

Crabs of the Families Tetraliidae, Trapeziidae and Xanthidae (Crustacea: Decapoda: Brachyura) new to the Ogasawara Islands, Japan

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Abstract A total of 17 species of three families (1 species of Tetraliidae, 2 species of Trapeziidae and 14 species of Xanthidae) are added to the crab fauna of the Ogasawara Islands, the oceanic islands at about 1,000 km south of Tokyo, Japan. Among 17 species, *Etisus odhneri* Takeda, 1972, and *Garthiella aberrans* (Rathbun, 1906) are new to the carcinological fauna of Japanese waters.

Key words: Tetraliid crabs, trapeziid crabs, xanthid crabs, taxonomy, biogeography, Japanese waters, West Pacific.

Introduction

The Ogasawara Islands are the oceanic islands situated at about 1000 km south of Tokyo, Japan, which are well known by the marine scientists under the name of the Bonin Islands (cf. Takeda and Komatsu, 2023). In 2011, the Ogasawara Islands were designated by UNESCO as the fourth World Natural Heritage site in Japan, being known by the Japanese people as *the Galapagos Islands in the Orient*, and then many researches were conducted by the staff of universities and museums in Japan, and the Tokyo Metropolitan Government to reveal and protect the unique fauna and flora of the oceanic islands.

All the recorded species of the crabs from the Ogasawara Islands, altogether 324 species, were enumerated by Takeda and Komatsu (2023). In the present paper, one species of the family Tetraliidae, two species of the family Trapeziidae and 14 species of the family Xanthidae are added to the crab fauna of the Ogasawara Islands, and some additional species of the other groups will be recorded in the forthcoming papers. The color photographs in life are given for the species

examined except for some old collections. The color in life is remarkably variable and not always indicative of the species criteria in some species, but is of much help for the species identification in some species, and as well known, the crustacean specimens are discolored in the preservative fluid.

The collection sites recorded in the present paper are referred to Fig. 1 and Takeda and Komatsu (2023, figs. 1–2). Most of the species were collected by the junior author (HK) and his colleagues during Scuba diving in shallow waters, except for *Euryxanthops flexidentatus* Garth and Kim, 1983, from the offshore and deep-sea Kaikata and Nikko Seamounts, northwest of the Ogasawara main islands obtained by the submersibles *Shinkai 2000* and *Shinkai 6500* of the JAMSTEC (Japan Agency for Marine-Earth Science and Technology).

In this paper, three families Tetraliidae, Trapeziidae and Xanthidae are dealt with alphabetically, and the species of the Trapeziidae (2 spp.) and Xanthidae (14 spp.) recorded in this paper are also arranged alphabetically in each family. The collecting date is shown in such a form of 13-XI-2013. The breadth and length of the carapace are abbreviated as cb and cl, respec-

