THE MALAYSIA-THAILAND BORDER JOINT GEOLOGICAL SURVEY COMMITTEE

LITHO- AND BIOSTRATIGRAPHIC CORRELATION OF CHERT BEDS IN VARIOUS ROCK UNITS ALONG THE MALAYSIA-THAILAND BORDER

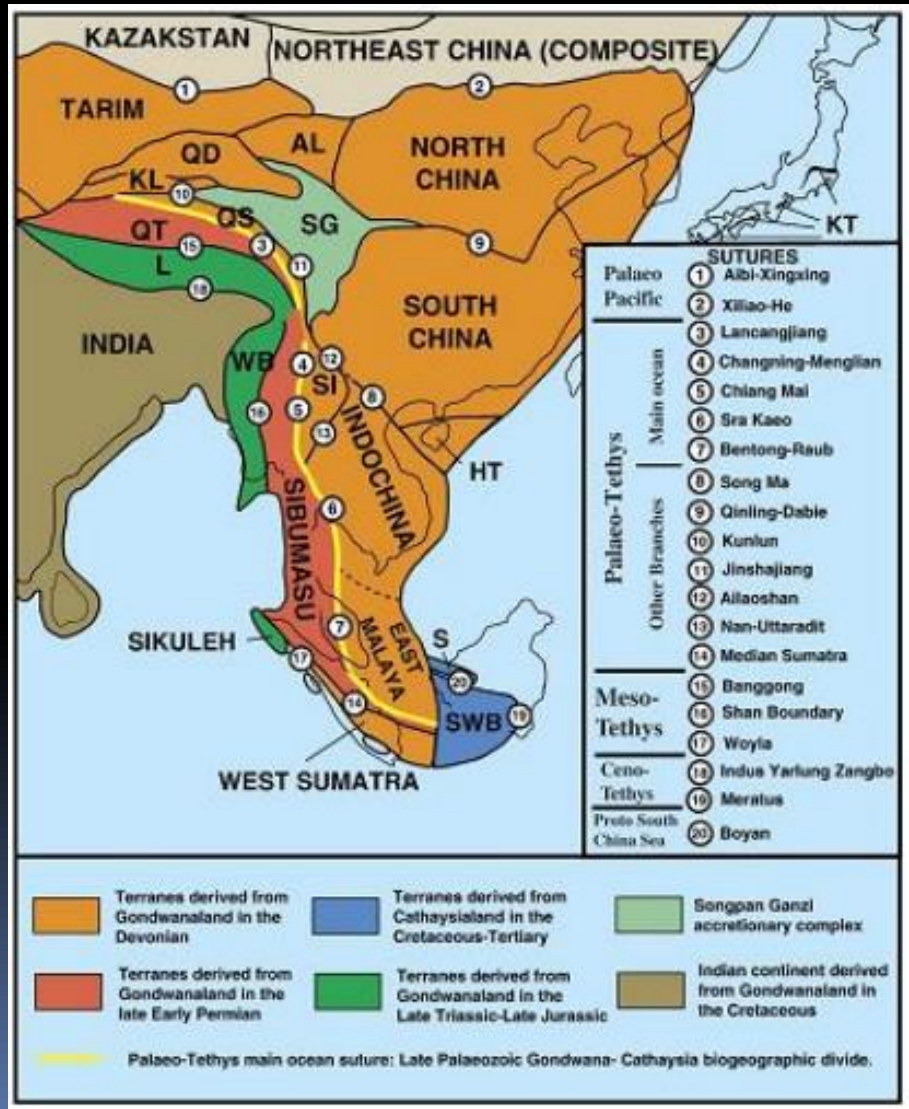
The Malaysian-Thai Working Group

CONTENTS

1. INTRODUCTION

- The continental terranes of Southeast Asia were drifted away from Gondwanaland at different times
- The developmental process of the Tethyan Ocean was divided into several stages created by rifting of continental blocks, and finally these continental blocks amalgamated to the Southeast Asian continent

(after Metcalfe, 2006)

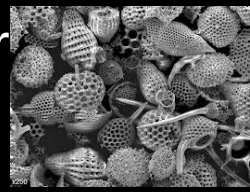


1. INTRODUCTION

- Detailed biostratigraphic data of the siliceous sedimentary rocks that yield radiolarians are necessary to elucidate the tectonic development and paleogeography of Southeast Asia.
- Realizing the importance of the radiolarian in understanding the palaeogeoraphy of this region, the MT-JGSC has agreed to undertake the study on the litho- and biostratigraphic correlation of the chert beds in various rock units along the Malaysia-Thailand border during the 7th Meeting of the Committee held in Krabi in June 2010.
- The joint study was scheduled to be carried out in two years time i.e., in the year 2011 and 2012.

2. SIGNIFICANCE OF RADIOLARIANS

- Radiolarians are planktonic protozoa that are widely distributed in the oceans, throughout the water column from the near surface to the bottom.

