothesis that initial collision of India-Asia occurred during this period. N margin of India plate (e.g., Tingri, Gyangze, Gamba and Zaskar areas) all collided with Asia at ~50 Ma (E Eocene), quasi-synchronously closing Neo-Tethys Ocean)

Jin, X. (1998)- A comparison between Permo-Carboniferous sequences of the Baoshan Block and the Lhasa Block, China. In: G.R. Shi et al. (eds.) *Permian of Eastern Tethys: biostratigraphy, palaeogeography and resources*, Strzelecki Symposium, Proc. Royal Society of Victoria Melbourne, 110, 1-2, p. 401-404.

(Baoshan and Lhasa Block in SW China and Tibet both have Permo-Carboniferous glacio-marine deposits and Gondwana affinity fauna and palynomorph assemblages, indicating Gondwana origin. Both blocks with Early Permian basalts/ red beds above glacial deposits, and overlain by M-U Permian- Triassic limestones)

Jin, X., H. Huang, Y. Shen & Y. Wang (2008)- Subdivision and correlation of Middle-Late Permian successions in the Baoshan Block, Western Yunnan, China: status and problems. *Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008)*, 4th ICGP 416, Bangkok, p. 341-348.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/103.pdf)

(Review of Middle-Late Permian lithostratigraphy of Baoshan Block, Yunnan, SW China (= Sibumasu terrane). Earliest Permian Dingjiazhai Fm with diamictites. Artinskian Woniusi Fm basalts, overlain with Kungurian hiatus by Roadian-Wordian red beds, then limestone. Lower Shazipo Fm with Verbeekina, Eopolydiexodina, overlain by Capitanian Shanita-Hemigordius assemblage)

Jin, X., H. Huang, Y. Shi & L. Zhan (2015)- Origin of Permian exotic limestone blocks in the Yarlung Zangbo suture zone, Southern Tibet, China: with biostratigraphic, sedimentary and regional geological constraints. *J. Asian Earth Sciences* 104, p. 22-38.

(Yarlung Zangbo Suture in S Tibet represents collision zone between India and Eurasia continents. Permian m-km-scale limestone blocks in highly deformed Late Triassic (and sometimes Late Jurassic-Cretaceous) siliciclastic sediments S of ophiolite belt. Fossils from blocks mainly Guadalupian (with fusulinids Nankinella, Yangchienia, Chusenella, Verbeekina, Armenina, Paraverbeekina and Neoschwagerina) and Lopingian (with Reichelina, Codonofusiella, Colaniella) and of mixed Gondwanan and Cathaysian character. Blocks originally deposited in peri-Gondwana environment, somewhere between Himalayan region and Lhasa Block)

Jin, Y. (1985)- Permian brachiopoda and paleogeography of the Qinghai-Xizang (Tibet) Plateau. *Palaeontologia Cathayana* 2, p. 19-71.

Jing, M., X.P. Xia, M. Zhou, C.K. Lai, Z. Cui, J. Xu & F. Aidoo (2023)- Detrital zircon U-Pb age constraints on the Meso-Tethys Ocean closure in SE Asia. *Geological Society, London, Special Publ.* 531, p. 287-299.
(*Location of Meso-Tethyan suture in SE Asia ambiguous due to overprint by later India-Asia collisional tectonics. For SE Asian E-ward continuation of Mesotethyan Bangong-Nujiang Suture in Tibet, two main candidates: (1) Longling-Ruilu Suture between Tengchong and Baoshan blocks and (2) Myitkyina ophiolite belt. New zircon, etc., data from Gaoligong Gp of Tengchong Block between above sutures suggest Gaoligong Gp contains Cambrian, Triassic and Cretaceous zircons, so is not Precambrian basement. With diagnostic age peak at ~1110 Ma, similar to ~1170 Ma peak in Australia-derived blocks (e.g. Lhasa, W Australia). Tengchong Block likely located adjacent to N Australia margin in Gondwana, and most likely linked with Lhasa Block (S Tibet) since E Paleozoic. Longling-Ruilu Suture likely continuation of Meso-Tethyan BNS in SE Asia.*)

Jonnalagadda, M.K., M. Benoit, S. Harshe, R. Tilhac, R.A. Duraiswami, M. Gregoire & N.R. Karmalkar (2022)- Geodynamic evolution of the Tethyan lithosphere as recorded in the Spontang Ophiolite, South Ladakh ophiolites (NW Himalaya, India). *Geoscience Frontiers* 13, 1, 101297, p. 1-25.

(online at: <https://hal.science/hal-03378242/file/1-s2.0-S1674987121001614-main.pdf>)

(*Spontang Ophiolite most complete sequence of S Ladakh Tethyan ophiolites in N India/S Tibet, which are fragments of Neotethys Ocean preserved along Indus Tsangpo Suture Zone (ITSZ = collisional boundary between continental plates of India in S and Eurasia in N). Spontang ophiolite two groups of mafic rocks, with distinct geochemical differences: (1) older (177 Ma; E-M Jurassic) N-MORB-type Neotethyan oceanic crust and (2) younger (~134 Ma; Valanginian) gabbros with primitive arc-related affinities, indicating gabbroic 'supra-subduction zone' magmatism with arc-related affinity, marking later supra-subduction zone (SSZ) stage of Spontang Ophiolite, associated with development of E Cretaceous Spong intra-Tethyan island arc (modifying geochemical signatures of Spontang ophiolite with slab-derived subducted oceanic sediment-derived melts)*)

Ju, Qi, Y.C. Zhang, F. Qiao & H.P. Xu (2021)- A Middle Permian assemblage of smaller foraminifera (*Shanita-Hemigordiopsis* assemblage) from the central Lhasa Block and its paleobiogeographic implications. *Palaeogeogr. Palaeoclim. Palaeoecology* 572, 110417, p. 1-15.

(*Characteristic M Permian (early Midian (Wordian)) smaller foram assemblage in Xiala Fm in central Lhasa Block in N Tibet. Shanita-Hemigordiopsis assemblage ranges from late Murgabian-Midian (~late Middle Permian) and is widely distributed on Cimmerian microcontinents and Gondwanan margin (Neotethys Realm), but absent from S China and Indochina)*)

Ju, Q., Y.C. Zhang, F. Qiao & H.P. Xu (2022)- First discovery of Wuchiapingian (Late Permian) foraminiferal fauna from the Zhari Namco area, central Lhasa Block, Tibet, and their palaeogeographic implications. *Geological Journal* 57, 7, p. 2564-2580.

(*New foraminiferal fauna from upper part Xiala Fm in C Lhasa Block, with three species of fusulines. Presence of Reichelina and Codonofusiella suggests Wuchiapingian age. Lopingian palaeobiogeography of Lhasa Block differs greatly from adjacent S Qiangtang, Karakorum and S Pamir blocks, and Tethys Himalaya region. Suggests Lhasa Block separated from S Qiangtang Block in N by Bangong-Nujiang Ocean and Tethys Himalaya in S by Neotethys Ocean in Lopingian. Lhasa and Tengchong blocks were linked during Permian.*)

Ju, Q., Y.C. Zhang, H.P. Xu, H. Zhang, Q.F. Zheng, M. Luo, W.K. Qie, Jun-Jie Liu & S.Z. Shen (2024)- A new foraminiferal fauna from the Tangra Yumco area, central Lhasa Block, Tibet and its palaeobiogeographic implications. *Palaeoworld* 33, 3, p. 724-743.

(*M Permian foraminiferal fauna from middle Xiala Fm in 'Cimmerian' C Lhasa Block with 8 species of fusulines and 24 species of smaller foraminifers, dominated by Nankinella-Chusenella fusulinid assemblage and smaller foraminifera Hemigordiopsis, indicating Capitanian (late Guadalupian) age. Guadalupian assemblages show close palaeobiogeographic relationships between Lhasa and Tengchong blocks, and between S Qiangtang and Baoshan blocks respectively, indicating wide Mesotethys Ocean that formed palaeobiogeographic barrier between Lhasa-Tengchong (links to Sibumasu?) and S Qiangtang-Baoshan blocks)*)

Ju, Q., Y.C. Zhang, D.X. Yuan, F. Qiao, H.P. Xu, H. Zhang, Q.F. Zheng, M. Luo, W.K. Qie et al. (2022)- Permian foraminifers from the exotic limestone blocks within the central Qiangtang Metamorphic Belt, Tibet and their geological implications. *J. Asian Earth Sciences* 239, 105426, p. 1-15.

(Two Permian foraminiferal faunas from exotic limestone blocks in C Qiangtang Metamorphic Belt (Paleotethys suture, possibly derived from Lugu Fm at N side of S Qiangtang block. Presence of fusulines Pseudodoliolina ozawai, Presumatrina neoschwagerinoides, Neoschwagerina simplex and Afghanella suggest late Kungurian-Roadian age. Suggests that in-situ deposits of Lugu Fm have been partly subducted beneath N Qiangtang Block during closing of Paleotethys Ocean along Longmu Co-Shuanghu Suture Zone)

Kang, Z.Q., J.F. Xu, S.A. Wilde, Z.H. Feng, J.L.Chen, B.D. Wang, W.C. Fu & H.B. Pan (2014)- Geochronology and geochemistry of the Sangri Group Volcanic Rocks, Southern Lhasa Terrane: Implications for the early subduction history of the Neo-Tethys and Gangdese Magmatic Arc. *Lithos* 200-201, p. 157-168.

(Sangri Group volcanic rocks along S margin of Lhasa Terrane, on N side of Indus-Yarlung Zangbo suture zone. Long considered to be Late Jurassic- Early Cretaceous in age, but new zircon U-Pb ages of ~195 Ma and 189Ma suggest Bima Fm volcanics formed during E Jurassic. With typical characteristics of arc volcanics. Interpreted to be generated by N-ward subduction of Neo-Tethys beneath S Lhasa Terrane, coeval with Late Triassic-Early Jurassic felsic intrusions in Gangdese arc, interpreted to be initiated at juvenile continental margin in Late Triassic-Early Jurassic, although a possible intra-oceanic arc setting cannot be excluded)

Kapp, P., P.G. de Celles, G.E. Gehrels, M. Heizler & L. Ding (2007)- Geological records of the Lhasa-Qiangtang and Indo-Asian collisions in the Nima area of central Tibet. *Geological Society of America (GSA) Bull.* 119, 7/8, p. 917-932.

(online at: <https://www.geo.arizona.edu/sites/www.geo.arizona.edu/files/07-kapp-et-al-nima-GSA.pdf>)

(Geological and geochronologic surveys of Nima area along Jurassic-E Cretaceous Bangong suture of C Tibet provides records of contractional deformation and sedimentation during M Cretaceous and M Tertiary)

Khan, S.D., D.J. Walker, S.A. Hall, K.C. Burke, M.T. Shah & L. Stockli (2009)- Did the Kohistan-Ladakh island arc collide first with India? *Geological Society of America (GSA) Bull.* 121, 3-4, p. 366-384.

(Kohistan-Ladakh block in NW Himalayas long recognized to represent a Jurassic- Cretaceous intra-oceanic island arc. Paleomagnetic data suggest arc close to Equator in Late Cretaceous- E Paleocene. New U-Pb zircon age show that calc-alkaline volcanic arc activity ended by 61 Ma, interpreted as time of collision of Kohistan with India. Final incorporation of India + Kohistan-Ladakh block into Asia at Shyok suture, at ~50 Ma (post-collisional granites ages 47 Ma- 41 Ma in N Kohistan; 51 Ma along Yarlung-Tsang Po suture between India and S Lhasa))

Krishna, J., S. Kumar & L.B. Singh (1982)- Ammonoid stratigraphy of the Spiti Shale (Upper Jurassic), Tethys Himalaya, India. *Neues Jahrbuch Geologie Palaontologie, Monatshefte* 1982, 10, p. 580-592.

(online at: http://jurassic.ru/pdf/krishna_singh1982_j_spiti.pdf)

(Spiti Shale of the Malla Johar area, Uttar Pradesh, N India, part of the Tethyan Himalayan sequence at N margin of India). Divided into: (1) Lower Spiti Shale (Oxfordian- ?Kimmeridgian, with abundant belemnites (incl. Belemnites gerardi group) and (2) Upper Spiti Shale rich in ammonites (incl. U Tithonian Blanfordiceras wallichi, etc.). Upper part with five distinct ammonoid assemblages ranging from lowest Tithonian to Berriasian-Valanginian. Like other parts of Tethys Himalayan and SE Asian regions, no positive proof of Kimmeridgean)

Laskowski, A.K., P. Kapp, L. Ding, C. Campbell & X. Hui Liu (2016)- Tectonic evolution of the Yarlung suture zone, Lopu Range region, southern Tibet. *Tectonics* 36, 1, p. 108-136.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016TC004334>)

(In India-Asia (Yarlung) suture zone evidence for Late Jurassic or Early Cretaceous subduction initiation followed by E Cretaceous fore-arc extension. Ophiolitic meange indicates ophiolites in suprasubduction zone position prior to Late Cretaceous time. Gangdese arc granitoids (U-Pb ages of 49-37 Ma) intrude subduction-accretion melange, recording Eocene S-ward trench migration after collision initiation. Jurassic-Eocene Yarlung suture tectonics with multiple cycles of slab rollback, breakoff, and shallow underthrusting?)

- Lei, M., J. Chen & C. Li (2022)- Geochemical evidence for the Eocene surface uplift of the southern Lhasa subterrane, southern Tibet and the implications. *Lithos* 434-435, 106919, p. 1-14.
(*Eocene (45-41 Ma) granitic plutons in S Tibet: Aima diorites and Huo'er pluton products of last stage of magmatism related to break-off of subducted Neo-Tethyan oceanic slab. Crust of S Lhasa subterrane thickened during Eocene, mainly caused by underplating of mafic magmas also by thrust-related accretion of continental crust of Indian terrane to Lhasa terrane. Eocene thickened crust triggered surface uplift of region in Eocene*)
- Lei, M., J. Chen, D. Wang, Y. Luo & Y.X. Liu (2023)- An early Eocene magmatic event in southern Tibet triggered by oceanic slab break-off: evidence from ocean island basalt-like mafic rocks. *Contributions to Mineralogy and Petrology* 178, 6, p.
(*Zhongba basalts response to slab break-off of Neo-Tethys oceanic lithosphere at ~52 Ma (E Eocene). Slab break-off triggered magmatic flare-up and other geological processes (e.g., decrease in velocity of Indian Plate) in S Tibet during Eocene (45 Ma timing suggested by W.Q. Ji et al. (2016))*)
- Leier, A. L.; P. Kapp, G.E. Gehrels & P. DeCelles (2007)- Detrital zircon geochronology of Carboniferous–Cretaceous strata in the Lhasa terrane, Southern Tibet. *Basin Research* 19, 3, p. 361-378.
(*Detrital zircon analyses of Late Paleozoic - Cretaceous sedimentary rocks in Lhasa terrane. Lithologies and detrital zircon age- plots of Carboniferous rocks in Lhasa and Qiangtang terranes and Tethyan strata in Himalaya suggest these areas were located close to one another within Gondwanaland*)
- Li, B., W.G. Yang, Z. Yang, L.D. Zhu, N. Li, Y. Zhang, L. Xie & Y.J. Ma (2025)- The Early Jurassic sedimentary records in the Central Lhasa Terrane, southern Tibet: Implications for the subduction and accretion of the Tethys Ocean. *J. Asian Earth Sciences* 281, 106475, p.
(*About M Triassic- Early Jurassic basin in C Lhasa terrane. Mainly andsitic volcanoclastics?, derived from accretionary arcs in Zhikong-Soumdo accretionary complex. Etc.)*
- Li, C., J. We, Z. Zhao, F. Yang, J. Yan, Y. Tian & R. Su (2023)- A residual Middle Triassic oceanic island-seamount in the Maoershan area, Northwest Tibet: implications for the evolution of the Paleo-Tethys Ocean. *Minerals (MDPI)* 13, 12, 1551, p. 1-23.
(*online at: <https://www.mdpi.com/2075-163X/13/12/1551>*)
(*M Triassic oceanic island-seamount in the Maoershan area in W Longmuco-Shuanghu metamorphic complex, (remnant of Paleo-Tethys Ocean in C Tibet), suggesting Longmuco-Shuanghu Paleo-Tethys Ocean remained open during M Triassic. Parts of the oceanic island-seamounts experienced deep subduction, resulting in formation of high-P metamorphic rocks*)
- Li, D., Y. Mai, W. Yang & L. Zhu (2022)- Late Cretaceous adakitic intrusive rocks in the Laimailang area, Gangdese batholith: implications for the Neo-Tethyan Ocean subduction. *Open Geosciences* 14, 1, p. 930-944.
(*online at: <https://www.degruyter.com/document/doi/10.1515/geo-2022-0396/html>*)
(*Cretaceous-Eocene Gangdese batholith in southern Lhasa terrane, Tibet, generally tied to Neotethys subduction from S. Laimailang monzogranite in S Gangdese, with Late Cretaceous (~81 Ma) zircon U-Pb ages and of adakitic affinity (derived from melting of thickened lower continental crust in late Cretaceous)*)
- Li, J., M. Lin, Y. Wu, H. Luo, J. Peng, L. Mu, B. Xu & C. Zhang (2020)- New biostratigraphic framework for the Triassic- Paleogene in the NeoTethys realm of southern Xizang (Tibet), China. *J. Asian Earth Sciences* 202, 104369, p. 1-20.
(*online at: http://www.oidipnoi.com/sourcedb_ivpp_cas/zw/klt/kycg/hshd/202312/P020231019559081520104.pdf*)
(*Extensive synthesis of biostratigraphy zonations of Triassic-Eocene in Qinghai- Xizang plateau region, S Tibet (Neotethys, S of Lhasa Block). Lower Triassic conodonts and ammonites, uppermost Triassic-Lower Jurassic ammonites, U Cretaceous planktonic foraminifera and calcareous nannofossils correlate well with international standards. Incl. occurrences of Maastrichtian Orbitoides-Omphalocyclus, Eocene Nummulites-Alveolina*)
- Li, N., W. Yang, L. Zhu, L. Xie, Y. Zhong, Y. Zhou, Y. Mai & H. Zhang (2022)- Provenance of Late Triassic-Early Jurassic forearc basin in southern Tibet and its tectonic significance. *Episodes* 2022, p. 1-12
(*online at: <https://www.episodes.org/journal/view.html?doi=10.18814/epiugs/2022/022043>*)

(On Late Triassic- E Jurassic arc magmatism in S Gangdese region and timing of Yarlung Zangbo-Ocean subduction (S side of Lhasa Block). Liuqiong Fm Late Triassic- E Jurassic 'foreland basin' deposits of intercalated clastics and volcanics and locally developed limestone, with detrital zircon U-Pb ages of mainly 202-249 Ma, indicating source from Late Triassic- E Jurassic arc magmatic rocks in to N (South Gangdese region), which record of N-ward subduction and S-ward accretion of Yarlung-Zangbo Ocean)

Li, S., C. Guilmette, L. Ding, Q. Xu, J.J. Fu & Y.H. Yue (2017)- Provenance of Mesozoic elastic rocks within the Bangong-Nujiang suture zone, central Tibet: implications for the age of the initial Lhasa-Qiangtang collision. *J. Asian Earth Sciences* 147, p. 469-484.

(Bangong-Nujiang suture zone, separating Lhasa and Qiangtang blocks, in Gaize area, C Tibet. With Upper Triassic-Lower Jurassic turbidites of Muganggri Gp, U Jurassic-Lower Cretaceous sandstone-dominated Wuga and Shamuluo Fms, and U Cretaceous Jingzhushan Fm continental molasse, all separated by unconformities. Youngest detrital zircon ages (max. depositional ages) of Wuga Fm foreland basin deposits ~147-150 Ma and post-collisional Jingzhushan Fm ~79-91 Ma. Wuga Fm mainly sourced from accretionary complex (Muganggri Gp) in N; Jingzhushan Fm sourced from Lhasa, Qiangtang and suture zone. Age of initial Lhasa-Qiangtang collision might be latest Jurassic (~150 Ma).

Li, S., D.J.J. van Hinsbergen, C. Deng, E. Advokaat & R. Zhu (2018)- Paleomagnetic constraints from the Baoshan area on the deformation of the Qiangtang-Sibumasu terrane around the Eastern Himalayan syntaxis. *J. of Geophysical Research: Solid Earth* 123, 2, p. 977-997.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2017JB015112>)

(Sibumasu Block in SE Asia E-ward continuation of Qiangtang Block. New paleomagnetic study on M Jurassic and Paleocene rocks from Baoshan block (N Sibumasu) suggests ~70-80° CW rotation since Paleocene. Previously published paleomagnetic data also suggest N Sibumasu and N Simao elements ~60-80° CW rotation since Paleocene (rotation in Eocene- M Miocene associated with Indochina extrusion + rotation after M Miocene associated with E-W extension in C Tibet). Jurassic and Cretaceous paleomagnetic results suggest Qiangtang/N Sibumasu originally curved structure oriented N60°W in Tibet and N10°W in S Sibumasu)

Li, S. (2024)- Paleomagnetic results from the Early-Middle Jurassic rocks in the Tethyan Himalayas and tectonic implications. *J. Asian Earth Sciences* 265, 106088, p.

(Paleomagnetic study of E-M Jurassic Ningri Fm strata in Zanda area, Tibet (Tethyan Himalayas). Results constrain E-M Jurassic paleolatitude of Tethyan Himalayas to $\sim 19 \pm 4^\circ\text{S}$ (consistent with cratonic India). Combining these results with published paleolatitudes of Lhasa Terrane, Neo-Tethys Ocean expanded by 2300-4200 km between Early and M Jurassic)

Li, S., S.L. Chung, Z. Hou, D. Chew, T. Wang, B. Wang & Y. Wang (2019)- Early Mesozoic Magmatism Within the Tibetan Plateau: implications for the Paleo-Tethyan tectonic evolution and continental amalgamation. *Tectonics* 38, 10, p. 3505-3543.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2019TC005546>)

(E Mesozoic (Triassic) magmatic rocks across much of Tibetan Plateau. Tectonomagmatism requires episodic S-ward opening of multi-Tethys oceans, punctuated by episodes of subduction and collision with two-stages of magmatic evolution and crustal growth)

Li, S., C. Yin, C. Guilmette, L. Ding & J. Zhang (2019)- Birth and demise of the Bangong-Nujiang Tethyan Ocean: a review from the Gerze area of central Tibet. *Earth-Science Reviews* 198, 102907, p.

(Reconstruction of evolution of Bangong-Nujiang Tethyan Ocean (BNTO) between Lhasa and Qiangtang terranes, inferred from dismembered ophiolite bodies, etc. along BN suture zone. BNTO opened in Late Permian (~260 Ma; earliest record of oceanic crust). N-ward subduction of BNTO beneath Qiangtang likely from E Jurassic (~195 Ma). Detrital zircons from Mesozoic arc-sourced strata suggest three episodes of arc magmatism: ~186-170 Ma, ~169-146 Ma and ~129-100 Ma (Jurassic- E Cretaceous) along S Qiangtang margin. Provenance data from Lower Cretaceous strata on N Lhasa margin suggest final closure of BNTO in E Cretaceous (~150-130 Ma) (N.B.: L.Z. Shi et al. (2020) argue for Late Cretaceous closure age of BNTO; G. Wu et al. (2021) argue there was no ocean between Lhasa and Qiantang in Permian-Triassic))

Li, S.M., Q. Wang, D.C. Zhu, R.J. Stern, P.A. Cawood, Q.L. Sui & Z. Zhao (2018)- One or two Early Cretaceous arc systems in the Lhasa Terrane, Southern Tibet. *J. of Geophysical Research: Solid Earth* 123, 5, p. 3391-3413.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2018JB015582>)

(E Cretaceous volcanic rocks from Baingoin-Yanhu arc in N Lhasa Terrane indicate S- dipping subduction of Bangong Tethys. Two distinct calc-alkaline magmatic successions: medium-K basalts and Mg-rich andesites (131-116 Ma; typical arc), and high-K basalts and trachyandesites (116-110 Ma). Likely two arc systems flanking Lhasa Terrane, related to opposed oceanic plate subduction: N-dipping subduction of Neo-Tethys and S-dipping subduction of Bangong Tethys. Compositional change to high-K calc-alkaline volcanism inferred to reflect rollback and breakoff of S-dipping Bangong Tethyan slab)

Li, S.Z., S.J. Zhao, X. Liu, H.H. Cao, S. Yu, S. Li, I. Somerville, S.Y. Yu & Y.H. Suo (2018)- Closure of the Proto-Tethys Ocean and Early Paleozoic amalgamation of microcontinental blocks in East Asia. *Earth-Science Reviews* 186, p. 37-75.

(Proto-Tethys paleo-ocean located between Tarim/N China and Sibumasu /Baoshan blocks opened from rifting of supercontinent Rodinia and mainly closed at end of E Paleozoic. Several continents/microcontinents in ocean. S suture marked by Longmu Co-Shuanghu-Changning-Menglian Suture. Tarim- Alax- N China Block to N of Proto-Tethys Ocean no clear affinity with Gondwana, had S-ward subduction polarity and collided with Gondwana along N margin of Gondwana in E Devonian. Etc.)

Li, X., X.M. Hu, W. An, W., Q. Liu, E. Garzanti & J. Meng (2023)- From Neo-Tethyan convergence to India-Asia collision: radiolarian biostratigraphy of the Cretaceous to Paleocene deep-water Tethys Himalaya. *Newsletters on Stratigraphy* 56, 1, p. 33-52.

(proof online at: www.researchgate.net/publication/359792125_From_Neo-Tethyan_convergence_to_India-Asia_collision_Etc.)
*(Distal North Indian margin deep-water strata just S of Yarlung-Tsangpo suture record evolution of Neotethys Ocean during India-Asia collision. Radiolaria only fossils present, with four zones: (1) *Cecrops septemporatus-Aurisaturnalis carinatus* (late Valanginian- Barremian), (2) *Turbocapsula costata* (Aptian), (3) *Spoletensis* zone (Albian), and (4) RP6a subzone (E Paleocene). India-derived sandstones below provenance reversal from India-to-Asia were deposited on Indian passive margin rather than Neotethys oceanic crust)*

Li, X., Y. Li, C. Wang & A. Matsuoka (2013)- Late Jurassic radiolarians from the Zhongba melange in the Yarlung-Tsangpo suture zone, southern Tibet. *Science Reports Niigata University (Geology)* 28, p. 23-30.

(online at: www.researchgate.net/publication/330079192_Late_Jurassic_radiolarians_from_the_Zhongba_melange Etc.)
(Red bedded chert from melange in Zhongba melange (Neotethys suture) yields well-preserved radiolarian fossils of Hsuum maxwelli zone (JR 7) of Kimmeridgian (Late Jurassic) age)

Li, X., A. Matsuoka, Y. Li, Y. Wei & C. Wang (2016)- Middle Jurassic to Early Cretaceous radiolarian assemblages from the chert blocks in the melange along the Yarlung-Tsangpo Suture Zone, near Zhongba County, Southern Tibet. *News of Osaka Micropaleontologists (NOM), Special Volume* 16, p. 79-94.

(online at: https://researchmap.jp/Amatsuoka/published_papers/12115623/attachment_file.pdf)
(M Jurassic- E Cretaceous radiolaria from red chert blocks in melange from Neotethys suture zone in Tibet)

Li, X., A. Matsuoka, Y. Li, Y. Wei & C. Wang (2018)- Radiolarian-based study on the fabric and the formation process of the Early Cretaceous melange near Zhongba, Yarlung-Tsangpo Suture Zone, southern Tibet. *Island Arc* 28, 1, e12282, p.

(Melanges in Yarlung-Tsangpo Suture Zone represent remnants of Neotethys oceanic plate through subduction and collision. Melange near Zhongba County, S Tibet, allows reconstruction of (Neotethys) ocean plate stratigraphy, including Lower Jurassic limestone within chert sequence accumulated at depth near CCD, Upper Jurassic red thin-bedded chert interbedded with claystone deposited in wide ocean basin, and Lower Cretaceous chert with siliceous mudstone representing middle parts of ocean plate stratigraphy)

Li, X., N. Suzuki, J. Meng, A. Matsuoka, P.O. Baumgartner & C. Wang (2023)- Constraints on the expanse of Greater India in the Early Cretaceous from radiolarians. *Earth Planetary Science Letters* 622, 118413, p.

(Newly discovered E Cretaceous austral radiolarians discovered in Tethys Himalaya (N India passive margin) compare well with non-Tethyan austral faunas from Argo Abyssal Plain, W Australia. Gyangze was under shallow warm-water conditions with typical Tethyan radiolarian fauna until late Valanginian when cold-water species arrived from S. Suggests eastern Greater India extended to Exmouth Plateau (>2400 km) during E Cretaceous)

Li, X., N. Suzuki, Y.C. Zhang, H. Zhang, M. Luo, D.X. Yuan, Q.F. Zheng, W.K. Qie et al. (2024)- The central Qiangtang Metamorphic Belt in northern Tibet is an in-situ Paleo-Tethys Ocean: Evidence from newly discovered Late Devonian radiolarians. *Gondwana Research* 125, p. 49-58.

(Paleogeographic position of N Qiangtang Block and C Qiangtang Metamorphic Belt in Tibet still debated. New Famennian-age radiolarian fauna (Late Devonian) from ophiolitic melange S of Gangtang Co in CQMB strongly suggests that Longmu Co-Shuanghu suture represents main branch of Paleotethys Ocean. Correlation of Late Devonian radiolaria in Tethys realm suggests connection of Longmu Co-Shuanghu suture to Changning-Menglian suture zone in W Yunnan, Chiang Mai-Inthanon and Chanthaburi suture zones in Thailand and Bentong-Raub suture zone in Malay Peninsula. Synchronous advent of Late Devonian radiolarians suggests Paleotethys Ocean may have opened during that time)

Li, Z., L. Ding, A.K. Laskowski, W.B. Burke, Y. Chen, P. Song, Y. Yue & J. Xie (2022)- New paleomagnetic constraints on the Early Cretaceous paleolatitude of the Lhasa Terrane (Tibet). *Frontiers in Earth Science* 10, 785726, p. 1-27.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2022.785726/full>)

(New zircon U-Pb dates from Zonggei Fm volcanics (N Lhasa, magmatic arc) indicate age of ~114-110 Ma (~Albian) and paleolatitude ~13 N°. Intracontinental crustal shortening on Asia side since onset of India-Asia collision 1,770 ± 470 km. Neo-Tethys Ocean reached maximum N-S width of 7,100 ± 530 km at ~132 Ma and shrank to 6,400 ± 550 km at ~115 Ma, consistent with previous estimates based on geophysical images of subducted Neo-Tethyan slab under Eurasia)

Li, Z., L. Ding, P.C. Lippert, P. Song, Y. Yue & D.J. van Hinsbergen (2016)- Paleomagnetic constraints on the Mesozoic drift of the Lhasa terrane (Tibet) from Gondwana to Eurasia. *Geology (GSA)* 44, 9, p. 727-730.

(online at: <https://dspace.library.uu.nl/handle/1874/342300>)

(Paleomagnetic data in Chinese literature provide new paleomagnetic pole from E Jurassic ~180 Ma) Sangri Gp adakite-like volcanics along S margin of Lhasa terrane, and paleolatitude of ~4°S, in middle of Eastern Tethys. This confirms trend in data suggesting Lhasa drifted from Gondwana in Late Triassic instead of Permian time. Results consistent with either an India or Australia provenance of Lhasa)

Li, Z., Y. Li, X. Tan, S. Li, X. Ma, S. Huang, S. Xiao, J. Cheng & J. Zhang (2023)- New palaeomagnetic results of Permian tectonic blocks in the western segment of the Yarlung Zangbo Suture Zone and their tectonic implications. *Geological Journal* 58, p. 2650-2667.

(online at: https://www.researchgate.net/publication/369305505_New_palaeomagnetic_results_of_Permian_tectonic_blocks_in_the_western_segment_of_the_Yarlung_Zangbo_Suture_Zone_and_their_tectonic_implications)

(Western end of ophiolitic melange of 'Neotethys' Yarlung-Zangbo Suture Zone contains common tectonic blocks of reddish and grey Late Permian limestones, interbedded with andesitic basalts. Coral and tropical fusulinids fossils and zircons of samples studied show latest Permian ages (~249-254 Ma). Paleomagnetic study of 83 samples suggests low paleolatitude of ~7.3° S. (similar to position of Sibumasu in latest Permian). Exotic blocks thought to most likely represent seamounts in low latitude of Neotethys (But too old for Neotethys? Dismembered part of S Lhasa block margin?; Similarities with Timor 'Maubisse Terrane?; JTVG))

Liao, S.Y., D.B. Wang, Y. Tang, F.G. Yin, S.N. Cao, L.Q. Wang, B.D. Wang & Z.M. Sun (2015)- Late Paleozoic Woniusi basaltic province from Sibumasu terrane: implications for the breakup of eastern Gondwana's northern margin. *Geological Society of America (GSA), Bull.* 127, 9-10, p. 1313-1330.

(Late Paleozoic detachment of E Cimmerian Sibumasu terrane from Australian Gondwana margin may be initiated by mantle plume of Woniusi basaltic province in Yunnan, SW China (Baoshan Block= N Sibumasu terrane). Woniusi basalt province spread over ~12,000 km² and ~300-500m thick. Zircon U-Pb ages Late

Carboniferous- late E Permian (301-282 Ma), synchronous with basaltic rocks from Panjal Traps, Tethyan Himalaya, Lhasa, and S Qiangtang, forming large, fragmented igneous province, possibly sharing common mantle plume centered in N Greater India. Baoshan Block no thick Permian rift series (basalts mainly E Permian?: overlie glacial diamictite; faunal data suggest post-M Artinskian age (Ueno 2002)?JTvG))

Liao, S.Y., F.G. Yin, Z.M. Sun, D.B. Wang, Y. Tang & J. Sun (2013)- Early Middle Triassic mafic dikes from the Baoshan subterrane, western Yunnan: implications for the tectonic evolution of the Palaeo-Tethys in Southeast Asia. *International Geology Review* 55, 8, p. 976-993.

(Zircon U-Pb data indicate tholeiitic dikes similar to enriched mid-ocean ridge basalts emplaced at N part of Sibumasu terrane at 240± 3 Ma. Mafic dikes interpreted to be generated during suturing of Baoshan (Sibumasu) and Simao (Indochina) subterrane)

Lin, C., J. Zhang, X. Wang, P. Putthapiban, B. Zhang, K. Liu & T. Huang (2020)- Late Triassic back-arc spreading and initial opening of the Neo-Tethyan Ocean in the northern margin of Gondwana: Evidences from Late Triassic BABB-type basalts in the Tethyan Himalaya, Southern Tibet. *Lithos* 358-359, 105408, p.

(Late Triassic tholeiitic basalts from Nieru Fm in Tibet derived from shallow and depleted mantle source, are similar to back-arc basin basalts and indicate extensional back-arc-basin setting along N margin of Gondwana during Late Triassic. Initial opening of Neo-Tethyan Ocean related to S-wards subduction of Paleo-Tethyan oceanic plate and back-arc-basin spreading during the Late Triassic)

Liu, B.P., Q.L. Feng, C. Chonglakmani & D. Helmcke (2002)- Framework of Paleotethyan archipelago ocean of western Yunnan and its elongation towards north and south. *Earth Science Frontiers* 9, 3, p. 161-171.

(Changning Menglian belt of W Yunnan continues N to Gangmacuo suture of NW Tibet and S to cryptic suture in N Thailand. Nan Uttaradit suture of NE Thailand probably extends N, but hidden under Mesozoic Cenozoic red beds of Simao basin. No evidence for stable Simao block during Paleotethys stage: sedimentary melanges consist of oceanic bedded cherts, seamount carbonates and passive margin clastics (Mae Sariang zone of NW Thailand). E Paleotethys probably double main branches. Mae Sariang zone probably connects NW to Luxi ophiolitic melange zone between Baoshan and Tengchong blocks in W Yunnan)

Liu, B.P., Q.L. Feng & N.Q. Fang (1991)- Tectonic evolution of the Paleo-Tethys in Changning-Menglian Belt and adjacent Regions, Western Yunnan. *J. China University of Geosciences* 2, p. 18-28.

Liu, B.P., Q.L. Feng & N.Q. Fang, J. Jia & F. He (1993)- Tectonic evolution of paleo-Tethys poly-island-ocean in the Changning-Menglian and Lancangjiang belts, southwestern Yunnan, China. *Earth Science, Journal of China University of Geoscience* 18, 5, p. 529-539. *(in Chinese, with English Abstract)*

(Changning-Menglian belt between Baoshan-Gengma and Simao-Lincang massifs is suture zone, representing closed branch of Devonian- M Triassic poly-island Paleotethys Ocean. Lincang Massif probably isolated Gondwana-affinity terrane that accreted to W margin of Simao massif in M Permian. May be connected to Nan-Uttaradit suture of N Thailand before Late Permian))

Liu, B.P., Q.L. Feng, N.Q. Fang, J. Jia, F. He, W. Yang & D. Liu (1997)- Tectono-paleogeographic framework and evolution of the Paleotethyan archipelagoes ocean in Changning-Menglian belt, Western Yunnan, China. In: *Devonian to Triassic Tethys in Western Yunnan*, China University of Geosciences Press, p. 1-12.

Liu, D., R. Shi, L. Ding & S.Y. Jiang (2019)- Survived seamount reveals an in situ origin for the Central Qiangtang Metamorphic Belt in the Tibetan Plateau. *J. of Earth Science (China)* 30, 6, p. 1253-1265.

(online at: <http://en.earth-science.net/en/article/doi/10.1007/s12583-019-1250-9>)

(Late Triassic (~ 229 Ma= Carnian) volcanic rocks intercalated and overlain by Triassic limestones near Chabo Co, Tibet (within S margin of C Qiangtang metamorphic belt), possess characteristic lithologies of seamount. OIB-type lavas did not experience high-grade metamorphism; suggesting Chabo Co seamount was detached from subducting Longmu Co-Shuanghu oceanic slab)

Liu, F., W. Lin, Y. Wang, L. Meng, M. Faure, V. Van Nguyen, Q. Wu, Y. Chu, W. Wei et al. (2023)- Heterogeneity of the Ailaoshan- Song Ma ophiolitic melange and its palaeogeographic implications for the evolution of Eastern Palaeo-Tethys. *Tectonophysics* 858, 229848, p. 1-17.
(*Heterogeneous Ailaoshan-Song Ma ophiolitic melange is suture zone between South China Block (SCB) and Indochina Block (IB). Commonly interpreted as branch of eastern Palaeo-Tethys*)

Liu, Q., F. Liu, H. Li & K. Zong (2020)- Remnants of Middle Triassic oceanic lithosphere in the western Indus-Tsangpo suture zone, southwestern Tibet. *Terra Nova* 33, 2, p. 109-119.
(*Discontinuous ophiolites within Indus-Tsangpo suture zone in S Tibet represent remnants of Neo-Tethyan oceanic lithosphere. Presence of gabbro in tectonic melange in southern ophiolitic belt yields age of 243 Ma with $\varepsilon_{\text{Hf}}(t)$ values of +7.9- +13.2. REE pattern resembles normal mid-ocean ridge basalt. Gabbro and surrounding mafic-ultramafic rocks represent remnants of M Triassic oceanic lithosphere in ITSZ, indicating Neo-Tethys Ocean between India and Lhasa terrane existed from at least M Triassic, contrasting with commonly held view that Neo-Tethys Ocean opened along N edge of Gondwana during late Triassic-early Jurassic*)

Liu, T., C. Liu, F. Wu, W. Ji, Chang Zhang, Weiqi Zhang & Zhenyu Zhang (2023)- Timing and mechanism of opening the Neo-Tethys Ocean: constraints from melanges in the Yarlung Zangbo suture zone. *Science China Earth Sciences* 66, p. 2807-2826. (online at: <https://dds.sciengine.com/cfs/files/pdfs/view/1674-7313/8D5884636F2E4B599F324779C9846F52-mark.pdf>)
(*Mafic rocks in Neotethys Yarlung Zangbo suture zone in S Tibet (between Lhasa and India; Neotethys) are ocean island basalt-like, with latest Permian-M Triassic, M-L Jurassic and E Cretaceous ages. Latest Permian (253 Ma) OIB-like block from Zhongba melanges in W is oldest OIB lithology identified in YZSZ melanges, but could be formed during continental rifting to incipient seafloor spreading. Opening of Yarlung Zangbo Neo-Tethys Ocean likely mainly at ~250-243 Ma (E Triassic). Etc.*)

Liu, Y., W. Fan, T. Peng, R. Shi, S. Chen & P. Huangfu (2024)- Spatiotemporal variation of the Cretaceous-Eocene arc magmatism in Lhasa-Tengchong Terrane. *Geophysical Research Letters*, 51, e2024GL108419, p. 1-9.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1029/2024GL108419>)
(*Two parallel Cretaceous- Paleogene magmatic belts in Lhasa-Tengchong terrane. N magmatic belt peak ages of 110 Ma in C and N Lhasa and 120 Ma in E Tengchong, possibly related to tectonic transition from Meso- and Neo-Tethyan double subduction to Neo-Tethyan single subduction. S magmatic belt with flare-ups at 100–85 Ma and 65–45 Ma in E and S Lhasa with juvenile crustal growth, while flare-ups at 75–45 Ma in western S Lhasa and Tengchong record ancient crustal reworking*)

Liu, Y., S. Li, Q. Zhai, Y. Tang, P. Hu, R. Guo, Y. Liu, Y. Wang, S. Yu, H. Cao et al. (2022)- Jurassic tectonic evolution of Tibetan Plateau: A review of Bangong-Nujiang Meso-Tethys Ocean. *Earth-Science Reviews* 227, 103973, p.
(*Jurassic subduction of Bangong-Nujiang Tethys Ocean recognized as significant event in geotectonic evolution of Tibetan Plateau. Geophysical data support tectonic evolution of Bangong-Nujiang Suture Zone (BNSZ) as remnant of Neotethys (with Carboniferous-Permian breakup, Triassic-E Jurassic extension and M-L Jurassic (S-ward?) subduction), which closed in M Jurassic in E, and in C and W BNSZ in late Early Cretaceous*)

Liu, Y., H. Liu, T. Theye & H.J. Massonne (2009)- Evidence for oceanic subduction at the NE Gondwana margin during Permo-Triassic times. *Terra Nova* 21, 3, p.195-202.
(*Blueschist recently recognized within Lhasa terrane Geochem path points to deep subduction of cold oceanic crust probably beneath NE Gondwana margin during Permo-Triassic times. (NB: Lhasa terrane not generally recognized as terrane with a Permo-Triassic active margin?- JTVG)*)

Liu, Y., W. Xiao, B.F. Windley, K. Zhou, R. Li, M. Zhan, M. Sang, H. Yang, X. Jia, Y. Chen et al. (2021)- Three stages of arc migration in the Carboniferous-Triassic in northern Qiangtang, central Tibet, China: Ridge subduction and asynchronous slab rollback of the Jinsha Paleotethys. *Geological Society of America (GSA) Bull.* 133, 11-12, p. 2485-2500.

(online at: https://www.researchgate.net/publication/350114060_Three_stages_of_arc_migration_in_the_Carboniferous-Triassic_in_northern_Qiangtang_central_Tibet_China_Ridge_subduction_and_asynch_Etc.)
(Carboniferous-Triassic magmatism in N Qiangtang, C Tibet, with Carboniferous-Triassic arc- plutonic-volcanic rocks. Three periods of migration, all above S-dipping subduction along northern margin of N Qiangtang Block?: (1) S-ward (312-252 Ma), (2) rapid N-ward (249-237 Ma), and (3) normal N-ward (234-205 Ma) migrations, corresponding to slab geodynamic processes of Jinsha Paleotethys)

Liu, Y., Q. Zhai, P. Hu, Y. Tang & R. Guo (2022)- Subduction initiation of the Bangong-Nujiang Tethys Ocean, Tibetan Plateau. *J. Asian Earth Sciences* 238, 105394, p. 1-19.

(Initiation of subduction of Bangong-Nujiang Meso-Tethys Ocean from Triassic-Jurassic magmatic rocks of C Tibetan Plateau. Early Triassic trachyandesite (248 Ma) from S Qiangtang terrane probably intraplate magma y at passive continental margin during BNTD opening. Late Triassic S-type granodiorite (220 Ma) and M Jurassic SSZ-type gabbro (~165 Ma) from S Qiangtang possible N-ward subduction of BNTD oceanic lithosphere. Etc.)

Liu, Y., Q. Zhai, P. Hu, Y. Tang & H. Lee (2022)- Evolution of the Paleo-Tethys Ocean: Constraints from detrital zircons of the Paleozoic to Triassic clastic rocks in the Qiangtang terrane, Tibetan Plateau. *J. Asian Earth Sciences* 232, 105226, p. 1-13.

(Detrital zircon U-Pb ages and isotopic data from Paleozoic-Triassic succession in Qiangtang terrane. In N Qiangtang subterrane U-Pb ages from 3399 Ma to 233 Ma, with major age peaks of 358 Ma and 266-248 Ma, likely from arc magmatic rocks associated with subduction of Paleo-Tethys oceanic lithosphere. In S Qiangtang U-Pb age peaks of 549-527 Ma, 973-940 Ma and 2504-2470 Ma, similar to zircon grains from Lhasa, Himalaya terranes and Indian Gondwana. N-ward subduction of Paleo-Tethys ocean continuous in Late Devonian-Triassic. Collision between N and S Qiangtang subterrane initiated at ~ 225 Ma (Late Triassic))

Liu, Y.M., J.G. Dai, C.S. Wang, H.A. Li, Q. Wang, & L.L. Zhang (2020)- Provenance and tectonic setting of Upper Triassic turbidites in the eastern Tethyan Himalaya: implications for early-stage evolution of the Neo-Tethys. *Earth-Science Reviews* 200, 103030, p. 1-17.

(U Triassic turbidites interbedded with layered basalts in E Tethyan Himalaya dominated by quartz, lithic fragments and plagioclase grains. Detrital zircon ages with main age populations at 280-210 Ma, 650-450 Ma and 1200-800 Ma, comparable to India margin Langiexue Gp and coeval turbidites from W Myanmar and C Tethyan Himalaya. Permian- Triassic (300-200 Ma) zircons suggest continental magmatic arc. Likely from marine rift basin of Indian passive continental margin with main provenance from Lhasa. Other contemporaneous turbidites from C Tethyan Himalaya with distinct primary sources from India and W Papua).

Luo, A.B., J.J. Fan, Y.J. Hao, H. Li, B.C. Zhang (2020)- Aptian flysch in central Tibet: constraints on the timing of closure of the Bangong-Nujiang Tethyan Ocean. *Tectonics* 39, 12, e2020TC006198, p. 1-42.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/10.1029/2020TC006198>)

(Aptian-age flysch (ca. 126-113 Ma) in M and W segments of (Mesotethys) Bangong-Nujiang suture zone represents N-derived trench deposits of N-dipping Bangong-Nujiang Tethyan subduction zone, immediately prior to Mesotethys Ocean closure at ~113-92 Ma (Albian-Cenomanian) (but Kapp et al. (2007) reported youngest detrital zircon age of 125 Ma in marine turbiditic sandstone of suture zone?))

Luo, A.B., J.J. Fan, B.C. Zhang, J.Z. Zhang, H. Li & M.L. Duan (2021)- From arc-continent collision to ocean closure: Lower Cretaceous Shamuluo Formation in the western segment of the Bangong-Nujiang suture zone, central Tibet. *Geoscience Frontiers* 12, 5, 101207, p. 1-18.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987121000712>)

(Shamuluo Fm in (Mesotethys) Bangong-Nujiang suture zone, Tibet, records transition from oceanic subduction to Lhasa- Qiangtang soft collision. Lower Shamuluo Fm bathyal Berriasian-Hauterivian subunit, overlain by shallow-marine Albian subunit with a.o. *Mesorbitolina lenticularis*. Albian distinct change of sedimentary facies and provenances represents closure of Meso-Tethys)

Luo, A.B., J.J. Fan, D.Y. Sun, H. Wu, Y.P. Yu, B.C. Zhang & Di Shen (2022)- Terminal stage of divergent double subduction: insights from Early Cretaceous magmatic rocks in the Gerze area, central Tibet. *Lithos* 420-421, 106713, p. 1-19.

(Meso-Tethys Ocean (Bangong-Nujiang Tethyan Ocean, between Lhasa and S Qiantang blocks) in C Tibet considered Mesozoic example of Divergent Double Subduction (DDS; similar to Molucca Sea). Albion (~105 Ma) volcanic rocks in Gerze area along both sides of W Bangong-Nujiang suture zone and different types. On N side, varied magmatism, including A-type rhyolites, basaltic latites, basalts, adakites and bimodal volcanic rocks. On S side only A-type rhyolite and magnesia-rich andesite and adakitic intrusions. Spatial and compositional variation may reflect slab breakoff in N branch of Meso-Tethys oceanic slab after ocean closure. Breakoff can cause upwelling of subslab asthenosphere, which leads to a complex magmatic response)

Ma, A., X. Hu, E. Garzanti, Z. Han & W. Lai (2017)- Sedimentary and tectonic evolution of the southern Qiangtang basin: implications for the Lhasa-Qiangtang collision timing. *J. of Geophysical Research: Solid Earth* 122, 7, p. 4790-4813.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/2017JB014211>)

(Mesozoic stratigraphic record of S Qiangtang basin in C Tibet records evolution and closure of Bangong-Nujiang ocean to S ('Mesotethys'). E-M Jurassic carbonate platform, early M Jurassic lithic sandstones (with youngest detrital zircons 183-170 Ma and with felsic volcanic arc detritus) and shoal limestones, all truncated by Bathonian angular unconformity. Arc-trench system developed toward end of E Jurassic. Late Bathonian folding-thrusting (~166 Ma) reflects Qiangtang block collision with Lhasa block)

Ma, A., X. Hu, P. Kapp, M. BouDagher-Fadel & W. Lai (2020)- Pre-Oxfordian (>163 Ma) ophiolite obduction in Central Tibet. *Geophysical Research Letters* 47, 10, e2019GL086650, p. 1-11.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2019GL086650>)

(Age of Bangong-Nujiang (Mesotethys) suture SSZ ophiolite obduction between Lhasa and Qiangtang terranes in C Tibet constrained between age of Oxfordian-Kimmeridgian (<163 Ma; Late Jurassic). Dongqiao Fm, which unconformably overlies B-N suture ophiolites, and age of ophiolite crystallization (189-181 Ma; E Jurassic)). Dongqiao Fm alluvial- shallow marine with Pseudocyclammina lituus, Cladocoropsis mirabilis, Everticyclammina virguliana, etc., and sourced from uplifted Bangong-Nujiang suture ophiolites and sedimentary and metamorphic rocks of Lhasa terrane affinity to S. B-N suture ophiolites obducted soon after crystallization (>163 Ma) onto Lhasa terrane or microcontinent of Lhasa terrane affinity)

Ma, A., X. Hu, P. Kapp, Z. Han, W. Lai & M. BouDagher-Fadel (2018)- The disappearance of a Late Jurassic remnant sea in the southern Qiangtang Block (Shamuluo Formation, Najiango area): Implications for the tectonic uplift of central Tibet. *Palaeogeogr. Palaeoclim. Palaeoecology* 506, p. 30-47.

(Najiango area between Bangong-Nujiang (Mesotethys) suture zone and Qiangtang Block in C Tibet contains Upper Jurassic-Lower Cretaceous sedimentary succession deposited during period of marine regression. Implications for Late Jurassic paleogeography, disappearance of Meso-Tethys sea, and topographic uplift of S Qiangtang Block in C Tibet)

Ma, A., X. Hu, P. Kapp, W. Lai, Z. Han & W. Xue (2020)- Mesozoic subduction accretion history in Central Tibet constrained from provenance analysis of the Muganggri subduction complex in the Bangong-Nujiang suture zone. *Tectonics* 39, 9, e2020TC006144, p. 1-22.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2020TC006144>)

(Muganggri Complex in C Tibet provides record of subduction accretion history between Lhasa and Qiangtang terranes. Three different groups of Triassic-Jurassic sandstone within Muganggri Complex. Strata on N part of Lhasa terrane dominated by U Triassic to Jurassic deep-marine turbiditic clastics, Lower Cretaceous shallow marine sediments, U Cretaceous continental redbeds, etc. Bangong-Nujiang Ocean (Mesotethys) opened prior to Permian (or Late Triassic?; other authors), remained open during M-L Triassic (and most of Jurassic) (with Late Triassic oceanic island arc rocks within B-N suture zone. Etc.))

Ma, X., S. Attia, T. Cawood, W. Cao, Z. Xu & H. Li (2022)- Arc tempos of the Gangdese batholith, southern Tibet. *J. Geodynamics* 149, p. 101897, p. 1-20.

(Gangdese arc activity in S Lhasa Terrane of S Tibet was episodic, displaying two magmatic flare-ups at ~100-80 Ma and ~65-45 Ma (= Neotethys subduction in Cenomanian- E Campanian and Paleocene- M Eocene prior to India collision). (also Jurassic granites and Oligo-Miocene adakitic intrusions at 30-10 Ma). Cretaceous flare-up accompanied by formation of thick arc root (mid-oceanic ridge subduction?), while ~65-45 Ma flare-up likely developed in thinner crust without arc root)

Ma, X., Y. Li, X. Tan, S. Li, Z. Li, J. Zhang, W. Bi, Y. Jia & B. Yang (2024)- Late Triassic paleolatitude of the Southern Qiangtang terrane, central Tibet: Implications for the closure of the Longmu Co-Shuanghu Paleo-Tethyan Ocean. *J. Asian Earth Sciences* 269, 106174, p.

(Late Triassic paleolatitude of S Qiangtang terrane was located at $34 \pm 4^\circ\text{N}$ during Norian time. W part of Longmu Co-Shuanghu Paleo-Tethyan Ocean closed during E Norian. Longmuco-Shuanghu Paleo-Tethyan Ocean closed diachronously from E to W)

Ma, Y., M.J. Dekkers, J.C. Duarte & T. Kusky (2025)- Subduction transference drove the Mesozoic convergence of microcontinents from Gondwana to Asia. *Nature Communications Earth & Environment* 6, 442, p. 1-9.

(online at: <https://www.nature.com/articles/s43247-025-02410-1>)

(Mesozoic evolution of the Tethys Ocean controlled by successive migrations of microcontinents from Gondwana to Eurasia. Permian-Jurassic paleomagnetic data from Lhasa terrane, reveal it drifted away from Gondwana at ~210 Ma, i.e. ~10 Myrs before S-N Qiangtang collision. Similarly, Lhasa- Qiangtang collision preceded rifting of India by ~10 Myrs. Age gaps align well with time required for collision-induced subduction transference, whereby new subduction zone forms outboard of newly accreted terrane and renewed slab-pull can be transmitted to southern segment of younger Tethys slab. Etc.)

Ma, Y., W. Ruan, C. Niu & T. Yang (2022)- Movement history of the microcontinents from the Tibetan Plateau based on paleomagnetic results with sufficient sampling units. *J. of Earth Science (China)* 33, p. 1072-1080.

(High-quality paleomagnetic results show that Qiangtang, Lhasa, and Tethyan Himalaya plates moved N-ward in Late Permian-M Triassic, Jurassic, and Cretaceous, respectively, then accreted to Asia in Late Triassic (N Qiantang collision; Paleotethys closure), Late Jurassic-Early Cretaceous (Lhasa collision; Mesotethys closure) and Paleocene- E Eocene (Tethyan Himalaya collision; Neotethys closure)

Ma, Y., Q. Wang, H. Wang, B. Wan, S. Zhang, C. Deng, D. Zheng, Q. Ren, T. Yang, D. Wu et al. (2022)- Jurassic paleomagnetism of the Lhasa Terrane- implications for Tethys evolution and True Polar Wander. *J. of Geophysical Research: Solid Earth* 127, 12, e2022JB025577, p. 1-23.

(online at: https://www.researchgate.net/publication/365998576_Jurassic_Paleomagnetism_of_the_Lhasa_Terrane_-_Implications_for_Tethys_Evolution_and_True_Polar_Wander)

(Paleomag of Late Triassic limestones and M Jurassic sandstones of Bima Fm in Xigaze area, Tibet, suggest paleolatitude of $8 \pm 4^\circ\text{S}$ at ~180 Ma. Lhasa terrane N-ward motion accelerated from ~2 cm/yr during ~220-180 Ma to ~17 cm/yr during ~180-170 Ma (implies Lhasa block separated from Gondwana by Late Triassic, opening Ceno-Tethys))

Ma, Y., Q. Wang, J. Wang, T. Yang, X. Tan, W. Dan, X. Zhang, L. Ma, Z. Wang, W. Hu et al. (2019)- Paleomagnetic constraints on the origin and drift history of the North Qiangtang Terrane in the Late Paleozoic. *Geophysical Research Letters* 46, 2, p. 689-697.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018GL080964>)

(Paleomag of Late Permian volcanics place N Qiangtang terrane at equatorial paleolatitude ($-7.6 \pm 5.6^\circ\text{N}$) at ~259 Ma. NQT drifted N together with S China block during Permian, had rifted from N margin of Gondwana (Greater India?) during Devonian, and collided with Eurasian terranes by Triassic or before))

Ma, Y., T. Yang, W. Bian, J. Jin, Q. Wang, S. Zhang, H. Wu, H. Li & L. Cao (2018)- A stable southern margin of Asia during the Cretaceous: paleomagnetic constraints on the Lhasa-Qiangtang collision and the maximum width of the Neo-Tethys. *Tectonics* 37, 10, p. 3853-3876.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018TC005143>)

(Paleomagnetic data suggest Lhasa-Qiangtang collision most likely occurred at or near the Jurassic-Cretaceous boundary at ~19°N. Neo-Tethys reached its maximum width (≥ 7450 km) during this time)

Ma, Y., T. Yang, W. Bian, J. Jin, S. Zhang, H. Wu & H. Li (2016)- Early Cretaceous paleomagnetic and geochronologic results from the Tethyan Himalaya: Insights into the Neotethyan paleogeography and the India-Asia collision. *Nature Scientific Reports* 6, 21605, p. 1-11.

(online at: <https://www.nature.com/articles/srep21605>)

(E Cretaceous Sangxiu Fm lava flows ~135- 124 Ma) in Tethyan Himalaya. Paleomagnetic data suggest Tethyan Himalaya was part of Greater India in Early Cretaceous, when Neotethyan Ocean was ~6900 km wide. It rifted from India sometime after ~130 Ma, and India-Asia collision should be a dual-collision process: Tethyan Himalaya-Lhasa terrane collision at ~55 Ma and India-Tethyan Himalaya collision at ~37 Ma)

Malpas, J., M.E. Zhou, R T. Robinson & P.H. Reynolds (2003)- Geochemical and geochronological constraints on the origin and emplacement of the Yarlung Zangbo ophiolites, Southern Tibet. In: Y. Dilek & P.T. Robinson (eds.) *Ophiolites in Earth history*, Geological Society, London, Special Publ. 218, p. 191-206.

(online at: https://www.academia.edu/17392252/Ophiolites_in_Earth_History)

(Indus-Yarlung Zangbo suture zone in S Tibet marks Eocene collision of India continent and Lhasa Block of Eurasia. In C part E-W belt of disrupted ophiolitic and related oceanic volcanic and sedimentary rocks. Almost complete ophiolite sequences near Xigaze. Luobusa ophiolite (~175 Ma?) mantle sequence dominates ophiolite massif (mainly harzburgite with podiform chromitites enveloped by dunite), forming basement to M-Jurassic-M-Cretaceous intra-oceanic volcanic arc ('Zhedong island arc'). Ophiolites suprasubduction zone geochemical signatures. U-Pb zircon age of 126 Ma for quartz diorite from Dazhuqu massif. Amphibolites large blocks in melanges at base of ophiolites considered to be remnants of metamorphic soles produced early in ophiolite obduction process. Ar/Ar geochronology on amphibole/biotite yields ages of 80/90 Ma (= Indian continental margin entering intra-oceanic subduction zone). Continued northward subduction of the remaining portion of the Neo-Tethyan ocean floor beneath S margin of Eurasia produced Gangdese continental arc on S margin of Lhasa Block and led to final closure of Neotethys ocean with India- Eurasia collision in Eocene)

Martin, C.R., O. Jagoutz, R. Upadhyay, L.H. Royden, M.P. Eddy, E. Bailey, C.I. O. Nichols & B.P. Weiss (2020)- Paleocene latitude of the Kohistan-Ladakh arc indicates multistage India-Eurasia collision. *Proc. National Academy of Sciences USA (PNAS)* 117, 47, p. 29487-29494.

(online at: <https://www.pnas.org/doi/epdf/10.1073/pnas.2009039117>)

(Paleomagnetic data show intra-oceanic Trans-Tethyan subduction zone existed S of Eurasian continent and N of Indian subcontinent until at least Paleocene time. System was active between 66 and 62 Ma at paleolatitude of $\sim 8 \pm 5.6^\circ$ N, placing it 600–2300 km S of contemporaneous Eurasian margin. First ophiolite obductions onto N India margin also occurred at this time, demonstrating multistage collision involving two subduction systems. Collision began with collision of India and Trans-Tethyan subduction zone in Late Cretaceous-E Paleocene, followed by collision of India (plus Trans-Tethyan ophiolites) with Eurasia in M Eocene. Total post-collisional convergence 1350-2150 km, limiting N-S extent of NW Greater India to <900 km)

McDermid, I.R.C., J. C. Aitchison, A.M. Davis, T.M. Harrison & M. Grove (2002)- The Zedong terrane: a Late Jurassic intra-oceanic magmatic arc within the Yarlung-Tsangpo suture zone, southeastern Tibet. *Chemical Geology* 187, p. 267-277

(online at: http://sims.ess.ucla.edu/PDF/Mcdermid_et_al_ChemGeol_2002.pdf)

(Igneous and volcanoclastic rocks along Yarlung-Tsangpo suture zone at S side of Lhasa terrane in SE Tibet. are remnants of Late Jurassic- M Cretaceous Zedong terrane intra-oceanic island arc. Mean age ~157 Ma)

Meng, Y., H. Yuan, Z. Wang & Y. Wei (2023)- Magmatic response to slab breakoff of the Neo-Tethyan ocean: constraints from Eocene diorites and gabbros in the southern Lhasa terrane, Tibet. *J. Asian Earth Sciences* 251, 105673, p. 1-14.

(In middle segment of S Lhasa terrane two episodes of Eocene magmatism: ~55 Ma and ~50 Ma. The ~55 Ma Gaga diorite-gabbro with adakitic features formed by partial melting of Neo-Tethyan oceanic slab and underwent amphibole fractional crystallization, and exhibits more prominent arc-type characteristics than ~50

Ma intrusives in adjacent areas. 55 Ma Gaga pluton formed during initial slab breakoff, the ~ 50 Ma pluton during late stage of slab breakoff)

Metcalf, K. & P. Kapp (2017)- The Yarlung suture melange, Lopu Range, southern Tibet: provenance of sandstone blocks and transition from oceanic subduction to continental collision. *Gondwana Research* 48, p. 15-33.

(Siliciclastic matrix tectonic melange in W Yarlung suture S Tibet includes abundant blocks of ocean plate stratigraphy and sparse blocks of sandstone. Metapelite and metabasite blocks in melange exhibit lower greenschist facies mineral assemblages, indicating they were not deeply subducted. Gradational transition in structural style from block-in-matrix melange in NE to S-vergent Tethyan thrust belt in SW. No arc-affinity sandstone blocks incorporated into subduction complex until India-Asia collision at ~ 59 Ma when Xigaze forearc basin became overfilled and Tethyan Himalayan strata entered trench. As collision progressed, gradual transition in structural style from block-in-matrix melange formation to imbricate-style thrust belt formation)

Otofuji, Y., C.L. Mu, K. Tanaka, D. Miura, H. Inokuchi, R. Kamei, M. Tamai, K Takemoto et al. (2007)- Spatial gap between Lhasa and Qiangtang blocks inferred from Middle Jurassic to Cretaceous paleomagnetic data. *Earth Planetary Science Letters* 262, 3-4, p. 581-593.

(online at: https://www.academia.edu/74281603/Spatial_gap_between_Lhasa_and_Qiangtang_blocks_inferred_from_Middle_Jurassic_to_Cretaceous_paleomagnetic_data)

(Paleomagnetic results from M Jurassic red sandstones of Sangba Fm near NE border of Lhasa Block indicate area was located at $7.7^{\circ}\text{N} \pm 7^{\circ}$ during M Jurassic the study. Comparisons suggest Lhasa Block was located S of Qiangtang Block at latitudinal difference of $31 \pm 11^{\circ}$. Until Cretaceous, large gap of >1200 km between Lhasa and Qiangtang Blocks, which vanished in Tertiary. Gap similar to that reported from Shan-Thai Block ($\sim 25.4^{\circ}\text{N}$). New reconstruction model with Lhasa, Shan-Thai and Qiangtang blocks shown in respective order from S to N along S margin of the Asian continent. During India-Asia collision E-ward extrusion of Shan-Thai Block from area between Qiangtang and Lhasa blocks.)

Pearce, J.A. & W.M. Deng (1988)- The ophiolites of the Tibetan Geotraverses, Lhasa to Golmud (1985) and Lhasa to Kathmandu (1986). *Philosophical Transactions Royal Society London, A*, 327, 1594, p. 215-238

(Ophiolite belts found in Tibet along Zangbo, Banggong and Jinsha River Sutures and in Anyemaqen mountains (E extension of Kunlun mountains)

Pullen, A., P. Kapp, G.E. Gehrels, L. Ding & Q. Zhang (2011)- Metamorphic rocks in central Tibet: Lateral variations and implications for crustal structure. *Geological Society of America (GSA) Bull.* 123, 3-4, p. 585-600.

(Tectonic melange of Triassic age with blueschist- and eclogite-bearing blocks within greenschist-facies matrix exposed over an E-W distance of ~600 km in central Qiangtang terrane, C Tibet (Paleotethys suture zone))

Qiao, F., H.P. Xu & Y.C. Zhang (2019)- Changhsingian (Late Permian) foraminifers from the topmost part of the Xiala Formation in the Tsochen area, central Lhasa Block, Tibet and their geological implications. *Palaeoworld* 28, 3, p. 303-319.

(Uppermost Xiala Fm in Aduogabu area, C Lhasa Block, with foraminiferal fauna dominated by Colaniella, indicating Changhsingian (Late Permian) age. Presence of Colaniella, Reichelina and absence of typical tropical Palaeofusulina indicate Lhasa Block has not merged into Equatorial regions during Changhsingian. Widespread Guadalupian and Lopingian (M-L Permian) carbonates with warm-water faunas in Lhasa Block contrasts with contemporaneous sequences in S Qiangtang Block and Gondwana margin, suggesting both Bangong-Nujiang Ocean and Neotethys Ocean opened by Guadalupian and Lopingian)

Qian, Q., J. Hermann, F. Dong, L. Lin & B. Sun (2020)- Episodic formation of Neotethyan ophiolites (Tibetan plateau): Snapshots of abrupt global plate reorganizations during major episodes of supercontinent breakup? *Earth-Science Reviews* 203, B9, 103144, p.

(Neotethyan (incl. Mesotethys?; JTvG) ophiolites along (Mesotethys) Bangong-Nujiang and (Neotethys) Yarlung Tsangpo sutures in Tibet mostly of supra-subduction zone (SSZ) type. E Jurassic Bangong-Nujiang ophiolites formed in forearc settings during subduction initiation, while M Jurassic- E Cretaceous Bangong-

Nujiang ophiolites and E Cretaceous Yarlung Tsangpo ophiolites formed in forearc settings at pre-existing subduction zones. Formation of Neotethyan SSZ ophiolites from E Mediterranean to SE Asia and formation of associated metamorphic rocks temporally coincided with major supercontinent breakup events: (1) initial breakup of Pangea in C Atlantic and westernmost Tethys (~190 Ma; E Jurassic); (2) separation of W and E Gondwana (170–160 Ma; M-L Jurassic); (3) breakups of E and W Gondwana (135–125 Ma; E Cretaceous); and (4) final breakup of Gondwana (104–96 Ma; mid-Cretaceous). Abrupt global plate reorganizations may have triggered episodic formation of Neotethyan SSZ ophiolites and rapid exhumation of metamorphic rocks in subduction zones)

Replumaz, A. (1999)- Reconstruction de la zone de collision Inde-Asie, Etude centrée sur l'Indochine. Ph.D. Thesis, Université Paris 7, p. 1-230. (*Unpublished*)
(*'Reconstruction of the India- Asia collision zone- a study centered on Indochina'*)

Replumaz, A., F.A. Capitanio, S. Guillot, A.M. Negredo & A. Villasenor (2014)- The coupling of Indian subduction and Asian continental tectonics. *Gondwana Research* 26, 2, p. 608-626.
(online at: https://www.researchgate.net/publication/261763195_The_coupling_of_Indian_subduction_and_Asian_continental_tectonics)
(*Reconstruction of India-Asia subduction-continent deformation history, using tomography, etc. Major breakoff between India and Tethys Ocean at ~45 Ma. In W vertical slab continuous to continent overrides deeper detached Tethys slab; in E no slab imaged. After Tethys slab broke off, subduction only resumed in C of margin. Second breakoff event detached C Indian slab from margin at ~15 Ma, which renewed Indian lithosphere underthrusting below Asia. Breakoff followed by large stresses in upper plate interiors, propagating at large distance from margin, along belt oriented at ~45° from trench. Successive strike-slip faulting across Asian continent, in agreement with models*)

Replumaz, A., S. Guillot, A. Villasenor & A.M. Negredo (2013)- Amount of Asian lithospheric mantle subducted during the India/Asia collision. *Gondwana Research* 24, p. 936-945.
(online at: https://www.researchgate.net/publication/277534247_Amount_of_Asian_lithospheric_mantle_subducted_during_the_IndiaAsia_collision)
(*Seismic tomography suggests existence of three Asian continental slabs. Asian continental subduction could accommodate up to 45% of Asian convergence; rest of convergence possibly accommodated by extrusion and shallow subduction/ underthrusting processes. Continental subduction major lithospheric process in intraplate tectonics of supercontinent like Eurasia*)

Replumaz, A., A.M. Negredo, S. Guillot & A. Villasenor (2010)- Multiple episodes of continental subduction during India/Asia convergence: insight from seismic tomography and tectonic reconstruction. *Tectonophysics* 483, p. 125-134.
(online at: https://www.researchgate.net/publication/222568391_Multiple_episodes_of_continental_subduction_during_IndiaAsia_convergence_Insight_from_seismic_tomography_and_tectonic_reconstruction)
(*Tomographic anomalies at <1100 km under India/Asia collision zone interpreted as subducted- collided continental slabs, and used here to constrain evolution of episodes of continental subduction. In W part two episodes of steep subduction of N margin of India: (1) starting at ~40-30 Ma and ending by slab breakoff at ~15 Ma; (2) subduction beneath Hindu Kush mountains since ~8 Ma. E of collision zone, beneath Burma and Andaman Sea, two episodes of SE-ward extrusion followed by subduction. Extruded portions initially located along N margin of India*)

Replumaz, A., A.M. Negredo, A. Villasenor & S. Guillot & (2010)- Indian continental subduction and slab break-off during Tertiary collision. *Terra Nova* 22, 4, p. 290-296.
(online at: https://www.researchgate.net/publication/227520932_Indian_continental_subduction_and_slab_break-off_during_Tertiary_Collision)
(*Prominent P-wave high-velocity anomaly under India between depths of ~450-900 km related to subduction event. We infer that large portion of NW margin of India initiated subduction at 35 ± 5 Ma along 1500-km-long WNW–ESE striking zone and ended with progressive slab break-off process. Break-off started probably around 25 Ma at W end of slab and propagated E-wards until complete break-off at ~15 Ma*)

Replumaz, A. & P. Tapponnier (2003)- Reconstruction of the deformed collision zone between India and Asia by backward motion of lithospheric blocks. *J. of Geophysical Research: Solid Earth* 108, B6, p. 101029-101053.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2001JB000661>)

Reconstructions of SE Asia block motions from India to Taiwan since ~50 Ma. Extrusion absorbed ~30% of convergence between India and Siberia during entire collision span, but varied with time)

Reuber, I. (1989)- The Dras arc: two successive volcanic events on eroded oceanic crust. *Tectonophysics* 161, 1-2, p. 93-106.

