

**HALIMEDA BIOHERMS - LOW ENERGY REEFS,
NORTHERN GREAT BARRIER REEF**

**BIOHERMES A HALIMEDA - RECIFS DE FAIBLE ENERGIE,
PARTIE NORD DE LA GRANDE BARRIERE DE CORAIL**

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ABSTRACT

Holocene bioherms, representing in-situ accumulations of the green alga Halimeda, cover large areas of the outer shelf in 30-50m depths in the northern Great Barrier Reef.

Seismic reflection and bathymetric profiles have revealed that areas up to 50 sq. km are covered by mound-shaped bioherms. The eastern edge of the biohermal complexes characteristically occur 1-2 km behind the shelf edge reefs. At this location individual bioherms are large, slightly elongate mounds, but decrease in size towards the west, until they are replaced by thin, sheet-like allochthonous deposits of similar composition. Seismic reflection profiling shows that the mounds have built up on a planar, gently westerly-dipping surface, which in cores is seen to be a Pleistocene limestone. Therefore, the bioherm morphology bears no relation to the morphology of the Pleistocene substrate. Bedding discontinuities, transparent zones and slope changes suggest that the bioherms are multi-generational structures.

Vibrocoring of the bioherms show that they are composed dominantly of Halimeda. Texturally the sediments are a gravelly sandy mud with a Halimeda dominated gravel fraction of 20 to 30 percent and a carbonate component of at least 75 percent. Up to 25 percent of the sediment is fine-grained terrigenous material (kaolinite, smectite and illite), indicating a relatively high degree of cross-shelf transport on this 60 km wide shelf.

Radiocarbon dating confirms a Holocene age, the oldest date so far of around 5000 yrs B.P., and vertical accretion rates which vary from 1m/1000 yrs at the bottom of the cores to 3m/1000 yrs at the top. The youngest age recorded was only a few hundred years, indicating that growth is still occurring.

Holocene bioherms, representing in-situ accumulations of Halimeda, are as thick as the reefs themselves, cover areas larger than individual reefs, and have accreted calcium carbonate at comparable rates. These characteristics, together with their positive relief, would probably identify them as reefs within the geological record.