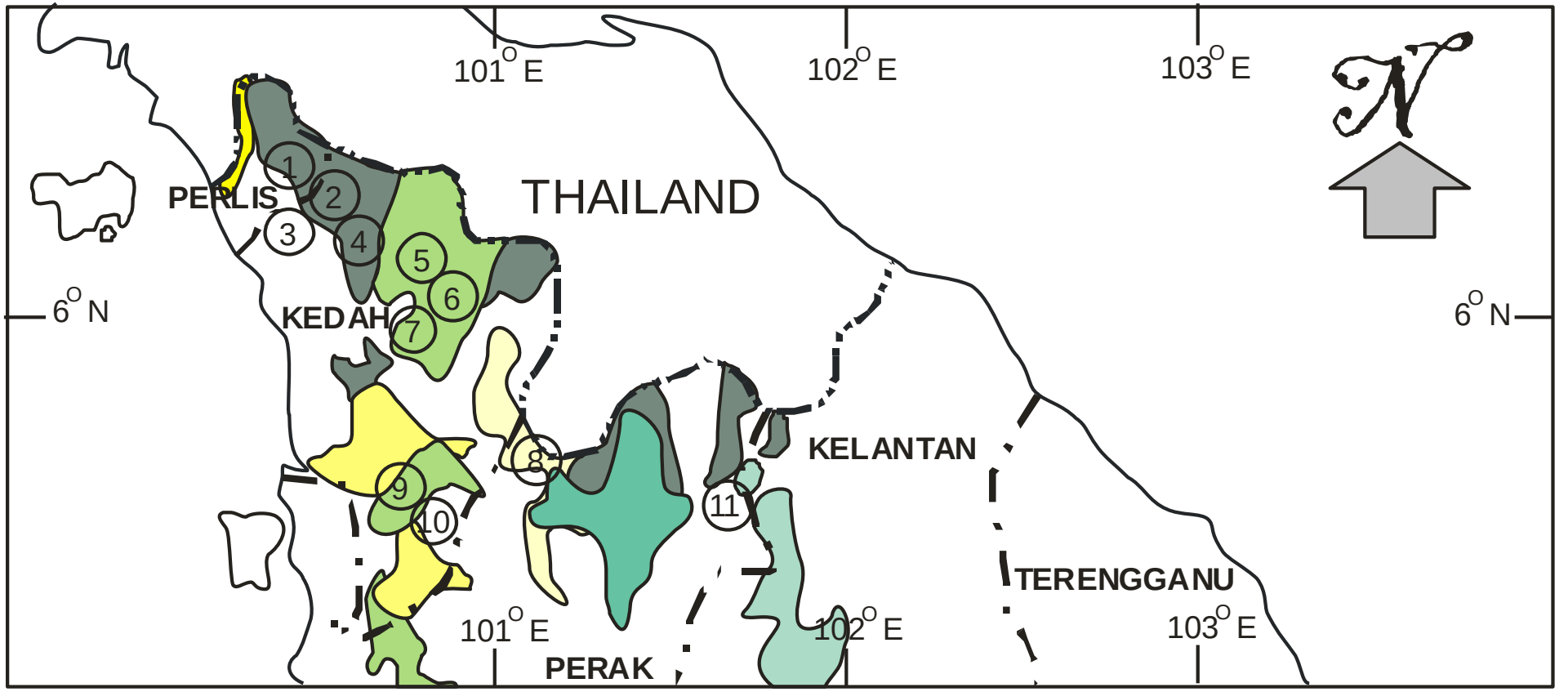


- They are the abundant organism record and the oldest known fossils contributing enormously to our understanding of the history of the Earth. Radiolarians (index fossil) provide data for palaeoecological interpretations, and they are especially useful in biostratigraphy because of their small size and abundance.

- Recently, detailed age determinations based on radiolarian biostratigraphy of pelagic, hemipelagic and continental margin sediments distributed in Southeast Asian countries have been used for terrane analysis and for understanding continental collisions and the opening and/or closing of the Palaeo-Tethys Ocean.

3. Distribution of chert and other radiolarian-bearing rocks along the Malaysia-Thailand Border

- MALAYSIAN SIDE:
  - the occurrences of chert had been reported in Kedah including Langkawi, in Perlis, Perak and western Kelantan
  - Setul Formations – Silurian-Devonian
  - Kubang Pasu Formation – Tournaisian
  - Singa Formation – no radiolarian found
  - Cherty unit & Gerik Formation - Permian
  - Semanggol Formation –Triassic



Legend:

- Semanggol Formation/Cherty unit
- Mangga Formation
- Gerik Formation
- Kubang Pasu Formation
- Mahang Formation
- Setul Formation

1. Bukit Tuntung, Pauh, Perlis
2. Bunit Binjal, Kedah
3. Kodiang
4. Bukit Kamelong
5. Bukit Tembaga
6. Bukit Larek
7. Bukit Yoi
8. Nenering, Pengkalan Hulu, Perak
9. Merbau Pulas
10. Kuala Ketil
11. Km 73.2, E-W Highway, Perak

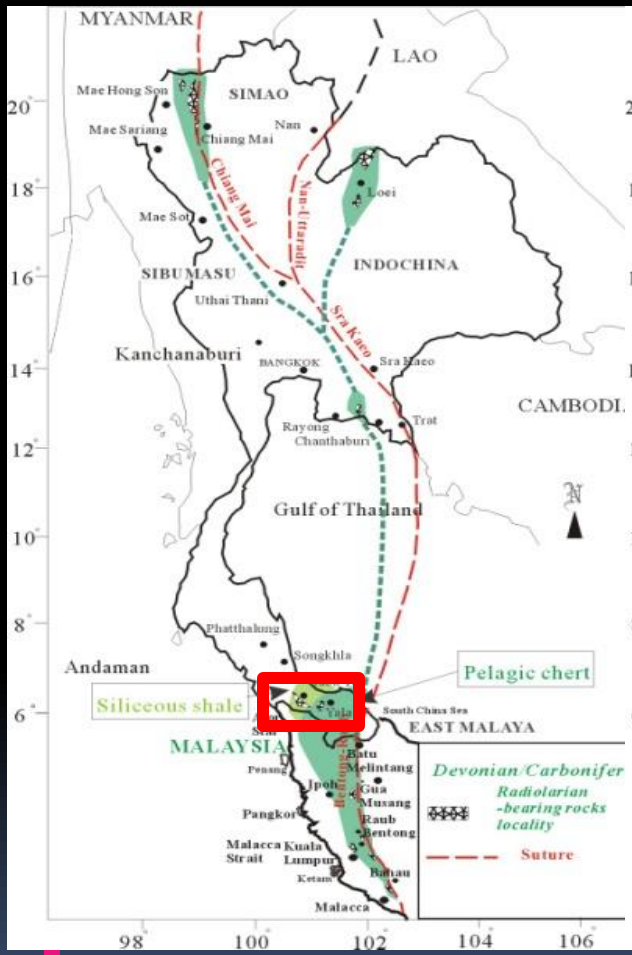
3. Distribution of chert and other radiolarian-bearing rocks along the Malaysia-Thailand Border

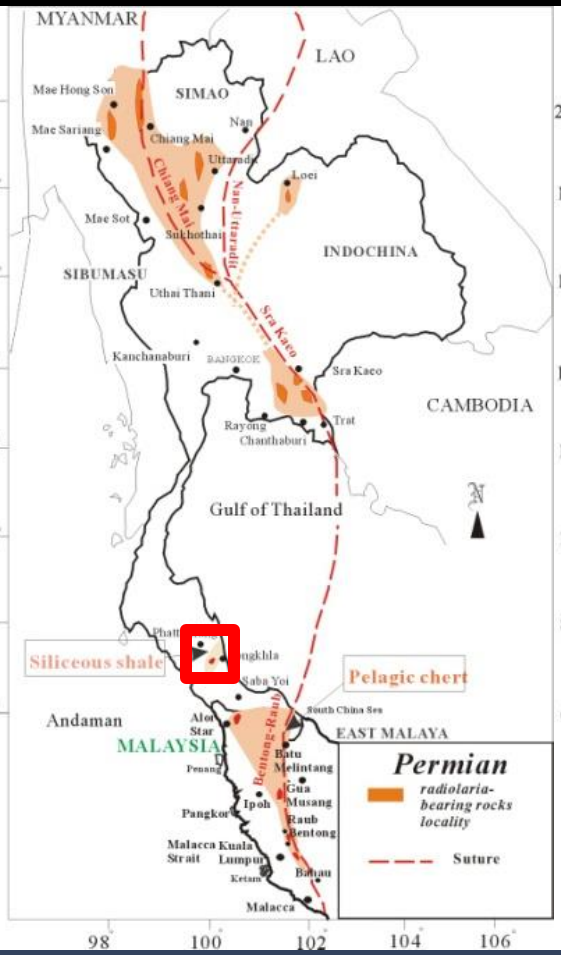
- THAI SIDE:
  - The Carboniferous to Triassic radiolarian-bearing rocks was reported from several areas of southern Thailand such as Hat Yai, Chana, Saba Yoi areas in Songkhla Province, Phatthalung Province and Yala Province.
  - Yaha Formation (Carboniferous)
  - Khao Phra Formation (Permian)
  - Na Thawi Formation and Chaiburi Formation (Triassic).