(Dras volcanic arc is recognized as intra-oceanic arc system in W part of Indus suture zone and links Ladakh batholith to Kohistan arc. Ultramafics probably oceanic substratum of these volcanics. Dras I volcanoclastic series slates and carbonates, assigned to Albo-Cenomanian, as dated by orbitolines. Unconformably overlain by Dras II pyroclastics which grade S-ward into volcanic breccia, Etc.)

Robertson, A. & P. Degan (1994)- The Dras arc Complex: lithofacies and reconstruction of a Late Cretaceous oceanic volcanic arc in the Indus Suture Zone, Ladakh Himalaya. *Sedimentary Geology* 92, 1-2, p. 117-145.

(Volcanoclastic sediments related to Cretaceous Neotethyan intra-oceanic volcanic arc successions of Dras arc Complex in Indus Suture Zone in Ladakh Himalayas, N India. Mainly Late Cretaceous (Aptian-Paleocene?) age. Passing S-wards into a proximal to distal forearc apron; N-dipping subduction zone. Underlain by dissected Late Jurassic? oceanic crust and mantle)

Ruan, T., Z.J. Bai, W.G. Zhu & S.J. Zheng (2025)- Multi-stage partial melting and melt metasomatism in the formation of the Luobusa ophiolite (Southern Tibet). *J. Asian Earth Sciences* 277, 106394, p. 1-18.

(online at: <https://www.sciencedirect.com/science/article/pii/S1367912024003894>)

(Luobusa ophiolite is one of Cretaceous ophiolites cropping out along E Yarlung-Zangbo Suture Zone in S Tibet, representing lithospheric fragments of Neo-Tethys Ocean. Also hosts largest chromite deposit in Tibet/China. Petrogenesis of peridotites linked to two-stage mantle evolution from Mid-Ocean Ridge peridotites (MORP; lherzolites) to Supra-Subduction Zone peridotites (SSZP; (porphyroblastic harzburgites))

Scharer, U., R.H. Xu & C.J. Allegre (1984)- U-Pb geochronology of Gangdese (Transhimalaya) plutonism in the Lhasa-Xigaze region, Tibet. *Earth Planetary Science Letters* 69, p. 311-320.

(Plutons from Lhasa-Xigaze segment of Gangdese (Transhimalaya) belt. Two diorites E of Xigaze with zircon ages of 93.4 and 94.2 Ma. Two granodiorites SW of Lhasa with ages of ~41-42 Ma. Magmatic activity lasted from mid-Cretaceous (Cenomanian) to Eocene (Lutetian), tied to subduction of Tethys oceanic lithosphere under Eurasia plate. If correct, collision of India with Eurasia postdates 41 Ma)

She, Z., C. Ma, Y. Wan, J. Zhang, M. Li, L. Chen, W. Xu, Y. Li, L. Ye & J. Gao (2012)- An Early Mesozoic transcontinental palaeoriver in South China: evidence from detrital zircon U-Pb geochronology and Hf isotopes. *J. Geological Society, London*, 169, p. 353-362.

(Late Triassic- E Jurassic fluvial sandstones from S China Craton basins with four similar detrital zircon age populations: 2.6-2.4 Ga, 2.0-1.7 Ga (with remarkable age peaks at ~1.85 Ga), 850-700 Ma and 480-210 Ma. Hf values between -22.5 and +3.6, suggest derivation from reworked Archaean crust and minor late Paleoproterozoic juvenile crustal additions. Correlate well with E Cathaysia Block (not Yangtze). Similarities in provenance of Triassic- Jurassic around S China Craton delineate E-W sediment belt from Korea to W China and ~2000km long W-draining transcontinental paleo-river feeding basins in Korea, S and W China)

Shen, S., N.W. Archbold, G.R. Shi & Z.Q. Chen (2000)- Permian brachiopods from the Selong Xishan section, Xizang (Tibet), China Part 1: Stratigraphy, Strophomenida, Productida and Rhynchonellida. *Geobios* 33, 6, p. 725-752.

(online at: www.academia.edu/27156072/Permian_brachiopods_from_the_SelongXishan_section_Xizang_Tibet_China_Part_1_Stratigraphy_Strophomenida_Productida_and_Rhynchonellida)

(M-L Permian brachiopod fauna of 42 species recorded from limestones of Selong Gp in S Xizang (Tibet). Various new species. Age Capitanian- Changhsingian. Three brachiopod assemblages)

Shen, S., S. Dongli & G.R. Shi (2003)- A biogeographically mixed late Guadalupian (late Middle Permian) brachiopod fauna from an exotic limestone block at Xiukang in Lhaze county, Tibet. *J. Asian Earth Sciences* 21, p. 1125-1137.

(online at: https://www.academia.edu/7238028/A_biogeographically_mixed_late_Guadalupian_late_Middle_Permian_brachiopod_fauna_from_an_exotic_limestone_block_at_Xiukang_in_Lhaze_county_Tibet)

(Km-size late M-U Permian limestone blocks in deformed Triassic flysch deposits in Indus-Tsangbo suture, Tibet, may be from carbonate build-up or seamount on oceanic crust. Fauna transitional between warm-water Cathaysian and cold- temperate Gondwanan faunas ('anti-tropical', peri-Gondwanan). Stenoscisma timorense, S. purdoni and ammonoid Timorites present, largely cool bi-temperate taxa, occurring in Basleo (W Timor), Japan, Tibet, Iran and W Texas. W Timor assigned to transitional Cathaysian- Gondwanan Cimmerian realm in M Permian (Shi and Archbold, 1995))

Shen, S.Z., G.R. Shi & N.W. Archbold (2003)- A Wuchiapingian (Late Permian) brachiopod fauna from an exotic block in the Indus-Tsangpo suture zone, southern Tibet, and its palaeobiogeographical and tectonic implications. *Palaeontology* 46, 2, p. 225-256.

(online at: <http://onlinelibrary.wiley.com/doi/10.1111/1475-4983.00296/pdf>)

(Late Permian (Wuchiapingian) brachiopod fauna from exotic reddish crinoidal limestone block in Indus-Tsangpo suture zone in S Tibet (= suture between Eurasian/Lhasa Block and Indian Plate). Comparable with faunas in Salt Range of Pakistan, Chitichun Lst in S Tibet and Basleo area of W Timor (incl. 'antitropical' peri-Gondwanan brachiopod species Stenoscisma purdoni and S. timorense, etc.). Fauna mixed peri-Gondwanan and Cathaysian character, possibly seamount biota originally from S margin of Neotethys in Late Permian, displaced and sandwiched into younger marine deposits in Cenozoic India- Eurasia collision)

Shi, L.Z., J.I. Huang & W. Chen (2020)- Birth and demise of the Bangong–Nujiang Tethyan Ocean: a review from the Gerze area of Central Tibet: Comment. *Earth-Science Reviews* 208, 103209, p.

(Commentary on S. Li et al. (2019) paper) Bangong-Nujiang Meso-Tethyan Ocean (BNMTO) suture zone between Lhasa and Qiantang terranes contains extensive mid-Cretaceous ophiolite fragments, Cretaceous marine sediments, along with M-Cretaceous magmatic arc (as late as 94 Ma) in S Qiantang margin, indicates BNMTO did not close until Late Cretaceous, consistent with paleomagnetic data)

Song, P., L. Ding, J Li, Y. Yue & J. Xie (2024)- Unraveling the Lhasa-Qiantang collision in Western Tibet: insights from geochronological and paleomagnetic analyses. *Geophysical Research Letters* 51, 14, e2024GL110264, p. 1-12.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024GL110264>)

(Lhasa-Qiantang collision in Tibet closed Meso-Tethys Ocean, but exact timing debated. Geochronological and paleomagnetic analyses on Cretaceous volcanics from W Qiantang yield paleolatitude of $\sim 30.5 \pm 5^\circ\text{N}$ for W Qiantang at ~ 110 -100 Ma (Albian). W Qiantang likely stationary during ~ 136 -34 Ma. W Lhasa N-ward motion during E Cretaceous dropped from ~ 12.3 cm/yr to nearly zero. Lhasa-Qiantang collision in W Tibet at ~ 132 Ma (Valanginian- Hauterivian). Crustal shortening of $\sim 1,000$ km between Lhasa and Qiantang during E Cenozoic)

Song, P., L. Ding, Z. Li, P.C. Lippert, T. Yang, X. Zhao, J. Fu & Y. Yue (2015)- Late Triassic paleolatitude of the Qiantang block: implications for the closure of the Paleo-Tethys Ocean. *Earth Planetary Science Letters* 424, p. 69-83.

(online at: <https://kd.nsf.gov.cn/paperDownload/1000023507598.pdf>)

(U Triassic Jiapila Fm volcanics on N edge of Qiantang block of C Tibet (34.1°N) dated to 204-213 Ma. Paleomagnetic data suggest Late Triassic latitude for block at $31.7 \pm 3.0^\circ\text{N}$. Closure of Paleo-Tethys Ocean at longitude of Qiantang block most likely in Late Triassic (similar results by Yu et al, 2022))

Song, P., L. Ding, Z. Li, P.C. Lippert & Y. Yue (2017)- An early bird from Gondwana: paleomagnetism of Lower Permian lavas from northern Qiantang (Tibet) and the geography of the Paleo-Tethys. *Earth Planetary Science Letters* 475, p. 119-133.

(online at: <https://www.sciencedirect.com/science/article/pii/S0012821X17304016>)

(Paleomagnetic data from Lower Permian Kaixinling Gp lavas on N Qiangtang block suggest paleolatitude of $21.9 \pm 4.7^\circ\text{S}$ at $\sim 297\text{ Ma}$. Corroborates earlier hypothesis that N Qiangtang block rifted away from Gondwana before Permian, and accreted to Tarim- N China continent by Norian time. Total N-ward drift $\sim 7000\text{ km}$ over $\sim 100\text{ My}$ ($\sim 7\text{ cm/yr}$). N Qiangtang no Laurasian affinity. C Qiangtang metamorphic belt possible intra-Qiangtang suture that developed at S latitudes outboard of Gondwanan margin)

Spicer, R.A., Tao Su, P.J. Valdes, A. Farnsworth, F.X. Wu, G. Shi, T.E.V. Spicer & Z. Zhou (2021)- Why ‘the uplift of the Tibetan Plateau’ is a myth. National Science Review (China), 8, nwaa091, p. 1-19.

(online at: <https://pmc.ncbi.nlm.nih.gov/articles/PMC8288424/pdf/nwaa091.pdf>)

(Often-used phrase ‘uplift of the Tibetan Plateau’ implies a flat-surfaced Tibet that rose as coherent entity, driven entirely by collision and N-ward movement of India. Growth of Tibet was complex process involving mostly Mesozoic collisions of several Gondwanan terranes with southern margin of Asia, thickening crust and generating complex relief before arrival of India)

Sun, G., X. Hu, Y. Xu & M.K. BouDagher-Fadel (2019)- Discovery of Middle Jurassic trench deposits in the Bangong-Nujiang suture zone: implications for the timing of Lhasa-Qiangtang initial collision. Tectonophysics 750, p. 344-358.

(Conglomeratic Gamulong Fm in western Bangong-Nujiang suture deposited in submarine fan environment. Youngest detrital zircon ages and fossils from limestone pebbles determine M Jurassic age ($\sim 166\text{ Ma}$). Zircons similar to Qiangtang terrane. Represents sediment recycling in trench, likely due to tectonic event (collision?))

Uhlig, V. (1910)- Die Fauna der Spiti-Schiefer des Himalaya, ihr geologisches alter und ihre Weltstellung. Denkschriften der kaiserlichen Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Klasse, Vienna, 85, p. 531-609.

(Text online at: https://www.zobodat.at/pdf/DAKW_85_0531-0609.pdf)

(‘The fauna of the Spiti shales of the Himalayas, their geological age and global significance’. Spiti shales of the northern parts of the Central Himalayas belt in N India (and Nepal- S Tibet) with M-L Jurassic ammonites (Perisphinctes, Phylloceras, Blanfordia wallichi, etc.) and belemnites (Belemnites gerardi, etc.) assemblages that are remarkably similar to marine Jurassic assemblages from Sula Islands in E Indonesia (Spiti shales now viewed as parts of the ‘Tethyan Himalayas’ (from N India (Zaskar, Spiti) to Nepal (Thakkola)- to southernmost Tibet), deposited at the N margin of India continent, while Sula islands Jurassic formed at the N margin of the New Guinea sector of Gondwana (= Gondwanan southern margin of Neotethys); JTVG)

Van Hinsbergen, D.J.J. (2022)- Indian plate paleogeography, subduction and horizontal underthrusting below Tibet: paradoxes, controversies and opportunities. National Science Review (China) 9, 8, nwac074, p. 1-19.

(online at: <https://academic.oup.com/nsr/article/9/8/nwac074/6571937>)

(Review of India- Asia collision zone. After initial collision around 60-55 Ma, 1000s of km of post-collisional subduction occurred arrival of unsubductable India continental lithosphere that currently horizontally underlies Tibet, but no orogen-wide geological record of oceanic subduction. Etc.)

Van Hinsbergen, D.J.J., P. Kapp, G. Dupont-Nivet, P.C. Lippert, P.G. Decelles & T.H. Torsvik (2011)- Restoration of Cenozoic deformation in Asia and the size of Greater India. Tectonics 30, 5, TC5003, p. 1-31.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2011TC002908>)

(Reconstruction of India- SE Asia collision. 250 km of Indochina extrusion from 30-20 Ma. Estimates for pre-collision size of Greater India far exceed documented shortening in Himalaya, suggesting much of Greater India was consumed by subduction or underthrusting, without leaving geological record at surface)

Van Hinsbergen, D.J.J., P.C. Lippert, G. Dupont-Nivet, N. McQuarrie, P.V. Doubrovine, W. Spakman & T.H. Torsvik (2012)- Greater India Basin hypothesis and a two-stage Cenozoic collision between India and Asia. Proc. National Academy of Sciences USA 109, 20, p. 7659-7664.

(online at: <https://www.pnas.org/doi/10.1073/pnas.1117262109>)

(Since 52 Ma, India and Asia plates have converged up to 3600 km, but upper crustal shortening from geological record of Asia and Himalaya much less. Discrepancy explained by subduction of extended continental and oceanic Indian lithosphere within Himalaya between ~ 50 -25 Ma. At $\sim 50\text{ Ma}$ “India”-Asia

collision was collision of Tibetan-Himalayan microcontinent with Asia, followed by subduction of largely oceanic Greater India Basin along subduction zone at location of Greater Himalaya. "Hard" India-Asia collision with thicker Indian continental lithosphere around 25-20 Ma)

Virdi, N.S. (1986)- Indus-Tsangpo suture in the Himalaya: crustal expression of a palaeo-subduction zone. *Annales Societatis Geologorum Poloniae* 56, p. 3-31.

(online at: <https://geojournals.pgi.gov.pl/asgp/article/download/12155/10629>)

(ITSZ 50-60 km wide and extends from Kohistan through Ladakh to S Tibet and represents line along which Indian plate embraced Tibetan plate after its N-ward drift during Mesozoic and its collision during Eocene. ITSZ represents site of an old subduction zone which lay at S margin of Tibet)

Wang, B., C.M. Xie, C. Yakymchuk, Y.S. Dong, Y.H. Song & M.L. Duan (2023)- Opening of the Sumdo Paleo-Tethys Ocean and rifting of the Lhasa terrane from Gondwana: insights from early Carboniferous magmatism in southern Tibet. *Geological Society of America (GSA) Bull.* 136, 1-2, p. 521-546

(online at: https://www.researchgate.net/publication/369991972_Opening_of_the_Sumdo_Paleo-Tethys_Oc)

(Petrogenesis of Lhasa Terrane meta-basalt (Tangjia) and meta-gabbro (Sumdo area) suggests origin from asthenospheric mantle with minor contributions from mantle, in intracontinental rift setting. Zircon ages of ~338 Ma and ~345 Ma. Sumdo Paleo-Tethys Ocean was limited oceanic basin in E Lhasa terrane which opened in E Carboniferous, driven by pull from N-ward Paleotethys oceanic slab subduction. Opening of Neo-Tethys Ocean and separation of Lhasa terrane from Australian Gondwana in M Permian)

Wang, C., L. Ding, F.L. Cai, H.Q. Wang, L.Y. Zhang & Y.H. Yue (2022)- Evolution of the Sumdo Paleo-Tethyan Ocean: constraints from Permian Luobadui Formation in Lhasa terrane, South Tibet. *Palaeogeogr. Palaeoclim. Palaeoecology* 595, 110974, p. 1-17.

(Existence of (rel. small) Sumdo Paleo-Tethyan Ocean inferred from (ultra-)high pressure metamorphic belt and dismembered ophiolite bodies between S and N Lhasa terranes. Luobadui Fm volcanics in Lhasa terrane suggests source transition from depleted mantle source to enriched mantle source, indicating continental-arc subduction. SPTO initially opened in Late Carboniferous (~304 Ma). N-ward subduction of SPTO lithosphere beneath N Lhasa likely started in E Permian (~275 Ma) and lasted until M Permian (~260 Ma). Main closure of SPTO in M-L Triassic (~240-220 Ma; recorded by medium-P metamorphism and syn-collisional magmatism))

Wang, J.G., W.T. Li, Z.C. Liu, Z. Meng & E. Garzanti (2024)- Record of an oceanic island in the Neo-Tethys Ocean (lowermost Cretaceous Xiazha Formation, Yarlung-Zangbo suture zone, South Tibet). *Lithos* 464-465, 107439, p.

(Xiazha Fm in Yarlung-Zangbo 'Neotethys' suture zone of S Tibet deposited in oceanic island/plateau in Neo-Tethyan domain. Stratigraphy records evolution from Jurassic- earliest Cretaceous? (186-121 Ma zircons) oceanic basaltic eruptions to development of carbonate platform surrounding the basaltic island, followed by drowning of atoll. Cannot be used as evidence for pre-Cretaceous initiation of Yarlung subduction zone.

Wang, J.G., Z. Meng, Z.C. Liu, E. Garzanti & W.T. Li (2025)- Late Triassic paleogeography of the northern Indian continental margin: Constraints from Nd isotopes of siliciclastic rocks (Tethys Himalaya, South Tibet). *J. Asian Earth Sciences* 279, 106463, p.

(Large volume of terrigenous detritus accumulated on N Indian margin of Neo-Tethys Ocean during Late Triassic, incl. large deep-sea turbidites fan of Langjiexue Gp . Whole-rock Nd isotopic analysis reveal two sources of detritus. Coastal Triassic facies indicate provenance from India, but Langjiexue Group detrital input mainly from E Gondwana (Australia and/or Antarctica). Influx of terrigenous detritus onto N Indian margin during Late Triassic controlled by rifting of Lhasa Block from NW Australia)

Wang, J., Xiugen Fu, Hengye Wei, Bo Zheng, Zhongwei Wang, Lijun Shen & A. Mansour (2024)- An overview of the Qiangtang Basin: Geology, hydrocarbon resources and the role of the Tethyan evolution. *J. Asian Earth Sciences* 266, 106128 p.

(Qiangtang Basin in N Tibet is large unexploited Mesozoic petroliferous basin that is still unexploited. Introduction to special issue))

Wang, Q., Y. Meng, Y. Wei, L. Jiang, Z. Wang & G. Mao (2022)- Identification of the Early Cretaceous granitic pluton and tectonic implications in the middle Gangdese belt, Southern Tibet. *Frontiers in Earth Science* 10, 979313, p. 1-18.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2022.979313/full>)

(Early Cretaceous magmatic exposures sporadic in Gangdese magmatic belt. In Quesang area zircon U-Pb dating of samples yielded ages of ~120-114 Ma (Aptian))

Wang, Q., D.C. Zhu, P.A. Cawood, S.L. Chung & Z.D. Zhao (2021)- Resolving the paleogeographic puzzle of the Lhasa Terrane in Southern Tibet. *Geophysical Research Letters* 48, e2021GL094236, p. 1-11.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021GL094236>)

(Widespread Tibetan Permo-Carboniferous glaciogenic diamictites generally thought to come from Indian Gondwana, but zircon U-Pb age spectra and $\epsilon_{\text{Hf}}(t)$ values suggest likely Australian source for Lhasa glacial diamictites. North India source likely for S Qiangtang and Tethyan Himalayan glacial deposits. Magmatic and metamorphic records indicate E Lhasa links to N C Australia, W Lhasa located outboard of W Australia)

Wang, T., G. Li, J.C. Aitchison, J. Sheng & X. Ma (2023)- Lower Cretaceous deep marine deposits in western Tibet: implications for paleoceanographic evolution of the Mesotethyan Ocean. *Cretaceous Research* 148, 105527, p.

(Cretaceous pelagic deposits in Bangong-Nujiang suture zone significant for understanding final stage of Mesotethys Ocean and constraining timing of initial Lhasa-Qiangtang collision. Radiolaria in pelagic siliceous sedimentary sequences indicate E Cretaceous ages (Hauterivian- late Aptian) age, indicate Mesotethys deep marine setting existed across W Tibet during late Aptian. Faunal similarities across the entire Tethyan realm, suggest Mesotethys was connected with Neotethyan Ocean during E Cretaceous (similar conclusions by Baxter et al. 2009; Mesotethys closure followed by late Aptian-Albian Orbitolina limestones)

Wang, X., X. Lang, J. Tang, Y. Deng, Q. He, F. Xie, L. Li, Q. Yin, Z. Li et al. (2020)- Early Carboniferous back-arc rifting-related magmatism in Southern Tibet: implications for the history of the Lhasa Terrane separation from Gondwana. *Tectonics* 39, 10, e2020TC006237, p. 1-23.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020TC006237>)

(Lhasa terrane records E Carboniferous (355-344 Ma) basic and intermediate back-arc rift magmatism. Rifting developed along N margin of Gondwana under S-ward subduction of Paleo-Tethys oceanic lithosphere during E Carboniferous. N branch evolved into 'Sumdo Paleotethys Ocean', which led to separation of N Lhasa terrane in Late Carboniferous time. Subsequent N-ward subduction of Sumdo Paleotethys beneath N Lhasa terrane during E-M Permian may have triggered southern branch to further evolve into Neo-Tethys Ocean and eventual separation of S Lhasa terrane from Gondwana)

Wang, Y., K. Ueno, Y.C. Zhang & C.Q. Cao (2010)- The Changhsingian foraminiferal fauna of a Neotethyan seamount: the Gyanyima Limestone along the Yarlung-Zangbo Suture in southern Tibet, China. *Geological Journal* 45, 2-3, p. 308-318.

(Late Guadalupian- Triassic limestone blocks along Yarlung-Zangbo Suture (between Lhasa Block to N and Himalaya Plate in S), probably remnants of Neotethyan seamounts. Gyanyima Lst with diverse latest Permian foraminiferal fauna dominated by *Reichelina pulchra*, *Colaniella parva* and *Dilatofusulina*. Can be correlated with *Palaeofusulina sinensis* Zone in E Tethys. With common corals, mainly *Waagenophyllum*, *Ipciphyllum*, etc. Composition of fauna suggests paleogeographic position at lower latitudes in Neotethys (NB: = Mesotethys of other authors?; JTvG))

Wang, Y., Y. Wang, C.K. Morley, Z. Li, J. Zhang & P. Zhang (2025)- Cenozoic crustal shortening and structural transition in the NW Yunnan Basin region, SE Tibetan Plateau. *Tectonics* 44, 2, e2024TC008688. p. 1-34.

(SE Tibetan Plateau transitioned from transpression to transtension and experienced kinematic reversal on regional fault systems since Late Miocene, approximately 40 Ma after initial India collision, forming basin-and-range style landscapes. (late-stage orogenic gravitational collapse?))

Wang, Z., Z. Zhao, P.D. Asimow, X. Li, Y. Meng, D. Liu, X. Mo, D.C. Zhu, Y. Tang & F. Cong (2022)- Two episodes of Eocene mafic magmatism in the southern Lhasa terrane imply an eastward propagation of slab breakoff. *Gondwana Research* 110, p. 31-43.

(manuscript online at: <https://authors.library.caltech.edu/115319/1/1-s2.0-S1342937X22001770-main.pdf>)

(Timing and geometry of breakoff of Neo-Tethyan slab after India-Asia collision debated. Two episodes of E-M Eocene mafic magmatism in Quxu area of S Lhasa terrane. Early gabbro (~53 Ma) with arc basalt characteristics, implying formation by partial melting of metasomatized lithospheric mantle. Late hornblende gabbro (~48 Ma) suggests interaction between sub-continental lithospheric mantle and asthenospheric mantle. Upwelling asthenosphere likely reached central S Lhasa at ~50 Ma, and Neo-Tethyan slab tore off here at this time. Age of Neo-Tethyan slab tear-off propagated E along collision zone throughout Paleocene-Eocene)

Wei, B., X. Cheng, M. Domeier, N. Jiang, Y. Wu, W. Zhang, K. Wu, B. Wang, P. Xu et al. (2022)- Placing another piece of the Tethyan puzzle: The first Paleozoic paleomagnetic data from the South Qiangtang Block and its paleogeographic implications. *Tectonics* 41, 10, e2022TC007355, p. 1-17.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2022TC007355>)

(M Permian Lugu Fm basalts (zircon age ~267 Ma; interbedded with limestones) from S Qiantang Block indicate SQB was located at latitude of ~22°S in M Permian (265 Ma). At this time Neo-Tethys Ocean spanned ~10–20° of latitude and Paleo-Tethys Ocean spanned ~50°, and was composite ocean system with at least two branches. SQB rifted from N margin of Gondwana during opening of Neo-Tethys (Mesotethys?; JTvG) in E Permian time, then drifted N until colliding with N Qiangtang block and S margin of Laurasia during final closure of Paleo-Tethys in Triassic)

Wei, B., X. Cheng, M. Domeier, Y. Zhou, Q. Chen, N. Jiang, L. Xing, D. Zhang et al. (2023)- Paleomagnetism of Late Triassic volcanic rocks from the South Qiangtang Block, Tibet: Constraints on Longmuco-Shuanghu Ocean closure in the Paleo-Tethys Realm. *Geophysical Research Letters* 50, e2023GL104759, p. 1-4.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1029/2023GL104759>)

(Paleomagnetic study of Late Triassic volcanic rocks of Xiaoqiebao Fm in S Qiangtang block suggests paleolatitude of ~30± 5°N at ~222 Ma. When combined with other data, this indicates S Qiangtang block (and other “Cimmerian” blocks) moved rapidly N between M Permian and Late Triassic. S branch of Paleotethys (Longmuco-Shuanghu Ocean) likely closed by mid-Late Triassic)

Wei, Z., X. Li, M. Sun, X. Fan, J. Wang, J. Zhou & S. Wei (2024)- Metamorphosed melange in the eastern Himalayan syntaxis: constraint for the India-Asia collision in the Eocene. *J. Geological Society, London*, 181, 1, 181, 1, jgs2023-067, p.

(Metamorphosed melange in Milin area of E Himalayan syntaxis exhibits a ‘block-in-matrix’ fabric in lower and upper parts and ‘lenticular-thrust-slices’ fabric in middle. Diverse blocks/slices of the melange, sourced from both subducting and overriding plates, and formed during Indian plate subduction. Etc.)

Wolff, R., R. Hetzel, K. Holzer, I. Dunkl, Q. Xu, A.A. Anczkiewicz & Z. Li (2023)- Rift propagation in south Tibet controlled by under-thrusting of India: a case study of the Tangra Yumco graben (South Tibet). *J. Geological Society, London*, 180, jgs2022-090, p. 1-14.

(online at: <https://www.lyellcollection.org/doi/pdf/10.1144/jgs2022-090>)

(Miocene-Recent N-S normal faulting in S Tibet and Himalaya reflects E-W extension of collision zone. N Tangra Yumco rift shows younging of rift initiation from ~19 Ma in S to ~14 Ma in N part of rift. Possibly caused by under-thrusting of India plate lower crust beneath Lhasa-Qiangtang Tibetan crust)

Wu, G., Z. Ji, G.G. Lash & J. Yao (2021)- The Upper Triassic deposits of the west Bangong-Nujiang suture zone and their paleogeographic implications. *Nature Scientific Reports* 11, 19509, p. 1-11.

(online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8484565/pdf/41598_2021_Article_98257.pdf)

(Bangong-Nujiang Suture Zone (BNSZ) between Lhasa and Qiantang blocks, Tibet, commonly interpreted as remnant of Bangong-Nujiang Ocean. However, U Permian- Triassic succession from central BNSZ suggests Lhasa and S Qiangtang terranes were contiguous, negating existence of ocean at that time. New data from limestones in Gaize area has yielded Norian-Rhaetian conodonts, and can be correlated with limestones of

central BNSZ as well as Triassic calcareous deposits of Lhasa and S Qiangtang terranes. Similar stratigraphies suggests shared depositional setting and that BNSZ was not an ocean in Permian-Triassic time?)

Wu, G.C., Z.S. Ji, G.G. Lash & J.X. Yao (2023)- Norian conodonts of the South Qiangtang Terrane, North Tibet, and their palaeogeographic implications. *Palaeogeogr., Palaeoclim. Palaeoecology* 613, 111402, p. 1-15.
(Carbonates of Mopanshan area of S Qiangtang Terrane with abundant Norian conodonts: Lacian *Ancyrogondolella uniformis*-*Norigondolella hallstattensis* Fauna and Alaunian *Mockina postera*-*Norigondolella steinbergensis* Fauna (*Norigondella hallstattensis* also known from Timor))

Wu, H., H. Liu, Y. Wang, X. Liu, Q. Zeng & P. Wang (2024)- Late Jurassic oceanic plateau subduction in the Bangong–Nujiang Tethyan Ocean of northern Tibet. *Geoscience Frontiers* 15, 4, 101813, p. 1-16.
(online at: <https://www.sciencedirect.com/science/article/pii/S1674987124000379>)
(Late Jurassic adakitic magmatism in Gaobaoyue area of northern Tibet (152-146 Ma) inferred to reflect oceanic plateau subduction and subsequent flat-slab subduction in Bangong-Nujiang Tethyan Ocean (Mesotethys, between Lhasa and S Qiangtang blocks))

Xia, G., N. Tian, M. Philippe, H. Yi, C. Wu, G. Li & Z. Shi (2020)- Oldest Jurassic wood with Gondwanan affinities from the Middle Jurassic of Tibetan Plateau and its paleoclimatological and paleoecological significance. *Review Palaeobotany Palynology* 281, 104283, p.
(Well-preserved fossil wood from M Jurassic Xiali Fm (Callovian) in S Qiangtang terrane of Tibetan Plateau. Assigned to new species *Circoporoxylon tibetense* sp. nov. Earliest Laurasian occurrence for *Circoporoxylon*, which has Gondwanan origin and became common in Laurasia during Cretaceous (may have reached Laurasia via Tibetan terrane). Absence of growth rings and absence of gypsum layers in S Qiangtang terrane (common gypsum layers in N Qiangtang terrane), suggests S Qiangtang terrane might be wetter during Callovian)

Xiao, D., X. Yang, C. Teng, T. Cheng, N. Zhu & Y. Cao (2024)- Early Cretaceous A-type acidic magmatic belt in Northern Lhasa Block: Implications for the evolution of the Bangong- Nujiang Ocean lithosphere. *Minerals (MDPI)* 14, 7, 681, p. 1-20.
(online at: <https://www.mdpi.com/2075-163X/14/7/681>)
(Newly documented 1200 km long, E Cretaceous A-type acidic magmatic belt in N Lhasa Block, Tibet. Burshulaling Granites peraluminous, high-K calc-alkaline, indicating post-collision setting with high T and low P. Zircon age 115-113 Ma (Late Aptian). Similar E-W line of E Cretaceous granites (117-103 Ma; Albion) along S side of Bangong-Nujiang Suture in N Lhasa, tracking a post-collisional A-type acidic magmatic belt. Magmatism resulted from slab break-off or orogenic root detachment, leading to melting of lower crust. Also indicates existence of S-ward subduction of Bangong-Nujiang Ocean or collapse after Andean-type orogen)

Xiao, H., S. Luo, J. Gao & G. Wang (2022)- Discovery of Late Triassic bivalves from Jurassic deep-water deposits in Riganpeicuo area, Tibet and their geological significance. *Nature Scientific Repts.* 12, 8267, p. 1-12.
(online at: <https://www.nature.com/articles/s41598-022-12338-7>)
(Late Triassic bivalves, including nine species of *Burmesia*, *Palaeocardita*, *Badiotella* and *Halobia*, in olistostromes from southern S Qiangtang block support Bangong-Nujiang Meso-Tethys Ocean already open in Late Triassic and formed mature ocean in E-M Jurassic, with subsequent rapid subduction. Opening and subduction completed in rel. short time)

Xie, Z., C. Xue, T. Yang, W. Wang, D. Xin (2025)- Geochemistry and detrital zircon U-Pb geochronology of Lower Carboniferous clastic sedimentary rocks in the Changning-Menglian Belt: Implications for the evolution of the Paleo-Tethys Ocean. *J. of Earth Science (China)* 36, 3, p. 910-929.
(online at: <http://en.earth-science.net/article/doi/10.1007/s12583-022-1659-4>)
(Zircon age spectra of Lower Carboniferous clastics in Changning-Menglian belt of SE Tibetan Plateau (= main Paleotethys suture) similar to those of Lower Paleozoic sedimentary rocks in Baoshan-Sibumasu Block, but different from older rocks in Simao-Indochina and other surrounding blocks, suggesting deposition at Paleotethys-facing margin of Baoshan-Sibumasu Block)

Xing, L., X. Cheng, M. Domeier, B. Wei, Z. Shen, N. Jiang, Q. Chen, S. Lan, D. Zhang et al. (2025)- Was the Lhasa Block at low latitudes in the Middle Permian? Insights from new paleomagnetic and geochronological data. *Geophysical Research Letters* 52, 7, e2024GL114347, p. 1-16.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2024GL114347>)

(New paleomagnetic and geochronological data from M Permian Luobadui Fm of Lhasa Block (basaltic volcanics with zircons-dated as ~268 Ma, between marine sediments with fusulinids Sumatrina, Verbeekina, Neoschwagerina and coral Iranophyllum) suggest paleo-location at $17 \pm 5^\circ\text{S}$ at ~268 Ma. New U-Pb detrital zircon ages from sandstones suggest Lhasa Block was once located along NW margin of Australia (zircon age distribution near-identical to Canning Basin). Block may thus have rifted from NW margin of Australian sector of Gondwana before ~268 Ma (M Permian). Combined with other geological evidence, we propose that Bangong Co-Nujiang and Yarlung-Zangbo oceans, now preserved as sutures N and S of Lhasa Block, were branches of same nascent Neotethys Ocean and probably existed side during M Permian)

Xiong, Q., W.L. Griffin, J.P. Zheng, S.Y. O'Reilly, N. J. Pearson, B. Xu & E.A. Belousova (2016)- Southward trench migration at ~130-120 Ma caused accretion of the Neo-Tethyan forearc lithosphere in Tibetan ophiolites. *Earth Planetary Science Letters* 438, p. 57-65.

(Widespread mafic magmatism at ~130-120 Ma in Yarlung Zangbo ophiolites. Extension of overlying harzburgitic lithosphere, subcretion of lherzolites, intrusion of mafic dykes, and waning of Gangdese-Arc magmatism all reflect S-ward trench migration in Neo-Tethyan subduction system from Gangdese Arc to oceanic forearc lithosphere. Probably far-field effects of plate reorganization related to Lhasa-Qiangtang collision and breakup of Gondwanaland in E Cretaceous)

Xu, B., D. Li, J. Xu, Y. Yu, J. Geng, J. Chen & C. Zhang (2024)- Tholeiitic magmatic record on an extensional passive continental margin: Constraints from Late Paleozoic Woniusi rock associations in the Baoshan block, SE Tibetan Plateau. *Lithos* 468-469, 107517, p.

(manuscript online at: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4635623)

(E Permian (~290 Ma) Woniusi tholeiitic basalt flare-up on Baoshan block at N tip of Sibumasu in SE Tibet, formed during opening of Meso-Tethyan Ocean at N Gondwana margin)

Xu, H.P., Y.C. Zhang., Y.J. Zhang., F. Qiao & S.Z. Shen (2024)- Lower Cisuralian brachiopod faunas from the Lhasa and South Qiangtang blocks in Tibet and their biostratigraphical and palaeobiogeographical implications. *Palaeoworld* 33, 3, p. 679-705.

(New lower Cisuralian (E Permian) brachiopod faunas from Lhasa and S Qiangtang Blocks. Similar 'Gondwana' compositions, with Bandoproductus, Spirelytha and Sulciplica thailandica. Comparable brachiopod faunas also in glaciomarine diamictites in E Cimmerian belt (Baoshan, Irrawaddy, Sibuma), as well as Tethyan Himalaya and Gondwanaland ('Indoralian paleobiogeographic province'), suggesting most of Cimmerian blocks (incl. Lhasa and S Qiangtang) still attached to N Gondwanan margin during E Cisuralian. (earliest Permian). In contrast, Kungurian-Roadian brachiopod faunas show distinct faunal differences between Lhasa and S Qiangtang blocks, suggesting S Qiangtang Block drifted faster into temperate-warm region of N Cimmerian Subprovince. Bangong-Nujiang Ocean (= Mesotethys) probably opened in Artinskian)

Xu, M., C. Li, X. Zhang & Y. Wu (2014)- Nature and evolution of the Neo-Tethys in central Tibet: synthesis of ophiolitic petrology, geochemistry, and geochronology. *International Geology Review* 56, 9, p. 1072-1096.

(Studies on ophiolitic melanges of Bangong-Nujiang suture zone (BNSZ) with late Permian-E Cretaceous ophiolitic fragments associated with thick M Triassic- M Jurassic flysch sediments ('Neo-Tethys suture' (or Mesotethys?; HvG)) and Shiquanhe-Yongzhu-Jiali ophiolitic melange belt in C Tibet (Late Triassic-E Cretaceous, dismembered, in fault contact with pre-Ordovician, Permian and Jurassic-E Cretaceous blocks) (short-lived intra-oceanic back-arc basin?). Neo-Tethys Ocean in C Tibet opened in late Permian and widened during Triassic. S-ward subduction started in Late Triassic in E and propagated W during Jurassic. After late E Jurassic, parts of oceanic basin subducted beneath S Qiangtang terrane, ...closing of Neo-Tethys Basin in E Jurassic in E and early Late Cretaceous in W)

Xu, W., N.C. Hughes, L. Liu, W. Zhang & P. Liu (2022)- Paleogeographic reconstruction of the Paleozoic Lhasa Terrane through detrital zircon mixing modeling. *Geophysical Research Letters* 49, e2022GL100160, p. 1-11.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2022GL100160>)

(Detrital zircon age populations of Permo-Carboniferous from Lhasa terrane range in age from 2000 to 480 Ma, with two major age populations: ~1250-1050 Ma (peak ~1170-1190 Ma) and 620-500 Ma (peak ~530-550 Ma). Modelling supports sediment source from NW Australia (mainly Perth basin), rather than India or Africa. Paleozoic Lhasa terrane located adjacent to boundary between Australia and India)

Xu, W., F. Liu, Q. Zhai & Y. Dong (2021)- Petrology and P-T path of blueschists from central Qiangtang, Tibet: Implications for the East Paleo-Tethyan evolution. *Gondwana Research* 94, p. 12-27

(C Qiangtang metamorphic belt blueschists record ~60 Myr (almost all of E Permian-Late Triassic) (cold) subduction of Longmu Co- Shuanghu Paleo-Tethys Ocean (LSPTO) and subsequent continental subduction, as well as Late Triassic rapid exhumation of oceanic and continental material. Confirms that C Qiangtang blueschist-bearing melange marks in-situ (Paleotethys) suture withing Qiangtang Block, formed during N-ward subduction and subsequent exhumation of LSPTO Ocean)

Xu, X.Z., B. Zoheir, J.S. Yang, F.H. Xiong, G.L. Guo, G.Y. Feng, Z.L. Li & T.F.Li (2023)- Tectonized Neotethyan lithosphere in southeastern Tibet: Results of the Luobusa ophiolite drilling. *Lithos* 436-437, 106947, p.

(Cretaceous Neotethyan Luobusa ophiolite within 2000km-long Yarlung-Tsangpo Suture in SE Tibet, between Indian plate to S and Lhasa terrane to N, holds large chromitite resource. Two boreholes to 1478m 1854m show three main lithological units: (1) mantle tectonites (harzburgite and lherzolite with lenses of residual dunite), (2) mantle-crust transition (mainly cumulative dunite), and (3) crustal cumulates (i.e., gabbros))

Xu, Y.G., J.B. Lan, Q.J. Yang, X.L. Huang & H.N. Qiu (2008)- Eocene break-off of the Neo-Tethyan slab as inferred from intraplate-type mafic dykes in the Gaoligong orogenic belt, eastern Tibet. *Chemical Geology* 255, 3-4, p. 439-453.

(M Eocene (40-42 Ma) basaltic dykes in Gaoligong-Tengliang belt, E Tibet, characterized by high Na₂O, different from widespread post-collisional potassic and ultrapotassic rocks in Tibetan Plateau. Represent melts from asthenosphere/mantle. Basalt geochemistry implies thin (< 80 km thick) lithosphere) and implies break-off of subducting Neo-Tethyan slab from Indian continental plate during M Eocene (~Oligocene-age Gaoligong orocline marks Tengchong-Baoshan blocks boundary, both separated from Gondwana in E Permian)

Xu, Z.Q., Y. Dilek, J.S. Yang, F.H. Liang, F. Liu, D.Z. Ba, Z.H. Cai, G.W. Li et al. (2015)- Crustal structure of the Indus-Tsangpo suture zone and its ophiolites in southern Tibet. *Gondwana Research* 27, 2, p. 507-524.

(The > 2000-km-long Indus-Tsangpo suture zone (ITSZ) in S Tibet contains remnants of Neotethyan Jurassic-Cretaceous oceanic lithosphere, ophiolitic melanges, flysch, etc., interpreted as boundary between India and Eurasia plates. Suprasubduction zone ophiolites first emplaced S-ward onto N proto-India margin in Late Cretaceous. Continental collision between ophiolite-laden proto-Indian margin and Lhasa terrane of Eurasian plate in E Paleogene resulted in backthrusting and inversion of structural order of ITSZ. Ophiolite massifs, melanges and flysch units thrust N as nappe sheets over Eocene and younger forearc basin strata)

Yan, Q., Z. Wang, S. Liu, Q. Li, H. Zhang, T. Wang et al. (2005)- Opening of the Tethys in southwest China and its significance to the breakup of East Gondwanaland in late Paleozoic: evidence from SHRIMP U-Pb zircon analyses for the Garze ophiolite block. *Chinese Science Bull.* 20, 3, p. 256-264.

(U-Pb zircon analyses of gabbro from Garze ophiolite block from Garze-Litang melange show mean age of ~292 Ma, suggesting earliest Permian age for sea floor spreading/ age of opening of Tethys at East Gondwanaland)

Yan, Y., L. Duan, S. Liang, J. Wang, B. Huang, W. Zheng & P. Zhang (2020)- Paleomagnetic constraint on the Carboniferous paleoposition of Indochina and its implications for the evolution of eastern Paleo-Tethys Ocean. *Tectonics* 39, e2020TC006168, p. 1-13.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2020TC006168>)

(Paleomagnetic study on M Carboniferous (~315 Ma) limestones from S-most Yunnan of S China (Indochina Block). Indochina Block likely at $18.4 \pm 4.0^\circ\text{S}$. Relatively quiet tectonic period suggested for N Qiangtang, Indochina, and S China blocks during M Carboniferous- E Permian, and sequential start of rapid drifting of these blocks recognized, coeval with rifting of Cimmerian terranes from Gondwana)

Yang, Z.M., R. Goldfarb & Z.S. Chang (2016)- Generation of postcollisional porphyry copper deposits in Southern Tibet triggered by subduction of the Indian continental plate. In: J.P. Richards (Ed.) *Tectonics and eetallogeny of the Tethyan orogenic belt*, Soc. Economic Geologists (SEG), Special Publ. 19, p. 279-300.

(online at: https://www.academia.edu/35516004/Generation_of_Postcollisional_Porphry_Copper_Deposits_in_Southern_Tibet_Triggered_by_Subduction_of_the_Indian_Continental_Plate)

(Oligocene -Miocene post-collisional porphyry Cu deposits in S part of E Gangdese belt in S Tibet, genetically associated with granodioritic-quartz monzogranitic porphyry intrusions with adakite-like signatures. Mineralization in S sub-belt ~30 Ma and in N sub-belt 21-13 Ma. Intrusions and mineralization possibly caused by H₂O-added melting of lower crust, triggered by relatively hot subduction of Indian continental plate)

Yin, An (2006)- Cenozoic tectonic evolution of the Himalayan orogen as constrained by along-strike variation of structural geometry, exhumation history, and foreland sedimentation. *Earth-Science Reviews* 76, p. 1-131.

(online at: <http://www2.ess.ucla.edu/~yin/05-Publications/papers/091-Yin-2006-ESR.pdf>)

(Major review of Himalayan orogen)

Yin, J. (2003)- Oxfordian (Jurassic) mayaitid (ammonite) dispersal in the Tibetan Himalaya as the first signal of the establishment of the Indo-Austral subrealm. *Progress in Natural Science* 13, 4, p. 282-287.

(Mid-Oxfordian ammonite fauna in Lanongla area, Tibetan Himalaya, characterized by endemic epimayaitids. Distribution of mayaitids around E Gondwana can be regarded as first signal establishment of Indo-Austral Subrealm in Late Jurassic-E Cretaceous)

Yin, Z., L. Ding, J. Li, Z. He, H. Wang, L. Wang, C. Zhao et al. (2024)- The Cretaceous suturing process of the eastern Bangong–Nujiang Ocean, Basu area. *Palaeogeogr. Palaeoclim. Palaeoecology* 642, 112154, p. 1-15.

(online at: https://www.researchgate.net/publication/379103768_The_Cretaceous_suturing_process_of_the_eastern_Bangong-Nujiang_Ocean_Basu_area)

(Sandstone petrologic and detrital zircon U–Pb–Hf isotopic analyses of Cretaceous Wada melange (~114 Ma), etc. suggest Lhasa-Qiangtang collision occurred in E Cretaceous (~113 Ma) in E segment of Bangong-Nujiang Suture Zone, ending N-ward subduction-accretion of Bangong-Nujiang Ocean (= Mesotethys closure; JTvG))

Yu, C., M. Wang, Di Shen, M. Lin, S. Zhang, R. Yang & D. Quewang (2024)- North Lhasa terrane in the Precambrian originated from Western Australia. *Precambrian Research* 405, 107371, p. 1-18.

(Newly discovered Precambrian basement in N Lhasa terrane, S Tibet, define two distinctive detrital zircon age populations of ~1170 Ma (with age and $\epsilon\text{Hf}(t)$ values identical to coeval detrital zircons from W Australia), and ~950 Ma (possibly sourced from N Indian margin). (The rest is weird?))

Yu, L., M. Yan, M. Domeier, C. Guan, M. Shen, Q. Fu, W. Xu, Z. Xu, Z. Niu, L. Yang et al. (2022)- New paleomagnetic and chronological constraints on the Late Triassic position of the Eastern Qiangtang Terrane: implications for the closure of the Paleo-Jinshajiang Ocean. *Geophysical Research Letters* 49, 2, e2021GL096902, p. 1-12.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2021GL096902>)

(Paleomagnetic investigation of Late Triassic (~225 Ma) volcanic Batang Fm in Qamdo region, showing E Qiangtang Terrane was at paleolatitude of $32.5 \pm 7.8^\circ\text{N}$ in early Late Triassic. EQT collided with Tarim Block/ Songpan-Ganzi/Yidun Terrane, closing Paleo-Jinshajiang Ocean most likely at ~230 Ma (Carnian))

Yuan, D.X., Y.C. Zhang, S.Z. Shen, C.M. Henderson, Y.J. Zhang, T.X. Zhu, X.Y. An & H.Z. Feng (2015)- Early Permian conodonts from the Xainza area, central Lhasa Block, Tibet, and their palaeobiogeographical and palaeoclimatic implications. *J. Systematic Palaeontology* 14, 5, p. 365-383.

(online at: https://www.researchgate.net/publication/281498943_Early_Permian_conodonts_from_the_Xainza_area_central_Lhasa_Block_Tibet_and_their_palaeobiogeographical_and_palaeoclimatic_implications)

(Abundant conodont fauna in lowest Xiala Fm in C Lhasa Block, including *Mesogondolella idahoensis*, *M. siciliensis*, *Vjalovognathus nicolli* n. sp. and *Hindeodus* sp, indicating late Kungurian age. Associated small solitary corals and absence of fusulinids suggest cool-water conditions. In contrast, U Xiala Fm with warm-water faunas of common fusulinids, compound and large solitary corals, and warm-water conodonts of late Guadalupian- Wuchiapingian in age. Change from cold to warm conditions after late Kungurian may reflect N-ward drift of Lhasa Block into warm-water regime in late Kungurian-Guadalupian)

Yuan, D.X., Y.C. Zhang, F. Qiao, H.P. Xu, Q. Ju & S.Z. Shen (2022)- A new late Kungurian (Cisuralian, Permian) conodont and fusuline fauna from the South Qiangtang Block in Tibet and their implications for correlation and paleobiogeography. *Palaeogeogr. Palaeoclim. Palaeoecology* 589, 110822, p. 1-12.

(Warm water late Kungurian conodonts and fusulines (*Armenina*, *Neoschwagerina simplex*, *Pseudodoliolina ozawai minima*, *Cancellina*) in lower part of Lugu Fm in S Qiangtang Block in Tibet (different from coeval cool water *Vjalovognathus* fauna without Tethyan fusulinids in basal part of coeval Xiala Fm of Lhasa Block, suggesting wide Bangong-Nujiang Ocean existed between SQB and Lhasa Block during late Kungurian.)

Yuan, D.X., Y.C. Zhang, Y.J. Zhang, T.X. Zhu & S.Z. Shen (2014)- First records of Wuchiapingian (Late Permian) conodonts in the Xainza area, Lhasa Block, Tibet, and their palaeobiogeographic implications. *Alcheringa* (Australasian J. Palaeontology) 38, 4, p. 546–556.

(online at: https://www.researchgate.net/publication/267397005_First_records_of_Wuchiapingian_Late_Permian_conodonts_in_the_Xainza_area_Lhasa_Block_Tibet_and_their_palaeobiogeographic_implications) (First Wuchiapingian (E Lopingian) conodonts from upper Xiala Fm in Lhasa Block, Tibet (rocks previously assigned to Guadalupian). *Clarkina orientalis* and *C. liangshanensis* support Lhasa Block in warm-water regime in Late Permian (Wuchiapingian/ Lopingian))

Yuan, J., C. Deng, Z. Yang, W. Krijgsman, Thubtantsering, H. Qin Z. Shen, Y. Hou et al. (2022)- Triple-stage India-Asia collision involving arc-continent collision and subsequent two-stage continent-continent collision. *Global and Planetary Change* 212, 103821, p. 1-17.

(online at: <https://www.sciencedirect.com/science/article/pii/S0921818122000881>)

(New paleomagnetic data from M Paleocene red siliceous shales-cherts of Sangdanlin Fm from most distal continental margin of Tethyan Himalaya terrane (rifted from Greater India in Late Cretaceous? = front = S margin of Neo-Tethys). Tethyan Himalaya was at paleolatitude of $14.1^{\circ} \pm 1.9^{\circ}\text{N}$ in E Paleocene, defining max. size of N India Sea to $\sim 2200 \pm 500$ km. India-Asia collision was triple-stage process, with (1) arc-continent collision at ca. 64 Ma between Tibetan/Tethyan Himalaya and Trans-Tethyan subduction zone, at paleolatitude of $\sim 8^{\circ}\text{N}$; (2) initial continent-continent collision at ~ 61 Ma between Tibetan Himalaya + accreted Trans-Tethyan subduction zone and Eurasia-margin Lhasa terranes at $\sim 14^{\circ}\text{N}$ paleolatitude (3) final and diachronous continent-continent collision at 53-47 Ma (M Eocene) between India and Tibetan Himalaya. Scenario explains three slab remnants below Tibet and India)

Zeng, M., R. Zhang, S. Chen, X. Liu, C. Li, F.R. Etensohn & L. Bie (2021)- Reconstructing Ocean-Plate Stratigraphy (OPS) to understand accretionary style and melange fabric: insights from the Bangong-Nujiang Suture (Tibet, China). *Geophysical Research Letters* 48, 18, e2021GL094457, p. 1-12.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021GL094457>)

(Bangong-Nujiang suture in Tibet records birth and demise of Meso-Tethys Ocean, between Lhasa and South Qiangtang blocks. Characterized by abundant flysch sequences (incl. U Triassic (216, 212 Ma) trench-fill) and ophiolitic melanges. Describe subduction of high-relief Zhonggang seamount (eroded earlier margin and accreted as coherent seamount slices) and subduction of the lower-relief, Gaize seamount (halted frontal accretion of trailing sediments, etc.)

Zeng, X.W., M. Wang, H. Li, Peng Chi & D. Shen (2022)- Early Jurassic intra-oceanic subduction initiation along the Bangong Meso-Tethys: Geochemical and geochronological evidence from the Shiquanhe ophiolitic complex, western Tibet. *Lithos* 416-417, 106657, p.

(Discovery of E Jurassic MORB-like fore-arc ophiolite (190-185 Ma) within Bangong-Nujiang suture (= Mesotethys between Qiangtang and Lhasa) in Shiquanhe area 'confirms E Jurassic intra-oceanic subduction initiation in Bangong Ocean')

Zeng, X.W., M. Wang, Y. Yu, H. Li, X. Zeng & D. Shen (2021)- Tectonic evolution of the Meso-Tethys Ocean: Insights from geochemistry and geochronology of the Jurassic ophiolitic complex in the Asa area, Central Tibet. *International Geology Review* 64, 3, p. 351-374.

(online at: https://www.researchgate.net/publication/348509585_Tectonic_Evolution_of_the_Meso-Tethys_Ocean_Insights_from_Geochemistry_and_Geochronology_of_the_Jurassic_ophiolitic_com_Etc.)

(*Voluminous Jurassic ophiolites reported along Bangong-Nujiang Suture Zone (BNSZ). Shiquanhe-Namco Ophiolite sub-belt composed of M-L Jurassic ophiolite (165-158 Ma; likely formed in N-dipping intra-oceanic island arc setting) and E Jurassic gabbros (~190 Ma; with island arc basalt affinities)*)

Zeng, Y., J.F. Xu, J.L. Chen, B.D. Wang, F. Huang, X. Xia & L. Mingjian (2021)- Early Cretaceous (~138-134 Ma) forearc ophiolite and tectonomagmatic patterns in Central Tibet: subduction termination and re-initiation of Meso-Tethys Ocean caused by collision of an oceanic plateau at the continental margin? *Tectonics* 40, 3, e2020TC006423, p. 1-22.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020TC006423>)

(*Bangong-Nujiang Suture Zone (BNSZ) in C Tibet represents relics of Permian- E Cretaceous Mesotethys Ocean that once separated Lhasa and S Qiangtang terranes. Evidence for presence of E Cretaceous ophiolite (Kangqiong Ophiolite), formed in forearc setting and related to subduction re-initiation of Meso-Tethys Ocean. Existence of E Jurassic oceanic plateau within Meso-Tethys, magmatic lull (~145–130 Ma) in Qiangtang Terrane, angular unconformity between Lower Jurassic oceanic rocks and U Jurassic shallow-marine strata, etc., suggest collision of oceanic plateau with Qiangtang margin caused termination of Meso-Tethyan subduction in Late Jurassic, followed by re-initiation behind oceanic plateau during E Cretaceous*)

Zeng, Y.C., J.F. Xu, M.N. Ducea, J.L. Chen, F. Huang & Le Zhang (2019)- Initial rifting of the Lhasa Terrane from Gondwana: Insights from the Permian (~262 Ma) amphibole-rich lithospheric mantle-derived Yawa basanitic intrusions in Southern Tibet. *J. of Geophysical Research: Solid Earth* 124, 3, p. 2564-2581.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018JB016281>)

(*M Permian (~262 Ma) Yawa intrusions in S Lhasa Terrane interpreted as formed at onset of lithospheric extension associated with initial rifting of Lhasa Terrane from Indian Gondwana margin during initial opening of Neo-Tethys (Mesotethys) Ocean) in late M Permian).*

Zhang, B.C., J.J. Fan, A.B. Luo & J.W. Bai (2024)- Middle–Late Jurassic subduction erosion caused by intra-oceanic arc subduction in central Tibet. *Geological Society of America (GSA) Bull.* 136, 9-10, p. 4035-4049.

(*Dongco granodiorites in C Bangong-Nujiang suture zone of C Tibet of Late Jurassic age (~158–155 Ma) originated from subducted oceanic plate, and were contaminated with accretionary wedge when they intruded Dongco ophiolite. It is believed that main body of central intra-oceanic arcs and portion of western intra-oceanic arcs in Meso-Tethys Ocean subducted beneath S Qiangtang terrane in Middle- Late Jurassic*)

Zhang, B.C., J.J. Fan, A.B. Luo & X.W. Zeng (2022)- The first identified oceanic core complex in the Bangong–Nujiang suture zone, central Tibet: New insights into the early Mesozoic tectonic evolution of the Meso-Tethys Ocean. *J. Asian Earth Sciences* 233, 105248, p. 1-21.

(*Bangong-Nujiang suture zone between Lhasa and S Qiantang blocks is remnant of Mesotethys, subducting N-ward under S Qiantang block. With E Jurassic Saibuco oceanic core complex from mid-ocean ridge setting (diabase dikes in serpentinized peridotites, tectonic breccias. Etc.)*)

Zhang, H.R., T.N. Yang, Z.Q. Hou, Y.C. Song, Y. Ding & X.F. Cheng (2013)- Petrogenesis and tectonics of late Permian felsic volcanic rocks, eastern Qiangtang block, north-central Tibet: Sr and Nd isotopic evidence. *International Geology Review* 55, 8, p.

(*Two Permian- Late Triassic arc-like volcanic suites in E Qiangtang block of N-C Tibet. Two-stage subduction model: Permian-E Triassic arc volcanics formed during N-ward subduction, whereas Late Triassic volcanics are related to S-ward subduction of mafic crust of Garze–Litang Ocean*)

Zhang, J., W. Fan, T. Peng & L. Ratschbacher (2021)- Southeastern continuation of the Bangong-Nujiang suture zone: Constraints from Middle Jurassic–Early Cretaceous sedimentary rocks in the western Baoshan block, SW China. *J. Asian Earth Sciences* 221, 104944, p. 1-17.

(Bangong-Nujiang Ocean ('Mesotethys') separated Lhasa and S Qiangtang blocks in Mesozoic. Not sure if also separates Tengchong and Baoshan blocks. M Jurassic- E Cretaceous Fms of W Baoshan block deposited on passive continental margin, with collisional provenance in Late Jurassic- E Cretaceous formations. Zircon U-Pb ages suggest M Jurassic formations sourced from S Qiangtang, Baoshan and Simao blocks and Changning-Menglian suture zone. In contrast, Late Jurassic- E Cretaceous derived mainly from Baoshan blocks, with some Tengchong. Tengchong-Baoshan collision in Late Jurassic welded Tengchong and Baoshan blocks together in E Cretaceous. Widespread E Cretaceous magmatic rocks in Tengchong block produced E-ward subduction of NeoTethyan Ocean. Banggong-Nujiang suture extends SE into SW China and Longling-Ruili Fault)

Zhang, J., W. Xiao, J. Wakabayashi, B.F. Windley & C. Han (2022)- A fragment of Argoland from East Gondwana in the NE Himalaya. *J. of Geophysical Research: Solid Earth* 127, 2, e2021JB022631, p. 1-20.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021JB022631>)

(Longzi block in NE Himalaya was part of westernmost Argoland, a continental sliver with Late Triassic-Lower Cretaceous strata, which rifted from E Gondwana in Late Jurassic (~153-140 Ma alkali intrusives). It collided with N-dipping Trans-Tethyan intra-oceanic subduction zone in E Cretaceous (S-vergent folding, 136-123 Ma; ~Barremian; mafic-dioritic-dacite dikes), long before Paleocene continent-continent collision along Yarlung-Tsangpo suture. This rifting-collision in Himalayan region reflects Mesozoic archipelagic paleogeography in E Neotethys, which was preceded by ocean closure, and two-stage collision of India-Eurasia in Cenozoic)

Zhang, L., J. Deng, S. Sun, Q. Sui, K. Wang & W. Sun (2023)- Subduction of the Neo-Tethys ridge beneath the Eurasian continent during the Cretaceous. *Ore Geology Reviews* 154, 105302, p. 1-7.

(online at: <https://www.sciencedirect.com/science/article/pii/S0169136823000173>)

(Description of likely subduction of spreading ridge of now-vanished Neo-Tethys ocean, now reflected as Late Cretaceous (~100 Ma) E-W-trending igneous rock belt along S margin of Eurasian continent from Gangdese terrane to S China block. These igneous rocks are adakites, like those derived from partial melting of subducted oceanic crust. Simultaneously, N-S compressional event at S margin of Gangdese terrane, etc., in Late Cretaceous, which agrees well with ridge subduction. Identification of Neo-Tethys ridge subduction of great significance for understanding evolution, magmatism and mineralization of Neo-Tethys domain)

Zhang, L.Y., M.N. Ducea, L. Ding, A. Pullen, P. Kapp & D. Hoffman (2014)- Southern Tibetan Oligocene-Miocene adakites: a record of Indian slab tearing. *Lithos* 210-211, p. 209-223.

(online

at:

www.academia.edu/14992287/Southern_Tibetan_Oligocene_Miocene_adakites_A_record_of_Indian_slab_tearing)

(Oligo-Miocene granitoids exposed in 1500km-long Gangdese arc, with adakitic compositions. Samples from SE Lhasa terrane near Namche Barwa with U-Pb zircon ages of 30-26 Ma, with characteristics of adakitic rocks. Thought to represent partial melting and mixing products of two parts of lower Tibetan crust: (1) roots of juvenile Gangdese arc crust and (2) newly-underplated high-K mafic magmas. Adakitic magmatism initiated at 30-26 Ma near E Himalayan syntaxis and decreases in age to W (18-9 Ma near Shigatse). Distribution of adakitic magmatism within Gangdese arc attributed to progressive tearing of Indian plate from E to W)

Zhang, M.Y., L.L. Hao, Q. Wang, Y. Qi & L. Ma (2022)- B-Sr-Nd isotopes of Miocene trachyandesites in Lhasa block of southern Tibet: insights into petrogenesis and crustal reworking. *Frontiers in Earth Science, Petrology*, 10, 953364, p. 1-13.

(online at: <https://www.frontiersin.org/articles/10.3389/feart.2022.953364/full>)

(Miocene post-collisional high-K adakitic trachyandesites (22 Ma) widespread in Lhasa block. Adakites commonly believed to be derived from partial melting of subducting juvenile crust. Instead, Miocene adakitic magmatism in E Lhasa block suggested to reflect magma underplating and subsequent crust–mantle mixing that induced reworking of juvenile crust beneath S Tibet, possibly related to foundering (break-off) of subducted India continental slab)

- Zhang, Q., H. Willems & L. Ding (2013)- Evolution of the Paleocene-Early Eocene larger benthic foraminifera in the Tethyan Himalaya of Tibet, China. *Int. J. Earth Sciences (Geologische Rundschau)* 102, p. 1427-1445.
(*Biozonation of Paleocene-E Eocene larger benthic foraminifera (LBF) in eastern Neo-Tethyan Ocean of Tibet still remain poorly known. Tten Shallow Benthic Zones (SBZ 1-10) recognized. High diversification of Lockhartia, Kathina, Daviesina, Miscellaneous, Ranikothalia, and Operculina and show progressively increasing diversity during SBZ 2–5. Larger Foraminifera Turnover (LFT) probably not synchronous in entire Neotethyan Ocean. During E Eocene new genera (Alveolina, Orbitolites, Nummulites, Assilina, Discocyclina) gained predominance in Tibet. Paleocene-Eocene boundary identified by us in upper SBZ 5. Sudden disappearance of all Paleocene lamellar-perforate LBFs (Lockhartia, Kathina, Daviesina, Miscellaneous, Ranikothalia), and initial dominance of E Eocene Alveolina marks SBZ 5-SBZ 6 boundary*)
- Zhang, Y.C., L.R. Cheng & S.Z. Shen (2010)- Late Guadalupian (Middle Permian) fusuline fauna from the Xiala Formation in Xainza County, Central Tibet: implication of the rifting time of the Lhasa Block. *Journal of Paleontology* 84, 5, p. p. 955-973.
(online at: www.researchgate.net/publication/257694639_Late_Guadalupian_Middle_Permian_Fusuline_Fauna_from_the_Xiala_Formation_in_Xainza_County_Central_Tibet_Implication_of_the_Rifting_Time_of_the_Lhasa_Block)
(*Fusuline fauna of 9 species in Xiala Fm of Mujiucuo section, Xainza County, Tibet (Lhasa Block), dominated by Nankinella, Chusenella and Schwagerina, indicating Midian (Late Guadalupian) age. Associated with Hemigordius-Shanita foram assemblage. Earliest appearance of fusuline fauna during Midian suggests Lhasa rifted later than Qiangtang Block in N (but both with Late Carboniferous- E Permian glacial diamictites; JTVG) and Baoshan and Tengchong blocks to E, all of which yield earlier fusulinids of Yakhtashian (Artinskian) age, but had drifted from Gondwana to relatively warm temperate zone in Late Guadalupian (M Permian) (N of Lhasa, Luobadui Fm massive limestones with basalt interlayers and fusulinids Neoschwagerina, Verbeekina, Lantschichites and Lepidolina, indicating Midian = Capitanian age; Huang et al. 2022))*)
- Zhang, Y.C., S.Z. Shen, Q.G. Zhai, Y.J. Zhang & D.X. Yuan (2016)- Discovery of a *Sphaeroschwagerina* fusuline fauna from the Raggyorcaka Lake area, northern Tibet: implications for the origin of the Qiangtang Metamorphic Belt. *Geological Magazine* 153, 3, p. 537-543.
(*New Sphaeroschwagerina fusuline fauna in Raggyorcaka Lake area in Qiangtang Metamorphic Belt supports interpretation that tN and S Qiangtang blocks were separated by wide ocean during Asselian (E Permian) time, indicating QMB formed by suturing of Paleotethys Ocean along Longmu Co-Shuanghu suture (results of fusulinid ages questioned by Qiao et al. 2021))*)
- Zhang, Y.C., S.Z. Shen, Y.J. Zhang, T.X. Zhu & X.Y. An (2016)- Middle Permian non-fusuline foraminifers from the middle part of the Xiala Formation in Xainza county, Lhasa Block, Tibet. *J. Foraminiferal Research* 46, 2, p. 99-114.
(*Non-fusuline foraminiferal fauna of 20 genera/ 27 species in middle Xiala Fm at Mujiucuo section of Xainza County, C Tibet. Mainly porcelaneous genera Agathammina, Midiella, Hemigordiopsis, Neodiscus, Multidiscus, etc., indicating Midian (Capitanian) age. Climatic warming after Late Paleozoic Ice Age, or by N drift of Lhasa Block, promoted diversification of non-fusuline foraminifers in middle Xiala Fm. Warm oceanic currents also played an important role in bringing biota from low latitude areas to northern Gondwanaland margin through newly-formed Neotethys Ocean. New genus Megacrassispirella, new species Agathammina vachardi*)
- Zhang, Y.C., S.Z. Shen, Y. Zhang, T.X. Zhu, X.Y. An, B.X. Huang, C.L. Ye, F. Qiao & H.P. Xu (2019)- Middle Permian foraminifers from the Zhabuye and Xiadong areas in the central Lhasa Block and their paleobiogeographic implications. *J. Asian Earth Sciences* 175, p. 109-120.
(*Two new M Permian foraminifer faunas from Xiala Fm in C Lhasa Block. Presence of Shanita, Lysites biconcavus and Hemigordiopsis indicates Lhasa Block part of Cimmerian Province ('Sibumasu'). Nankinella-Chusenella fusulinids assemblage (also with Neoschwagerina, Verbeekina) in upper Xiala Fm resembles fusuline faunas from Xainza and Bashor areas in Lhasa Block and N part of Tengchong Block. Endemism of Nankinella-Chusenella in Lhasa and Tengchong indicates these two blocks were isolated from S Qiangtang Block and N Gondwanan margin in M Permian. Also suggests Bangong-Nujiang Ocean and Neotethys Ocean opened before M Permian*)

Zhang, Y.C., G. Shi. S. Shen & D. Yuan (2014)- Permian fusuline fauna from the lower part of the Lugu Formation in the Central Qiangtang Block and its geological implications. *Acta Geologica Sinica* 88, 2, p. 365-379.

(Kungurian fusuline fauna from lower Lugu Fm in Cuozheqiangma, C Qiangtang Block, belongs to Southern Transitional paleobiogeographic zone, characterised by distinctive bi-temperate genus Monodiexodina and genera common in lower latitude Tethyan areas such as Parafusulina and Pseudodoliolina. Occurrence of Monodiexodina confirms seamount-type carbonates of Lugu Fm did not originate from Paleotethys Ocean, but rather from branch of Neotethys Ocean after rifting of Qiangtang Block from Gondwana in Artinskian)

Zhang, Y.C., Y. Wang & S.Z. Shen (2009)- Middle Permian (Guadalupian) fusulines from the Xilanta Formation in the Gyanyima Area of Burang County, Southwestern Tibet, China. *Micropaleontology* 55, 5, p. 463-486.

(online at: https://www.researchgate.net/publication/286049709_Middle_Permian_Guadalupian_Fusulines_from_the_Xilanta_Formation_in_the_Gyanyima_area_of_Burang_County_southwestern_Tibet_China)

(Diversified M Permian (Midian/ Guadalupian) fusuline foram fauna from SW Tibet (Himalyan Tethys zone?), in exotic coral limestone blocks with Permian mixed Gondwanan-Cathaysian faunas in Yarlung-Zangbo suture, SW of Lhasa Block (Neo-Tethys seamounts?). Nine genera, incl. common Neoschwagerina and also Verbeekina, but no Sumatrina (Neoschwagerina, Verbeekina and Sumatrina also in Midian of Lhasa, Qiangtang and Sibumasu)

Zhang, Y.C., Y. Wang, Y.J. Zhang & D.X. Yuan (2013)- Artinskian (Early Permian fusuline fauna from the Rongma area in northern Tibet: palaeoclimatic and palaeobiogeographic implications. *Alcheringa (Australasian Journal of Palaeontology)*, 37, 4, p. 529-546.

