

Mesophotic coral ecosystems on the walls of Coral Sea atolls

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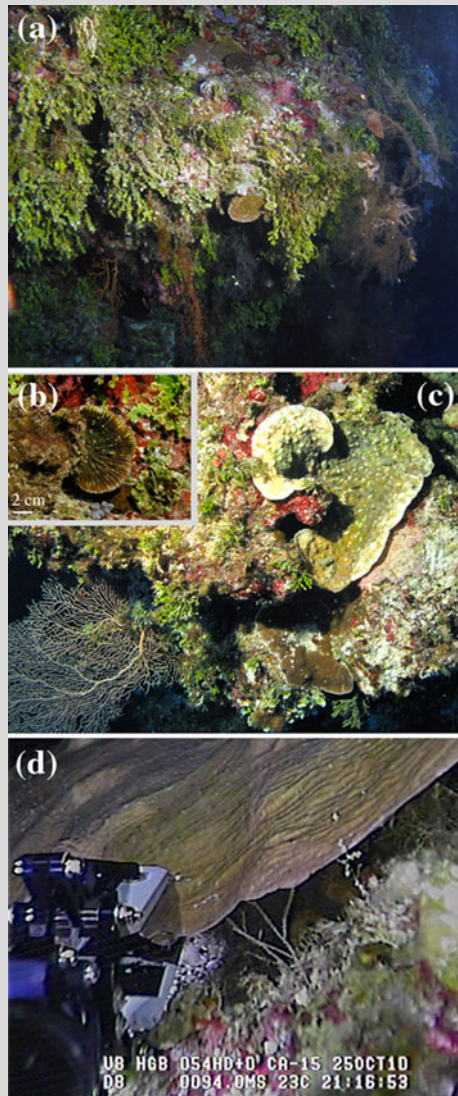


Fig. 1 a *Halimeda* curtains at 50 m, b *Echinomorpha nishihirai* at 40 m, c *Mycedium elephantotus* at 40 m, d ROV collecting from a large *Pachyseris speciosa* colony at 94 m

A research cruise was undertaken in October 2010 to explore potential mesophotic coral communities (30–150 m) in the recently established Coral Sea Conservation Zone (CSCZ). The CSCZ covers an area of almost one million square kilometres east of the Great Barrier Reef (Australia), with its reefs and atolls located hundreds of kilometres from the nearest landmass and surrounded by deep oceanic water. Three of the atolls in the CSCZ (West Holmes Reef [16.243°S, 147.874°E], East Holmes Reef [16.459°S, 148.024°E] and Flora Reef [16.755°S, 147.738°E]) were assessed using SCUBA and a Seabotix ROV. Shallow reef areas (<30 m) consisted largely of bare substrate with predominantly juvenile corals and very low coral cover due to past cyclone damage and thermal bleaching events. In contrast, the steep walls in 40–100 m depth were covered by extensive *Halimeda* curtains (Fig. 1a), which harboured diverse scleractinian coral communities, including *Acropora*, *Astreopora*, *Fungia*, *Galaxea*, *Goniastrea*, *Porites*, *Mycedium* (Fig. 1c), *Seriatopora* and *Turbinaria* spp., with *Pachyseris* (Fig. 1d), *Leptoseris* and *Montipora* spp. recorded to 102 m depth. At least one of the collected specimens represents a new species record for Australia: *Echinomorpha nishihirai* (Fig. 1b). Diverse communities of azooxanthellate octocorals were also observed to 150 m, the maximum depth of the ROV. These observations confirm the presence of mesophotic coral ecosystems (MCEs) along the walls of Coral Sea atolls and indicate that MCEs may form extensive features in the CSCZ. The deep-water coral communities may play an important role in the recovery of shallow reef areas on these isolated atolls by functioning as refugia from the repeated disturbances that have affected these reefs.

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Reef sites

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