

dips towards the southeast while the northwestern part gently dips to the northwest.

The age of the complex is Te^5 (Lower Miocene) as evidenced by the combined occurrence of *Eulepidina* sp and *Miogyssina* sp. Shales of the Setap Formation deposited contemporaneously with the limestones belong to the *Globigerina binaiensis* zone (combined occurrence of *Globigerinoides trilobus/immaturus* group and *G. binaiensis*), also of Lower Miocene age.

The Subis complex is an isolated carbonate development underlain, surrounded and covered by clastic sediments. It apparently formed on a paleo-high resulting from slight tectonic uplift. The coast at that time was nearby and located to the south or southwest.

Lower Miocene (Te^5) limestones are found in several other places in Northwest Borneo: in the Suai wells to the west, the upper part of the Melinau limestone sequence to the east and the Gomantong limestones in Sabah.

THE TENDEH HANTU ATOLL-A LOWER MIOCENE CARBONATE BUILD-UP IN MANGKALIHAT PENINSULA, EAST KALIMANTAN

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A narrow east-west trending positive area, with steep north and south flanks, formed during a tectonic event of mid Oligocene age. This positive area persisted throughout the Miocene and Pliocene and developed into the present day Mangkalihat Peninsula.

Several outcropping carbonate build-ups (Tendeh Hantu Atoll, Pulusetebah Patch Reef, Gunung Menumbar Barrier Reef) of Lower Miocene age, show that this positive feature was an ideal environment for reef growth.

The Tendeh Hantu (ghost mountains) "Atoll" consists of an outcropping sub-circular, sub-horizontal platform with a diameter of about 30 kilometres. The Atoll is surrounded by a sharp edge, which shows a superficial morphology remarkably like a "spur and groove" system (Stoddart 1969) and which is a common feature on the windward side of many recent reefs. This morphology is only well developed on the southern and eastern border of the Tendeh Hantu "Atoll". To the northwest, the interior horizontal platform becomes lower step-wise, and is overlain by Pliocene sediments. The coralline sediments forming the edge, dip at 30 to 50 degrees towards the interior of the "Atoll". This dip has probably been accentuated by differential compaction (stronger at the interior than at the edge itself) and by some deformation during the main period of uplift.

The majority of limestones forming the interior are slightly dolomitized bioclastic lime packstones showing a strictly monomict fauna, indicating a restricted shallow marine environment.

The limestones forming the edge are mostly bioclastic lime packstones to wackestones with a much more heterogeneous fauna (calcareous algae and larger foraminifera are abundant, corals common) indicating most probably a shallow water, back reef environment which was periodically exposed.

Deep marine clays with intercalations of turbiditic limestone containing abundant debris of shallow water fauna outcrop some 20 kilometres from the "Atoll". Their age is Lower Miocene (N.9). The exposed shallow water carbonates can only be dated by means of the larger foraminifera. *Flosculinella globulosa*, *Flosculinella cf. reicheli* and *Austrotrillina howchini* are identified close to both the base and the top of the out — cropping carbonate sequences and these restrict the age to early Middle Miocene (lower Tf stage), corresponding to the N.7 — N.10 plankton zone span. The nearby deep marine clays and calciturbidites of late Lower Miocene (N.9) age are therefore taken to have been deposited synchronously with the shallow water carbonates.

Dolomitization is found only in the interior. On the exterior of the atoll edge, the limestones were partly dissolved and leached soon after deposition. Leached porosity and druses of secondary calcite were formed. Parts of these secondary cavities were infilled with very fine lime mud containing small forams and ostracods, not dissimilar to the cavity faunas known in the interior of recent reefs. These cavities and cements may therefore be penecontemporaneous with reef growth.

MIOCENE ALGAL REEF MOUNDS, SENGKANG PROVINCE, SULAWESI

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The southern edge of the Sengkang Basin, situated in the South Arm of Sulawesi, contains well exposed outcrops of algal reef limestone. Numerous discrete mound-shaped bioherms are recognised, rooted into an Upper Miocene limestone platform and covered by pelagic calcareous mudstones of Upper Miocene to Pliocene age.

The bioherms are composed mainly of filamentous calcareous algae; corals form a significant proportion of the framework only at the base. Internally, no lateral facies trends are apparent. Flanking biostromes are thick and coarse-grained at the base where corals are common, but are thin towards the crest of the bioherms. The flanks generally possess fore-reef characteristics.

During the Upper Miocene, shallow water, moderate to high energy deposition gave way to open pelagic sedimentation. During this period of continual subsidence, the algal bioherms flourished and then died. The deterioration in reef growth is attributed to gradual subsidence below the photic zone.

REEF EXPLORATION IN BINTUNI BASIN AND BOMBERAI TROUGH — IRIAN JAYA

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The Bintuni Basin of western Irian Jaya forms a part of the Australian miogeosyncline, the stable platform of which extends from the Salawati Basin area in