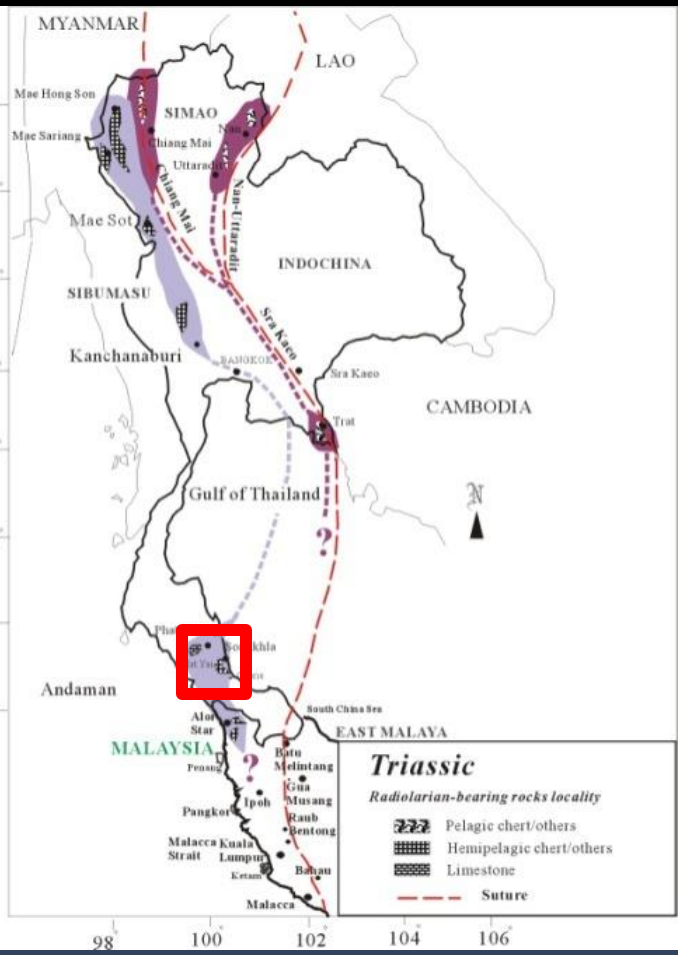
Devonian-Carboniferous

Permian

Triassic







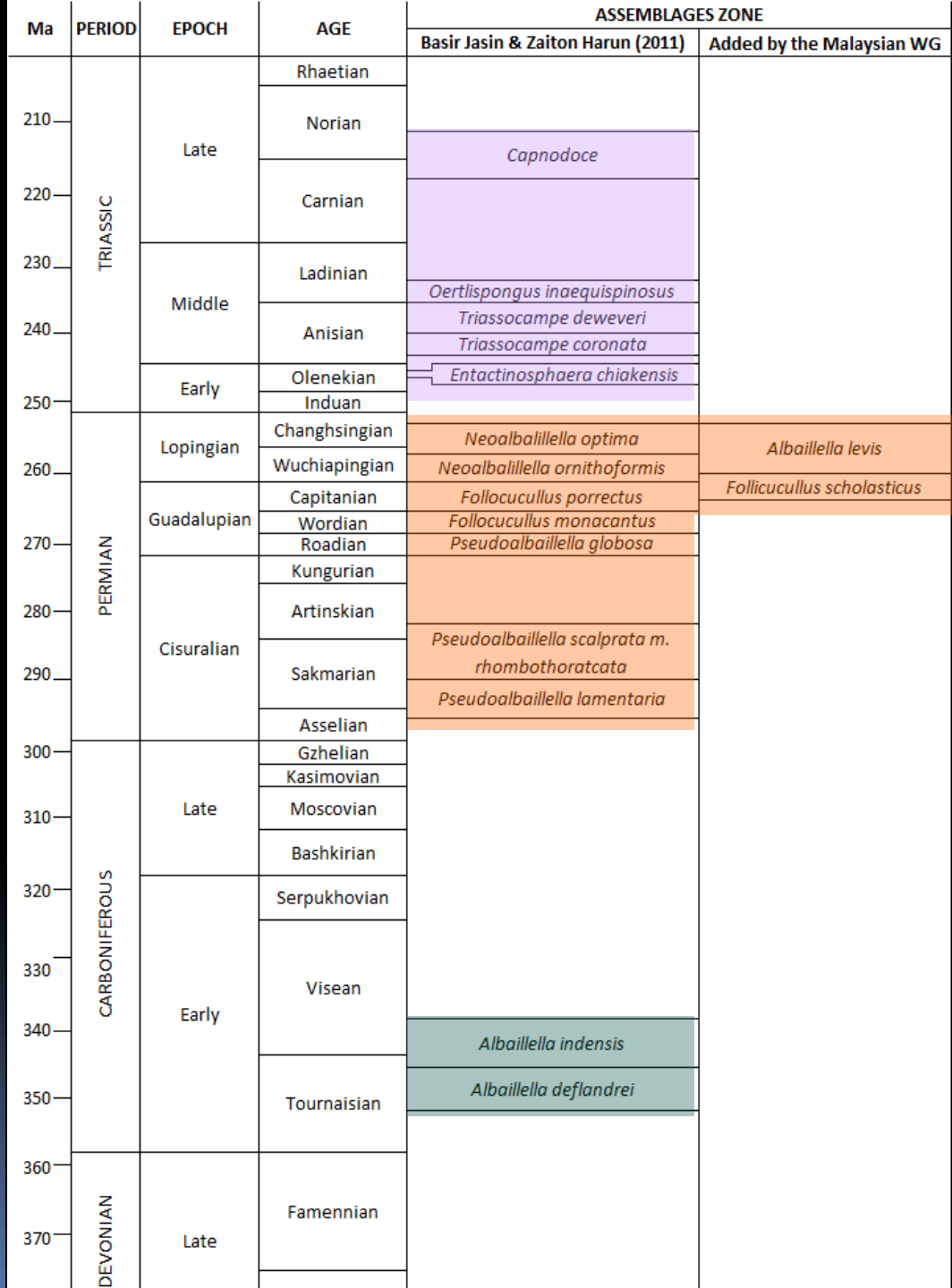
4. LITHOSTRATIGRAPHY

AGE	Malaysia	S-Thailand
Tr	Semanggol F.	Na Thawi F./ Chaiburi F.
P	Gerik F./ Mangga F.	Khao Phra F.
C	Kubang Basu F. / Singa F.	Yaha F.
SD	Setul F.	