(Peri-Gondwanan fusuline fauna with Pseudofusulina pamirensis, Neodutkevitchia, etc., in Qiangtang Block grouped palaeobiogeographically into Southern Transitional Zone in S part of Peri-Gondwanan blocks during late Sakmarian and Artinskian)

Zhang, Y.J., X.Y. An, S.L. Liu & Y.C. Zhang (2023)- The sedimentary facies and tectono-stratigraphic successions of the Carboniferous- Lower Permian deposits in western South Qiangtang Block: implication for a rifting process on the Gondwana margin. *Palaeoworld* 33, 3, p. 706-723.

(S Qiangtang Block commonly viewed as part of Cimmerian Continent, which rifted off Gondwana margin during E Permian. With thick Late Carboniferous E Permian glacio-marine deposits dominated by dark shales and diamictites. Overlain by marine-deltaic clastics. Etc. SQB E Permian stratigraphy best explained by tectonic subsidence resulted from rifting of the SQB from Gondwanan margin)

Zhang, Z., W. An, R.M. Palin, H. Ding, X. Dong & Z. Tian (2023)- Intraoceanic subduction system within the Neo-Tethys: evidence from Late Cretaceous arc magmatic rocks of the Eastern Himalaya. *Geochem. Geophysics Geosystems* 24, 12, p. 1-13.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2023GC011214>)

(New geochronologic/ geochemical data for orthogneisses and amphibolites from E Himalayan orogen indicate Late Eocene-Pliocene metamorphic ages (~52–3 Ma), but were derived from Late Cretaceous arc-like magmas (zircon cores ages ~85-95 Ma; peak 89 Ma; Turonian-Coniacian), which formed in intraoceanic arc in Neo-Tethys, and accreted onto passive margin of Indian continent prior to terminal continental collision. Huge Late Cretaceous subduction system likely operated in E Neo-Tethys Ocean. Two subduction zones and two-stage collision history responsible for consumption of Neotethys)

Zhang, Z.M., H.X. Ding; R.M. Palin; X. Dong; Z.L. Tian & X.W Li (2024)- Crustal evolution of a continental magmatic arc from subduction to collision: A case study in the Gangdese arc, southern Tibetan Plateau. *Geological Society of America (GSA) Bull.* 136, 9-10, p. 4059-4071.

(Large (Cretaceous- Paleogene?) Gangdese magmatic arc in S Tibet magmatic arc response to Neotethys subduction)

Zheng, M., Y. Song, H. Li, C. Guilmette, J. Tang, Q. Zhang, Z. Liu & F. Li (2022)- Triassic trachytic volcanism in the Bangong-Nujiang Ocean: geochemical and geochronological constraints on a continental rifting event. *Geological Magazine* 159, 4, p. 519-534.

(online at: <https://www.cambridge.org/core/journals/geological-magazine/article/triassic-trachytic-volcanism-in-the-bangongnujiang-ocean-geochemical-and-geochronological-constraints-on-a-continental-rifting-Etc>.)

(Riasairi trachytes within Mugangri Gp in Bangong-Nujiang suture zone ('Mesotethys', between Qiangtang and Lhasa terranes), with mean age of ~236 Ma (basal Carnian). Geochemically similar to intra-continental rift felsic lavas. Trachytes interpreted as derived from S margin of Qiangtang terrane, reflecting opening of BN Ocean by M Triassic (= later than commonly interpreted break-up of Qiangtang terrane from Gondwana)

Zheng, Y.C., Z.Q. Hou, W. Li, W. Liang, K.X. Huang, Q.Y. Li, Q.Z. Sun, Q. Fu & S. Zhang (2012)- Petrogenesis and geological implications of the Oligocene Chongmuda-Mingze adakite-like intrusions and their mafic enclaves, Southern Tibet. *Journal of Geology* 120, 6, p.

(Tibetan Plateau with Oligocene-Miocene ultrapotassic and adakite-like igneous rocks. Geochemistry of Oligocene adakite-like granitoids in Chongmuda-Mingze complex of S Tibet suggests likely derived from enriched lithospheric mantle source, and suggests Oligocene -Miocene convective removal of lower lithospheric root below S Tibet. Upwelling of asthenosphere induced by delamination could have supplied heat to induce anatexis of residual lithosphere, generating adakite-like rocks and related mafic enclaves)

Zheng, Y.C., J.F. Xu, M.N. Ducea, J.L. Chen, F. Huang & L. Zhang (2019)- Initial rifting of the Lhasa Terrane from Gondwana: Insights from the Permian (~262 Ma) amphibole-rich lithospheric mantle-derived Yawa basaltic intrusions in Southern Tibet. *J. of Geophysical Research: Solid Earth* 124, 3, p. 2564-2581.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1029/2018JB016281>)

(Late M Permian (~262 Ma) Yawa intrusions in S Lhasa Terrane derived by partial melting of amphibole-rich lithospheric mantle. Yawa intrusions may have formed at onset of lithospheric extension associated with initial rifting of Lhasa Terrane from Indian Plate during Gondwana breakup, a precursor to opening of Neo-Tethys)

Zhong, H., J. Dai, C. Wang, Y. Li & Y. Wei (2017)- Middle Jurassic- Early Cretaceous radiolarian assemblages of the western Yarlung Zangbo suture zone: Implications for the evolution of the Neo-Tethys. *Geoscience Frontiers* 8, 5, p. 989-997.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987116301372>)

(Cherts in Zhongba melange of W Yarlung Zangbo (Neotethys) suture zone with M Jurassic-E Cretaceous (Aptian) radiolarian assemblages. Siliceous mudstones deposited during E Aptian. During Jurassic, Neo-Tethys was wide ocean with distal pelagic sediments only; in M Cretaceous (~130-120 Ma), Neo-Tethys Ocean started to subduct along S margin of Lhasa block, starting influx of terrigenous-derived siliceous material)

Zhou, X.Y., B. Zhao, L. Yan & Y. Li (2014)- Lithostratigraphy and biostratigraphy of Angjie Formation-Xiala formation of middle-lower Permian in Anglaren Co of the Gaize Area, Tibet. *J. Earth Science and Environment* 36, p. 107-116.

(E-M Permian smaller foraminifera in Angjie Fm limestone overlying glacial diamictites in Lhasa Block)

Zhou, Y., X. Cheng, Y. Wu, V. Kravchinsky, R. Shao, W. Zhang, B. Wei, R. Zhang, B. Wei et al. (2019)- The northern Qiangtang Block rapid drift during the Triassic Period: Paleomagnetic evidence. *Geoscience Frontiers* 10, 6, p. 2313-2327.

(online at: <https://www.sciencedirect.com/science/article/pii/S167498711930091X>)

(Paleomagnetic data from Triassic sediments of N Qiangtang Block suggest 3-stage N-ward drift for NQB: (1) NQB was in subtropical part of S hemisphere until E Triassic; (2) block rapidly drifted to N hemispheres during Triassic; and (3) block converged with Eurasian continent in Late Triassic (= ~4800 km N ward movement from Early to Late Triassic = ~11.8 cm/yr)

Zhu, D.C., S.M. Li, P.A. Cawood, Q. Wang, Z.D. Zhao, S.A. Liu & L.O. Wang (2016)- Assembly of the Lhasa and Qiangtang terranes in central Tibet by divergent double subduction. *Lithos* 245, p. 7-17.

(manuscript online at: https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/9072/Cawood_2015_Lithos_Assembly_AM.pdf)

(Lhasa-Qiangtang collision zone in C Tibet (Bangong suture and adjacent regions) characterized by absence of E Cretaceous high-grade metamorphic rocks and presence of extensive magmatism with enhanced mantle contributions at ca. 120-110 Ma (Aptian-Albian). Two Jurassic–Cretaceous magmatic arcs identified, in W Qiangtang Terrane and in N Lhasa Terrane, reflecting N-ward and S-ward subduction of Bangong Ocean lithosphere (although other data suggest Bangong Ocean may have closed in Late Jurassic–Early Cretaceous (most likely ~140–130 Ma) through arc-arc “soft” collision rather than continent–continent “hard” collision)

Zhu, D.C., X.X. Mo, Z.D. Zhao, Y. Niu, L.Q. Wang, Q.H. Chu, G.T. Pan, J.F. Xu & C.Y. Zhou (2010)- Presence of Permian extension- and arc-type magmatism in southern Tibet: Paleogeographic implications. Geological Society of America (GSA), Bull. 122, 7-8, p. 979-993.

(online at: https://www.researchgate.net/publication/249527457_Presence_of_Permian_extension-_and_arc-type_magmatism_in_southern_Tibet_Paleogeographic_implications)

(Permian (Sakmarian-Artinskian) basalts of Jilong Fm in Lhasa terrane (at S margin of C Lhasa Subterrane). Also on C. Lhasa block Leiqingla andesites of calc-alkaline, high-Al basalt affinity (~265 Ma; M Permian), overlain by Luobadui Fm limestone with M Permian corals and fusulinids). Geochemical features, combined with documentation of Permian Songdo eclogite and sedimentological observations, indicate existence of subduction system beneath C Lhasa subterrane in Permian. C Lhasa may have been microcontinent isolated in Paleo-Tethyan Ocean during Carboniferous- M Permian time (but glacial diamictites suggests C Lhasa still attached to Gondwana in Late Carboniferous- earliest Permian?; JTvG))

Zhu, D.C., Q. Wang, P.A. Cawood, Z.D. Zhao & X.X. Mo (2017)- Raising the Gangdese Mountains in southern Tibet. J. of Geophysical Research: Solid Earth 122, 1, p. 214-223.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016JB013508>)

(Gangdese Mts in S Tibet attained elevation of >4000 m at ~55-45 Ma, as result of isostatic surface uplift-driven by crustal thickening (60-70 km thick) and slab breakoff and reached present-day elevation by 20-10 Ma.)

Zhu, D.C., Q. Wang, R.F. Weinberg, P.A. Cawood, Z. Zhao, Z.Q. Hou & X.X. Mo (2023)- Continental crustal growth processes recorded in the Gangdese Batholith, Southern Tibet. Annual Review Earth Planetary Sciences 51, p. 155-188.

(online at: <https://www.annualreviews.org/doi/pdf/10.1146/annurev-earth-032320-110452>)

(Overriding plate of India-Asia collision zone in S Tibet characterized by overthickened felsic layer above underlying granulite-eclogite layer. Crust experienced magmatism from 245 to 10 Ma, as recorded by Gangdese Batholith. Magmatism punctuated by flare-ups at 185-170 Ma, 90-75 Ma, and 55-45 Ma. Growth of this crust (1) starts with period dominated by fractional crystallization and formation of voluminous (ultra)mafic arc cumulates in lower crust during oceanic subduction, (2) melting during late-subduction and collision, due to changes in convergence rate. Combined accumulation-melting process resulted in vertical stratification and density sorting of Gangdese crust. Comparisons with other similarly thickened collision zones suggests this is general process of stabilization of continental crust.)

Zhu, D.C., Q. Wang, R.F. Weinberg, P.A. Cawood, S.L. Chung, Y.F. Zheng, Z. Zhao, Z.Q. Hou & X.X. Mo (2022)- Interplay between oceanic subduction and continental collision in building continental crust. Nature Communications 13, 7141, p. 1-10.

(online at: https://pmc.ncbi.nlm.nih.gov/articles/PMC9681875/pdf/41467_2022_Article_34826.pdf)

(Gangdese continental crust in S Tibet developed during subduction of Neo-Tethyan oceanic slab in Mesozoic prior to reworking during Cenozoic India-Asia collision. Continental arc magmatism started with medium-K calc-alkaline suites, followed by ~70 Ma remelting of pre-existing lower crust, producing more potassic compositions. Increased remelting coincides with acceleration in convergence rate between India and Asia leading to higher basaltic flow into Asian lithosphere; followed by convergence deceleration due to slab breakoff, enabling high heat flow and melting of base of arc)

Zhu, D.C., Q. Wang, Z.D. Zhao, S.L. Chung, P.A. Cawood, Y. Niu, S.A. Liu, F.Y. Wu & X.X. Mo (2015)- Magmatic record of India-Asia collision. Nature Scientific Reports 5, 14289. p. 1-9.

(online at: <https://www.nature.com/articles/srep14289>)

(Magmatic activity from India-Asia collision zone shows distinct magmatic flare-up event ascribed to slab breakoff. Continental arc magmatism in S Tibet during 80–40Ma migrated from S to N, then back to S with significant mantle input at 70–43Ma. Flare up in magmatic intensity at ~52–51 Ma corresponds to decrease in India-Asia convergence rate. Geological and geochemical data consistent with mantle input controlled by slab rollback from ~70 Ma and slab breakoff at ~53Ma. Slowdown of Indian plate at ~51Ma largely consequence of slab breakoff of subducting Neo-Tethyan oceanic lithosphere, rather than onset of India-Asia collision, implying initial India-Asia collision started earlier, likely at ~55Ma)

Zhu, D.C., Z.D. Zhao, Y. Niu, Y. Dilek & X.X. Mo (2011)- Lhasa Terrane in southern Tibet came from Australia. *Geology (GSA)* 39, 8, p. 727-730.

(online at: <https://pubs.geoscienceworld.org/gsa/geology/article/39/8/727/130631/Lhasa-terrane-in-southern-Tibet-came-from>)

(U-Pb age and Hf isotope data on detrital zircons from Carboniferous-Permian metasedimentary rocks in Lhasa terrane (Tibet) define distinctive age population of ~1170 Ma, most likely derived from granites in Albany-Fraser orogenic belt in SW Australia (1150 Ma peak absent in W Qiangtang and Tethyan Himalaya terranes, which have zircon age peak of ~950 Ma, possibly sourced from Himalayas to S). Second Lhasa age peak of ~535 Ma, similar to W Australia and W Qiantang. Lhasa terrane not part of Indian sector of Gondwana)

Zhu, D.C., Z.D. Zhao, Y. Niu, Y. Dilek, Q. Wang, W.H. Ji, G.C. Dong, Q.L. Sui et al. (2012)- Cambrian bimodal volcanism in the Lhasa Terrane, southern Tibet: Record of an early Paleozoic Andean-type magmatic arc in the Australian proto-Tethyan margin. *Chemical Geology* 328, 19, p. 290-308.

(online at: https://www.researchgate.net/publication/256681007_Cambrian_bimodal_volcanism_in_the_Lhasa_Terrane_southern_Tibet_Record_of_an_early_Paleozoic_Andean-type_magmatic_arc_in_the_Austral_Etc)

(Cambrian metavolcanic rocks in C Lhasa bimodal volcanic suite, dated at ~492 Ma (Late Cambrian). Part of E Paleozoic Andean-type magmatic arc facing the proto-Tethyan Ocean (for Crow et al. (2023) Lhasa terrane Cambrian arc volcanism is continuation of Sibumasu Cambrian Arc, when both were part of Gondwana; JTvG))

Zhu, D.C., Z.D. Zhao, Y. Niu, X.X. Mo, S.L. Chung, Z.Q. Hou et al. (2011)- The Lhasa Terrane: record of a microcontinent and its histories of drift and growth. *Earth Planetary Science Letters*, 301, 1/2, p. 241-255.

(online at: <https://yaolingniu.webspace.durham.ac.uk/wp-content/uploads/sites/234/2021/04/2010ZhuEtAl-EPsL.pdf>)

(Lhasa Terrane in S Tibet last geological block accreted to Eurasia before India collision in Cenozoic. Lhasa Terrane has Proterozoic and Archean basement rocks in centre (ages up to 2870 Ma), with Phanerozoic crust accreted along N and S edges. C Lhasa microcontinent survived journey across Paleo-Tethyan Ocean basins and has grown at edges through magmatism resulting from oceanic subduction beneath it, and subsequent collisions with Qiangtang to N and India to S. Much of Mesozoic magmatism in Lhasa Terrane may be associated with S-ward Bangong-Nujiang (Meso-)Tethyan seafloor subduction beneath Lhasa in M Permian (or earlier) to late E Cretaceous. Significant changes of zircon $\epsilon\text{Hf}(t)$ at ~113 and ~52 Ma record slab break-off and related mantle melting events following Qiangtang- Lhasa and India- Lhasa amalgamations respectively)

Zhu, Z. & Z. Yang (2008)- Distribution, origin and mineralization of two types of Cenozoic adakite and adakite-like rocks in southeastern Asia. *Dizhi Lixue Xuebao = J. Geomechanics*, Beijing, 14, 4, p. 328-338.

(In Chinese with English summary.) (Adakite and adakite-like intermediate-acid magmatic rocks well developed in Cenozoic of Indonesia- New Guinea. Two types of origin: (1) oceanic type tholeiitic/calc-alkaline series with REE pattern of oceanic island arcs, seen at the oceanic islands; (2) continental type high-K calc-alkaline series with continental type REE patterns, often in continental margin orogenic zone and related to arc-continent collision zone or post-collision. Continental-type adakite similar distribution to large porphyry copper-gold deposits; oceanic island arc type adakite rocks related to epithermal gold zones and ehalation ore deposits)

Ziabrev, S.V., J.C. Aitchison, A. V. Abrajevitch, Badengzhu, A.M. Davis & H. Luo (2003)- Precise radiolarian age constraints on the timing of ophiolite generation and sedimentation in the Dazhuqu terrane, Yarlung-Tsangpo suture zone, Tibet. *J. Geological Society, London*, 160, p. 591-599.

(online at: https://www.researchgate.net/publication/236002189_Precise_radiolarian_age_constraints_on_the_timing_of_ophiolite_generation_and_sedimentation_in_the_Dazhuqu_terrane_Yarlung-Tsangpo_sutur_Etc)

(Abundant radiolarians provide age constraints on timing of eruption of ophiolitic basalts exposed along Yarlung-Tsangpo suture zone in S Tibet. Dazhuqu terrane ophiolites generated in intra-oceanic supra-subduction zone setting from late Barremian- late Aptian (~10 Myrs). Sedimentation over newly generated ophiolite initially in series of rift-controlled sub-basins associated with various spreading centres. Increasing flux of arc-derived volcanoclastic sediment upsection indicates nearby volcanic arc activity. Dazhuqu terrane developed in intra-oceanic setting within (Neo-)Tethys, isolated from continental influence)

Ziabrev, S.V., J.C. Aitchison, A. V. Abrajevitch, Badengzhu, A.M. Davis & H. Luo (2004)- Bainang Terrane, Yarlung-Tsangpo suture, southern Tibet (Xizang, China): a record of intra-Neotethyan subduction-accretion processes preserved on the roof of the world. *J. Geological Society, London*, 161, p. 523-539.

(Bainang terrane is intra-oceanic island arc/subduction complex into which Tethyan oceanic rocks accreted during Cretaceous, now preserved within Yarlung-Tsangpo suture zone of S Tibet. With history of sedimentation in central Tethyan domain from Late Triassic- mid-Cretaceous. Rocks preserved within S-verging imbricate thrust stack of thin (<<1 km) N-ward younging tectonic slices. N tract, which accumulated on N side of Neotethys probably separated from southern counterpart by mid-ocean ridge. Oceanic plate stratigraphy of N tract records N-ward travel and mid-Cretaceous (late Aptian) approach towards a S-facing intra-oceanic subduction zone. Rocks in S tract developed closer to Indian subcontinent and experienced M Jurassic basic alkaline intraplate magmatism. Overall tectonostratigraphy in remote intra-oceanic setting)

Zong, P., L. Zhan, S. Lee, H. Huang, G.R. Shi & X. Jin (2024)- Cisuralian-Guadalupian brachiopod assemblages from the northern Tengchong Block in western Yunnan, China and their paleogeographical implications- a revisit. *Journal of Paleontology* 98, 1:p. 1-32.

(E-M Permian brachiopods from N Tengchong Block in W Yunnan, SW China: in ascending order Elivina-Etherilosia Assemblage (late Sakmarian- E Artinskian), Spiriferella-Spiriferellina Assemblage (late Artinskian) and Waagenites-Costiferina Assemblage (late Roadian - E Wordian). Evident transition from cool-water faunas of Gondwanan affinities to mixed warm-temperate (transitional) faunas with Cathaysian elements during Artinskian- Guadalupian, reflecting Gondwana deglaciation and N-ward drift of peri-Gondwanan blocks)

IX.11. SE Asia Regional Geology, Tectonics, Gondwanan-Tethyan regional paleo(bio)geography

Achache, J., A. Abtout & J.J. Mouel (1987)- The downward confirmation of Magsat crustal anomaly field over Southeast Asia. *J. of Geophysical Research* 92, B11, p. 11584-11596.

(Magnetic field data over SE Asia acquired by Magsat satellite. Stable continental blocks generally associated with positive anomalies, and intervening collision belts correspond to negative anomalies. A prominent low is observed above Himalaya and Tibet Plateau, confirming anomalous crustal and thermal structure of this area)

Achache, J., V. Coutillot & J. Besse (1983)- Paleomagnetic constraints on the Late Cretaceous and Cenozoic tectonics of Southeast Asia. *Earth Planetary Science Letters* 63, p. 123-136.

(online at: https://www.academia.edu/20265943/Paleomagnetic_constraints_on_the_late_Cretaceous_and_Cenozoic_tectonics_of_southeastern_Asia)

(Cretaceous- Cenozoic paleomagnetic data show negligible rotation of S China and CW rotation of Indochina, consistent with Tapponnier India indentation model. Malaya and Borneo data can be reconciled with model, but less straightforward. Large CCW rotation of S Tibet implies rotation with India during collision. M Cretaceous reconstruction of S margin of Asia shows continuity of geological features in Tibet and Indochina, with active subduction of Indian plate oceanic crust taking place to S at subtropical latitudes)

Acharyya, S.K. (1998)- Break-up of the greater Indo-Australian continent and accretion of blocks framing South and East Asia. *J. Geodynamics* 26, 1, p. 149-170.

(online at: https://www.academia.edu/32329634/Break_up_of_the_Greater_Indo_Australian_Continent_and_accretion_of_blocks_framing_South_and_East_Asia)

(Plate tectonic history of SE Asia, with emphasis on India-Andaman region. Tibetan and 'Sibumasu' continental blocks rifted from N margin of Gondwanan Indo-Australia in Permian; IndoBurma-Andamans, Sikuleh, Lolotoi micro-continents in Late Jurassic. Tibetan and Sibumasu blocks drifted N in M-L Permian, opening Neo-Tethys. Indian and Australian continents separated in Cretaceous opening up Indian Ocean and closing Tethyan ocean. Etc. Ophiolite trail on IBA does not represent E suture of Indian continent. Convergence between Australian continent and Indonesian Arc emplaced Lolotoi continental rocks. Maubisse exotic blocks and ophiolitic rocks as nappes over Timor shelf, which possibly remained attached to Australian continent)

Acharyya, S.K. (2000)- Break up of Australia-India-Madagascar Block, opening of the Indian Ocean and continental accretion in Southeast Asia with special reference to the characteristics of the peri-Indian collision zones. *Gondwana Research* 3, p. 425-443.

(Tibetan and Sibumasu- W Yunnan continental blocks were located near proto-Himalayan part of Indian continent, rifted and drifted from N margin of E Gondwana continent in Late Paleozoic. Indo-Burma-Andaman, Sikule and Lolotoi blocks rifted and drifted from same margin in Late Jurassic, followed by break-up of Australia-India-Madagascar continental block in Cretaceous)

Agematsu, S. & T Oo (2023)- Ordovician geology of the Sibumasu Block, Southeast Asia. In: T. Servais et al. (eds.) *A global synthesis of the Ordovician System, Part 2*, Geological Society, London, Special Publ. 533, p. 519-544.

(Ordovician stratigraphy of Sibumasu Block, which formed part of equatorial peri-Gondwana during E Paleozoic. U Cambrian sequences dominated by coarse shallow marine clastics. Lower Ordovician fine-grained clastics in Shan Plateau, shallow-marine clastics in N and W Thailand and shallow-marine carbonates in S Thailand- NW Malaysia. M Ordovician carbonates. U Ordovician deeper environments. Sibumasu Block adjacent to W Australia throughout E Paleozoic).

Ager, D.V.A. & D.L. Sun (1988)- Distribution of Mesozoic brachiopods on the northern and southern shores of Tethys. *Palaeontologia Cathayana* 4, p. 23-51.

(Late Triassic brachiopod Misolia widely distributed in S Tethys; recorded from Middle East to E Indonesia (Misool, Timor, Seram). Halorella/ Timorhynchia more typical of Late Triassic of N Tethys margin)

Ahmad, S., W. Jalal, F. Ali, M. Hanif, Z. Ullah, S. Khan, A. Ali, I.U. Jan & K. Rehman (2015)- Using larger benthic foraminifera for the paleogeographic reconstruction of Neo-Tethys during Paleogene. *Arabian J. Geosciences* 8, 7, p. 5095-5110.

(Comparison of Paleogene larger foraminifera from E part of NeoTethys in Kohat Basin of Pakistan compared with W, C Neo-Tethys to establish Paleogene migration pathways in Neo-Tethys. LBF species mostly confined to blocks derived from Gondwana (Iran, Iraq, Pakistan, India, Indonesia) and Laurasia (Italy, France, Spain), with only few on margin of Gondwanan continents (Oman). Includes brief review of Indonesian LBF)

Ali, J.R. (2006)- Biogeographical and geological evidence for a smaller, completely-enclosed Pacific basin in the Late Cretaceous: a comment. *J. of Biogeography* 33, 9, p. 1670-1674.

(Critical discussion of McCarthy 2005 paper that describes Pacific history in expanding earth model))

Ali, J.R., J.C. Aitchison, H.M.Z. Cheung, S.S.Y. Chik & Y. Sun (2012)- Late Paleozoic development of Gondwana: detachment of the >13,500-km-long Cimmerian super terrane and its drift to Asia. *Proc. First Int. Symposium of IGCP-589, Xi'an, China 2012, Acta Geologica Sinica* 33, Supplement 1, p. 1-2. *(Abstract only)*
(online at: <http://igcp589.cags.ac.cn/pdf/02-ALI%20Jason.pdf>)

(Presentation online at: <http://rwg-tag.bravehost.com/Conferences/geocon/ppt/1120-1140%20Ali.pdf>)

(Cimmerian terrane almost unbroken chain stretching >13,500 km, from S Europe, via Middle East, Afghanistan, Tibet, SW China, Myanmar to W Indonesia. Example of 'sliver terrane' dwarfing other examples like Palawan Block in W Philippines and Lord Howe Rise in Tasman Sea. Dispersal from Gondwana in E Permian. Sibumasu lay offshore of Australia; Qiangtang and Lhasa off Greater India- SE Arabia)

Archbold, N.W. (1983)- Permian marine invertebrate provinces of the Gondwanan realm. *Alcheringa* 7, p. 59-73.

(Permian chonetidine brachiopods allow distinction of five Permian Gondwanan faunal provinces: Andean, Paratitan, Austrazean (E Australia- New Zealand), Westralian (W Australia) and Cimmerian (Cimmerian terranes, from Tunisia, Himalayas, Thailand, Sumatra, Leti to W Papua). With description of Waterhouseiella n.gen. for Waagenites speciosus)

Archbold, N.W. (1987)- South-western Pacific Permian and Triassic marine faunas: their distribution and implications for terrane identification. In: E.C. Leith & E. Scheibner (eds.) *Terrane accretion and orogenic belts*, American Geophysical Union (AGU), *Geodynamics Series* 19, p. 119-127.

(Three SW Pacific Permian faunal provinces: (1) Cimmerian (Arabia to Irian Jaya, Timor: cold earliest Permian with bivalve Eurydesma, etc., warm-tropical later in E Permian), (2) Westralian (cold earliest Permian followed by temperate faunas, with tropical elements only in Late Permian) and (3) Austrazean (E Australia- New Zealand, New Caledonia), with cold and cool temperate conditions throughout Permian. Marine Triassic faunas two provinces: (1) Tethyan- cosmopolitan, (2) cool Maori Province in New Zealand (not including Torlesse))

Archbold, N.W. (1998)- Correlations of Western Australian Permian and Permian Ocean circulation patterns. *Proc. Royal Society of Victoria* 110, p. 85-106.

Archbold, N.W. (1999)- Permian Gondwanan correlations: the significance of the western Australian marine Permian. *J. African Earth Sciences* 29, 1, p. 63-75.

(Conodonts, fusulinid foraminifera and ammonoids, commonly used for Permian correlations, are absent or rare in Gondwanan marine sequences. Marine faunas of Permian exhibit pronounced provincialism. W Australia marine sections 18 brachiopod zones and offer correlation interface between new global standard and extensive Permian sequences of Gondwana)

Archbold, N.W. (2000)- Palaeobiogeography of the Australasian Permian. In: A.J. Wright et al. (eds.) *Palaeobiogeography of Australasian faunas and floras*, *Memoir Assoc. Australasian Palaeontologists (AAP)* 23, p. 287-310.

Archbold, N.W. (2001)- Pan-Gondwanan, Early Permian (Asselian-Sakmarian-Akastinian) correlations. In: R.H. Weiss (ed.) Contributions to Geology and Paleontology of Gondwana in honour of Helmut Wopfner, Cologne 2001, p. 29-39.

(Correlation tables of E Permian formations and faunas from Gondwanan and peri-Gondwanan regions. Incl. Malay Peninsula and Timor Somohole ammonoid fauna (E Sakmarian?) and Bisnain brachiopod fauna (Late Sakmarian?))

Archbold, N.W. (2001)- Wallace lines in eastern Gondwana: palaeobiogeography of Australasian Permian brachiopoda. In: I. Metcalfe, J.M.B. Smith et al. (eds.) Faunal and floral migrations and evolution in SE Asia-Australasia, Balkema, Lisse, p. 73-83.

(Australian continent was major component of NE Gondwana in Permian. Surrounding what is now Australia, were additional elements of NE Gondwana that are now incorporated into New Zealand, New Caledonia, New Guinea, Timor, SE Asia, Himalaya and S Tibet. Pronounced provincialism of global marine faunas in Permian. Brachiopoda can be used to define Westralian and Austrazean provinces)

Archbold, N.W. (2002)- Peri-Gondwanan Permian correlations: the Meso-Tethyan margins. In: M. Keep & S.J. Moss (eds.) The sedimentary basins of Western Australia 3, Proc. West Australian Basins Symposium, Perth 2002, p. 223-240.

(Permian of 16 regions of NE Gondwana compared with Australian continent. Paleoclimatic changes and tectonic events: (1) Asselian- E Artinskian change from cold to temperate environments, associated with basaltic volcanism and initial rifting of peripheral N Gondwanan margin; (2) Late Artinskian-Kungurian warming with onset of carbonate deposition in several Cimmerian terranes. Basaltic volcanism in several terranes indicative of rifting and opening of Meso-Tethys; (3) Roadian (Late Ufimian) and (4) Wordian-Capitanian: widespread, subtropical, marine carbonates on Cimmerian blocks as they drifted N and on N parts of Meso-Tethys S margin. Equivalent carbonates in subsurface W Australia. Andesitic volcanism in E Australia; (5) Wuchiapingian: marine transgressions extending into NW basins of Australia; (6) Changhsingian: minor marine transgressive events in Trans-Himalaya with Selong section of Tibet most complete Permo-Triassic for S Meso-Tethys margin)

Archbold, N.W., C.J. Pigram, N. Ratman & S. Hakim (1982)- Indonesian Permian brachiopod fauna and Gondwana-South-East Asia relationships. Nature 296, p. 556-558.

(First description of late E Permian articulate brachiopods in Birds Head. Assemblage similar to Thailand Rat Buri Limestone, suggesting geographical proximity of Thailand and NW Irian Jaya in E Permian)

Archbold, N.W. & G.R. Shi (1995)- Permian brachiopod faunas of Western Australia: Gondwanan-Asian relationships and Permian climate. J. Southeast Asian Earth Sciences 11, 3, p. 207-215.

(W Australian Permian brachiopod faunas mixture of Gondwanan, endemic Westralian and Asian (Tethyan) genera. Presence of Tethyan genera largely temperature dependent; no apparent geographical barriers to migration of such genera into intracratonic basins of W Australia. Paleotemperature curve indicates peak warm conditions in Sterlitamakian and Late Baigendzhinian and subtropical conditions in Dzhulfian)

Archbold, N.W. & G.R. Shi (1996)- Western Pacific Permian marine invertebrate palaeobiogeography. In: Z.X. Li, I. Metcalfe & C.M. Powell (eds.) Breakup of Rodinia and Gondwanaland and assembly of Asia, Australian J. Earth Sciences 43, 6, p. 635-641.

(Permian of W Pacific 4 provinces for Asselian-Tastubian (Indoralian, Himalayan, Cathaysian, Verkolyma), 6 for Sterlitamakian-Aktastinian (Austrazean, Westralian, Cimmerian, Cathaysian, Sino-Mongolian, Verkolyma), 7 for Baigendzhinian- E Kungurian (Austrazean, Westralian, Cimmerian- with Sibumasu and Himalayan subprovinces- Cathaysian, Sino-Mongolian, Verkolyma) and 3 for Kazanian-Midian (Austrazean, Cathaysian, Verkolyma). Changing pattern of provincialism best understood in terms of evolution of Sino-Mongolian Sea in N and rift-drift history of Cimmerian continental blocks in S, and climate amelioration during Permian)

Arias, C. (2006)- Northern and Southern Hemispheres ostracod palaeobiogeography during the Early Jurassic: possible migration routes. Palaeogeogr. Palaeoclim. Palaeoecology 233, p. 63-95.

(Australian E Jurassic ostracod faunas similar to W Tethyan and C European assemblages, probably indicating communication route along western Tethys, aided by action of western currents)

Asama, K. (1976)- *Gigantopteris* flora in Southeast Asia and its phytopalaeogeographic significance. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 17, p. 191-207.

(Gigantopteris flora is typical Cathaysian flora, best developed in N and NE China and Korea, but also in Yunnan and extending S to Malay Peninsula (Johore). Gigantopteris species described from E Permian Jambi flora of W Sumatra by Jongmans & Gothan 1935 differ from typical Gigantopteris flora. Djambi flora may still belong to Cathaysian flora, but probably older than typical Gigantopteris flora. W New Guinea Permian flora most likely part of Glossopteris flora)

Asama, K. (1984)- *Gigantopteris* flora in China and Southeast Asia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 25, p. 311-323.

(Mainly on classification and evolution of 'Cathaysian' Permian Gigantopteris flora. C Sumatra Permian Jambi flora typical Asian Gigantopteris flora, not Gondwanan Glossopteris flora)

Audley-Charles, M.G. (1983)- Reconstruction of eastern Gondwanaland. *Nature* 306, p. 48-50.

(Model of E Gondwanaland on basis of distribution of floras and faunas, lithofacies patterns and identification of Triassic magmatic arc that characterized E margin of Gondwanaland. Continental fragments that rifted from N Australia-New Guinea in Jurassic identified as S Tibet-Burma-Thailand-Malaya and Sumatra. Sumatra attached to New Guinea through Triassic. Original site of deposition of 'Maubisse' subtropical Permian limestones and tropical Late Triassic limestones, overthrust onto N margin of Australia in late Cenozoic collision, is located in this greater Gondwanaland)

Audley-Charles, M.G. (1988)- Evolution of the southern margin of Tethys (North Australia region) from Early Permian to Late Cretaceous. In: M.G. Audley-Charles & A. Hallam (eds.) *Gondwana and Tethys*. Geological Society, London, Special Publ. 37, p. 79-100.

(online at: http://searg.rhul.ac.uk/pubs/audley-charles_1988%20N%20Australia%20evolution.pdf)

(Review of Mesozoic stratigraphies of Banda terranes and Permo-Carboniferous- Cretaceous paleogeography. Mid-Permian rift event removed continental blocks now in Asia from Gondwana. Present NW Australia- New Guinea margin formed in Jurassic with breakup of S. Tibet/Burma/Malaya/ W and E Borneo/Sumatra/W Sulawesi/ Banda allochthons. E Sulawesi/ Banggai-Sula/ Kemum still part of N Guinea margin in Early Cretaceous. Margin E of Scott Plateau modified by Tertiary collisions with arc systems)

Audley-Charles, M.G., P.D. Ballantyne & R. Hall (1988)- Mesozoic-Cenozoic rift-drift sequence of Asian fragments from Gondwanaland. *Tectonophysics* 155, p. 317-330.

(online at: <http://searg.rhul.ac.uk/pubs/audley-charles%20et%20al%201988.pdf>)

(Reconstruction of continental blocks dispersal from E Gondwanaland from Latest Jurassic- Late Miocene. Burma-Malaya-Sumatra rifted off New Guinea in Jurassic and colliding with SE Asia in Late Cretaceous (clearly too late; JTvG), etc.)

Audley-Charles, M.G. & R. Harris (1990)- Allochthonous terranes of the Southwest Pacific and Indonesia. *Philosophical Transactions Royal Society London, A* 331 (1620), p. 571-587.

(online at: http://searg.rhul.ac.uk/pubs/audley-charles_harris_1994%20allochthonous%20terranes.pdf)

(Mesozoic breakup of Gondwana and subsequent collisional events led to formation and emplacement of allochthonous terranes in fold-thrust mountain belts. Many allochthonous terranes of SW Pacific and E Indonesia accreted during last 3 Ma)

Audley-Charles, M.G. & R. Harris (1991)- Allochthonous terranes of the Southwest Pacific and Indonesia. In: J.F. Dewey, I.G. Gass et al. (eds.) *Allochthonous terranes*, Cambridge University Press, Cambridge, p. 115-127.

(Same paper as Audley-Charles & Harris (1990), above)

Bansal, M., R.J. Morley, S.K. Nagaraju, S. Dutta, A. K. Mishra, J. Selveraj et al. (2022)- Southeast Asian Dipterocarp origin and diversification driven by Africa-India floristic interchange. *Science* 375, 455-460, p. 1-6.

(Documentation of tropical-African origin of Dipterocarpaceae in mid-Cretaceous and dispersal to India during Late Maastrichtian and Paleocene. India-Asia collision facilitated dispersal of dipterocarps from India to similar climatic zones in SE Asia)

Barrier, E., B. Vrielynck, J.F. Brouillet & M.F. Brunet (2018)- Paleotectonic reconstruction of the Central Tethyan Realm. Tectonono-sedimentary palinspastic maps from Late Permian to Pliocene. Commission for the Geological Map of the World (CCGM/CGMW), Paris, p. 1-21.

(online at: https://www.researchgate.net/publication/328233233_Paleotectonic_Reconstruction_of_the_Central_Tethyan_Realm_Tectonono-Sedimentary-Palinspastic_maps_from_Late_Permian_to_Pliocene)

(Atlas of 20 paleogeographic/ paleotectonic maps from E Mediterranean- India since Late Permian (no SE Asia) (DARIUS project maps))

Beckinsale, R.D. (1979)- Granite magmatism in the tin belt of South-East Asia. In: M.P. Atherton & J. Tarney (eds.) Origin of granite batholiths: geochemical evidence, Shiva Press, Orpington, p. 34-44.

Ben-Avraham, Z. (1978)- The evolution of marginal basins and adjacent shelves in East and Southeast Asia. In: S. Uyeda (ed.) Active plate boundaries of the Western Pacific, Tectonophysics 45, p. 269-288.

(In Mesozoic W Pacific Ocean and E Indian Ocean were parts of Tethys Sea, moving N relative to Antarctica, causing E-W Mesozoic ridge system, E-W trending magnetic anomalies and N-S transform faults. In Late Cretaceous-Eocene segments of spreading ridge gradually submerged at trenches to N, causing gradual change in direction of Pacific plate motion, separating Pacific and E Indian Ocean plates. Only remnant of Mesozoic ridge system today at W Philippine Basin)

Berry, W.B.N. & A.J. Boucot (1972)- Correlation of the Southeast Asian Silurian rocks. Geological Society of America (GSA), Special Paper 137, p. 1-35.

Besse, J. & V. Courtillot (1988)- Paleogeographic maps of the continents bordering the Indian Ocean since the Early Jurassic. J. of Geophysical Research 93, B10, p. 11791-11808.

(Plate reconstructions primarily driven by paleomagnetism)

Bird, P. (2003)- An updated digital model of plate boundaries. Geochem. Geophysics Geosystems 4, 3, 1027, p. 1-52.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2001GC000252/epdf>)

(Global plate boundaries, showing 14 larger plates (incl. Australia, Eurasia, Pacific, Philippine Sea) and 38 small plates (in SE Asia-SW Pacific: Sunda, Burma, Molucca Sea, Banda Sea, Timor, Birds Head, Maoke, Caroline, Mariana, N Bismarck, Manus, S Bismarck, Solomon Sea, Woodlark, New Hebrides (Maoke Plate is newly-defined small tectonic plate in West Papua, underlying western Central Range/ Mamberamo area to Cenderawasih Bay))

Blendinger, W., W.M. Furnish & B.F. Glenister (1992)- Permian cephalopod limestones, Oman Mountains: evidence for a Permian seaway along the northern margin of Gondwana. Palaeogeogr. Palaeoclim. Palaeoecology 93, p. 13-20.

(Cephalopod limestones of M Permian (M Guadalupian, Wordian) age at base of Hawasina nappes in Oman Mts are condensed sequence on N side of Arabian platform (or allochthonous unit thrust onto N margin). Ammonoid and conodont faunas remarkably similar to W Mediterranean (Sicily Sosio Lst) and Timor, suggesting unrestricted faunal exchange in Permian seaway along distal pelagic N margin of Gondwana (or distal margins of Cimmerian terranes?; JTvG))

Bodet, F. & U. Scharer (2000)- Evolution of the SE Asian continent from U-Pb and Hf isotopes in single grains of zircon and baddeleyite from large rivers. Geochimica Cosmochimica Acta 64, p. 2067-2091.

(Three Paleoproterozoic crust-formation episodes in mainland SE Asia (2.5 Ga, 2.2-2.3 Ga and ~1.9 Ga), identified from zircons of Red River, Mekong, Salween and Irrawaddy Rivers)

Bolotov, I.N., R. Pasupuleti, N.V. Subba Rao, S.K. Unnikrishnan, Nyein Chan, Zau Lunn, Than Win et al. (2022)- Oriental freshwater mussels arose in East Gondwana and arrived to Asia on the Indian Plate and Burma Terrane. *Nature Scientific Reports* 12, 1518, p. 1-26.

(online at: <https://www.nature.com/articles/s41598-022-05257-0>)

(Distributions of freshwater mussels (Unionidae) in S-SE Asia. Indian Subcontinent harbors taxonomically poor fauna of Parreysiinae, which most likely originated in E Gondwana in Jurassic and representatives arrived to Asia on two Gondwanan fragments: Indian Plate and Burma Terrane. Burma Terrane was connected with Indian Plate until end-Cretaceous. During Paleogene, blocks served as isolated evolutionary hotspots for freshwater mussels. Burma Terrane collided with mainland Asia in Late Eocene, and played major role as Gondwanan "biotic ferry" alongside with Indian Plate)

Bose, S., W.P. Schellart, V. Strak, J.C. Duarte & Z. Chen (2023)- Sunda subduction drives ongoing India-Asia convergence. *Tectonophysics* 849, 229727, p. 1-13.

(online at: https://research.vu.nl/ws/portalfiles/portal/292036688/Sunda_subduction_drives_ongoing_India-Asia_convergence.pdf)

(Active subduction of Indo-Australian plate along Sunda subduction zone probably the main driver of continued India-Asia convergence, Indian indentation, and consequent growth of Himalaya-Tibet mountains, and also the present-day E-ward crustal displacement of SE Asia. Experiments show that at least 880 km of N-ward indentation of India would not have ensued in absence of lateral subduction zones)

Boucot, A. (2003)- Some thoughts about the Shan-Tai Terrane. In: N. Mantajit (ed.) *Proc. Symposium on Geology of Thailand, Bangkok 2002*, Dept. Mineral Resources (DMR), p. 4-13.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2002/6368.pdf)

(Review of stratigraphy and fossils of Silurian- Permian of Shan-Tai (= Sibumasu) terrane of W Thailand. Rel. cool climate 'Gondwanan' faunas through E Permian. Includes carbonate-rich Ordovician, Silurian black graptolite shales, E Devonian carbonates and 'tentaculite' mudstones, E Permian pebbly mudstones, etc.)

Boucot, A.J. (2007)- What happens at the northern end of the Shan-Thai terrane, where does it go from there. In: W. Tantiwanit (ed.) *Int. Conference on Geology of Thailand: Towards sustainable development and sufficiency economy (GEOTHAI'07)*, Bangkok, Dept. Mineral Resources (DMR), p. 373-377.

(online at: http://library.dmr.go.th/library/Proceedings-Yearbooks/M_1/2007/12752.pdf)

(Scattered Cambrian- E Devonian lithofacies and biogeographic data from Himalayan area (Nepal, Xizang= Tibet) consistent with Shan-Thai Terrane (= Sibumasu) having originally been E extension of former. E extension of S end of Shan-Thai Terrane in Sumatra is poorly known, with S half of New Guinea being a possibility)

Brandon-Jones, D. (2001)- Borneo as a biogeographic barrier to Asian-Australasian migration In: I. Metcalfe et al. (eds.) *Faunal and floral migrations and evolution in SE Asia-Australasia*. Balkema, Lisse, p. 365-372.

Brayard, A., G. Escarguel & H. Bucher (2007)- The biogeography of Early Triassic ammonoid faunas: clusters, gradients and networks. *Geobios* 40, p. 749-765.

(E Triassic ammonoid assemblages, incl. Timor, which is 'highly connected' with Afghanistan and S China, defining an equatorial Tethyan group)

Brayard, A., G. Escarguel, H. Bucher & T. Bruhwiler (2009)- Smithian and Spathian (Early Triassic) ammonoid assemblages from terranes: paleoceanographic and paleogeographic implications. *J. Asian Earth Sciences* 36, p. 420-433.

(Cluster analysis of E Triassic ammonoid faunas. Timor grouped with Afghanistan, South China, Oman, Iran, etc., as S Tethyan cluster. (Very little detail on locations/ origin of samples; JTvG))

Brookfield, M.E. (1996)- Paleozoic and Triassic geology of Sundaland. In: M. Moullade & A.E.M. Nairn (eds.) *The Phanerozoic geology of the world, 1, The Palaeozoic*, B, Elsevier, Amsterdam, p. 183-264.

Brookfield, M.E. (1996)- Reconstruction of Western Sibumasu. Proc. International Symposium Geology of Southeast Asia and adjacent areas, Hanoi 1995, Journal of Geology, Hanoi, Special Issue, Geological Survey of Vietnam, B, p. 65-80.

(Core of Sibumasu terrane (Shan Plateau, Kanchanaburi, W Malaya) is S-facing Paleozoic passive margin, rifted off Gondwanaland in Permian and collided with Indochina in Triassic-E Jurassic. Equivalent of Qiantang Block of C Tibet)

Brookfield, M.E. & V.J. Gupta (1988)- The Devonian of Northern Gondwanaland: a Himalayan viewpoint and terrane analysis. In: N.J. MacMillan et al. (eds.) Devonian of the World, Proc. 2nd International Symposium on the Devonian System, Calgary, 1, Regional Syntheses, Canadian Society of Petroleum Geologists, Memoir 14, p. 579-589.

(Microcontinents that rifted off N Gondwana like Lut, Helmand, Nowshera, Karakorum, High Himalaya and Thai-Malaya terranes have Devonian stratigraphies indicating they were part of Gondwanaland in Devonian)

Buerki, S., F. Forest & N. Alvarez (2014)- Proto-South-East Asia as a trigger of early angiosperm diversification. Botanical J. Linnean Society, London, 174, p. 326-333.

(online at: <https://academic.oup.com/botlinnean/article/174/3/326/2416344>)

(Angiosperms (flowering seed plants) originated abruptly in E Cretaceous (Hauterivian), followed by rapid diversification in Hauterivian-Aptian. Islands in SE Asia region today probably played major role in angiosperm diversification in Late Jurassic- E Cretaceous (but no discussion of support from actual fossil botanical records of SE Asia; HvG)

Buffetaut, E. (1981)- Elements pour une histoire paleobiogeographique du Sud-est Asiatique: l'apport des vertebres fossiles continentaux. Bull. Societe Geologique France (7) 23, 6, p. 587-593.

('Elements for a paleobiogeographic history of SE Asia: the contribution of continental vertebrate fossils'. Incl. report of Jurassic fresh-water crocodilian Sunosuchus from NE Thailand, of Laurasian affinity)

Buffetaut, E. (1984)- The palaeobiogeographical significance of the Mesozoic continental vertebrates from South-East Asia. Memoires Societe Geologique France, N.S., 147, p. 37-42.

Bunopas, S. & S. Khositantont (2008)- Did Shan-Thai twice marry Indochina and then India?: a review. Bull. Earth Sciences Thailand (BEST) 1, 1-2, p. 1-27.

(online at: <https://ph01.tci-thaijo.org/index.php/bestjournal/article/view/246419/167510>)

(Shan-Thai (= Sibumasu) and Indochina microcontinents migrated from W Australia since latest Devonian, to settle in Late Norian. During Late Triassic both microcontinents drifted up latitude and stayed in N Hemisphere. Pre-first continent-continent collision between Shan-Thai and Indochina occurred just under Equator as early as E Triassic. Breakup of Pangea in Late Cretaceous time. At 45 Ma Himalayan extrusion, caused by 2nd continent-continent collision, began and have its paroxysm in M Miocene. Etc.)

Bunopas, S., P. Vella, H. Fontaine, S. Hada, C. Burrett, P. Haines, S. Potisat, T. Wongwanich, P. Chaodumrong, K.T. Howard & S. Khositantont (2001)- Growth of Asia in the Late Triassic continent- continent collision of Shan-Thai and Indochina against South China. Gondwana Research 4, 4, p. 584-585.

(Abstract only. Late Triassic (M-L Norian) continent-continent collision between Shan-Thai (=Sibumasu) and Indochina microcontinents resulted in formation of axial core of SE Asia. Continent-continent collision terminated marine environments between Shan-Thai - Indochina and S China. Lower-Middle Triassic volcanic arc-trench systems developed on E active margin of Shan-Thai W of Pha Som Suture zone from Nan-Uttaradit-Sra Kaeo and Bentong-Raub line. Etc.)

Bunopas, S., P. Vella, H. Fontaine, S. Hada, C. Burrett, P. Haines, S. Potisat, T. Wongwanich, P. Chaodumrong, K.T. Howard & S. Khositantont (2002)- Growing of Asia in the Late Triassic continent- continent collision of Shan-Thai and Indochina against South China. In: N. Mantajit (ed.) Proc. Symposium on Geology of Thailand, Bangkok 2002, Dept. Mineral Resources (DMR), p. 129-135.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_1/2002/6385.pdf)

(Extended version of Bunopas et al. 1991, Gondwana Research (2001). Collision of Sibumasu (Shan-Thai) and Indochina in late Norian terminated Paleotethys in SE Asia, along suture zone from W Yunnan- Nan-Uttaradit-Sra Kaeo- Yala to Raub-Bentong at 23°N above Equator. Cenozoic CW rotation of Thailand of >30°)

Bunopas, S., P. Vella, H. Fontaine, S. Hada, C. Burrett, P. Haines, S. Potisat, T. Wongwanich, P. Chaodumrong, K.T. Howard & S. Khositantont (2002)- Shan-Thai and Indochina, Lower Paleozoic Gondwana derived paired microcontinents growing Pangea by first continent-continent collision in Late Norian with South China suffered second continent-continent collision of India to Asia. In: Geodynamic processes of Gondwanaland-derived terranes in East and Southeast Asia, their crustal evolution, emplacement and natural resources potential, Phitsanulok 2002, p. 120-133.

(online at: http://library.dmr.go.th/Document/Proceedings-Yearbooks/M_3/2547/9535.pdf)

Buratti, N. & S. Cirilli (2007)- Microfloristic provincialism in the Upper Triassic Circum-Mediterranean area and palaeogeographic implication. *Geobios* 40, 2, p. 133-142.

(Two U Triassic (Carnian) palynoflora provinces: (1) Onslow of NW Australia (incl. European forms Camerosporites, Aulisporites, Enzonasporites, Ovalipollis, Samaropollenites, Infernopollenites, Minutosaccus) and (2) Ipswich of S and E Australia. W Timor floras from U Triassic pelagic deposits placed in Onslow microflora. Suggests Onslow microflora assemblages, with minor variations, present from W Tethys to N Australian margin (W Timor))

Burrett, C.F. (1974)- Plate tectonics and the fusion of Asia. *Earth Planetary Science Letters* 21, p. 181-189.

(Early paper describing amalgamation of Asia. Nine blocks defined. Paleogeographical, paleontological and tectonic evidence suggest Asia did not fuse completely until well into Mesozoic)

Burrett, C., N. Duhig, R. Berry & R. Varne (1991)- Asian and South-western Pacific continental terranes derived from Gondwana, and their biogeographic significance. In: P.Y. Ladiges et al. (eds.) *Australian biogeography*, Australian Syst. Botany 4, 1, p. 13-24.

(Most small geological terranes in Indo-Pacific region rifted from Gondwana. Shan-Thai terrane rifted from Australia in Permian and collided with Indo-China in Triassic. Parts of Sumatra and Kalimantan may have rifted from Australia in Cretaceous and carried angiosperm flora to North. Other terranes now in SE Asia and Pacific were part of Australian continent at various times in Cenozoic)

Burrett, C., J. Long & B. Stait (1990)- Early-Middle Palaeozoic biogeography of Asian terranes derived from Gondwana. In: W.S. McKerrow & C.R. Scotese (eds.) *Palaeozoic palaeogeography and biogeography*. Geological Society, London, Memoir 12, p. 163-174.

(Contiguity of Shan-Thai (=Sibumasu) Terrane and NW Australia suggested by faunal affinities in Late Cambrian trilobites, Ordovician molluscs, stromatoporoids, brachiopods and conodonts. Re-evaluation of E Paleozoic paleomagnetism places Shan-Thai against NW Australia. N China Block was next to N Australia/New Guinea, rifted off in E Devonian or earlier. S China micro-vertebrates and conodonts suggest Shan-Thai still close to Australia in M Devonian)

Burrett, C. & B. Stait (1986)- Southeast Asia as a part of an early Palaeozoic Australian Gondwanaland. In: G.H. Teh & S. Paramananthan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 103-107.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986009.pdf>)

(Provenance of Paleozoic sediments from Thailand and Malaysia and trilobite- mollusc studies suggest Sibumasu block was adjacent to NW Australia in Ordovician. Probable Upper Carboniferous glacial sediments in Thailand and Malaysia, with boulders from cratonic source and detrital diamonds. Early Carboniferous breakup most likely. Collision with Indochina Block in Triassic)

Burrett, C.F. & B. Stait (1986)- Southeast Asia as a part of an Ordovician Gondwanaland- paleogeographic test of a tectonic hypothesis. *Earth Planetary Science Letters* 75, p. 184-190.

(Upper Cambrian- Ordovician micro- and macrofaunas very close similarities between Thailand-Malaysia Sibumasu Block and NW Australia, suggesting E Paleozoic proximity)

Burrett, C., M. Udchachon & H. Thassanapak (2016)- Palaeozoic correlations and the palaeogeography of the Sibumasu (Shan-Thai) terrane- a brief review. *Research and Knowledge* 2, 2, p. 1-17.

(online at: <https://rk.msu.ac.th/wp-content/uploads/2017/09/01-Clive-Burrett4-compressed.pdf>)

(Review of Cambrian-Permian predominantly shelfal marine siliciclastics and carbonates of Sibumasu Terrane in NW Malaysia (Langkawi), S Thailand (Satun), Shan States of Myanmar and Baoshan Block of W Yunnan. Continuous platform sequences in W Sibumasu and deep-water shales and cherts in E Sibumasu, without significant unconformities. Silurian-Devonian faunas mainly peri-Gondwana distributions. Sibumasu part of Australia until E Permian breakup (oriented with Baoshan near Himalayan margin; Sumatra closer to West Papua). Late Triassic (late Norian?) collision with Indochina/Sukhothai Arc terrane)

Burrett, C., M. Udchachon & H. Thassanapak (2021)- The Truong Son, Loei-Phetchabun, and Kontum Terranes in Indochina: provenance, rifting, and collisions. *Frontiers in Earth Science* 9, 603565, p. 1-24.

(online at: www.frontiersin.org/articles/10.3389/feart.2021.603565/full)

(Indochina terranes docked in earliest Carboniferous (collision Truong Son with Loei-Phetchabun) and in Permian (Kontum). Major carbonate platforms in Givetian-earliest Tournaisian on Truong Son and Visean-M-Permian across Truong Son and Loei-Phetchabun. Ordovician within-plate basalts in Kontum and transition from shallow marine Ordovician to Silurian deep-marine sediments and volcanic arc in Truong Son suggest rifting of both terranes from Gondwana in Late Ordovician. Initial docking of Truong Son with S China in late Silurian- E Devonian; docking of Loei-Phetchabun and Truong Son in late Tournaisian- E Visean)

Burrett, C., K. Zaw, S. Meffre, C.K. Lai, S. Khositantont, P. Chaodumrong, M. Udchachon, S. Ekins & J. Halpin (2014)- The configuration of Greater Gondwana- evidence from LA ICPMS, U-Pb geochronology of detrital zircons from the Palaeozoic and Mesozoic of Southeast Asia and China. *Gondwana Research* 26, p. 31-51.

(online at: https://www.academia.edu/14933844/The_configuration_of_Greater_Gondwana_Evidence_from_LA_ICPMS_U_Pb_geochronology_of_detrital_zircons_from_the_Palaeozoic_and_Mesozoic_Etc)

(Detrital zircon ages from Paleozoic-Mesozoic in Malaysia, Thailand, Laos, Vietnam, Cambodia and China, compared to zircon ages from Australia, Asia. Indochina and S China terranes and Tethyan Himalayas close to similar source areas. E Paleozoic paleobiogeographic data suggest N China was close to Gondwana, but not supported here. Similarity between Ordovician Tarutao Fm of Sibumasu and Tumblagooda Sst of W Australia and Tethyan Himalaya. Quartzite and granite clasts in Permian glaciomarine deposits of Sibumasu with age spectra similar to W and N Australia (incl. 1850 Ma Barramundi Orogeny peak). Triassic Lampang and Song Groups of N Thailand detrital zircons suggest Indochina terranes source for basins of Sukhothai Terrane)

Cai, F., L. Ding, A.K. Laskowski, P. Kapp, H. Wang, Q. Xu & L. Zhang (2016)- Late Triassic paleogeographic reconstruction along the Neo-Tethyan Ocean margins, southern Tibet. *Earth Planetary Science Letters* 435, p. 105-114.

(online at: <https://manuscript.elsevier.com/S0012821X15007906/pdf/S0012821X15007906.pdf>)

(Petrographic and detrital zircon analyses of U Triassic sandstones from S Lhasa and N margin of India. Tethyan Himalaya Sequence dominated by Indian-affinity Precambrian detrital zircons, but nearby areas with populations of Permian- E Jurassic (291-184 Ma) zircons for which there is no known Indian source, so probably derived from continental crustal fragments that were adjacent to NW margin of Australia. May be part of Late Triassic submarine fan along N Australian shelf, together with age-equivalent beds in W Sulawesi, Timor and W Papua with similar zircon age populations. U Triassic Mailonggang Fm from S side of S Lhasa terrane with Carnian-Norian carbonates-clastics, at that time probably the S margin of Eurasia (SW-directed paleocurrents), dominated by Permian zircons from proximal Lhasa terrane sources; differs from Tethyan Himalaya beds, suggesting separation from Greater India by Neo-Tethys Ocean)

Cai, J.X. & K.J. Zhang (2009)- A new model for the Indochina and South China collision during the Late Permian to the Middle Triassic. *Tectonophysics* 467, p. 35-43.

(Indochina and South China separated from Gondwana in Silurian. Analysis of E Paleozoic suggests Indochina may be extended to include N Vietnam, part of Qinzhou tectonic zone and S Hainan Island (traditionally regarded as parts of S China). U Paleozoic turbidites and mid-oceanic ridge basalts along new

Dian-Qiong suture illustrate ocean between Indochina and S China consumed by S-directed subduction under Indochina in Late Permian- M Triassic)

Cai, Z.R., J.Y. Xiang, Q.T. Huang, Z.X. Yin, Y.J. Yao, H.L. Liu & B. Xia (2016)- Textural and map contrasts of the subduction-collision boundary between the Philippine Arc and the Sunda margin. *Arabian J. Geosciences* 9, 4, p. 1-10.

(Review of active subduction-collision boundary between Philippine Arc and Sunda margin, from Taiwan, S along Manila Trench, through thrust fault zone of Mindoro, to Negros Trench at E edge of Sulu Sea, then through thrust fault zone of Zamboanga to Cotabato Trench at E side of Celebes Sea/ Sangihe Arc)

Calais, E., L. Dong, M. Wang, Z. Shen & M. Vergnolle (2006)- Continental deformation in Asia from a combined GPS solution. *Geophysical Research Letters* 33, L24391, p. 1-6.

(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2006GL028433/epdf>)

(New model of Asia tectonic plates relative horizontal motions from GPS measurements)

Campbell, H.J. & J.A. Grant-Mackie (2000)- The marine Triassic of Australasian and its interregional correlation. In: H. Yin et al. (eds.) *Permian-Triassic evolution of Tethys and Western Circum-Pacific, Developments in palaeontology and stratigraphy* 18, Elsevier, p. 235-255.

(Review of stratigraphy/ fauna of marine Triassic outcrops of E Indonesia, New Caledonia, Australia and New Zealand. Including brief summaries of PNG (Yuat River gorge argillites with Anisian ammonites), Misool, Seram, Buru (Norian- Rhaetian Fogi Beds with Misolia), Timor-Roti and SE Sulawesi-Buton (late Norian Monotis subcircularis in Winto beds). No maps, strat columns)

Capitanio, F.A. & A. Replumaz (2015)- Subduction and slab breakoff controls on Asian indentation tectonics and Himalayan western syntaxis formation. *Geochem. Geophysics Geosystems* 14, 9, p. 3515-3531.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/ggge.20171/pdf>)

(On link between large-scale Asian continent deformations and Indian slab subduction and breakoff. Formation of C Asian intracontinental faulting, the Bangong-Red River Fault and Altyn Tagh fault followed successive Indian slab breakoff episodes)

Capitanio, F.A., A. Replumaz & N. Riel (2015)- Reconciling subduction dynamics during Tethys closure with large-scale Asian tectonics: Insights from numerical modeling. *Geochem. Geophysics Geosystems* 16, 3, p. 962-982.

(online at: https://www.researchgate.net/publication/273474332_Reconciling_subduction_dynamics_during_Tethys_closure_with_large-scale_Asian_tectonics_Insights_from_numerical_modeling)

Caputo, M.V. & J.C. Crowell (1985)- Migration of glacial centers across Gondwana during Paleozoic era. *Geological Society of America (GSA) Bull.* 96, p. 1020-1036.

Carling, P.A., T. Tada, R. Tada, W. Songtham, A.J. Cresswell, D.C.W. Sanderson, N. Porat et al. (2024)- Regionally extensive ejecta layer of the Australasian tektite strewn field: the MIS 20/19 large meteorite impact in mainland South-East Asia. *Progress in Earth and Planetary Science* 11, 58, p. 1-30.

(online at: <https://link.springer.com/content/pdf/10.1186/s40645-024-00660-9.pdf>)

(Major review of the M Pleistocene (MIS 20; ~788-785 ka) large meteorite impact in mainland SE Asia, the 'Australasian Tektite Strewn Field' of >300,000 km² and its sedimentary impact signature)

CCOP-IOC (1974)- Metallogenesis, hydrocarbons and tectonic patterns in Eastern Asia. Report of the IDOE Workshop on Tectonic Patterns and Metallogenesis in East and Southeast Asia, Bangkok 1973, United Nations ESCAP, Bangkok, CCOP, Technical Publication 2, p. 1-158.

(online at: www.jodc.go.jp/info/ioc_doc/Workshop/015652eo.pdf)

(Overview of SE Asia tectonics and proposals by Katili et al. for SEATAR transect for future work)

Cecca, F. (1999)- Palaeobiogeography of Tethyan ammonites during the Tithonian (latest Jurassic). *Palaeogeogr. Palaeoclim. Palaeoecology* 147, p. 1-37.

(Focused on Western and Central Tethys; little or nothing on SE Asia/ Australia)

Cesari, S.N. & C.E. Colombi (2013)- A new Late Triassic phytogeographical scenario in westernmost Gondwana. *Nature Communications* 4, 1889, p. 1-6.

(online at: www.nature.com/articles/ncomms2917.pdf)

(Floral provincialism in S Hemisphere in Late Triassic characterized by Ipswich and Onslow provinces of E Gondwana here extended to NW Argentina. Previously considered part of Ipswich, but diagnostic Euramerican species in assemblages with Gondwanan taxa allows placing palynofloras in Onslow province)

CGMW/UNESCO (1986)- Metallogenic map of South and East Asia, Sheet 4 (1: 5M scale). Geological Survey of Japan.

Chablais, J., R. Martini, E. Samankassou, T. Onoue & H. Sano (2009)- Microfacies and depositional setting of the Upper Triassic mid-oceanic atoll-type carbonates of the Sambosan accretionary complex (southern Kyushu, Japan). *Facies* 56, 2, p. 249-278.

(Sambosan U Triassic shallow-water limestones remnant of mid-oceanic atoll on seamount in Panthalassan Ocean, accreted along with deep-water ribbon-cherts rocks to E margin of Asia in Late Jurassic- E Cretaceous. Seventeen microfacies distinguished. Foraminifers (incl. Triasina hantkeni) indicate Late Carnian- Rhaetian age. Tethyan affinity of faunas suggests Sambosan seamount located in low- middle-latitude of S Hemisphere during Late Triassic)

Chaloner, W.G. & G.T. Creber (1988)- Fossil plants as indicators of Late Palaeozoic plate positions. In: M.G. Audley-Charles & A. Hallam (eds.) *Gondwana and Tethys*, Geological Society, London, Special Publ. 37, p. 201-210.

(On latest Carboniferous and Early Permian floral provinces. In SE Asia juxtaposition of Cathaysian (S China, Thailand, Malay Peninsula, Sumatra) and Gondwanan (India, Australia, New Guinea) floras)

Chaloner, W.G. & W.S. Lacey (1973)- The distribution of Late Palaeozoic floras. In: N.F. Hughes (ed.) *Organisms and continents through time*, Special Paper Palaeontology 12, p. 271-289.

(online at: www.palass.org/sites/default/files/media/publications/special_papers_in_palaeontology/number_12/spp12_pp271-290.pdf)

(33 plant genera can be used to define four main Permian floral provinces)

Chandra, U. (1984)- Tectonic segmentation of the Burmese-Indonesian Arc. *Tectonophysics* 105, p. 279-290.

(Transverse boundary zones (North Andaman Boundary Zone, Sunda Boundary Zone) separate segments of the active Burma- Indonesia volcanic arc)

Chen, H., S. Sun, J. Li, F. Heller, J. Dobson, M. Haag & K.J. Hsu (1993)- Early Triassic paleomagnetism and tectonics, South China. In: B.K. Tan et al. (eds.) *7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII)*, Bangkok 1991, *J. Southeast Asian Earth Sciences* 8, p. 269-276.

(Paleomagnetic data from Lower Triassic limestones in S China support existence of four continental blocks, in E Triassic all scattered in E Paleotethys low latitude, separated by oceans: Yangtze, Xianggui, Cathaysia and Dongnanya (=S China Sea NW margin). Cathaysia block ~90° CW rotation. Permian on Hainan island ~25° CCW rotation)

Chen, X.F., J. Ye, Y. Xiang & X. Chen (2017)- Metallogenic characteristics of the major type deposits in Southeast Asia. *Acta Geologica Sinica (English Edition)*, 91, Suppl. 1, p. 257-258.

(online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/1755-6724.13283>)

(Extended Abstract. Major types of deposits in SE Asia: porphyry type copper (gold-molybdenum), orogenic type gold, skarn type copper-gold, epithermal type gold-silver. Other deposits include intrusion-related golds, VHMS, MVT, SEDEX, IOCG, granitoid-related tungsten-tin, REE and potash deposits).

Chen, Y., V. Courtillot, J.P. Cogne, J. Besse, Z. Yang & R. Enkin (1993)- The configuration of Asia prior to the collision of India: Cretaceous paleomagnetic constraints. *J. of Geophysical Research* 98, B12, p. 21927-21941.

(Paleomagnetic data from C Asia show 1700±610 km of shortening of S Asia since Cretaceous absorbed by distributed deformation between S Tibet and Siberia craton, based on Cretaceous poles from Junggar, Tarim, Tibet, Indochina, S and N China and Mongolia blocks. Remarkable consistency between upper and lower Cretaceous results, suggesting Cretaceous time of little displacement. Paleogeographic reconstruction of Asia in Cretaceous)

Chiu, J.M., B.L. Isacks & R.K. Cardwell (1991)- 3-D configuration of subducted lithosphere in the western Pacific. *Geophysical J. International* 106, p. 99-111.

(online at: <https://academic.oup.com/gji/article/106/1/99/740584>)

(Interesting 3-D displays of subducting slabs in W Pacific region (incl. Indonesia) (Benioff-Wadati zones of deep earthquake hypocenter distributions. Depth of deepest earthquakes decreases in W direction along Sunda Arc)

Choong, C.M., M. Pubellier, B. Sautter & H.T. Gebreetsadik (2022)- Records of the oceanic propagator closure at the southern splay of the Palaeo-Tethys. *Geological Journal* 57, 9, p. 3881-3915.

(Paleozoic- E Mesozoic Palaeo-Tethys ocean diverged into several splays throughout E and SE Asia. Remnants of Paleotethys oceanic crust and deep-sea sediments from Himalayas in N, across S China (Yunnan), Thailand, Peninsular Malaysia to Bangka and Belitung islands in S. Paleotethys suture in Riau Archipelago, Indonesia, extensively eroded: Bangka and Belitung islands show only minor serpentine and pillow basalts along line that curves towards Borneo. Syn- and post-collisional granitic bodies that form large batholiths in Thailand and Malaysia relatively small in Indonesia, particularly on Belitung, suggesting lack of large underplating of Sibumasu crust in region. Observations suggest S-ward opening of propagating oceanic basin from Devonian to Carboniferous, which began to close from Permian to Triassic period (and closed in Triassic))

Chumakov, N.M. & M.A. Zharkov (2002)- Climate during Permian- Triassic biosphere reorganizations, 1: Climate of the Early Permian. *Stratigraphy and Geological Correlation* 10, 6, p. 586-602.

Chumakov, N.M. & M.A. Zharkov (2003)- Climate during Permian- Triassic biosphere reorganizations, 2. Climate of the Late Permian and Early Triassic: general inferences. *Stratigraphy and Geological Correlation* 11, 4, p. 361-375.

Claude, J. (2017)- The continental fossil record and the history of biodiversity in Southeast Asia. In: S. Morand et al. (eds.) *Biodiversity conservation in Southeast Asia- Challenges in a changing environment*, Chapter 2, p. 1-13.

(Brief review of land plant assemblages in SE Asia, from Late Paleozoic until now)

Claude, J., H. Tong, A. van der Geer, P.O. Antoine, M. Reyes, J. de Vos & T. Ingicco (2024)- The origin of the Malesian fossil turtle diversity: Fossil versus molecular data. *Annales de Paleontologie* 110, 102665, p. 1-15.

