# Devonian Carbonate of Telen River, East Kalimantan

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In 1925, the Dutch Colonial Government sent a scientific expedition team to East Kalimantan, which was called "Midden Oost Borneo Expeditie" and led by H. Witkamp. The expedition collected rock samples from Telen River, a tributary of Mahakam River. In 1940, L. Rutten analyzed the rock samples and found Devonian fossils, which were known as the oldest fossils in western part of Indonesia. The fossils were found in a dark, crystalline limestone and Marks (1951) included the limestone into Danau facies. The existence and location of the limestone is often mentioned and cited by many geologist, such as Van Bemmelen (1949), Marks (1957), Sartono (1970) and Soejono (1988), since it is assumed as a classical stratigraphic location.

The location of the Devonian limestone had never been revisited since the Dutch expedition, due to its remote location and difficult accessibility. The distribution of the Devonian limestone and its stratigraphic correlation with other units were still a mystery. Noticing the limitation of the geological information on the Devonian limestone, the Association of Geology Students "GEA" from Bandung Institute of Technology (ITB) organized a scientific expedition, which is called Devonian Expedition 1989. Field work was conducted in October to November 1989.

The research area is covered by tropical rain forest with a rugged terrain. Most of the valleys have V-shape and rapid flowing rivers. The morphology in the south east of research area is more subtle and bounded to the north west area by a NE-SW lineament. The lineament is interpreted as fault that forms the boundary between Tertiary and Pre-Tertiary rocks.

The expedition managed to find, map and collect the Devonian Limestones. The Devonian age is inffered by the *Heliolites porosus*, a fossilized coral. It is classified as tetra coral that lived in a colony which have a diameter about 5 cm. Each colony has several calice with diameter of about 2 mm and each calice consists of 12 septa. This Devonian limestones were found as blocks or boulders in a stratigraphic unit consisted of interbedded graywacke and calcareous sandstone. The calcareous sandstone contains fusulinid foraminifers from Neoschwagerinidae sub family, indicating Permian age. The graywacke and calcareous sandstone are interpreted to be deposited as debris flows. Two stratigraphic units were conformably deposited above the Permian sandstone and graywacke. The first unit consists of interbedded black slate and sand-

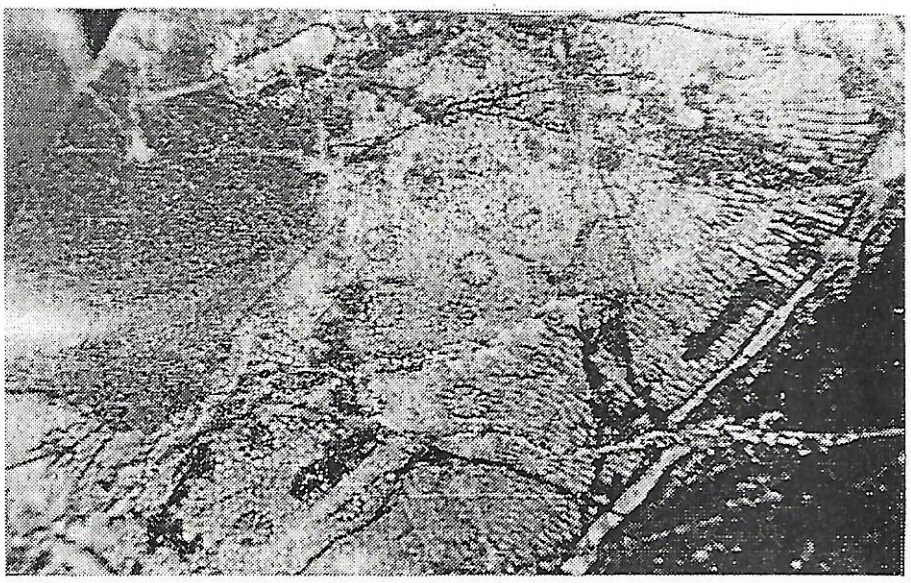



**Fig 1.** Dark crystalline limestone with Devonian age *Heliolites porosus*

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stone. The black slate is debris flow deposits, indicated by blocks floating on the black slate, whereas the sandstone is a turbidite deposits. Subsequently above the first unit, the second unit is interbedded green sandstone, red slate, green slate and chert. Tuffaceous polymic conglomerate was unconformably depsited above these units. Outcrop of schist was also observed in the research area. The schist is interpreted to be the oldest rocks in the research area and pre-dated the Devonian limestone. In the south east, quartz sandstone was found and thought to be the youngest unit. It may have a fault contact boundary with the above stratigraphic units, based on the interpreted NE-SW lineaments. This unit may correlate with Kayanniut Formation as in Geology of Muara Wahau Quadrangle (Supriyatna, 1989), which has Eocene age.

Igneous rocks had been identified in the research area. They consist of andesite lava, diorite stock, andesite dyke and stock. The andesite lava was lain unconformably above the graywacke and calcareous sandstone. In the east, the andesite and diorite intruded the quartz sandstone, suggesting that the intrusions are post dating the quartz sandstone.