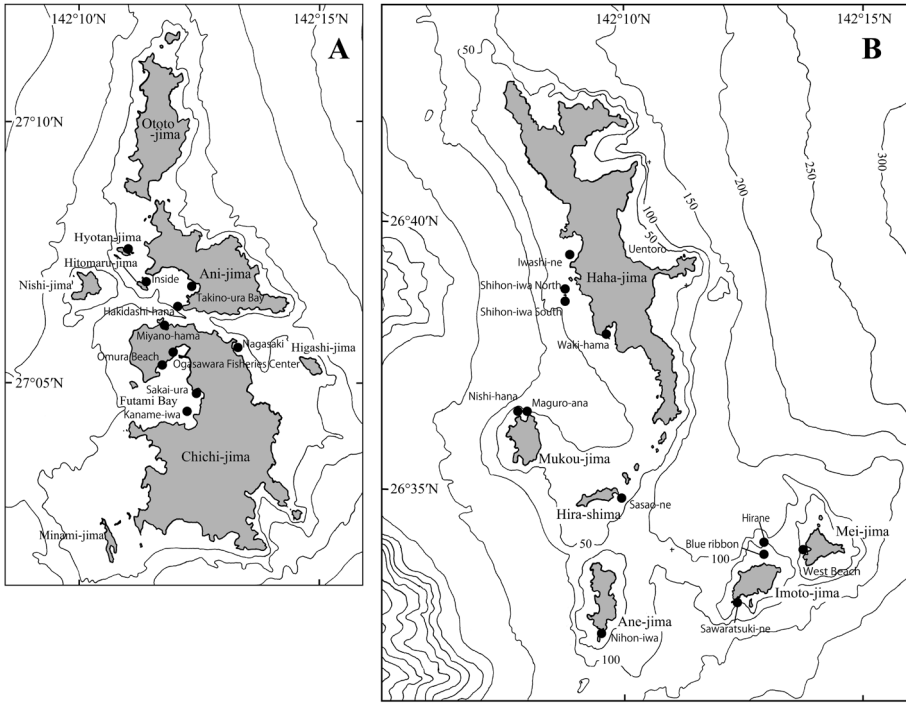


Fig. 1. A, B: Maps of the Chichi-jima and Haha-jima Islands showing the collecting sites (●).

tively, with the size as $cb \times cl$ in millimeter, and the male first gonopod is abbreviated as G1. The Japanese name was recorded for all the species under the abbreviated heading as Jn behind each scientific name.

All the specimens are preserved in the collections of the National Museum of Nature and Science, Tokyo (NSMT).

Records of the Species

Family TETRALIIDAE Castro, Ng and Ahyong, 2004

Tetralia brunalineata Trautwein, 2007

[Jn: Sujiashi-hime-sangogani]

(Fig. 2A)

Material examined. Chichi-jima Is.—Hitomaru-jima I. (27°06'57"N, 142°11'14"E), 6–8 m, 1 juv. (NSMT-Cr 31510; cb 3.2 × cl 2.7 mm), 29-VI-2014, T. Akiyama leg.

Remarks. The specimen at hand is juvenile, but the identification was based on its fine color photograph (Fig. 2A) that agrees well with the

color photograph of the holotype (Trautwein, 2007, fig. 4A–B). This species is most close to *Tetralia nigrolineata* which was originally named *T. glaberrima* forme *nigrolineata* by Serène and Pham (1957) and later treated as a full species, *T. nigrolineata* by Galil (1988), and also similar to some related species in having the brackish-colored front and anterior part of the carapace anterolateral margins, with a bluish transverse line behind the frontal margin. Among the species having such type of carapace coloration, however, this species is characteristic in having some longitudinal bands of pinkish or brick reddish color on each segment of the ambulatory legs.

Distribution. This species was originally described based on many specimens from Guam (Mariana Is.), Okinawa (Ryukyu Is.), and Moorea (Society Is.), and recently, Maenosono (2017) reported this species from some local places in Okinawa-jima Island.