(online at: <https://repository.naturalis.nl/pub/801161/Claude-2024-The-origin-of-the-Malesian-fossil-turtle-diversity-A.pdf>)

(Four families of turtles/ tortoises in insular SE Asia, mainly of Quaternary age (also undescribed Eocene carettochelyids in W Sumatra), and several endemic species: E Pleistocene fossil record dominated by giant tortoises (S Sulawesi; Geochelone atlas, Java (Bumiaya, Sangiran), Flores), M Pleistocene (Trinil, Timor, etc.) with first of extant taxa in area. Late Pleistocene cave faunas. Most faunas stronger relationships with Indochina than with E Asia, suggesting colonisation followed Siva- or Sino-Malayan routes onto Sunda Shelf and dispersed further E during periods of low sea-level. Box turtle 'Cuora amboinensis' arrived in Philippines before early M Pleistocene. Duboisemys isocline is endemic extinct genus. Etc.)

Cloetingh, S. & R. Wortel (1986)- Stress in the Indo-Australian plate. *Tectonophysics* 132, p. 49-67.

(Modeling of state of stress in Indo-Australian plate. Regional stress field along Sunda arc varies from compression seaward of and parallel to Sumatra trench to tension perpendicular to Java-Flores segment)

Cobbing, E.J., D.I.J. Mallick, P.E.J. Pitfield & L.H. Teoh (1986)- The granites of the Southeast Asian tin belt. *J. Geological Society, London*, 143, p. 537-550.

(Four granite provinces, each with its own pattern of cassiterite mineralization: (1) Main Range Province (Triassic), 2. Eastern Province, 3. Western (Peninsular Thailand-Burma) Province, 4. North Thailand Migmatitic Province. Peninsular Malaysia granites from Main Range and E Provinces two contrasted suites which correspond to I and S-types)

Cobbing, E.J. & P.E.J. Pitfield (1986)- South-East Asia granite project- Field report for Thailand 1985. British Geological Survey (BGS) Overseas Division, Report MP/86/16/R, p. 1-213.
(online at: http://library.dmr.go.th/Document/DMR_Technical_Reports/1985/1633.pdf)

Cobbing, E.J., P.E.J. Pitfield, D.P.F. Darbyshire & D.I.J. Mallick (1992)- The granites of the South-East Asian tin belt. British Geological Survey (BGS), Overseas Memoir 10, p. 1-369.
(online at: <https://pubs.bgs.ac.uk/publications.html?pubID=B04056>)
(Extensive study of granites in Malaysia, Indonesia, Thailand and Myanmar. Not all granites have age-equivalent volcanics. Distinct belt. In Malaysian segment Permo-Triassic- lower Jurassic Eastern Belt with tin deposits (incl. Bangka- Belitung calc-alkaline I-types in Indonesia) (mainly cassiterite-magnetite skarns), while neighboring Central Belt more gold-bearing. Western Province Cretaceous granites with tin in S-type granites only. Rb-Sr ages for Bangka granites mainly ~220 Ma (213-229 Ma (Norian); in line with Priem and Bon (1982)). Some age results of 200 Ma, 251-252 Ma; Barber et al. 2005)

Cocks, L.R.M. & R.A. Fortey (1988)- Lower Palaeozoic facies and faunas around Gondwana. In: M.G. Audley-Charles & A. Hallam (eds.) Gondwana and Tethys, Geological Society, London, Special Publ. 37, p. 183-200.
(Ordovician and Silurian paleogeographic maps, some with W Papua data control points)

Cocks, L.R.M. & T.H. Torsvik (2013)- The dynamic evolution of the Palaeozoic geography of eastern Asia. Earth-Science Reviews 117, p. 40-79.
(Paleogeographical reconstructions for 11 intervals from M Cambrian- end Permian through E Asia region, centered on continental blocks of N China, S China and Annamia (Indochina). Annamia and S China left Gondwana margin area together during Lower Devonian opening of Paleotethys Ocean, but shortly afterwards they separated into two, not to reunite until Triassic. Cambrian- Permian rocks in Japan largely represent active volcanic arcs which originally lay to SE of S China. Neotethys Ocean opened in M Permian, dividing Sibumasu and Tibetan terranes from Gondwana, and Paleotethys Ocean started to close)

Copley, A., J.P. Avouac & J.Y. Royer (2010)- India-Asia collision and the Cenozoic slowdown of the Indian plate: Implications for the forces driving plate motions. J. of Geophysical Research: Solid Earth 115, 3, B03410, p. 1-14.
(Plate motion of India changed dramatically between 50-35 Ma, with convergence between India and Asia dropping from 15 to 4 cm/yr, coincident with onset of India-Asia collision. Apparent relationship between plates velocities and length of subduction zones along boundaries, probably reflecting importance of slab pull as driving mechanism)

Copper, P. & C.R. Scotese (2003)- Megareefs in Middle Devonian supergreenhouse climates. Geological Society of America (GSA), Special Paper 370, p. 209-230.
(>7 Mid-Devonian 'Great Barrier Reefs', including S. China plate (Vietnam-Hunan, ~1700 km), E Australia-New Guinea (spottily preserved isolated platforms; ~2000 km) and Canning Basin (~400 km))

Crame, J.A. (1986)- Late Mesozoic bipolar bivalve faunas. Geological Magazine 123, 6, p. 611-618.
(Bipolar bivalve genera probably existed through greater part of late Jurassic- Cretaceous, probably controlled by global climatic zonation. Examples of 'anti-tropical genera: Buchia s.l. and inoceramids (Retroceramus) in latest Jurassic, Aucellina in E Cretaceous, etc.)

Crowell, J.C. (1995)- The ending of the Late Paleozoic ice age during the Permian period. In: P.A. Scholte et al. (eds.) The Permian of Northern Pangea, Springer, Berlin, 1, p. 62-74.

Crowell, J.C. (1999)- Pre-Mesozoic ice ages: their bearing on understanding the climate system. Geological Society of America (GSA) Memoir 192, p. 1-106.

(Cenozoic Ice Age from ~43 Ma-Recent, preceded by warmer interval of ~70 My back into mid-Cretaceous time. Next older Mesozoic icy intervals are E Cretaceous (~105-140 Ma) and Jurassic (~160-175 Ma and ~188-195 Ma). Late Paleozoic Ice Ages waxed and waned between ~256-338 Ma. Iciness expanded during Late Devonian-E Carboniferous (353- 363 Ma). Ordovician-Silurian strong and short ice age between ~429-445 Ma. During Late Proterozoic-Cambrian, three or four ice ages (~520-950 Ma). At some localities glaciation occurred at low latitudes)

Cuneo, N.R. (1996)- Permian phytogeography in Gondwana. *Palaeogeogr. Palaeoclim. Palaeoecology* 125, p. 75-104.

(Review of Gondwanan phytogeographic units for five Permian time slices. Nothing on SE Asia)

Dagys, A.S. (1993)- Geographic differentiation of Triassic brachiopods. *Palaeogeogr. Palaeoclim. Palaeoecology* 100, p. 79-87.

(Maximum paleobiogeographic differentiation of Triassic brachiopods in Late Triassic, with at least five biochores: Boreal, N Tethyan, peri-Gondwanian, Notal or Maorian and E Pacific. E part of peri-Gondwana Tethys with Misolia, Timorhynchia)

Damborenea, S.E. (2002)- Jurassic evolution of Southern Hemisphere marine palaeobiogeographic units based on benthonic bivalves. *Geobios* 35, Suppl. 1, p. 51-71.

(Latest Triassic- earliest Cretaceous distribution of bivalves in S Hemisphere. Tethyan Realm with Australian unit restricted to Late Triassic. Late Jurassic Maorian Province extends to Antarctic and W Pacific localities incl. Timor, Sula, Buru, Seram, but overall endemism diminishes from Oxfordian to Tithonian-Berriasian. Oxfordian-Kimmeridgian Malayomaorica has Austral distribution, reaching Australia-New Guinea. Austral Province of Indo-Pacific Region (South Temperate) strongly developed at beginning of Cretaceous, incl. Australia, New Zealand, New Guinea)

Damborenea, S.E., J. Echevarría & S. Ros-Franch (2013)- Southern Hemisphere palaeobiogeography of Triassic-Jurassic marine bivalves. *Springer Briefs in Earth System Sciences*, p. 1-139.

(online at: https://www.researchgate.net/publication/285408112_Southern_Hemisphere_Palaeobiogeography_of_Triassic-Jurassic_Marine_Bivalves_Chapter_1_Introduction)

Darbyshire, D.P.F. (1987)- Rb/Sr and Sm/Nd isotope studies of granites of Southeast Asia. *Warta Geologi* 13, p. 117-120.

(online at: <https://gsm publ.files.wordpress.com/2014/09/ngsm1987003.pdf>)

(Summary of British Geological Survey program of radiometric dating of SE Asia granites (see also Cobbing et al. 1992))

Delescluse, M. & N. Chamot-Rooke (2007)- Instantaneous deformation and kinematics of the India-Australia Plate. *Geophysical J. International* 168, 2, p. 818-842.

(Present-day deformation distributed around Afanasy Nikitin Chain in Central Indian Basin (CIB; shortening) and within Wharton Basin (WB; strike-slip). N portion of NinetyEast ridge (NyR) major discontinuity for strain and velocity. Taking into account intraplate velocity field in vicinity of Sumatra trench, we obtain convergence rate of 46 mm/yr towards N18°E at epicenter of 2004 Aceh mega-earthquake. Predicted shortening in CIB and WB and extension near Chagos-Laccadive in agreement with deformation measured from plate reconstructions and seismic lines, suggesting continuum of deformation since onset of intraplate deformation around 7.5-8 Ma)

Dercourt, J., L.E. Ricou & B. Vrielynck (eds.) (1993)- Atlas Tethys, Palaeoenvironmental maps. Gauthier-Villars, Paris, p. 1-307.

(Fourteen plate reconstructions and paleogeography maps of Tethys Oceans from mid-Permian-Tortonian. Maps do not include much of SE Asia)

De Wever, P. & F. Baudin (1996)- Palaeogeography of radiolarites and organic-rich deposits in Mesozoic Tethys. *Geologische Rundschau* 85, 2, p. 310-326.

(Siliceous and marine organic-rich deposits both result of high planktonic productivity, but sometimes associated, sometimes separate in space and time. Siliceous marine phtanite family facies contains organic material and are blackish (vs red/green for radiolarite facies) and deposited generally in shallower environments. Paleogeographic analysis for three Mesozoic high sea-level intervals (Toarcian, Kimmeridgian and Cenomanian) show: (a) in Jurassic siliceous deposits closer to open ocean waters than organic-rich ones; (b) during Cretaceous times often associated)

De Wever, P., F. Baudin, J. Azema & E. Fourcade (1995)- Radiolarians and Tethyan radiolarites from primary production to their paleogeography. In: J. Dercourt & A.E.M. Nairn (eds.) *The ocean basins and margins 8, The Tethys Ocean*, Plenum Press, p. 267-318.

Dewey, J.F., S. Cande, S. & W.C.I. Pitman (1989)- Tectonic evolution of the India/ Eurasia collision zone. *Eclogae Geologicae Helvetiae* 82, p. 717-734.

(online at: <http://dx.doi.org/10.5169/seals-166399>)

(Since collision of India with Eurasia at ~45 Ma in M Eocene, N-S intracontinental convergence continued at ~5 cm/ year. Convergence was accommodated principally by lithospheric thickening in widening zone between E transpressive sinistral megashear from Makran- Baikal and W dextral megashear from Sumatra to Tanlu Fault System. Lateral extrusion or escape was not a major factor in accommodating India/Eurasia convergence)

Dickins, J.M. (1985)- Late Palaeozoic glaciation. *BMR J. Australian Geology Geophysics* 9, p. 163-169.

(online at: www.ga.gov.au/metadata-gateway/metadata/record/81179/)

(Review of Carboniferous- Permian glaciation in Australia- SE Asia. Main widespread terrestrial glaciation across Gondwana in Asselian (earliest Permian). In all areas rel. warm conditions returned in Sakmarian)

Dickins, J.M. (1985)- Palaeobiofacies and palaeobiogeography of Gondwanaland from Permian to Triassic. In: K. Nakawara & J.M. Dickins (eds.) *The Tethys*, Tokai University Press, Tokyo, p. 83-92.

Dickins, J.M. (1992)- Permian geology of Gondwana countries: an overview. *International Geology Review* 34, p. 986-1000.

(Earliest Permian of most Gondwanan areas characterized by glacial deposits and cold-water marine faunas. In W Australia glaciation confined to Asselian, followed by amelioration and rise in sea level in Sakmarian)

Dickins, J.M. (1996)- Problems of a Late Palaeozoic glaciation in Australia and subsequent climate in the Permian. *Palaeogeogr. Palaeoclim. Palaeoecology* 125, p. 185-197.

(Two main periods of glaciation: (1) Namurian (E Carboniferous) possibly extending into beginning of Late Carboniferous; (2) Asselian (earliest Permian). End of glaciation associated with worldwide eustatic rise in sea-level in basal Sakmarian (after this no good evidence for glaciation in Australia). In some places in Australia subtropical or tropical conditions in U Sakmarian, U Artinskian, Kungurian, Kazanian and Dzhulfian, all separated probably by colder periods. Marine Carboniferous Levipustula fauna may represent less cold sea water than E Permian Eurydesma fauna)

Dickins, J.M. (2000)- The northern margin of Gondwanaland: uppermost Carboniferous to lowermost Jurassic and its correlation. In: H.F. Yin, J.M. Dickins et al. (eds.) *Permian-Triassic evolution of Tethys and Western Circum-Pacific*, *Developments in Palaeontology Stratigraphy* 18, Elsevier, p. 257-270.

(In latest Carboniferous- early E Permian no apparent continuous sea in Tethys sensu Suess. Earliest Permian land barrier separated C Asian Sea from southern sea connecting 'Gondwana' countries. Youngest recognized marine deposits connecting through warm water C Asian Sea not younger than E Permian (Sakmarian). In U Permian-Triassic a N shore of Gondwanaland can be traced with southern sediment source. N shore of Tethys largely remains to be delineated)

Dickins, J.M. & Phan Cu Tien (1997)- Indosinian tectogeny in the geological correlation of Vietnam and adjacent regions. In: J.M. Dickins et al. (eds.) Late Palaeozoic and Early Mesozoic Circum-Pacific events and their global correlation. Cambridge University Press, p. 87-96.

(Review of U Devonian- Triassic stratigraphy of Vietnam. Indosinian orogeny manifested by Dzhulfian (U Permian) widespread unconformity and volcanic activity. Second Indosinian orogenic phase at end-Carnian, with widespread intrusive activity and deposition of coal-bearing molasse)

Dickins, J.M., Y. Zunyi, Yin Hongfu et al. (eds.) (1997)- Late Palaeozoic and Early Mesozoic Circum-Pacific events and their global correlation. Cambridge University Press, p. 1-255.

(Mainly mainland E Asia papers; nothing on Indonesia)

Diener, C. (1916)- Die marinen Reiche der Triasperiode. Denkschriften Kaiserliche Akademie Wissenschaften, Wien, Mathematisch-Physikalische Klasse, 92, p. 405-549.

(online at: https://opac.geologie.ac.at/ais312/dokumente/Diener_1915_Triasperiode.pdf)

(‘The marine realms of the Triassic period’. Review of global Triassic macrofaunas as known in 1916. Four main faunal provinces (Boreal, Mediterranean, Himalayan and Andean), based on cephalopods, bivalves, etc. The Indonesian area groups in Himalayan Domain. Brief reviews of Triassic on Timor, Roti, Savu, Sumatra, Seram, Buru. Only Timor has complete Triassic section, with cephalopods and corals very similar to Alps. In other areas Triassic starts with Carnian transgression. Triassic of Sumatra mainly shallow marine clastics)

Ding, W.W., X. Huang, Liang Zhao, J. Wu, C.B. Dimalanta, M. Pubellier & F. Wang (2024)- Dynamic processes of the Southeast (SE) Asia convergent system and its impact on continental deformation and marginal basin formation: Preface. Tectonophysics 878, 230314, p.

(SE Asia at convergent region between Eurasian, Philippine Sea and Indo-Australian plates. Interplay of these plates resulting subduction zones, volcanic arcs, marginal basins, and continental deformation (Introduction to Special Issue of Tectonophysics)

Ding, W.W., R.X. Zhu, B. Wan, L. Zhao, L., X.W. Niu, P. Zhao, B. Sun & Y. Zhao (2023)- Geodynamic processes of the southeastern Neo-Tethys Ocean and the formation mechanism of the curved subduction system in Southeast Asia. Science China Earth Sciences 66, p. 703-717. (also Erratum, vol. 67, 3, p. 894)

(SE Asia at intersection of Tethys and Pacific domains, resulting in complicated deep structure, surface magma responses, and dynamic processes of SE Asia. P-wave velocity structure shows remnant of Neo-Tethys subducted slab in lower mantle beneath SE Asia at ~1500 km. Java- E Timor subduction zone: remnant slab is coupled with Indo-Australian subducting slab in upper mantle, while on Sumatra subduction zone, remnant slab is decoupled from Indo-Australian subducting slab. Curved subduction system in SE Asia resulted from N-ward subductions of Neo-Tethys and current Indo-Australian Plate, and W-ward subduction of Pacific Plate since Mesozoic. Etc.)

Domeier, M. (2018)- Early Paleozoic tectonics of Asia: towards a full-plate model. Geoscience Frontiers (Beijing) 9, 3, p. 789-862.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987117302074>)

(Extensive review of Cambrian- Silurian plate tectonics of Asia. Not much on SE Asia- Indonesian region)

Domeier, M. & T.H. Torsvik (2014)- Plate tectonics in the late Paleozoic. Geoscience Frontiers (Beijing), 5, p. 303-350.

(online/open access at: www.sciencedirect.com/science/article/pii/S1674987114000061)

Doyle, P. (1992)- A review of the biogeography of Cretaceous belemnites. Palaeogeogr. Palaeoclim. Palaeoecology 92, p. 207-216.

(Belemnites display Boreal and Tethyan marine faunal realms from Early Jurassic- earliest Cretaceous. Austral marine realm was lacking. In late Barremian- early Aptian Austral Realm was initiated with first Gondwanan family, Dimitobelidae. Tethyan belemnite realm cannot be recognised after Cenomanian)

Doyle, P. & P. Howlett (1989)- Gondwana Antarctic belemnite biogeography and the break-up of Gondwana. In: J.A. Crame (ed.) Origins and evolution of Antarctic biota, Geological Society, London, Special Publ. 47, p. 167-182.

(In Late Jurassic, belemnite genera Hibolithes and Belemnopsis abundant and widespread in Tethys, characterizing Tethyan Realm from S Europe and Asia to Antarctica. Distinct S Hemisphere 'Austral' belemnite realm was absent, although some endemism exists at species level. Late Jurassic Indo-Pacific belemnites dominated by Belemnopsis with Hibolithes as minor element of fauna)

Earnest, A., T.C. Sunilkumar & K. Silpa (2021)- Sinking slab stress and seismo-tectonics of the Indo-Burmese arc: a reappraisal. Tectonics 40, e2021TC006827, p. 1-15.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2021TC006827>)

Ehiro, M. (1996)- Permian and Triassic paleogeography based on ammonoid fossils of East Asia. Chikyū Monthly, 18, p. 724-729. *(in Japanese)*

Ehiro, M. (1997)- Ammonoid palaeobiogeography of the South Kitakami palaeoland and palaeogeography of eastern Asia in Permian to Triassic time. Proc. 30th International Geological Congress, Beijing 1996, 12, Palaeontology and historical geology, VSP, Utrecht, p. 18-28.

(Biogeographic analysis of Permian- Triassic ammonoids in E Asia suggests Kitakami Terrane in NE Japan, was in equatorial realm near S China/ Khanka Terranes. Four ammonoid provinces in Permian: (1) Boreal, (2) Equatorial American, (3) Equatorial Tethyan (incl. S China, SE Asia, Iran, Timor; with E Permian perrinitids, M Permian Timorites, Waagenoceras?) and (4) Peri-Gondwanan (incl. Australia, Himalayas, Salt Range))

Ehiro, M. (1998)- Permian ammonoid fauna of the Kitakami Massif, Northeast Japan- biostratigraphy and Palaeobiogeography. In: Y. Jin et al. (eds.) Permian stratigraphy, environments and resources 2, Palaeoworld 9, p. 113-122.

(online at: <http://english.nigpas.cas.cn/sp/Palaeoworldbackup/vol9/201103/P020110302550822076467.pdf>)

(Similar to above. Late M Permian Timorites- Waagenoceras ammonites of 'allochthonous Timor' affiliated with Tethyan instead of peri-Gondwanan assemblages)

Enay, R. & E. Cariou (1996)- Identification du Kimmeridgien du domaine Indo-Sud-Ouest Pacifique: la faune à *Parabuliceras* (Ammonitina) de l'Himalaya à la Nouvelle-Zélande. Comptes Rendus Académie Sciences, Paris, ser. 2, 322, 6, p. 469-474.

('Recognition of the Kimmeridgian Stage in the Indo-SW Pacific: the Parabuliceras fauna from the Himalayas to New-Zealand'. Kimmeridgian Stage not easily recognizable in Indo-SW Pacific because of lack of European taxa. Faunal sequence of Spiti Shales in C Nepal shows faunas with Parabuliceras (previously thought to be of Tithonian age) are diagnostic of Kimmeridgian. This endemic Kimmeridgian biogeographic association extends from Himalayas to New Zealand.)

Enay, R. & E. Cariou (1997)- Ammonite faunas and palaeobiogeography of the Himalayan belt during the Jurassic: initiation of a Late Jurassic austral ammonite fauna. Palaeogeogr. Palaeoclim. Palaeoecology 134, 1, p. 1-38.

(Jurassic ammonite faunas form basis for new biogeographical interpretation of U Bathonian- Tithonian/ Berriasian peri-Gondwanan faunas. Low diversity Austral ammonite fauna around E and S Gondwanaland, from Himalaya to Patagonia)

Enay, R. & E. Cariou (1999)- Jurassic ammonite faunas from Nepal and their bearing on the palaeobiogeography of the Himalayan belt. J. Asian Earth Sciences 17, 5-6, p. 829-848.

(M-L Jurassic Himalayan ammonite faunas rel. low diversity and dominance of indigenous genera. Faunas extending from Himalayas to Antarctica represent an actual biogeographical unit: Indo Pacific Realm. With Blanfordiceras wallichi in Tithonian)

Enkin, R.J., Z. Yang, Y. Chen & V. Courtillot (1992)- Palaeomagnetic constraints on the geodynamic history of the major blocks of China from the Permian to the present. J. of Geophysical Research 97, p. 13953-13989.

(Review of paleomagnetic data of China region suggests major blocks probably in contact in Permian-Triassic, but Jurassic key age for present configuration. During Cretaceous, Chinese poles agree with poles from other continents transferred onto Eurasia. Much of China affected by small (<20°) rotations, interpreted as deformation caused by extrusion away from India collision)

ESCAP (1990)- Triassic biostratigraphy and paleogeography of Asia. ESCAP Atlas of Stratigraphy IX, Mineral Resources Development Series 59, United Nations, New York, p. 1-92.

(online at: <https://www.unescap.org/kp/1990/stratigraphic-correlation-between-sedimentary-basins-escap-region-vol-xv-escap-atlas>)

(Brief descriptions of Triassic across Asia, incl. Malaysia and Timor)

Fang, Z.J. (1991)- Sibumasu biotic province and its position in Paleotethys. *Acta Palaeontologica Sinica* 30, 4, p. 344-349.

*(Sibumasu province characterized by: (1) No reliable Gondwana cold-water biota or glacial deposits (interpreted glaciomarine pebble-bearing layers are debris flows; molluscs identified as *Eurydesma* are *Schiziodus*). Temperate and warm water fauna dominant; carbonates not common; (2) No tropical Cathaysian biotas and reef complexes. Absence of Late Paleozoic coal seams and occurrence of mixed Permian Cathaysian-Gondwana flora in W Yunnan suggest Sibumasu between equatorial coal swamp zone (Cathaysian flora) and S temperate coal swamp zone (*Glossopteris* flora); (3) Contains Peri-Gondwana and Cathaysian elements but also European, Ural and Boreal elements; (4) Common endemic genera and species)*

Fang, Z.J. (1994)- Biogeographic constraints on the rift-drift accretion history of the Sibumasu block. *J. Southeast Asian Earth Sciences* 9, 4, p. 375-385.

(online at: https://www.researchgate.net/publication/285649456_Sibumasu_biotic_province_and_its_position_in_Paleotethys)

(Paleozoic biogeographic history of Sibumasu block stages: (1) Cambrian-Ordovician with Australian faunal affinities; (2) Silurian-Devonian with Rhenish-Bohemian faunal affinities; (3) Carboniferous- Permian independent biotic province, different from both peri-Gondwanaland (no true E Permian glacial deposits) and Cathaysian biotas (no Permian coals) in Tethyan realm. Towards end Permian, Cathaysian elements more important, especially in E margin, indicating Cathaysian and Sibumasu biotas began to merge. Sibumasu rifted from Gondwanaland in M Ordovician or earlier (Should be Permian?; JTvG) and sutured to East Continent in Late Permian and E Triassic)

Fedorov, P.I. & A.V. Koloskov (2005)- Cenozoic volcanism of Southeast Asia. *Petrology* 13, 4, p. 352-380.

(Three main periods of activity in Cenozoic volcanic complexes of SE China, Vietnam, Thailand and S China Sea: E Tertiary, Miocene and Pliocene-Quaternary. First period characterized by potassic basalt (Vietnam) and tholeiitic bimodal (SE China) volcanism. Subsequent periods dominated by intraplate-type tholeiitic and alkaline volcanism and minor bimodal tholeiitic magmatism (basalts and rhyolites of Okinawa Trough))

Fernandez, V., J. Claude, G. Escarguel, E. Buffetaut & V. Suteethorn (2009)- Biogeographical affinities of Jurassic and Cretaceous continental vertebrate assemblages from SE Asia. In: E. Buffetaut (ed.) *Late Palaeozoic and Mesozoic continental ecosystems in SE Asia*, Geological Society, London. Special Publ. 315, p. 285-300.

(Late Jurassic- Early Cretaceous vertebrate assemblages from Khorat Gp of Thailand strong provincialism)

Ferrari, O.M., C. Hochard & G.M. Stampfli (2008)- An alternative plate tectonic model for the Palaeozoic-Early Mesozoic Palaeotethyan evolution of Southeast Asia (Northern Thailand-Burma). *Tectonophysics* 451, p. 346-365.

(Alternative model for Cambrian- Triassic geodynamic evolution of SE Asia. Differs in Paleotethys suture location in Thailand at Mae Yuam fault. Closure of E Paleotethys related to S-ward oceanic subduction that triggered E Neotethys opening as back-arc, due to Late Carboniferous- E Permian arc magmatism in Mergui (Burma) and Lhasa block (S Tibet) and absence of arc magmatism E of suture. To explain Carboniferous-E Permian and Permo-Triassic arcs in Cambodia, U Triassic magmatism in E Vietnam and L-M Permian arc volcanics in W Sumatra, we introduce Orang Laut terranes, which detached from Indochina and S China

during back-arc opening due to W-ward subduction of Paleopacific. This also explains location of Cathaysian W Sumatra block W of Cimmerian Sibumasu block (see also comments by Metcalfe 2009))

Fielding, C.R., T.D. Frank & J.L. Isbell (2008)- The late Paleozoic ice age- a review of current understanding and synthesis of global climate patterns. Geological Society of America (GSA), Special Paper 441, p. 343-354. *(Late Paleozoic ice age was series of 1-8 My duration discrete glacial events separated by periods of warmer climate. After smaller precursor events massive expansion of ice at Carboniferous-Permian boundary, and glaciation became bipolar. Ice sheets at maximum in Asselian- E Sakmarian, after which they decayed rapidly over much of Gondwana. Minor glaciations continued in Australia and Siberia through late E- M Permian)*

Flower, M., R.M. Russo, K. Tamaki & N. Hoang (1998)- Mantle contamination and the Izu-Bonin-Mariana (IBM) 'high-tide mark': evidence for mantle extrusion caused by the Tethyan closure. Tectonophysics 333, p. 9-34.

(Discussion of SE Asia- W Pacific tectonics and plate kinematics. W Pacific back-arc basins opened in 3 main episodes of arc-trench rollback: (1) Eocene W Philippine Sea and Celebes Sea, (2) Oligocene-Miocene Japan, South China, Sulu and Makassar Seas, and (3) Late Miocene- Quaternary Okinawa, Mariana Troughs and Andaman Sea. Extrusion of Tethyan asthenosphere, contaminated by sub-Asian cratonic lithosphere, was major cause of W Pacific arc rollback and basin opening)

Flower, M., K. Tamaki & N. Hoang (1998)- Mantle extrusion: a model for dispersed volcanism and DUPAL-like asthenosphere in East Asia and the Western Pacific. In: M.F.J. Flower et al. (eds.) Mantle dynamics and plate interactions in East Asia, American Geophysical Union (AGU), Geodynamics Series 27, p. 67-88.

(On dispersed volcanic clusters over much of Asia and W Pacific following India-Asia and Australia-Indonesia collisions: (1) variably potassic tholeiites and alkali basalts in tension gashes, pull-apart basins, etc., and (2) shoshonite series (K-rich boninite) at extensional, near-collision shear zones and sundered arcs)

Fluteau, F., J. Besse, J. Broutin & M. Berthelin (2001)- Extension of Cathaysian flora during the Permian-climatic and paleogeographic constraints. Earth Planetary Science Letters 193, 3, p. 603-616.

(Mixed Gondwanan, Euramerian and Cathaysian floral elements in 'Mid' Permian Gharif Fm of Oman (see also Berthelin et al. 2003))

Fontaine, H. (1981)- Pre-Tertiary hydrocarbon potential of the South China Sea. Proc. 17th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP), Bangkok 1980, Paper 15, p. 304-321.

(online at: <https://repository.unescap.org/items/7e5623b0-bcfc-4f92-96d3-0d07128db168>)

*(Brief review of Paleozoic-Mesozoic geology of areas surrounding the S China Sea (not in SCS area itself), incl. mainland SE Asia, Nand W Sumatra, Borneo and Mindoro in the Philippines. To NW and SE of S China Sea oil-gas shows and potential have been noted in pre-Tertiary sections. Interesting otherwise unpublished record of *Blanfordiceras* cf. *wallichi* ammonite fragment from C Sulawesi (loc. 11 on Fig. 15= Tithonian age, Gondwanan Tethys margin, presumably part of Banggai-Sula plate stratigraphy; JTvG))*

Fontaine, H. (1986)- Shan-Thai Block and Indochina Block during the Carboniferous and the Permian; palaeontological and stratigraphical data. Proc. First Conference on Geology of Indochina, Ho Chi Minh City 1986, General Department of Geology of Vietnam, 1, p. 101-103.

Fontaine, H. (1986)- The Permian of Southeast Asia. United Nations ESCAP, Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas, CCOP, Technical Bulletin 18, p. 1-111.

(online at: <https://repository.unescap.org/items/312125a5-1653-453e-97d7-3adb1899913d>)

(Extensive review of geology and paleontology of Permian of Thailand, Vietnam, Laos, Malaysia, Sumatra, etc. Followed by 7 appendices on Permian fauna-flora by H. Fontaine, Nguyen Duc Tien (foraminifera), D. Vachard and C. Vozenin-Serra (fossil wood))

Fontaine, H. (2002)- Permian of Southeast Asia: an overview. J. Asian Earth Sciences 20, 6, p. 567-588.

(Permian rocks widespread in SE Asia. Many limestones with fusulinaceans recognized as Permian, but ones without fusulinaceans and previously assigned to Permian, found to be Triassic. Widespread massive limestones represent extensive carbonate platforms. Local occurrences of thick-bedded cherts indicate deep marine environments. Pebbly mudstones in Myanmar, Thailand, NW Malaysia and Sumatra formed in glacial environment. Volcanic rocks absent in NW Peninsular Malaysia and Thailand, but widespread in N Vietnam, Sumatra, E Malay Peninsula and Timor. Faunal and floral assemblages used to establish climatic conditions, environments of deposition and to define crustal blocks and Permian paleogeography)

Fontaine, H., P. David, R. Pardede, N. Suwarna, J.P. Bassoullet, L. Beauvais, E. Buffetaut & R. Ingavat (1983)- The Jurassic in Southeast Asia (Thailand, Laos, Cambodia, Viet Nam, Malay Peninsula, Sumatra, Borneo, West Philippines). CCOP, Technical Bulletin 16, p. 1-75.

(online at: <https://repository.unescap.org/items/72341977-4dbb-441d-962f-088707385870>)

(Extensive review of Jurassic in SE Asia. Jurassic in Cambodia, Laos, Vietnam, E Thailand and Malay Peninsula mainly in continental facies, with occasional thin, shallow marine interbeds. Busuanga, Linapacan and Ili islands, NE of Palawan, Philippines, 200m thick Late Jurassic limestone with Cladocoropsis, Pseudocyclammina lituus, Salingoporella spp., Thaumtoporella, etc. (Fontaine et al. 1983, Bassoulet 1983). Late Jurassic- E Cretaceous limestones with Cladocoropsis- Pseudocyclammina at many localities across W Sumatra (NW Sumatra, Jambi, S Sumatra; all tied to 'Woyla Terranes'?; JTvG), U Jurassic Bau Limestone in W Sarawak, etc.)

Fontaine, H., C. Chonglakmani, I. Amnan & S. Piyasin (1994)- A well-defined Permian biogeographic unit: Peninsular Thailand and northwest Peninsula Malaysia. J. Southeast Asian Earth Sciences 9, p. 129-151.

(M-U Permian-Triassic Ratburi Lst of Peninsular Thailand and Chuping Lst of NW Peninsular Malaysia with rel. low diversity corals and fusulinids (Pseudofusulina, Staffella, Monodioxodina), and with forams incl. Hemigordiopsis and Shanita. These characterize a well-defined biogeographic unit (Shan-Tai/ Sibumasu terrane; JTvG). Noted similarities of several fossil groups with Timor Permian faunas)

Fontaine, H., P. David, R. Pardede & N. Suwarna (1983)- Marine Jurassic in Southeast Asia. UN-ESCAP CCOP, Technical Bulletin 16, p. 3-30.

(online at: <https://repository.unescap.org/items/72341977-4dbb-441d-962f-088707385870>)

(Jurassic in W Philippines (Palawan Block), W Borneo, W Sumatra, Malay Peninsula, Thailand, Kampuchea and Vietnam. Marine Jurassic generally in limited areas only, and incomplete sections. Strong faunal affinities with Tethyan realm in E-M Jurassic, with Jurassic of Japan in Upper Jurassic)

Fontaine, H. & M. Mainguy (1981)- Pre-Tertiary hydrocarbon potential of the South China Sea. Proc. EAPI/CCOP Workshop, Energy 6, 11, p. 1165-1177.

(Similar paper to Fontaine (1981), above)

Fontaine, H. & M. Mainguy (1985)- Pre-Tertiary oil and gas potential in the South China Sea. Proc. 2nd EAPI/CCOP Workshop, Energy 10, 3-4, p. 403-412.

(Mainly addendum to paper above on distribution of pre-Tertiary sediments in SE Asia and petroleum potential. Permian limestone section probably best target for petroleum exploration. Pre-Tertiary sediments probably gas prone)

Fontaine, H. & V. Suteethorn (1992)- Permian corals of Southeast Asia and the bearing of a recent discovery of Lower Permian corals in Northeast Thailand. In: C. Piencharoen (ed.) Proc. National Conference on Geologic Resources of Thailand: potential for future development, Bangkok 1992, Dept. of Mineral Resources (DMR), p. 346-354.

(online at: <http://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=s&mmid=8934&bid=6234>)

(Brief review of Permian corals of SE Asia. Permian corals of Thailand more diverse than Peninsular Thailand, NW Peninsular Malaysia and Timor, all of which are richer and more prolific than those from Australia. Timor corals rel. low diversity, mainly solitary Rugosa without dissipiments and some Tabulata. S Sumatra corals of Padang and W Jambi regions high diversity Permian reefal limestone (M Permian Guguk Bulat, etc.). M Carboniferous- basal M Permian Terbat Lst of W Borneo locally common fusulinids, but few or no corals. New

Lower Permian fossil localities in NE Thailand (Loei) with solitary and compound rugose corals, incl. Kepingophyllidae)

Fortey, R.A. & L.R.M. Cocks (1998)- Biogeography and palaeogeography of the Sibumasu terrane in the Ordovician: a review. In: R. Hall & J.D. Holloway (eds.) Biogeography and geological evolution of SE Asia, Backhuys Publishers, Amsterdam, p. 43-56.

(online at: http://searg.rhul.ac.uk/searg_uploads/2016/01/Fortey_Cocks.pdf)

(Sibumasu (=Shan-Tai) paleocontinent comprises Sumatra, Malaysia, W Thailand and Burma. Ordovician rocks in China, Burma, S Thailand and interior Australia mainly carbonates. Lower Ordovician shelf faunas from Thailand- Langkawi low-latitude faunas, with affinities with N China- Australia, but M-U Ordovician trilobites most similar to S China)

Fourcade, E., J. Azema, J.P. Bassoullet, F. Cecca, J. Dercourt, R. Enay & R. Guiraud (1995)- Palaeogeography and palaeoenvironments of the Tethys during Jurassic Pangaean break-up. In: A.E.M. Nairn, L.E. Ricou et al. (eds.) The ocean basins and margins 8, The Tethys Ocean. Plenum, New York, Chapter 3B, p. 191-214.

Fournier, M., L. Jolivet, P. Davy & J. Thomas (2004)- Backarc extension and collision: an experimental approach to the tectonics of Asia. Geophysical J. International 157, 2, p. 871-889.

(online at: <https://academic.oup.com/gji/article/157/2/871/2080608>)

(Modeling of E Asia deformation. Large parts of SE Asia affected by subduction-related extension, interacting with far field effects of India- Asia collision. Major backarc basins associated with ~N-S right-lateral strike-slip faults which accommodate N-ward penetration of India into Eurasia)

Fujikawa, M. & T. Ishibashi (2000)- Paleozoic ammonoid paleobiogeography in Southeast Asia. Geosciences Journal 4, 4, p. 295-300.

(Paleobiogeography of Late Paleozoic ammonoids in SE Asia. Sibumasu terrane separated from Gondwanaland in E-M Permian. Contrary to previous opinion, no close faunal resemblance between Indochina and S China from Pennsylvanian to M Permian)

Fujiwara, K.P., H. Zaman, A. Surinkum, N. Chaiwong, M. Fujihara, H.S. Ahn & Y. Otofujii (2014)- New insights into regional tectonics of the Indochina Peninsula inferred from Lower-Middle Jurassic paleomagnetic data of the Sibumasu Terrane. J. Asian Earth Sciences 94, p. 126-138.

(Sibumasu Terrane between CW-rotated Indochina Block and CCW-rotated S Sundaland Block. Paleomagnetic data from E-M Jurassic Umphang Gp red sandstones in Ratchaburi area variable declinations (348.5° and 44.7°) for Sibumasu. Sibumasu Terrane behaved as independent fragment when Indochina was undergoing CW rotation and S-ward displacement, as result of extrusion tectonics after India-Asia collision. CCW rotation of 15° estimated for Sibumasu Terrane, as result of continuous N-ward indentation of Australian Plate into S Sundaland Block)

Fuller, M., R. Haston, J.L. Lin, B. Richter, E. Schmidtke & J. Almasco (1991)- Tertiary paleomagnetism of regions around the South China Sea. J. Southeast Asian Earth Sciences 6, 3-4, p. 161-184.

(Paleomag data for Borneo, Malay Peninsula, Philippines)

Fyhn, M.B.W., P.F. Green, S.C. Bergman, J. Van Itterbeeck, T.V. Tri, P.T. Dien, I. Abatzis, T.B. Thomsen, S. Chea, S.A.S. Pedersen et al. (2016)- Cenozoic deformation and exhumation of the Kampot Fold Belt and implications for south Indochina tectonics. J. of Geophysical Research: Solid Earth 121, 7, p. 5278-5307.

(Latest Mesozoic- earliest Cenozoic deformation of Sundaland core between SE Asian fusion and Cenozoic era of rifting and basin formation. In S Cambodia and Vietnam major latest Cretaceous- Paleocene thrusting and uplift of Kampot Fold Belt and surrounding regions, with up to ~11 km exhumation. Latest Cretaceous- Paleocene orogenesis affected much of greater Indochina, probably due to plate collision along E Sundaland or combination of collisions along E and W Sundaland. AFTA and ZFTA data document protracted cooling of Cretaceous granites and locally elevated thermal gradients 10's of My after emplacement. Thermal gradient stabilized by E Miocene time, and Miocene cooling probably reflects renewed denudation pulse)

Gan, C.S., Y. Zhang, Y. Wang, X. Qian & Y. Wang (2021)- Reappraisal of the Mesozoic tectonic transition from the Paleo-Tethyan to Paleo-Pacific domains in South China. *Geological Society of America (GSA) Bull.* 133, 11-12, p. 2582-2590.

(Triassic and Jurassic igneous rocks and detrital zircon data of contemporaneous sediments in SE South China Block suggest transition from Paleo-Tethyan to Paleo-Pacific dynamic domain during E-M Jurassic)

Gao, B., J. Chen, W. Qie & X. Wang (2022)- Revisiting the paleogeographic framework of northeastern Gondwana in the late Paleozoic: implications from detrital zircon analysis. *Sedimentary Geology* 434, 3-4, 106144, p. 1-18.

(Baoshan, Tengchong, Lhasa, S Qiangtang, and Sibumasu terranes were part of Gondwana prior to rifting and drifting from N margin since E Permian. Zircon data suggest S Qiangtang, Baoshan and part of Sibumasu were outboard of N margin of Indian Gondwana during Paleozoic, whereas Lhasa and Sumatra terranes were located along N margin of Australia. Provenance shifts of late Paleozoic glaciogenic sedimentary rocks in NE Gondwana suggests two main ice sheets developed during late Paleozoic)

Gao, X., X. Ma & X. Li (2011)- The great triangular seismic region in eastern Asia: thoughts on its dynamic context. *Geoscience Frontiers* 2, 1, p. 57-65.

(online at: <http://ac.els-cdn.com/>)

(On SE Asia earthquake distributions and major plate movements)

Gatinsky, Y.G. (1986)- Geodynamics of Southeast Asia in relation to the evolution of ocean basins. *Palaeogeogr. Palaeoclim. Palaeoecology* 55, p. 127-144.

(Geodynamics of SE Asia closely connected with cyclic development of large oceanic basins: Paleotethys (M Paleozoic-E Mesozoic), Tethys (end Paleozoic- beginning Cenozoic), and Indian and Pacific Oceans (Late Mesozoic- Cenozoic). Opening of basins accompanied by simultaneous closing of earlier basins)

Gatinsky, Y.G. & C.S. Hutchison (1986)- Cathaysia, Gondwanaland, and the Paleotethys in the evolution of continental Southeast Asia. In: G.H. Teh & S. Paramanathan (eds.) *Proc. 5th Regional Congress Geology, Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 1, *Bull. Geological Society Malaysia* 19, p. 179-199.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986b10.pdf>)

(Continental SE Asia dominated by Precambrian continental blocks overlain by Late Proterozoic-Paleozoic platform successions. Most blocks rifted and drifted from Australian Gondwanaland in Early Paleozoic and were in equatorial position by Permian time. Between blocks are intensely folded mobile belts. West Borneo block initial separation from Eurasia in Late Triassic-Jurassic (creation of Proto-South China Sea), then detached from Indosinia in Late Cretaceous-Paleogene and moved S along fault margin of Vietnam shelf)

Gatinsky, Y.G., C.S. Hutchison, N.N. Minh & T.V. Tri (1984)- Tectonic evolution of Southeast Asia. 27th International Geological Congress, Moscow, Report 5, p. 225-239.

Gatinsky, Y.G., A.V. Mischina, I.V. Vinogradov & A.A. Kovalev (1978)- The main metallogenic belts of Southeast Asia as the result of different geodynamic conditions interference. In: P. Nutalaya (ed.) *Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III)*, Bangkok, Asian Institute of Technology, p. 313-318.

(Majority of mineral occurrences of SE Asia in five metallogenic belts)

Gatinsky, Y.G., Y.G. Zorina & A.A. Chistyakov (1983)- Fault tectonics in Southeast Asia. *Proc. 19th Session Committee Co-ord. Joint Prospecting Mineral Resources in Asian Offshore Areas (CCOP)*, Tokyo 1982, 2, Technical Reports, p. 243-253.

(Brief descriptions of characteristics of main fault zones in SE Asia)

Geyer, O.F. (1977)- Die "Lithiotis-Kalke" im Bereich der unterjurassischen Tethys. *Neues Jahrbuch Geologie Palaontologie, Abhandlungen* 153, p. 304-340.

('The Lithiotis limestones' in the Early Jurassic Tethys Realm'. Tethyan Early Jurassic reefal limestones commonly dominated by large thick-walled Lithiotis-type bivalves (also present in Fatu Limestones of Timor; Krumbeck 1923, Hayami 1984))

Gibbons, A. (2012)- Regional plate tectonic reconstructions of the Indian Ocean. Ph.D. Thesis University of Sydney, p. 1-185.

(online at: <http://ses.library.usyd.edu.au/handle/2123/8580>)

(New model of Indian Ocean plate tectonic history, suggesting smaller extent of Greater India and later collision than previous models. Main driver is Jurassic rock sample dredged from Cretaceous Wharton basin off W Australia. Argoland accreted to equatorial intra-oceanic arc at ~126 Ma (E Cretaceous; obduction event recorded in zircons from ophiolites in Yarlung-Tsangpo suture zone between Indian and Eurasian blocks). E Argoland accreted to Sumatra at ~80 Ma, possibly re-attaching Woyla Terranes back to Sumatra margin. Greater India's indenter, Gascoyne block, reached W Burma and E edge of intra-oceanic arc at ~50 Ma, as India continued to migrate North. Final collision between Greater India (accreted to intra-oceanic arc) and Eurasia did not take place until ~35 Ma)

Gibbons, A., J.M. Whittaker & R.D. Muller (2013)- The breakup of East Gondwana: assimilating constraints from Cretaceous ocean basins around India into a best-fit tectonic model. J. of Geophysical Research: Solid Earth 118, 3, p. 808-822.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1002/jgrb.50079>)

(Mainly on terranes leaving East Gondwana, which separated from Africa in M-Jurassic. Breakup of Greater India from Australia-Antarctica started at ~136 Ma (E Cretaceous). Seafloor spreading between Australia and Antarctica started at ~83-79 Ma (~Campanian, Late Cretaceous). Etc.)

Gibbons, A.D., S. Zahirovic, R.D. Muller, J.M. Whittaker & V. Yatheesh (2015)- A tectonic model reconciling evidence for the collisions between India, Eurasia and intra-oceanic arcs of the central-eastern Tethys. Gondwana Research 28, 2, p. 451-492.

(manuscript online at: https://earthbyte.org/Resources/Pdf/Gibbons_etal_2015_Tectonic_model_collisions_India-Eurasia_intra-oceanic_arcs_Central-Eastern_Tethys.pdf)

(Plate tectonic model for India-Eurasia collision. With plate reconstructions since M Jurassic (160 Ma) and including chapter on SE Asia and Woyla Arc of Sumatra)

Gobbett, D.J. (1973)- Carboniferous and Permian correlation in Southeast Asia In: B.K. Tan (ed.) Proc. Regional Conference on the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geological Society Malaysia 6, p. 131-142.

(online at: <https://gsm.org.my/products/702001-101350-PDF.pdf>)

(Late Paleozoic rocks from Thailand, Malaysia, Myanmar, Vietnam, Laos, Cambodia, Sumatra, Borneo, etc.)

Goldfarb, R.J., R.D. Taylor, G.S. Collins, N.A. Goryachev & O.F. Orlandini (2014)- Phanerozoic continental growth and gold metallogeny of Asia. Gondwana Research 25, p. 48-102.

(Review of tectonic evolution and associated gold deposits of mainland Asia in past 800 Myrs. Nothing on Indonesia)

Golonka, J. (2007)- Late Triassic and Early Jurassic palaeogeography of the world. Palaeogeogr. Palaeoclim. Palaeoecology 244, p. 297-307.

(Paleogeographic maps for Late Triassic (Carnian-Norian) and E Jurassic (Hettangian-Toarcian). Triassic continued N-ward drift of Cimmerian continent corresponded with closure and consumption of Paleotethys and opening of Neotethys. Most significant Late Triassic convergent event was Indosinian orogeny, result of consolidation of S and N China blocks. Also, Indochina and 'Indonesia' sutured to S China. Triassic- Jurassic boundary important biotic extinction event)

Golonka, J. (2007)- Phanerozoic paleoenvironment and paleolithofacies maps- Late Paleozoic. Geologia 33, 2, p. 145-209.

(online at: http://journals.bg.agh.edu.pl/GEOLOGIA/2007-02/Geologia_2007_2_01.pdf)

(Global plate tectonic and paleogeographic maps for 8 E Devonian- Permian time intervals. Includes Australia- SE Asia blocks evolution. 'Indonesia' shown as part of Cimmerian Blocks that rifted off Gondwana in Permian and collide with mainland SE Asia in Triassic)

Golonka, J. (2007)- Phanerozoic paleoenvironment and paleolithofacies maps- Mesozoic. *Geologia* 33, 2, p. 211-264. (online at: <https://www.infona.pl/resource/bwmeta1.element.baztech-article-AGH5-0014-0138/content/partDownload/013ae5dd-4beb-3cdb-8fba-a89e19fc09ef>)

(Global plate tectonic and paleogeographic maps for 8 Mesozoic time intervals. Most significant Triassic convergent event was Indosinian orogeny (collision of Indochina and Indonesia with S China). N-ward drift of Cimmerian continents driven by closing of Paleotethys and opening of Neotethys Ocean. SE Asia not very well portrayed in this global map series)

Golonka, J. (2009)- Phanerozoic paleoenvironment and paleolithofacies maps- Cenozoic. *Geologia* 35, 4, p. 507-587.

(online at: http://journals.bg.agh.edu.pl/GEOLOGIA/2009-04/Geologia_2009_4_01.pdf)

Golonka, J. (2009)- Phanerozoic paleoenvironment and paleolithofacies maps- Early Paleozoic. *Geologia* 35, 4, p. 589-654.

(online at: http://journals.bg.agh.edu.pl/GEOLOGIA/2009-04/Geologia_2009_4_02.pdf)

(Global plate tectonic and paleogeographic maps for 8 Cambrian- Silurian time intervals. Australia and China blocks in low northern latitudes)

Golonka, J. (2012)- Paleozoic paleoenvironment and paleolithofacies maps of Gondwana. AGH University of Science and Technology Press, Krakow, p. 1-82.

(Paleozoic global plate reconstructions, with focus on Gondwana region)

Golonka, J., A. Embry & M. Krobicki (2018)- Late Triassic global plate tectonics. In: L.H. Tanner (Ed.) *The Late Triassic World, Earth in a time of transition*, Topics in Geobiology 46, Springer International, Chapter 2, p. 27-57.

(Late Triassic global plate reconstruction, at time of Early Cimmerian and Indosinian orogenies that closed Paleotethys Ocean (earlier in Alpine-Carpathian-Mediterranean area, and latest in SE Asia). Pulling force of N-dipping subduction along N margin of Neotethys (= Mesotethys) caused drifting of new set of plates from passive Gondwana margin, dividing Neotethys Ocean (= opening of Cenotethys; Lhasa plate separation))

Golonka, J. & D. Ford (2000)- Pangean (Late Carboniferous-Middle Jurassic) paleoenvironment and lithofacies. *Palaeogeogr. Palaeoclim. Palaeoecology* 161, p. 1-34.

(Six global reconstructions for Pangea from Late Carboniferous- M Jurassic. Most of Indonesia shown as part of 'Cimmerian Plates' that rifted from Gondwana in Permian and sutured with SE Asia in Late Triassic)

Golonka J. & A. Gaweda (2012)- Plate tectonic evolution of the southern margin of Laurussia in the Paleozoic. In: E. Sharkov (ed.) *Tectonics- Recent advances*, Chapter 10, InTech, p. 261-282.

(online at: <http://cdn.intechopen.com/pdfs-wm/37859.pdf>)

(Trench-pulling effect of N-dipping subduction at S margin of Eurasia caused rifting as well as transfer of plates from Gondwana to Laurasia. This model applied here to S margin of Laurussia in Paleozoic times. With 12 plate tectonic maps for time slices from Early Cambrian- Late Carboniferous)

Golonka, J., M. Krobicki & Nguyen Van Giang (2006)- Paleogeographic maps of Southeast Asia. *Proc. Second Int. Workshop IGCP Project 480, Structural and tectonic correlation across the Central Asian orogenic collage, Ulaanbaatar 2006*, p. 71-74. (Extended Abstract only)

(online at: www.igcp.itu.edu.tr/Publications/GolonkaKrob_06.pdf)

Golonka, J., M. Krobicki, J. Pajak & Nguyen Van Giang & W. Zuchiewicz (2006)- Phanerozoic palaeogeography of Southeast Asia. *Geolines* 20, p. 40-43. (Extended Abstract only)

(online at: <http://geolines.gli.cas.cz/fileadmin/volumes/volume20/G20-040.pdf>)

(Brief summary of larger SE Asia project)

Golonka, J., M. Krobicki, J. Pajak, Nguyen Van Giang & W. Zuchiewicz (2006)- Global plate tectonics and paleogeography of Southeast Asia. Faculty of Geology, Geophysics and Environmental Protection, AGH University of Science and Technology, Arkadia, Krakow, p. 1-128.

(Major review of global plate tectonic evolution from Cambrian- Recent in 32 maps/ time slices, with detailed maps for SE Asia (Vietnam focused). Differs from recent Hall and Metcalfe models in depicting a more 'traditional' view of SW Borneo as always having been part of Indochina-Sibumasu complex (which rifted off the Indochina/ S China margin by opening of Proto- South China Sea in Jurassic or Cretaceous))

Golonka, J., M. Krobicki, Z. Paul & A. Khudoley (2006)- Central Asia- Southeast Asia connection during Paleozoic orogenies: problems and questions. *Geolines* 20, p. 21-23.

(online at: www.igcp.itu.edu.tr/Publications/Golonka_06.pdf)

(Peak of Paleozoic orogenesis in SE Asia and S China in Silurian- earliest Devonian. In N Vietnam deep water Ordovician and Silurian synorogenic deposits overlain by continental E Devonian red beds. With plate tectonic map for Early Ordovician)

Gorur, N. & A.M.C. Sengor (1992)- Paleogeography and tectonic evolution of the Eastern Tethysides: implications for the Northwest Australian margin breakup history. In: U. von Rad et al. (eds.) *Proc. Ocean Drilling Program (ODP), Scientific Results 122*, College Station, p. 83-106.

(online at: www-odp.tamu.edu/publications/122_SR/VOLUME/CHAPTERS/sr122_05.pdf)

(Last major breakup from NW Australian continental margin (Exmouth, Wombat, Scott Plateaus) (often named 'Argoland')) in Berriasian- Hauterivian. Major continental fragments in Asiatic Tethyside orogenic collage already collided with Asia by that time. Similarity of Mesozoic geological record suggests Sikuleh-Natal continental sliver in Sumatra, plus possible extensions in Java probably were continental object that left NW Australia in Berriasian- Hauterivian. This sliver records E Cretaceous rapid subsidence and collision with Sumatra along Woyla suture in Late Cretaceous. NW Australian margin two older breakup events: (1) latest Carboniferous-earliest Permian: departure of Sibumasu block and E Cimmerian continent (Baoxan, W Thailand, E Burma), W Malaya and part of C Sumatra; (2) Late Triassic-Jurassic. Lhasa- C Burma block left Gondwanaland, which leads us to think breakup event was latest Triassic, probably Rhaetian)

Grant-Mackie, J.A., Y. Aita, B.E. Balme, H.J. Campbell, A.B. Challinor, D.A.B. MacFarlan, R.E. Molnar, G.R. Stevens & R.A.Thulborn (2000)- Jurassic palaeobiogeography of Australasia. In: A.J. Wright (ed.) *Palaeobiogeography of Australasia*, Memoir Assoc. Australasian Palaeontologists (AAP) 23, p. 311-353.

(Review of Australian Jurassic fossils distribution)

Grunow, A.M. (1999)- Gondwanan events and palaeogeography: a palaeomagnetic review. *J. African Earth Sciences* 28, 1, p. 53-69.

Guillot, S., K. Hattori, P. Agard & S. Schwartz & O. Vidal (2009)- Exhumation processes in oceanic and continental subduction contexts: a review. In: S. Lallemand and F. Funiciello (eds.) *Subduction zone geodynamics*, Springer-Verlag p. 175-205.

(Review of exhumation of high and ultrahigh pressure metamorphic rocks and ophiolites. Three types of subduction zones: (1) Accretionary-type subduction zones exhume HP metasedimentary rocks by underplating; (2) Serpentinite-type subduction zones exhume HP to UHP in 1-10 km thick serpentinite subduction channel (incl. Bantimala, Sulawesi, Luk Ulo, C Java); (3) continental-type subductions exhume UHP rocks of continental origin. With examples from SE Asia)

Guo, F. (1990)- Terranes of Southwest China since the Late Paleozoic. In: T.J. Wiley et al. (eds.) *Terrane analysis of China and the Pacific Rim*, Circum-Pacific Council Energy and Mineral Resources, Houston, Earth Sci. Publ. 13, p.

Guo, F. (1991)- The boundary between Gondwana and Pacifica and the suturing ages of their allied terranes in Southwestern China. *Acta Geologica Sinica (English Ed.)* 4, p. 87-95.

(Two terrane groups in SW China: (1) with Permo-Carboniferous ice-rafted marine sediments and cold-water fauna of Gondwana facies (Gangmar Co, Lhasa, Sa' gya, Tengchong, Baoshan terranes), (2) with Yangtze-type U Paleozoic with Cathaysian flora and Pacific-type fusulinids (Changning-Menglian, Shuangjiang-Lancang, Qamdo and Bayan Har terranes). Longmu Co-Shuanghu-Dengqen- N Lancang River- Kejie-Mengding suture zone between two groups is boundary between Gondwana and Pacifica in SW China. Baoshan and Nyainrong-Sog in Lhasa composite terrane first combined with Asian continent in early E Jurassic. N Tibet- W Yunnan microplate (with Gangmar Co, Lhasa, Tengchong terranes) collided with Asia at end of E Cretaceous)

Hada, S., K. Ishii, C.A. Landis, J. Aitchison & S. Yoshikura (2001)- Kurosegawa Terrane in Southwest Japan: disrupted remnants of a Gondwana-derived terrane. *Gondwana Research* 4, p. 27-38.

(Kurosegawa Terrane in SW Japan, between two Mesozoic subduction complex terranes, is exotic terrane with Permian limestones with fusulinacean forams Cancellina, Colania and Lepidolina, suggesting terrane once situated within Colania- Lepidolina territory in E Tethys-Panthalassa region at equatorial latitude, possibly close to E margin of S China or Indochina-E Malaya continental blocks. These blocks had rifted from Gondwana by Late Devonian. Amalgamated with proto-Asian continent (S China?) in Late Triassic (or later))

Hall, R. (2015)- Provenance and basement studies of SE Asia. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE)*, Kuala Lumpur, p. 1-5. *(Extended Abstract)*

(Brief review of recent Royal Holloway sandstone provenance work (Gunawan, Sevastjanova, Zimmermann))

Hall, R. & H. Breitfeld (2017)- Nature and demise of the Proto-South China Sea. *Bull. Geological Society Malaysia* 63 (50th Anniversary Issue 1), p. 61-76.

(online at: www.gsm.org.my/products/702001-101708-PDF.pdf)

(Proto-South China Sea should be used only for oceanic slab subducted beneath Sabah and Cagayan between Eocene- E Miocene; Paleo-Pacific Ocean used here for lithosphere subducted under Borneo in Cretaceous. Good evidence for subduction between Eocene- E Miocene below Sabah, and W limit of Proto-S China Sea subduction was W Baram Line; subducted slab imaged in lower mantle by P-wave tomography. Present-day NW Borneo Trough and Palawan Trough not subduction trenches: NW Borneo Trough flexural response to gravity-driven deformation of Neogene sediment wedge NW of Sabah. Palawan Trough is continent-ocean transition at SE edge of modern S China Sea)

Hall, R., M.A. Cottam & M.E.J. Wilson (2011)- The SE Asian gateway: history and tectonics of the Australia-Asia collision. In: R. Hall, M.A. Cottam & M.E.J. Wilson (eds.) *The SE Asian gateway: history and tectonics of the Australia-Asia collision*, Geol. Soc, London, Special Publ. 355, p. 1-6.

(Introduction to collection of geological papers on E Indonesia from 2009 SAGE conference)

Hallam, A. (1986)- Evidence of displaced terranes from Permian to Jurassic faunas around the Pacific margins. *J. Geological Society, London*, 143, p. 209-216.

(Permian- Jurassic Tethyan marine invertebrate faunas from low latitude can be distinguished from less diverse higher latitude faunas. Displacement of these low-latitude faunas high latitudes around Pacific margins provides evidence for movement of displaced terranes. Fullest story worked out for W margin of N America, as far N as S Alaska. Also evidence for N-ward movement of continental segments along NE Asian margin. Torlesse Terrane of New Zealand appears to have moved considerable distance S-wards)

Halle, T.G. (1935)- On the distribution of the Late Palaeozoic floras in Asia. *Geografiska Annaler* 17, Suppl. (Sven Hedin volume), p. 106-111.

(First paper to recognize three Permian floral provinces in Asia: Indian Gondwanan-Glossopteris in SW, Angara flora in N, Cathaysian/ Sino-Malayan or Gigantopteris flora in SE. No figures)

Hao, S. & P.G. Gensel (1998)- Some new plant finds from the Posongchong Formation of Yunnan, and consideration of a phytogeographic similarity between South China and Australia during the Early Devonian. *Science in China, ser. D*, 41, 1, p. 1-13.

(online at: <http://engine.scichina.com/publisher/scp/journal/Sci%20China%20Earth%20Sci-D/41/1/10.1007/BF02932414?slug=full%20text>)

(E Devonian plants from Posongchong Fm of SE Yunnan, suggest E Devonian NE Gondwana phytogeographic unit in Equatorial position, comprising Australia, S China Block and perhaps Shan-Thai Block)

Haproff, P.J., A.V. Zuza, An Yin, T. M. Harrison, C.E. Manning, C.S. Dubey, L. Ding, C. Wu & J. Chen (2019)- Geologic framework of the northern Indo-Burma Ranges and lateral correlation of Himalayan-Tibetan lithologic units across the eastern Himalayan syntaxis. *Geosphere* 15, 3, p. 856-881.

(online at: <https://pubs.geoscienceworld.org/gsa/geosphere/article/15/3/856/569860/Geologic-framework-of-the-northern-Indo-Burma>)

(Major lithologic units of the eastern Himalayan Orogen, exposed in N Indo-Burma Ranges, the N-most segment of 'Eastern Flanking Belt' (NE India?) and correlation of these units with classic lithologic divisions of Himalayan orogen and Lhasa terrane to W)

Harzhauser, M., A. Kroh, O. Mandic, W.E. Piller, U. Gohlich, M. Reuter & B. Berning (2007)- Biogeographic responses to geodynamics: a key study all around the Oligo-Miocene Tethyan Seaway. In: 48th Phylogenetic Symposium on historical biogeography, *Zoologischer Anzeiger* 246, 4, p. 241-256.

(Extensive terrestrial exchanges initiated by closure of Tethyan Seaway in Early Miocene. Until closure, marine faunal exchange via Mesopotamian Trough and Zagros Basin, reflected by Indonesian corals in Iran and 'western' gastropods in Pakistan and India. Divergences on both sides of seaway starting in Oligocene. Around closure event Proto-Mediterranean faunas already little in common with Indo-West Pacific Region)

Hasegawa, S. (1996)- Ridge subduction model- a mechanism for an earlier South China Sea opening and an alternative paleogeographic reconstruction of Southeast Asia. *Proc. 11th Offshore Southeast Asia Conference Exhibition (OSEA96)*, Singapore 1996, p. 155-167.

(Late Mesozoic- Tertiary plate reconstruction, generally compatible with Tapponnier extrusion model. The now subducted Kula-Pacific Ridge beneath Eurasia Plate caused S China basins rifting and provides heat under S China continental crust)

Hashimoto, W., E. Aliate, N. Aoki, G. Balce, T. Ishibashi, N. Kitamura, T. Matsumoto, M. Tamura & J. Yanagida (1975)- Cretaceous system of Southeast Asia. In: T. Kobayashi & R. Toriyama (eds.) *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 15, p. 219-287.

(online at: <http://twgeoref.moeacgs.gov.tw/star/1975/19750026/0219.pdf>)

(Extensive review of Japanese work on Cretaceous stratigraphy and paleontology of Taiwan, Philippines, Borneo, Java, Sulawesi, etc. Incl. significant details on Cretaceous Orbitolina occurrences on Borneo)

Hashimoto, W. & T. Sato (1980)- Correlation of the structural belts in East and Southeast Asia. In: T. Kobayashi, R. Toriyama et al. (eds.) *Symposium on the geology and paleontology of SE Asia*, Tsukuba 1978, *Geology and Palaeontology of Southeast Asia*, University of Tokyo Press, 21, p. 343-356.

(Brief review of Mesozoic and Cenozoic structural belts of SE and East Asia)

Hayami, I. (1984)- Jurassic marine bivalve faunas and biogeography in Southeast Asia. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia* 25, University of Tokyo Press, p. 229-237.

(Unique E Jurassic (Pliensbachian?) heavy bivalve assemblage from Timor with Lithotis, Pachymegalodon, Gervilleioperna, etc. described from Fatu Lst of Timor by Krumbeck (1923). Upper Jurassic bivalves in W Borneo part of East Asian Province with Philippines and Japan. Timor-Roti, Seram, Misool, etc., are part of Maorian Province with Malayomaorica and Retroceramus haasti)

He, C., S. Dong, M. Santosh & X. Chen (2012)- Seismic evidence for a geosuture between the Yangtze and Cathaysia Blocks, South China. *Nature Scientific Reports* 3, 2200, p. 1-7.

(online at: <https://www.nature.com/articles/srep02200.pdf>)

(S China block composed of sub-blocks Yangtze in NW and Cathaysia in SE, which collided and amalgamated in Neoproterozoic along Jiangnan Orogen. Felsic lower crust of Cathaysia Block and Jiangnan orogenic belt may represent fragments derived from Gondwana supercontinent)

- Heine, C. (2002)- The tectonic evolution of the Northwest Shelf of Australia and southern Southeast Asia. M.Sc. Thesis Ruhr-Universat Bochum and University of Sydney, p. 1-94.
(online at: www.earthbyte.org/people/christian/media/Heine_02_MScThesis_e-version.pdf)
(Argo and Gascoyne Abyssal Plains off NW Australia are the only preserved patches of Tethyan ocean floor; rest destroyed by subduction. W Burma Block identified as continental fragment breaking up from NW Shelf in Late Jurassic and accreted to SE Asian mainland in Santonian-Coniacian (85-80Ma) near W Thailand)
- Heine, C., R.D. Muller & C. Gaina (2004)- Reconstructing the lost Eastern Tethys Ocean basin: convergence of the SE Asian margin and marine gateways. In: P. Clift et al. (eds.) Continent-ocean interactions within East Asian marginal seas, American Geophysical Union (AGU), Geophysical Monograph Series 149, p. 37-54.
(online at: https://www.paleoearthlabs.org/pdf/Heine_04_LostTethysOceanBasin_AGU-GM.pdf)
(Reconstruction of E Tethys (Mesotethys and Neotethys) ocean basin for last 160 Myr, with reconstructions in 20 Myr increments, constrained by magnetic anomalies in Argo and Gascoyne abyssal plains of Australia NW shelf, assuming symmetrical spreading, etc.)
- Helmcke, D. (1983)- On the Variscan evolution of Central Mainland Southeast Asia. Earth Evolution Sciences, 1982, 4, p. 309-319
- Helmcke, D. (1984)- The orogenic evolution (Permian-Triassic) of central Thailand. Implications on paleogeographic models for mainland SE Asia. Memoires Societe Geologique France, N.S., 147, p. 83-91.
- Helmcke, D. (1985)- The Permo-Triassic 'Paleotethys' in mainland Southeast Asia and adjacent parts of China. Geologische Rundschau 74, 2, p. 215-228.
(Discussion of geodynamic evolution of mainland SE Asia and China. Permo-Triassic 'Paleotethys' suture must be expected S of Tibet and in Burma. All sutures in Thailand, Vietnam and Yunnan already closed during Paleozoic)
- Helmcke, D., R. Ingavat-Helmcke & D. Meischner (1993)- Spätvariszische Orogenese und Terranes in Sudost-Asien. Gottinger Arbeiten Geologie Palaeontologie, 58, p. 29-38.
(Late Variscan orogenesis and terranes in Southeast Asia')
- Henderson, R.A., J.S. Crampton, M.E. Dettmann, J.G. Douglas, D. Haig, S. Shafik, J.D. Stilwell & R.A. Thulborn (2000)- Biogeographical observations on the Cretaceous biota of Australasia. In: A.J. Wright et al. (eds.) Palaeobiogeography of Australasian faunas and floras, Memoir Assoc. Australasian Palaeontologists (AAP) 23, p. 355-404.
(Overview of Cretaceous macrofauna, microfauna, flora in Australia. Maximum paleobiogeographic gradients in Albian, Late Campanian and Maastrichtian)
- Herngreen, G.F.W., M. Kedves, L.V. Rovnina & S.B. Smirnova (1996)- Cretaceous palynological provinces: a review. In: J. Jansonius & D.C. MacGregor (eds.) Palynology: principles and applications, American Assoc. Stratigraphic Palynologists (AASP) Found. 3, p. 1157-1188.
(Includes map of Albian-Cenomanian tropical-subtropical Elaterosporites microfloral province (peaking in subtropical arid climate?). Also known from PNG)
- Hirsch, F., K. Ishida, T. Kozai & A. Meesook (2006)- The welding of Shan-Thai. Geosciences Journal (Geological Society Korea), 10, 3, p. 195-204.
(online at: https://www.researchgate.net/profile/Francis-Hirsch/publication/225772382_The_welding_of_Shan-Thai/links/02e7e527e0d27785a2000000/The-welding-of-Shan-Thai.pdf)
(Shan-Thai Terrane is remnant of 'poly-island' Paleo-Tethys oceanic system in SE Asia. It is composite terrane, with Cathaysian internal elements and transitional 'Sibumasu' central part. External 'Shan' elements left Gondwana last and have clear cold-water imprint. Final welding and Paleotethys closure in end Triassic-earliest Jurassic Late Indosinian event. Cenozoic Himalayan escape tectonics compressed Shan-Thai, opened Gulf of Thailand and disrupted original alignment of Gondwana-Tethys divide)

- Hobbs, W.H. (1944)- Mountain growth, a study of the Southwestern Pacific Region. Proc. American Philosophical Soc. 88, 4, p. 221-268.
(Old review of SW Pacific mountain systems, including Sunda-Banda Arc)
- Holcombe, C.J. (1977)- How rigid are the lithospheric plates? Fault and shear rotations in southeast Asia. J. Geological Society, London, 134, p. 325-342.
(Significant fault movement in Tertiary in continental SE Asia. Three rotations: Indochina subplates wrench rotation, Sunda shear rotation, and rotation of Malay Peninsula and Sunda Platform by movements along Ranong and Semangko faults)
- Holloway, J. & R. Hall (1998)- SE Asian geology and biogeography: an introduction. In: R. Hall & J.D. Holloway (eds.) Biogeography and geological evolution of SE Asia, Backhuys Publishers, p. 1-23.
- Holloway, J. (1998)- Geological signal and dispersal noise in two contrasting insect groups in the Indo-Australian tropics: R-mode analysis of patterns in Lepidoptera and cicadas. In: R. Hall & J.D. Holloway (eds.) Biogeography and geological evolution of SE Asia, Backhuys Publishers, p. 291-314.
- Honza, E. & K. Fujioka (2004)- Formation of arcs and backarc basins inferred from the tectonic evolution of Southeast Asia since the Late Cretaceous. Tectonophysics 384, p. 23-53.
(New data in NW West Philippines basin Daito Ridge used to reconstruct Late Cretaceous- Tertiary plate tectonics of SE Asia. In model S Borneo rotated 90° CCW since Cretaceous)
- Hou, Z., R. Wang, H. Zhang, Y. Zheng, S. Jin, H. Thybo, R.F. Weinberg, B. Xu et al. (2023)- Formation of giant copper deposits in Tibet driven by tearing of the subducted Indian plate. Earth-Science Reviews 243, 104482, p. 1-11.
(Common Miocene giant to large porphyry copper deposits in Tibet. Inversion of gravity, magnetotelluric and geochemical data show subducted Indian continental lithosphere was torn into several pieces, with different subduction angles during Cenozoic India-Asia collision. Tears in Indian slab provide channels for asthenospheric upwelling, which reworks overlying Asian lithosphere and triggers melting, generating ultrapotassic mafic melts that ascend and pond at base of crust, generating hydrous granitoid magmas. Three key factors generate collision-related PCDs: torn slab subducted at moderate angle, prior fertilization of lower crust with Cu, and trans-lithospheric vertical structures for magma ascent)
- Hou, Z. & H. Zhang (2015)- Geodynamics and metallogeny of the eastern Tethyan metallogenic domain. Ore Geology Reviews 70, p. 346-384.
(online at: <https://www.sciencedirect.com/science/article/pii/S0169136814002777>)
(Major review of metallogeny of eastern Tethysides orogenic belt from Turkey to SE Asia, incl. SE Asia and Tengchong-Lianghe Sn-W belts, etc.)
- Houseman, G. & P. England (1993)- Crustal thickening versus lateral expulsion in the Indian-Asian continental collision. J. of Geophysical Research 98, B7, p. 12233-12249.
(Since beginning of continental collision between India and Asia ~2500 km of convergence. N-ward movement of India accommodated by major internal deformation of Asian lithosphere, incl. crustal thickening in and around Tibetan Plateau. Experimental modeling suggests crustal thickening dominant mode of indentation strain accommodation. Although common 10- 30° paleomagnetic rotations, probably not accompanied by large Eastward 'extrusion')
- Hsu, K.J., J. Li, H. Chen, Q. Wang, S. Sun & A.M.C Sengor (1990)- Tectonics of South China: key to understanding West Pacific geology. Tectonophysics 183, p. 9-39.
(S China is composite of Proterozoic-Mesozoic orogenic belts. Three continental blocks: Yangzi, Huanan, and Dongnanya. Yangzi separated from Gondwana in Late Precambrian. N margin of Huanan was N active Gondwana margin until Devonian. Huanan and Yangzi collided in Triassic. Huanan separated in Devonian, with continuous Devonian-Triassic sequence on S passive margin of Huanan. Dongnanya with Permian glacial marine deposits, separated from Gondwana in Late Permian and may be E continuation of Sibumasu)

Hua, Y., D. Zhao & Y.G. Xu (2022)- Azimuthal anisotropy tomography of the Southeast Asia subduction system. *J. of Geophysical Research: Solid Earth* 127, 2, e2021JB022854, p. 1-21.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2021JB022854>)

(3-D tomographic model of P wave isotropic velocity and azimuthal anisotropy beneath SE Asia shows high-velocity subducting Australian slab penetrated through mantle transition zone and reached depth of ~1200 km beneath Sumatra, but trapped within MTZ beneath Java. Hainan mantle plume significant low-V anomaly beneath MTZ, extending down to bottom of model (~1600-km depth). Coexistence of mantle plume and stagnant slab may have caused complex tectonic history and geological features in SE Asia (e.g. arc and back-arc volcanoes, intraplate volcanism, and widespread Cenozoic basalts)

Huang, W., D.J.J. van Hinsbergen, P.C. Lippert, Z. Guo & G. Dupont-Nivet (2015)- Paleomagnetic tests of tectonic reconstructions of the India-Asia collision zone. *Geophysical Research Letters* 42, 8, p. 2642-2649.

