

## Polynoidae (Annelida) from bathyal and abyssal depths in southern and eastern Australia

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**ABSTRACT.** We provide a systematic account of the family Polynoidae (Annelida) from deep waters (> 1000 m) around Australia. Specimens were collected during surveys to the Great Australian Bight (2013–2017), east coast of Australia (2017), and southern seamounts off Tasmania (1997–2018). The taxonomic account includes 21 species from 12 genera, with accepted or provisional names, and we further describe nine new species. New species from four subfamilies described here include Arctonoinae: *Parahololepidella mensa* sp. nov.; Lepidastheniinae: *Anotochaetonoe rubermaculata* sp. nov.; Macellicephalinae: *Bruunilla magnantennata* sp. nov., *Bruunilla posteroantennata* sp. nov., and *Polaruschakov investigatoris* sp. nov.; Polynoinae: *Eunoe albacauda* sp. nov., *Eunoe apicolata* sp. nov., *Eunoe benhami* sp. nov., and *Eunoe danmurrayi* sp. nov. An additional 11 operational taxonomic units (OTUs) are represented by incomplete material. One species is given a new status: *Eunoe abyssorum* McIntosh, 1885 *nomen dubium*. One species previously placed in *Bathyedithia* Pettibone, 1976 is given a new combination as *Polaruschakov retierei* (Bonifácio & Menot, 2018) comb. nov. Two species formerly placed in *Lagisca* Malmgren, 1865 are new combinations as *Harmothoe longipalpa* Kirkegaard, 1995 comb. nov. and *Harmothoe torbeni* (Kirkegaard, 1995) comb. nov. *Polyeunoe monroi* Averincev, 1978 is recognised as a valid species distinct from *Parapolyeunoe flynni* (Benham, 1921), rather than a synonym of that species as previously suggested. We provide a phylogenetic analysis based on COI, 16S, 18S and 28S gene fragments placing our new taxa within the family Polynoidae. Molecular results support three monophyletic subfamilies Admetellinae, Macellicephalinae, and Polynoinae. This study provides the first comprehensive review of deep-water polynoids from Australia.

**Keywords:** Deep sea, scale-worms, Aphroditiformia, Australia

**ZooBank registration:** urn:lsid:zoobank.org:pub:E10487E9-317A-48E9-A993-7F4F34D6BAF7

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**Submitted:** 15 May 2024 **Accepted:** 11 August 2025 **Published:** 1 October 2025 (in print and online simultaneously)

**Publisher:** The Australian Museum, Sydney, Australia (a statutory authority of, and principally funded by, the NSW State Government)

**Citation:** Murray, A., I. Burghardt, L. M. Gunton, N. Mohamed Nizar, M. C. Nikolic, and R. S. Wilson. 2025. Polynoidae (Annelida) from bathyal and abyssal depths in southern and eastern Australia. *Records of the Australian Museum* 77(4): 193–269.

<https://doi.org/10.3853/j.2201-4349.77.2025.1904>

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