

Zoanthids (Cnidaria: Hexacorallia: Zoantharia) from shallow waters of the southern Chilean fjord region, with descriptions of a new genus and two new species

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Abstract

The taxonomy of the order Zoantharia (= Zoanthidea = Zoanthiniaria) is greatly hampered by the paucity of diagnostic morphological features. To facilitate discrimination between similar zoanthids, a combination of morphological and molecular analyses is applied here. The three most abundant zoanthid species in shallow waters of the southern Chilean fjord region are described. Comparison with other zoanthids using molecular markers reveals that two of them are new to science; these are described as *Mesozoanthus fossii* gen. n., sp. n. and *Epizoanthus fiordicus* sp. n. Their representatives grow on rocky substratum and do not live in symbiosis with demosponges. In the less abundant *M. fossii*, animals are greyish in colour and resemble members of *Parazoanthus* in growth form. Individual polyps can be up to 35 mm long. The more abundant *E. fiordicus* are also greyish; the polyps arise from thin stolons and reach only 12 mm in length. The third species studied is *Parazoanthus elongatus* McMurrich, 1904. For these three Chilean zoanthid species, in-situ photographs are presented as well as information on distribution, habitat and associated species. Establishment of the *Mesozoanthus* gen. n. is of particular importance to taxonomy in the chaotic suborder Macrocnemina.

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Introduction

The diversity of marine organisms in the southern Chilean fjord region (42–55°S) provides great potential

for taxonomic studies. However, the inhospitable geomorphological conditions and remote location make access very difficult. Thus, the benthic fauna of the region is poorly studied and the zoanthid fauna (order Zoantharia [= Zoanthidea = Zoanthiniaria]) is almost unknown. Among the seven currently valid zoanthid genera (representing five families), only *Isozoanthus* Carlgren has not been reported from the Pacific Ocean.

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Species number estimations are very difficult due to the taxonomical chaos in the order. Characters used to describe species have not been standardised; thus, many species names may eventually fall as junior synonyms. This concerns especially the tropical shallow-water zoanths, which show high colour variation and morphological plasticity. Few studies have focused on Chilean zoanths (Carlgren 1899, 1927; McMurrich 1904; Lwowsky 1913). Prior to the present study there were four zoanthid species described from Chile: *Epizoanthus patagonichus* Carlgren, 1899 from Calbuco (approx. 41°45'S, 73°06'W; S1 in Fig. 1; depth

20 fathoms (c. 36 m)); *Parazoanthus fuegiensis* Carlgren, 1899 from Dawson Island/Puerto Harris in the Straits of Magellan (approx. 53°50'S, 70°25'W; S2 in Fig. 1; intertidal); *P. elongatus* McMurrich, 1904 from Calbuco (S1 in Fig. 1); and *Epizoanthus balanorum* Lwowsky, 1913 from the “Chilean coast”. *Epizoanthus patagonichus* had been described originally from southern Argentina (44°14'S, 61°23'W; east of S3 in Fig. 1; depth 60 fathoms (c. 110 m)); several specimens found later at Calbuco were assigned to this species by McMurrich (1904). Calbuco and the Straits of Magellan constitute approximately the northern and southern limits of the Chilean fjord region, respectively (Fig. 1).

Between 1994 and 2007, Vreni Häussermann and Günter Försterra collected, examined and preserved shallow-water anthozoans from more than 170 sites along the Chilean coast from Arica (18°30'S, 70°19'W) to Fuerte Bulnes, Straits of Magellan (53°36'S, 70°56'W). Detailed descriptions of the sampling sites are given in Häussermann (2004a, b, 2005, in the respective electronic supplementary material) and in Häussermann and Försterra (2007). Among the numerous specimens collected, three species of zoanths have been identified from this region and ascribed to the suborder Macrocnemina. In the present study, we apply a combination of molecular methods and the analyses of *in vivo* morphological and ecological observations to elucidate phylogenetic relationships among these morphologically similar zoanths.