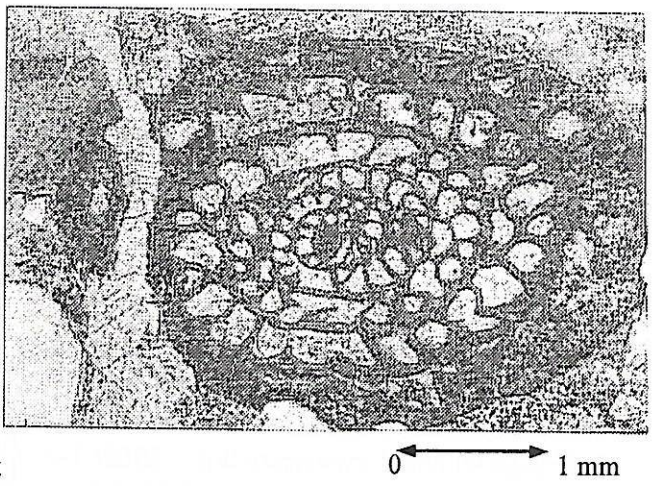



**Fig 2.** Fusulinid foraminifers from Neoschwagerinidae sub family, indicating Permian age

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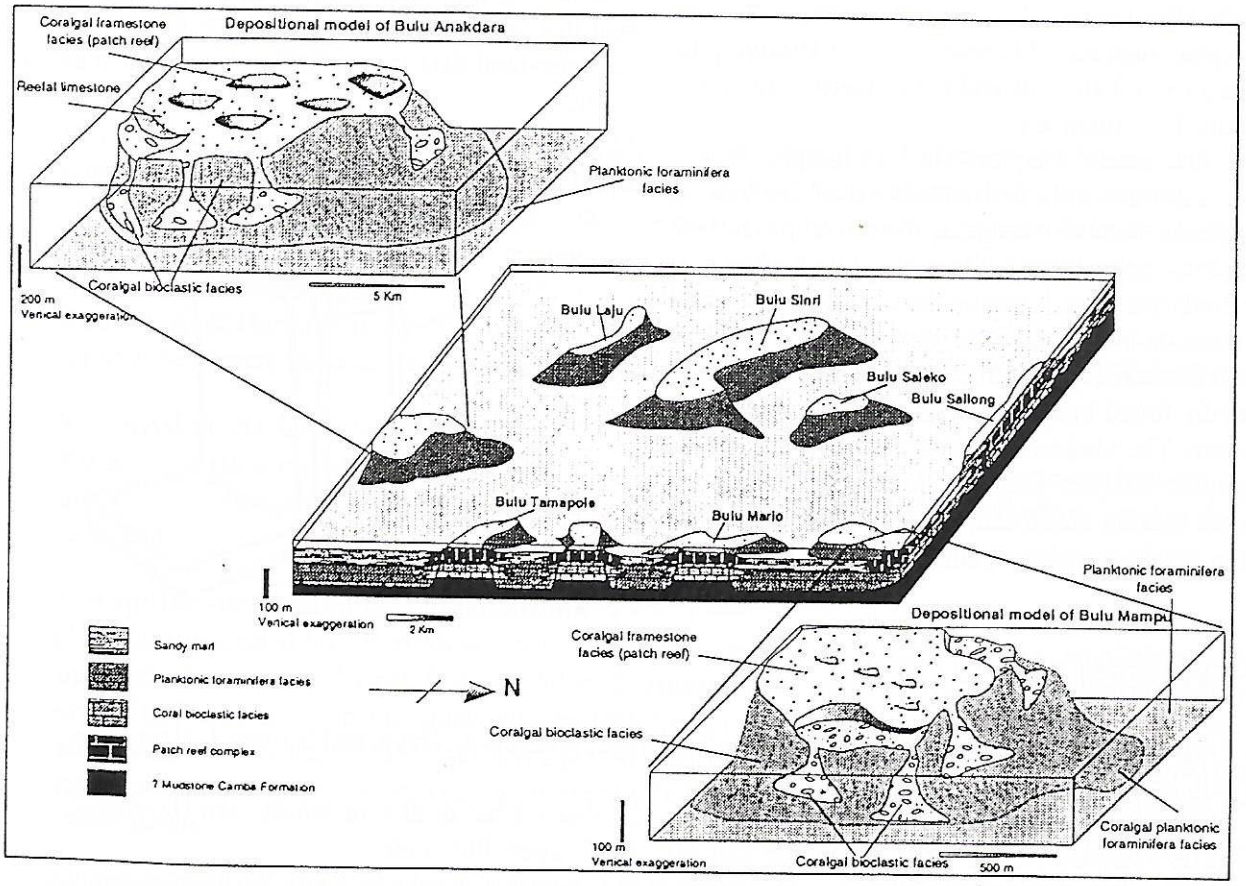



**Fig. 3** Palaeocontructionof the Northern Bone region in the upper Miocene, showing knoll-reefs build-ups which are surrounded by deep water. The depositional setting of Bulu Anakdara and Bulu Mampu are highlighted. The evidence of block faulting is seen on seismic in figure 2.