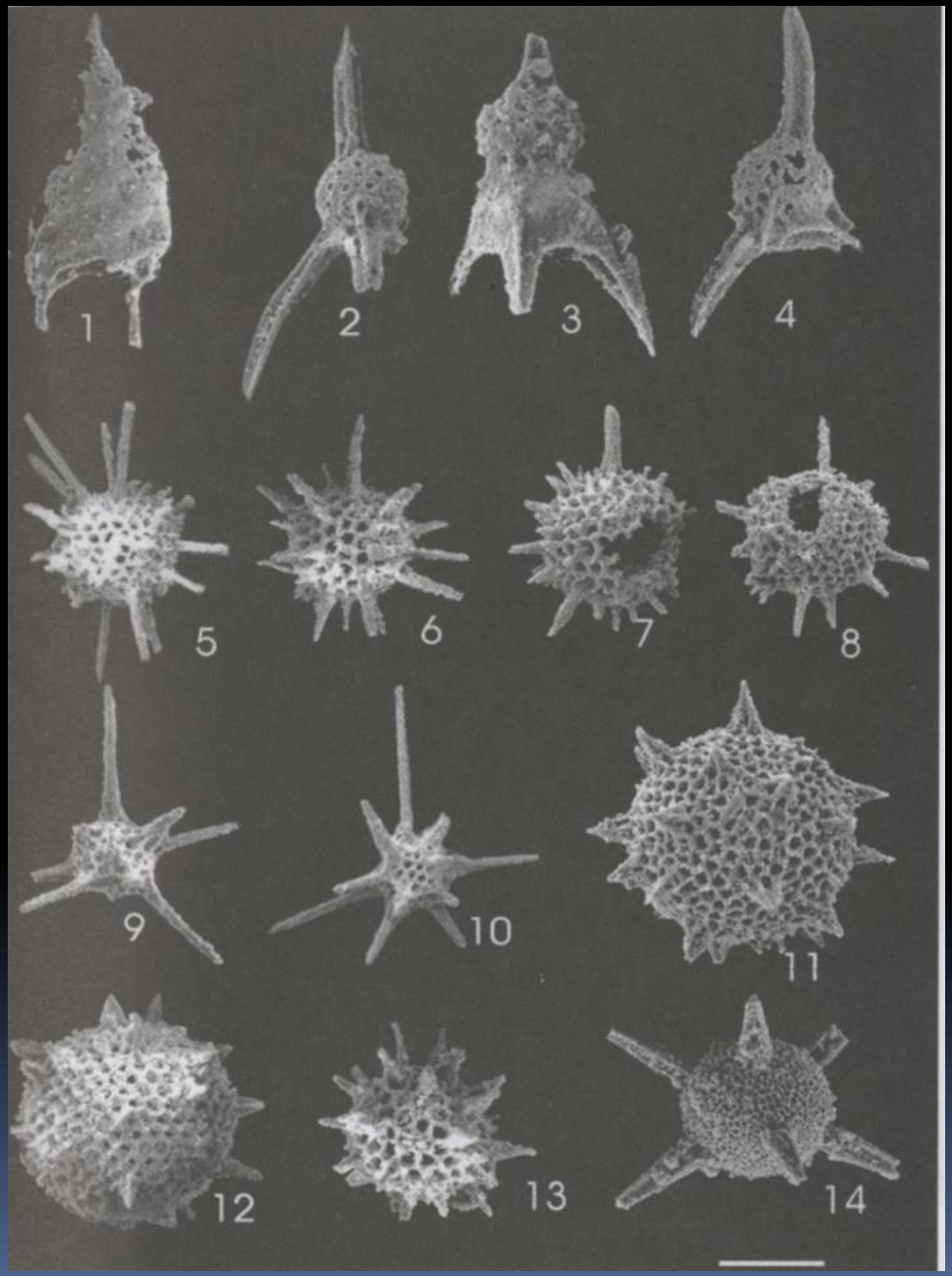
Chert at Bukit Tuntung, Ulu Pauh

5. RADIOLARIAN BIOSTRATIGRAPHY

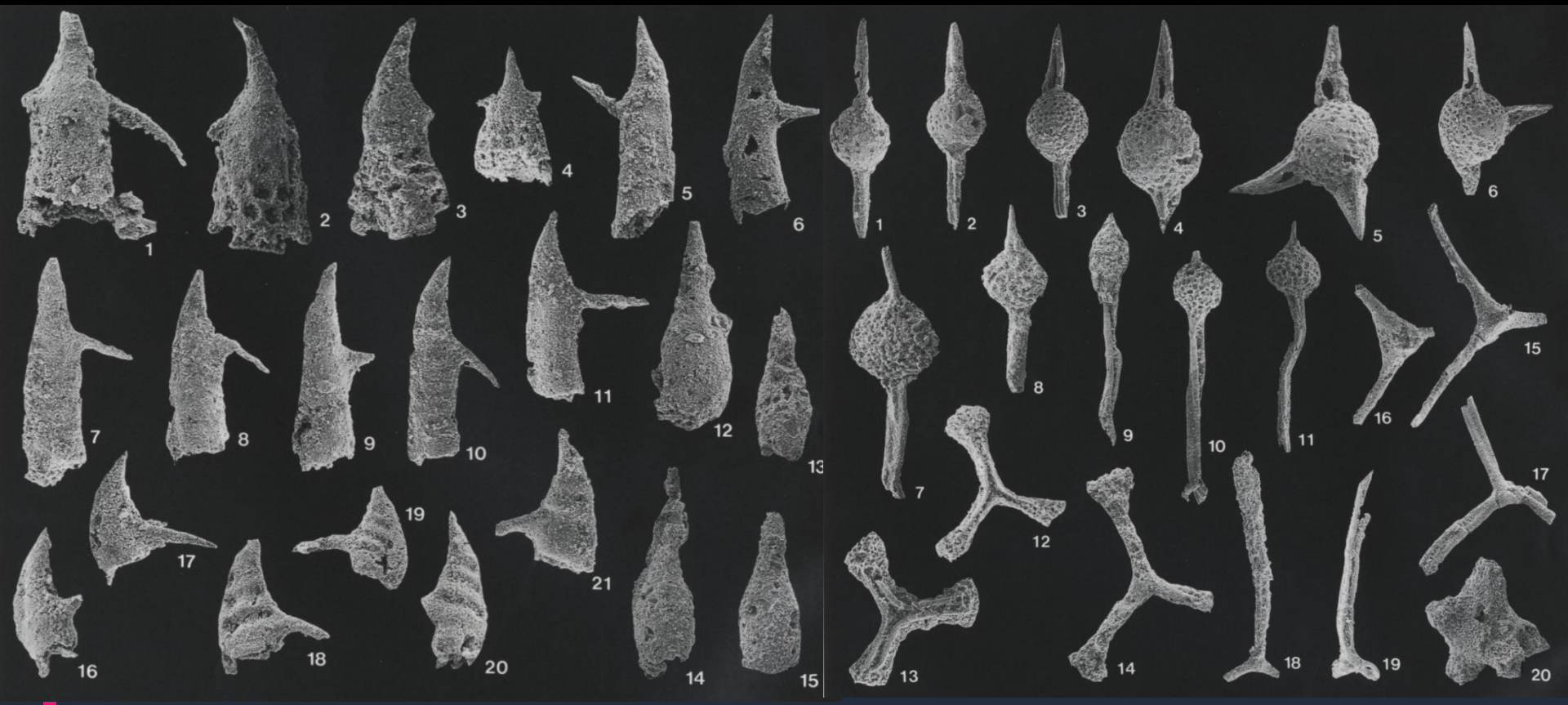
- MALAYSIAN SIDE



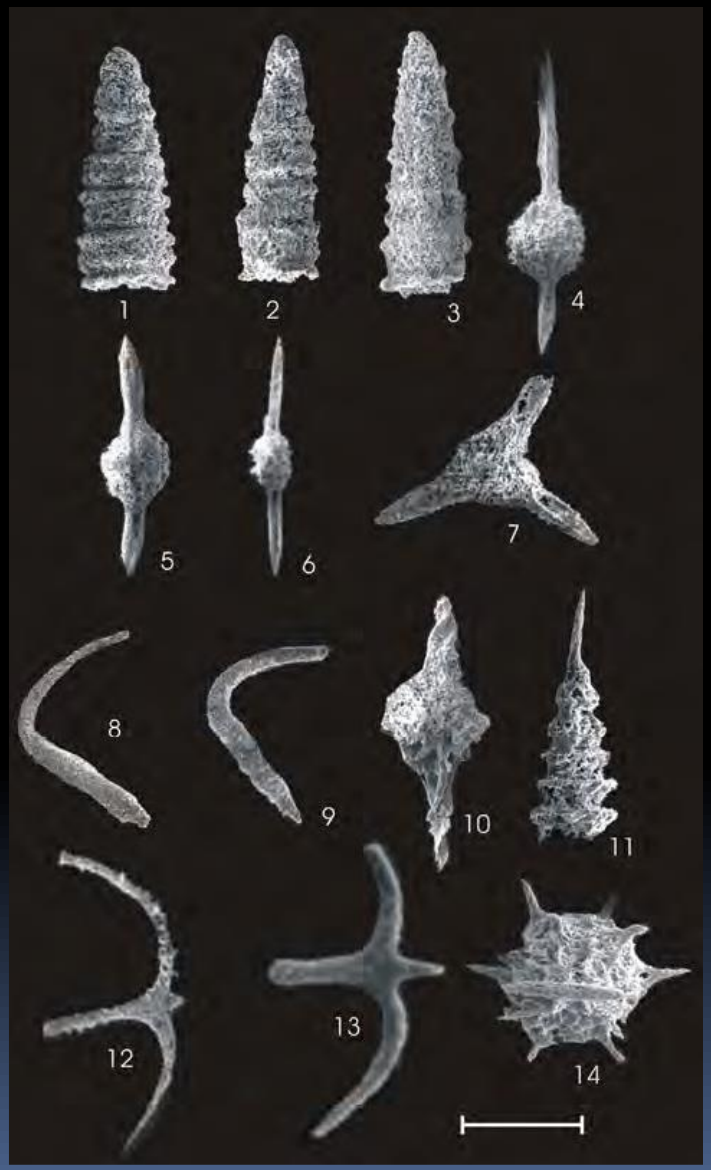
Carboniferous

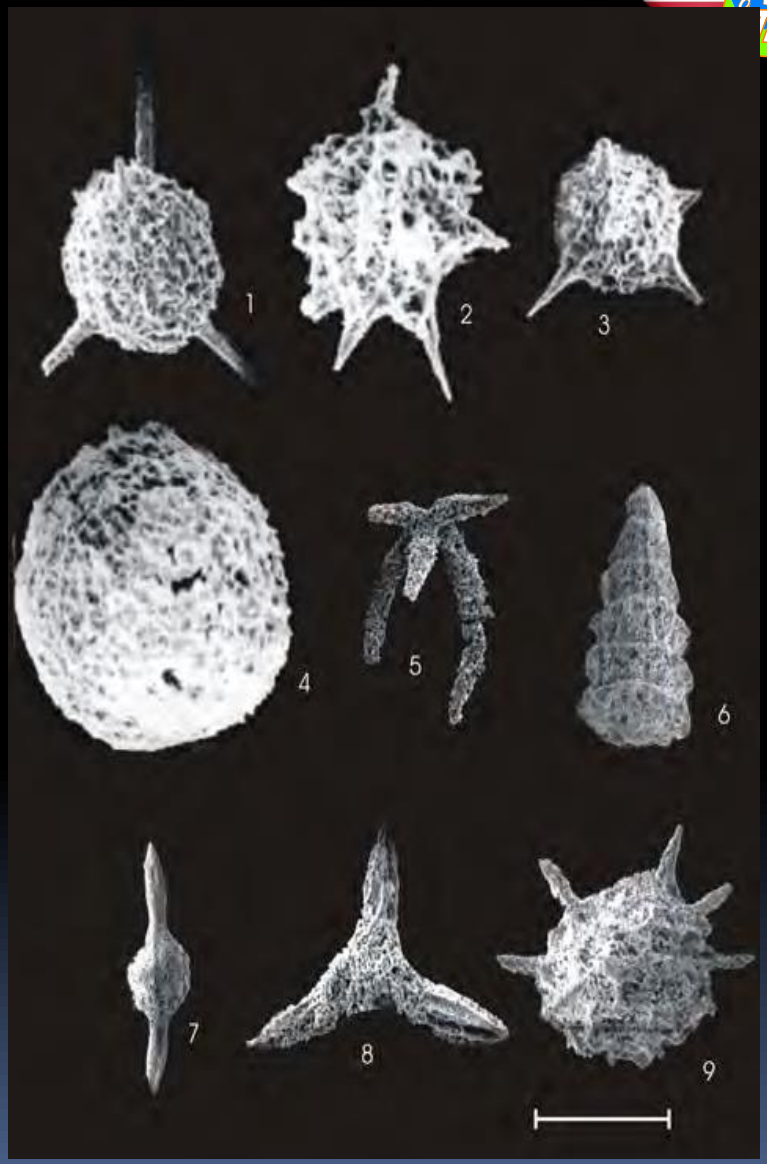


Permian



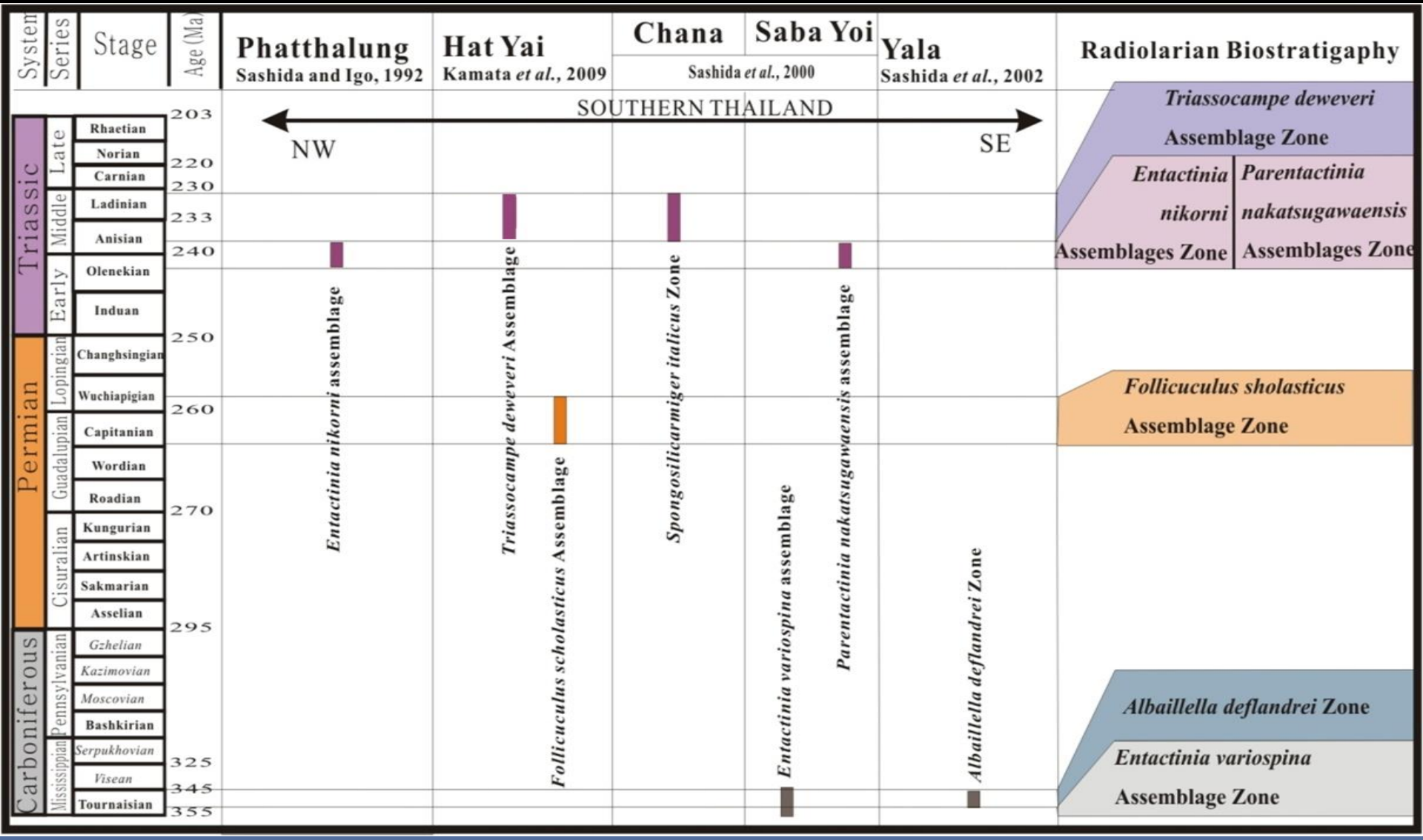
Triassic



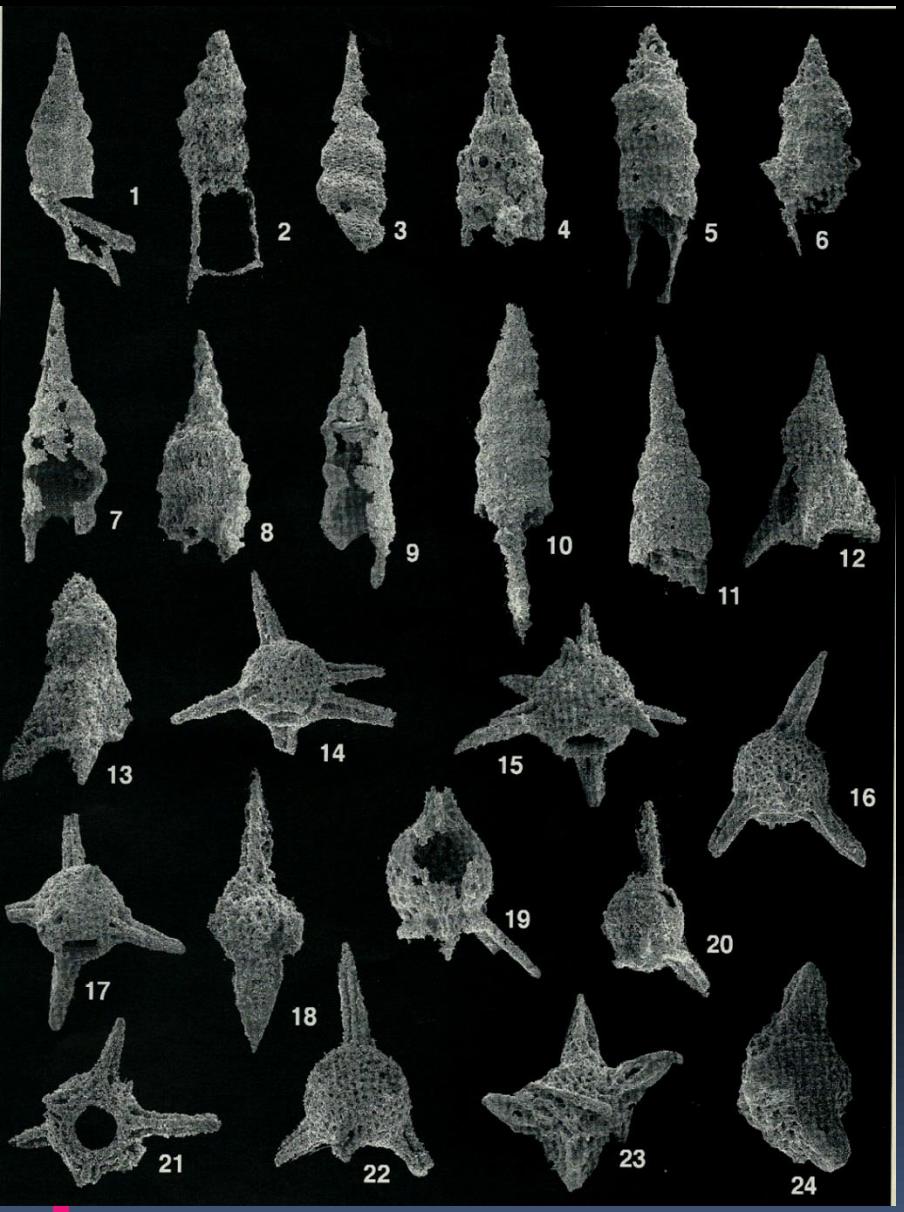


5 .RADIOLARIAN BIOSTRATIGRAPHY

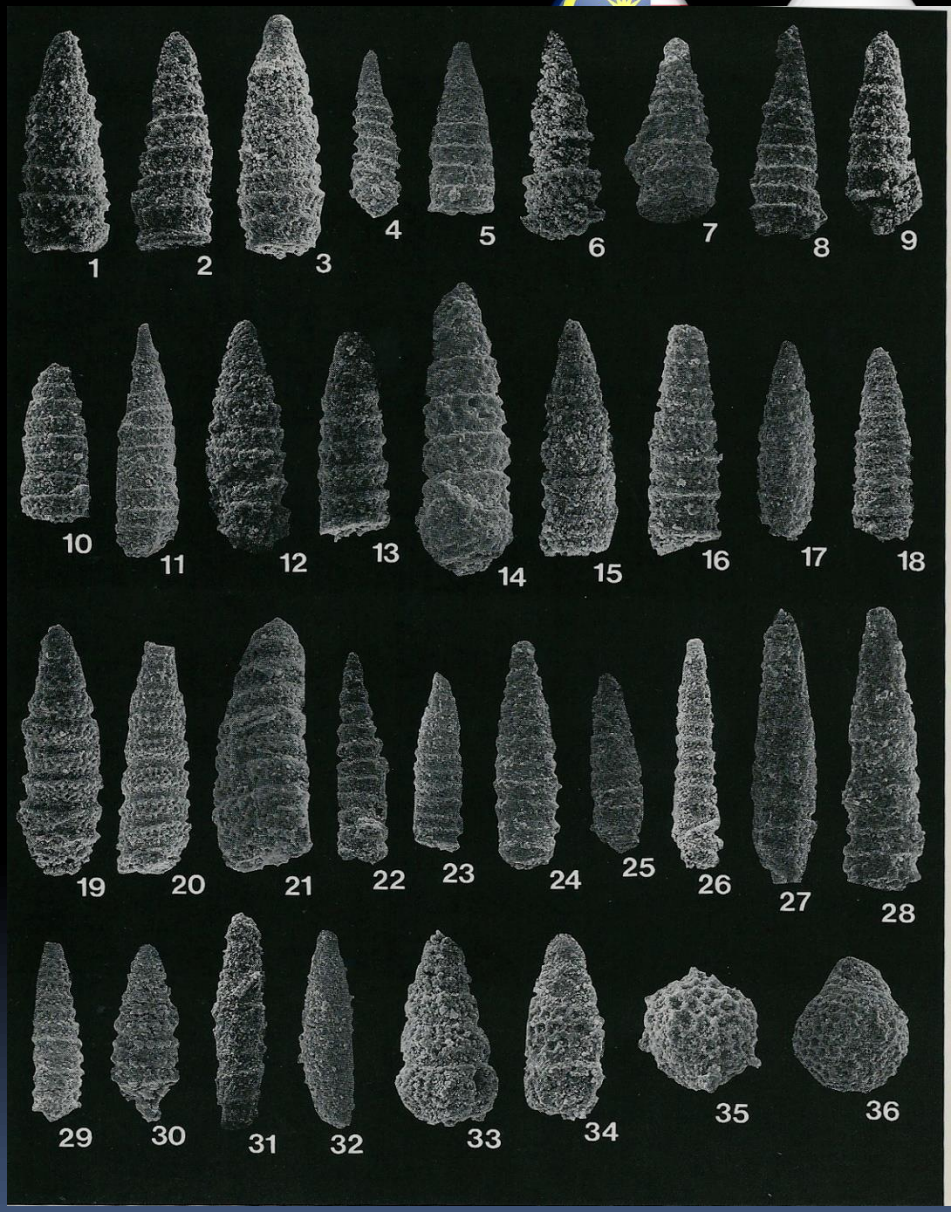
- THAI SIDE



Carboniferous

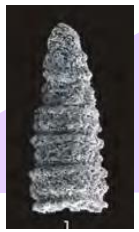


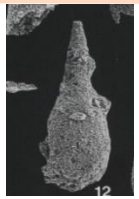
