



The most common sponges on the Great Barrier Reef seabed, Australia, include species new to science (Phylum Porifera)

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Abstract

We describe two new species amongst the most common sponges living on the seabed (inter-reef) of the Great Barrier Reef (GBR) collected during a multi-agency survey (GBR Seabed Biodiversity Project 2003–2006) of the shelf benthic biota using a trawl and dredge at 1254 sites. More than 1,200 sponge morphospecies (operational taxonomic units or OTUs) were recognised, many of which are potentially new species. This paper describes five of the most common sponges, two of which are new to science, *Dercitus xanthus* **sp. nov.** and *Paracornulum fistulosum* **sp. nov.** Taxonomic revisions of the three other most common species (*Coscinoderma nardorus* (Lendenfeld, 1886), *Sphēciospongia vagabunda* (Ridley, 1884) and *Xenospongia patelliformis* Gray, 1858), reveal new characters not previously recorded. Extensive distribution maps are provided for these species within the GBR Marine Park. Analysis of the physical data associated with the biota revealed these species had strong preference for sand and carbonate sediments. As colonisers of the soft seabed these most prevalent species provide important habitat stabilisation, enabling succession communities to more readily establish on the seabed. This wide-scale study along the length and breadth of the GBR provides a concise and encompassing view of the distribution and diversity of the seabed benthos, and has significant implications for the conservation and management of the GBR World Heritage Area.

Key words: Demospongiae, *Dercitus*, *Coscinoderma*, *Paracornulum*, *Sphēciospongia*, *Xenospongia*, inter-reef, new species, predicted distribution, taxonomy

Introduction

The Great Barrier Reef (GBR), Australia, is the world's largest reef ecosystem and forms part of the largest World Heritage Area (GBRWHA). The GBR consists of a network of nearly 3,000 coral reefs rising from a continental shelf area of 224,000 km², stretching 2,300 km north to south along its outer perimeter, and extending 23 to 260 km eastwards from the Queensland coast (Hopley 2008). Within the GBRWHA coral reefs occupy only about 7% of the area, whereas the area in between these reefs on the continental shelf (known as the inter-reef or seabed (or reefless seafloor; Hopley 2008), and herein referred to as the seabed), makes up approximately 61% of the GBRWHA (Great Barrier Reef Marine Park Authority, 2009).

The seabed is predominantly shallow, ranging from 20 to 40 m depth in the inshore and wider portions of the shelf, sloping down to about 100 m depth in some places at the edge of the shelf (Hopley 2008), and contains a wide diversity of habitats, such as seagrass beds, submerged patch reefs, sponge gardens and bryozoan mats. Although far more poorly known than the adjacent coral reefs (e.g. see overview of current knowledge of the GBR in Hutchings *et al.*, 2008), this vast seabed area is fundamental to the coral reef ecosystem in providing passages of connectivity between individual reefs and reef systems, and contributes a significant ecological role to the biodiversity of the entire GBR. The seabed is also highly significant for supporting large commercial and recreational fisheries and other activities whose sustainability is dependent on its continuing health, yet until recently knowledge of the seabed was far more rudimentary than the emergent coral reefs.