The deepwater demersal ichthyofauna of the western Coral Sea

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Abstract

The highly diverse deepwater demersal ichthyofauna of the western Coral Sea was first systematically surveyed in two exploratory voyages in 1985 and 1986, and these fish assemblages have not been investigated at the same level since. Only recently have catch data and specimens, obtained from these first voyages almost 3 decades ago, been rigorously investigated and analysed. Some 393 species of fishes from 125 families were collected during the 1985 voyage which surveyed the northeastern Australian continental margin, and the Saumarez and Queensland Plateaus. A checklist of the species caught is provided. Levels of endemicity of deepwater fishes in the western Coral Sea are very high with about 50% of well-studied groups, such as sharks and rays, confined to this relatively small geographic region. A very high proportion of species caught during this voyage were either undescribed (78 species or 20%) or new Australian records (96 species or 24%) at the time of the survey. Another 68 species (17%) are the subject of further taxonomic investigation or are currently undergoing formal description. The fauna exhibits some intraregional differences in structure. Biogeographically informative fishes such as skates appear to be cryptically partitioned within the region, differing in composition to other Australian regions and those of French territories to the east. Strong depth-related partitioning of the fauna is also evident, and its structure follows zonation patterns observed across the wider Australian region. Given the high level of micro-endemicity and regional uniqueness of the fauna, there is a compelling argument for the existence of a faunal gyre in the Coral Sea. New gap-filling surveys are needed to better define the structure of this fauna and determine its distribution.

Key words: deepwater fishes, biogeography, biodiversity, Coral Sea, southwestern Pacific

Introduction

The structure, composition and distribution of Australia’s marine biological resources have been the subject of considerable investigation in recent decades for regional marine planning (IMCRA, 1998), and this research has not been confined to the faunas of inshore environments. In a bioregionalisation of Australian seas based on fish distribution data sets (Last et al. 2005), the continental slope was subdivided into eight province-level bioregions (see Fig. 1 in Last et al. 2011). Two deepwater faunal provinces were identified in the Coral Sea: a northern ‘Cape Province’ and the ‘North Eastern Province’ off central Queensland (1a and 1b in Last et al. 2011). However, this work identified the Coral Sea as having a major knowledge gap in marine fish biodiversity in the Australian Exclusive Economic Zone and, given the paucity of biological surveys to the region, is likely to represent an even bigger knowledge gap for other marine biota. Although based on very limited data, these tropical deepwater provinces were found to be faunally distinct from those of cooler subtropical and temperate waters of the southwestern Pacific, and from comparable latitudes in the eastern Indian Ocean off western Australia. As presently defined, the ‘Northeast IMCRA Province’, which lies beyond the continental shelf off central Queensland, covers an area of 95,530 km² (Department of the Environment & Heritage 2006). It includes a long section of continental slope bordering the Great Barrier Reef, as well as deep offshore plateaus, troughs, and a small area of abyssal basin. The seabed of the ‘Cape Province’, which covers an area of 111,220 km², is largely unexplored.

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exists in this region, and based on data herein, our understanding of its ‘true’ complexity is probably conservative. A modern biodiversity survey of the region is needed to improve on existing datasets to provide a better understanding of the distribution and bathymetric partitioning of the biota and baseline data against which to assess future human impacts in these seas. Australia will soon acquire a new deepwater research platform, the newly commissioned RV *Investigator*, capable of achieving such goals. Major survey gaps within the region include the continental slopes of the Gulf of Papua and insular slopes of the central Coral Sea. Evaluating the existence, strength and structure of a faunal gyre in the Coral Sea are critical needs for understanding regional biodiversity and to assist the regional marine planning process.

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