(Late Cretaceous and Paleogene paleolatitudes of Tibetan Himalaya difficult to reconcile with current hypotheses of collision age (34, 52 or 65 Ma) and inferred Asian shortening (600-900km))

Huang, W.Q., J.Y. Pan, P. Ni, J.G. Zhou, T. Shui, H. Chen, M.S. Fan & J.M. Cui (2024)- Recognition of Neogene tin mineralization in the Southeast Asian tin belt. *Geological Society of America (GSA) Bull.* 136, 11-12, p. 5300-5312.

(SE Asian tin belt prolonged mineralization history from Permian to Paleogene (~285-45 Ma). Tin typically associated with subduction and collision of Paleo-Tethys, Meso-Tethys and Neo-Tethys slabs. However, E Miocene cassiterite (21-19 Ma) in Yunling, W Yunnan; youngest tin mineralization in SE Asia tin belt. Sn mineralization possibly linked to extensive lithospheric delamination of lithosphere in SE Tibet, leading to upwelling and decompression partial melting of asthenosphere, providing explanation for high T required for release of Sn from biotite-dehydration melting of sedimentary protolith)

Huang, Z.C., D.P. Zhao & L. Wang (2015)- P wave tomography and anisotropy beneath Southeast Asia: insight into mantle dynamics. *J. of Geophysical Research: Solid Earth* 120, 7, p. 5154-5174.

(online at: <http://onlinelibrary.wiley.com/doi/10.1002/2015JB012098/epdf>)

(Tomographic images of mantle under SE Asia show high-velocity zones high-V zones around SE Asia which generally represent subducting slabs. Slabs generally extend down to the Mantle Transition Zone. Low-velocity zones with trench-normal anisotropy in uppermost mantle, indicating back-arc spreading or secondary mantle-wedge flow induced by slab subduction. Trench-parallel anisotropy in deep upper mantle reflects structures in subducting slab or in upper mantle surrounding slab. Gap in slab under area between Sumatra and Java)

Hutchison, C.S. (2005)- The geological framework. In: A. Gupta (ed.) *The physical geography of Southeast Asia*, Oxford University Press, p. 3-23.

(Review of SE Asia tectonic framework)

Isbell, J.L., M.F. Miller, K.L. Wolfe & P.A. Lenaker (2003)- Timing of late Paleozoic glaciation in Gondwana: was glaciation responsible of the development of northern hemisphere cyclothems? In: M.A Chan & A.W. Archer (eds.) *Extreme depositional environments: mega end members in geologic time*, Geological Society of America (GSA), Special Paper 370, p. 5-24.

Izokh, E.P. (1997)- Australasian tektites and a global disaster of about 10,000 years BP, caused by collision of the Earth with a comet. *Russian Geology Geophysics* 38, 3, p. 669-699.

(Based on evidence from Vietnam, age of gigantic Australasian Tektite Strewn Field here considered to be close to 10,000 years ago, much younger than commonly accepted age of 0.7 Ma (very unlikely; JTvG), and may have triggered global climate changes and mass extinctions at Pleistocene/Holocene boundary)

Jagoutz, O., F.A. MacDonald & L. Royden (2016)- Low-latitude arc-continent collision as a driver for global cooling. *Proc. National Academy of Sciences USA (PNAS)* 113 (18), p. 4935-4940.

(online at: <https://www.pnas.org/doi/full/10.1073/pnas.1523667113>)

(New constraints on tectonic evolution of Neo-Tethys Ocean indicate that at ~90-70 Ma and at ~50-40 Ma, vast quantities of mafic and ultramafic rocks were emplaced at low latitude onto continental crust within tropical humid belt. These events correspond with, and are potential agents for, global climatic cooling events that terminated Cretaceous Thermal Maximum and Eocene Climatic Optimum. Obducted rocks (mafic/ultramafic) and tropical humid climate with high precipitation rate result in significant consumption of CO₂)

Jagoutz, O., L. Royden, A.F. Holt & T.W. Becker (2015)- Anomalously fast convergence of India and Eurasia caused by double subduction. *Nature Geoscience* 8, p. 475-478.

(online at: https://www.researchgate.net/publication/275830959_Anomalously_fast_convergence_of_India_and_Eurasia_caused_by_double_subduction)

(Before collision with Eurasia, Indian Plate moved rapidly N, at rates >140 mm/yr for 20 Myrs (50-100% faster than rates of convergence of main tectonic plates today). Geological data support existence of two, almost parallel, N-dipping subduction zones between Indian and Eurasian plates during E Cretaceous, generating anomalously rapid convergence: (1) N arc along S margin of Eurasia (Karakoram-Gangdese Arc, etc.; ~20°-25° N.) and (2) Trans-Tethyan subduction system (Kohistan-Ladakh Arc, ophiolites of Tsangpo suture, etc.), formed near Equator). Threefold increase in plate convergence rate between 80- 65 Ma (Late Cretaceous). Rapid convergence ended at ~50 Ma when Indian Plate collided with southern subduction system (Kohistan Arc); collision of India with Eurasia and N subduction system little effect on plate convergence rates)

Jenny, C. & G. Stampfli (2000)- Permian palaeogeography of the Tethyan Realm. *Permophiles* 37, p. 24-33.

(Well-illustrated series of Tethys reconstructions for Late Carboniferous- Late Permian, showing generally accepted model of Paleozoic ocean N of Cimmerian continents (Paleotethys), a Late Paleozoic- Mesozoic ocean S of this continent (Neotethys; = Mesotethys of other authors?; JTVG), and M Jurassic ocean (Alpine Tethys))

Jin, X.C. & W.J. Xiao (2017)- Development of the Asian Tethyan Realm. *Int. J. Earth Sciences (Geologische Rundschau)* 106, p. 1177-1180.

(Introduction to papers from IGCP-589 Symposia in Philippines (2013) and Iran (2014), 120 years after E. Suess coined the concept of the ancient Tethys Ocean, the remnants of which are in Tethysides, a superorogenic complex stretching from S Europe to S and E Asia)

Jin, X.C. & X.N. Yang (2004)- Paleogeographic implications of the *Shanita-Hemigordius* fauna (Permian foraminifer) in the reconstruction of Permian Tethys. *Episodes* 27, 4, p. 273-278.

(online at: www.episodes.co.in/www/backissues/274/273-278%20Jin.pdf)

(Permian foraminifer Shanita of special paleobiogeographic importance. Occurs in Gondwana-derived blocks, in strip from Peninsular Thailand to Burma, S China, S Afghanistan, Oman, etc. to Turkey. Often associated with Hemigordius. Shanita-Hemigordius fauna considered as marker of marginal Gondwana environment (more specifically 'Cimmerian' strips that rifted off Gondwana in M-L Permian?; JTVG))

Jin, X.C. & K. Zhao (2001)- Permo-Triassic paleogeographic, paleoclimatic and paleoceanographic evolutions in eastern Tethys and their coupling. *Science in China, D*, 44, 11, p. 968-978.

(Reconstructions of paleogeography and paleoceanography of Chihshian (E Permian), Wuchapingian, Anisian and Norian (Late Triassic) intervals in E Tethys. Paleogeographic change of E Tethys and N-ward shift of Pangea during Permo-Triassic periods governed coeval paleocurrent pattern and evolution)

Jolivet, L., C. Faccenna, T. Becker, M. Tesauro, P. Sternai & P. Bouilhol (2018)- Mantle flow and deforming continents: from India-Asia convergence to Pacific subduction. *Tectonics* 37, p. 2887-2914.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018TC005036>)

(Tectonic and kinematic records of last 50 Ma with seismic tomography and anisotropy models suggest closure of Tethys Ocean and extensional deformation of E Asia best explained if asthenospheric mantle transporting India N-ward reaches East Asia, where it overrides W-flowing Pacific mantle and contributes to subduction dynamics, distributing extensional deformation over 3000-km wide region)

Jones, P.J., I. Metcalfe, B.A. Engel, G. Playford, J. Rigby, J. Roberts, S. Turner & G.E. Webb (2000)- Carboniferous palaeobiogeography of Australasia. In: A.J. Wright (ed.) *Palaeobiogeography of Australasia*, Memoir Assoc. Australasian Palaeontologists (AAP) 23, p. 259-286.
(*Mainly on Carboniferous biostratigraphy of Australian region and Australian-derived SE Asia terranes*)

Jourdan, F., S. Nomade, M.T. D. Wingate, E. Eroglu & A. Deino (2019). Ultraprecise age and formation temperature of the Australasian tektites constrained by $^{40}\text{Ar}/^{39}\text{Ar}$ analyses. *Meteoritics & Planetary Science* 54, 10 p. 2573-2591
(*online at: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/maps.13305>*)
(*New high-precision $^{40}\text{Ar}/^{39}\text{Ar}$ age data from tektites from Thailand, China, Vietnam, and Australia ('Australasian' impact event in Indochina), combined with published $^{40}\text{Ar}/^{39}\text{Ar}$ data yield a weighted mean age of 788.1 ± 3.0 ka. Minimum T of formation of Thai tektite between 2350 °C and 3950 °C*)

Kanmera, K. & K. Nakazawa (1973)- Permian- Triassic relationship and faunal changes in the eastern Tethys. *Canadian Society of Petroleum Geologists, Memoir* 2, p. 100-119.
(*Audley-Charles et al. 1979: Permian Maubisse Fm of Timor close affinities with Asian facies and faunas*)

Kasuya, A., Y. Isozaki & H. Igo (2012)- Constraining paleo-latitude of a biogeographic boundary in mid-Panthalassa: fusuline province shift on the Late Guadalupian (Permian) migrating seamount. *Gondwana Research* 21, p. 611-623.
(*Using Permian fusulinid forams and paleomagnetic data to reconstruct low latitude origin of M Permian seamount, which accreted to S China (Japan) margin in Jurassic. Two or three coeval M Permian biogeographic territories in Tethys-Panthalassa realms: Neoschwagerina-Yabeina territory (>12 °S), Colania-Lepidolina territory (<12°), and higher latitude Eopolydixodina territory (>~25°S)*)

Kato, H., A. Reedman, Y. Shimazaki et al. (eds.) (2016)- Stone heritage of East and Southeast Asia. *Geol. Survey of Japan and CCOP, Thailand*, p. 1-234.
(*online at: www.ccop.or.th/download/pub/ccop_stone_book_low_res.pdf*)
(*Examples of use of natural stone in construction of temples, monuments, castles, forts, etc., in nine SE Asian countries. Incl. chapter on Indonesia by S. Baskoro (not much detail on rock types and nothing on West Papua/PNG, where stone culture persisted until very recently)*)

Kennett, J.P., G. Keller & M. Srinivasan (1985)- Miocene planktonic foraminiferal biogeography and paleoceanographic development of the Indo-Pacific region. In: J.P. Kennett (ed.) *The Miocene ocean: paleoceanography and biogeography*, Geological Society of America (GSA) Memoir 163, p. 197-236.
(*Planktonic foraminifera distribution patterns suggest closure of Indonesian Seaway around 13-12 Ma*)

Khan, P.K., S. Shamim, M. Mohanty, P. Kumar & J. Banerjee (2017)- Myanmar-Andaman-Sumatra subduction margin revisited: insights of arc-specific deformations. *J. of Earth Science (China)* 28, 4, p. 683-694.
(*online at: <http://en.earth-science.net/PDF/20170721111758.pdf>*)
(*Analysis of concave and convex sectors of subducting Indian Ocean plate along >3000km long Myanmar-Andaman-Sumatra active margin from earthquake data*)

Kiessling W., E. Flugel & J. Golonka (1999)- Paleoreef maps: evaluation of a comprehensive database on Phanerozoic reefs. *American Assoc. Petroleum Geol. (AAPG) Bull.* 83, 10, p. 1552-1587.

Kiessling W., E. Flugel & J. Golonka (2003)- Patterns of Phanerozoic carbonate platform sedimentation. *Lethaia* 36, 3, p. 195-225.
(*Review of carbonate platforms and distribution from Ordovician-Neogene*)

Kimura, T. (1984)- Mesozoic floras of East and Southeast Asia, with a short note on the Cenozoic floras of Southeast Asia and China. In: T. Kobayashi et al. (eds.) *Geology and Palaeontology of Southeast Asia* 25, University of Tokyo Press, p. 325-350.

(Review of Triassic- Cretaceous floras in SE Asia and China. Late Triassic- E Jurassic flora from Krusin Fm near Kuching. W Sarawak is part of Indochina/ South China Dictyophyllum-Chlathropteris floristic province)

Kimura, T. (1985)- Notes on the present status of Late Triassic floras in East and Southeast Asia. Proc. III Congres Latino America Paleontology, Mexico City, Simposium sobre Floras Trias, Memoir 3, p. 5-9.

Kimura, T. (1987)- Geographical distribution of Paleozoic and Mesozoic plants in East and Southeast Asia. In: A. Taira & M. Tashiro (eds.) Historical biogeography and plate tectonic evolution of Japan and Eastern Asia, Terra Science Publishers, Tokyo, p. 135-200.

Kirillova, G.L. (1993)- Types of Cenozoic sedimentary basins of the East Asia and Pacific Ocean junction area. Palaeogeogr. Palaeoclim. Palaeoecology 105, p. 17-32.

(Classification of marginal basins in W Pacific (incl. Philippine Sea, E China Sea, etc.): (1) oceanic and transitional crust basins: mainly deep water trenches, back-arc, inter-arc, forearc and intra-arc basins; (2) basins with continental crust: marginal-continental shelf and intracontinental basins, filled with alluvial deltaic and lacustrine sediments up to 11 km thick)

Klimetz, M.P. (1987)- The Mesozoic tectonostratigraphic terranes and accretionary heritage of south-eastern mainland Asia. In: E.G. Leitch & E. Scheibner (eds.) Terrane accretion and orogenic belts, American Geophysical Union (AGU) Geodynamics Series 19, p. 221-234.

(On mainland SE Asia tectonic terranes, with focus on Mesozoic accretionary history of China)

Kobayashi, F. (1997)- Middle Permian biogeography based on fusulinacean faunas In: C.A. Ross et al. (eds.) Late Paleozoic foraminifera, their biostratigraphy, evolution and paleoecology, and the Mid-Carboniferous boundary, Cushman Foundation Foraminiferal Research, Special Publ. 36, p. 73-76.

(Permian fusuline foram faunas three provinces: (A) Western Tethys, with Yabeina, Afghanella and Sumatrina and without Lepidolina; extends from Mediterranean to N Arabia; (B) Eastern Tethys, with diverse neoschwagerinids and verbeekinids, incl. Afghanella and Sumatrina, covering SE Asia, S China, Indochina, and limestone units in SW Japan Permian accretionary complex; (C) Panthalassan: without sumatrinids, dominant Yabeina and less Lepidolina, in exotic limestone blocks around Circum-Pacific (N America, Siberia, Japan))

Kobayashi, F. (1997)- Middle Permian fusulinacean faunas and paleobiogeography of exotic terranes in the Circum-Pacific. In: C.A. Ross et al. (eds.) Late Paleozoic foraminifera, their biostratigraphy, evolution and paleoecology, and the Mid-Carboniferous boundary, Cushman Foundation Foraminiferal Research, Special Publ. 36, p. 77-80.

Kobayashi, F. (1999)- Tethyan uppermost Permian (Dzhulfian and Dorashamian) foraminiferal faunas and their paleogeographic and tectonic implications. Palaeogeogr. Palaeoclim. Palaeoecology 150, p. 279-307.

(Latest Permian Palaeofusulina fauna serves as paleogeographic constraints on E and SE Asian terranes. Common in S China, Indochina and E Malaya shelf limestone facies. Also present on Early Permian rifted terranes, like N Thailand (Sibumasu terrane) and Tibet (Qiangtang Terrane). Absence of Palaeofusulina fauna and presence of late Midian Lepidolina multiseptata faunas in Lhasa Terrane (Tibet) and Woyla Terrane in Sumatra important for identifying rift-drift-collision process of Gondwana-affinity terranes)

Kobayashi, T. (1944)- Reciprocal development of radiolarian rocks as between Asiatic and Australian sides. Proc. Imperial Academy (Tokyo) 20, 4, p. 234-238.

(online at: https://www.jstage.jst.go.jp/article/pjab1912/20/4/20_4_234/_pdf)

(Brief review of radiolarian bearing formations in Japan, SE Asia, Australia. Sambosan and Higashigawa suites of Japan mainly Permo-Triassic age. Also in chert series in Malay Peninsula, Tuhur Fm of Sumatra and Danau Fm in Borneo. Danau Fm suggested by Hinde to be Jurassic age, but here thought to be mostly Permo-Triassic (based on Krekeler observations). Danau facies appears continues into Philippines via Palawan and Jolo or Sulu arcs, where radiolarian cherts are called Babuyan Fm)

- Kobayashi, T. (1973)- The early stage of the Burmese-Malayan Geosyncline. In: B.K. Tan (ed.) Proc. Regional Conference on the Geology of SE Asia, Kuala Lumpur 1972, Bull. Geological Society Malaysia 6, p. 118-129.
(online at: www.gsm.org.my/products/702001-101351-PDF.pdf)
(Discussion of belt of Paleozoic (Ordovician- Permian) and Triassic rocks, extending from Shan Plateau (Myanmar) and W Yunnan (S China) in N, through Thai-Malayan Peninsula in south and continuing into Borneo. No figures, maps)
- Kobayashi, T. & M. Tamura (1983)- On the Oriental Province of the Tethyan Realm in the Triassic period. Proc. of the Japan Academy, Ser. B, 59, 7, 47, p. 203-206.
(online at: https://www.jstage.jst.go.jp/article/pjab1977/59/7/59_7_203/_pdf/-char/en)
(Short paper on provinciality in Triassic bivalves. In addition to cosmopolitans, many Triassic bivalve genera are distributed from Alps to China, Indochina and USSR. Oriental Province of Tethys with species indigenous to E and SE Asia. Stretches from Kashmir, Burma, S China, Malay Peninsula, to E Indonesia)
- Kong, F., R. Gao, S.S. Gao, K.H. Liu, W. Ding, X. Niu, A. Ruan, P. Tan, J. Fan et al. (2023)- Mantle flow underneath the South China Sea revealed by seismic anisotropy. National Science Review (China) 10, 10, nwad176, p. 1-8.
(online at: <https://academic.oup.com/nsr/article/10/10/nwad176/7199670>)
(Shear wave splitting analyses datas from OBS array deployed in-2019-2020 in South China Sea (SCS) points to mantle flow in NNW–SSE orientation, which can be attributed to mantle flow extruded from Tibetan Plateau by the ongoing Indian–Eurasian collision. E-W oriented flow fields observed in South China and Indochina Peninsula do not extend to central SCS)
- Konyukhov, A.I. (2009)- Geological structure, sedimentation conditions, and petroleum potential of sedimentary basins in Southeast Asia. Lithology and Mineral Resources 44, 5, p. 427-440.
(Russian review of SE Asian basins. Most sedimentary basins of SE Asia related to processes of rifting that activated in Paleo-Eocene after consolidation of continental crust of the Sunda (Malay) microplate, which ended in Late Cretaceous. Wide development of lacustrine basins, which accumulated main source rocks for oil and gas in region)
- Kozur, H. (1973)- Faunenprovinzen in der Trias und ihre Bedeutung für die Klärung der Paleogeographie. Geologische Palaontologische Mitteilungen Innsbruck 3, 8, p. 1-41.
(online at: www2.uibk.ac.at/downloads/c715/gpm_03/03_08_001-041.pdf)
(‘Faunal provinces in the Triassic and their significance for paleogeography’. Paleobiogeography based mainly on conodonts biogeography. Triassic of SE Asia (incl. Timor) is in Asiatic Tethyan faunal province. No maps)
- Kristan-Tollmann, E. (1987)- Triassic of the Tethys and its relations with the Triassic of the Pacific realm. In: K.G. MacKenzie (ed.) Int. Symposium on Shallow Tethys 2, Wagga Wagga, Balkema, Rotterdam, p. 169-186.
- Kristan-Tollmann, E. (1988)- Unexpected microfaunal communities within the Triassic Tethys. In: M.G. Audley-Charles & A. Hallam (eds.) Gondwana and Tethys, Geological Society, London, Special Publ. 37, p. 213-223.
(Remarkable uniformity in Triassic faunas throughout Tethyan region. Both planktonic and benthic organisms. Very little on SE Asia)
- Kristan-Tollmann, E. (1988)- Pandemic ostracod communities in the Tethyan Triassic. In: R. Whatley & C. Maybury (eds.) Ostrocods and global events, British Micropal. Soc. Publ., p. 541-544.
(Tethyan Late Triassic ostracodes in Sahul Shoals 1 well, 1880-1890m, Australia NW Shelf. Most common species *Cytherella acuta*, with other Tethyan species *Nodobairdia mammilata* and *Tethyscythere austriaca*. Similar Triassic ostracode faunas on N and S sides of Tethys (Timor, NW Australia))
- Krobicki, M. & J. Golonka (2006)- Caledonian orogeny in Southeast Asia: questions and problems. Geolines, 20, p. 75-78. (Extended Abstract)
(online at: <http://geolines.gli.cas.cz/fileadmin/volumes/volume20/G20-076.pdf>)

Krobicki, M. & J. Golonka (2009)- Palaeobiogeography of Early Jurassic *Lithotis*-type bivalve buildups as recovery effect after Triassic/Jurassic mass extinction and their connections with Asian palaeogeography. Proc. 5th International Symposium of IGCP-516, Geological anatomy of East and South Asia, Kunming, Acta Geoscientica Sinica 30, Suppl. 1, p. 30-33.

(online at: www.cagsbulletin.com/)

(Buildups of large bivalves of Lithotis group molluscs are first reefal features after end-Triassic extinction. Present across S Tethys margin, including Nepal-Tibet (Lhasa Block?) and Timor (Krumbeck 1923))

Lacassin, R., P.H. Leloup & P. Tapponnier (1993)- Bounds on strain in large Tertiary shear zones of SE Asia from boudinage restoration. J. Structural Geology 15, p. 677-692.

(Restoration of stretched, boudinaged layers in mylonitic gneisses of Oligo-Miocene Red River-Ailao Shan (Yunnan) and Wang Chao (Thailand) shear zones suggests layer-parallel extension of 250-870%, implying minimum left-lateral strike-slip displacements of ~330 km (Red River-Ailao Shan) and ~35 km (Wang Chao))

Lai, C.K., S. Meffre, A.J. Crawford, K. Zaw, C.D. Xue & J.A. Halpin (2014)- The Western Ailaoshan volcanic belts and their SE Asia connection: a new tectonic model for the Eastern Indochina Block. Gondwana Research 26, p. 52-74.

(W Ailaoshan volcanic belts mark western boundary of S China-Indochina Suture along Ailaoshan Fold Belt. Multiple phases of Late Carboniferous- Permian arc/ backarc magmatism and Late Permian- E. Triassic syn- and post-collisional magmatism. With new plate geodynamic evolution model from 440-210 Ma))

Langford, R.P., B. Cairncross & M. Friedrich (1992)- Permian coal and palaeogeography of Gondwana. Bureau Mineral Resources Geology Geophysics, Canberra, Record 1991/95, Palaeogeography 39, p. 1-136.

(online at: www.ga.gov.au/corporate_data/14505/Rec1991_095.pdf)

(Review of Early and Late Permian coal distribution across Gondwana (Australia- W Papua, India, Antarctica, etc.). Coal deposition mainly in paleolatitudes from ~45° S to 75° S, representing cold to cool temperate climate with high precipitation, ideal for peat swamp development (Permian equatorial peat swamp coal deposits in Cathaysia not discussed). Most prolific period of coal deposition late E Permian, during climatic amelioration after glaciation (No details on thin Permian coals of West Papua))

Laveine, J.P., B. Ratanasthien & A.H. Hussin (1999)- The Carboniferous floras of Southeast Asia: implications for the relationships and timing of accretion of some Southeast Asian blocks. In: I. Metcalfe (ed.) Gondwana dispersion and Asian accretion, IGCP 321 Final Results Volume, Balkema, Rotterdam, p. 229-246.

(Carboniferous flora of E Peninsular Malaysia ('Kuantan flora' of Asama) and NE Thailand typical Euramerican aspect, suggesting Indo-China Block was in terrestrial connection with N Paleotethyan landmass, probably S China Block since at least E Carboniferous. E Malaya Block also part of North Paleotethyan domain)

Laveine, J.P., S. Zhang & Y. Lemoigne (2000)- Palaeophytogeography and palaeogeography, on the basis of examples from the Carboniferous. Revue de Paleobiologie, Geneve 19, 2, p. 409-425.

Laveine, J.P., S. Zhang, Y. Lemoigne & B. Ratanasthien (1999)- Paleogeography of East and Southeast Asia during Carboniferous times on the basis of paleobotanical information: some methodological comments and additional results. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 55-72

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)

(Review of Carboniferous paleofloras in E and SE Asia)

Le Fort, P., M. Colchen & C. Montenat (eds.) (1986)- Evolution des domaines orogeniques d'Asie meridionale (de la Turquie a l'Indonesie). Livre jubilaire en l'honneur de Pierre Bordet, Memoires Sciences de la Terre 47, Fondation Scientifique de la geologie et de ses application, Nancy, p. 1-429.

('Evolution of the orogenic domains of southern Asia (from Turkey to Indonesia): volume in honor of Pierre Bordet')

- Le Pichon, X., M. Fournier & L. Jolivet (1992)- Kinematics, topography, shortening, and extrusion in the India-Eurasia collision. *Tectonics* 11, p. 1085-1098.
(*Spatial distribution of topography in Greater India- Eurasia suggest transfer of lower crust to mantle by eclogitization and lateral extrusion account for minimum of one third/ one half of total amount of shortening between India -Asia since 45 Ma*)
- Li, C. & R. van Der Hilst (2010)- Structure of the upper mantle and transition zone beneath Southeast Asia from traveltimes tomography. *J. of Geophysical Research: Solid Earth* 115, B07308, p. 1-19.
(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2009JB006882/epdf>)
(*Tomographic sections mainly in area of India-Asia collision and China margin*)
- Li, C., R.D. van der Hilst, E.R. Engdahl & S. Burdick (2008)- A new global model for P wave speed variations in Earth's mantle: *Geochem. Geophysics Geosystems* 9, 5, Q05018, p. 1-21.
(online at: <http://onlinelibrary.wiley.com/doi/10.1029/2007GC001806/epdf>)
(*Include examples of tomography sections across Indonesia*)
- Li, C., R.D. van der Hilst & M.N. Toksoz (2006)- Constraining P-wave velocity variations in the upper mantle beneath Southeast Asia. *Physics Earth Planetary Interiors* 154, 2, p. 180-195.
(*Tomographic inversions reveal high-velocity roots beneath Archean Ordos Plateau, Sichuan Basin and other continental blocks in SE Asia. Beneath Himalayan Block high velocities, associated with subduction of Indian lithospheric mantle, visible above 410 km discontinuity, and may not connect to remnant of Neo-Tethys oceanic slab in lower mantle. Only SW part of Tibetan plateau underlain by Indian lithosphere*)
- Li, C.F. & J. Wang (2016)- Variations in Moho and Curie depths and heat flow in Eastern and Southeastern Asia. *Marine Geophysical Research* 37, 1, p. 1-20.
(*Oldest continental and oceanic domains (N China craton, Pacific and Indian Ocean) thermally perturbed by events probably linked to small-scale convection or serpentinization in mantle and volcanic seamounts and ridges. W Philippine Sea Basin anomalously small Curie depths. W Pacific marginal seas have lowest Moho temperature; contrary in most parts of easternmost Eurasian continent. Magmatic processes feeding Permian Emeishan large igneous province along plate boundary may be caused by tectonic processes along plate margins, rather than by deep mantle plume*)
- Li, J., W. Ding, J. Lin, Y. Xu, F. Kong, S. Li, X. Huang & Z. Zhou (2021)- Dynamic processes of the curved subduction system in Southeast Asia: a review and future perspective. *Earth-Science Reviews* 217, 8, 103647, p. 1-15.
(online at: <https://www.sciencedirect.com/journal/earth-science-reviews/vol/217/suppl/C>)
(*SE Asia surrounded by inward subduction systems on three sides, largest and most complicated curved convergent subduction system on Earth. Review of mechanisms of evolution of ring-shape subduction systems*)
- Li, N., W. Yang, L. Zhu, L. Xie, Y. Zhong, Y. Mai, Y. Zhou & H. Zhang (2022)- Permian arc magmatism in southern Tibet: implications for the subduction and accretion of the Zhikong-Sumdo Paleo-Tethys Ocean. *Gondwana Research* 111, 4, p. 265-279.
(online at: https://www.researchgate.net/publication/363355170_Permian_arc_magmatism_in_southern_Tibet_Implications_for_the_subduction_and_accretion_of_the_Zhikong-Sumdo_Paleo-Tethys_Ocean)
(*Zhangda complex in Lhasa Block composed of gabbro, gabbro diorite, and tonalite. Zircon U-Pb ages 258-281 Ma (late E- M Permian). Tied to N-ward subduction/accretion of Zhikong- Sumdo Ocean under Lhasa block*)
- Li, P., Gao Rui, J. Cui & Guan Ye (2004)- Paleomagnetic analysis of eastern Tibet: implications for the collisional and amalgamation history of the Three Rivers Region, SW China. *J. Asian Earth Sciences* 24, p. 291-310.
(*Analysis of paleolatitudes and latitudinal displacements for S China, Simao, Baoshan, Shan-Thai, Indochina, Qiangtang, Lhasa and Himalayan blocks: (1) Simao Block S China-derived; (2) Baoshan and Shan-Thai blocks rapid N drift from Late Carboniferous- Late Permian; (3) Baoshan Block collided with Simao Block in Late*

Permian and continued to drift N, together with S China and Shan-Thai blocks until Late Triassic; (4) Paleo-Tethys separating Baoshan and Simao blocks possibly opened in E Silurian; (5) Meso-Tethys ranged in age from E Permian- E Cretaceous, and reached greatest width of ~42° latitude in Late Triassic)

Li, S., E. Advokaat, D.J.J. van Hinsbergen, M. Koymans, C. Deng & R. Zhu (2017)- Paleomagnetic constraints on the Mesozoic-Cenozoic paleolatitudinal and rotational history of Indochina and South China: review and updated kinematic reconstruction. *Earth-Science Reviews* 171, p. 58-77.

(online at: https://www.geologist.nl/wp-content/uploads/2017/05/2017_Li_ESR.pdf)

(Review of paleomagnetic data suggests (1) no significant rotations of S China Block relative to Eurasia since latest Jurassic; (2) No paleomagnetically resolvable S-ward motion of Indochina Block (inclinations lower than expected, probably due to inclination shallowing in sediments; (3) large rotating blocks in N Indochina and SE Tibetan margin (up to 70° CW), more than ~10-15° rotation of stable SE Indochina Block. Blocks bounded by fold-thrust belts and strike-slip faults, accommodating Cenozoic block rotations. NW part of Indochina extruded 350 km more along Ailao Shan-Red River fault than SE part, accommodated by internal NW Indochina rotation and deformation. 250 km of extrusion of SE part of Indochina)

Li, S., B.M. Jahn, S. Zhao, L. Dai, X. Li, Y. Suo, L. Guo, Y.M. Wang et al. (2017)- Triassic southeastward subduction of North China Block to South China Block: insights from new geological, geophysical and geochemical data. *Earth-Science Reviews* 166, p. 270-285.

(Subduction prior to assembly of S China and N China blocks traditionally considered directed N-ward, but new tectonic model suggests SE ward subduction of N China under S China. S margin of N China Block passive margin in Triassic, without arc magmatism, etc. Suture lateral subduction zone rather than collision zone)

Li, X.M., X.D. Wang, L. Yao, Y.C. Zhang & X.J. Wang (2022)- Permian rugose coral *Thomasiphyllum* as a paleogeographical indicator of the Gondwana-derived Cimmerian continent. *J. Asian Earth Sciences* 228, 105146, p. 1-8.

(Solitary rugose coral *Thomasiphyllum* with 10 species occurs in M Permian carbonates in SE Iran, C Tibet, SW Yunnan (with *Eopolydixodina*-*Sumatrina*-*Verbeekina* fusulinid assemblage), C Myanmar, W Thailand and W Sumatra. All belong to Cimmerian continent which rifted from N Gondwana (incl. Lhasa, Tengchong, and Sibuma), and located at subtropical latitudes during M Permian. In Indonesia known from Lake Singkarak, Sumatra (20 species formerly assigned to *Thomasiphyllum* from S China do not belong in genus))

Li, X.Q., H.W. Peng, K.L. Xiang, X.G. Xiang, F. Jabbour, R. del C. Ortiz, P.S. Soltis, D.E. Soltis & W Wang (2024)- Phylogenetic evidence clarifies the history of the extrusion of Indochina. *Proc. National Academy of Sciences USA (PNAS)* 121, 35, e2322527121, p. 1-6.

(online at: <https://www.pnas.org/doi/epdf/10.1073/pnas.2322527121>)

(SE-ward extrusion of Indochina over ~500- 1,150 km along Ailao Shan- Red River shear zone one of most prominent consequences of India-Asia collision (initially proposed by Tapponnier et al., 1990). Study of 42 plant and animal clades (1,721 species) show lineage divergences across ARSZ, interpreted as associated with Indochinese extrusion, starting at ~53 Ma (E Eocene; 'soft collision')) and accelerated sharply between ~35-16 Ma (latest Eocene- E-M Miocene boundary), peaking at ~19 Ma. Results suggest two-phase extrusion of Indochina, with second episode at 11-5 Ma (Late Miocene))

Li, X.X. (1986)- The mixed Permian Cathaysia-Gondwana flora. *The Palaeobotanist* 35, 2, p. 211-222.

(online at: http://14.139.63.228:8080/pbrep/bitstream/123456789/1262/1/PbV35N2_211.pdf)

(Mixed Gondwanan- Cathaysian floras from Turkey to Saudi Arabia, Kashmir to Western New Guinea)

Li, X.X. & G.L. Shen (1996)- A brief review of the Permian macrofloras in southeast Asia and their phytological delimitation. *J. Southeast Asian Earth Sciences* 13, p. 161-170.

(Overview of Permian macrofloras of SE Asia, with map of Permian phytogeographical provinces. Djambi flora of C Sumatra is southernmost Cathaysian flora. New Guinea Permian flora mixed Gondwanan and Cathaysian)

Li, X.X. & X.Y. Wu (1994)- The Cathaysian and Gondwana floras; their contribution to determining the boundary between eastern Gondwana and Laurasia. *J. Southeast Asian Earth Sciences* 9, 4, p. 309-317.

(Permian floras suggest boundary between E Gondwana and Laurasia runs along Bangongge-Denggen suture of Qinghai-Xizang (Tibet) plateau, turns S near Qamdo in E Xizang, then possibly extends through Baoshan District of W. Yunnan to link up with Pham Sore and Bentong-Raub sutures of Thailand- Peninsular Malaysia, from where it continues further S across E Sumatra to Indian Ocean. Jambi flora of Sumatra, Jengka and Linggiu floras of Malaysia and Phetchabun and Loei floras of Thailand all contain elements of Cathaysian flora. W New Guinea Permian floras mixed Cathaysian-Gondwana flora.)

Li, X.X. & X.Y. Wu (1996)- Late Paleozoic phytogeographic provinces in China and its adjacent regions. *Review Palaeobotany Palynology* 90, p. 41-62.

(Review of Devonian-Permian floral provinces of China. Cathaysian Floral province two major blocks: Sino-Korean-Tarim (N China) and S China Block, both vegetated by Euramerican floras until Late Carboniferous when Cathaysian elements first began to differentiate Two Cathaysian provinces established by Permian. Cathaysian flora developed in tropical, ever-wet climatic zone. Tropical conditions persisted in S China throughout Permian, but in N China, by early Late Permian alternating wet and dry climates, and by late Late Permian most of N Hemisphere in extreme arid conditions. Large leaved forms like Taeniopteris more common in N China and Gigantopteris almost completely restricted to S China. S China also with abundant Psaronius tree ferns and Gleicheniaceae ferns)

Liu, Y., W. Fan, T. Peng, R. Shi, S. Chen & P. Huangfu (2025)- Reconstruction of Cretaceous-Eocene arcs along the southern Asian margin under Neo-Tethyan subduction. *Lithos* 500-501, 107995, p.

(Late Cretaceous-Eocene extended Neotethyan continental arc formed on S Asian margin from S Lhasa, (Gangdese arc) through Tengchong- Shan Scarps to Sumatra. Magmatism in eastern S Lhasa and Sumatra dominated by juvenile crust growth with flare-ups at 105-85 Ma (late Albian- Turonian) and 65-45 Ma (Paleocene- E Eocene). Magmatic flare-ups at 75-45 Ma and ancient crust reworking recorded in western S Lhasa, Tengchong, and Shan Scarps. Variations in magmatic flare-ups probably related to asynchronous rollback of Neo-Tethyan slab under different sections (Also late Cretaceous-Eocene magmatism in W Burma, (but intra-oceanic arc?) Sumatra, and Sulawesi, similar to those in Gangdese)

Li, Z.X. & C.M. Powell (2001)- An outline of the palaeogeographic evolution of the Australasian region since the beginning of the Neoproterozoic. *Earth-Science Reviews* 53, p. 237-277.

(Plate reconstructions of Australian region from 1000 Ma- recent)

Li, Z.X., L. Zhang & C.M. Powell (1996)- Positions of the East Asian cratons in the Neoproterozoic supercontinent Rodinia. *Australian J. Earth Sciences* 43, p. 593-604.

(Three major E Asian crustal blocks (Tarim, N China and S China) have records of the Neoproterozoic rifting events that broke up supercontinent Rodinia. Tarim Block may have been adjacent to Kimberley region, S China Block between E Australia and Laurentia, and N China Block adjacent to NW corner of Laurentia and Siberia during E Neoproterozoic. All three blocks probably separated from larger cratons towards end of Neoproterozoic but stayed close to Australian margins of Gondwanaland from Cambrian-Devonian)

Liao, W.H. (1990)- The biogeographic affinities of East Asian corals. In: W.S. McKerrow and C.R. Scotese (eds.) *Palaeozoic biogeography and biogeography*, Geological Society, London, Memoir 12, p. 175-179.

(In E Asia tabulate and rugose corals present from E Ordovician- end Permian. Ordovician corals of N China related to Americo-Siberian region; S China close affinity to E Australia in Early Silurian, but more akin to Urals and C Asia in M-L Silurian. E-M Devonian 5 biogeographic provinces in E Asia: (1) Arctic; (2) Junggar-Hinggan; (3) Uralo-Tian Shan; (4) Paleotethys and (5) S China. In E Permian N and S parts of Asia belong to cold-water Lytvolasma fauna, middle part warm-water Tethyan with Iranophyllum/ Ipciphyllum fauna)

Licht, A., G. Dupont-Nivet, J. Westerweel, Zaw Win, A. Guihou, P. Deschamps & D.W. Aung (2025)- The missing arcs of the India-Asia collision. *Gondwana Research* 147, p. 260-275.

(Compilation of detrital zircon ages from NE India, Burma Terrane, and Asian margin to identify age populations that could indicate presence of Trans- (Neo-)Tethyan Arc system. Arrival of allochthonous material onto India is best explained by input from Asian forearc (Xigaze Forearc) alone, without requiring input from additional missing arc. Burma sedimentary record suggestive of missing Cretaceous-Paleogene Trans-Tethyan

Arc arc between Myanmar and Asia, but not required to explain history of Burma Terrane and its detrital zircon record)

Lin, J., Y. Xu, Z. Sun & Z. Zhou (2019)- Mantle upwelling beneath the South China Sea and links to surrounding subduction systems. *National Science Review (China)* 6, 5, p. 877-881.
(online at: <https://academic.oup.com/nsr/article/6/5/877/5555739>)
(*Evolution of S China Sea directly linked to complex subduction systems of surrounding Pacific, Philippine Sea and Indo-Australian Plates*)

Lin, J.L., M. Fuller & W.Y. Zhang (1985)- Paleogeography of the North and South China blocks during the Cambrian. *J. Geodynamics* 2, p. 91-114.
(*Paleomagnetic results show S China block close to equator in Cambrian, probably adjacent to N Australia. This juxtaposes Cambrian marine basins in S China and Australia, explains stratigraphic similarity between late Precambrian Sinian System in S China and Adelaide System in Australia and continuing fossil affinities in Cambrium- Ordovician. Proposed geographic configuration lasted from late Precambrian (800 Ma) - E Ordovician (470 Ma). Paleomag from Cambrian of N China block indicates it was in S Hemisphere, with paleontological evidence suggesting it was close to Tibet, Iran and N India during Paleozoic*)

Liou, J.G., W.G. Ernst, R.Y. Zhang, T. Tsujimori, B.M. Jahn (2009)- Ultrahigh-pressure minerals and metamorphic terranes- the view from China. *J. Asian Earth Sciences* 35, p. 199-231.
(*Review of Ultra High-Pressure (UHP) metamorphic terranes in China and adjacent areas. These represent continental and oceanic crustal protoliths which experienced P-T conditions near coesite stability field (>~2.7 GPa and ~700°C). Typical products include eclogite, garnet peridotite, and UHP varieties of metapelite, quartzite, marble, paragneiss and orthogneiss. UHP metamorphic assemblages require relatively cold lithospheric subduction to mantle depths. Includes some data from Indonesia (Sulawesi)*)

Liu, S., P. Ma, B. Zhang & M. Gurnis (2021)- The horizontal slab beneath East Asia and its subducted surface dynamic response. *J. of Geophysical Research: Solid Earth* 126, 3, e2020JB021156, p. 1-19.
(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2020JB021156>)
(*East Asia (China, Japan, etc.) characterized by unusually large horizontal slab within mantle transition zone. Tectonics and topography of East Asia strongly contrast with SE Asia and reflect slabs ephemerally stagnating in mantle below East Asia while avalanching into lower mantle below SE Asia*)

Liu, S., T. Qian, W. Li, G. Dou & P. Wu (2015)- Oblique closure of the northeastern Paleo-Tethys in central China. *Tectonics* 34, 10.1002/2014TC003784, p. 1-22.
(*NE branch of Paleo-Tethys Ocean that separated N China and South China plates closed by oblique collision along two N-dipping suture zones in C China. Shangdan suture developed in Late Paleozoic; Mianlue suture to S in M-L Triassic (collisional sutures obscured by thrust faults in S Qinling-Dabieshan orogen)*)

Lohman, D.J., M. de Bruyn, T. Page, K. von Rintelen, R. Hall, P.K.L. Ng, H.T. Shih, G.R. Carvalho & T. von Rintelen (2011)- Biogeography of the Indo-Australian Archipelago. *Annual Review Ecology Evolution Systematics* 42, p. 205-226.
(online at: https://www.researchgate.net/publication/232715269_Biogeography_of_the_Indo-Australian_Archipelago)
(*Extraordinary species richness and endemism in Indo-Australian Archipelago. Present distribution patterns of species shaped largely by pre-Pleistocene dispersal and vicariance events, whereas more recent changes in connectivity of islands in Archipelago influenced partitioning of intraspecific variation*)

Longley, I. (2023)- Greater SE Asian frontier exploration potential- 15 untested Billion barrel potential opportunities. SE Asia Petroleum Exploration Society (SEAPEX) 50th Jubilee Convention, Singapore 2023, 148p. (*Abstract + Presentation*)
(*Review of untested hydrocarbon opportunities in Indonesia, Malaysia, Vietnam, NW Australia, Taiwan, Indian Andamans, the Philippines and South Korea*)

- Lu, Z., J. Li, C.F. Li & X. Du (2023)- Tectonic controls on effective elastic thickness of lithospheres around the Southeast Asian subduction zones. *Tectonophysics* 863, 229994, p. 1-12.
(SE Asia most complicated convergent system on Earth. Estimates of effective elastic thickness T_e . Spatial variations of T_e coincide with tectonic settings, including oceanic crustal age. Lowest T_e (≤ 10 km) in NE Indian Seamount Province and young oceanic basins. Sunda Shelf relatively low T_e (10-20 km), where Cenozoic rifting and extension weakened lithosphere. Molucca Sea and most continental regions show high T_e (≥ 40 km). Low T_e (≤ 10 km) N Sumatra and C Java subduction zone consistent with presence of slab tear/window and mantle upwelling. Etc.)
- Lunt, P. & X. Luan (2022)- Choosing between a dichotomy of methods in stratigraphy. *Geology Today* 38, 2, p. 69-74.
*(online at: www.researchgate.net/publication/360094966_Choosing_between_a_dichotomy_of_methods Etc.)
 (Overview of stratigraphical methods, with examples from tectonically active basins of SE Asia. Largely a critique of perceived excessive-use of eustatic sea level changes and sequence stratigraphic cycle charts in stratigraphic interpretation in SE Asia, and advocating evidence-based over model-driven interpretations)*
- Lunt, P. & X. Luan (2022)- Towards a formal method in tectono-stratigraphy; using SE Asia's unique dataset. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2022)*, Kuala Lumpur, p. 1-5.
- Lunt, P. & X. Luan (2023)- Giving names to features in geology; the choice between subjective listing or researching objective natural divisions. *Berita Sedimentologi* 49, 2, p. 28-55.
*(online at: <https://journal.iagi.or.id/index.php/FOSI/article/view/429/407>)
 (Essay on often poor naming practices in SE Asia geology)*
- Luyendyk, B.P. (1974)- Gondwanaland dispersal and the early formation of the Indian Ocean. In: B.P. Luyendyk & T.A. Davies (eds.) *Initial Reports Deep Sea Drilling Project (DSDP)*, Washington, D.C., 26, p. 945-952.
*(online at: www.deepseadrilling.org/26/volume/dsdp26_37.pdf)
 (Early paper on formation of Indian Ocean and dispersal of Gondwana pieces towards Asia. Shows Late Jurassic separation of Borneo and Sulawesi from NW Australian margin)*
- Lynner, C. & M.D. Long (2014)- Sub-slab anisotropy beneath the Sumatra and circum-Pacific subduction zones from source-side shear wave splitting observations. *Geochem. Geophysics Geosystems* 15, 6, p. 2262-2281.
*(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdfdirect/10.1002/2014GC005239>)
 (Source-side shear wave splitting measurements for C America, Alaska-Aleutians, Sumatra, Ryukyu and Izu-Bonin-Japan-Kurile subduction systems. Trench parallel fast splitting dominant beneath Izu-Bonin, Japan, S Kurile slabs and part of Sumatra system; fast directions paralleling motion of downgoing plate dominant in Ryukyu, C America, N Kurile, W Sumatra and Alaska-Aleutian regions. Older subducting lithosphere (>95 Ma) associated with trench parallel splitting, younger lithosphere with plate motion parallel fast splitting directions)*
- Mallick, R., E.O. Lindsey, L. Feng, J. Hubbard, P. Banerjee & E.M. Hill (2019)- Active convergence of the India-Burma-Sunda plates revealed by a new continuous GPS network. *J. of Geophysical Research: Solid Earth* 124, 3, p. 3155-3171.
*(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018JB016480>)
 (New GPS data on geometries and slip rates of three major faults that accommodate India-Burma-Sunda plate motion: (1) Rakhine-Bangladesh megathrust, (2) Churachandpur-Mao Fault, and (3) Sagaing Fault. Faults likely fully coupled; modern shortening rate across Burma plate is 12–24 mm/year, while total dextral shear rate is 25-32 mm/year. Megathrust now accumulating strain, eventually being released in earthquakes)*
- Marcoux, J. & A. Baud (1996)- Late Permian to Late Triassic Tethyan paleoenvironments. Three snapshots: Late Murgabian, Late Anisian, Late Norian. In: X. Nairn et al. (eds.) *The Tethys Ocean*, Plenum Press, New York, p. 153-190.
(Three paleogeographic reconstructions of Tethys Ocean, from Europe to Australia (similar to maps of Tethys Atlas Project by Dercourt et al., 1993))

Maruyama, S., J.G. Liou & T. Seno (1989)- Mesozoic and Cenozoic evolution of Asia. In: Z. Ben-Avraham (ed.) The evolution of the Pacific Ocean margins, Oxford University Press, Monographs Geology Geophysics 8, p. 75-99.

Maruyama, S., J.G. Liou & M. Terabayashi (1996)- Blueschists and eclogites of the world and their exhumation. *International Geology Review* 38, 6, p. 485-594.

(Includes brief descriptions of Indonesian (Java, SE Kalimantan, Sulawesi, Timor, N New Guinea) and SW Pacific (E PNG, New Caledonia, etc.) blueschist occurrences)

Maruyama, S., H. Masago, I. Katayama, Y. Iwase, M. Toriumi, S. Omori & K. Aoki (2010)- A new perspective on metamorphism and metamorphic belts. *Gondwana Research* 18, p. 106-137.

(Includes discussion of ongoing exhumation of continent collision-type metamorphic belt in Timor-Tanimbar region)

Maruyama, S., S. Omori, H. Senshu, K. Kawai & B.F. Windley (2011)- Pacific-type orogens: new concepts and variations in space and time from present to past. *J. of Geography (Chigaku Zasshi)* 120, p. 115-223.

(online at: www.jstage.jst.go.jp/article/jgeography/120/1/115/_pdf)

(In Japanese with English summary. Overview of Pacific-type active margins, with examples from Indonesia. Show Miocene forearc spreading in Banda outer arc, creating ophiolites that now rest on metamorphic belts from Timor, through Leti-Moa-Sermata to Dai islands, etc.)

Maung, H. (1983)- A new reconstruction of Southeast Asia and Gondwanaland in relation to mantle plumes or hotspots. *Proc. SE Asia Petroleum Exploration Society (SEAPEX)* 6, p. 66-70.

Mayr, E. (1945)- Wallace's Line in the light of recent zoogeographic studies. *The Quarterly Review of Biology* 19, 1, p. 1-14. *(online at:*

http://faculty.jsd.claremont.edu/dmcfarlane/bio176mcfarlane/pdf%20papers/Wallaces%20Line%20_1944.pdf)

(Wallace's zoogeographic line not boundary between Indo-Malayan and Australian regions, rather the edge of Sunda shelf area. Weber's Line separates islands in W with predominantly Indo-Malayan elements from islands in E with dominantly Australo-Papuan elements)

Mayr, E. (1945)- Wallace's Line in the light of recent zoogeographic studies. In: P. Honig & F. Verdoorn (eds.) *Science and scientists in the Netherlands Indies*. Board for the Netherlands Indies, Surinam and Curacao, New York, p. 241-250.

(online at: <https://archive.org/details/in.ernet.dli.2015.183759>)

(Reprint of paper above. The concept of Wallace's Line has been criticized by many subsequent workers)

Mazur, S., C. Green, M.G. Stewart, J.M. Whittaker, S. Williams & R. Bouatmani (2012)- Displacement along the Red River Fault constrained by extension estimates and plate reconstructions. *Tectonics* 31, 5, TC5008, p. 1-22.

(New plate tectonic interpretations for Greater S China Sea area since 35 Ma, partly constrained by amounts of extension computed from gravity models. Best-fit plate model assumes 250 km of left-lateral displacement along Red River Fault (calculated at Vietnamese coast of Gulf of Tonkin) from 35- 20.5 Ma)

McCabe, R. (1984)- Implications of paleomagnetic data on the collision related bending of island arcs. *Tectonics* 3, 4, p. 409-428.

(Paleomagnetic studies from C Philippines, Sulawesi, Fiji-New Hebrides, etc., show differences in declination within same arc. Rotated segments of upper plate where buoyant feature on downgoing plate (seamount, continental fragment or island arc) locally deforms margin of upper plate. Stresses resulting from collision may result in (1) strike-slip faults causing sideward extrusion of portions of upper plate; (2) changes in subduction zone polarity; (3) strike-slip faults around margin of indenter; or (4) reorganization of entire plate margin)

McCabe, R. & J. Cole (1987)- Speculations on the Late Mesozoic and Cenozoic evolution of the South East Asian margin. In: M.K. Horn (ed.) Trans. 4th Circum-Pacific Energy and Mineral Resources Conference, Singapore 1986, p. 375-394.

(Sulu, Celebes and Banda Sea marginal basins all have E-W trending magnetic anomalies, progressively younging to North from Cretaceous to Paleogene, therefore believed to be parts of single marginal oceanic basin. With 6 plate reconstruction maps Cretaceous-Miocene (Subsequent work suggests Banda Sea not Cretaceous but Neogene age: JTvG))

McCabe, R. & J. Cole (1989)- Speculations on the Late Mesozoic and Cenozoic evolution of the Southeast Asian margin. In: Z. Ben-Avraham (ed.) The evolution of the Pacific Ocean margins, Oxford Monographs Geology Geophysics 8, Oxford University Press, p. 143-160.

(Same as McCabe and Cole 1987)

McCabe, R., S. Harder, J.T. Cole & E. Lumadyo (1993)- The use of palaeomagnetic studies in understanding the complex Tertiary tectonic history of East and Southeast Asia. In: B.K. Tan et al. (eds.) 7th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA VII), Bangkok 1991, J. Southeast Asian Earth Sciences 8, p. 257-268.

(Paleomag data from Philippines, Indo-China, Japan. Many published paleomagnetic studies on Mesozoic-Paleozoic rocks show magnetizations that are same as that of overlying Cenozoic volcanics, suggesting possible resetting, and making older rocks results suspect)

McCabe, R., D. Merrill, J.T. Cole & E. Lumadyo (1996)- The use of palaeomagnetic studies in understanding the complex Tertiary tectonic history of East and Southeast Asia. In: G.P. & A.C. Salisbury (eds.) Trans. 5th Circum-Pacific Energy and Mineral Resources Conference, Honolulu 1990, Gulf Publishing, Houston, p. 369-383.

(Same paper as McCabe et al. 1993)

McElhinny, M.W., B.J.J. Embleton, H. Max & Z.K. Zhang (1981)- Fragmentation of Asia in the Permian. Nature 293, p. 212-216.

(Compilation of Permian paleomagnetic data. Asia is composite continent formed by accretion of crustal blocks. Malay Peninsula and Japan were situated near Equator in Permian and therefore separated from Asian continent. Permian of Sino-Korean and Yangtze blocks of China also near Equator)

McElhinny, M.W., N.S. Haile & A.R. Crawford (1974)- Paleomagnetic evidence shows Malay Peninsula was not a part of Gondwanaland. Nature 252, 5485, p. 641-645.

(Reconnaissance paleomagnetic survey on Malay Peninsula suggests it lay at 15° N in Late Paleozoic, so could not have been part of Gondwanaland)

McGowran, B., M. Archer, P. Bock, T.A. Darragh et al. (2000)- Australasian palaeobiogeography: the Palaeogene and Neogene record. In: A.J. Wright et al. (eds.) Palaeobiogeography of Australasian faunas and floras, Memoir Assoc. Australasian Palaeontologists (AAP) 23 23, p. 405-470.

McLoughlin, S. (2001)- The breakup history of Gondwana and its impact on pre-Cenozoic floristic provincialism. Australian J. Botany 49, 3, p. 271-300.

(From Carboniferous to Cretaceous S continents broadly similar floras but some species-level provincialism apparent at all times. Gondwanan floras radical turnovers near end Carboniferous, end Permian and end Triassic that appear unrelated to isolation or fragmentation of supercontinent. Throughout Late Paleozoic and Mesozoic high-latitude southern floras maintained different composition to paleoequatorial and boreal regions even though they remained in physical connection with Laurasia for much of this time)

McManus, J. & R.B. Tate (1978)- Fragmentation of the China Plate and the development of marginal seas of S.E. Asia. Proc. SEAPEX Offshore South East Asia Conference, Singapore 1978, p. 1-14.

(Tectonics of SE Asia, particularly Sulu- Celebes Seas. Some marginal seas originated by intraplate spreading, others by border spreading)

Meert, J. (2003)- A synopsis of events related to the assembly of eastern Gondwana. *Tectonophysics* 362, p. 1-40.

(Assembly of E part of Gondwana supercontinent (incl. E Africa, Arabia, India, E Antarctica and Australia) resulting from complex series of orogenic events from ~750- 530 Ma. Rel. little on Australia, which in ~800-700 Ma restores to N Hemisphere)

Mei, S. & C.M. Henderson (2001)- Evolution of Permian conodont provincialism and its significance in global correlation and paleoclimate implication. *Palaeogeogr. Palaeoclim. Palaeoecology* 170, p. 237-260.

(Early Permian Gondwana Cool Water Province with Vjalovognathus in Canning, Carnarvon basins and W Timor. Permian conodont provincialism not distinct until Kungurian)

Mei, S. & C.M. Henderson (2002)- Comments on some Permian conodont faunas reported from Southeast Asia and adjacent areas and their global correlation. *J. Asian Earth Sciences* 20, 6, p. 599-608.

(Conodont faunas from SE Asia classified in new faunal provinces: Equatorial Warm Water (EWWP), peri-Gondwana Cool Water (GCWP) and N Cool Water (NCWP; N China). GCWP marked by Vjalovognathus, etc., EWWP by absence of Gondolelloides and Vjalovognathus in E-M Cisuralian, abundance of Sweetognathus and Pseudosweetognathus in Kungurian, etc. Mixed faunas between EWWP and GCWP include W Timor Artinskian, SE Pamirs Kungurian and Salt Range Guadalupian- Lopingian)

Mei, S., C.M. Henderson & B.R. Wardlaw (2002)- Evolution and distribution of the conodonts *Sweetognathus* and *Iranognathus* and related genera during the Permian, and their implications for climate change. *Palaeogeogr. Palaeoclim. Palaeoecology* 180, p. 57-91.

(On evolution of conodonts of E-M Permian Sweetognathus and Late Permian Iranognathus lineages)

Meister, C. (2007)- Les Phricodoceratidae Spath, 1938 (Mollusca, Cephalopoda): ontogenese, evolution et paleobiogeographie. *Geodiversitas* 29, 1, p. 87-117.

(p. 112-113: Lower Jurassic ammonites described from Roti by Krumbeck (1922; Pliensbachian Ibex zone) have N Tethys affinities, suggesting these are from exotic blocks now on S Tethys/ Australian margin?)

Metcalf, I. (1983)- Southeast Asia. In: R.H. Wagner et al. (eds.) *The Carboniferous of the world*, 1, Int. Union Geol. Sci. Publ. 16, p. 213-243.

(Extensive review of Carboniferous in W and E Malay Peninsula, W and NE Thailand, Vietnam, Laos, N and E Sumatra, W Sarawak, etc. Sumatra Alas Fm of Late Visean age)

Metcalf, I. (1984)- Stratigraphy, palaeontology and palaeogeography of the Carboniferous of Southeast Asia. *Memoires Societe Geologique France*, N.S. 147, p. 107-118.

(online at: www.researchgate.net/publication/273380797_Stratigraphy_palaeontology_and_palaeogeography_of_the_C_Etc.)

(Older continental part of SE Asia four tectonic blocks (Sibumasu, Manabor (Malaya- Natuna- W Borneo), Indochina, S China), with independent pre-Triassic histories. Carboniferous mainly shallow marine with subordinate epicontinental and continental deposits. Carboniferous of Sibumasu continental margin deposits with glacial-marine diamictites. Manabor block shallow marine clastics with reefal limestones and abundant volcanics interpreted as possible island arc. C part of Indochina Block emergent in Carboniferous and bordered by non-marine. Carboniferous faunas of SE Asia mainly of Eurasian aspect)

Metcalf, I. (1986)- Late Palaeozoic palaeogeography of Southeast Asia: some stratigraphical, palaeontological and palaeomagnetic constraints. In: G.H. Teh & S. Paramanathan (eds.) *Proc. 5th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA V)*, Kuala Lumpur 1984, 1, Bull. Geological Society Malaysia 19, p. 153-164.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1986012.pdf>)

(First of many Metcalfe papers on SE Asian tectonic blocks, their Gondwanan origins and histories of rifting, drift and collision with Asia. SE Asia 4 tectonic blocks, SIBUMASU, MANABOR, Indochina and South China. Indochina and S China rifted off Gondwana in Late Devonian- E Carboniferous and sutured to each other by M

Carboniferous. SIBUMASU separated from Australian Gondwana in late Lower Permian. MANABOR accreted to Indochina/S China by Late Triassic, possibly earlier)

Metcalf, I. (1988)- Origin and assembly of South-East Asian continental terranes. In: M.G. Audley-Charles & A. Hallam (eds.) *Gondwana and Tethys*, Geological Society, London, Special Publ. 37, p. 101-118.
(*Documentation of stratigraphic successions and paleobiogeographic affinities of Sibumasu, East Malaya, Indochina and SW Borneo blocks*)

Metcalf, I. (1989)- Carboniferous and Permian palaeogeography of Southeast Asia. *Comptes Rendus 9th Congres International de Stratigraphie et de Geologie du Carbonifere*, Beijing 1987, 4, p. 245-264.

Metcalf, I. (1990)- Allochthonous terrane processes in Southeast Asia. In: J. Dewey et al. (eds.) *Allochthonous Terranes*, Philosophical Transactions Royal Society London, Ser. A, 331, 1620, p. 625-640.
(online at: <http://journals.royalsociety.org/content/d673155257474040/fulltext.pdf>)

Metcalf, I. (1991)- Late Palaeozoic and Mesozoic palaeogeography of Southeast Asia. *Palaeogeogr. Palaeoclim. Palaeoecology* 87, p. 211-221.
(online at: https://www.academia.edu/download/38333391/Metcalf_1991_Palaeo-3.pdf)

Metcalf, I. (1992)- Ordovician to Permian evolution of Southeast Asian terranes: NW Australian Gondwana connections. In: B.D. Webby & J.R. Laurie (eds.) *Global perspectives on Ordovician geology*, Proc. 6th Int. Symposium on the Ordovician System, A.A. Balkema, Rotterdam, p. 293-305. (online at: https://www.researchgate.net/publication/273635421_Ordovician_to_Permian_evolution_of_Southeast_Asian_terranes_NW_Australian_Gondwana_connections)
(*Continental 'core' of SE Asia four main terranes: South China. Sibumasu, Indochina and East Malaya. Ordovician faunas of S China and Sibumasu strong affinities with N and NW Australia and Tasmania and include forms endemic to Australia and Gondwana. Affinities of E Palaeozoic faunas of Indochina and E Malaya not yet known. N China placed near N Australia, Sibumasu adjacent to NW Australia and S China, Indochina, Tarim, Tsaidam, Lhasa and Changtang blocks formed part of North India-Iran margin of Gondwana.*)

Metcalf, I. (1993)- Palaeomagnetic research in Southeast Asia: progress, problem and prospects. *Exploration Geophysics* 24, 2, p. 277-282.
(*Stratigraphical, sedimentological, paleobiogeographic and paleomagnetic data suggest that probably all SE Asian continental terranes derived from Gondwana. Terranes assembled between Late Paleozoic and Cenozoic. Progressive CCW rotation of Borneo- Malay Peninsula region during Late Cretaceous- Cenozoic. Most Paleozoic data from mainland Asia probably affected by Late Carboniferous and Cretaceous resets. Paleomagnetic data vital for constraining movements of crustal blocks*)

Metcalf, I. (1993)- Southeast Asian terranes: Gondwanaland origins and evolution. In: R.H. Findlay et al. (eds.) *Gondwana Eight- Assembly, evolution and dispersal*, Proc. 8th Gondwana Symposium, Hobart, 1991, Balkema, Rotterdam, p. 181-200.
(online at: https://www.researchgate.net/publication/273635883_Southeast_Asian_terranes_Gondwanaland_origins_and_evolution)
(*One of the early papers in milestone series by I. Metcalf on SE Asia plate reconstructions. SE Asia is complex assembly of allochthonous continental terranes now far removed from their original sites of origin, together with island arcs, accretionary complexes and small ocean basins. Continental core with four main blocks, South China, Indochina, Sibumasu and East Malaya. Etc. etc.*)

Metcalf, I. (1994)- Late Palaeozoic and Mesozoic palaeogeography of Eastern Pangea and Tethys. In: A.F. Embry et al. (eds.) *Pangea: global environments and resources*, Canadian Society of Petroleum Geologists, Memoir 17, p. 97-111.
(online at: https://www.academia.edu/download/38332654/Metcalf_1994_Pangea.pdf)
(*Evolution of E Pangea and Tethys in Late Paleozoic- Mesozoic involved rifting of continental slivers/fragments from NE Gondwanaland, N-ward drift and amalgamation/accretion to form proto East Asia. Three continental*

slivers rifted from NE Gondwanaland in Silurian- E Devonian (N China, S China, Indochina/ E Malaya, Qamdo-Simao and Tarim terranes), E-M Permian (Cimmerian continent, incl. Sibumasu, Lhasa and Qiangtang terranes) and Late Jurassic (W Burma terrane, Woyla terranes). N-ward drift of terranes effected by opening and closing of three successive Tethys oceans, Paleo-Tethys, Meso-Tethys and Ceno-Tethys)

Metcalf, I. (1994)- Gondwanaland origin, dispersion, and accretion of East and Southeast Asian continental terranes. *J. South American Earth Sciences* 7, 3-4, p. 333-347.

(online at: https://www.academia.edu/14503828/Gondwanaland_origin_dispersion_and_accretion_of_East_and_Southeast_Asian_continental_terranes)

(On the assembly of Gondwana-derived allochthonous continental terranes, island arcs, etc. in SE Asia)

Metcalf, I. (1995)- Gondwana dispersion and Asian accretion. *Proc. IGCP Symposium on Geology of SE Asia, Hanoi XI/1995, Journal of Geology, Hanoi, ser. B, 5-6, p. 223-266.*

(online at: https://www.academia.edu/24247563/Gondwana_dispersion_and_Asian_accretion)

(Modified version of Metcalf (1996, Geological Society London SP106 below)

Metcalf, I. (1996)- Pre-Cretaceous evolution of SE Asian terranes. In: R. Hall & J. Blundell (eds.) *Tectonic evolution of Southeast Asia*, Geological Society, London, Special Publ. 106, p. 97-122.

(online at: www.researchgate.net/publication/247220174_Pre-Cretaceous_evolution_of_SE_Asian_Etc.)

(Pre-Cretaceous continental terranes of E and SE Asia all derived from Gondwanaland. Continental slivers rifted from N margin of Gondwanaland in Devonian (N China, S China, Indochina/East Malaya/Simao, Qaidam and Tarim), E-M Permian (Cimmerian continent incl. Sibumasu and Qiangtang); and Late Triassic-Late Jurassic (Lhasa, W Burma and Woyla). N drift of terranes accompanied by opening and closing of Paleo-Tethys, Meso-Tethys and Ceno-Tethys. Assembly of Gondwanaland-derived terranes began with amalgamation of S China and Indochina/ E Malaya in Late Devonian/E Carboniferous to form 'Cathaysia'. Suturing of Sibumasu and Qiangtang to Cathaysia in Late Permian-Triassic. S and N China amalgamated, then accreted to Laurasia by Late Triassic-E Jurassic. Kurosegawa Terrane of Japan possibly from Australian Gondwana, accreted to Japanese Eurasia in Late Jurassic. Lhasa, W Burma and Woyla terranes accretion to SE Asia in Cretaceous. SW Borneo and Semitau terranes derived from S China/ Indochina by Cretaceous opening of marginal basin, subsequently destroyed by S-ward subduction during rifting of Reed Bank-Dangerous Grounds terrane from S China when S China Sea opened)

Metcalf, I. (1996)- Gondwanaland dispersion, Asian accretion and evolution of the eastern Tethys. *Australian J. Earth Sciences* 43, p. 605-623.

