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Descriptions of two new species and designation of three neotypes of Japanese Coralliidae from recently discovered specimens that were collected by Kishinouye, and the introduction of a statistical approach to sclerite abundance and size

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Abstract

Here we describe eight specimens of Japanese precious coral (Octocorallia: Coralliidae) collected and identified by Kishinouye over one hundred years ago, and recently rediscovered in the collections at the USNM, Smithsonian Institution. Although Kishinouye identified four of the specimens he sent to the Smithsonian as *Corallium elatius* (Ridley, 1882), two of them represent two new species which we describe: *Corallium uchidai* sp. nov. and *C. gotoense*, sp. nov. Kishinouye did not designate any type material for the species he described in his publications nor did he ever mention sending any specimens to the Smithsonian Institution. Because his original material remains missing, we here select neotypes from the Smithsonian material for three of his species: *Corallium konojoi* Kishinouye, 1903; *Pleurocorallium inutile* Kishinouye, 1902 and *C. japonicum* Kishinouye, 1903. In this study, thanks to advances in computer technology and software, we have been able to quantify and thus improve the vague descriptions of sclerite numbers found in past literature such as “few” or “many”. Our goal in reporting percent composition data for each kind of sclerite is to help to make species identifications easier for non-specialists.

Key words: *Corallium*, *Paracorallium*, *Pleurocorallium*, *Corallium uchidai*, *Corallium gotoense*

Introduction

Species in the family Coralliidae (Octocorallia: Alcyonacea) are known as precious coral, because their colorful and hard axial skeletons have been valuable for use as jewelry, medicine, and other products for at least 5,000 years. The original precious coral—*Corallium rubrum* (Linnaeus, 1758)—was initially collected from the Mediterranean, and other species of precious coral have been collected from Japanese waters for about 200 years.

The first taxonomic papers on Japanese precious corals were those of Ridley (1882) and Kishinouye (1902, 1903a,b, 1904a,b) over 100 years ago. Kishinouye’s description of *Pleurocorallium inutile* as a new species (Kishinouye 1902: later renamed *Corallium inutile* by Kishinouye 1903a) was the first octocoral study ever published by a Japanese scientist (Imahara 2007), and the fishery of precious corals still continues not only in Japan but elsewhere in the world (Nonaka & Muzik 2009). In 1956, Bayer described a number of corals in the Coralliidae, including new species from Hawaiian waters, and provided a key to the known species of Indo-Pacific *Corallium*, including Japanese species, and Pasternak (1981) recorded *C. boshuensis* Kishinouye, 1903 in the Marcus-Necker Sea Mounts near Hawaii. Imahara (1996) listed all octocorals reported from Japanese waters, recording eight species of *Corallium* and two species of *Pleurocoralloides* in the family Coralliidae. Bayer & Cairns (2003) suggested that the genus *Pleurocoralloides* was actually a synonym of *Acabaria*, and in the same publication established the new genus *Paracorallium* in the family Coralliidae. They moved seven known species of *Corallium* including *C. inutile* and *C. japonicum*, to the new genus, leaving 19 species in *Corallium*, but they did not mention two other Japanese species, *C. boshuensis* and *C. pusillum* Kishinouye, 1904. Nonaka & Muzik (2010) reviewed the past studies of Indo-Pacific species of Coralliidae, finding much confusion about the features used for identification.

In the Indo-Pacific, there are 25 nominal species in the family Coralliidae (Nonaka & Muzik 2010), including seven from Japan (Ridley 1882, Kishinouye 1902, 1903a, 1904a), eight from Hawaii (Bayer 1956, 1996, Pasternak 1981), three from Indonesia (Hickson 1905, 1907; Bayer 1950), one from Ceylon (Thomson & Henderson 1906),