



Zoantharians (Hexacorallia: Zoantharia) Associated with Cold-Water Corals in the Azores Region: New Species and Associations in the Deep Sea

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Zoantharians are a group of cnidarians that are often found in association with marine invertebrates, including corals, in shallow and deep-sea environments. However, little is known about deep-sea zoantharian taxonomy, specificity and nature of their associations with their coral hosts. In this study, analyses of molecular data (mtDNA COI, 16S, and 12S rDNA) coupled with ecological and morphological characteristics were used to examine zoantharian specimens associated with cold-water corals (CWC) at depths between 110 and 800 m from seamounts and island slopes in the Azores region. The zoantharians examined were found living in association with stylasterids, antipatharians and octocorals. From the collected specimens, four new species were identified: (1) *Epizoanthus martinsae* sp. n. associated with the antipatharian *Leiopathes* sp.; (2) *Parazoanthus alicae* sp. n. associated with the stylasterid *Errina dabneyi* (Pourtales, 1871); (3) *Zibrowius alberti* sp. n. associated with octocorals of the family Primnoidae [*Paracalyptophora josephinae* (Lindström, 1877)] and the family Plexauridae (*Dentomuricea* aff. *meteor* Grasshoff, 1977); (4) *Hurlizoanthus hirondeleae* sp. n. associated with the primnoid octocoral *Candidella imbricata* (Johnson, 1862). In addition, based on newly collected material, morphological and molecular data and phylogenetic reconstruction, the zoantharian *Isozoanthus primnoidus* Carreiro-Silva, Braga-Henriques, Sampaio, de Matos, Porteiro & Ocaña, 2011, associated with the primnoid octocoral *Callogorgia verticillata* (Pallas, 1766), was reclassified as *Zibrowius primnoidus* comb. nov. The zoantharians, *Z. primnoidus* comb. nov., *Z. alberti* sp. n., and *H. hirondeleae* sp. n. associated with octocorals showed evidence of a parasitic relationship, where the zoantharian progressively eliminates gorgonian tissue and uses the gorgonian axis for structure and support, and coral sclerites for protection. In contrast, the zoantharian *P. alicae* sp. n. associated with the stylasterid *E. dabneyi* and the zoantharian *E. martinsae* sp. n. associated with the antipatharian *Leiopathes* sp., appear to use the coral host only as support with no visible damage