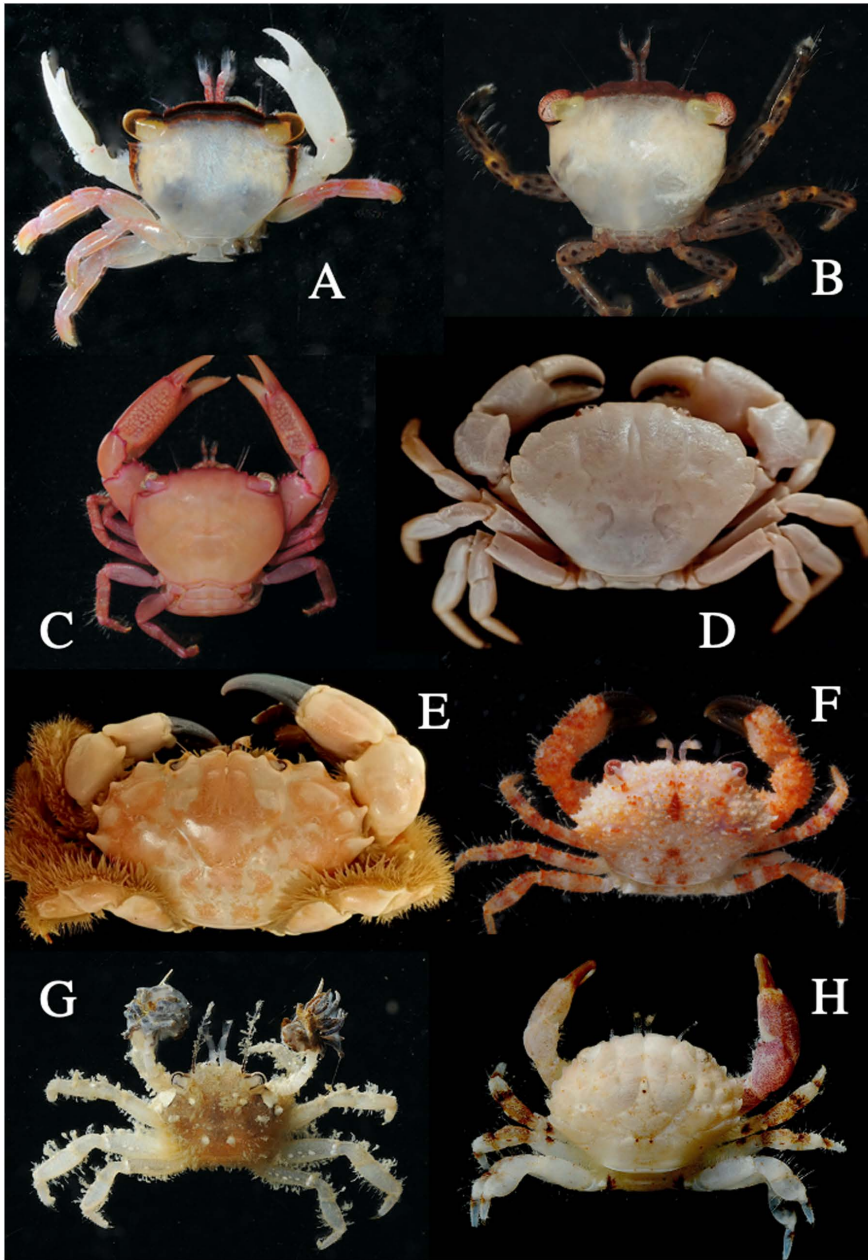


Fig. 2. A: *Tetralia brunalineata* Trautwein, juv. (NSMT-Cr 31510; cb 3.2 × cl 2.7 mm) from Hitomaru-jima. B: *Trapezia guttata* Rüppell, ♂ (NSMT-Cr 31511; cb 5.7 × cl 5.0 mm) from Omura Beach, Chichi-jima. C: *Trapezia serenei* Odinetz, ovig. ♀ (NSMT-Cr 31512; cb 10.3 × cl 8.9 mm), from Omura Beach, Chichi-jima. D: *Euryxanthops flexidentatus* Garth and Kim, ♂ preserved in spirit (NSMT-Cr 31519; cb 22.2 × cl 16.3 mm) from Kaikata Seamount. E: *Juxtaxanthias lividus* (Latreille), ♂ preserved in spirit (NSMT-Cr 31527; cb 46.6 × cl 31.0 mm) from Futami Bay, Chichi-jima. F: *Garthiella aberrans* (Rathbun), ♀ (NSMT-Cr 31524; cb 8.5 × cl 5.6 mm) from Haha-jima. G: *Lybia caestifera* (Alcock), ♂ (NSMT-Cr 31535; cb 3.6 × cl 3.2 mm) from Ani-jima. H: *Etisus odhneri* Takeda, ♂ (NSMT-Cr 31514; cb 5.8 × cl 4.3 mm) from Ani-jima.

Family TRAPEZIIDAE Miers, 1886

Trapezia guttata Rüppell, 1830

[Jn: Kanoko-sangogani]

(Fig. 2B)

Material examined. Chichi-jima Is.—Chichi-jima I., Omura Beach (27°05'35"N, 142°11'38"E), 12 m, 1 ♂ (NSMT-Cr 31511; cb 5.7 × cl 5.0 mm), 13-XI-2013, H. Komatsu leg.

Remarks. This species is readily distinguished from the congeners by having the dark-colored front and the ambulatory legs with dark-colored spots of variable size and shape (Fig. 2B). Although the original description (Rüppell, 1830, p. 27) is short, without figure, but the detailed references are referred to Serène (1984), with the figures of the distinguishing characters by Miers (1886, pl. 12 fig. 1), Sakai (1976, fig. 270, pl. 183 fig. 3), Chen and Lan (1978, pl. 2 fig. 8), and Serène (1984, pl. 38 fig. A). Castro (1997a, b; 2003; 2009) were greatly contributed to the taxonomy and distribution of the genus *Trapezia* including this species. *Trapezia davaoensis* Ward, 1941, was synonymized with this species by Galil and Clark (1990) after the examination of the type specimens preserved in the American Museum of Natural History.

