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Three new species of shallow water, yellow zoanthids (Hexacorallia: Zoanthidea: Epizoanthidae) from southern California, USA, and southern Australia

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Abstract

In southern California and southern Australia, several species of hexacorals that are common at diving depths have been referred to as "Yellow Zoanthids." We describe three new species of them in the genus *Epizoanthus* because all have a macrocnemic mesenterial arrangement and mesogleal marginal sphincter muscle. *Epizoanthus giveni* is from southern California, and *Epizoanthus karenae* and *Epizoanthus rodmani* are from southern Australia. Distinguishing features of *E. giveni* **n. sp.** are a sphincter muscle with alveoli arrayed in a single, longitudinal column, polyps no longer than 8 mm beyond the coenenchyme, obvious scapus ridges numbering 19 or fewer, and mesenteries numbering 36 or fewer. Distinguishing features of *E. karenae* **n. sp.** are radiating dark-orange lines on the oral disc (in life), a broad sphincter muscle filling most of the margin distally and transversely stratified proximally, polyps no longer than 12 mm beyond the coenenchyme, obvious scapus ridges numbering 20 or fewer, and mesenteries numbering no more than 40. Distinguishing features of *E. rodmani* **n. sp.** are the lack of lines on the oral disc (in life), a sphincter muscle situated in the middle of the mesoglea with alveoli more elliptical than circular in section, polyps no longer than 8 mm beyond the coenenchyme, scapus ridges not obvious, and mesenteries numbering 48 or fewer.

Key words: Cnidaria, Coelenterata, *Epizoanthus*, Pacific Ocean, taxonomy, Zoantharia, Zoanthiniaria

Introduction

We describe three new species of shallow-water zoanthids, *Epizoanthus giveni* **n. sp.** from the north-eastern Pacific Ocean off southern California, USA, and *Epizoanthus karenae* **n. sp.** and *Epizoanthus rodmani* **n. sp.** from the south-western Pacific Ocean off southern Australia. All have been observed and photographed by scuba divers for many years, and in both places are commonly referred to as "Yellow Zoanthids" (Gotshall 2005; Gowlett-Holmes 2008).

Zoanthidea, one of the least-studied orders of phylum Cnidaria, has about 330 nominal species (Fautin 2008) among which are likely to be many synonyms (Burnett *et al.* 1997). Zoanthids, most species of which are clonal or colonial, live from shallow to deep water throughout the world's oceans, many in symbiosis with other animals such as octocorals and hermit crabs (Ryland *et al.* 2004). A zoanthid polyp has one siphonoglyph, two cycles of tentacles, and mesenteries that have been referred to as both paired and coupled (Hyman 1940; Dunn 1982; Herberts 1987; Manuel 1981) or only paired (Pax 1925; Walsh 1967; Ryland and Lancaster 2003). Individuals of most species range in diameter from 3 to 15 mm (Ryland and Lancaster 2003).

One reason for the dearth of knowledge about these animals is that zoanthids can be difficult to identify, being homogeneous morphologically when compared with members of other hexacorallian orders. Another reason for the scarcity of research on these animals is that in many species, particles (e.g. sand grains) incorporated into the mesoglea (Ryland and Muirhead 1993) cause problems in making histological sections, which are necessary to study the taxonomically important musculature and mesenterial arrangement.

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