Triassic

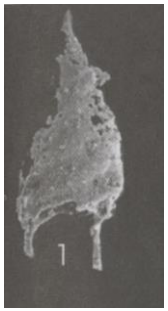


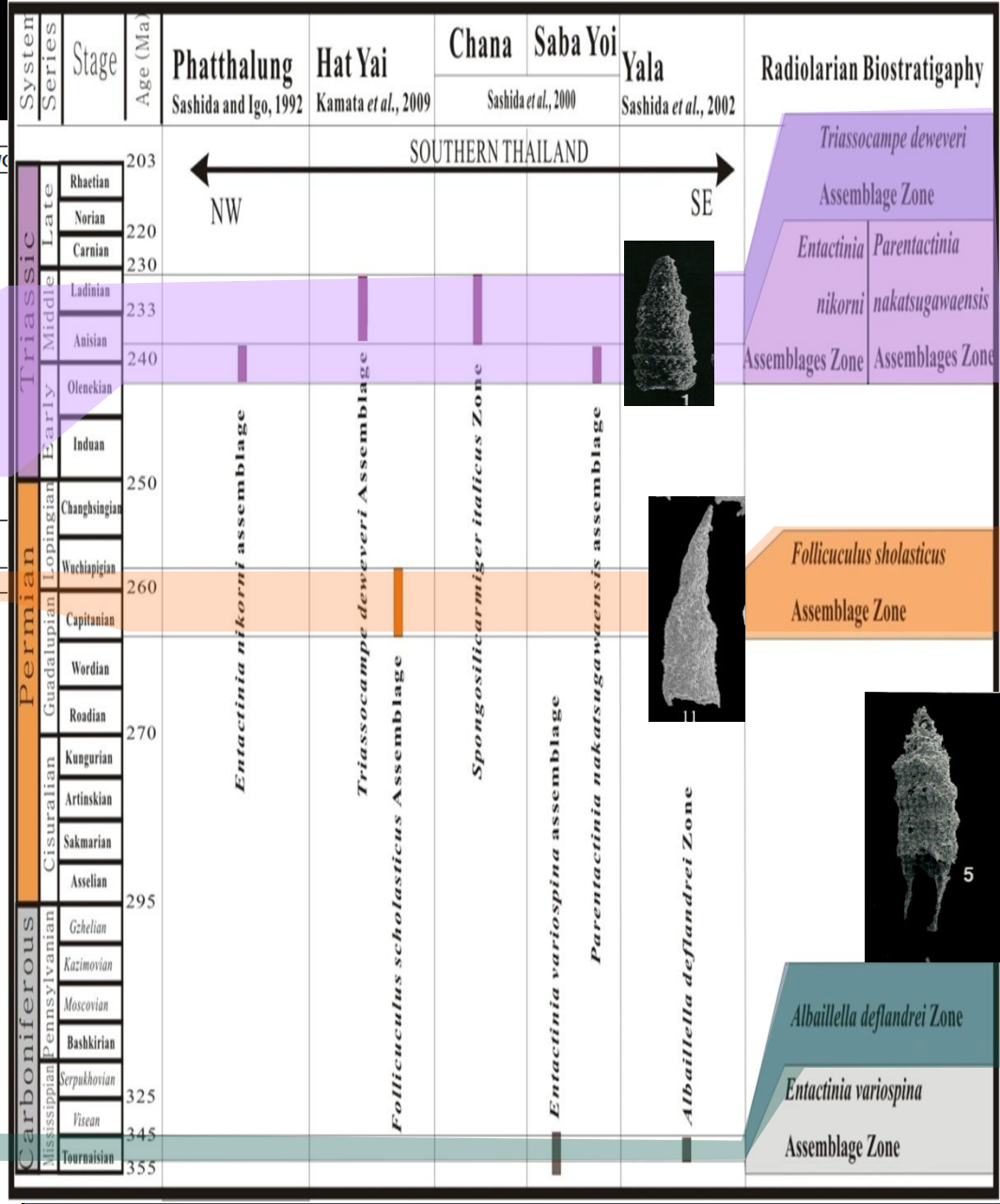
Malaysia

Ma	PERIOD	EPOCH	AGE	ASSEMBLAGES ZONE: Basir Jasin & Zaiton Harun (2011)	ASSEMBLAGES ZONE: Added by the Malaysian WG
210	TRIASSIC	Late	Rhaetian		
			Norian		
220			Carnian	*Capnodoce*	
230		Middle	Ladinian	*Oertlispongus inaequispinosus*	
240			Anisian	*Triassocampe deweveri*	
				Triassocampe coronata	
		Early	Olenekian	*Entactinosphaera chiakensis*	
250			Induan		
	PERMIAN	Lopingian	Changhsingian	*Neoalbalillella optima*	*Albaillella levis*
