

Late Miocene fossils from shallow marine sediments in Brunei Darussalam: systematics, palaeoenvironment and ecology.

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The geology of Brunei Darussalam is fascinating but difficult to approach: rainforests and heavy precipitation tend to erode and smoothen the landscape limiting rocks exposure, whereas abundant constructions sites and active quarries allow the creation of short time available outcrop, which have to be immediately sampled.

The stratigraphy of Brunei Darussalam comprises mainly Neogene sediments deposited in a wave to tide dominated shallow marine environment in a pure siliciclastic system. Thick and heavily bioturbated sandstone layers alternate to claystone beds which occasionally yield an extraordinary abundance and diversity of fossils. The sandstones, when not bioturbated, are commonly characterized by a large variety of sedimentary structures (e.g., ripple marks, planar laminations and cross beddings).

In this study, we investigate the sediments and the fossil assemblages to record the palaeoenvironmental evolution of the shallow marine environment during the late Miocene, in terms of sea level change, chemostratigraphy and sedimentation rate.

The study area is one of the best in terms of accessibility, extension, abundance and preservation of fossils; it is located in the region -'Bukit Ambug' (Ambug Hill), Tutong District. The fossils fauna collected encompasses mollusks, decapods, otoliths, shark and ray teeth, amber, foraminifera and coccolithophorids.

In this investigation, sediment samples were taken along a section which measures 62.5 meters. A thick clay layer of 9 meters was sampled each 30 cm to investigate microfossils occurrences. Each sample was treated in peroxide and then sieved through 63 μm , 150 μm , 250 μm , 450 μm , 600 μm , 1mm and 2mm sieves.

Results point on the changes in biodiversity of foraminifera along the different horizons collected reflecting sea level changes and sediment production. The most abundant taxa identified are *Pseudorotalia schroeteriana*, *Ampistegina lessonii*, *Elphidium advenum*, *Quinqueloculina* sp., *Bolivina* sp., *Globigerina* sp.

Coccolithophorids assemblage recovered from one horizon dates the sediment to the biozone NN11a due to the presence of *Discoaster berggrenii* and *D. quinqueramus*, which are both also warm water indicators. The absence of *Amaurolithus primus* reduces the stratigraphic range to the uppermost Tortonian only (~7.5-8 Ma).