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SEM study of species of *Oswaldella* Stechow, 1919 (Cnidaria, Hydrozoa, Kirchenpaueriidae), with an annotated checklist of the species of the genus

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Abstract

Oswaldella is the most speciose genus, and one of the most characteristic, of hydrozoans inhabiting the Antarctic benthic marine ecosystem. Its species have relatively many important taxonomic characters allowing for their identification. Some of them, however, are difficult to study properly with a compound microscope. With the aim of improving scientific knowledge concerning species of the genus, a SEM survey of species of *Oswaldella* was carried out to study key morphological characters. Fourteen out of the 27 known nominal species were considered. The study has revealed unknown important characters, such as the presence of nematothecae associated with the nematophores at the cauline apophyses, and has provided a better understanding of others, such as the shape of the nematotheca associated with the medial infrathecal nematophore. A final general discussion on some of the characters studied and on the bathymetrical and geographical distribution of all known species is also included. Finally, an annotated checklist including all known nominal species has also been assembled.

Key words: Hydrozoans, hydroids, Southern Ocean, taxonomy, geographic distribution

Introduction

Oswaldella Stechow, 1919 is the most speciose genus of hydrozoans inhabiting the Antarctic benthic marine ecosystem, embracing approximately 20% of the biodiversity of Antarctic Leptothecata (Peña Cantero 2007). The genus is almost completely endemic to the Antarctic region; only *Oswaldella herwigi* El Beshbeeshy, 2011 is found outside Antarctic waters, being present in the sub-Antarctic Patagonian region (cf. Peña Cantero & Vervoort 2004). At present there are 27 valid nominal species (cf. Peña Cantero & Vervoort 2004; Peña Cantero & Ramil 2006; Peña Cantero 2007). In addition, there are four putative species described at the generic level (cf. Peña Cantero & Vervoort 1995, 2004). Consequently, there might be up to 31 known species of *Oswaldella*.

Oswaldella is one of the most characteristic genera of benthic hydroids and its study has raised great interest, being the subject of biodiversity studies (e.g. Peña Cantero *et al.* 1997; Peña Cantero & Vervoort 2004), evolutionary studies (Peña Cantero & Marques 1999; Peña Cantero *et al.* 2010) and biogeographical studies (Marques & Peña Cantero 2010; Miranda *et al.* 2013).

The main goal of this study was to carry out a Scanning Electron Microscopy (SEM) survey of species of *Oswaldella* to examine several morphological structures of taxonomic importance that are difficult to observe with light microscopy, particularly those associated with the cauline apophyses because these are usually directed upwards and lay oriented very close to the stem. We also aimed to enhance descriptions of the studied species with information and figures obtained through SEM analysis. Finally, we provide an update on natural history data and geographical distribution of all known species of *Oswaldella*. This was undertaken because since the paper by Peña Cantero & Vervoort (2004), in which the ecology and distribution of all known species of *Oswaldella* were considered, two more species have been described, *O. niobae* Peña Cantero & Ramil, 2006 and *O. laertesi* Peña Cantero, 2007, and new records for several species have been added in subsequent publications (Peña Cantero 2006, 2008, 2009, 2013, 2014; Peña Cantero & Gili 2006; Peña Cantero & Ramil 2006; Peña Cantero & Vervoort 2009).

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