



An overview of the Australian psolid sea cucumbers (Echinodermata: Holothuroidea: Psolidae) with the description of 5 new species

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Abstract

Four new species of *Psolus* Oken from Australia are described: *Psolus parantarcticus* **sp. nov.** from Macquarie Island, *Psolus salottii* **sp. nov.** from South Australia and Macquarie Island, *Psolus steuarti* **sp. nov.** from Victoria, and *Psolus springthorpei* **sp. nov.** from Queensland. One new species of *Psolidium* Ludwig from Australia is described: *Psolidium oloughlini* **sp. nov.** from King Island. All Australian psolid species are included in the overview: *Ceto cuvieria* (Cuvier), *Psolidium berentsae* O’Loughlin & Maric, *P. granuliferum* H.L. Clark, *P. hutchingsae* O’Loughlin & Maric, *P. karenae* O’Loughlin & Maric, *P. laperousazi* O’Loughlin & Maric, *P. marshae* O’Loughlin & Maric, *P. mccallumae* O’Loughlin & Maric, *P. minutum* (H.L. Clark), *P. nigrescens* H.L. Clark, *P. parmatum* (Sluiter), *P. ravum* Hickman, *P. spinuliferum* (H.L. Clark), and *Psolus antarcticus* (Philippi). A key to the Australian species of Psolidae is provided.

Key words: *Psolus*, *Psolidium*, *Ceto*, taxonomy, Dendrochirotida, keys

Introduction

In the order Dendrochirotida, psolid sea cucumbers (Psolidae) differ from other families through the presence of dorsal scales and a clearly demarcated ventral sole, this sole being thin and calcareous in most species. Of the six known genera of Psolidae, *Ceto* Gistel, 1848, *Echinopsolus* Gutt, 1990, *Ekkentropelma* Pawson, 1971, *Lissothuria* Verrill, 1867, *Psolidium* Ludwig, 1886, and *Psolus* Oken, 1815, only three occur in Australian waters: *Ceto*, *Psolus*, and *Psolidium*. Following the work initiated by O’Loughlin & Maric (2008) on Australian Psolidae we have further studied material from collections at the Smithsonian Institution, Museum Victoria, South Australian Museum, Australian Museum, and Western Australian Museum. To the overview of Australian species of *Psolidium* provided by O’Loughlin & Maric (2008), which included keys to Psolidae genera and *Psolidium* species, we add four new species of *Psolus*, one new species of *Psolidium*, and some minor amendments to their key. We provide a single key for all Australian Psolidae.

Methods

Photographs of specimens were taken using a SLR Canon EOS5D digital camera with 65 and 100 mm lenses, SLR Nikon D70 and 300S digital cameras with 105 mm lens, and a Pentax K10D digital SLR camera using a variety of lenses. Ossicles were cleared for observation using commercial bleach. Photographs of ossicles were taken using a Leica DC500 digital camera and Auto-Montage software. Photographs of specimens were taken by Leon Altoff, Audrey Falconer, Caroline Harding, Chris Rowley and Melanie Mackenzie, with the live specimen photo of *Ceto* provided by Neville Coleman. Photographs of ossicles were taken by Caroline Harding, Melanie Mackenzie and Emily Whitfield. Figures were prepared by Ben Boonan with assistance from Melanie Mackenzie, Emily Whitfield, and Mark O’Loughlin using Adobe Photoshop CS5. Loan material was sourced from a number of Australian museums and the National Museum of Natural History / Smithsonian Institution, in Washington DC, and registration numbers are provided.