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A revision of the genus *Eugorgia* Verrill, 1868 (Coelenterata: Octocorallia: Gorgoniidae)

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Abstract

The species of the gorgoniid genus *Eugorgia* that occur along the eastern Pacific are taxonomically revised based on original type material of all species described until now, and reference specimens from recent surveys and expeditions. The genus *Eugorgia* is characterised by having a dominance of double disc sclerites in the coenenchyme which separate this taxon from the other gorgonians with similar external morphology such as *Leptogorgia*. In this revision, 12 species are recognized as valid and one is synonymised, *E. forreri*. Lectotypes were assigned for two species in order to establish their taxonomic status, and three varieties were established as species, *E. alba*, *E. excelsa* and *E. purpurascens*. All the species are described and illustrated. Based on the morphology of colonies and sclerites and supported by a phylogenetic analysis, we recognised three species groups within the genus *Eugorgia*: the "*ampla*-group" consisting of eight species, with slightly raised polyp-mounds and dichotomous branching or irregular variations of it; the "*daniana* group", consisting of three species, with prominent polyp-mounds and pinnate-like branching; and the "*rubens*-group" consisting of a single species, *E. rubens*, which is closely related to species within the second group. The fauna herein reported does not represent the diversity or geographical range of the species because more surveys are needed and more material stored in museums needs attention to complete the regional assessment.

Key words: Cnidaria, Coelenterata, octocorals, eastern Pacific, Mexico, Costa Rica, Panama, Ecuador, *Eugorgia*, phylogenetic analysis

Introduction

Gorgonians are widely distributed along the eastern Pacific, from Baja California to Peru including the oceanic islands, and the families Gorgoniidae and Plexauridae are the most abundant in shallow waters (<50 m in depth). Genera of these families have representatives in both the Pacific and Atlantic ocean, like *Muricea* Lamouroux, 1812, *Leptogorgia* Milne Edwards & Haime, 1857, and *Pacifigorgia* Bayer, 1951. However, the genus *Eugorgia* Verrill, 1868 has fewer species and is restricted to the eastern Pacific. Ten nominal species and three varieties were established (Horn 1860; Duchassaing & Michelotti 1864; Verrill 1864, 1868, 1868a, 1870; Studer 1883; Bielschowsky 1918, 1929), but not without problems. As pointed out for other genera, authors have failed to provide detailed illustrations in species descriptions, delineations were not clear, and in most cases, holotypes were not designated or are missing (Breedy & Guzman 2002, 2007). For some species, the type material is represented by one specimen, in some cases deteriorated, or by small fragments.

This revision is based on original type material of all species described until now, as well as reference specimens from recent surveys and expeditions along the eastern Pacific coast. The species are described or redescribed, and illustrated. In addition, a phylogenetic analysis is conducted using morphological characters to determine the relationships among species of *Eugorgia*. The species treated in this paper, in general, do not occur frequently and do not have a wide geographical distribution; several are known just from the type locality (Table 4), and some were collected deeper than 50 m by dredging.

This research represents the third contribution in a series proposed to evaluate the genera of gorgonians reported for the shallow eastern Pacific waters. The previous two deal with *Pacifigorgia* and *Leptogorgia*. Herein, we revise the genus *Eugorgia*.

Abbreviations

CASIZ: California Academy of Science, Invertebrate Zoology, San Francisco, USA; CDRS: Charles Darwin Research Station, Galapagos, Ecuador; MCZ: Museum of Comparative Zoology, Harvard University, Boston, USA; MNHN: Museum National d´Histoire Naturelle, France; MZUF: Museo Zoologico dell'Università di Firenze, Italy; SEM: Scanning Electron Microscopy; STRI: Smithsonian Tropical Research Institute, Panamá; RMNH: National Museum of Natural History Naturalis, Leiden, The Netherlands; UCR: Museo de Zoología, Escuela de Biología, Universidad de Costa Rica, Costa Rica; USNM: National Museum of Natural History, Smithsonian Institution, Washington, USA; YPM: Yale Peabody Museum of Natural History, New Haven, USA; and ZMHC: Hamburg Museum, Hamburg, Germany.