Molecular analyses have shown that taxonomic relationships within and between zoanthid genera inferred from morphological characters did not adequately represent the phylogeny (Sinniger et al. 2005). At the species level, Reimer et al. (2004) have demonstrated the usefulness of DNA data to clarifying relationships within morphologically variable clades. In accordance with the taxonomic studies on zoanths published recently (Reimer et al. 2007a, 2008), we compared the sampled species with other zoanths using the following molecular markers: mitochondrial 16S ribosomal DNA (mt 16S rDNA; Fig. 2), cytochrome oxidase subunit I (COI), and nuclear internal transcribed spacer of ribosomal DNA (ITS-rDNA). The results indicate one genus and two species new to science, which are established below as *Mesozoanthus fossii* gen. n., sp. n. and *Epizoanthus fiordicus* sp. n. The third of our study species is identified as *Parazoanthus elongatus*. For all three species, data on habitat, geographic and bathymetric distribution as well as on associated species are provided.

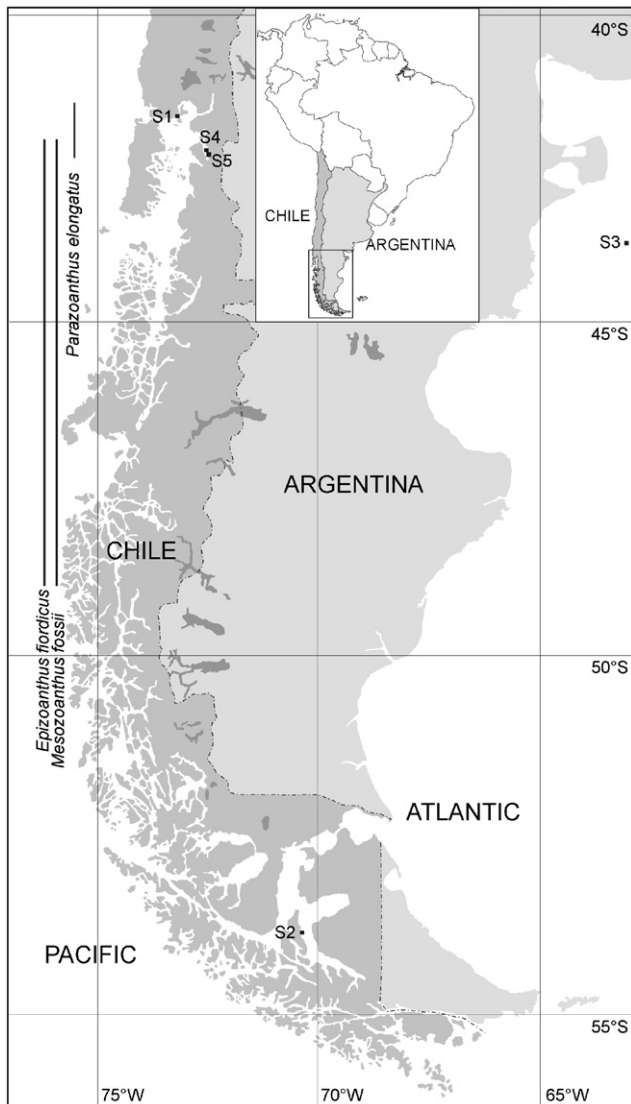


Fig. 1. Map of the southern South American distribution of shallow-water zoanths. Vertical bars indicate known ranges, dots indicate type localities as follows: S1 (Calbuco) = *Parazoanthus elongatus*, S2 = *P. fuegiensis*, S3 (representing true locality at 44°14'S, 61°23'W, outside of map) = *Epizoanthus patagonichus*, S4 = *E. fiordicus* sp. n., S5 = *Mesozoanthus fossii* gen. n., sp. n.

Material and methods

Seventeen specimens were examined and photographed in situ during scuba dives in the coastal waters

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