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New species of *Laetmonice* (Aphroditidae, Annelida) from bathyal and abyssal depths around Australia

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Abstract. Research voyages on board RV *'Investigator'* between 2015 and 2022 sampled benthic communities of Australia's Eastern and Southern continental margins from the slope down to abyssal depths (463–5000 m) as well as the seamounts off the Australian Indian Ocean Territories (IOT) that include Christmas Island and Cocos (Keeling) Islands. Over 500 specimens of the annelid family Aphroditidae were collected during the voyages. Some of the most common aphroditids collected during these voyages belonged to the large-bodied members of the genus *Laetmonice*. We used fragments of *COI* and *16S* genes to investigate the diversity of the genus. Phylogenetic studies revealed the presence of at least nine distinct mitochondrial genetic lineages within *Laetmonice*, four of which have been described here as *Laetmonice hutchingsae* sp. nov., *L. murrayae* sp. nov., *L. mensahaedorum* sp. nov. and *L. paxtonae* sp. nov. The new taxa are clearly structured by their bathymetric distributions. These results argue against eurybathic distribution within the genus *Laetmonice* and demonstrate the existence of genetically divergent taxa isolated by bathymetric environmental gradients.

Introduction

Biological communities of the continental slope, abyssal plains and seamounts around Australia have recently been rigorously sampled for the first time, investigations made possible by the commissioning of the Australian research vessel (RV) *Investigator* in late 2014. Voyages conducted between 2015 and 2022 examined patterns of deep-sea biodiversity in the Great Australian Bight, seamounts off Tasmania, Commonwealth Marine Reserves (CMR) of the Eastern Australian Abyss, Australia's Indian Ocean Territories (Christmas Island and Cocos (Keeling) Island Marine Parks), and most recently, Gascoyne Marine Park off Western Australia. Of particular interest in terms of species diversity and abundance of discovered macroinvertebrates were the "Sampling the abyss" expedition that examined the lower slope and abyss of Australia's eastern margin from off mid-Tasmania (42°S) to the Coral Sea (23°S) (O'Hara *et al.*, 2020) and "Investigating the IOT" expedition that studied remote western Indian Ocean localities in the new Christmas Island and Cocos (Keeling) Island Marine Parks.

Polychaetes constitute a macrobenthic group of great abundance and diversity in all marine ecosystems and are typically a dominant macrofauna in deep-sea soft sediments (Herring, 2010; Rex & Etter, 2010). Polychaetes have been well represented in the samples collected during the expeditions cited above: in total, over 6000 specimens were collected during the 2017 expedition (Gunton *et al*., 2021) and 463 during the 2021 and 2022 expeditions.

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