

Early Permian radiolaria from Ulu Kelantan, Malaysia

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An isolated bedded chert is exposed at an outcrop along a dirt road near Pos Belau, Ulu Kelantan. The terms "bedded chert" commonly denote rock sequence that include both chert and siliceous mudstone. The radiolarian chert exhibits a bedding style characterised by rhythmically alternating thin beds of chert ranging from 2 cm to 15 cm and siliceous mudstone. The total thickness of the bedded chert is approximately 50 m. The chert is very important clue to solve the tectonic of the Malay Peninsula. This chert is located very close to the Bentong Suture. The chert was also considered as the eastern border of the Bentong Suture by Tjia & Syed Sheikh Almashoor (1993). They recognized sequence of schist, phyllite, olistostrome and bedded chert.

Patchy distribution of cherts was also recorded in Ulu Kelantan, especially in the Kuala Betis area. These cherts were probably of the same age. The bedded chert was not yet dated. Some *Argaticeras* sp. were observed in the mudstone layers that interbed with the chert. The general strike of the chert is NW-SE and moderately dipping towards NE.

Several samples of chert were collected from the outcrops. The chert were treated with hydrofluoric acid to release the radiolaria. Some radiolaria are quite well preserved and many are poorly preserved. Three samples yielded well preserved radiolaria.

Several species of radiolaria were identified, they are *Latentifistula Crux* Nazarov and Ormiston, *Latentifistula patagilatera* Nazarov and Ormiston, *Latentibifistula triancanthopora* Nazarov and Ormiston, *Pseudoalbaella sakmariensis* Kozur, *Pseudoalbaella longicornis* Ishiga and Imoto, *Latentifistula* sp., *Entactinia pycnolada* Nazarov and Ormiston. *Copicyntra* sp. *Ruzhencevispongus uralicus* Kozur. Many more species could not be identified.

Latentifistula crux was used by Nazarov & Ormiston (1985) as a zonal marker for the Lowermost zone of Asselian. *Ruzhencevispongus uralicus* Kozur was reported from the Late Artinskian. The radiolaria indicate that the age of the chert ranges from Asselian to Artinskian, Early Permian.

The age of the Gua Musang Formation was dated as Late Permian to Triassic based on the occurrence of fusulinacea in the Limestone and the Triassic bivalve. It is not sure whether the chert belongs to the Gua Musang Formation or the Bentong Group.

This chert is a biogenic silica consists of mainly radiolarian skeleton which was deposited in an environment far away from the sources of terrigenous detritus. The absence of calcareous material indicates that the chert was deposited near or below the calcite compensation depth.

The interbedded and mudstone chert represents continental margin chert association (Murchey *et al.*, 1983). No ultrabasic or basic igneous rocks were observed in the surrounding area. The chert was probably deposited in an environment very close to the continental shelf.

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