

Hard corals of the Darwin Region, Northern Territory

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Surveys were conducted in Darwin harbour and nearby reefs to record and describe species of corals present in the region for the first time. The coral fauna of the region is surprisingly diverse given the sub-optimal conditions for coral survival and growth. Darwin harbour is a relatively shallow estuarine system which is naturally turbid and is flooded annually, producing hypersaline conditions each wet season. 115 species of scleractinian corals from 16 families and 47 genera were recorded. The Faviidae is the dominant family, with large numbers of species from the Acroporidae and Poritid families also present. Intertidal reef flats, associated with the large tidal range, are extensive in the Darwin region. Similar numbers of species are recorded from the reef flat and the subtidal zones. Fewer species, but similar proportions of all major genera are recorded from each family compared with east and west coasts of Australia. These surveys now open the way for more research on the corals in this region eg there has been virtually no work on species of corals across the northern Australian coastline or the extent of gene flow between the east and west coasts. A handbook to the hard corals of the Darwin region will be available in 1999, published by the Northern Territory Museum.

Latitudinal differences in the response of the scleractinian coral (*Pocillopora damicornis*, Linnaeus) to elevated water temperature

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Reef-building corals are sensitive to small changes in water temperature, with bleaching (= loss of symbiotic dinoflagellates) being a common response. Water temperature varies as a function of latitude but as to how corals have adapted to regional variability in temperature is currently unknown. This project examined the response of the ubiquitous coral *Pocillopora damicornis* to small increases in temperature at two sites that differed in terms of latitude and hence average temperature. The two sites were One Tree Island (OTI; 23.50°S 152.10°E) and Orpheus Island (OI; 18.34°S 146.29°E) on the Great Barrier Reef, Australia. Corals used in this study were collected from depths of 1-3 m from habitats at both locations that were also thermally characterised. Three distinct thermal habitats were also identified at OTI: the entrance (mean temperature of 23.0°C±0.45 S.D.), microatoll (23.6°C±0.49 S.D.) and reef crest (21.1°C±1.38 S.D.). Corals from these habitats were also used in the physiological comparisons. The results indicated differences in physiological performance as a function of temperature. Corals from all OTI regimes and OI that were exposed to 32°C (the upper thermal limit), had slower growth rates than those exposed to ambient temperatures. Growth rates per day (relative to growth rate of corals at ambient temperatures) were highest in corals from the entrance (33%), followed by those from the crest (26%), microatoll (20%) and OI (15%). Although corals from OI had a lower growth rate at 32°C than those from OTI, they were able to endure exposure to high temperatures of 32°C for up to 21 days and only showed critical signs of stress (e.g. coral tissue sloughing) at 33°C after 4 days. In contrast OTI corals showed the same signs in less than 24 hours after exposure to 32°C. It therefore appears that *Pocillopora damicornis* from OI (lower latitude) has a greater tolerance to higher temperatures than do the corals from OTI. Possible mechanisms for how corals adapt to increased temperature are discussed.