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A new genus and new species of family Antedonidae (Echinodermata: Crinoidea) from southern Japan

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Abstract

A new genus and new species of antedonid comatulid is described from southern Japan. *Belonometra* n. gen. has a unique appearance with ten long arms, numerous cirri, and remarkably long and crowded pinnules. The new genus shares some characters with subfamily Heliometrinae. However, the comparative length of pinnules, which is a diagnostic character to determine subfamily Antedonidae, is different. The subfamily into which the new genus should be placed is unclear.

Key words: Comatulida, feather star, Shikoku Island, Ryukyu Islands

Introduction

Family Antedonidae Norman, 1865 is the largest family of comatulids, and consists of more than 150 nominal species, about a quarter of extant comatulids. The members are distributed worldwide, from intertidal to abyssal depths, and from polar areas to tropical coral reefs (A.H. Clark & A.M. Clark 1967).

A.H. Clark (1909) divided extant comatulids into two suborders, based on the size of the centrodorsal cavity: Oligophreata with smaller cavities and Macrophreata with larger centrodorsal cavities. He placed Antedonidae in the later. However, this definition is unclear because the size of centrodorsal cavity is continuous, and the size range overlaps between the two groups (Meyer 1972; Hess & Messing 2011). In a recent major taxonomic revision of order Comatulida, Antedonidae was assigned to superfamily Antedonoidea, which corresponds to the former Macrophreata excluding family Atelecrinidae (Hess & Messing 2011). The members of this superfamily are characterized by having high and thin muscular fossae, a narrow radial cavity without a central plug, and pinnules without terminal combs or aboral carination. Unlike the other two families of the superfamily that are clearly defined (Pentametrocrinidae with non-bifurcated arms and Zenometridae with a cirlet of basals and cirrus sockets in characteristic shape) (Messing & White 2001; Hess & Messing 2011), Antedonidae seems to be an assemblage of various ten-armed species. A.H. Clark (1909) recognized six subfamilies on the basis of characters of cirri and oral pinnules: Antedoninae, Perometrinae, Zenometrinae, Heliometrinae, Thysanometrinae and Bathymetrinae. After that, he added subfamily Isometrinae (former Isometrinae, renamed by Fet & Messing (2003)) (A.H. Clark, 1917). However, the borders between subfamilies are arbitrary and confusing (e.g., A.M. Clark in A.H. Clark & A.M. Clark 1967; A.M. Clark 1980). Messing & White (2001) redefined Zenometrinae, and raised the group to family rank, Zenometridae. Currently six other subfamilies are accepted, and 12 genera remain incertae sedis. Recent phylogenetic studies have disclosed that this family and also some subfamilies are polyphyletic (Rouse *et al.* 2013; Hemery *et al.* 2013). A complete taxonomic revision of the taxa formerly included in Antedonidae is needed (Hess & Messing 2011).

Recently an unusual comatulid species was found off southwest coast of Shikoku Island and Okinawa Island, southern Japan. Collected specimens had a peculiar appearance with numerous cirri, and extremely elongated