

Unique fish assemblages at world's southernmost oceanic coral reefs, Elizabeth and Middleton Reefs, Tasman Sea, Australia

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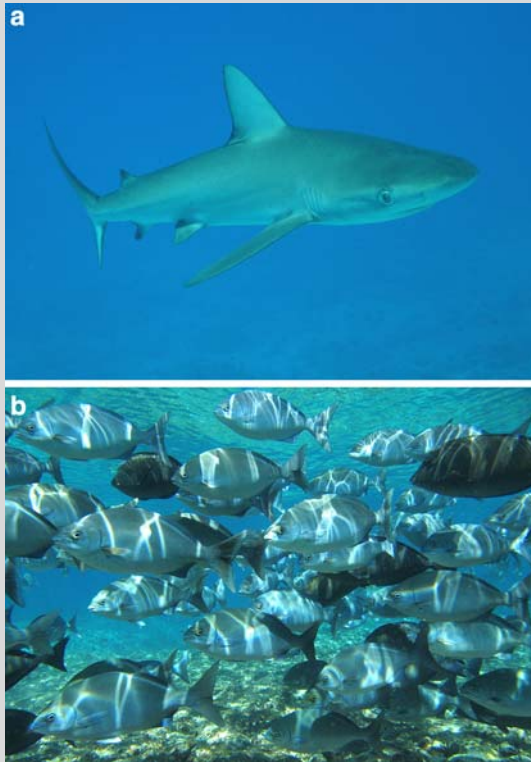


Fig. 1 **a** Galapagos shark and **b** temperate herbivores (*Prionurus maculatus* and *Kyphosus pacificus*) at Middleton Reef

Located in the northern Tasman Sea, 600 km east of Australia, Elizabeth (29°56'S, 159°05'E.) and Middleton Reefs (29°27'S, 159°07'E) form the southernmost oceanic platform coral reefs in the world (Oxley et al. 2004). Previous surveys indicated an unusual fish fauna at these reefs (Australian Museum 1992; Oxley et al. 2004). Further detailed underwater surveys of the fish fauna conducted in February 2006 and 2007 confirmed that the combination of geographic location, isolation and the convergence of tropical and temperate waters have produced a unique fish assemblage comprising tropical, temperate and endemic species.

Two characteristics distinguish these reef fish assemblages from those on other coral reefs. Firstly, the numerical dominance of two large predators: the black cod (*Epinephelus daemeli*) and Galapagos shark (*Carcharhinus galapagensis*) (Fig. 1a), which were abundant on the outer reef (2.9 per ha and 1.8 per ha, respectively), with even greater densities (5.1 per ha and 4.8 per ha, respectively) in the lagoon, an apparent nursery area. Both species have been overfished throughout their ranges, however the remoteness and protected status of these two reefs provides a refuge for these species.

The second characteristic was the abundance of large temperate herbivorous fishes, particularly the Pacific drummer (*Kyphosus pacificus*, 31.5 per 1,000 m²) and sawtail surgeonfish (*Prionurus maculatus*, 16.5 per 1,000 m²) (Fig. 1b). Their high abundance, and the rarity of sea urchins, indicates that temperate fishes play a major herbivory role on these coral reefs. The uniqueness of these coral reef communities has been recognised by the Australian Government and the reefs have been protected as a Marine National Nature Reserve since 1987.

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J.-P. A. Hobbs (✉) · J. H. Choat · W. D. Robbins · L. van Herwerden · D. A. Feary
School of Marine and Tropical Biology, James Cook University, Townsville, QLD 4811, Australia
e-mail: jean-paul.hobbs@jcu.edu.au

A. M. Ayling
Sea Research, PO Box 810, Mossman, QLD 4873, Australia

Reef sites

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