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Fig. 1. Terraced reef, causing damming of water shoreward



Fig. 2. Two *Trochus niloticus* on reef surface, at low tide, covered by algae

Intertidal reefs under extreme tidal flux in Buccaneer Archipelago, Western Australia

Accepted: 2 August 2001
Published Online: 8 June 2002
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The numerous, nearshore reefs of the Buccaneer Archipelago (16°15'S, 123°30'E), off the Kimberley region of Western Australia, experience bi-diurnal tidal fluxes of up to 10 m. This tidal range is the largest of any coral reef system and creates unusual geomorphologies for the intertidal sections of these fringing coral reefs. Wave energy on these reefs is generally low, except during cyclonic periods, but tidal currents can exceed 10 knots. The carbonate crusts of these Late Quaternary reefs are generally 10–50 cm deep, on top of a sandstone or quartz rock base (Wells et al. 1995). Geomorphologies are unlike the platform reefs of the Great Barrier Reef on Australia's eastern coast, but instead, are either terraced (Fig. 1) or gently curved towards the seaward margin. The intertidal terraces are miniature reef crests, tens of centimeters to several meters in height, comprised mainly of crustose coralline algae. The often expansive, intertidal sections of the reefs are up to 500 m wide and the hard carbonate surfaces extend 4–5 m above tidal zero, being exposed

for 3–4 h around each low spring tide. Most of the reefs dam water (< 50 cm) at low tide, particularly behind terraces, creating an unconsolidated reef-flat habitat that rises to a continuous height across large sections.

The sessile biota are diverse and patchy at a fine scale. Hard corals on the intertidal sections are represented mostly by small favid and poritid colonies, but surface coverage is generally low (< 5%). Soft corals (mainly *Lobophyton* and *Sinluaria*) are sparse, but colonial ascidians and encrusting sponges such as *Dysidea*, *Echinochalina*, and *Haliclona* are common. The algal communities are speciose, only a few centimeters tall and dominated aurally by geniculate phaeophytes and rhodophytes (Fig. 2).

Five species of topshell gastropods (Trochidae) are common and the largest of these, *Trochus niloticus* (Fig. 2), is important commercially to aboriginal fishers along this coast. Other reef taxa are largely unexploited. The aboriginal communities have been involved recently in research and developmental projects in stock enhancement of *T. niloticus* (see Purcell and Lee 2001). High abundance and sympatry of

trochids on the reefs make them convenient subjects for future ecological studies. The reefs have been studied little but offer substantial scope for research on the intertidal habitats and the sessile and motile benthic flora and fauna that flourish in this extreme tidal regime.

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