260			Wuchiapingian	*Neoalbalillella ornithoformis*	
		Guadalupian	Capitanian	*Follocucullus porrectus*	*Follicucullus scholasticus*
270			Wordian	*Follocucullus monacantus*	
			Roadian	*Pseudoalbaillella globosa*	
		Cisuralian	Kungurian		
280			Artinskian		
			Sakmarian	*Pseudoalbaillella scalprata m. rhombothoratcata*	
290			Asselian	*Pseudoalbaillella lamentaria*	
300	CARBONIFEROUS	Late	Gzhelian		
			Kasimovian		
310			Moscovian		
			Bashkirian		
320		Early	Serpukhovian		
330			Visean		
340				*Albaillella indensis*	
350			Tournaisian	*Albaillella deflandrei*	
360	DEVONIAN	Late	Famennian		
370					
380			Fraspian		







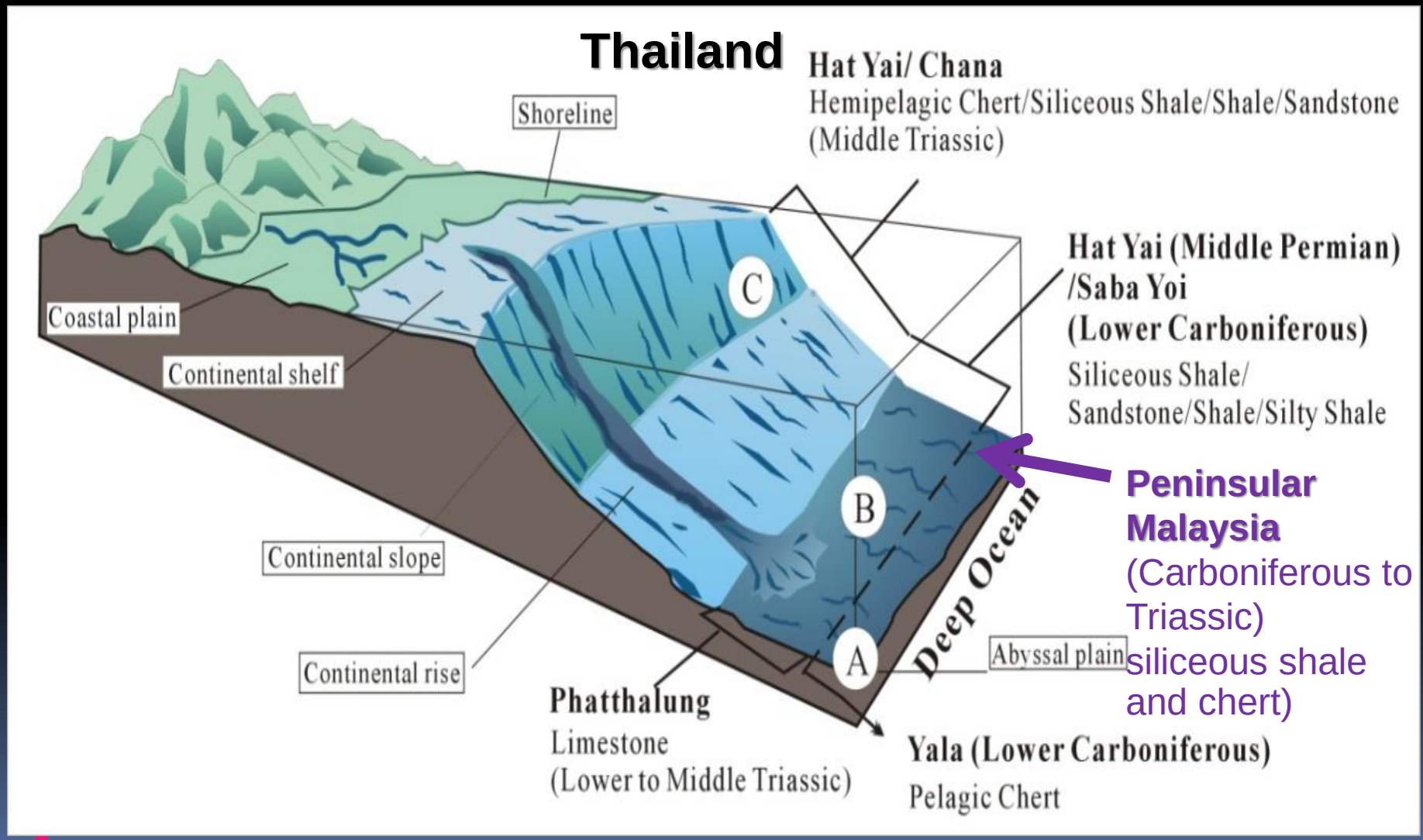


Thailand

5. RADIOLARIAN BIOSTRATIGRAPHY

- Moreover, the radiolarian faunas of these zones are similar to those of France (Gourmelon, 1987), Germany (Braun, 1990 and Braun and Schmit-Effing, 1993), southwestern China (Feng *et al.,* 1997), southern China (Wu *et al.,* 1994), Turkey (Holdsworth, 1973). Japan (e.g. Ishiga, 1990, Sugiyama, 1997), eastern Thailand (Sashida *et. al,* 1997), Oregon (Blome and Reed, 1992), and Far East of Russia (Bragin, 1991).

6. DEPOSITIONAL ENVIRONMENT OF RADIOLARIAN-BEARING ROCKS



- However, the depositional environment of the radiolarian-bearing rock sequences in Thailand and Malaysia are still debatable. The study of lithostratigraphy and radiolarian biostratigraphy of radiolarian-bearing rocks is very important in elucidating the depositional environment and tectonic development of the Palaeozoic and Mesozoic in Thailand and Malaysia. Further work is required to resolve this issue.

RADIOLARIAN

MICROBIOLOGY

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