(online at: www.academia.edu/14458322/Gondwanaland_dispersion_Asian_accretion_and_evolution_Etc.)

(Modified version of Metcalf (1996), above)

Metcalf, I. (1997)- The Palaeo-Tethys and Palaeozoic- Mesozoic tectonic evolution of Southeast Asia. In: P. Dheeradolok et al. (eds.) *Proc. Int. Conf. Stratigraphy and tectonic evolution of Southeast Asia and the South Pacific (GEOTHAI'97)*, Dept. Mineral Resources (DMR), Bangkok, 1, p. 260-272.

(online at: https://www.academia.edu/24249355/The_Palaeo_Tethys_and_Palaeozoic_Mesozoic_tectonic_evolution_of_Southeast_Asia?auto=download&email_work_card=download-paper)

(Main Paleotethys Ocean basin, which separates Late Paleozoic Gondwanaland from Cathaysian terrane, represented by Triassic suture zones Lancangjiang and Changning-Menglian (SW China), Nan-Uttaradit and Sra Kaeo (Thailand) and Bentong-Raub (Peninsular Malaysia). Subsidiary branches of Paleotethys represented by Ailaoshan suture in Yunnan, Song Ma suture in Vietnam (E Carboniferous) and other possible suture segments in N Thailand and S China. Radiolarian assemblages from deep marine cherts show Paleotethys opened in M-L Devonian and closed in Late Triassic)

Metcalf, I. (1998)- Palaeozoic and Mesozoic geological evolution of the SE Asian region: multidisciplinary constraints and implications for biogeography. In: R. Hall & J.D. Holloway (eds.) *Biogeography and geological evolution of SE Asia*. Backhuys Publishers, Leiden, p. 25-41.

(online at: http://searg.rhul.ac.uk/searg_uploads/2016/01/Metcalf.pdf)

(On E and SE Asia 'jigsaw puzzle' of continental terranes. Various Asian terranes derived directly or indirectly from N margin of Gondwanaland, in Devonian, E-M Permian and Late Triassic-Jurassic. N-ward movement of the terranes created the Paleotethys, Mesotethys and Ceno-Tethys oceans. Suturing of Sibumasu and Qiantang terranes to Cathaysia and amalgamation with North China in Permian-Triassic. Lhasa, W Burma and Woyla terranes rifted from Australian Gondwana in Late Triassic- Late Jurassic and accreted to proto-SE Asia in Cretaceous. SW Borneo and Semitau terranes derived from S China-Indochina margin by opening of subsequently-destroyed marginal basin. Etc.)

Metcalf, I. (1999)- The ancient Tethys Oceans of Asia: how many? how old? how deep? how wide? UNEAC Asia papers, University of New England, Armidale, 1, p. 1-9.

(online at: www.une.edu.au/asiacentre/PDF/Metcalf.pdf)

(Concept of ancient, now vanished Tethys Ocean first proposed by E. Suess (1893. Tethys complex in E Asia with remnants of three successive ocean basins: Paleo-Tethys (late E Devonian opening- M Triassic closing), Meso-Tethys (late E Permian opening- Late Cretaceous closing) and Ceno-Tethys (opening in Late Triassic (in W)/Late Jurassic (in E), closing in Cenozoic). Ocean basins water depths comparable to modern ocean basins and all three had widths of 2000- 3000 km in E parts at maximum development)

Metcalf, I. (1999)- The ancient Tethys Oceans of Asia: how many? how old? how deep? how wide? In: Ratanasthien, B. & S.L. Rieb (eds.) Proc. International Symposium on Shallow Tethys 5, Chiang Mai 1999, p. 1-15.

(online at: https://www.academia.edu/download/44586979/Metcalf_1999_Shallow_Tethys.pdf)

(Same paper as above)

Metcalf, I. (1999)- Gondwana dispersion and Asian accretion: an overview. In: I. Metcalf (ed.) Gondwana dispersion and Asian accretion, IGCP 321 Final Results Volume, A.A. Balkema, Rotterdam, p. 9-28. *(online at: www.researchgate.net/publication/273694493_Gondwana_dispersion_and_Asian_accretion_an_overview)*

Metcalf, I. (1999)- The Palaeo-Tethys in East Asia. In: G.H. Teh (ed.) Proc. 9th Regional Congress Geology Mineral Energy Resources of SE Asia (GEOSEA '98), Kuala Lumpur 1998, Bull. Geological Society Malaysia 43, p. 131-143.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1999013.pdf>)

(Paleo-Tethys opened in Devonian when N China, S China, Tarim, Indochina separated from N Gondwanaland and closed in Permian- Triassic when Sibumasu-/Qiantang terrane amalgamated with Indochina/ S China. Main suture zone in E Asia represented by Lancangjiang and Changning-Menglian zones of SW China, Nan-Uttaradit and Sra Kaeo zones of Thailand and Bentong-Raub suture zone of Peninsular Malaysia)

Metcalf, I. (2000)- The nature and ages of Palaeo-Tethyan suture zones in East Asia. In: Papers 2nd Symposium IGCP Project 411, Geodynamic processes of Gondwanaland-derived terranes in Eastern Asia, Geosciences Journal (Korea) 4, Special Edition, p. 33-38.

(All East Asian terranes derived from Gondwanaland. Rifted and separated as three continental strips in Devonian, late early Permian and Late Triassic- Late Jurassic, opening Paleo-Tethys, Meso-Tethys and Ceno-Tethys oceans. East Asia formed by assembling/ closing of these oceans)

Metcalf, I. (2000)- The Bentong-Raub suture zone. J. Asian Earth Sciences 18, 6, p. 691-712.

(Bentong-Raub Suture Zone of Malay Peninsula is closed segment of Devonian- M Triassic Paleo-Tethys ocean and boundary between Sibumasu and Indochina terranes. Suture zone result of Permian N-ward subduction of Paleo-Tethys under Indochina and Triassic collision of Sibumasu terrane. Sibumasu separated from Gondwana in late Sakmarian (E Permian), then drifted N in Permian-Triassic, with E Malaya I-type volcano-plutonic arc on Indochina margin. Main structural discontinuity in Peninsular Malaysia between Paleozoic and Triassic. Orogenic deformation started in U Permian-Lower Triassic. E-M Triassic, A-Type subduction and crustal thickening generated Late Triassic- E Jurassic Main Range syn- to post-orogenic granites. Foredeep basin developed on margin of Sibumasu in front of accretionary complex with Semanggol Fm rocks. Suture zone covered by latest Triassic- Cretaceous red bed overlap sequence)

Metcalf, I. (2001)- The Bentong-Raub suture zone, Permo-Triassic orogenesis and amalgamation of the Sibumasu and Indochina terranes. *Gondwana Research* 4, 4, p. 701-702.

(online at: https://www.researchgate.net/profile/I-Metcalf/publication/240439246_The_Bentong-Raub_Suture_Zon_Etc

(Abbreviated version of above paper)

Metcalf, I. (2001)- Warm Tethys and cold Gondwana: East and SE Asia in Greater Gondwana during the Phanerozoic. In: R.H. Weiss (ed.) *Contributions to Geology and Palaeontology of Gondwana in honour of Helmut Wopfner*, Kolner Forum fur Geologie und Palaeontologie 22, Cologne, p. 333-348

(online at: https://www.academia.edu/14326587/Warm_Tethys_and_Cold_Gondwana_East_and_SE_Asia_in_Greater_Gondwana_during_the_Phanerozoic)

Metcalf, I. (2001)- Palaeozoic and Mesozoic tectonic evolution and biogeography of SE Asia-Australasia (2001)- In: I. Metcalf, J.M.B. Smith et al. (eds.) *Faunal and floral migrations and evolution in SE Asia-Australasia*, A.A. Balkema, Lisse, p. 15-34.

(online at: https://www.academia.edu/17983095/Palaeozoic_and_Mesozoic_tectonic_evolution_and_biogeography_of_SE_Asia_Australasia)

(Similar to several Metcalf papers above. SE Asia is complex assembly of continental fragments, bounded by suture zones that represent former oceans. All of the main SE Asia terranes were part of 'Greater Gondwanaland' in E Paleozoic, and rifted and separated from NW Australia as three continental slivers with new ocean basins, at ~350 Ma (E Carboniferous, opening of Palaeo-Tethys; separation of China and Indochina terranes), 270 Ma (~E-M Permian, Mesotethys opening, separation of Sibumasu and Qiantang) and 200-140 Ma (Jurassic; separation of Lhasa, West Burma, ?Sikuleh; Borneo, W Sulaesi; opening of Neotethys). Etc.)

Metcalf, I. (2002)- Permian tectonic framework and palaeogeography of SE Asia. *J. Asian Earth Sciences* 20, 6, p. 551-566.

(On Gondwanan versus S China/Indochina-derived continental terranes in SE Asia. 'Cathaysian' S China-Indochina and Simao terranes at equatorial paleolatitude in Permian, but derived from Gondwana in Devonian. Sibumasu attached to NW Australia Gondwana until Sakmarian, then evolved through Permian intermediate stage to Cathaysian, reflecting separation and N ward drift. W Birma and smaller terranes (Paternoster, W Sulawesi, Mangkalihat) split off Gondwana in Late Triassic- Jurassic. SW Borneo, Luconia, Reed Bank, Palawan derived from S China/ Indochina in Cretaceous. Various terranes in E Indonesia derived from New Guinea in Cenozoic)

Metcalf, I. (2002)- Tectonic history of the SE Asian-Australian region. In: P. Kershaw et al. (eds.) *Bridging Wallace's Line: the environmental and cultural history and dynamics of the SE Asian- Australian region*, *Advances in Geology* 34, Catena Verlag, p. 29-48.

Metcalf, I. (2005)- Asia: South-East. In: R.C. Selley et al. (eds.) *Encyclopedia of Geology* 1, Elsevier, Oxford, p. 169-198.

(Another elegant Metcalf review of plate tectonic evolution of SE Asia since Early Paleozoic and distributions of mineral resources)

Metcalf, I. (2008)- Gondwana dispersion & Asian accretion: an update. *Proc. Int. Symposium Geoscience Resources and Environments of Asian Terranes (GREAT 2008)*, 4th IGCP 516 and 5th APSEG, Bangkok, p. 23-25.

(online at: www.geo.sc.chula.ac.th/Geology/Thai/News/Technique/GREAT_2008/PDF/003.pdf)

(Update of 1999 paper. Re-evaluations suggest W Sumatra and W Burma blocks separated from Gondwana in Devonian, along with Indochina and E Malaya and together with S China formed 'Cathaysialand' in Permian. 'Argoland', which separated from NW Australia in Jurassic previously interpreted to be W Burma but may be SW Borneo)

Metcalf, I. (2009)- Late Palaeozoic and Mesozoic tectonic and palaeogeographic evolution of SE Asia. In: E. Buffetaut, G. Cuny et al. (eds.) Late Palaeozoic and Mesozoic continental ecosystems in SE Asia. Geological Society, London, Special Publ. 315, p. 7-23.

(online at: https://www.academia.edu/17980795/Late_Palaeozoic_and_Mesozoic_tectonic_and_palaeogeographical_evolution_of_SE_Asia)

(SE Asia collage of continental terranes derived from India-Australian margin of E Gondwana. Late Paleozoic-Mesozoic rifting and separation of three elongate continental slivers from E Gondwana and opening and closure of Paleo-Tethys, Meso-Tethys and Ceno-Tethys ocean basins. W Sumatra, W Burma, Indochina and East Malaya blocks separated from Gondwana in Devonian and with S China formed 'Cathaysialand' in Permian. They were translated W to positions outboard of Sibumasu Terrane by strike-slip tectonics in Late Permian-E Triassic at convergence between Meso-Tethys and Palaeo-Pacific plates. SW Borneo, previously considered of 'Cathaysian' origin, is possibly 'Argoland' that separated from NW Australia in Jurassic)

Metcalf, I. (2009)- Comment on "An alternative plate tectonic model for the Palaeozoic-Early Mesozoic Palaeotethyan evolution of Southeast Asia (Northern Thailand-Burma)" by O.M. Ferrari et al. (2008). Tectonophysics 471, p. 329-332.

(Critique of Ferrari et al. redefining 'Shan-Thai' terrane in Thailand as Cathaysian, Indochina-derived terrane instead of traditional view of Gondwanan continental block, introducing unnecessary confusion. Mai Yuam Fault, identified as Paleo-Tethys suture, is Cenozoic fault. Paleo-Tethys suture zone represented by Inthanon Suture zone in Thailand, equivalent to previously recognized Inthanon zone. Concept of derivation of 'Orang Laut' terranes from S China- Indochina by back-arc spreading is innovative. Little evidence to support proposed S-wards subduction of Paleo-Tethys beneath E Gondwana in Permian)

Metcalf, I. (2010)- Gondwana dispersion and Asian accretion: tectonic and palaeogeographic evolution of eastern Tethys. In: 6th Symposium Int. Geological Correlation Program (IGCP), Project 516, Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 13-15.

(online at: http://geology.um.edu.my/gsmpublic/IGCP516/IGCP516_2010_Proceedings.pdf)

(Brief version of Metcalfe 2011, etc.)

Metcalf, I. (2011)- Tectonic framework and Phanerozoic evolution of Sundaland. Gondwana Research 19, p. 3-21.

(online at: <https://imetcal2.une.edu.au/web-data/PDF%20Files/Metcalf%202011%20Gond%20Res%20Sundaland.pdf>)

(Sundaland collage of continental blocks derived from E Gondwana and assembled by closure of multiple Tethyan and back-arc ocean basins. Core of Sundaland comprises Sibumasu block in W and Indochina-E Malaya block in E, with island arc terrane, which formed on Indochina- E Malaya margin, in-between. Paleo-Tethys represented by Changning-Menglian, Chiang Mai/Inthanon and Bentong-Raub suture zones. W Sumatra and possibly W Burma blocks separated from Gondwana, with Indochina and E Malaya in Devonian and accreted to Sundaland core in Triassic. W Burma now considered Cathaysian, similar to W Sumatra, from which it separated by Andaman Sea opening. SW Borneo and E Java-W Sulawesi tentatively identified as 'Banda Block' and 'Argoland', which separated from NW Australia in Jurassic and accreted to SE Sundaland in Cretaceous (puzzling how these rifted off NW Australia at same time, switch relative E-W positions along way, then both accreted to Sundaland margin at similar time but with Meratus suture separating them?; JTvG))

Metcalf, I. (2011)- Palaeozoic-Mesozoic history of SE Asia. In: R. Hall, M.A. Cottam & M.E.J. Wilson (eds.) The SE Asian gateway: history and tectonics of Australia-Asia collision, Geological Society, London, Special Publ. 355, p. 7-35.

(online at: www.academia.edu/13303900/Palaeozoic_Mesozoic_history_of_SE_Asia)

(One of later versions of Metcalfe SE Asia Cambrian- Eocene reconstructions of Gondwana-derived blocks and Tethyan oceans. Recent modification is identification of SW Borneo and/or E Java- W Sulawesi as missing 'Argoland' that separated from NW Australia in Jurassic and accreted to SE Sundaland in Cretaceous)

Metcalf, I. (2013)- Gondwana dispersion and Asian accretion: tectonic and palaeogeographic evolution of eastern Tethys. J. Asian Earth Sciences 66, p. 1-33.

(online at: https://www.academia.edu/10307779/Gondwana_dispersion_and_Asian_accretion_Tectonic_and_palaeogeographic_evolution_of_eastern_Tethys)

(Review paper on SE Asian plate tectonics. SW Borneo and E Java- W. Sulawesi now identified as missing 'Banda' and 'Argoland' blocks, separated from NW Australia in Late Triassic- Late Jurassic by opening of Ceno-Tethys and accreted to SE Sundaland by subduction of Meso-Tethys in Cretaceous)

Metcalfe, I. (2017)- Tectonic evolution of Sundaland. Bull. Geological Society Malaysia 63 (50th Anniversary Issue 1), p. 27-60.

(online at: www.gsm.org.my/products/702001-101709-PDF.pdf)

(Latest in series of Metcalfe review papers on SE Asian plate tectonics. By Late Triassic principal continental core blocks of Sundaland (Sibumasu, Sukhothai Arc, Simao, Indochina) had amalgamated and collided with S and N China to form proto-E and SE Asia. Paleo-Tethys represented by Changning-Menglian, Chiang Mai-Chiang Rai, Chanthaburi and Bentong-Raub Suture Zones that form boundary between Sibumasu and Sukhothai Arc. Sukhothai Arc formed on margin of Indochina in Carboniferous, then separated by back-arc spreading in Permian. Jinghong, Nan-Uttaradit and Sra Kaeo Sutures represent this closed back-arc basin. Cathaysian W Sumatra Block with its continental margin arc may well be displaced segment of Sukhothai Arc system, translated outboard of Sibumasu by strike-slip tectonics in Triassic. W Burma Block was already attached to Sundaland before Late Triassic and is likely disrupted part of Sibumasu. Nature of any hidden continental core of SW Borneo remains enigmatic. Etc.)

Metcalfe, I. (2021)- Multiple Tethyan ocean basins and orogenic belts in Asia. Gondwana Research 100, p. 87-130.

(Extensive review of Tethyan parts of S and SE Asia. Four Tethyan ocean basins recognised in Asia: (1) Proto-Tethys (Late Proterozoic- Silurian), (2) Palaeo-Tethys (M Devonian- Late Triassic), (3) Meso-Tethys (M Permian- Late Cretaceous) and (4) Ceno-Tethys (late M Triassic- Eocene). Asia giant convergent zone for >500 My, recording collision and accretion of Gondwana-derived continental blocks and Indian Craton. Three major orogenic belts in Asia: (1) Central Asian (evolution of Paleo-Asia Ocean, ending with Permian-Triassic Indosinian (Cimmerian) orogeny), (2) Tethyan (Tethysides) and (3) Alpine-Himalayan (evolution of Tethyan ocean basins (Cretaceous-Paleogene Himalayan-Tibetan Orogeny, caused by subduction of Meso- and Ceno-Tethys oceans and the Lhasa-Asia and India-Asia collisions).

Metcalfe, I., C. Jen, J. Chavet & S. Hade (eds.) (1999)- Gondwana dispersion and Asian accretion. IGCP 321 Final Results Volume, A.A. Balkema, Rotterdam, p. 1-361.

(Final results of IGCP Project 321 'Gondwana dispersion and Asian accretion'. Collection of 19 papers on tectonics of SE Asia)

Metcalfe, I., J.M.B. Smith, M. Morwood & I. Davidson (eds.) (2001)- Faunal and floral migrations and evolution in SE Asia- Australasia. A.A. Balkema, Lisse, p. 1-416.

(Collection of 31 papers on biogeography and paleobiogeography of SE Asia- Australia, presented at Armidale 1999 conference)

Metcalfe, I., F.C.P. Spiller, B. Liu, H. Wu & K. Sashida (1999)- The Paleo-Tethys in Mainland East and Southeast Asia: contributions from radiolarians studies. In: I. Metcalfe (ed.) Gondwana dispersion and Asian accretion, Final Results IGCP Project 321. A.A. Balkema, Rotterdam, p. 259-281.

(online at: www.researchgate.net/publication/273383337_The_Palaeo-Tethys_in_Mainland_East_and_Southeast_A Etc.)

(Radiolarian biostratigraphy in remnants of Paleo-Tethys ocean in Thailand, S China, Malaysia, etc., constrains ages of Paleotethys Ocean opening (Devonian) and closing when Sibumasu-Qiantang collided with Indochina/ S China in Triassic)

Meyerhoff, A.A. (1996)- Surge-tectonic evolution of southeastern Asia: a geohydrodynamics approach. J. Southeast Asian Earth Sciences 12, 3-4, p. 145-247.

(Unorthodox, non-plate tectonic model for tectonic history of SE Asia)

Meyerhoff, A.A., A.J. Boucot, D. Meyerhoff Hull & J.M. Dickins (1996)- Phanerozoic faunal and floral realms of the Earth: the intercalary relations of the Malvinokaffric and Gondwana realms with the Tethyan faunal realm. Geological Society of America (GSA) Memoir 189, p. 1-69.

(Review of global paleobiogeographic realms through time from 'anti-plate tectonics' perspective)

Michaux, B. (1991)- Distributional patterns and tectonic development in Indonesia: Wallace reinterpreted. Australian Systematic Botany (CSIRO) 4, 1, p. 25-36.

Michaux, B. (1994)- Land movements and animal distributions in east Wallacea (eastern Indonesia, Papua New Guinea and Melanesia). Palaeogeogr. Palaeoclim. Palaeoecology 112, p. 323-343.

(Present-day animal distribution patterns linked to plate tectonics)

Michaux, B. (1995)- Distributional patterns in west Wallacea and their relationship to regional tectonic structure. Sarawak Museum Journal 48, 69, p. 163-179.

Michaux, B. (2010)- Biogeology of Wallacea: geotectonic models, areas of endemism, and natural biogeographical units. Biological J. Linnean Society, London, 101, 1, p. 193-212.

(online at: <https://doi.org/10.1111/j.1095-8312.2010.01473.x>)

(Review of models of geological development of Indonesia and Philippines. Areas of present-day endemism within Wallacea identified. Tanimbar Islands biologically part of S Maluku. Timor (plus Savu, Roti, Wetar, Damar, Babar) and W Lesser Sunda islands form separate areas of endemism. Wallacea formed from complex of mainly Australasian exotic fragments linked by geological processes within complex collision zone)

Min, M., K.L. Khin, Q. Feng, C. Chonglakmani, D. Meischner, R. Ingavat-Helmcke & D. Helmcke (2001)- Tracing disrupted outer margin of Paleoeurasian continent through Union of Myanmar. J. China University of Geosciences 12, 3, p. 201-206.

(Discussion of difficulty of carrying Paleotethys suture between Gondwanan 'Sibumasu' terranes and Paleo-Eurasia continent through Myanmar and into Yunnan, S China. Main point of contention is position of Boashan Block, which has both Gondwanan and Tethyan characteristics in Permian. Margin farther W than usually assumed)

Mishra, H.K. (1996)- Comparative petrological analysis between the Permian coals of India and Western Australia: paleoenvironments and thermal history. Palaeogeogr. Palaeoclim. Palaeoecology 125, p. 199-216.

Mitchell, A.H.G. (1977)- Tectonic settings for emplacement of Southeast Asian tin granites. Bull. Geological Society Malaysia 9, p. 123-140.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1977026.pdf>)

(Most tin-bearing granitic rocks in SE Asia in one of three main belts: (1) Late Carboniferous- E Triassic East Belt (tin-bearing, emplaced in continental crust of E Malaya- E Central Thailand above E-dipping Benioff zone); (2) Late Triassic Central Belt ('Indosinian orogeny' syn-collisional granites, emplaced during collision of 'Sibumasu' (W Malaya, etc.); and (3) Western belt with widespread Late Cretaceous-E Eocene plutons (emplaced in W zone above E-dipping Benioff zone))

Mitchell, A.H.G. (1979)- Rift, subduction and collision-related tin belts. Bull. Geological Society Malaysia 11, p. 81-102.

(online at: <https://gsm publ.files.wordpress.com/2014/09/bgsm1979003.pdf>)

(General discussion of tin belts in different tectonic settings, incl. SE Asian province)

Mitchell, A.H.G. (1981)- Phanerozoic plate boundaries in mainland SE Asia, the Himalayas and Tibet. J. Geological Society, London, 138, p. 109-122.

(Recognition of Phanerozoic subduction systems and two continental fragments of Gondwanaland through mainland SE Asia. Cambrian subduction system and 5 Mesozoic-early Cenozoic collision belts identified. Indochina, E Thailand and Cl Tibet accreted to China in E Triassic; western SE Asia and S Tibet separated from Gondwanaland in Permian or E Triassic and collided with Asia in Late Triassic. W Burma island arc

system collided with Asia in Jurassic. U Triassic flysch and schist in E Indoburman Ranges accreted to W Burma in Jurassic- E Cretaceous)

Mitchell, A.H.G. (1985)- Collision-related fore-arc and back-arc evolution of the northern Sunda Arc. *Tectonophysics* 116, p. 323-334.

(In fore-arc area of N Sunda Arc (W Burma-Andaman-Nicobar- W Thailand) emplacement of serpentinite melange diapirs and deposition of olistostromes were caused by Campanian collision with continental fragment since underthrust E-wards beneath arc. Age and position of E-directed thrusts and associated tin granites in continental back-arc area implies thrusting and generation of granites genetically related to collision)

Mitchell, A.H.G. (1986)- Mesozoic and Cenozoic regional tectonics and metallogenesis in mainland SE Asia. In: G.H. Teh & S. Paramanathan (eds.) *Proc. GEOSEA V Conf.*, Kuala Lumpur 1984, 2, *Bull. Geological Society Malaysia* 20, p. 221-239.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/bgsm1986b12.pdf>)

(Main Mesozoic tectonic event in mainland SE Asia was Late Triassic Indosinian orogeny. Deformation and uplift in Malaysia Main Range and N Thailand, emplacement of syn- to late-tectonic two-mica granites of Central Tin Belt, and imbricate thrusting in Bangka Island best be explained by E Triassic collision of Shan-Thai block foreland with Indochina block to E. Continental fragment, exposed in Indoburman Ranges, collided with Burma in latest Jurassic, etc.)

Mizutani, S. & S. Kojima (1992)- Mesozoic radiolarian biostratigraphy of Japan and collage tectonics along the eastern continental margin of Asia. *Palaeogeogr. Palaeoclim. Palaeoecology* 96, p. 3-22.

(On belt of Jurassic accretionary complex along E Asian margin from Japan to S, composed of deformed sediments with U Permian limestone, Triassic bedded cherts and Lower Jurassic siliceous shales and younger clastic rocks)

Mizutani, S., J. Shao & Q. Zhang (1990)- The Nadanhada Terrane in relation to Mesozoic tectonics on continental margins of East Asia. *Acta Geologica Sinica (English Ed.)* 3, 1, p. 15-29.

(Nadanhada Jurassic disrupted terrane in NE China mainly composed of Permo- Carboniferous limestone and greenstone, Triassic bedded chert and M Jurassic siliceous shale enclosed in Late Jurassic- E Cretaceous clastics. Identical to Mino terrane of Japan, and representing parts of long E Asian Late Jurassic- Cretaceous accretionary belt along E Asia continental margin after Triassic amalgamation of Chinese continent. Also included Ryukyu arc, Palawan Blocks of Philippines and probably Borneo (Danau Fm))

Molnar, P. & P. Tapponnier (1975)- Cenozoic tectonics of Asia: effects of a continental collision. *Science* 189 (4201), p. 419-426.

(Classic paper linking major strike slip faults in Asia to India-Asia collision)

Monnier, C. (1996)- *Mechanismes d'accrétion des domaines océaniques arrière-arc et géodynamique de l'Asie du Sud-Est*. These Doct. Université de Bretagne Occidentale, p. 1-605. *(Unpublished)*

('Accretion mechanisms of oceanic fore-arc domains and geodynamics of SE Asia')

Montaron, B., P. Tapponnier, A. Briais & P.H. Leloup (2026)- A reconstruction of the last 50 My of South-East Asia's tectonic history. *Tectonophysics* 919, 230981, p. 1-18.

(online at: <https://www.sciencedirect.com/science/article/pii/S0040195125003671>)

(New series of (oversimplified) 2-D reconstructions of SE Asia in last 50 My, an extended version of the classic continental extrusion model of P. Tapponnier (1982, 1986). From ~46 Ma, a first NNE trending right-lateral fault opens Mergui basin. From ~42 until 32 Ma, five major NW-SE left-lateral strike-slip faults activate from SW to NE, extruding blocks to SE (formation of Pattani, Malay, Tonle Sap, Yinggehai and Natuna-Rajang pull-apart basins and terminating in Makassar, Nam Con Son, Cuu Long Basins and South China Sea). After ~15 Ma extrusion stops in Sundaland and migrates further N. A major tectonic reorganization follows on land with offshore inversion of motion of several microplates, initiating a thrust of Borneo over S margin of S China Sea, forming a sedimentary prism often misinterpreted as evidence for subduction of a proto-S China Sea. Etc.)

Morley, C.K. (2001)- Combined escape tectonics and subduction rollback-back arc extension: a model for the evolution of Tertiary rift basins in Thailand, Malaysia and Laos. *J. Geological Society, London*, 158, 3, p. 461-474.

(Tertiary rift basins of Thailand and adjacent countries show considerable variability in timing of rifting and inversion episodes. Rift basins developed on blocks that were extruded SE-ward, possibly tied to Himalayan extrusion tectonics. In Thailand major sinistral strike-slip motion ceased at ~30 Ma, before formation of most rift basins. Alternative mechanism to open rift basins is subduction rollback of Indian plate W of Thailand)

Morley, C.K. (2002)- A tectonic model for the Tertiary evolution of strike-slip faults and rift basins in SE Asia. *Tectonophysics* 347, p. 189-215.

(Two types of SE Asia Tertiary evolution models: (1) escape tectonics with no proto-S China Sea, (2) subduction of proto-S China Sea oceanic crust beneath Borneo. Proposed tectonic model with key points: (1) Ailao Shan- Red River shear zone mainly active in Eocene-Oligocene tied to extension in S China Sea, less active in Miocene; (2) three regions of metamorphic core complex development affected Indochina from Oligocene-Miocene; (3) Subduction of proto-S China Sea in Eocene- E Miocene necessary to explain evolution of NW Borneo; (4) Eocene-Oligocene collision of NE India with Burma activated extrusion tectonics in mainland SE Asia and right lateral motion along Sumatran subduction zone)

Morley, C.K. (2004)- Nested strike-slip duplexes, and other evidence for Late Cretaceous-Palaeogene transpressional tectonics before and during India-Eurasia collision in Thailand, Myanmar and Malaysia. *J. Geological Society, London*, 161, p. 799-812.

(Late Cretaceous S-type granites from Malaysia-Thailand to Myanmar long used to infer episode of crustal thickening, supported by late Cretaceous-Eocene ophiolites in Myanmar, but no evidence for associated fold-thrust belt. Fission-track studies of Thailand indicate modest regional uplift from ~80-40 Ma. Left lateral motion on major NW-SE-trending strike-slip fault zones (Mae Ping and Three Pagodas faults) in Myanmar and Thailand attributed to Himalayan-Tibetan escape tectonics, but fault zones are network of branching faults with important N-S trends as well as NW-SE trends. This diffuse 1000 km long/up to 250 km wide, branching network of strike-slip faults may represent Late Cretaceous- Paleogene transpressional belt. Himalayan escape tectonics represent later deformation)

Morley, C.K. (2007)- Variations in Late Cenozoic- Recent strike-slip and oblique-extensional geometries, within Indochina: the influence of pre-existing fabrics. *J. Structural Geology* 29, p. 36-58.

(From Yunnan to N Thailand, Late Cenozoic-Recent faults strike predominantly NNE-SSW, N-S to NNE-SSW and NE-SW to ENE-WSW. Associated sedimentary basins are aligned NE-SW to N-S. Fault patterns commonly interpreted as strike-slip dominated deformation, but N Thailand interpreted to have evolved mainly by oblique extension. Multiple episodes of basin inversion in N Thailand during Miocene require changes in stress pattern)

Morley, C.K. (2009)- Evolution from an oblique subduction back-arc mobile belt to a highly oblique collisional margin: the Cenozoic tectonic development of Thailand and eastern Myanmar. In: P.A. Cawood & A. Kroner (eds.) *Earth accretionary systems in space and time*, Geological Society, London, Special Publ. 318, p. 373-403.

(N to NE subduction beneath SE Asia during Mesozoic-Cenozoic resulted in development of hot, thickened crust in Thailand-Myanmar region in back-arc mobile belt setting. Setting changed in Eocene-Recent to highly oblique collision when India coupled with W Burma block)

Morley, C.K. (2012)- Late Cretaceous- Early Palaeogene tectonic development of SE Asia. *Earth-Science Reviews* 115, 1-2, p. 37-75.

(Late Cretaceous-E Paleogene history of continental core of SE Asia (Sundaland), prior to India- Asia collision. In Myanmar and Sumatra subduction s interrupted in Aptian-Albian by phase of arc accretion (Woyla and Mawgyi arcs) and in Java, E Borneo and W Sulawesi by collision of continental fragments rifted from N Australia. Subsequent resumption of subduction in Myanmar-Thailand sector explains: (1) early creation of oceanic crust in Andaman Sea in supra-subduction zone setting at ~95 Ma; (2) belt of granite plutons of Late Cretaceous- E Paleogene age in W Thailand and C Myanmar; (3) amphibolite grade metamorphism at 70-80 Ma in W and C Thailand; and (4) accretionary prism development in W Belt of Myanmar, until glancing collision with NE corner of Greater India promoted ophiolite obduction and deformation in E Paleogene)

Morley, C.K. (2013)- Discussion of tectonic models for Cenozoic strike-slip fault-affected continental margins of mainland SE Asia. *J. Asian Earth Sciences* 76, p. 137-151.

(On relationship between Cenozoic strike-slip faults of mainland SE Asia and adjacent sedimentary basins (Gulf of Thailand, Gulf of Martaban/Andaman Sea, Gulf of Tonkin). Most major onshore SE Asia strike-slip faults probably do not extend far offshore)

Morley, C.K. (2018)- Understanding Sibumasu in the context of ribbon continents. *Gondwana Research* 64, p. 184-215.

(Ribbon continent belts like Zealandia in SW Pacific provide analogues for Permo-Triassic development of Sibumasu. Key parameters for ribbon continents are width, and how rifting developed. Example of Sibumasu (~3000 km long and up to 500-600 km wide): (1) separated from N margin of Gondwana in E Permian; (2) basin inversion in Late Triassic and possibly E Jurassic, with mixed thick- and thin-skinned deformation; (3) extensional collapse around 215 Ma (Late Triassic); (4) Slab delamination and extension-related decompression melting generating granites and crustal thickening; (5) metamorphism relatively high T, lower P)

Morley, C.K. (2024)- Atypical syn-collisional wedges at thrust fronts: Their tectonic and gravity-driven development, and interpretation-related controversies. *Earth-Science Reviews* 249, 104663, p.

(Examples of atypical syn-collisional wedges that resemble accretionary prisms, but formed over subducted and/or underthrust lower plate continental crust in orogen f(off Sabah and Palawan, Indo-Burma Ranges, Banda Arc, etc.

Morley, C.K., R. King, R. Hillis, M. Tingay & G. Backe (2011)- Deepwater fold and thrust belt classification, tectonics, structure and hydrocarbon prospectivity: a review. *Earth-Science Reviews* 104, p. 41-91.

(Overview of deepwater fold-thrust systems. Two types: Type 1 mainly on passive margins, driven by sediment loading or local uplift, typically with high-quality continent-derived quartz sst reservoirs; Type 2 on active margins, in areas of continental convergence. Examples include NW Borneo, W Sulawesi- Makassar Straits, Banda Arc, Seram)

Morley, C.K. & Y. Wang (2023)- The Cenozoic hyper-oblique collision zone of Indochina: A re-appraisal of escape tectonics. *Earth-Science Reviews* 243, 104453, p. 1-60.

(Four main stages of development of Cenozoic strike-slip faults in Indochina: (1) widespread Paleogene transpressional deformation; (2) 30-27 Ma transition, with retreat of transpressional deformation to SE Tibetan Plateau; (3) 27-17 Ma onset of major sinistral displacement on ASRRSZ; (4) <17 Ma- Present, diachronous reversal of motion on many faults, and cessation of extension in Thailand rifts)

Morley, R.J. (2000)- Origin and evolution of tropical rain forests. John Wiley & Sons, New York, p. 1-362.

(SE Asia chapter describes Cenozoic vegetation response to plate tectonic evolution, as reflected in Indonesia palynology records. Middle Eocene arrival of palynomorphs known from older deposits in India is consequence of India-Asia collision. In M Eocene SW Sulawesi has Laurasian flora, and was attached to E Kalimantan. Makassar Straits became floral-faunal migration barrier in Late Eocene. First Australian- New Guinea floral elements (Casuarina, etc.) start appearing in W Java Sea around 22-21 Ma)

Morley, R.J. (2018)- Assembly and division of the South and South-East Asian flora in relation to tectonics and climate change. *J. Tropical Ecology* 34, 4, p. 209-234.

(Discussion of main phases of plant dispersal into and out of SE Asia in relation to plate tectonics and changing climates. Late Cretaceous poorly understood, but Paleocene topography mountainous, and climate probably seasonally dry. India's drift into perhumid low latitudes in Eocene brought dispersal into SE Asia of megathermal angiosperms which originated in W Gondwana, starting at ~49 Ma, and with terrestrial connection after ~41 Ma. Oligocene seasonally dry climates except along E and SE seaboard of Sundaland, but with collision of Australian Plate with Sunda at end of Oligocene widespread perhumid conditions in region. With Late Miocene strengthening of Indian monsoon, seasonally dry conditions expanded. Some dispersals from Australasia after collision with Sunda. Pleistocene refuge theory applies to SE Asian region).

Morley, R.J. (2024)- The establishment of Palaeotropical rainforests from Africa to Oceania in relation to plate tectonics and zonal tropical climates. In: G. Dupont-Nivet et al. (eds.) Asian geodynamics, climate and biodiversity, Geological Society, London, Special Publ. 549, p. 113-136.

(Canopy-forming Dipterocarpus genera evolved in Africa in Late Cretaceous and dispersed to India. Palaeotropical rainforests formed in equatorial Africa in Campanian, in India in late Maastrichtian-Paleocene, in SE Asia in M Eocene and in Oceania in Miocene. Current megadiverse SE Asian rainforests descended from immigrant taxa)

Morley, R.J. & H.P. Morley (2021)- The prelude to the Holocene: tropical Asia during the Pleistocene. In: N. Kumaran & D. Padmalal (eds.) Holocene Climate Change and Environment, Elsevier, Chapter 1, p. 1-32.

(Review of climate and vegetation history for tropical Asia and India for last 3 Myrs. Pliocene witnessed demise of humid tropical forests across India, which were replaced in N by open grasslands, which supported diverse fauna, elements of which migrated to Java during E Pleistocene. During Pleistocene glaciations, expansion of desert and savanna vegetation at expense of deciduous and evergreen forests across Indian subcontinent, while in SE Asia rain forests remained along equator, with pine forest at N subequatorial latitudes, followed by savanna in Indochina, but with expansion of seasonal evergreen and deciduous forests to S, across emergent Java Sea and Java. Widespread Pleistocene megafauna may have modified vegetation across region)

Morley, R.J., J. Teasdale & H.P. Morley (2024)- Southeast Asia tectonics, palaeogeography and palaeoclimate. Proc. GESGB-SEAPEX Asia Pacific Conference, London 2024, 1p. (Abstract only)

(online at: <https://archives.datapages.com/data/southeast-asia-petroleum-exploration-society/data/033/033001/pdfs/15.pdf>)

(Discussion of disagreements with existing plate tectonic reconstructions. Palaeoclimate data favours plate a more northerly position of Borneo in Eocene compared to today, with extrusion of Sundaland after collision of India with Asia, with consequent CW rotation of Borneo into current equatorial position during Oligocene- E Miocene. Rotation accompanied by extension, especially during Late Eocene and Oligocene. No figures)

Moyne, S. & P. Neige (2007)- The space-time relationship of taxonomic diversity and morphological disparity in the Middle Jurassic ammonite radiation. Palaeogeogr. Palaeoclim. Palaeoecology 248, p. 82-95.

(Australia biogeographic realm comprises Western Australia, New Zealand, New Guinea and Sula Islands. Not much specific data/ interpretation)

Moyne, S., P. Neige, D. Marchandet & J. Thierry (2004)- Repartition mondiale des faunes d'ammonites au Jurassique moyen (Aalenien superieur a Bathonien moyen): relations entre biodiversite et paleogeographie. Bull. Societe Geologique France 175, 5, p. 513-523.

('Global distribution of ammonite faunas in the Middle Jurassic (Upper Aalenian to Middle Bathonian): relations between biodiversity and paleogeography'. Tethyan, Pacific, Boreal domains and associated epicratonic platforms divided into 16 paleobiogeographical provinces. Provinces that show strong endemism are isolated (Boreal and SE Tethyan margins))

Muller, R.D. & M. Seton (2015)- Paleophysiography of ocean basins. In: Encyclopedia of Marine Geosciences, Springer, Dordrecht, p. 1-15.

(Review of ocean basins, with global reconstructions for last 200 Myrs)

Muller, R.D., M. Seton, S. Zahirovic, S.E. Williams, K.J. Matthews, N.M. Wright, G.E. Shephard, K.T. Maloney, N. Barnett-Moore, M. Hosseinpour, D.J. Bower & J. Cannon (2016)- Ocean basin evolution and global-scale plate reorganization events since Pangea breakup. Annual Review Earth Planetary Sciences 44, p. 107-138.

(Revised global plate motion model from Triassic at 230 Ma- present day. Plate velocities controlled or modified by increases in subduction processes and collisional events and ridge subduction events)

Najman, Y., E. Appel, M. Boudagher-Fadel, P. Bown, A. Carter, E. Garzanti, L. Godin, J. Han, U. Liebke, G. Oliver et al. (2010)- Timing of India-Asia collision: Geological, biostratigraphic, and palaeomagnetic constraints. *J. of Geophysical Research: Solid Earth* 115, B12, B12416, p. 1-18.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2010JB007673>)

(Qumiba section located S of (Neotethys) Yarlung Tsangpo suture in Tibet, with youngest marine sediments E Eocene age (Assilina- Discocyclina; ~51-53 Ma), in broad agreement with timing of cessation of marine facies elsewhere in region. Dating of detrital zircons indicates Asian contribution, thus documenting time of arrival of Asian material onto Indian plate, and suggesting initial contact between India-Asia in E Eocene)

Nakamura, K., D. Shimizu & Z. Liao (1985)- Permian palaeobiogeography of brachiopods based on faunal provinces. In: K. Nakazawa & J.M. Dickins (eds.) *The Tethys, her paleogeography and paleobiogeography from Paleozoic to Mesozoic*, Tokai University Press, Tokyo, p. 185-198.

(On brachiopod provinciality of Early, Middle and Late Permian in Asia: Gonwana Tethyan, Cathaysian Tethyan, Angara Tethyan, West Tethyan, etc. No data points from Indonesia-New Guinea)

Nicoll, R.S. (2004)- New Permian cold water conodont faunas from the Tethyan Gondwanan margin of Australia. *GSA Rocky Mountain and Cordilleran Joint Meeting*, 20-11 (*Abstract only*)

Nicoll, R.S. & I. Metcalfe (1998)- Early and Middle Permian conodonts from the Canning and southern Carnarvon basins, W Australia; their implications for regional biogeography and paleoclimatology. In: G.R. Shi et al. (eds.) *Strzelecki Int. Symposium Permian of eastern Tethys; biostratigraphy, palaeogeography and resources*. *Proc. Royal Society of Victoria* 110, 1-2, p. 419-461.

(Small, low diversity conodont faunas from E-M Permian of S Carnarvon- Canning basins of W Australia (paleolatitude up to 60°S). Species of Hindeodus and Vjalovognathus cool-temperature tolerant forms were first conodonts to invade after Late Carboniferous-E Permian glaciation. Faunas of similar age from Timor (paleolatitude ~45°S) significantly greater faunal diversity)

Nicoll, R.S. & I. Metcalfe (2001)- Cambrian to Permian conodont biogeography in East Asia-Australasia. In: I. Metcalfe et al. (eds.) *Faunal and floral migrations and evolution in SE Asia-Australasia*. Balkema, Lisse, p. 59-72.

(Conodont faunas of allochthonous East Asian terranes show biogeographic affinities with Australasia during Cambrian- Permian, suggesting close proximity or Australian Gondwanaland from ~500- 250 Ma)

Nie, S., D.B. Rowley & A.M. Ziegler (1990)- Constraints on the location of Asian microcontinents in Palaeo-Tethys during the Late Palaeozoic. In: W.S. McKerrow & C.R. Scotese (eds.) *Palaeozoic palaeogeography and biogeography*, Geological Society, London, Memoir 12, p. 397-409.

(Overview of Permian terranes history, mainly of mainland Asia. Biogeographic provinces well developed in Late Paleozoic due to steep equator-to-pole gradients. As continents rifted from S margin of Paleo-Tethys, they lost temperate Gondwanan affinities and acquired sub-tropical to tropical floras and faunas. A S belt of terranes, from Helmand block in Iran-Afghanistan, through W Qiangtang and Lhasa blocks of Tibet to Sibumasu block of Thailand-Malaya, all rifted off margins of Gondwana in Permian. Cathaysian floras existed in N parts of Gondwana (New Guinea), and since Cathaysian plants like Gigantopteris had to be dispersed by seeds this suggests land connections between Cathaysian microcontinents and Gondwana)

Niu, Y., Y. Liu, Q. Xue, F. Shao, S. Chen, M. Duan, P. Guo, H. Gong, Y. Hu, Z. Hu, J. Kong et al. (2015)- Exotic origin of the Chinese continental shelf: new insights into the tectonic evolution of the western Pacific and eastern China since the Mesozoic. *Science Bulletin (China)* 60, 18, p. 1598-1616.

(online at: <http://engine.scichina.com/publisher/scp/journal/SB/60/18/10.1007/s11434-015-0891-z?slug=full%20text>)

(Basement of continental shelf beneath E and S China Seas may be of exotic origin, geologically unrelated to continental lithosphere of E China. Jurassic-Cretaceous granitoids in region associated with W Pacific oceanic subduction. 'Sudden' termination of granitoid magmatism at ~88 ± 2 Ma suggests trench jam at ~100 Ma, pointing to collision of buoyant oceanic plateau or microcontinent. Jammed trench (suture) located near coastline of SE continental China. Trench jam at ~100 Ma led to re-orientation of Pacific plate motion, making

boundary between Pacific plate and newly accreted plate of E Asia transform fault E of exotic-origin continental shelf. This explains apparent ~40 Myr magmatic gap from ~88 to ~50 Ma)

Noakes, L.C. (1977)- Review of provenance for mineral sands and tin in Southeast Asia. United Nations ESCAP, CCOP, Technical Bulletin 11, p. 157-168.

(online at: <https://repository.unescap.org/items/62741596-bd53-4f3d-b9bd-fc94701cbe59>)

Ogg, J.G., F.M. Gradstein, J.A. Dumoulin, M. Sarti & P. Brown (1994)- Sedimentary history of the Tethyan margins of Eastern Gondwana during the Mesozoic. In: R.A. Duncan et al. (eds.) Synthesis of results from Scientific Drilling in the Indian Ocean, American Geophysical Union (AGU), Geophysical Monograph 70, p. 203-224.

(Review of Mesozoic of Gondwana margins of E Tethys Ocean (Australian and Himalayan margins, Timor and ODP Legs 122-123). Region drifted N in Triassic, entering tropical paleolatitudes in Late Triassic- E Jurassic, then returned to mid-latitudes for M Jurassic- E Cretaceous. Episodes of deltaic sandstone progradation over shelves. Widespread hiatus between Callovian shelf deposits and Oxfordian deep-water sediments, coinciding with block faulting off NW Australia. Shallow depths of carbonate compensation during Late Jurassic- E Cretaceous over most of Argo basin off NW Australia caused deposition of radiolarian-rich claystone. Volcanism accompanied final stages of rifting between India and Australia in Late Berriasian-Valanginian. Late Barremian and Aptian rise in CCD, with warming and increased organic-rich claystone)

Ogg, J.G. & U. von Rad (1994)- The Triassic of the Thakkhola (Nepal). II: Paleolatitudes and comparison with other Eastern Tethyan margins of Gondwana. Geologische Rundschau 83, p. 107-129.

(Comparison of Triassic in Nepal Himalaya and other parts of continental margin of Gondwana that faced E Tethys ocean and was continuous from Arabia to NW Australia (incl. Timor). Paleomagnetic data suggest Gondwana progressively shifted N into lower latitudes, causing increase in carbonate deposition through Triassic on Himalaya-Australian margins. General mega-cycle of major transgression at base Triassic, followed by general shallowing-upward of facies during M and Late Triassic and latest Triassic regression)

Oh, C., J. Legrand, K. Kim, M. Philippe & I. Paik (2011)- Fossil wood diversity gradient and Far-East Asia palaeoclimatology during the Late Triassic- Cretaceous interval. J. Asian Earth Sciences 40, p. 710-721.

(Mesozoic fossil floras of E Asia (China, Mongolia, Siberia, Korea, Japan) with (1) northern Tetori flora reflecting warm-temperate and moderately humid climate and (2) southern Ryoseki-type floras with features of hot and arid/ semi-arid floras and Tetori-type plants being 'typical of conditions' (nothing on SE Asia))

Okada, H. & N.J. Mateer (eds.) (2000)- Cretaceous environments of Asia. Developments in Palaeontology and Stratigraphy 17, Elsevier, p. 1-255.

(Collection of 15 papers on Cretaceous of Japan, Philippines, mainland E Asia; nothing on Indonesia/ New Guinea)

Oostingh, C.H. (1938)- Betrekkingen tusschen het Indische en het Mediterrane Tertiair. Handelingen 8e Nederlands-Indisch Natuur Wetenschappelijk Congres, Soerabaja 1938, p.

('Relationships between the East Indies and Mediterranean Tertiary'. Neogene mollusc biostratigraphy and comparisons)

Ozawa, T. (1987)- Permian fusulinacean biogeographic provinces in Asia and their tectonic implication. In: A. Taira & M. Tashiro (eds.) Historical biogeography and plate tectonic evolution of Japan and Eastern Asia, Terra Scientific Publishing, Tokyo, p. 45-63.

Parsons, A.J., K. Hosseini, R.M. Palin & K. Sigloch (2020)- Geological, geophysical and plate kinematic constraints for models of the India-Asia collision and the post-Triassic central Tethys oceans. Earth-Science Reviews 208, 103084, p. 1-63.

(Substantial review of models for India-Asia collision and Central Tethys oceans)

Parsons, A.J., K. Sigloch & K. Hosseini (2021)- Australian plate subduction is responsible for Northward motion of the India-Asia collision zone and ~1,000 km lateral migration of the Indian slab. *Geophysical Research Letters*, 48, 18, p. 1-13.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2021GL094904>)

Page, K.N. (2008)- The evolution and geography of Jurassic ammonoids. *Proc. Geologists Association, London*, 119, 1, p. 35-57.

(Jurassic ammonites 7 suborders, in ~20 distinguishable biogeographical provinces and subprovinces. S Pan-Tethyan Realm includes Mediterranean-Caucasian, E Pacific, Indo-Pacific and Austral realms/ subrealms. Indo-Malgach Province recognizable first in Callovian, with endemic Sphaeroceratidae (Macrocephalites, Subkosmatia) and Perisphinctidae (Indosphinctes, Choffatia, Kinkeliniceras, etc.). Persisted into Oxfordian times, with place of Macrocephalitinae taken by endemic Mayatinae. By Tithonian, several restricted Indo-Pacific/Austral genera and endemic species: Pachysphinctes, Virgatosphinctes, Aulacosphinctoides, Himalayitidae, Neocomitidae (incl. endemic Blanfordiceras), Uhligites, etc.)

Peltzer, G. & P. Tapponnier (1988)- Formation and evolution of strike-slip faults, rifts, and basins during the India-Asia collision: an experimental approach. *J. of Geophysical Research* 93, B12, p. 15085-15117.

(More extensive discussion of Tapponnier et al. 1982 plasticine models, used to explain SE Asia extrusion)

Peng, Y., B. Zhang, H. Cao, X. Wang, G. Chi, C. Liu, J. Tian, Z. Wang, Y. Zhou & T. Deng (2025)- Genesis of Late Cretaceous Sn deposits and magmatism in the Yidun Terrane, China: Further northward extension of the Southeast Asian Tin Belt and implication for exploration Gondwana Research 148, p. 368-392.

(Yidun Terrane in China (E Tibetan Plateau) argued to be a N extension of the Late Cretaceous Southeast Asian Tin Belt (SATB).any Sn-Pb-Zn-Ag and Cu-Mo-W deposits. New garnet and cassiterite U-Pb ages (99-97 Ma) from Gongjuelong Sn deposit consistent with ages of nearby Pb-Zn-Ag deposits and zircon U-Pb ages (~98 Ma) of causative Late Cretaceous Haizishan granites.)

Philippe, M., M. Bamford, S. McLoughlin, L.S.R. Alves, H.J. Falcon-Lang, S. Gnaedinger, E.G. Ottone, M. Pole, A. Rajanikanth, R.E. Shoemaker, T. Torres & A. Zamuner (2004)- Biogeographic analysis of Jurassic-Early Cretaceous wood assemblages from Gondwana. *Review Palaeobotany Palynology* 129, p. 141-173.

(Distribution of Jurassic- Early Cretaceous fossil wood across Gondwana suggests 5 climate zones: summer wet, desert, winter wet, warm temperate, cool temperate. Araucarian-like conifer wood dominant, cosmopolitan element, whereas other taxa more provincialism)

Pitfield, P.E.J. (1987)- South-East Asia Granite Project- Report on the geochemistry of the Tin islands of Indonesia. British Geological Survey, Overseas Directorate, Report No. MP/87/9/R, p. 1-51 + Appendices (Unpublished)

(text online at: <https://resources.bgs.ac.uk/PublicationPDFs/19799969.pdf>)

(maps online at: <https://resources.bgs.ac.uk/PublicationPDFs/19799970.pdf>)

(Extensive geochemical studies of Triassic- E Jurassic I-type and S-type granites on Bangka, Belitung and Riau islands (Singkep, Karimun, Kundur, Bintan, Batam, etc.))

Pitfield, P.E.J. (1987)- Geochemistry of the Tin Islands granites of Indonesia in relation to those of Peninsular Malaysia. *Warta Geologi* 13, p. 125-133.

(online at: <https://gsmpublic.files.wordpress.com/2014/09/ngsm1987003.pdf>)

(In Thai-Malay Peninsula two separate granite provinces established, separated by Raub-Bentong line suture: (1) Main Range granitoids (associated with 'Sibumasu' Lower Paleozoic shallow marine sequences) and (2) Eastern Province (C and E Belts) granitoids (associated with Permo-Triassic deeper water volcano-sedimentary sequences). Tin Islands of Indonesia largely fall in Permo-Triassic volcano-sedimentary terrain, but characteristics of granites variable. Comparisons of granitoids suggest S-ward extrapolation of Raub-Bentong line between Karimun (E Province type) and Kundur (Main Range type) along chain of isles comprising Merak gabbro. Further S it may pass through C Singkep Island between Dabo (E Province type) and unnamed Main Range pluton in SW Belitung seems to comprise largely E Province plutons)

Pitfield, P.E.J., E.J. Cobbing, M.C.G. Clarke, D.I.J. Mallick & L.H. Teoh (1987)- Granite provinces in the Southeast Asian Tin Belt. In: M.K. Horn (ed.) Trans. 4th Circum Pacific Energy and Mineral Resources Conference, Singapore 1986, p. 575-589.

(Four granite provinces delineated in SE Asia tin belt: (1) Eastern Province (I-type, Carboniferous- Triassic 200-280 Ma; volcanic arc, and 70-80 Ma), (2) Main Range (S-type, mainly Triassic, 200-230 Ma; syn-collisional), (3) N Thailand Migmatitic (S-type, Permo-Triassic; syn-collisional) and (4) Western (Peninsular Thailand- Burma, S and I-types, Cretaceous 82-98 and 130 Ma). E and C Belts of Peninsular Malaysia distinguished by Hutchison (1977), but are similar. Tin Islands of Indonesia part of E Province, Permo-Triassic. Widespread Cretaceous post-orogenic plutons, but not in Main Range and Tin Islands, and not associated with mineralization)

Pitfield, P.E.J., L.H. Teoh & E.J. Cobbing (1990)- Textural variation and tin mineralization in granites from the main range province of the Southeast Asian Tin Belt. Geological Journal 25, p. 419-429.

(Textural evolution from coarse K-feldspar megacrystic granite, through heterogeneous granite porphyry to microgranite corresponds to sequence of geochemical evolution)

Polhemus, D.A. (1996)- Island arcs, and their influence on Indo-Pacific biogeography. In: A. Keast & S.E. Miller (eds.) The origin and evolution of Pacific island biotas, New Guinea to eastern Polynesia: patterns and processes, SPB Academic Publishing, Amsterdam, p. 51-66.

Powell, C.M. & B.D. Johnson (1980)- Constraints on the Cenozoic position of Sundaland. Tectonophysics 63, p. 91-109.

(Old paper on India collision and evolution of Sundaland)

Powell, C. McA., B.D. Johnson & J.J. Veevers (1980)- Constraints on the positions of India, Australia and Southeast Asia since the Late Cretaceous. Proc. 5th Conference SE Asia Petroleum Exploration Society (SEAPEX V), Singapore, p. 82-89.

(Paleomagnetic data from Indochina, Malaysia and Kalimantan show similar declination at similar times, suggesting much of older continental nuclei of SE Asia acted as single continental block ('Sundaland') at least since ~80 Ma. Plate motions derived from continental paleomagnetism and seafloor spreading show continental Sundaland moved W-ward across wake of N-moving Greater India ~15 My ago (M Miocene) while at same time Australia moved N-ward across Sundaland 's wake)

Pusok, A.E. & D.R. Stegman (2020)- The convergence history of India-Eurasia records multiple subduction dynamics processes. Science Advances 6,19, eaaz8681, p. 1-8.

(online at: <https://www.science.org/doi/epdf/10.1126/sciadv.aaz8681>)

(Indian plate movement towards Eurasia in Cretaceous at fastest rates ever recorded. Two distinct pulses of fast motion, separated by noticeable slowdown. Arrival of Reunion mantle plume initiated intra-oceanic subduction zone, adding enough force to drive plates at anomalous speeds. The two-stage closure of double subduction system, including accretion of island arc at 50 Ma, led to protracted India-Eurasia collision)

Qian, X., S. Jin, Y. Wang, P.A. Cawood, Y. Yu, M. Udchachon, K.A. Mustapha, T.C. Sheldrick, Y. Zhang & C. Gan (2025)- Nature and tectonic setting of the Paleotethyan giant igneous belt in Southeast Asia. Gondwana Research 141, p. 228-245.

(Paleotethyan giant igneous belt records Late Paleozoic-Triassic history of Paleotethys Ocean subduction and consumption of oceanic crust. Subduction began in Late Carboniferous (~315 Ma) and continued until M Triassic (~240 Ma). Slab roll-back started after ~270 Ma (M Permian). Transition from subduction to initial continental collision from ~237 Ma (M-L Triassic boundary). Gravitational collapse of orogenic belt during Late Triassic with major phase at ~220 Ma (Norian), forming Central granite province)

Qasim, M., J. Ashraf, L. Ding, J.I. Tanoli, F. Cai, I.A. Abbasi & S.U.R.K. Jadoon (2024)- Rapid India-Asia initial collision between 50 and 48 Ma along the western margin of the Indian Plate: detrital zircon provenance evidence. Geosciences (MDPI) 14, 11, 289, p. 1-20.

(online at: <https://www.mdpi.com/2076-3263/14/11/289>)

(Combined U-Pb geochronological data and sandstone petrography from Fort Munro, Pakistan, along W margin of Indian Plate show uppermost Ghazij Fm with first evidence of <100 Ma zircons, attributed to northern source (Kohistan-Ladakh arc), after earlier constant older zircons provenance from India. Provenance shift from India to Asia also reflected in sandstone petrography. Provenance change attributed to onset of Asia-India collision along W part at ~50-48 Ma (Eocene), i.e. younger than collision ages reported from C and NW segments of Indian plate margin (70–59 Ma and 56 Ma, respectively))

Qiu, Y. & B. Zhang (2000)- Eastern extension of the Paleotethys in southern China. *Zhongguo Quyu Dizhi* (Regional Geology of China), Beijing, 19, 2, p. 175-180.

(E section of Paleotethys suture extends from Qinghai-Tibet to W Yunnan, S to Putong, Changning-Menglian, Uttarradit and Bentong-Raub, through Kalimantan (Kuching), Palawan, Luzon, Taiwan and Japan. Present 'U' shape of suture zone caused by N-moving Indian plate, S China Sea spreading and W-pushing Philippine Sea plate since 45 Ma. Restored Paleotethys suture oriented E-W from Late Cretaceous- Early Cenozoic)

Raes, N. & P.C. van Welzen (2009)- The demarcation and internal division of Flora Malesiana: 1857-present. *Blumea- Biodiversity, Evolution and Biogeography of Plants* 54, 1-3, p. 6-8.

(online at: <https://www.ingentaconnect.com/contentone/nhn/blumea/2009/00000054/f0030001/art00002>)

(Recent review of present-day plant geographic boundaries in 'Malesia' floristic region (= mainly the Indonesian Archipelago) since work of Zollinger (1857). Three floristic sub-regions, corresponding closely to plate tectonic evolution of the archipelago: (1) West (Sundaland continental region), (2) Central ('Wallacea', microplates between Wallace Line and Lydekker Line) and (3) East (Sahul Shelf- New Guinea)):

Rangin, C. (2016)- Rigid and non-rigid micro-plates: Philippines and Myanmar-Andaman case studies. *Comptes Rendus Geoscience* 348, 1, p. 33-41.

(online at: <https://comptes-rendus.academie-sciences.fr/geoscience/item/10.1016/j.crte.2015.10.008.pdf>)

(Philippine Mobile Belt complex tectonic zone composed of rigid rotating crustal blocks. In Myanmar, N-most tip of Sumatra-Andaman subduction system also complex zone of various crustal blocks in-between convergent plates, but sustaining internal deformation with platelet buckling, indicative of non-rigid behavior)

Raven, P.H. & D.I. Axelrod (1972)- Plate tectonics and Australasian paleobiogeography. *Science* 176, 4042, p. 1379-1386.

(On relationship between modern faunal- floral distributions and Australia- SE Asia plate tectonic history)

Rees, P.M., A.M. Ziegler, M.T. Gibbs, J.E. Kutzbach, P.J. Behling & D.B. Rowley (2002)- Permian phytogeographic patterns and climate data/model comparisons. *Journal of Geology* 110, 1, p. 1-31.

(online at: www.geo.arizona.edu/rees/2202-4.pdf)

(Global 'icehouse-hothouse' climate transition began during Permian. Reconstructions for two stages, Sakmarian (285-280 Ma) and Wordian/ Kazanian (267-264 Ma), integrating floral with lithological data to determine climates globally)

Ren, J., B. Niu, J. Wang, X. Jin, L. Zhao & R. Liu (2013)- Advances in research of Asian geology- a summary of 1:5M International Geological map of Asia project. *J. Asian Earth Sciences* 72, p. 3-11.

(Asia is composite continent consisting of three major cratons: Siberian, Indian and Arabian and three huge orogenic belts with minor cratons and microcontinents. Main body of Asian continent took its shape in Mesozoic. Main orogenic belts: Paleo-Asian, Tethyan and Pacific. Small cratons, like Sino-Korea, Yangtze, Tarim, and Sibumasu were on N margin of Gondwana before disappearance of Paleo-Asian Ocean. Ophiolites in Asia progressively younger from N to S, reflecting accretion of Asia by S-ward migration of orogenic belts. Large amounts of Mesozoic volcanic rocks in E Asian coastal areas mainly of Cretaceous age. Most Carboniferous- Permian volcanic rocks in C. Asia not arc volcanics, but product of extensional stage)

Ren, J., K. Tamaki, Sitian Li & J. Zhang (2002)- Late Mesozoic and Cenozoic rifting and its dynamic setting in Eastern China and adjacent areas. *Tectonophysics* 344, p. 175-205.

(On widespread Late Mesozoic and Cenozoic extension in E China and adjacent areas. First rift stage in Late Jurassic- E Cretaceous, second phase in NE Asia. Paleogene stage widespread continental rift systems and continental margin basins in E China (incl. S China Sea))

Rensch, B. (1936)- Die Geschichte des Sundabogens, eine tiergeographische Untersuchung. Borntraeger, Berlin, p. 1-318.

(‘The history of the Sunda Arc: a zoogeographic investigation’. Results of 1927 German biological ‘Rensch-Sunda Expedition’ to the Lesser Sunda Islands (Lombok, Sumbawa, Flores). Zoogeographic provinces, mainly of the W Indonesian region)

Replumaz, A., H. Karason, R.D. van der Hilst, J. Besse & P. Tapponnier (2004)- 4-D evolution of SE Asia’s mantle from geological reconstructions and seismic tomography. Earth Planetary Science Letters 221, p. 103-115.

(online at: https://www.researchgate.net/publication/46650371_4-D_evolution_of_SE_Asia%27s_mantle_from_geological_reconstructions_and_seismic_tomography)

(Reconstructions of SE Asia block motions from India to Taiwan since ~50 Ma from tomography of subducted lithosphere)

Rich, T.H. & G.C. Young (1996)- Vertebrate biogeographic evidence for connections of the east and southeast Asian blocks with Gondwana. In: Z.X. Li, I. Metcalfe & C.McA. Powell (eds.) Breakup of Rodinia and Gondwanaland and Assembly of Asia, Australian J. Earth Sciences 43, 6, p. 625-634.

(Fluctuating affinities between aquatic faunas of China and Australia in Devonian. Within S China Block similar endemic freshwater fish faunas on Yangtze and Huanan terranes demonstrate juxtaposition in mid-Paleozoic. Triassic tetrapod faunas of Australia quite distinct from China and Thailand)

Richards, J.P. (2015)- Tectonic, magmatic, and metallogenic evolution of the Tethyan orogen: from subduction to collision. Ore Geology Reviews 70, 4, p. 323-345.

(Review of tectonic, magmatic and metallogenic history of Tethyan orogen fromt Carpathians to Indochina, with focus on formation of porphyry Cu±Mo±Au deposits, the most characteristic mineral deposit type formed during both subduction and collisional processes in region)

Ricou, L.E. (1994)- Tethys reconstructed: plates, continental fragments and their boundaries since 260 Ma from Central America to Southeastern Asia. Geodinamica Acta 7, 4, p. 169-218.

(online at: <https://www.tandfonline.com/doi/epdf/10.1080/09853111.1994.11105266?needAccess=true>)

(Evolution with plate reconstructions of the former Tethys ocean since 260 Ma (Late Permian))

Ricou, L.E. (1995)- Tethys and transit plate patterns viewed against long-term periodicity of magnetic field reversals. Physics Earth Planetary Interiors 87, p. 255-265.

(On Tethyan pattern of transit plates between converging boundary in N and diverging boundary in S (repeatedly offset by S-ward shifts))

Ridd, M.F. (1971)- South East Asia as part of Gondwana. Nature 234, p. 531-533.

(Stratigraphic evidence in Thailand and Malaya suggest they were once joined with India (E Permian tilloids in Phuket Group of Thailand, etc., cratonic clastic source from W for Malay Peninsula and Thailand, detrital diamonds in Permian Phuket Gp of Thailand, etc.). India and SE Asia must have drifted N to collide with mainland Asia after break-up of Gondwanaland. ‘Interesting’ reconstruction)

Ridd, M.F. (1980)- Possible Palaeozoic drift of SE Asia and Triassic collision with China. J. Geological Society, London, 137, 5, p. 635-640.

(Paleozoic- E Mesozoic of Thai-Malay Peninsula provide evidence of subduction zone to E and, in Lower Paleozoic, cratonic sediment source to W. First paper to recognize separation of W Thai- Malay Peninsula from Gondwana in mid-Paleozoic and collision with mainland Asia in Late Triassic?)

Ridd, M.F. (2023)- SE Asia as part of Gondwana: a 1960s regional mapping project over Southern Thailand that lay behind the hypothesis. In: R.W.H. Butler et al. (eds.) Geological mapping of our world and others, Geological Society, London, Special Publ. 541, p. 329-346.

(BP reconnaissance geological mapping over S Thailand in 1960s threw new light on differences in Paleozoic succession between Upper and Lower Peninsula. Phuket Group of Upper Peninsula with thick diamictite-bearing succession of Devonian?- E Permian age and apparently sourced in W, suggesting possible Gondwana origin for SE Asia, a contentious concept at the time, but now widely accepted. Broad regional mapping projects such as BP's in Thailand may reveal important new stratigraphic and tectonic insights)

Rigby, J.F. (1998)- Upper Palaeozoic floras of SE Asia. In: R. Hall & J.D. Holloway (eds.) Biogeography and geological evolution of SE Asia, Backhuys Publishers, Leiden, p. 73-82.

(online at: http://searg.rhul.ac.uk/searg_uploads/2016/01/Rigby.pdf)

(Minor Carboniferous flora in Thailand and W Malaysia (including 'Kuantan flora'), probably similar to S China floras. More extensive Permian floras known from Thailand, Laos, W. Malaysia, Sumatra and Irian Jaya. All are 'Cathaysian' floras, but some floras from Thailand and Irian Jaya also contain Gondwanan Glossopteris)

Rigby, J.F. (1999)- Permian floras and palaeogeography with particular emphasis on Gondwanaland and the Tethyan margin. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 185-196

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)
(Review of Permian floral provinces and paleo-reconstructions. Glossopteris floras endemic to Gondwanaland, but penetrated into Cathaysian Gigantonuclea and Pecopteris floral domain in New Guinea and Thailand, suggesting Tethyan seaway not a major barrier to migration. Etc.)

Ringenbach, J.C., C. Clerc & E. Masini (2017)- Rifted margins structural variety, worldwide and in SE Asia. Exploration issues. Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017), EAGE, Kuala Lumpur, 43562, p. 184-188. *(Extended Abstract)*

Rong, J., A.J. Boucot, Y.Z. Su & D.L. Strusz (1985)- Biogeographical analysis of late Silurian brachiopod faunas, chiefly from Asia and Australia. Lethaia 28, 1, p. 39-60.

(Silurian shallow marine brachiopod Retziella Fauna known from SW Tienshan, China, N Vietnam and E Australia. Possibly also in N Korea, C Pamirs, Afghanistan and New Zealand (Sino-Australian Province). Coeval Tuvaella Fauna occurs only in S marginal belt of Siberian Plate (Mongolo-Okhotsk Province))

Ross, C.A. & J.R.P. Ross (1985)- Carboniferous and Early Permian biogeography. Geology (GSA) 13, 1, p. 27-30.

Rowley, D.B. (1992)- Reconstructions of the Circum-Pacific region. In: G.E.G. Westermann (ed.) The Jurassic of the Circum-Pacific, Cambridge University Press, p. 15-26.

Roy, A., N. Mandal & J. van Hunen (2024)- Dynamic evolution of competing same-dip double subduction: New perspectives of the Neo-Tethyan plate tectonics. Earth Planetary Science Letters 647, 119032, p.

(manuscript online at: <https://durham-repository.worktribe.com/output/3197430>)

(Models of (intra-oceanic) 'Same-dip double-subduction systems' offer insights into complex tectonic evolution of major Neo-Tethyan subduction zones, particularly the Indo-Eurasian and Andaman convergent systems, where multiple Cretaceous- E Tertiary intra-Neotethys subduction episodes were identified (Kohistan Arc, Andaman Arc, etc.))

Roy, B.C. (1974)- Geologie, ressources minerales et geophysique de l'Asie tropicale humide. In: Ressources naturelles de l'Asie tropicale humide, UNESCO, Paris, p. 93-129.

(online at: https://unesdoc.unesco.org/ark:/48223/pf0000010409_fre)

('Geology, mineral resources and geophysics of tropical humid Asia'. Broad overview of stratigraphy and mineral resources of SE Asia, by former Director of Geological Survey of India)

Roy, S.S. (1978)- Eastern Tethys and microplates framed in Himalayan, Central and Southeast Asian geology. In: P. Nutalaya (ed.) Proc. 3rd Regional Conference Geology and Mineral Resources SE Asia, GEOSEA III, Bangkok 1978, p. 165-172.

(Early version of SE Asian plates history)

Safonova, I. & S. Maruyama (2014)- Asia: a frontier for a future supercontinent Amasia. International Geology Review 56, 9, p. 1051-1071.

(online at: www.tandfonline.com/doi/pdf/10.1080/00206814.2014.915586)

(Review of tectonic blocks and continental growth of Asia and prediction of formation of future supercontinent 'Amasia' 200-250 Myrs from now)

Santini, F. & R. Winterbottom (2002)- Historical biogeography of Indo-Western Pacific coral reef biota: is the Indonesian region a centre of origin? J. of Biogeography 29, 29, p. 189-205.

(online at: https://www.academia.edu/2503326/Historical_biogeography_of_Indo_western_Pacific_coral_reef_biota_is_the_Indonesian_region_a_centre_of_origin)

(Most lineages of Indo-West Pacific marine fauna may have originated in western Indian Ocean, Australia, or SW Pacific, probably from lineages that remained isolated after breakup of Gondwanan supercontinent, or because of movement of island arcs)

Sato, T. (1975)- Marine Jurassic formations and faunas in Southeast Asia and New Guinea. In: T. Kobayashi & R. Toriyama (eds.) Geology and Palaeontology of Southeast Asia, University of Tokyo Press, 15, p. 151-189.

(Compilation of Jurassic fossils/ stratigraphy in SE Asia. Jurassic rel. rare. May be classified as (1) thick geosynclinal sequences in Sumatra, Timor and New Guinea; (2) marine calcareous facies with rich macrofaunas in E Sulawesi, Sula, Buru, Ceram and Misool; (3) marine clastic sediments with poor molluscs in W Thailand/ Burma, W Sarawak/NW Kalimantan, Laos, Cambodia, Vietnam, etc. and (4) Khorat Group continental red beds in NE Thailand- S Laos)

Sato, T. and CCOP Working Group (2000)- Geotectonic map of East and Southeast Asia: sheets 4, 5 and 6. CCOP-CPCEMR Geotectonic Map Project. CCOP, Technical Bulletin 27, p. 1-16.

(Geotectonic Map of E and SE Asia. Sheet 4: Philippines, Vietnam, S China, Sheet 5: Malaysia, W Indonesia, Sheet 6: E Indonesia)

Sato, T. and CCOP Working Group (2002)- Geotectonic map of East and Southeast Asia: sheets 1, 2, 3 and 8. CCOP-CPCEMR Geotectonic Map Project. CCOP, Technical Bulletin 31, p. 1-16.

(Tectonic maps E and SE Asia: Sheet 1: Shikhotse Alin, Korea, NE China, Japan), Sheet 2: C and S China, Taiwan, Ryukyu arcs), Sheet 3: S China, Indochina, Malaysia, Myanmar), Sheet 8: W Pacific Ocean. Also available in digital format)

Sautter, B. & M. Pubellier (2022)- Structural control of Mesozoic orogens on SE Asia Basin opening. J. Asian Earth Sciences 230, 105207, p. 1-20.

(Key review of SE Asia tectonics. Present continental margin of Sundaland developed alongside large magmatic arc active from Permian to M Cretaceous, subsequently stretched during Cenozoic. Rifting of Cenozoic basins of SE Asia triggered and conditioned by relaxation of orogens that assembled Sunda Plate in past)

Schellart, W.P., Z. Chen, V. Strak, J.C. Duarte & F.M. Rosas (2019)- Pacific subduction control on Asian continental deformation including Tibetan extension and eastward extrusion tectonics. Nature Communications 10, 4480, p. 1-15.

(online at: <https://www.nature.com/articles/s41467-019-12337-9.pdf>)

(India-Asia collision caused extensive intraplate deformation in Asia. Synchronous interaction of collision and subduction zones explain Asian deformation. E-ward continental extrusion and Asian backarc basin formation controlled by large-scale Pacific and Sunda slab rollback. Indentation and rollback produce ~260-360 km of E-ward extrusion and large-scale clockwise upper mantle circulation from Tibet to E Asia and back to India)

Schellart, W.P. & G.S. Lister (2005)- The role of the East Asian active margin in widespread extensional and strike-slip deformation in East Asia. *J. Geological Society, London* 162, p. 959-972.

(Most of E Asia Cenozoic deformation not extrusion tectonics, but back-arc extension caused by E-ward rollback of subducting slab along E Asian active margin and collapse of overriding plate towards retreating hinge-line. Extension took place along ~7400 km long stretch of E Asian margin during most of Cenozoic)

Schuster, R.M. (1972)- Continental movements, “Wallace’s Line” and Indomalayan-Australasian dispersal of land plants: some eclectic concepts. *The Botanical Review* 38, 1, p. 3–86.

(Early review of history of development of the extremely diverse land plant floras of SE Asia and adjacent regions, mainly as result of continental drift/ plate tectonic evolution and ensuing migration pathways)

Schwan, W. (1985)- The worldwide active Middle/Late Eocene geodynamic episode with peaks at ± 45 and ± 37 Mybp, and implications and problems of orogeny and sea-floor spreading. *Tectonophysics* 115, p. 197-234.

(Numerous tectonic events globally in M-L Eocene at ~45 Ma and ~37 Ma, suggesting major reorganization in plate tectonic pattern. (not much specifically on SE Asia, but may be relevant; JTvG)

Scotese, C. (2001)- Atlas of Earth History, PALEOMAP Project, University of Texas, Arlington, p. 1-52.

(Atlas of global plate and paleogeographic reconstructions for 20 time periods from 650 Ma- Recent. For SE Asia major source was Hutchison (1989))

Scotese, C.R., A.J. Boucot & W.S. McKerrow (1999)- Gondwanan palaeogeography and palaeoclimatology. *J. African Earth Sciences* 28, p. 99-114.

(Reconstructions of Gondwana with interpreted paleoclimates from Late Ordovician-Cretaceous)

Scotese, C.R. & R.P. Langford (1995)- Pangea and paleogeography of the Permian. In: P.A. Scholle et al. (eds.) *The Permian of Northern Pangea*. Springer, Berlin, p. 3-19.

Searle, M.P. (2019)- Timing of subduction initiation, arc formation, ophiolite obduction and India–Asia collision in the Himalaya. In: P.J. Treloar & M.P. Searle (eds) *Himalayan tectonics: A modern synthesis*, Geological Society London, Special Publications 483, p. 19-37.

(online at: https://www.researchgate.net/publication/327604556_Timing_of_subduction_initiation_arc_formation_ophiolite_obduction_and_India-Asia_collision_in_the_Himalaya)

(Reconstruction of W Himalaya requires three subduction systems operating beneath Spong arc, Dras-Kohistan arc and Asian continent during Late Cretaceous–Paleocene. Final closure of Neo-Tethys in E Eocene. Etc.)

Searle, M.P., L.J. Robb & N.J. Gardiner (2016)- Tectonic processes and metallogeny along the Tethyan mountain ranges of the Middle East and South Asia (Oman, Himalaya, Karakoram, Tibet, Myanmar, Thailand, Malaysia). In: J. Richards (ed.) *Tectonics and metallogeny of the Tethyan orogenic belt*, Soc. Economic Geologists (SEG), Special Publ. 19, Chapter 12, p. 301-327.

(Genesis of mineral deposits in Tethyan collision zones of Asia, in: (1) oceanic crust (hydrothermal Cu-Au; Fe, Mn nodules) and mantle (Cr, Ni, Pt), in ophiolite complexes around Arabia/India- Asia collision (Oman, to Myanmar, Andaman Islands); (2) island arcs and ancient subduction complexes (VMS Cu-Zn-Pb), in Dras-Kohistan arc (Pakistan) and arc complexes along Myanmar-Andaman segment; (3) Andean-type margins (Cu-Au-Mo porphyry; epithermal Au-Ag) in Jurassic-Eocene Transhimalayan ranges and Myanmar; (4) continent-continent collision zones prominent along Myanmar-Thailand-Malaysia Sn-W granite belts, less common along Himalaya. Mogok metamorphic belt of Myanmar known for gemstones associated with regional high T metamorphism (ruby, spinel, sapphire, etc))

Sengor, A.M.C. (1979)- Mid-Mesozoic closure of Permo-Triassic Tethys and its implications. *Nature* 279, 5714, p. 590-593.

(First definition of the Cimmerian continent as thin and very long continental strip between Paleotethys and Neo-Tethys suture zones (in SE Asia called Sibumasu; JTvG))

- Sengor, A.M.C. (1984)- The Cimmeride orogenic system and the tectonics of Eurasia. Geological Society of America (GSA), Special Paper 195, p. 1-74.
(Major review of plate tectonic history of the Alpine- Himalayan system, which is product of obliteration of the Tethys Ocean. During E-M Mesozoic Tethyan domain consisted of two oceans, separated by string of continents called Cimmerian continent, which had begun separating from N margin of Gondwanaland in Triassic (although rifting in E-most parts had begun earlier). N of Cimmerian continents was Paleo-Tethys, S of it was Neo-Tethys. Closure of Paleo-Tethys formed Cimmerides (Carpathians- Caucasus-Tibet to E Sulawesi), closure of Neotethys formed the Alpides)
- Sengor, A.M.C. (1985)- The story of Tethys: how many wives did Okeanos have? Episodes 8, 1, p. 3-12.
(online at: www.episodes.co.in/www/backissues/81/ARTICLES--3.pdf)
(Tethys ocean is ancestral sea out of which Alpine-Himalayan mountain ranges grew. The main Tethys had formed until Triassic, but older Tethys (Paleo-Tethys) existed, the closure of which formed Cimmeride orogenic system, which is distinct from, but largely overprinted by Alpidic orogenic system, which is product of demise of 'classical Tethys' (Neo-Tethys))
- Sengor, A.M.C. (1985)- Die Alpiden und die Kimmeriden: Die verdoppelte Geschichte der Tethys. Geologische Rundschau 74, 2, p. 181-213.
(Similar to Sengor (1986) below. Repeated episodes of Tethyan Ocean closing: Paleotethys closed by accretion of Cimmerides terranes, Neotethys by accretion of Alpidic terranes)
- Sengor, A.M.C. (1986)- The dual nature of the Alpine-Himalayan system: Progress, problems and prospects. Tectonophysics 127, 3, p. 177-195.
(Alpine-Himalayan system interpreted as places where two independent Tethyan ocean complexes (Palaeo- and Neo-Tethys) vanished during Permo-Carboniferous- E Cretaceous and late Cretaceous- Present respectively. Older orogen is called Cimmerides, younger Alpides. Cimmerides, together forming Tethysides)
- Sengor, A.M.C. (1987)- Tectonics of the Tethysides: orogenic collage development in a collisional setting. Annual Review Earth Planetary Sciences 15, p. 213-244.
(Review of plate tectonic history of the Alpine- Himalayan- Indonesian mountain ranges since Late Paleozoic)
- Sengor A.M.C. (1992)- The Palaeo-Tethyan suture: a line of demarcation between two fundamentally different architectural styles in the structure of Asia. Island Arc 1, 1p. 78-91.
(Paleo-Tethyan suture separates regions characterized by two different tectonic styles in Tethysides. N of suture (Iran, Turkmenistan, Afghanistan, Tadjikistan, Kirgizstan, Uzbekistan, Kazakhstan large parts of Russia and China), orogenic development characterized by large subduction-accretion complexes developed since Late Proterozoic. S of Paleo-Tethyan suture, orogeny characterized by Sumatra- or Andean-type continental margin arc that in places became island arc by back-arc basin rifting and later collided with Atlantic continental margin to create Alpine- or Himalayan-type orogenic belts. Paleo-Tethyan suture is line across which rate of continental enlargement by subduction-accretion changed dramatically. Rel. little on SE Asia)
- Sengor A.M.C. (1998)- Die Tethys: vor hundert Jahren und heute. Austrian J. Earth Sciences (Mitteilungen Österreichischen Geologischen Gesellschaft) 89 (1996), p. 5-177.
(online at: https://www.zobodat.at/pdf/MittGeolGes_89_0005-0177.pdf)
('The Tethys: hundred years ago and today'. Extensive historic review of discovery and development of interpretations of Tethys Ocean(s). Includes chapter (p. 104-114) on contributions to tectonic understanding of mountain building by the Dutch 'heroes' geologists working in Indonesia between 1900-1940, particularly Molengraaff, Brouwer, Wing Easton, Smit Sibinga, who were early supporters of 'mobilism', i.e. Wegener's continental drift hypothesis)
- Sengor, A.M.C., D. Altiner, A. Clin, T. Ustaosmer & K.J. Hsu (1988)- Origin and assembly of the Tethyside orogenic collage at the expense of Gondwana Land. In: M.G. Audley-Charles & A. Hallam (eds.) Gondwana and Tethys, Geological Society, London, Special Publ. 37, p. 119-181.

(Major review of plate tectonic history of the Alpine- Himalayan- Indonesian mountain ranges since Late Paleozoic. Mainly on mainland S Asia)

Sengor, A.M.C., D. Altiner, C. Zabcı, G. Sunal, N. Lom, E. Aylan & T. Oner (2023)- On the nature of the Cimmerian continent. *Earth-Science Reviews* 247, 104520, p. 1-145.

(online at: <https://www.sciencedirect.com/science/article/pii/S001282522300209X>)

(Cimmerian Continent (first proposed by Sengor, 1979) is narrow continental strip that rifted from NE Gondwanaland mostly during Permian, from Balkan regions to Indonesia. Collided with Laurasian margin between latest Triassic and Late Jurassic. Cimmerian Continent did not leave Gondwana in one piece, but submarine platforms in Turkey, and what is here called the Greater Lhasa (from Afghanistan to Myanmar) began separating both from Gondwana-Land and from rest of Cimmerian continent around same time in Permian. North part of Cimmerian continent remained a large, island arc-type ribbon continent from Turkey to Malaysia (Rhodope-Pontide Fragment in Turkey, most of Transcaucasia and Iran, Farah, W Qiangtang, Bao-Shan, Myanmar Shan States/W Thailand/W Malaysia blocks). This coherent 'ribbon continent' was almost wholly an ensialic arc; N margin of Cimmerian Continent Pacific-type arc. Many oceanic basins that opened within and behind Cimmerian Continent (incl. Neo-Tethys) were back-arc basins and Cimmerian continent had serpentine motion as it traversed Tethyan realm. Cimmerian continent also had complex internal tectonics.(see p. 123- 125: for SE Asian Cimmerides, but virtually nothing on Indonesia Sumatra and beyond?- JTVG)).

Sengor, A.M.C. & S. Atayman (2009)- The Permian extinction and the Tethys: an exercise in global geology. Geological Society of America (GSA), Special Paper 448, p. 1-85.

(End-Permian faunal extinctions may be consequence of sealing off of Paleo-Tethys ocean from Panthalassa by land bridge formed from Cimmerian Continent, Cathaysian and Manchuride orogenic collages and Tuva-Mongol fragment of eastern Altaids. Limited Late Permian water exchange between Paleo-Tethys and Panthalassa and Neo-Tethyan rifts, starting anoxia in Paleo-Tethys)

Sengor, A.M.C., S. Atayman & R. Presnell (2008)- Paleo-Tethys, Permian extinction, and stratabound copper-sulfide deposits of the Cimmerides. In: J.E. Spencer & S.R. Titley (eds.) *Ores and orogenesis: Circum-Pacific tectonics, geologic evolution and ore deposits*, Arizona Geological Society Digest 22, p. 19-30.

Sengor, A.M.C., A. Cin, D.B. Rowley & S. Nie (1991)- Magmatic evolution of the Tethysides. *Palaeogeogr. Palaeoclim. Palaeoecology* 87, p. 411-440.

(Five maps showing spatial and temporal evolution of magmatic activity along Tethysides for: (1) late Carboniferous- Permian; (2) Triassic- E Jurassic; (3) M Jurassic-early Cretaceous; (4) late Cretaceous-early Cenozoic and (5) late Cenozoic-present)

Sengor, A.M.C., A. Cin, D.B. Rowley & S.Y. Nie (1993)- Space-time patterns of magmatism along the Tethysides: a preliminary study. *Journal of Geology* 101, 1, p. 51-84.

(Five maps of magmatism along the Tethysides for: Late Carboniferous and Permian (320-248 Ma), Triassic and Early Jurassic (247-188 Ma), Middle Jurassic-Early Late Cretaceous (187-98 Ma), early Late Cretaceous-early Cainozoic (97-25 Ma), and late Cainozoic (24-0 Ma))

Sengor, A.M.C. & K.J. Hsu (1984)- The Cimmerides of Eastern Asia: history of the eastern end of Palaeo-Tethys. *Memoires Societe Geologique France* 17, p. 139-167.

Sengor, A.M.C. & B.A. Natalin (1996)- Palaeotectonics of Asia, fragments of a synthesis. In: A. Yin & T.M. Harrison (eds.) *Tectonic evolution of Asia*, Cambridge University Press, p. 486-640.

Setchell, W.A. (1930)- The Wallace and Weber lines: a suggestion as to climate boundaries. *Proc. 4th Pacific Science Congress, Java 1929, III*, p. 311-321.

Seton, M. & R.D. Muller (2008)- Reconstructing the junction between Panthalassa and Tethys since the Early Cretaceous. In: J.E. Blevin et al. (eds.) *Eastern Australasian basins symposium III, Energy security for the 21st century*, Sydney, Petroleum Exploration Society Australia (PESA), Special Publ., p. 263-266.

(online at: https://www.researchgate.net/publication/232095770_Reconstructing_the_junction_between_Panthalassa_and_Tethys_since_the_Early_Cretaceous)
(Series of plate reconstructions of now mostly vanished oceanic plates (Eastern Neotethys, Junction Plate, etc.) between Australia and Eurasia since 140 Ma)

Seton, M., R.D. Muller, S. Zahirovic, C. Gaina, T. Torsvik, G. Shephard, A. Talsma, M. Gurnis, M. Turner, S. Maus & M. Chandler (2012)- Global continental and ocean basin reconstructions since 200 Ma. *Earth-Science Reviews* 113, p. 212-270.

(online at: https://www.earthbyte.org/Resources/Pdf/Seton_etal_Global_Plate_Model_ESR2012.pdf)
(Major review of ocean basins evolution, incl. Indian Ocean and Tethys)

Sewell, R.J., A. Carter & M. Rittner (2016)- Middle Jurassic collision of an exotic microcontinental fragment: Implications for magmatism across the Southeast China continental margin. *Gondwana Research* 38, p. 304-313.

(Major deformation event in Hong Kong between 164-161 Ma (M-L Jurassic) linked to collision of microcontinent along SE China continental margin. Accreted terrane zircon age spectra close affinities to sources along N Gondwana margin. Collision of exotic terrane and subduction rollback, hastened foundering of postulated flat slab beneath SE China, leading to widespread igneous event at 160 Ma)

Shahabpour, J. (2009)- Analogous tectonic evolution of the Tethyan and SE Asian regions. *Iranian J. Science and Technology, Transactions A*, 33, A1, p. 57-64.

(Similar tectonic histories in W Tethys and SE Asia of microcontinents rifting off Gondwana in Devonian-Permian and collisions with Eurasia in Late Triassic, etc.)

Shaw, R.D. (1997)- Some implications of Eurasian and Indo-Australian plate collision on the petroleum potential of Tertiary intracratonic basins of Southeast Asia. In: J.V.C. Howes & R.A. Noble (eds.) *Proc. Int. Conference Petroleum Systems of SE Asia & Australia*, Jakarta 1997, Indonesian Petroleum Association (IPA), p. 63-80.

(Extensive intra-cratonic rift system within intra-cratonic SE Asia, with >70 Tertiary basins from N Thailand across Gulf of Thailand, SE-wards to Natuna Ridge. It includes significant hydrocarbon provinces (Malay, W Natuna, Pattani, Phitsanulok) and represents transtension along major faults and suture zones. Most rift basins affected by subsequent Miocene and Pliocene transpressional deformation. Onset of rifting tied to Eocene start of India- Eurasia plates collision)

Shen, S.Z. & G.R. Shi (2000)- Wuchiapingian (early Lopingian, Permian) global brachiopod palaeobiogeography: a quantitative approach. *Palaeogeogr. Palaeoclim. Palaeoecology* 162, 3-4, p. 299-318.

(Late Permian brachiopods five marine biotic province: Cathaysian (tropical), W Tethyan (tropical), Himalayan (warm temperate), Austrazean (cold temperate) and Greenland-Svalbard (cold temperate). Also Cimmerian biogeographical region from Middle East through Afghanistan and Himalayas SE to Shan-Thai terrane and Timor, typified by mix of genera of both Cathaysian and Gondwanan affinities)

Shen, S.Z. & G.R. Shi (2004)- Capitanian (Late Guadalupian, Permian) global brachiopod palaeobiogeography and latitudinal diversity pattern. *Palaeogeogr. Palaeoclim. Palaeoecology* 208, p. 235-262.

(Six paleogeographic provinces based on M Permian brachiopods: (A) Greenland-Svalbard (Arctic region), (B) Grandian (W North America), (D) Cathaysian (Paleotethys and Mesotethys), (F) Austrazean (E Australia- New Zealand), and two transitional zones (C) Sino-Mongolian-Japanese (N temperate zone) and (E) Himalayan (S temperate zone) Province. West Timor Aileu-Maubisse assemblages grouped with Lhasa, Chitichun and Zhongba assemblages of S Tibet and Salt Range (Pakistan) in 'Himalayan Province')

Shen, S.Z., H. Zhang, Q.H. Shang & W.Z. Li (2006)- Permian stratigraphy and correlation of Northeast China: a review. *J. Asian Earth Sciences* 26, p. 304-326.

(Review of Permian successions and fossils in NE China. Dominated by brachiopods, fusulinids and land plants, with limited ammonoids, conodonts and bivalves. Guadalupian (M Permian) in Manchuride, Altaid and Yanbian

Belts with bi-temperate Roadian- E Wordian Monodioxodina fauna and late Wordian- Capitanian Codonofusiella- Schwagerina or Neoschwagerina-Yabeina faunas)

Shen, S.Z., H. Zhang, G.R. Shi, W.Z. Li, J.F. Xie, L. Mu & J.X. Fan (2013)- Early Permian (Cisuralian) global brachiopod palaeobiogeography. *Gondwana Research* 24, p. 104-124.

(Three paleolatitude-related brachiopod paleobiogeographic realms in E Permian. Six provinces distinguished in Asselian: Faunas from Gondwana not well differentiated at province level and form Indoralian province. From Sakmarian large transition zone (S Transitional Zone) between Paleoequatorial and Gondwanan Realms formed, with Austrazean province (E Australia- New Zealand) in E margin of Gondwanaland, contemporaneous with peak of Late Paleozoic Ice (Sakmarian Eurydesma- Bandoproductus-Cimmeriella assemblage, followed by Stereochia, Kasetia, Dyschrestia and Spiriferella faunas). Large Cathaysian province stretching from S China, Iran in W Palaeotethys to Mongolian continent in N. In E Permian cluster analyses Timor group brachiopods closest to Baoshan block in Group D (Southern Transition Zone, with links to paleoequatorial))

Sheng, J.Z. & Y.G. Jin (1994)- Correlation of Permian deposits in China. *Palaeoworld* 4, p. 14-113.

Shi, G.R. (1998)- Aspects of Permian marine biogeography: a review on nomenclature and evolutionary patterns, with particular reference to the Asian- Western Pacific region. In: Y. Jin. et al. (eds.) *Permian stratigraphy, environments and resources* 2, *Palaeoworld* 9, p. 97-112.

Shi, G.R. (2001)- Possible influence of Gondwanan glaciation on low-latitude carbonate sedimentation and trans-equatorial faunal migration: the Lower Permian of South China. In: IGCP Project No. 411 on the Geodynamic Processes of Gondwanaland-derived Terranes in Eastern Asia, *Geosciences Journal* 5, 1, p. 57-63.
(Early Permian from S China Block with mixed Cathaysian and cold-water Gondwanan brachiopod taxa, widespread rosettes of calcite prisms ('Chrysanthemum stones') and lack of significant reef buildups, suggesting cold water influence in paleo-equatorial S China in E Permian (but ample paleomag data for equatorial setting?). Possibly upwelling of cold water along W coast of S China terrane during E Permian)

Shi, G.R. & N.W. Archbold (1995)- A quantitative analysis on the distribution of Baigendzhinian- Early Kungurian (Early Permian) brachiopod faunas in the western Pacific region. *J. Southeast Asian Earth Sciences* 11, 3, p. 189-205.

(Cluster analysis of distribution of 222 species of E Permian brachiopods from 25 localities across E Asia- Australia suggest 6 bioprovinces. In SE Asia two provinces (both sub-provinces of Cimmerian terranes): (1) Group B, Shan-Tai/ Sumatra/ W Papua Birds Head (warm temperate to S-subtropical; with Stereochia-Stictozoster) and (2) Group C, Himalayan/ Lhasa/ Timor (S-temperate; with Reedoconcha, Callytharella; also fusulinid Monodioxodina). Notable conclusions: Timor (Maubissee) was southern extension of Lhasa terrane, W Thailand most similar to Birds Head, Sumatra Jambi and Padang faunas similar and grouped with Shan Tai)

Shi, G.R. & N.W. Archbold (1995)- Palaeobiogeography of Kazanian-Midian (Late Permian) western Pacific brachiopod faunas. *J. Southeast Asian Earth Sciences* 12, p. 129-141.

(W Timor transitional Cimmerian province between Cathaysian and Gondwanan Realms in M Permian)

Shi, G.R. & N.W. Archbold (1998)- Permian marine biogeography of SE Asia. In: R. Hall & J.D. Holloway (eds.) *Biogeography and geological evolution of SE Asia*, Backhuys Publishers, Leiden, p. 57-72.

(Three main Permian biotic provinces in SE Asia: Cathaysian (Simao, Indo-China, E Malaya), Sibumasu (Shan-Tai, Tengchong, Baoshan, W Malaysia, NE Sumatra; until Late Midian when joined Cathaysian province) and short-lived Sakmarian-Asselian Indoralian province)

Shi, G.R., N.W. Archbold & M. Grover (eds.) (1998)- Strzelecki International Symposium on Permian of Eastern Tethys: biostratigraphy, palaeogeography and resources. *Proc. Royal Society of Victoria*, Melbourne, 110, p. 1-480.

Shi, G.R., N.W. Archbold & L.P. Zhan (1995)- Distribution and characteristics of mixed (transitional) mid-Permian (Late Artinskian-Ufimian) marine faunas in Asia and their palaeogeographical implications. *Palaeogeogr. Palaeoclim. Palaeoecology* 114, p. 241-271.

(Asia Permian marine biogeography 3 realms: Boreal, Tethyan and Gondwanan. In early E Permian sharp biogeographical boundaries, due to Gondwanan glaciation. In M Permian two transition zones with mixed faunas: (1) North (N China, Japan, etc.), with warm Cathaysian and temperate Boreal genera, (2) South (Arabia, Iran, Shan-Tai, Timor, W Irian Jaya, etc.) with both Gondwanan and Cathaysian elements. Both transition zones have anti-tropically distributed genera like Monodiexodina, Lytvolasma and Spiriferella and are succeeded by Late Permian tropical Tethyan faunas. Timor brachiopods from Sakmarian Maubisse Fm similar to W. Australia, Bitauani late E Permian assemblage mixed Gondwana-Tethyan elements, Late Permian Basleo fauna is 'Tethyan' subtropical-tropical)

Shi, G.R. & T.A. Grunt (2000)- Permian Gondwana-Boreal antitropicality with special reference to brachiopod faunas. *Palaeogeogr. Palaeoclim. Palaeoecology* 155, p. 239-263.

(Permian marine antitropicality (genera from Boreal and Gondwanan Realms but absent in Paleoequatorial Realm) reported from most marine pelagic or benthic invertebrate groups, suggesting biotic interchanges between Gondwanan and Boreal Realms. Possible migration pathways and mechanisms reviewed: 'stepping-stone' migration via islands in E Paleotethys, migration along W coast of Paleotethys, etc.)

Shi, G.R. & J.B. Waterhouse (1990)- Sakmarian (Early Permian) brachiopod biogeography and constraints on the timing of tectonic rifting, drift and amalgamation in SE Asia, with reference to the nature of Permian 'Tethys'. *Pacific Rim 90 Congress*, p. 271-276.

Shi, G.R., J.B. Waterhouse & S. McLoughlin (2010)- The Lopingian of Australasia: a review of biostratigraphy, correlations, palaeogeography and palaeobiogeography. *Geological Journal* 45, 2-3, p. 230-263.

(Distribution of Lopingian (Late Permian) strata and biota in Australia, New Zealand, Timor and New Caledonia, with new paleogeographic reconstruction. In New Zealand Lopingian beds in several terranes, mainly representing displaced segments of volcanic arcs, fore-arc basins and accretionary complexes, originally located near NE Australia on convergent margin. Most non-marine successions in E Australia rich in coal. Marine Lopingian of W Australia and Timor dominated by carbonates with sparse siliciclastic sediments and volcanoclastics, accumulated in large basin on passive and rifted continental margin, sharing many shallow-marine invertebrate species with Himalayan region of Nepal, S Tibet and N India)

Shi, X., J. Kirby, C. Yu, A. Jimenez-Diaz & J. Zhao (2017)- Spatial variations in the effective elastic thickness of the lithosphere in Southeast Asia. *Gondwana Research* 42, p. 49-62.

(Maps of spatial variations of Effective elastic thickness for SE Asia from coherence of topography and Bouguer gravity anomaly data. Results suggest E Borneo may share similar crustal basement, and represent broad tectonic zone of destroyed Mesotethys Ocean extending from W-C Java, through E Borneo to N Borneo. Indosinian suture between Indochina and Sibumasu may extend further SE across Billiton to offshore SE Borneo, and Singapore platform and SW Borneo may belong to same block)

Shu, L., M. Faure, B. Wang, X. Zhou & B. Song (2008)- Late Palaeozoic-Early Mesozoic geological features of South China: response to the Indosinian collision events in Southeast Asia. *Comptes Rendus Geoscience* 340, 2, p. 151-165.

(Late Permian- E Triassic collision of S China- Indosinian blocks along Song Ma-Menglian suture closed Paleo-Tethys Ocean, caused folding and thrusting and granitic magmatism in S China Block (SCB). E and C parts of SCB SW-dipping paleoslope in Late Paleozoic-Early Mesozoic. Ophiolitic melanges of E SCB formed in Neoproterozoic, not Permian or Triassic (Neoproterozoic oceanic relics with Proterozoic acritarchs). M-U Triassic granitoids (235-205 Ma) belong to post-collision peraluminous S-type granites)

Shu, L.S., X.M. Zhou, P. Deng, B. Wang, S.Y. Jiang, J.H. Yu & X.X. Zhao (2009)- Mesozoic tectonic evolution of the Southeast China Block: new insights from basin analysis. *J. Asian Earth Sciences* 34, p. 376-391.

(On SE China Block two types of Mesozoic basins (1) Late Triassic- E Jurassic post-Indosinian orogenic basins and (2) M Jurassic- Cretaceous intracontinental extensional graben and half-graben basins. Modern basin and range framework was settled down in Cretaceous. In Late Triassic–Early Jurassic sediment source areas were to N and NE of outcrop region)

Silberling, N.J. (1985)- Biogeographic significance of the Upper Triassic bivalve *Monotis* in Circum-Pacific accreted terranes. In: D.G. Howell (ed.) Tectonostratigraphic terranes of the Circum-Pacific region, Circum-Pacific Council Energy and Mineral Resources, Houston, p. 63-70.

(Five biogeogeographic areas in Circum-Pacific region, based on Late Triassic thin-shelled bivalve Monotis. In SE Asia: (1) Bipolar fauna C (Monotis subcircularis + Eomonotis + Entomonotis ochotica) in E Asia, Japan, NW Borneo; (2) Fauna E (Monotis salinaria) in Tethyan rocks of Alpine- Himalayan belt and Banda Sea region (Timor, Seram?))

Silver, E.A. & R.B. Smith (1983)- Comparison of terrane accretion in modern Southeast Asia and the Mesozoic North American Cordillera. *Geology (GSA)* 11, p. 198-202.

(Indo-Pacific region from Tonga Trench to E Indonesia proposed as analog with tectonic setting of North American Cordillera, which is also composed of numerous suspect terranes)

Simpson, G.G. (1977)- Too many lines; the limits of the Oriental and Australian zoogeographic regions. *Proc. American Philosophical Society* 121, p. 107-120.

(Critical discussion of the multiple proposed biogeographic boundaries between Oriental/Asian and Australian zoogeographic regions (Muller Line, Wallace Line, Murray Line, Huxley Line, Weber Line, Lydekker Line, etc.))

Smith, A.B. (1988)- Late Palaeozoic biogeography of East Asia and palaeontological constraints on plate tectonic reconstructions. *Philosophical Transactions Royal Society London, A*, 326, p. 189-227.

(Biogeographic patterns of Carboniferous- Permian rugose corals of E Asia. In Carboniferous Cathaysian region one cohesive block (N and S China, Tarim, Kunlun, Qiangtang terranes), lying tropically or subtropically, biotically isolated from C Asia. S boundary of Cathaysian region does not coincide with single suture, nor sharply defined: gradual faunal impoverishment S-ward across Tibetan Plateau, implying faunal ranges controlled by prevailing climate, not by geographical barrier ('Paleotethys'). Region formed part of Gondwanaland craton, extending into tropical latitudes until separation in late Lower Permian)

Srivastava, A.K. & D. Agnihotri (2010)- Dilemma of Late Palaeozoic mixed floras in Gondwana. *Palaeogeogr. Palaeoclim. Palaeoecology* 298, p. 54-69.

(Carboniferous and Permian plant assemblages of N and S hemispheres distributed in four floral provinces. Mixed M and U Permian Cathaysian- Gondwanan floras from margins of Paleo-Tethys, i.e. New Guinea, Tibet, Kashmir, Oman, Jordan, etc. No clear explanation)

Srivastava, A.K., V.A. Krassilov & D. Agnihotri (2010)- Peltasperms in the Permian of India and their bearing on Gondwanaland reconstruction and climatic interpretation. *Palaeogeogr. Palaeoclim. Palaeoecology* 310, p. 393-399.

(First find of peltasperms in Permian of Gondwana, in Lower Permian Barakar Fm of Satpura Basin, C India, where they co-occur with diverse glossopterids. These are dominant group of N American- European arboreal vegetation and suggest floristic exchanges between Laurasia and Gondwana. Satpura occurrence assigns Indian subcontinent to low-latitude zone of mixed Laurasian/Gondwanan floristic assemblages)

Stait, B. & C. Burrett (1987)- Biogeography of Australian and Southeast Asian Ordovician nautiloids. In: G.D. McKenzie (ed.) *Gondwana Six: stratigraphy, sedimentology and paleontology*, American Geophysical Union (AGU), Geophysical Monograph 41, p. 21-28.

(E Ordovician faunas of SE Asia Sibumasu plate similar to those of Canning Basin, NW Australia)

Stampfli, G.M. (2000)- Tethyan Oceans. In: E. Bozkurt et al. (eds.) *Tectonics and magmatism in Turkey and the surrounding area*. Geological Society, London, Special Publ. 173, p. 1-23.

(Ordovician- Permian plate reconstructions of early Tethyan oceans (focused on W Tethys). Paleotethys opened in Ordovician-Silurian, with detachment of ribbon-like Hun Superterrane along Gondwana margin. Neotethys opened from Late Carboniferous- late E Permian from Australia- E Mediterranean, with drifting of Cimmerian superterrane and final closing of Paleotethys in M Triassic. N-ward subduction of Paleotethys triggered opening of back-arc oceans along Eurasian margin. Some closed during Eocimmerian collisional event, others stayed open and their delayed subduction induced opening of younger back-arc oceans (Black Sea, etc.). Subduction of Neotethys mid-ocean ridge responsible for major change in Jurassic plate tectonics)

Stampfli, G.M. & G.D. Borel (2002)- A plate tectonic model for the Paleozoic and Mesozoic constrained by dynamic plate boundaries and restored synthetic oceanic isochrons. *Earth Planetary Science Letters* 196, p. 17-33.

(online at: <https://www.sciencedirect.com/science/article/pii/S0012821X0100588X>)

(Ordovician- Cretaceous reconstructions of greater Tethyan realm)

Stampfli, G.M., C. Hochard, C. Verard, C. Wilhem & J. von Raumer (2013)- The formation of Pangea. *Tectonophysics* 593, p. 1-19.

(New Neoproterozoic- Triassic global reconstructions, with latest Neoproterozoic creation of Gondwana, Devonian opening of Paleotethys, Carboniferous Variscan orogeny along W Paleotethys and creation of Pangea super-continent. E of Spain Paleotethys remained open until Triassic, subducting N under Laurasia. Rollback of Paleotethyan slabbed caused Permian rifts/ backarc basins, some becoming oceanized in Triassic. End-Triassic breakup of Pangea and opening of Alpine- Tethys oceanic seaways)

Stauffer, P.H. (1974)- Malaya and Southeast Asia in the pattern of continental drift. *Bull. Geological Society Malaysia* 7, p. 89-138.

(online at: <https://gsmpubl.files.wordpress.com/2014/09/bgsm1973026.pdf>)

(Review of early plate tectonic models of SE Asia)

Stauffer, P.H. (1978)- Anatomy of the Australasian tektite strewnfield and the probable site of its crater. In: P. Nutalaya (ed.) *Proc. 3rd Regional Conference Geology and Mineral Resources of SE Asia (GEOSEA III)*, Bangkok, p. 285-289.

(Most likely location of Pleistocene impact crater that created large tektite fields is under Mekong River Delta. On Malay Peninsula, in Gambang tin field, tektites at base of lower tin-bearing 'Old Alluvium')

Stauffer, P.H. (1983)- Unravelling the mosaic of Paleozoic crustal blocks in Southeast Asia. *Geologische Rundschau* 72, 3, p. 1061-1080.

(Many parts of SE Asia have Paleozoic or older continental crust. Ophiolite belts indicate mosaic of different blocks. If Permian pebbly mudstones are glacial deposits much of SE Asia was attached to Gondwana and rifting-separation took place after Permian)

Stauffer, P.H. (1985)- Continental terranes in Southeast Asia: pieces of which puzzle ? In: D.G. Howell (ed.) *Tectonostratigraphic terranes of the Circum-Pacific region*, Circum-Pacific Council for Energy and Min. Res., Houston, *Earth Science Series* 1, p. 529-539.

(Continental crust under much of pre-Tertiary core of SE Asia. Late Paleozoic glacial marine deposits in W SE Asia indicate attachment to Gondwana in Permian)

Stauffer, P.H. & D.J. Gobbett (1972)- Southeast Asia a part of Gondwanaland? *Nature* 240, 102, p. 139-140.

(Brief discussion of Ridd (1971) and Tarling (1972) reconstructions)

Stephenson, M.H. & L. Angiolini (2006)- Relating the fossil record to deglaciation in the early Permian of Gondwana: development of a Gondwana-wide biotic deglaciation model. *Permophiles* 47, p. 18. *(Abstract only)*

*(Maximum rate of deglaciation around time of *Granulatisporites confluens* Oppel-zone in late Asselian-early Sakmarian time)*

Stephenson M.H., L. Angiolini & M.J. Leng (2007)- The Early Permian fossil record of Gondwana and its relationship to deglaciation; a review. In: M. Williams et al. (eds.) Deep-time perspectives on climate change: marrying the signal from computer models and biological proxies, Geological Society London, p. 169-189.

(manuscript online at: https://nora.nerc.ac.uk/id/eprint/4580/1/Stephenson_JGS_deglac.pdf)

(Biotic criteria for E Permian deglaciation sequences in Gondwana. Marine cold-water bivalves *Eurydesma* and *Deltopecten* and brachiopods *Lyonia* and *Trigonotreta* in earliest post-glacial marine transgressions, replaced by more diverse, temperate fauna. Palynomorph succession changes from monosaccate pollen assemblages, associated with fern spores, to more diverse assemblages with common bisaccate pollen. Organic matter shows decreasing $\delta^{13}C$ trend, believed to be due to post-glacial global warming. E Permian O isotopes show $\delta^{18}O$ decline in Asselian- Artinskian, likely due to melting of glaciers at high latitudes)

Stern, R.J., Shi-Min Li & G.R. Keller (2018)- Continental crust of China: a brief guide for the perplexed. Earth-Science Reviews 186, p. 72-94.

(Useful review of crustal architecture of China. Three major Precambrian cratonic blocks: Proterozoic South China, Paleoproterozoic North China and Archean Tarim cratons, surrounded by Paleozoic and Mesozoic accreted terranes)

Stevens, C.H. (1985)- Reconstruction of Permian paleogeography based on distribution of Tethyan faunal elements. Proc. 9th Int. Congress of Carboniferous Stratigraphy and Geology, Washington 1979, 5, p. 383-393.

Stevens, G.R. (1963)- Faunal realms in Jurassic and Cretaceous belemnites. Geological Magazine 100, 6, p. 481-497.

(Three faunal realms recognized for Jurassic and Cretaceous belemnites. Boreal and Tethyan realms for Jurassic ammonites, but no equivalent for Pacific. They apparently are divided, partly in the Boreal and partly in the Indo-Pacific. Boundary between Boreal and Tethyan realms was distinct and stable, boundary between Tethyan and Indo-Pacific realms varied considerably in Upper Jurassic and Lower Cretaceous)

Stevens, G.R. (1977)- Mesozoic biogeography of the South-West Pacific and its relationship to plate tectonics. In: Int. Symposium Geodynamics in South-West Pacific, Noumea 1976, Technip, Paris, p. 309-326.

Stevens, G.R. (1980)- Southwest Pacific faunal palaeobiogeography in Mesozoic and Cenozoic times: a review. Palaeogeogr. Palaeoclim. Palaeoecology 31, p. 153-196.

(Review of faunal provinciality of SW Pacific (focus on New Zealand- New Caledonia). In late Middle- Late Jurassic region received repeated waves of benthic immigrants from Tethyan/Indo-Pacific region, etc.)

Stonely, R. (1974)- Evolution of the continental margins bounding a former southern Tethys. In: C.A. Burk & C.L. Drake (eds.) The geology of continental margins, Springer Verlag, New York, p. 889-903.

(Early interpretation of S part of Tethyan orogenic belt, from Mediterranean Sea to Indonesia)

Sun, D.L. (1993)- On the Permian biogeographic boundary between Gondwana and Eurasia in Tibet, China as the eastern section of the Tethys. Palaeogeogr. Palaeoclim. Palaeoecology 100, p. 59-77.

(Mainly on China terranes; no mention of Timor. *Glossopteris* flora, bivalve *Eurydesma*, rugose coral *Lytvolasma*, brachiopod *Globiella* and fusulinid *Monodioxodina* are cool climate flora/fauna, often occurring with tillites along N margin of Gondwanaland in E Permian. In late M Permian Gondwana Tethys became still warmer and warm tropical fauna of *Neoschwagerina* and *Verbeekina* replaced cool water one)

Sun, J., X. Ni, S. Bi, W. Wu, J. Ye, J. Meng & B.F. Windley (2014)- Synchronous turnover of flora, fauna, and climate at the Eocene–Oligocene boundary in Asia. Nature Scientific Reports 4, 1, p. 1-6.

(online at: <https://www.nature.com/articles/srep07463>)

(Eocene-Oligocene Boundary (~34 Ma) marks one of largest extinctions of marine and mammalian fauna in Cenozoic. New magnetostratigraphy, pollen and climatic proxies in Asian interior across Eocene–Oligocene boundary show climate change forced a turnover of flora and fauna, including change from large perissodactyl-dominant land mammal fauna in warm-temperate forests to small rodent/lagomorph fauna in dry-temperate forest-steppe. To date, still lack of evidence for dramatic uplift of Tibetan Plateau at 34 Ma)

Sun, X., M. Zheng, T. Pei, P. Hollings, X. Si, R. Zhang & J. Deng (2025)- Reassessing the spatial and temporal evolution of the Southeast Asian Tin Belt: Insights into recurrent tin mineralization. *Earth-Science Reviews* 270, 105233, p.

(SE Asia Tin Belt with six discrete episodes of tin mineralization from Permian -Miocene. (1) Permian (~290-260 Ma) deposits in E Malaysia associated with granites E of Paleo-Tethys suture zone, (2) Triassic (~230–200 Ma) deposits within Main Range Province on both sides of Paleotethys suture, from Indonesia, Malaysia, Thailand to SW China. (3) Late Cretaceous- Cenozoic (mainly 90-40 Ma) deposits in Western Province hosted by granites in Sibumasu-Baoshan-Tengchong Block. Tin also in W Yunnan, etc. Tin mineralization across SETB reflects episodic remelting of long-lived Proterozoic-E Paleozoic metasedimentary crust, episodically triggered during successive subduction– collision cycles of Paleo-, Meso-, and Neo-Tethys oceans and India-Asia collision)

Talent, J.A. (1984)- Australian biogeography past and present: determinants and implications. In: J.J.Veevers (ed.) *Phanerozoic Earth history of Australia*, Oxford Monographs Geology Geophysics 2, Clarendon Press, Oxford, p. 57-93.

(In Permian most of Australia in cold Gondwana realm (Glossopteris flora), but N edge intruded into warm Tethyan realm (Bonaparte Gulf, Timor, New Guinea; temporary extension of Cathaysian Gigantopteris flora into W New Guinea. Late Triassic mollusc fauna of Jimi River/PNG no species in common with contemporaneous faunas from Misool, Seram, Timor, suggesting some paleobiogeographic boundary between these, although all are supposedly in warm-water Tethyan realm)

Talent, J.A., R. Manson, J.C. Aitchison, R.T. Becker et al. (2000)- Devonian palaeobiogeography of Australia and adjoining regions. *Mem. Assoc. Australian Palaeont.* 23, p. 167-257.

(Summaries of Devonian fossil groups in Australia. No maps)

Tan, B.K. (1996)- ‘Suture zones’ in peninsular Malaysia and Thailand: implications for palaeotectonic reconstruction of southeast Asia. *J. Southeast Asian Earth Sciences* 13, p. 243-249.

(Correlating geological belts/ suture zones from N Thailand to S Peninsular Malaysia very difficult)

Tan, D.N.K. (1983)- Cherts of Southeast Asia. In: A. Iijima et al. (eds.) *Siliceous deposits in the Pacific Region*, Developments in Sedimentology 36, Elsevier, p. 79-91.

(Lower Paleozoic chert confined to peninsular Thailand and NW and C Peninsular Malaysia. Upper Paleozoic chert in Thailand, Indochina, and Peninsular Malaysia, with isolated occurrence in W Sarawak. Triassic chert in N Thailand, N Peninsular Malaysia, Singapore, Sumatra, Bangka, Sarawak, and N Palawan. Jurassic-Cretaceous chert in SE and NE Kalimantan, S and W Sumatra, C Java, S Sulawesi, Natuna, Sarawak, Sabah and Philippines (but not Thailand, Indochina, and Peninsular Malaysia). Tertiary age chert or older blocks in Tertiary melange in Indonesia (Nias, Timor, Philippines, Sarawak and Sabah)

Tapponnier, P., G. Peltzer, A.Y. LeDain & R. Armijo (1982)- Propagating extrusion tectonics in Asia: new insights from simple experiments with plasticine. *Geology (GSA)* 10, p. 611-616.

(Interesting and popular, but disputed tectonic model explaining major strike slip zones and blocks rotations in SE Asia as results of India- Asia collision in Eocene)

Tapponnier, P., G. Peltzer & R. Armijo (1986)- On the mechanics of the collision between India and Asia. In: M.P. Coward & A.C. Ries (eds.) *Collision tectonics*, Geological Society, London, Special Publ. 19, p. 115-157.

(Extended and updated version of SE Asia extrusion model. Since Eocene large prograding zone of deformation migrated across Asia, concurrently with N-ward movement of India collision front. Several large left-lateral strike-slip faults activated. In first 20-30 Ma of collision process, India may have pushed sideways S part of Sundaland (incl. SW Borneo, Sumatra and Peninsular Malaysia) then all of Sundaland (incl. S Yunnan, Indochina, Thailand and Shan Plateau. Red River Fault may have taken up 800-1000 km of extrusion to SE. In Oligocene- E Miocene Sundaland would have rotated clockwise by ~20-25°)

Tarling, D.H. (1988)- Gondwanaland and the evolution of the Indian Ocean. In: M.G. Audley-Charles & A. Hallam (eds.) *Gondwana and Tethys*, Geological Society, London, Special Publ. 37, p. 61-77.

Teasdale, J. & J. Bon (2017)- A new plate model for South East Asia aimed at understanding basin evolution. Proc. SE Asia Petroleum Exploration Society (SEAPEX) Conference 2017, Singapore, Session 7, p. 1-15. (Abstract + Presentation)

(Eight SE Asia plate reconstruction models from 55- 0 Ma. SW Borneo and Peninsular Malaysia part of same rigid Sundaland basement terrane. 'Rotational extrusion' of Sundaland caused clockwise rotation of Sundaland + Borneo in two phases in Late Eocene and Oligocene. Counter-clockwise rotation of Bird's Head. E Indonesian 'salami-slicer' extends NW to Borneo, where it accounts for M Miocene Sabah Orogeny. Etc.)

Teichert, C. (1951)- The marine Permian faunas of Western Australia. Palaeont. Zeitschrift 24, 1-2, p. 75-90. *(W Australian Permian faunas more in common with Tethys than with E Australia. Timor faunas appear related, but significant differences. One record of fusulinid foraminifera in Desert Basin could not be relocated and is probably erroneous. Low diversity coral fauna, mainly indigenous with Australian species. Crinoid faunas related to Timor, but much impoverished)*

Teichert, C. (1974)- Marine sedimentary environments and their faunas in Gondwana area. In: Plate Tectonics-assessments and reassessments, American Assoc. Petroleum Geol. (AAPG), Memoir 23, p. 361-394. *(Widespread Paleozoic-Mesozoic marine rocks in W Australia, S Africa Antarctica, etc., inconsistent with hypothesis of Gondwanaland (?))*

Tingay, M., C. Morley, R. King, R. Hillis & D. Coblenz (2009)- Southeast Asian stress map: implications for petroleum exploration and production. First Break 27, p. 81-88.

(Overview of new SE Asian Stress Map, with stress information from borehole breakouts, drilling-induced fractures, and focal mechanism solutions across 14 provinces in SE Asia. Intraplate stress field of SE Asia (Sundaland) is variable and not aligned with absolute plate motion)

Tingay, M., C. Morley, R. King, R. Hillis, D. Coblenz & R. Hall (2010)- Present-day stress field of Southeast Asia. Tectonophysics 482, p. 92-104.

(Variable stress pattern throughout SE Asia largely inconsistent with Sunda plate ESE motion direction. Present-day maximum horizontal stress in Thailand, Vietnam and Malay Basin predominately N-S, consistent with radiating stress patterns from E Himalayan syntaxis. Maximum horizontal stress in Borneo primarily NW-SE; may reflect plate-boundary forces or topographic stresses exerted by C Borneo highlands. S and C Sumatra basins maximum horizontal stress NE-SW, perpendicular to Indo-Australian subduction front. Plate-scale stress field in SE Asia controlled by combination of Himalayan-related deformation, subduction forces (trench suction, collision) and intraplate sources of stress such as topography and basin geometry)

Tjia, H.D. (2008)- Tertiary stress regimes of western Southeast Asia. In: J.A. Katili et al. (eds.) Tectonics and resources of Central and SE Asia (Halboutsy volume), Pusat Survei Geologi, Bandung, Special Publ. 34, p. 125-138.

(In W SE Asia pre-Middle Miocene mainly extensional regimes. Changes in plate dynamics towards end E Miocene terminated spreading of S China Sea and Philippines basins and allowed impact of W-directed Pacific convergence. After short transition in Langhian (16.3-14.2 Ma) start of compressional regimes)

Tollman, A. & E. Kristan-Tollman (1985)- Paleogeography of the European Tethys from Paleozoic to Mesozoic and the Triassic relations of the Eastern part of the Tethys and Panthalassa. In: K. Nakazawa & J.M. Dickens (eds.) The Tethys, her paleogeography and paleobiology, from the Paleozoic to the Mesozoic, Tokai University Press, Japan, p. 3-22.

(The concept of 'Tethys' was introduced by Austrian geologist Eduard Suess (1893, 1901), as "a great ocean that once stretched across Eurasia", as far East as Timor)

Tong-Dzuy, T., H.F. Hou, T.H. Phuong, H.H. Nguyen et al. (1996)- Outlines of stratigraphy and remarks on paleobiography of Devonian in Southeast Asia. Proc. IGCP Symposium on Geology of SE Asia, Hanoi 1995, Journal of Geology, Hanoi, B, 1996, 7-8, p. 10-34.

(Review of Devonian stratigraphies and macrofaunas of S China, Indochina W Malaysia. Lower Devonian in most places marine clastics, M Devonian mainly carbonates. Devonian faunas of SE Asa greater similarities with Europe than with Australia, questioning common wisdom that this region was derived from Gondwana)

Tong-Dzuy, T., P. Janvier & P. Ta Hoa (1996)- Fish suggest continental connections between South China and Indochina blocks in Middle Devonian times. *Geology (GSA)* 24, 6, p. 571-574.

(Yunnanolepiform antiarch (placoderm fish) from Givetian Dong Tho Fm, C Vietnam, on Indochina Block, well S of Song Ma suture. Previously known only from Lower Devonian of South China block. Massive sandstones of Dong Tho Fm may be southern extension of Do Son Sst of Hai Phong area, S China)

Torsvik, T.H. & L.R.M. Cocks (2004)- Earth geography from 400 to 250 Ma: a palaeomagnetic, faunal and facies review. *J. Geological Society, London* 161, 4, p. 555-572.

Torsvik, T.H. & L.R.M. Cocks (2009)- The Lower Palaeozoic palaeogeographical evolution of the northeastern and eastern peri-Gondwanan margin from Turkey to New Zealand. In: M.G. Bassett (ed.) *Early Palaeozoic peri-Gondwana terranes: new insights from tectonics and biogeography*, Geological Society, London, Special Publ. 325, p. 3-21.

(Review of E Paleozoic of NE sector of Gondwanan and peri-Gondwanan margin from Turkey through Middle East, N Indian subcontinent, S China- SE Asia, to Australia and New Zealand. SE Australia enlarged through accretion of island arcs. Most of area represented passive margin. Paleotethys opened no earlier than Late Silurian. N China and others probably not attached to Gondwana in Lower Paleozoic. S China close to Gondwana, but not part of it, and Sibumasu probably part of Gondwana. New paleogeographical maps for Cambrian (500 Ma), Ordovician (480 Ma) and Silurian (425 Ma))

Torsvik, T.H. & L.R.M. Cocks (2013)- Gondwana from top to base in space and time. *Gondwana Research* 24, p. 999-1030.

(Review of evolution of Gondwana supercontinent, from unification of several cratons in Late Neoproterozoic, combination with Laurussia in Carboniferous to form Pangea, to progressive fragmentation in Mesozoic. New paleogeographic reconstructions from E Cambrian (540 Ma) to 200 Ma. Sibumasu microcontinent stretches from Burma and Yunnan to Sumatra (unlike earlier Cocks-Fortey papers, now accepted to have been part of E Gondwana craton adjacent to NW Australia, until opening of Neotethys Ocean in Permian)

Toyokuni, G., D. Zhao & K. Kurata (2022)- Whole-mantle tomography of Southeast Asia: new insight into plumes and slabs. *J. of Geophysical Research: Solid Earth* 127, 11, e2022JB024298, p. 1-29.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/pdf/10.1029/2022JB024298>)

(3-D tomographic images of P wave velocity structure of mantle beneath SE Asia and surrounding regions, from 23,587 earthquakes. Continuous low-V zone from surface to core-mantle boundary beneath Hainan hotspot, reflecting Hainan plume. Beneath Australian slab subducted into lower mantle, low-V anomaly may reflect subslab hot mantle upwelling due to return flow of slab subduction. Subducted slabs present in upper mantle and slab remnants in lower mantle. Hole in subducting Australian slab at depths of 280-460 km below E Java (first noticed by Hall & Spakman, 2015). Slab hole, with mixture of island arc magma and hot mantle upwelling, may have caused huge eruptions of Tambora and Rinjani volcanoes at E end of slab hole)

Tozer, E.T. (1982)- Marine Triassic faunas of North America: their significance for assessing plate and terrane movements. *Geologische Rundschau* 71, 8, p. 1077-1104.

(Marine Triassic paleobiogeography. Norian 'Tethyan/ low paleolatitude' Monotis salinaria in Hallstatt facies of Timor, 'Pacific/ mid-high paleolatitude' Monotis ochotica in New Caledonia, New Zealand, etc.)

Truswell, E.M. (1981)- Pre-Cenozoic palynology and continental movements. In: M.W. McElhinny & D.A. Valencio (eds.) *Paleoreconstruction of the continents*, American Geophysical Union (AGU) Geodynamics Series 2, p. 13-25.

Truswell, E.M., P.A. Kershaw & I.R. Sluiter (1987)- The Australian-Malaysian connection: evidence from the paleobotanical record. In: T.C. Whitmore (ed.) Biogeographical evolution of the Malay Archipelago, Oxford Monographs Biogeography 4, Oxford University Press, p. 32-49.

Twidale, C.R. (2005)- Granitic terrains. In: A. Gupta (ed.) The physical geography of Southeast Asia, Oxford University Press, p. 123-141.

(Basic review of granitic rocks, weathering and distribution in SE Asia)

Ueno, K. (1999)- Gondwana/Tethys divide in East Asia: solution from Late Paleozoic foraminiferal paleobiogeography. In: B. Ratanasthien & S.L. Rieb (eds.) Proc. Int. Symposium Shallow Tethys (ST) 5, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 45-54.. *(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)*
(Review of main Gondwanan (Sibumasu, etc.) versus Tethyan (Indochina, etc.) terranes in Late Paleozoic)

Ueno, K. (2000)- Permian fusulinacean faunas of the Sibumasu and Baoshan Blocks: implications for the paleogeographic reconstruction of the Cimmerian continent. Geosciences Journal 4 (Special Edition), p. 160-163.

(Expanded version see Ueno (2003) below)

Ueno, K. (2002)- Geotectonic linkage between West Yunnan and mainland Thailand: Toward the unified geotectonic evolution model of East Asia. In: Geodynamic Processes of Gondwanaland-derived terranes in East and Southeast Asia, their crustal evolution, emplacement and natural resources potential, Fourth Symposium IGCP Project 411, Phitsanulok, p. 35-42.

Ueno, K. (2003)- The Permian fusulinoidean faunas of the Sibumasu and Baoshan blocks: their implications for the paleogeographic and paleoclimatologic reconstruction of the Cimmerian Continent. Palaeogeogr. Palaeoclim. Palaeoecology 193, p. 1-24.

(Permian fusulinids in four levels in Baoshan and Sibumasu Blocks. East Cimmerian continent poor Tethyan neoschwagerinid and verbeekiniid genera in M Permian. Increase in diversity from E to late M Permian (N-ward drift of Cimmerian continent) and from E to W (W Cimmerian closer to tropical Tethyan domain than E). M Permian Cimmerian two subregions: W= Tethyan Cimmerian and E= Gondwanan Cimmerian. Rare Tethyan fusulinids in Baoshan and Sibumasu blocks suggests E Cimmerian continent still far from Cathaysian domain and in warm temperate- subtropical zone until end-Permian. E Cimmerian block migrated into tropical zone by Late Triassic with Carnian sponge-coral buildups in Sibumasu Block)

Ueno, K. (2006)- The Permian antitropical fusulinoidean genus *Monodiexodina*: distribution, taxonomy, paleobiogeography and paleoecology. J. Asian Earth Sciences 26, p. 380-404

(online at: https://www.academia.edu/15355494/The_Permian_antitropical_fusulinoidean_genus_Monodiexodina_Distribution_taxonomy_paleobiogeography_and_paleoecology)

(Review of 'subtropical', late E Permian fusulinid genus Monodiexodina from 33 areas, incl. several Timor occurrences, all in middle part of Maubisse Fm. Type species of Monodiexodina is Schwagerina wanneri Schubert 1915 first described from Timor. Monodiexodina-bearing areas can be restored to either N or S middle latitudes, suggesting genus is paleobiogeographically anti-tropical taxon. Generally found in monotypic, crowded manner in sandy sediments with uni-directionally aligned shells. Long-ranging 'mid-Permian', Artinskian- E Midian (=Capitanian))

Ueno, K., A. Miyahigashi & T. Charoentitirat (2010)- The Lopingian (Late Permian) of mid-oceanic carbonates in the Eastern Palaeotethys: stratigraphical outline and foraminiferal faunal succession. Geological Journal 45, p. 285-307.

(SW China Changning-Menglian Belt and N Thailand Inthanon Zone best-studied Paleotethys collisional belts in Asia. Thick E Carboniferous- Late Permian carbonate build-ups with basalt at base formed on top of oceanic seamounts. Foraminiferal faunas record shallow-marine domain in Paleotethys (Cathaysian Province) with high diversity fusulinids. Coeval Neotethyan domain also high diversity fusulinids. Lopingian Panthalassan mid-oceanic build-ups likely lower foraminiferal diversity than Paleo- and Neotethys)

Uhlig, V. (1911)- Die marinen Reiche des Jura und der Unterkreide. Mitteilungen der Geologischen Gesellschaft in Wien, 4, 3, p. 389-448.

(online at: https://www.zobodat.at/pdf/MittGeolGes_4_0329-0448.pdf)

('The marine realms of the Jurassic and the Lower Cretaceous'. Subdivision of Jurassic- Cretaceous into 5 main faunal provinces. Includes review of Indonesian Mesozoic macrofossils known at that time, all classified in 'III.Himalayan Province', which stretches from Tibet to Indonesia and New Guinea, and possibly into New Zealand. Common deep-water faunas with Liassic dominated by ammonite Phylloceras, Dogger characterized by ammonites Stephanoceras and Macrocephalites. With one map of global distribution of bioprovinces)

Umbgrove, J.H.F. (1929)- Tertiary sea connections between Europe and the Indo-Pacific area. Proc. 4th Pan-Pacific Science Congress, Java 1929, 2A, p. 91-104.

Unesco (1972)- Geological map of Asia and the Far East 1:5 Million; Explanatory note, 2nd edition, Unesco, Paris, p. 1-100.

(online at: <https://unesdoc.unesco.org/ark:/48223/pf0000133205>)

United Nations- ESCAP (1978)- Stratigraphic correlation between sedimentary basins of the ESCAP region, vol. 5, ESCAP Atlas of Stratigraphy I, Burma, Malaysia, Thailand, Indonesia, Philippines. U.N. Mineral Resources Development Series 44, p. 1-58 + many plates.

(online at: <https://repository.unescap.org/items/bb52a31d-ca39-4fad-9391-ad4d1b7df8a7>)

(Summaries of regional stratigraphy and correlations of SE Asian basins)

Uno, K., K. Furukawa & S. Hada (2011)- Margin-parallel translation in the western Pacific: paleomagnetic evidence from an allochthonous terrane in Japan. Earth Planetary Science Letters 303, 1-2, p. 153-161.

(Paleomagnetic study shows latitudinal translation of allochthonous Kurosegawa ribbon continent of Japan along W margin of Pacific Ocean. Terrane was at 4°N paleolatitude in Late Triassic, 18°N in E Cretaceous, then translated ~1500km N to present position, associated with sinistral strike-slip along E Asian continental margin, in Mid-Late Cretaceous. Also show SW Borneo plate in Equatorial position since Jurassic)

Uno, K., K. Hisada, K. Ueno, Y. Kamatad, H. Hara, M. Fujikawa et al. (2010)- Paleomagnetic evidence for latitudinal change of the Indochina Block during the Late Paleozoic to Mesozoic. In: C.P. Lee et al. (eds.) 6th Symposium Int. Geological Correlation Program, Project 516 (IGCP516), Geological anatomy of East and South Asia, Kuala Lumpur 2010, p. 26. *(Abstract only)*

(Paleomagnetic paleolatitude calculated for samples from around Loei, Thailand (17.6°N), suggest W Indochina Block was at 9°N or 9°S in E Permian and at 5°N or 5°S in Carboniferous. Two tectonic models conceivable. Most likely Indochina Block was near equator in Carboniferous and N-motion of block lasted through Permian)

Usuki, T., C.Y. Lan, K.L. Wang & H.Y. Chiu (2013)- Linking the Indochina block and Gondwana during the Early Paleozoic: evidence from U-Pb ages and Hf isotopes of detrital zircons. Tectonophysics 586, p. 145-159.

(online at: www.academia.edu/13912929/Linking_the_Indochina_block_and_Gondwana_during_the_Ea_Etc.)
(Detrital zircons from river sediment in Truong Son Belt of Indochina block in N-C Vietnam with mainly Neoproterozoic (~2.5 Ga), Mesoproterozoic (1.7-1.4 Ga), Grenvillian (~0.95 Ga) and Pan-African (0.65-0.5 Ga) ages. Similarity of age distribution and Hf isotope compositions of Indochina and those of Tethyan Himalaya, W Cathaysia, and Qiangtang suggests Indochina was outboard of Qiangtang and S of S China along Indian margin of Gondwana in E Paleozoic. Results consistent with paleontological correlations of E Gondwana margin)

Van Balgooy, M.M.J. (1987)- A plant geographic analysis of Sulawesi. In: T.C. Whitmore (ed.) Biogeographical evolution of the Malay Archipelago, Clarendon Press, Oxford, p. 94-102.

(Discussion of modern plant biogeography of Sulawesi by Indonesian botanist Max van Balgooy, who studied under Prof. C.G.G.J. van Steenis in Leiden)

Van de Lagemaat, S.H.A. (2023)- Junction jigsaw: Reconstructing the plate tectonic puzzle from the Panthalassa to the Tethys realm. Ph.D. Thesis, University of Utrecht, Utrecht Studies in Earth Sciences 288, p. 1-441.

(online at: <https://dspace.library.uu.nl/handle/1874/431449>)

(Collection of papers published elsewhere in 2018-2023)

Van de Lagemaat, S.H.A., L. Cao, J. Asis, E. Advokaat, P. Mason, M.J. Dekkers & D.J.J. van Hinsbergen (2023)- Causes of Cretaceous subduction termination below South China and Borneo: was the Proto-South China Sea underlain by an oceanic plateau? *Geoscience Frontiers* 15, 2, 101752, p. 1-25.

(online at: <https://www.sciencedirect.com/science/article/pii/S1674987123002190>)

(China, Indochina and Borneo margins around S China Sea contain long-lived magmatic arcs that became inactive at ~85 Ma, even though embayment of oceanic crust ('Proto-South China Sea') remained in intervening region. Mesozoic subduction below S China and Borneo probably stopped when a Paleo-Pacific oceanic plateau entered trench)

Van de Lagemaat, S.H.A. & D.J.J. van Hinsbergen (2023)- Plate tectonic cross-roads: Reconstructing the Panthalassa-Neotethys junction region from Philippine Sea Plate and Australasian oceans and orogens. *Gondwana Research* 126, p. 129-201.

(online at: <https://www.sciencedirect.com/science/article/pii/S1342937X23002617>)

(Discovery of new, now mostly subducted large tectonic plate in Junction Region between Panthalassa and Tethys realms. Molucca Sea Plate formed as Eocene back-arc basin behind N-dipping subduction zone that consumed Australian oceanic lithosphere. Jurassic oceanic crust preserved in Philippines (Palawan?) originated from N Australian margin when back-arc basin formed. Etc.)

Van der Meer, D.G., W. Spakman, D.J.J. van Hinsbergen, M.L. Amaru & T.H. Torsvik (2010)- Towards absolute plate motions constrained by lower-mantle slab remnants. *Nature Geoscience* 3, p. 36-40.

(Global mantle tomography model used to estimate longitude of past oceanic subduction zones. Identified 28 remnants of oceanic plates subducted into lower mantle and link these to mountain building zones from which they likely originated. Assuming remnants sank vertically through mantle, we reconstruct longitude at which they were subducted. No oceanic plate remnants from Carboniferous (~300-360 Ma))

Van der Meer, D.G., T.H. Torsvik, W. Spakman, D.J.J. van Hinsbergen & M.L. Amaru (2012)- Intra-Panthalassa Ocean subduction zones revealed by fossil arcs and mantle structure. *Nature Geoscience* 5, p. 215-219.

(Vast Panthalassa Ocean once surrounded supercontinent Pangaea, but subduction since then consumed most of ocean floor. Extinct intra-oceanic volcanic arcs accreted to N American and Asian continental margins. To constrain paleoposition of extinct arcs, they were correlated with remnants of subducted slabs identified in mantle from-wave tomographic models)

Van der Meer, D.G., D.J.J. van Hinsbergen & W. Spakman (2018)- Atlas of the underworld: slab remnants in the mantle, their sinking history, and a new outlook on lower mantle viscosity. *Tectonophysics* 723, p. 309-448.

(online at: www.sciencedirect.com/science/article/pii/S0040195117304055)

(Global inventory of 94 subducted slabs in mantle, as identified from tomography. Including slabs from SE Asia: Arafura, Banda, Burma (formerly part of Sunda slab), Halmahera (15-0 Ma), Kalimantan (active from ~70- 20 Ma: interpreted by some as deeper part of Sunda slab), Papua (base age 90-45 Ma, top age 26-20 Ma), Sangihe (base age 30-25 Ma; at shallow upper mantle levels separated into several slabs: Philippine Trench slab, Molucca Sea West slab, Sulu and Celebes Sea South slab) and Sunda slab (active since 50-45 Ma). (see also associated website: www.atlas-of-the-underworld.org/)

Van Leeuwen, T.M. (2014)- The enigmatic Sundaland diamonds- a review. In: I. Basuki & A.Z. Dahlius (eds.) *Sundaland Resources*, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI), Palembang, p. 181-204.

(online at: www.academia.edu/18356584/The_enigmatic_Sundaland_diamonds)

(Review of alluvial diamond occurrences with no obvious primary sources in Myanmar, Thailand and Sumatra ('Sibumasu diamonds'; spatially associated with Carboniferous-Permian glacial pebbly mudstones, stretching from Myanmar to Sumatra) and in 4 districts in Kalimantan ('Kalimantan diamonds'). Together they are referred herein as 'Sundaland diamonds'. Three possible scenarios for formation of Kalimantan diamonds: A. formed in sub-continental lithospheric mantle and transported to surface by kimberlite or lamproite, B. formed in descending slab during failed subduction at low T and depth under ultrahigh pressure conditions and sampled by non-kimberlitic magmas, C. derived from obducted ophiolite)

Van Waterschoot Van der Gracht, W.A.J.M. (1928)- The problem of continental drift. Proc. Symposium Theory of continental drift; a symposium on the origin and movement of land masses, both inter-continental and intra-continental, as proposed by Alfred Wegener, New York 1926, American Assoc. Petroleum Geol. (AAPG), p. 1-75.

(Overview of merits of the then still controversial theory of continental drift. On p. 57 vWvdG points out that most of the early Dutch geologists working in 'East Indies' (Molengraaff, Brouwer, Wing Easton) were supportive of Wegener's hypothesis, because New Guinea obviously rapidly drifted to N, and that very rapid active uplift and subsidence can be observed in E Indonesia (later Dutch regional geologists like Van Bemmelen, Kuenen and Umbgrove (wrongly) argued that continental drift was physically impossible; JTvG))

Van Welzen, P.C., J.A.N Parnell & J.W.F. Slik (2011)- Wallace's Line and plant distributions: two or three phytogeographical areas and where to group Java? Biological J. Linnean Society, London, 103, p. 531-545.

(online at: www.naturalscience.tcd.ie/assets/pdf/Wallace's%20line.pdf)

(No sharp E-W boundary in modern plant distributions in SE Asia. Three areas on basis of floristic affinities/similarities (1) islands of Sunda Shelf, W Java (everwet Sundaland floristic group); (2) Wallacea, consisting of central islands and E Java, with two sub-areas: Java, the Philippines and Lesser Sunda Islands with more Oriental flora and Sulawesi and Moluccas with more Australian flora; (3) New Guinea/Sahul Shelf)

Van Welzen, P.C., J.W.F. Slik & J. Alahuhta (2005)- Plant distribution patterns and plate tectonics in Malesia. Biologische Skrifter Danske Vidensk. Selskab 55, p. 199-217.

(online at: http://phylodiversity.net/fslik/index_files/BiolSkr2005.pdf)

(Philippines, Borneo, and especially New Guinea comprise significantly more than average endemic plants. Three major distribution patterns in 'Malesia' (SE Asia): Indian-Malesian, Circum-Pacific and Wallacea, the transition zone between Sunda and Sahul floras)

Veevers, J.J. (ed.) (2000)- Billion-year earth history of Australia and neighbours in Gondwanaland. GEMOC Press, Sydney, p. 1-388.

Veevers, J.J. (2004)- Gondwanaland from 650-500 Ma assembly through 320 Ma merger in Pangea to 185-100 Ma breakup: supercontinental tectonics via stratigraphy and radiometric dating. Earth-Science Reviews 68, p. 1-132.

Veevers, J.J. (2013)- Pangea: geochronological correlation of successive environmental and strati-tectonic phases in Europe and Australia. Earth-Science Reviews 127, p. 48-95.

(Supercontinent Pangea formed from Ouachita-Variscan oblique collision of Laurussia and Gondwanaland in Late Carboniferous (~320-300 Ma) (in European region). Shortening in C Australia, megakinking in Lachlan orogen and bending of oroclinal in E. Australia possibly tied to this event (but 10,000 km away!). Followed by Extensions I (~300 Ma, Carboniferous-Permian boundary; E Australia cut into long magmatic rift) and II (235 Ma, Carnian), expressed as rifts and sags that accumulated second set of coal-bearing strata)

Veevers, J.J. & C.M. Powell (eds.) (1994)- Permian-Triassic Pangean basins and foldbelts along the Panthalassan margin of Gondwanaland. Geological Society of America (GSA) Memoir 184, p. 1-368.

Veevers, J.J. & R.C. Tewari (1995)- Permian-Carboniferous and Permian-Triassic magmatism in the rift zone bordering the Tethyan margin of southern Pangea. Geology (GSA) 23, p. 467-470.

(Magma emplaced in India-Australia rift zone along Tethyan margin in Permian-Carboniferous and Permian-Triassic times)

Veevers, J.J. & R.C. Tewari (1995)- Gondwana master basin of Peninsular India between Tethys and the interior of the Gondwanaland Province of Pangea Geological Society of America (GSA) Memoir 187, p. 1-73.
(Deposition in Gondwana master basin of Peninsular India in latest Carboniferous- E Jurassic on Archean-Proterozoic basement. Gondwana deposition ceased with breakup of Greater India from rest of Gondwanaland in Late Jurassic- E Cretaceous, followed by rift-drift succession along its margins. Master basin 1000km inboard of passive margin of Tethyan Gondwanaland; filled initially with lobes of glaciogenic sediment)

Verolino, A., S.F. Wee, S.F. Jenkins, F. Costa & A. D. Switzer (2024)- SEATANI: hazards from seamounts in Southeast Asia, Taiwan, and Andaman and Nicobar Islands (eastern India). Natural Hazards Earth System Sciences 24, p. 1203-1222.

(online at: <https://nhess.copernicus.org/articles/24/1203/2024/nhess-24-1203-2024.pdf>)

(Compilation of 466 seamounts (topographic features >100m above surrounding seafloor) and potential hazards in deep waters of 'SEATANI' (SE Asia, Taiwan, and Andaman-Nicobar Islands). All assumed to be of volcanic origin. Majority Type Stage 2 (65%; >1000m above seafloor and >700m below sea level). Highest concentrations of Stage-1 and Stage-2 seamounts in extensional and back-arc basins (e.g. S China Sea, Banda Sea) and in zones undergoing subduction (off Sumatra, Java, Philippines)

Von Hagke, C. & M. Gurnis (2016)- Origin and time evolution of subduction polarity reversal from plate kinematics of Southeast Asia. Geology (GSA) 44, 8, p. 659-662.

(online at: <http://web.gps.caltech.edu/~avouac/publications/vonHagke-Geology-2016.pdf>)

(Regional model of plate geometry and kinematics of SE Asia since Late Cretaceous and origin of subduction polarity reversal currently observed in Taiwan)

Von Koenigswald, G.H.R. (1936)- De glasmeteorieten van Nederlandsch-Indie. Summary of lecture for KNV (Koninklijke Natuurkundige Vereeniging), held at TH Bandung, 11 October 1936. Natuurkundig Tijdschrift voor Nederlandsch-Indie 96, p. 283-286.

('The glass meteorites of the Netherlands Indies'. Discussion of Middle Pleistocene tektites, in Indonesia known from three areas (1) Billiton, Natuna islands, Malacca, (2) Borneo (Riam River, Martapura, British North Borneo) and Java (Jepara, Trinil Beds, Sangiran) and all tied to single meteorite impact event in mainland SE Asia)

Von Koenigswald, G.H.R. (1960)- Tektite studies I: The age of the Indo-Australian tektites. Proc. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, B 63, p. 135-141.

(On the distribution of glassy tektites, widespread in M Pleistocene of SE Asia and Australia, and derived from meteorite impact somewhere in Indochina. (Age ~0.8 Ma; JTvG). In Sangiran, C Java, tektites reported from Upper Kabuh Fm)

Von Koenigswald, G.H.R. (1960)- Tektite studies II: The distribution of the Indo-Australian tektites. Proc. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, B 63, p. 142-153.

(Stauffer 1983: First paper to point out distribution of Australasian tektites in terms of size and shape from NW (Indochina) to SE (Australia), an observation crucial to later understanding of origin of these bodies)

Von Koenigswald, G.H.R. (1964)- The problem of tektites. Space Science Rev. 3, 3, p. 433-445.

(Early significant review of tektites, including Pleistocene Australasian strewn field and their extra-terrestrial impact origin)

Von Koenigswald, G.H.R. (1968)- Tektite studies X: The relationship of shape, size and texture in Asiatic tektites. Proc. Koninklijke Nederlandse Akademie van Wetenschappen, Amsterdam, B 71, 2, p. 1-9.

Wallace, A.R. (1860)- On the zoological geography of the Malay Archipelago. Zoological J. of the Linnean Society 4, 16, p. 172-184. *(transcription of paper online at: https://digitalcommons.wku.edu/cgi/viewcontent.cgi?article=1003&context=dlps_fac_arw) (with description of what became known as the 'Wallace Line', the line across the Malay Archipelago (= the Indonesian Archipelago) separating Indo-Malayan (Asian) faunas in the West and Austro-Malayan faunas in the East. Communicated to the Linnean Society in London by Charles Darwin, 3 November 1859, while Wallace was still in the Far East (N.B.: Earlier reports of this well-known faunal and floral divide had actually already been published earlier, by German and Swiss naturalists Salomon Muller (1839, 1842, 1850) and Heinrich Zollinger (1857). Wallace was merely the first to write about it in the English-language literature; JTVG)*

Wallace, A.R., (1863)- On the physical geography of the Malay Archipelago. The Journal of the Royal Geographical Society of London 33, p. 217-234. *(online at: <https://www.jstor.org/stable/1798448>) (Early brief, English-language description of physical geography of the Inonesian Archipelago. With one map)*

Wallace, A.R. (1869)- The Malay Archipelago: The land of the orang-utan and the bird of paradise. A narrative of travel with studies of Man and Nature. MacMillan & Co, U.K., p. 1-525. *(With several reprint editions. Classic work of present-day natural history/ faunal provinces of Indonesia by English naturalist Wallace (not much on geology))*

Wang, J.H., A. Yin, T.M. Harrison, M. Grove, Y.Q. Zhang & G.H. Xie (2001)- A tectonic model for Cenozoic igneous activities in the eastern Indo-Asian collision zone. Earth Planetary Science Letters 188, p. 123-133. *(online at: http://sims.ess.ucla.edu/pdf/wang_et_al_2001.pdf) (Cenozoic activities in the eastern Indo-Asian collision zone of SE China and Indochina in two episodes, each with distinctive geochemical signatures, at 42-24 Ma and 16-0 Ma)*

Wang; L., E. Garzanti, F. Cai, J. Zhang; L. Shen; P. Nulay, N. Siritongkham, L. Ding & C. Wang (2023)- The underestimated role of tectonics in the mid-Late Cretaceous desertification in SE Asia. Geological Society of America (GSA) Bull. 136, 1-2, p.: 418-432. *(Mid-Late Cretaceous desertification of mainland SE Asia (Simao Basin, Khorat Plateau, etc.) here tied to elevated topography caused by closure of Bangong-Nujiang suture (Mesotethys), affecting atmospheric circulation and drainage development across SE Asia)*

Wang, M., X.W. Zeng, C.M. Xie, A. Danzeng, C. Lia, J.J. Fan & H. Li (2019)- Dating of detrital zircon grains and fossils from Late Palaeozoic sediments of the Baruo area, Tibet: constraints on the Late Palaeozoic evolution of the Lhasa terrane. International Geology Review 62, 4, p. 1-14. *(online at: www.researchgate.net/publication/333204695_Dating_of_detrital_zircon_grains_and_fossils_from_Late_Palaeozoic_sediments_of_the_Baruo_area_Tibet_constraints_on_the_Late_Palaeozoic_evolution_of_the_Lhasa_terrane) (U-Pb dating of detrital zircons from Late Carboniferous- E Permian lower-greenschist-facies clastics of Lagar Fm in Baruo area, Tibet (northern Lhasa Terrane). Deposited in shallow-marine environment at N margin of Gondwana. Glacial marine diamictites common in basal part. Overlying Angjie Fm limestones with E-M Permian fusulinids and solitary corals. Zircon ages in Lagar Fm 90% Precambrian ages. Characteristic age peaks at ~520, ~1140, 2390 and 2650 Ma. Youngest grain 322 Ma)*

Wang, P. (2004)- Cenozoic deformation and the history of sea-land interactions in Asia. In: P. Clift et al. (eds.) Continent-ocean interactions within East Asian marginal seas, American Geophysical Union (AGU), Geophysical Monograph Series 149, p. 1-22. *(After India-Asia collision in Eocene, Asia significantly enlarged its size and increased its altitude. W-tilting topography of E Asia reversed with uplift of Tibetan Plateau and opening of marginal seas, resulting in Asian fluvial system radiating from uplifted center of continent. Cenozoic deformation of Asia also responsible for initiation of Asian monsoon system in E Miocene and further strengthening at ~8 Ma and ~3 Ma)*

Wang, Q., J. Deng, C. Li, G. Li, L. Yu & L. Qiao (2016)- The boundary between the Simao and Yangtze blocks and their locations in Gondwana and Rodinia: Constraints from detrital and inherited zircons. *Gondwana Research* 26, p. 438-448.

(Simao (N Indochina) and Yangtze (S China) continental blocks amalgamated in Late Paleozoic- Triassic by closure of Paleotethys branch (Ailaoshan ocean). Detrital and inherited zircons suggest Laowangzhai-Mojiang suspect terrane belongs to Simao-Indochina block, so Paleotethys suture along Ailaoshan late-Devonian- E Carboniferous ophiolite belt. Precambrian detrital zircon ages suggest Yangtze block not part of Australia or India in Rodinia, while Simao-Indochina block derived from Indian Gondwana)

Wang, W., Q.M. Qu & M. Zhu (2010)- A brief review of the Middle Palaeozoic vertebrates from Southeast Asia. *Palaeoworld* 19, p. 27-36.

(On Silurian-Devonian fish remains from Shan-Thai (=Sibumasu), Indochina and S China blocks and their biogeographic affinities. Vertebrate fossils suggest proximity between S China and Indochina terranes in M Paleozoic and close relationship between Shan-Thai and E Gondwana (Australia) in M Devonian)

Wang, X., K. Makato & W. Hongzhen (1996)- On the tectonic position of the Baoshan region during the Late Palaeozoic. *J. Southeast Asian Earth Sciences* 13, p. 171-183.

(Devonian- Permian fauna of Baoshan block in Yunnan, SW China, very similar to S Tibet, but not Yangtze region. Faunal and paleomagnetic data for Late Paleozoic show Yangtze region very close to Equator, but Baoshan and S Tibet in middle latitudes (~32-43°S; probably in Gondwana domain))

Wang, X., I. Metcalfe, P. Jian, L. He & C. Wang (2000)- The Jinshajiang- Ailaoshan suture zone: tectono-stratigraphy, age and evolution. *J. Asian Earth Sciences* 18, p. 675-690.

(On M Triassic age for Jinshajiang- Ailaoshan suture, formed by collision of Changdu-Simao Block with S China Block. Jinshajiang oceanic lithosphere formed (as oceanic marginal basin of S China Block) in latest Devonian- earliest Carboniferous)

Wang, X., I. Metcalfe, P. Jian, L. He & C. Wang (2000)- The Jinshajiang suture zone: tectono-stratigraphic subdivision and revision of age. *Science in China, ser. D*, 43, 1, p. 10-22.

(Jinshajiang suture zone in W Yunnan- W Sichuan is remnant of backarc basin in E part of Paleo-Tethys. Basin started in Late Devonian, closed in E-M Triassic)

Wang, X.D., K. Hu, Y.K. Shi, J.T. Chen, S.R. Yang, X.Y. Ye, X.M. Li, Y.F. Song, B. Chen, X.L. Chang et al. (2021)- The missing upper Carboniferous in the Cimmerian continent: A critical review. *Earth-Science Reviews* 217, 12, 103627, p. 1-30.

(online at: www.sciencedirect.com/journal/earth-science-reviews/vol/217/suppl/C)

(Cimmerian continent series of blocks rifted from Gondwana in E Permian, then drifted towards tropical areas and collided with S Eurasia in Triassic. Cimmerian blocks include Shan-Thai (=Sibumasu), Tengchong, Baoshan, Lhasa, S Qiangtang, S Afghanistan (Pamir) and S Iran. U Carboniferous sediments absent (different from S China and other Tethyan regions). Lower Carboniferous sediments in Cimmerian blocks Tournaisian-Visean ages, with chert nodules and faunas of Eurasian affinity. Lower Permian glacial-marine siliciclastics with cool/cold-water bivalves, small solitary non-dissepimented corals, low diversity fusulinids Pseudofusulina and Eoparafusulina (Peri-Gondwanan fauna). Basaltic magmatism in Cimmerian blocks mainly in Artinskian, likely related to initial rifting from N Gondwana margin. Late E Permian- M Permian siliciclastics and carbonates with mixed cold-warm-water fauna indicate N-ward drifting of Cimmerian blocks. Typical Cimmerian taxa: rugose coral Thomasiphyllum, fusulinids Monodiexodina and Eopolydiexodina, and also some tropical Tethyan elements. U Permian mainly dolomitic limestones with Cimmerian foraminifera Shanita and Hemigordius and Tethyan taxa like compound coral Waagenophyllum)

Wang, X.D, W. Lin, S.Z. Shen, P. Chaodumrong, G.R. Shi, X. Wang & Q.L. Wang (2013)- Early Permian rugose coral *Cyathaxonia* faunas from the Sibumasu Terrane (Southeast Asia) and the southern Sydney Basin (Southeast Australia): paleontology and paleobiogeography. *Gondwana Research* 24, 1, p. 185-191.

(Sibumasu Terrane rifted from Gondwana in E Permian. Small solitary rugose Cyathaxonia coral faunas in Lower Permian of Sibumasu in SE Asia and Sydney Basin, SE Australia, suggesting cool shallow marine

conditions, while Cathaysian corals reflect location near Paleo-equator. *M Permian corals in Sibumasu dominated by solitary and compound Waagenophyllidae ('Cathaysian'), but some endemic taxa in Sibumasu Terrane during this time suggest it was still independent paleobiogeographical entity. Eleven coral species including 5 new taxa described. No Late Carboniferous corals known from Gondwanan terranes in SE Asia)*

Wang, X.D., G.R. Shi, T. Sugiyama & R.R. West (2003)- Late Palaeozoic corals of Tibet (Xizang) and West Yunnan, Southwest China: successions and palaeobiogeography. *Palaeogeogr. Palaeoclim. Palaeoecology* 191, 3, p. 385-397.

(On coral faunal provincialism on Carboniferous- Permian of Tibet- W Yunnan and Cimmerian terranes. Sakmarian-Artinskian Cyathaxonia fauna. In late E Permian development of Himalayan (N margin of Gondwana) and Cimmerian provinces (Lhasa- Qiantang, Tengchong, Baoshan, W Yunnan), with Roadian solitary corals, Wordian-Capitanian Waagenophyllidae and endemic Cimmerian taxa such as Thomasiphyllum and Wentzellophyllum persicum. Thomasiphyllum has distinctive paleogeographical distribution in M Permian of Cimmerian continents, also in W Sumatra, etc. Late Permian Himalayan fauna with small solitary corals only (Lytvolasma fauna) and Cathaysian with Ipciphyllum, Liangshanophyllum, etc.)

Wang, X.D. & T. Sugiyama (2002)- Permian coral faunas of the eastern Cimmerian continent and their biogeographical implications. *J. Asian Earth Sciences* 20, p. 589-597.

(online at: https://repository.geologyscience.ru/bitstream/handle/123456789/28078/Wang_02.pdf)

(Early Permian corals of E Cimmerian continent (= Sibumasu) of Peri-Gondwanan affinity with small solitary forms; different from Cathaysian area, where abundant large solitary and compound corals occur. In M Permian endemic Cimmerian- Cathaysian fauna of large solitary and massive Waagenophyllidae, with Cathaysian aspect. Late Permian corals all Cathaysian. Changes related to rifting of Cimmerian continent from Gondwanaland in late Early Permian and subsequent N-ward drift)

Wang, X.D., T. Sugiyama, K. Ueno & Y. Mizuno (1999)- Peri-Gondwanan sequences of Carboniferous and Permian age in the Baoshan Block, West Yunnan, Southwest China. In: B. Ratanasthien & S.L. Rieb (eds.) *Proc. Int. Symposium Shallow Tethys (ST) 5*, Chiang Mai 1999, Dept. of Geological Science, Chiang Mai University, p. 88-100

(ST5 book online at: <https://library.dmr.go.th/elib/cgi-bin/opacexe.exe?op=mmvw&db=Main&skin=S&mmid=19206&bid=17374>)

(Baoshan Block in SW China includes Gondwanan Lower Permian diamictites overlain by with Cyathaxonia corals and low diversity fusulinids with Pseufusulina and Eoparafusulina species. Overlying E Permian Woniusi Fm basalts, followed by Shazipo Fm carbonates with Eopolydixodina and Shanita- Hemigordius (close to Sibumasu block of SE Asia))

Wang, X.D., Y.Q. Zhang & Wei Lin (2010)- Carboniferous-Permian rugose coral *Cyathaxonia* faunas in China. *Science China, Earth Sciences*, 53, 12, p. 1864-1872

(Cyathaxonia faunas of small solitary corals widely distributed in Carboniferous- Permian beds across China. 12 families and 40 genera recognized. Cyathaxonia faunas of Baoshan, W Yunnan and S Anhui, occur just below large dissepimented solitary and compound corals in continuous sequence, implying occurrence not strictly related to Gondwanan or peri-Gondwanan cold water environment, but may reflect by deeper water, mud-rich, quieter sedimentary environments)

Wang, Y., X. Qian, P.A. Cawood, H. Liu, Q. Feng, G. Zhao, Y. Zhang, H. He & P. Zhang (2018)- Closure of the East Paleotethyan Ocean and amalgamation of the Eastern Cimmerian and Southeast Asia continental fragments. *Earth-Science Reviews* 186, p. 195-230.

(Paleotethys suture zones (Changning-Menglian, Inthanon, Bentong-Raub) all relicts of E Paleotethys Ocean. E-ward subduction of ocean resulted in series of magmatic arc/ backarc basin/ continental fragments in SE Asia (from W to E: Lincang-Sukhothai-E Malaya arc, Jinghong-Nan-Sa Kaeo back-arc basin, Simao/ W Indochina fragment, Luang Prabang-Loei back-arc basin, S Indochina fragment, Wusu and Truong Son back-arc basins, N Indochina fragment, Jinshajiang-Ailaoshan-Song Ma branch/back-arc basin and S China Block. Assembly of fragments resulted in Triassic (Indosinian) metamorphism and related tectonothermal event. Switch from subduction of main E Paleotethys to collision of Sibumasu with Simao/Indochina at ~237 Ma. Timing of

collision events along Jinshajiang-Ailaoshan-Song Ma suture generally ~10 Ma older than along Changning-Menglian, Inthanon and Bentong-Raub suture zones)

Wang, Y., X. Qian, Y. Zhang, C. Gan, A. Zhang, F. Zhang, Q. Feng, P.A. Cawood & P. Zhang (2021)- Southern extension of the Paleotethyan zone in SE Asia: evidence from the Permo-Triassic granitoids in Malaysia and West Indonesia. *Lithos* 398-399, 3-4, 106336, p. 1-19.

(Consumption of E Paleotethyan Ocean final step in creating SE Asia continent. New geochronological, etc., data for granitoids from W Kalimantan, W Java, Bangka-Belitung and Peninsular Malaysia suggest subdivision into (1) Eastern granites (W Kalimantan/~256-207 Ma, W Java/208-207 Ma, E Peninsular Malaysia/~289-217 Ma; from juvenile crust and Indochina basement) and (2) Main Range granites (Bangka-Belitung and W Peninsular Malaysia, ages ~226-198 Ma; from meta-greywacke source). Bentong-Raub Paleotethys suture extends S into easternmost Bangka-Belitung and W Java (?). Eastern granites reflect E-ward subduction of Paleotethys. Main Range granites post-collisional rocks)

Wang, Z., D. Zhao, X. Chen & R. Gao (2022)- Subducting slabs, Hainan plume and intraplate volcanism in SE Asia: insight from P-wave mantle tomography. *Tectonophysics* 831, 229329, p. 1-17.

(P wave tomography model down to 1600 km under SE Asia, with subducted plates revealed as high-velocity bodies. Intraplate volcanoes in Borneo underlain by low-velocity anomalies in upper mantle, with high-velocity anomaly in lower mantle. Hot and wet upwelling flows in mantle wedge above stagnant slab in mantle transition zone may have caused intraplate volcanism in Borneo. Large low-velocity anomaly under mainland SE Asia basalt province, possibly hot zone with mantle (e.g. Hainan plume).

Wanless, H.R. & J.R. Cannon (1966)- Late Paleozoic glaciation. *Earth-Science Reviews* 1, 4, p. 247-286.

(Late Paleozoic glaciation reported from many localities on Gondwana, including India, Pakistan, Australia, etc. Nothing known from SE Asia yet)

Waterhouse, J.B. (1972)- The evolution, correlation, and paleogeographic significance of the Permian ammonoid family Cyclolobidae. *Lethaia* 5, 3, p. 251-270.

(Cyclolobidae of M Permian age. Waagenoceras- Timorites lineage inhabited paleotropical latitudes, and Timorites found around rim of Pacific Ocean (both also present on Timor; JTvG))

Waterhouse, J.B. (1982)- An Early Permian cool-water fauna from pebbly mudstones in south Thailand. *Geological Magazine* 119, 4, p. 337-354.

(E Permian (Asselian) small brachiopod fauna from E Permian pebbly mudstones- sandstones of Phuket Gp at Ko Muk and Ko Phi Phi islands, Andaman Sea. With Komukia, Cancrinelloides, Rhynchopora, Sulciplica, etc. At one locality associated with solitary coral Euryphyllum. Most genera found in temperate- high paleolatitudes, suggesting pebbly mudstones are cool water deposits, contemporaneous with Late Asselian Gondwana glacial deposits (=Phuket Gp is part of 'Sibumasu terrane'; JTvG))

Waterhouse, J.B. (1987)- Perceptions of the Permian Pacific- the Medusa hypothesis. In: E. Brennan (ed.) *Proc. Pacific Rim Congress 1987, Gold Coast, Australasian Institute of Mining and Metallurgy, Parkville*, p. 607-614.

Waters, J.A. (1990)- The palaeobiogeography of the Blastoidea (Echinodermata). In: W.S. McKerrrow & C.R. Scotese (eds.) *Palaeozoic palaeogeography and biogeography*, Geological Society, London, Memoir 12, p. 339-352.

(Permian blastoids widespread but most diverse in SE Asia and Australia. Timor faunas Sakmarian-Asselian and Kazanian, and most diverse and abundant. Paleocology and stratigraphy poorly understood. Some common species between Timor and Australia, but others conspicuously absent: Angioblastus, Deltoblastus not in Australia; Australoblastus not in Timor. Reasons for local endemism unclear. Kazanian Timor fauna is last successful blastoid community before going extinct)

Webby, B.D., I.G. Percival, G. Edgecombe, F. Vandenberg, R. Cooper, J. Pickett et al. (2000)- Ordovician biogeography of Australasia. In: J. Wright et al. (eds.) *Palaeobiogeography of Australasian faunas and floras*, Assoc. Australian Palaeont., Memoir 23, p. 63-126.

Webster, G.D. (1998)- Palaeobiogeography of Tethys Permian crinoids. In: G.R. Shi, N.W. Archbold & M. Grover (eds.) Strzelecki Int. Symposium on Permian of Eastern Tethys: biostratigraphy, palaeogeography and resources, Proc. Royal Society of Victoria 110, 1-2, p. 289-308.

(No Permian crinoid fauna in world as diverse and abundant as Timor. Five horizons between Sakmarian-Wuchiapingian. Australian faunas generally considered as cooler water faunas, >35°S. Timor warm-water shelf. In Artinskian greater similarity between W Australia and Timor than between W and E Australia)

Wei, W., D. Zhao, W. Yu & Y. Shi (2022)- Complex patterns of mantle flow in eastern SE Asian subduction zones inferred from P-wave anisotropic tomography. J. of Geophysical Research 127, 5, e2021JB023366, p.

(New P-wave velocity models beneath eastern SE Asia reveal detailed structures of subducting S China Sea (SCS), Negros, Molucca Sea, Philippine Sea, and Banda slabs, the previously subducted Proto-SCS slab and remnants of other paleo slabs, showing long-lived subductions. Low dip angle of SCS slab S of 18°N caused by subduction of extinct mid-ocean ridge, and a slab tear possibly formed at 18°N. Etc.)

Westermann, G.E.G. (1980)- Ammonite biochronology and biogeography of the circum-Pacific Middle Jurassic. In: M.R. House & J.R. Senior (eds.) The Ammonoidea, Academic Press, London, p. 459-498.

Westermann, G.E.G. (1988)- Middle Jurassic ammonite biogeography supports ambi-Tethyan origin of Tibet. In: M.G. Audley-Charles & A. Hallam (eds.) Gondwana and Tethys, Geological Society, London, Special Publ. 37, p. 235-239.

(M Jurassic ammonites from Tibet Tethyan Himalaya (Spiti Shale) typical of SE margin of Tethys, with connections to W India, E Africa, NW Australasia. N Tibet (Qamdo) and S Tibet (Lhasa) consistent with Eurasian position in M Jurassic. Tithonian ammonoid affinities of Tethyan Himalaya very close to NW Australia, which Uhlig (1911) correctly included in Himalayan province)

Westermann, G.E.G. (ed.) (1993)- The Jurassic of the Circum-Pacific. Cambridge University Press, p. 1-688.

(Collection of 27 papers on Jurassic geology, floras, faunas and biogeography of circum-Pacific region, incl. Sukanto & Westermann on Indonesia/ PNG and Sato on SE Asia and Japan)

Westermann, G.E.G. (1993)- Global bio-events in mid-Jurassic ammonites controlled by seaways. In: M.R. House (ed.) The Ammonoidea: environment, ecology and evolutionary change. Systematics Association Special Volume 47, Oxford Science Publ., p. 187-226.

Westermann, G.E.G. (2000)- Marine faunal realms of the Mesozoic: review and revision under the new guidelines for biogeographic classification and nomenclature. Palaeogeogr. Palaeoclim. Palaeoecology 163, p. 49-68.

(Review of published Mesozoic marine realms subrealms and superrealms and problems in defining them. Most important superrealms: (1) Boreal/Euroboreal (Arctic and Boreal-Atlantic) and (2) Tethys-Panthalassa (Tethyan, Mediterran-Caucasian, Indo-Pacific (Jurassic-E Cretaceous) and Austral (M-Late Cretaceous))

Whitmore, T.C. (ed.) (1981)- Wallace's Line and plate tectonics. Clarendon Press, Oxford, p. 1-90.

(Collection of papers on relation between present-day faunal provinces and plate tectonic history of Indonesia, incl. Audley-Charles paper on plate tectonics)

Whitmore, T.C. (ed.) (1987)- Biogeographical evolution of the Malay Archipelago. Oxford Monographs Biogeography 4, Clarendon Press, Oxford, p. 1-145.

Whymark, A. (2021)- A review of evidence for a Gulf of Tonkin location for the Australasian tektite source crater. Thai Geoscience J. 2, 2, p. 1-29.

(online at: https://www.academia.edu/50761325/A_review_of_evidence_for_a_Gulf_of_Tonkin_location_for_the_Australasian_tektite_source_crater)

Whymark, A. (2021)- Constraints on the location of the Australasian tektite impact crater. Unpublished Draft Report. p. 1-64. (online at:

www.academia.edu/45122493/Constraints_on_the_Location_of_the_Australasian_Tektite_Impact_Crater)
(Extensive review of large Pleistocene cosmic impact event in Indochina Peninsula around ~0.788 Ma, and its 1448 known Australasian tektites (AAT) localities across SE Asia, Australia and beyond. AAT strewn field with proximal (e.g. indochinite, chinite), medial (e.g. philippinite, billitonite) and distal (e.g. javaite, australite) tektites. This, with likely pattern of 'ejecta rays' radiating from S Laos/ C Vietnam to NW Gulf of Tonkin area, point to impact location in this area, but impact crater not yet firmly identified. Crater diameter likely ~40 km and obliquity of Australasian impact was perhaps 15°- 25°. Sangiran, Java, tektites transitional between ablated and unablated forms. Etc.)

Wilson, K.M., M.J. Rosol & W.W. Hay (1989)- Global Mesozoic reconstructions using revised continental data and terrane histories: a progress report. In: J.W. Hillhouse (ed.) Deep structure and past kinematics of accreted terranes, American Geophysical Union (AGU) Geophysical Monograph Series 50, p. 1-39.

(online at: www.agu.org/books/gm/v050/GM050p0001/GM050p0001.pdf)

(Series of interesting M Triassic- E Cretaceous global plate reconstructions, largely driven by faunal records)

Wnuk, C. (1996)- The development of floristic provinciality during the Middle and Late Paleozoic. Review Palaeobotany Palynology 90, p. 5-40.

(On evolution of floristic provinces since Silurian. Three main phytogeographic units in earliest fossil floras (Angara, Euramerica, Gondwana). Fourth unit (Cathaysia) differentiated from Euramerica in latest Carboniferous. Includes mention of New Guinea Gondwanan flora. Nothing on Sumatra or other SE Asia)

Wood, G.D., M.A. Miller, D.T. Pocknall, A.M. Aleman, J.A. Stein & R. Dino (1998)- Paleoclimatologic, paleoecologic and biostratigraphic significance of the Middle Cretaceous elaterate microfloral province, Gondwana. In: AAPG International Conference Exhib., Abstracts, American Assoc. Petroleum Geol. (AAPG) Bull. 82, 10, p. 1982. (Abstract only)

(One of best defined Cretaceous phytogeographic realms is Albian-Cenomanian 'elaterate' microfloral province, bracketing Cretaceous paleo-equator, in tropical-subtropical Africa- S America and outliers in China, Middle East and PNG. Typified by elater bearing pollen Elaterocolpites, Elateroplicites, Elateropollenites, etc. Parent plants inhabited paleotropical humid coastal plains of Proto-South Atlantic and Tethys oceans)

Wopfner, H. (1996)- Gondwana origin of the Baoshan and Tengchong terranes of west Yunnan. In: R. Hall et al. (eds.) Tectonic evolution of Southeast Asia, Geological Society, London, Special Publ. 106, p. 539-547.

(Permo-Carboniferous glaciomarine deposits, Permian cold-water faunas and *Glossopteris* indicate a Gondwana provenance of Baoshan and Tengchong Blocks in W Yunnan, SW China. Late Permian- E Triassic post-glacial phase much warmer climate. Glacigene successions of Baoshan Block rel. thin and overlain by thick basalts and red beds (volcanic rift setting). On Tengchong Block glacigene marine deposits >1000 m, followed by thick E Permian reefal limestones (proximal passive margin at somewhat lower latitude). Both terranes separated from Gondwana in late Early Permian, and part of Sibumasu tectonostratigraphic terrane)

Wopfner, H. (1999)- The Early Permian deglaciation event between East Africa and Northwestern Australia. J. African Earth Sciences 29, p. 77-90.

(Late Paleozoic glacigene deposits form base of Gondwana megasequence along entire length of Tethyan margin of Gondwana. Examples of deglaciation sequences, including Tanzania, S Oman, Lesser Himalaya, NW Australia and SW China. All deglaciation sequences Late Asselian- E Sakmarian age. High content of organic matter in deglaciation deposits, like Late Asselian-E Sakmarian Treachery Shale of Australian NW Shelf with microflora of *Pseudoreticulatispora* (= *Granulatisporites*) confluens. Peak sea level in Late Sakmarian- E Artinskians. Swift and synchronous climatic amelioration reflect rapid and substantial global warming)

Wopfner, H. (2001)- Gondwana terranes of southwest China and their connections to India and Australia. J. Indian Association Sedimentologists, Delhi, 20, p. 1-19.

(Two groups of terranes with Late Carboniferous-E Permian glacial deposits that separated from Gondwana in Permian: (1) LBS (Lhasa Block, Tibet and Baoshan, W Yunnan) and Shan Thai (E Burma)), which evolved in

volcanic rift setting with margin of Greater India and NW Australia, and separated from Gondwana in Artinskian; (2) TMS (Tengchong Block, peninsular Thailand, W Malay Peninsula and N Sumatra), developed on peri-continental non-volcanic rift along N margin of Australia and pre-Permian New Guinea and separated slightly earlier than LBS)

Wopfner, H. & X.C. Jin (2009)- Pangea megasequences of Tethyan Gondwana-margin reflect global changes of climate and tectonism in Late Palaeozoic and Early Triassic times- a review. *Palaeoworld* 18, p. 169-192.

(Late Carboniferous- M Triassic 'Pangea stage' similar trends across Gondwana. Late Carboniferous- E Permian glacial- periglacial deposits followed by deglaciation in E Sakmarian, with typical facies with coal measures and redbeds. In E Permian, large graben structures started to develop between Africa and India and between India and Australia. Rifting along Tethyan margin started in E Permian, associated with volcanism between Kashmir and Yunnan and in NW Australia. Spreading of Neo-Tethys lead to separation of Cimmerian Blocks from Gondwana in late E Permian- Triassic. Two facies realms (1) intracratonic rift (Kashmir, Lhasa, Baoshan blocks) and (2) detached more distal blocks (Tengchong, Malaya, Sumatra))

Wright, A.J., G.C. Young, J.A. Talent & J.R. Laurie (eds.) (2000)- Palaeobiogeography of Australasian faunas and floras. *Memoir Assoc. Australasian Palaeontologists (AAP)* 23, p. 1-515.

(Collection of 10 papers describing Australasian floras-faunas and paleobiogeography from Cambrian-Quaternary (but not including Triassic; JTVG))

Wu, G.Y. & B.L. Cong (1995)- Tethyan evolution and SE Asian continental accretion. *Proc. Int. Symposium Geology of Southeast Asia and adjacent areas, Hanoi 1995, Journal of Geology. Hanoi, B, 1995, 5-6, p. 293-301.*

Wu, H.R., C.A. Boulter, B.J. Ke, D.A.V. Stow & Z.C. Wang (1995)- The Changning-Menglian suture zone; a segment of the major Cathaysian-Gondwana divide in Southeast Asia. *Tectonophysics* 242, p. 267-280.

(Changning-Menglian suture zone of W Yunnan, SW China, is major Cathaysia- Gondwana divide, representing closing of Paleo-Tethys Ocean. Narrow N-S zone of E Devonian- M Permian oceanic siliceous sediments and dismembered ophiolite complexes, including reef-capped oceanic islands. Simao terrane is E of suture, has Cathaysian affinities and not part of Sibumasu terrane as suggested by various authors. Subduction created active continental margin on W edge of Simao terrane throughout much of Triassic;until closure of this branch of Paleotethys in early Late Triassic)

Wu, J. & J. Suppe (2017)- Proto-South China Sea plate tectonics using subducted slab constraints from tomography. *J. of Earth Science (China)*, 29, 6, p. 1304-1318.

(online at: <https://link.springer.com/content/pdf/10.1007/s12583-017-0813-x.pdf>)

(Reconstruction of vanished Proto-South China Sea ocean plate, from tomography imaging of subducted slab. Two slabs identified, now at depths of 750-900 km. Proto-South China Sea consumed by double-sided subduction: (1) 'North Proto-South China Sea' (now under northern S China Sea- Philippines) subducted southward in Oligo-Miocene under Dangerous Grounds, expanding S China Sea by in-place 'self subduction' similar to W Mediterranean basins; (2) limited Southward subduction of proto-S China Sea under Borneo before Oligocene (35 Ma), represented by 800-900 km deep 'S Proto-South China Sea' slab (now under southern South China Sea- North Borneo))

Wu, J., J. Suppe & R.V.S. Kanda (2012)- Constraints on the extrusion of SE Asia from subducted slabs of the Indian, Australian, Philippine Sea and Molucca Sea plates. *EGU General Assembly, Vienna 2012, p. 10019 (Abstract only)*

(Subducted slabs under SE Asia mapped from seismic tomography and seismicity. When unfolded and restored, slabs show incompatibilities with existing plate-tectonic models. Philippine Sea, Molucca Sea and Celebes Sea plates are fragments of once much larger NE Indian-Australian Ocean, once continuous with Sunda slab and present Indian Ocean)

Wu, J., J. Suppe, R. Lu & R. Kanda (2016)- Philippine Sea and East Asian plate tectonics since 52 Ma constrained by new subducted slab reconstruction methods. *J. of Geophysical Research: Solid Earth* 121, 6, p. 4670-4741.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/2016JB012923>)

(Reconstructed Philippine Sea and E Asian plate tectonics since E Eocene from 28 slabs mapped from global tomography, with subducted area of ~25% of present-day global oceanic lithosphere. Slab constraints include subducted parts of existing Pacific, Indian and Philippine Sea oceans, plus subducted proto-S China Sea and newly discovered 8000 × 2500 km 'East Asian Sea' between Pacific and Indian Oceans at 52 Ma based on lower mantle flat slabs. Philippine Sea formed above Manus plume near Pacific- E Asian Sea plate boundary. Philippine Sea W-ward motion and post-40 Ma max. 80° CW rotation accompanied late Eocene-Oligocene collision with Caroline/Pacific plate. Philippine Sea moved N post-25 Ma over northern East Asian Sea, forming N Philippine Sea arc that collided with SW Japan-Ryukyu margin in Miocene (~20-14 Ma).Etc.)

Xia, Y., X. Xu, Y. Niu & L. Liu (2017)- Neoproterozoic amalgamation between Yangtze and Cathaysia blocks: The magmatism in various tectonic settings and continent-arc-continent collision. *Precambrian Research* 309, p. 56-87.

(manuscript online at: <http://dro.dur.ac.uk/21242/1/21242.pdf>)

(Neoproterozoic amalgamation history of Yangtze and Cathaysia blocks, forming S China Block: (1) ~1000-860 Ma NW-ward intra-oceanic subduction and SE-ward ocean-continent subduction (with continental margin magmatism in Cathaysia Block); (2) ~860-825 Ma steepening subduction caused development of back-arc basin in intra-oceanic arc zone and slab rollback induced arc and back-arc magmatism in Cathaysia Block. NW-ward ocean-continent subduction formed continental margin magmatism in Yangtze Block; (3) ~825-805 Ma continent-arc-continent collision and final amalgamation between Yangtze and Cathaysia blocks (Jiangnan Orogen); (4) ~805-750 Ma collapse of Jiangnan Orogen and Nanhua rift basin formed)

Xu, C., H. Shi, C.G. Barnes & Z. Zhou (2016)- Tracing a late Mesozoic magmatic arc along the Southeast Asian margin from the granitoids drilled from the northern South China Sea. *International Geology Review* 58, p. 71-94.

(online at: www.researchgate.net/publication/281536288_Tracing_a_late_Mesozoic_magmatic_arc_Etc.)

(Granitoids drilled in N S China Sea two magmatic episodes: Late Jurassic (162-148 Ma) and E Cretaceous (137-102 Ma). Jurassic magmatism probably began in late M Jurassic, documented by inherited zircons. I-type granites, generated in continental arc environment. Arc granites of SCS, with accretionary wedge of Palawan terrane to SE and zone of lithospheric extension to N throughout SE China, define late Mesozoic SW-NE trench-arc-backarc setting for SE Asian continental margin, related to subduction of Paleo-Pacific slab beneath Asia)

Xu, C., L. Zhang, H. Shi, M.R. Brix, H. Huhma, L. Chen, M. Zhang & Z. Zhou (2017)- Tracing an Early Jurassic magmatic arc from South to East China Seas. *Tectonics* 36, 3, p. 466-492.

(E Jurassic granite and diorite in wells in NE S China Sea and SW E China Sea (198-187 Ma), probably part of arc-related granitoids, that, along with SE Taiwan, may define E Jurassic NE-SW trending Dongsha-Talun-Yandang magmatic arc zone along East Asian continental margin paired with Jurassic accretionary complexes from SW Japan, E Taiwan to W Philippines. Arc-subduction complex associated with oblique subduction of Paleo-Pacific slab beneath Eurasia)

Xu, H.P., Y.C. Zhang, D.X. Yuan & S.Z. Shen (2022)- Quantitative palaeobiogeography of the Kungurian-Roadian brachiopod faunas in the Tethys: implications of allometric drifting of Cimmerian blocks and opening of the Meso-Tethys Ocean. *Palaeogeogr. Palaeoclim. Palaeoecology* 601, 111078, p. 1-15.

(Two new S and N Cimmerian paleobiogeographic subprovinces recognized, besides previously defined Cathaysian, Transhimalayan, Westralian and Austrazeen provinces. Lhasa, Tengchong and Irrawaddy blocks (main parts of S Cimmerian Subprovince), probably situated near peri-Gondwanan region. S Qiangtang, Baoshan and Sibuma blocks of N Cimmerian Subprovince probably in temperate region of S Hemisphere during E-M Permian transition. Meso-Tethys Ocean may have existed before late E Permian)

Xu, J., Z. Ben-Avraham, T. Kelty & H.S. Yu (2014)- Origin of marginal basins of the NW Pacific and their plate tectonic reconstructions. *Earth-Science Reviews* 130, p. 154-196.

(Basins of Bohai Gulf, S China Sea, E China Sea, Japan Sea, Andaman Sea, Okhotsk Sea and Bering Sea typical geometry of dextral pull-apart. Java, Makassar, Celebes and Sulu Seas basins together with grabens in Borneo also dextral, transform-margin type basin system. Formation of gigantic linked dextral pull-apart basin system in NW Pacific due to NNE- to ENE-ward motion of E Eurasia, mainly response to Indo-Asia collision which started at ~50 Ma)

Xu, Y., P.A. Cawood, Y. Du, L. Hu, W. Yu, Y. Zhu & W. Li (2013)- Linking South China to northern Australia and India on the margin of Gondwana: Constraints from detrital zircon U-Pb and Hf isotopes in Cambrian strata. *Tectonics* 32, 6, p. 1547-1558.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/full/10.1002/tect.20099>)

(Cambrian sedimentary rocks in S part of S China Craton derived from source to S or SE, beyond current limits of craton. U-Pb ages and Hf isotope data on detrital zircons from Cambrian two age peaks at 1120 Ma and 960 Ma, with $\epsilon\text{Hf}(t)$ values similar to coeval detrital zircons from W Australia and Tethyan Himalaya zone, respectively. ~1120 Ma detrital zircons likely derived from Wilkes-Albany-Fraser belt (between SW Australia-Antarctica); ~960 Ma zircons possibly sourced from Rayner-Eastern Ghats belt (between India-Antarctica). Suggesting S China was at nexus between India, Antarctica, and Australia along N margin of E Gondwana)

Xu, Y., P.A. Cawood, Y.S. Du, H. Huang & X. Wang (2014)- Early Paleozoic orogenesis along Gondwana's northern margin constrained by provenance data from South China. *Tectonophysics* 636, p. 40-51.

(Cambrian- Ordovician boundary unconformity in S part of S China Craton related to coeval orogenic activity along Indian margin of E Gondwana. Disconformity at base Ordovician part of regional break also documented in Himalaya, Qiangtang, Lhasa, Sibumasu and W Australia, with angular unconformity, metamorphism of older units and widespread magmatic activity. S China Craton also deformed and metamorphosed during mid-Paleozoic intra-continental Kwangsian orogeny, with regional angular unconformity between Devonian cover and metamorphosed pre-Devonian along with granite intrusion between 460-400 Ma)

Xue, F. (2017)- New understanding on the potentials and approaches of Pre-Tertiary carbonate reservoirs in Southeast Asia. *Proc. Asia Petroleum Geoscience Conference and Exhibition (APGCE 2017)*, EAGE, Kuala Lumpur, 43213, p. 179-183. *(Extended Abstract)*

Yamashita, I., A. Surinkum, Y. Wada, M. Fujihara, M. Yokoyama, H. Zaman & Y. Otofujii (2011)- Paleomagnetism of the Middle-Late Jurassic to Cretaceous red beds from the Peninsular Thailand: implications for collision tectonics. *J. Asian Earth Sciences* 40, 3, p. 784-796.

(Paleomagnetic data of Jurassic- Cretaceous red sandstones from Peninsular Thailand suggests two opposite tectonic rotations in Trang area. As part of Thai-Malay Peninsula underwent CW rotation after Jurassic together with Shan-Thai and Indochina blocks. Between Late Cretaceous and M Miocene, as part of S Sundaland Block (incl. Peninsular Malaysia, Borneo and S Sulawesi), up to $24.5^\circ \pm 11^\circ$ CCW rotation relative to S China Block. N boundary of CCW rotated zone between Trang area and Khorat Basin)

Yan, J.X. & H. Yin (2000)- Paleoclimatic constraints for early Permian paleogeography of Eastern Tethys. In: H. Yin et al. (eds.) *Permian-Triassic evolution of Tethys and Western Circum-Pacific*, *Developments in Palaeontology and Stratigraphy* 18, Elsevier, p. 1-15.

*(Paleoclimate indicators used to distinguish major Asian blocks. Early Permian cooler climate areas with diamictites and *Glossopteris* flora, warm climates have fusulinid limestones, *Gigantopteris* floras, etc. Suggest N-ward movement in Permian of blocks like Sibumasu from S Hemisphere Gondwana to N Hemisphere Asia)*

Yan, J.X. & D. Zhao (2001)- Advancement of the Mesotethys along the northern margin of the South China Sea. *Marine Geol. Quaternary Geology*, Beijing, 21, 4, p. 49-54.

(In Chinese. Marine Mesozoic strata along N margin of S China Sea indicate marine basin. Basin was large ocean in Mesozoic and can be traced W-ward to Mesotethys (Meratus suture of Kalimantan, and Woyla suture on Sumatra), E-ward ocean connected to extinct ocean in Sakawa zone of Japan through Taiwan Straits. Ocean closed around M Cretaceous, resulting from docking of N Palawan Terrane and Reed Bank terrane)

Yan, J.X. & K. Zhao (2001)- Permo-Triassic paleogeographic, paleoclimatic and paleoceanographic evolutions in eastern Tethys and their coupling. *Sci. China, Ser. D*, 44, p. 968-978.

(Permian and Triassic (Chihstian, Wujapingian, Anisian and Norian) reconstructions and paleogeography of E Tethys area, mainly driven by paleoclimate records)

Yan, Q.S. & X.F. Shi (2007)- Hainan mantle plume and the formation and evolution of the South China Sea. *Geol. J. Chinese Universities* 13, 2, p. 311-322.

(Seismic tomographic images suggest possible mantle plume beneath and around Hainan island (sub-vertical low-velocity column, extending from shallow depths to 660-km seismic discontinuity and continuously to depth of 1900 km. Large quantity of Cenozoic alkali basalts distributed in S China Sea and adjacent areas)

Yan, Q., X. Shi, I. Metcalfe, S. Liu, T. Xu, N. Kornkanitnan, T. Sirichaiseth, L. Yuan, Y. Zhang & H. Zhang (2018)- Hainan mantle plume produced late Cenozoic basaltic rocks in Thailand, Southeast Asia. *Nature Scientific Reports* 8, 2640, p. 1-14.

(online at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5805767/pdf/41598_2018_Article_20712.pdf)

(Intraplate volcanism started after 16 Ma, shortly after cessation of seafloor spreading in S China Sea, affecting large areas. Geochemistry of Late Miocene- Pleistocene basalts from Khorat Plateau and Sukhothai arc terrane in Thailand show Oceanic Island Basalt -like characteristics. Post-spreading intra-plate volcanism around S China Sea region probably induced by Hainan mantle plume)

Yan, Y., B. Huang, D. Zhang, P. Charusiri & A. Veeravananakul (2018)- Paleomagnetic study on the Permian rocks of the Indochina Block and its implications for paleogeographic configuration and northward drifting of Cathaysia in the Paleo-Tethys. *J. of Geophysical Research: Solid Earth* 123, 6, p. 4523-4538.

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018JB015511>)

(Paleomagnetic constraints of Permian paleo-position of Indochina and its drifting history in Paleo-Tethys Ocean. E-M Permian limestones from Khao Khwang Platform in C Thailand (W margin of Indochina Block) were at paleolatitude $21 \pm 6^\circ\text{S}$ (now 15°N), supporting $\sim 5,000$ km N-ward transition of Indochina block from near Gondwana in E-M Permian (~ 280 Ma) to S margin of Eurasia by Late Triassic (Norian, ~ 220 Ma). Concurrent Permian N-ward drift history suggested for Indochina, North Qiangtang and South China blocks)

Yan, Y., B. Huang, J. Zhao, D. Zhang, X. Liu, P. Charusiri & A. Veeravananakul (2017)- Large southward motion and clockwise rotation of Indochina throughout the Mesozoic: paleomagnetic and detrital zircon U-Pb geochronological constraints. *Earth Planetary Science Letters* 459, p. 264-278.

(Paleomagnetic and U-Pb geochronologic study of Late Triassic-Cretaceous Huai Hin Lat and Nam Phong Fms in NE Thailand (W Khorat Plateau; part of Indochina Block). Paleolatitudes in Norian (<227 Ma) at $33 \pm 7^\circ\text{N}$ to Late Cretaceous $25 \pm 5^\circ\text{N}$. Data indicate S-ward displacement with CW rotation)

Yan, Y., Q. Zhao, Y. Zhang, B. Huang, W. Zheng & P. Zhang (2019)- Direct paleomagnetic constraint on the closure of Paleo-Tethys and its implications for linking the Tibetan and Southeast Asian blocks. *Geophysical Research Letters* 46, 24, p. 14368-14376

(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2019GL085473>)

(Paleo-latitudinal constraints on Paleo-Tethys suture zone in W Yunnan indicates N branch of Paleo-Tethys Ocean closed no later than Carnian (Late Triassic), and confirms geographic linkage between N Qiangtang and Indochina Blocks at least during E Permian- Late Triassic.

Yang, J., P.A. Cawood & Y. Du (2015)- Voluminous silicic eruptions during late Permian Emeishan igneous province and link to climate cooling. *Earth Planetary Science Letters* 432, p. 166-175.

(Case study for ~ 260 Ma Emeishan Large Igneous Province in S China, where silicic volcanic rocks are minor component of preserved rock due to extensive Late Permian erosion. Silicic volcanic rocks $\sim 30\%$ of volume of eroded Emeishan volcanics. Basalt-derived silicic eruptions released sulfur gases into higher atmosphere, contributing to climate cooling at Capitanian-Wuchiapingian transition at ~ 260 Ma)

Yang, J., P.A. Cawood, Y. Du, H. Huang & L. Hu (2014)- A sedimentary archive of tectonic switching from Emeishan plume to Indosinian orogenic sources in SW China. *J. Geological Society, London*, 171, 2, p. 269-280.

(U Permian- M Triassic sediments in Youjiang Basin, S China, record change from Late Permian within-plate mafic-dominated source to NW (zircons ages ~260 Ma; mainly from Emeishan Large Igneous Province), to E-M Triassic mixed magmatic arc-recycled orogenic source to W (subduction-collision rocks of Indosinian Orogeny) and E (recycled Precambrian- E Paleozoic rocks in S China hinterland))

Yang, K. (1998)- A plate reconstruction of the Eastern Tethyan orogen in Southwestern China. In: M.F.J. Flower et al. (eds.) *Mantle dynamics and plate interactions in East Asia*, American Geophysical Union (AGU) Geodynamics Series 27, p. 269-287.

(E Tethyan orogenic belt in SW China includes S Tibet, N Tibet, Baoshan-Shan-Thai, Changdu-Simao-Indochina and Zhongza terranes between India and Yangtze continental plates, separated by sutures with dismembered ophiolites and arc volcanic belts, recording series of closed Carboniferous- Tertiary Tethyan ocean basins. Lancangjiang suture records Permo-Carboniferous Tethyan ocean, separating Gondwanaland and Eurasia. Two phases (1) Carboniferous-Triassic spreading of Lancangjiang, Jinshajiang and Garze-Litang oceans and breakup of Changdu-Simao-Indochina and Zhongza terranes from S margin of Eurasia; (2) Triassic-Tertiary spreading of Nujiang and Yarlung Zangpo oceans associated with breakup of S Tibet, N Tibet and Baoshan-Shan-Thai terranes from N Gondwanaland)

Yap, S. (2002)- On the distributional patterns of Southeast-East Asian freshwater fish and their history. *J. of Biogeography* 29, 9, p. 1187-1199.

(Present-day fresh water fish distributions classified into 19 biogeographical zones/ main river systems Sundaic islands grouped into four pairs: Malay Peninsula- N Sumatra, C Sumatra-W Borneo, N Borneo-E Borneo-Sarawak and S Borneo-Java. Java is relatively small, but landbridge island connected it with large islands of Sumatra and Borneo during Pleistocene low sea level periods)

Yeh, M.W. & J.G. Shellnutt (2016)- The initial break-up of Pangaea elicited by Late Paleozoic deglaciation. *Nature Scientific Reports* 6, 31442, p. 1-9.

(online at: <https://www.nature.com/articles/srep31442>)

(‘Unconventional’ hypothesis suggesting Permian rifting of Cimmerian ribbon terrane from S Tethys/ N Gondwana margin was driven by E Permian glacial-deglaciation. Mantle-plume model used to explain rift-related volcanism but Cimmerian rifts do not correlate well with pre-existing suture zones. Location and timing of Cimmerian rifting resulted from exploitation of structural heterogeneities within crust that formed due to repeated glacial-interglacial cycles in Late Paleozoic. Effects of continental deglaciation helped to create shape of Cimmeria and Neotethys (= Mesotethys; JTvG) Ocean)

Yin, An (2010)- Cenozoic tectonic evolution of Asia: a preliminary synthesis. *Tectonophysics* 488, p. 293-325. *(Cenozoic tectonic evolution model of Asia, including lateral extrusion of SE Asia between 32- 17 Ma after India- Asia collision)*

Yin, Hongfu (1997)- Triassic biostratigraphy and palaeobiogeography of East Asia. In: J.M. Dickins (ed.) *Late Palaeozoic and Early Mesozoic Circum-Pacific events and their global correlation*, Cambridge University Press, p. 168-185.

(Timor Triassic faunas classified as ‘Gondwanan Tethys’ facies, similar to Lhasa- W. Birma?; different from ‘India-Gondwana’ and ‘Cathaysian-Tethys’. Misolia is part of subtropical ‘Gondwanan Tethys’. Gondwanan Tethys and Tropical Tethys merged in Late Triassic due to S-ward expansion of tropical-subtropical biota)

Yin, Hongfu, J.M. Dickins, G.R. Shi & J. Tong (eds.) (2000)- *Permian-Triassic evolution of Tethys and Western Circum-Pacific*. *Developments in Palaeontology and Stratigraphy* 18, Elsevier, 412p.

(Reviews of Permian-Triassic in mainland E Asia, New Zealand, etc. Little on Indonesia, New Guinea)

Yin, Hongfu & Y. Peng (2000)- The Triassic of China and its interregional correlation. In: H. Yin et al. (eds.) Permian-Triassic evolution of Tethys and Western Circum-Pacific, Developments in Palaeontology and Stratigraphy 18, Elsevier, p. 197-220.

(Review of Triassic stratigraphy of China. Six regions, incl. NW Pacific (marine), tropical Cathaysian Tethys and warm-temperate Gondwanan Tethys (Himalayas and SE extension into Yunnan-Tengchong area))

Yin, Hongfu, S.D. Wu, Y. Du, J. Yan & Y. Peng (1999)- South China as a part of archipelagic Tethys during Pangea time. Proc. Int. Conference on Pangea and the Paleozoic- Mesozoic transition, Wuhan 1999, p. 69-73.

(South China composed of several microplates in Late Paleozoic, at time when Eastern Tethys was an 'archipelagic Ocean' with numerous microplates that amalgamated into Paleosia during Late triassic Indosinian orogeny)

Yin, Hongfu, K. Zhang & Q. Feng (1999)- The Archipelagic Ocean system of the Eastern Eurasian Tethys. Acta Geologica Sinica (English Edition) 78, 1, p. 230-236.

(Unlike typical oceans such as wide and 'clean' Atlantic, Tethys Ocean showed archipelagic pattern during all stages, especially E Tethys. Evolutionary history of Qinling-Qilian-Kunlun, S China and Xizang (Tibet) to Yunnan regions)

Yu, C., X. Shi, X. Yang, J. Zhao, M. Chen & Q. Tang (2017)- Deep thermal structure of Southeast Asia constrained by S-velocity data. Marine Geophysical Research 38, 4, p. 341-355.

(Deep thermal structure of SE Asia, derived from empirical relation between S-velocity and T. Temperature at depth of 80 km in rifted and oceanic basins (Thailand Rift Basin, Gulf of Thailand, Andaman Sea and S China Sea) is ~200 °C higher than in plateaus (Khorat Plateau, Sumatra Island) and subduction zones (Philippine Trench). Surface heat flow in S China Sea mainly dominated by deep thermal state. Temperatures at 100-120 km depths more uniform. Estimated base of lithosphere corresponds to ~1400 °C isotherm; good correlation with tectonic setting.)

Zahirovic, S. (2020)- Resolving geological enigmas using plate tectonic reconstructions and mantle flow models. In: N. Scarselli et al. (eds.) Regional Geology and Tectonics, Vol. 1, Principles of geological analysis, 2nd. Edition, Chapter 6, Elsevier, p. 93-111.

(On geological and geophysical constraints into plate motion models that are integral to better understanding the formation and evolution of economic geological resources, as well as changes in Earth's biogeographic evolutionary trajectory. Including example section on ' Sundaland and New Guinea', p. 102-105, area of complex interaction of converging Indo-Australian, Eurasian and Pacific plates, where regional flooding patterns that are out of sync with global sea level. In Sundaland, accretion of the Woyla Arc onto Sumatra margin in Late Cretaceous (~80 Ma) led to a ~15 Myr interruption in arc volcanism and subduction, leading to several 100m of dynamic uplift. Renewed subduction by ~60 Ma (especially after ~30 Ma) led to progressive dynamic subsidence of Sundaland. Etc.)

Zahirovic, S., N. Flament, R.D. Muller, M. Seton & M. Gurnis (2016)- Large fluctuations of shallow seas in low-lying Southeast Asia driven by mantle flow. Geochem. Geophysics Geosystems 17, 9, p. 3589-3607.

(online at: <http://ro.uow.edu.au/cgi/viewcontent.cgi?article=5216&context=smhpapers>)

(On link between mantle flow and surface tectonics. SE Asia one of lowest lying continental regions in world, with half of continental area presently inundated by shallow sea. Widespread Late Cretaceous-Eocene regional unconformity in SE Asia likely driven by dynamic topography during a subduction hiatus, i.e. several 100m of emergence of Sundaland between ~80-60 Ma due to slab breakoff after Late Cretaceous collision of Gondwana-derived terranes with Sundaland. Renewed subduction from ~60 Ma re-initiated dynamic subsidence of Sundaland, leading to submergence from ~40 Ma)

Zahirovic, S., K.J. Matthews, N. Flament, R. Muller, K. Hill, M. Seton & M. Gurnis (2016)- Tectonic evolution and deep mantle structure of the eastern Tethys since the latest Jurassic. Earth- Science Reviews 162, p. 293-337.

(manuscript online at: www.academia.edu/28878030/Tectonic_evolution_and_deep_mantle_structure_of_the_eastern_Tethys_since_the_latest_Jurassic)

(Major review of plate tectonics of since 160 Ma. Rifting of 'Argoland' (E Java and W Sulawesi) in latest Jurassic from NW Australian shelf, likely colliding first with parts of Woyla intra-oceanic arc in M Cretaceous, and accreting to Borneo (Sundaland) core by ~80 Ma. Neo-Tethyan ridge likely consumed along intra-oceanic subduction zone S of Eurasia from ~105 Ma, leading to change in motion of Indian Plate by ~100 Ma)

Zahirovic, S., K. Matthews, Ting Yang, N. Flament, D. Garrad, G. Brocard, J. Iwanec, K. Hill, M. Gurnis, R. Hassan, M. Seton & D. Muller (2018)- Tectonics and geodynamics of the eastern Tethys and northern Gondwana since the Jurassic. Proc. Australian Exploration Geoscience Conference (AEGC 2018), Sydney, p. 1-6.

(Extended Abstract) (online at: http://www.publish.csiro.au/ex/pdf/ASEG2018abM1_1C)

(Evolution of E Neo-Tethys since latest Jurassic rifting along N Gondwana. New Guinea N-ward motion over subducted slabs (related to Sepik back-arc basin and Maramuni subduction system), resulted in long-term flooding of margin since ~20 Ma. Sundaland continental promontory dynamic uplift in latest Cretaceous-Eocene due to accretion of Woyla Arc at ~80 Ma, leading to slab breakoff and temporary interruption of subduction. Renewed subduction along Sunda margin resulted in renewed dynamic subsidence from ~30 Ma, amplified by regional basin rifting events. Sinking Sunda slab likely triggered mantle slab avalanche, resulting in contemporaneous basin inversion and dynamic subsidence from ~15 Ma)

Zahirovic, S., M. Seton & R.D. Muller (2014)- The Cretaceous and Cenozoic tectonic evolution of Southeast Asia. Solid Earth (EGU) 5, p. 227-273.

(online at: www.solid-earth.net/5/227/2014/se-5-227-2014.pdf)

(Major review and new model of tectonic evolution of SE Asia in last 155 My, with significant differences from R. Hall, I. Metcalfe and other plate reconstruction models. SW Borneo already part of SE Asia in Late Jurassic, and did not originate from NW Australia. SE Java and W Sulawesi blocks rifted off New Guinea margin in Late Jurassic, etc. With animation model in supplement)

Zakharov, Y.D., A.M. Popov & A.S. Biakov (2008)- Late Permian to Middle Triassic palaeogeographic differentiation of key ammonoid groups: evidence from the former USSR. Polar Research 27, p. 441-468.

(Incl. paleogeographic reconstructions with Late Permian- earliest Triassic (260- 247 Ma) distributions of ammonites in Paleotethys)

Zaw, K. (2014)- Metallogeny of mainland SE Asia. In: I. Basuki & A.Z. Dahlius (eds.) Sundaland Resources, Proc. Annual Conv. Indonesian Soc. Economic Geologists (MGEI), Palembang, p. 27-33.

(Brief review of mainland SE Asia mineral resources associated with complex tectonic history; see also Zaw (2014) paper below)

Zaw, K., C. Makoundi, M.B.I. Basori, G.T. Lai & Z.A. Rahman (2022)- Emerging trends in Earth science for sustainable futures in the SE Asia region. J. Asian Earth Sciences 237, 1, 105358, p. 1-9.

(online at: www.researchgate.net/publication/362617431_Emerging_trends_in_earth_science_for_sustainable_futures_in_the_SE_Asia_region)

(Review of recent key papers on regional geology of SE Asia)

Zaw, K., S. Meffre, C.K. Lai, C. Burrett, M. Santosh, I. Graham, T. Manaka, A. Salam, T. Kamvong & P. Cromie (2014)- Tectonics and metallogeny of mainland Southeast Asia- a review and contribution. Gondwana Research 26, p. 5-30.

(Review of SE Asia mineral resources associated with complex tectonic history of Gondwana supercontinent break-up, arc magmatism, backarc basin development and collisions that created present-day mainland SE Asia. This paper summarizes historical and current SE Asian geological research and ore deposit studies. Incipient arc/backarc basin magmatism is key to formation of many important ore deposits in Truong Son and Loei fold belts. Triassic to Cenozoic arc-continent and continent-continent collisions led to formation of sediment-hosted/orogenic gold deposits in Sukhothai and Sibumasu terranes. Oblique Cretaceous- Recent subduction along Andaman-Sunda trench responsible for gold and copper-gold-molybdenum porphyry and epithermal mineralization along arc in Myanmar and Sumatran volcanic arc)

- Zenonos, A., L. De Siena, S. Widiyantoro & N. Rawlinson (2019)- P and S wave travel time tomography of the SE Asia-Australia collision zone. *Physics Earth Planetary Interiors* 293, 106267, p. 1-14.
(*P and S wave tomography show clear evidence of subducted slabs penetrating into mantle along Sunda arc, Banda arc and Halmahera arc. Also evidence for slab gaps or holes near E Java. Banda arc slab single curved subduction zone. High velocity mantle connection between N Australia and E margin of Sunda arc*)
- Zhang, B.C., J.J. Fan, A.B. Luo & X.W. Zeng (2023)- Tectonic evolution of the Meso-Tethys Ocean in the Jurassic: birth, growth, and demise of a missing intra-oceanic arc. *Gondwana Research* 122, p. 41-59.
(online at: https://www.researchgate.net/publication/371434082_Tectonic_evolution_of_the_Meso-Tethys_Ocean_in_the_Jurassic_Birth_growth_and_demise_of_a_missing_intra-oceanic_arc)
(*M Jurassic diabase and contemporaneous fore-arc basalts and boninites in Bangong-Nujiang suture zone, Tibetan Plateau, likely formed during intra-oceanic subduction initiation, while M-L Jurassic dacites, granodiorites, granites and andesites likely formed in mature intra-oceanic arc. Therefore, Meso-Tethys Ocean may contain ~1000 km long intra-oceanic subduction zone with M-L Jurassic mature intra-oceanic arc. Intra-oceanic subduction initiation at ~180 Ma. likely arose via subduction transfer caused by collision of oceanic plateau and S Qiangtang terrane at ~182-177 Ma. Middle-Late ~171-155 Ma intra-oceanic arc. Intra-oceanic arc W section potentially collided with S Qiangtang terrane at ~155-145 Ma (latest Jurassic); middle section potentially lasted until E Cretaceous*)
- Zhang, B.C., J.J. Fan, A.B. Luo, S.L. Sun & J.W. Bai (2024)- Middle-Late Jurassic subduction erosion caused by intra-oceanic arc subduction in central Tibet. *Geological Society of America (GSA) Bull.* 136, 9-10, p. 4035-4049.
(online at: https://www.researchgate.net/publication/378783701_Middle-Late_Jurassic_subduction_erosion_caused_by_intra-oceanic_arc_subduction_in_central_Tibet)
(*Dongco granodiorites in C Bangong-Nujiang suture of C Tibet ~158-155 Ma (~Kimmeridgean) originated from subducted oceanic plate, and contaminated with accretionary wedge when intruded Dongco ophiolite. suggesting Dongco ophiolite was emplaced in subducted accretionary wedge before Late Jurassic. Etc.*)
- Zhang, C.L., M. Santosh, Q.B. Zhu, X.Y. Chen & W.C. Huang (2015)- The Gondwana connection of South China: evidence from monazite and zircon geochronology in the Cathaysia Block. *Gondwana Research* 28, 3, p. 1137-1151.
(*E Paleozoic structures, metamorphism and magmatic activity suggest Cathaysia (= SE part of S China block) collisional orogenic belt rather than intraplate type. Angular unconformity between Silurian- Devonian; transition from collision to post-collision at ~430 Ma. Some E Paleozoic clastics probably of Gondwana origin.*)
- Zhang, K.J. (1998)- The Changning-Menglian suture zone: a segment of the major Cathaysia-Gondwana divide in Southeast Asia- comment. *Tectonophysics* 290, p. 319-321.
(*Commentary of Wu et al. 1995 paper. Jinshajiang-Ailaoshan suture is main Cathaysia- Gondwana divide in China, not Lancangjiang-Changning-Menglian suture*)
- Zhang, X., S.L. Chung, Y.M. Lai, A.A. Ghani, S. Murtadha, H.Y. Lee & C.C. Hsu (2019)- A 6000-km-long Neo-Tethyan arc system with coherent magmatic flare-ups and lulls in South Asia. *Geology (GSA)* 47, 6, p. 573-576.
(online at: https://www.researchgate.net/publication/332487986_A_6000-km-long_Neo-Tethyan_arc_system_with_coherent_magmatic_flare-ups_and_lulls_in_South_Asia)
(*Magmatic arcs typically exhibit non-steady-state evolution with episodic flare-ups and lulls. Sumatra records long-lived magmatic arc, with detrital zircon data showing several Late Triassic- Miocene magmatic pulses (212-11 Ma). M Cretaceous- E Eocene zircons positive $\epsilon_{\text{Hf}}(t)$ values, indicating juvenile magma sources and matching Gangdese batholiths in S Lhasa terrane. These suggest ~6000 km long Neo-Tethyan arc system from S Tibet to Sumatra with concurrent magmatic lulls (~150-105 and 85-65 Ma) and flare-ups (~105-85 and 65-40 Ma). Late Cretaceous magmatic lull coincided with strong regional deformation and increasingly fast N-ward drift of India. Periodic pulses of Neo-Tethyan arc magmatism most likely correlated with repeated steepening and shallowing of slab dip, rather than India-Eurasia convergence rates*)

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(online at: <https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2018JB015780>)
(*Sibumasu not single united terrane derived from E Gondwana, and W Sumatra not linked to Cathaysia. Detrital zircon data show scarcity of E Neoproterozoic zircons in W Sumatra block, arguing against connection between W Sumatra and Cathaysia. Detrital zircons from E Sumatra similar to Lhasa, W Burma and W Australia (probably sourced from W Australia). Sibusima (= Sibumasu without E Sumatra) detrital zircon ages resemble S Qiangtang and Tethyan and High Himalaya terranes (likely derived from N India). In E Paleozoic, E Sumatra and W Burma outboard of Lhasa terrane along NW Australian margin; Sibusima on N Greater India margin*)
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