Distribution. Numerous specimens from many localities in the Indo-West Pacific waters were recorded by the previous studies including the works cited above. In Japanese waters this species is found in the coral islands of the Ryukyu Islands.

Trapezia serenei Odinetz, 1984

[Jn: Seren-sangogani]

(Fig. 2C)

Material examined. Chichi-jima Is.—Chichi-jima I., Omura Beach (27°05'35"N, 142°11'38"E), 12 m, 1 ♂ (NSMT-Cr 31512; cb 7.4 × cl 6.8 mm), 1 ovig. ♀ (NSMT-Cr 31513; cb 10.3 × cl 8.9 mm), 12-XI-2013, H. Komatsu leg.

Remarks. The specimens examined agree with the line drawing of the holotype from Guam (Odinetz, 1984, fig. 3B). This species is, as explained in

detail by Castro (1997a), most characteristic in orange-pink carapace, chelipeds and ambulatory legs, with the dark pinkish carapace margin and cheliped and ambulatory segments. Absence of orange-red spot on the distal end of the ambulatory propodi is said by Castro (1997a, b) to be an important clue to distinguish this species from the closest congener *T. bidentata* (Forskål, 1775), which was made clear to be a senior synonym of *T. ferruginea* Latreille, 1828, by Castro *et al.* (2004).

Distribution. West Pacific from the Ryukyu Islands to French Polynesia, and Western Australia. In Japan, this species was recorded by Sakai (1976, p. 507, pl. 182 fig. 2, as *T. ferruginea*, Yoron-to I., Ishigaki-jima I. and Taketomi-jima I.), and Nagai and Nomura (1988, p. 214, 1 unnumbered fig., as *T. ferruginea*, no definite locality in the Ryukyu Is.), and from Iriomote-jima I. by Minemizu (2000, p. 284, 1 unnumbered fig., as *T. ferruginea*, Iriomote-jima I.), and Higashiji *et al.* (2013, p. 85, fig. 2D, as *T. serenei*, Ie-jima I.).

Family XANTHIDAE MacLeay, 1838

Etisus odhneri Takeda, 1972

[New Jn: Minami-hime-hizumegani]

(Fig. 2H)

Material examined. Chichi-jima Is.—Ani-jima I., Hakidashi-hana (27°06'37"N, 142°12'00"E), 5–12 m, 1 ♂ (NSMT-Cr 31514; cb 5.8 × cl 4.3 mm), 9-XI-2013, T. Akiyama leg.; Chichi-jima I., Sakai-ura (27°05'06"N, 142°12'19"E), 3–9 m, 1 ♀ (NSMT-Cr 31515; cb 5.8 × cl 4.4 mm), 13-XI-2013, T. Akiyama leg.; Chichi-jima I., Omura Beach (27°05'35"N, 142°11'39"E), 3 m, 1 juv. ♂ (NSMT-Cr 31516; cb 4.6 × cl 4.0 mm), 30-VI-2014, H. Komatsu leg.; Hitomaru-jima I. (27°07'04"N, 142°11'27"E), 6–8 m, 1 juv. ♂ (cb 5.2 × cl 3.9 mm), NSMT-Cr 31517, 29-VI-2014, H. Komatsu leg.

Haha-jima Is.—Haha-jima I., diving site *Iwashi-ne* (26°39'40"N, 142°08'44"E), 1 juv. (cb 3.7 × cl 2.9 mm), NSMT-Cr 31518, 5-VII-2015, T. Akiyama leg.

Remarks. The specimens examined are seemingly very close to *Etisus demani* Odhner, 1925, and *E. odhneri* Takeda, 1972, in sharing the carapace flattened areolation and anterolateral triangular dentation, the developed and weakly two-lobed front, and the strongly curved fingers with deeply hoofed tips (Odhner, 1925, p. 83; Takeda, 1972a, p. 193, pl. 3). In the specimens examined, however, the carapace anterolateral margin has no supplemental spinules between the main teeth, the ambulatory meri are indistinctly serrated with a series of spinules of ten or so in number, and the G1 possesses no long hairs at the base of the distal beak. These features are characteristic for *E. odhneri* distinct from *E. demani*. The G1 is figured by Takeda (1972a, fig. 3E–F), Serène (1984, fig. 3E–F), and Mendoza *et al.* (2014, fig. 6F), and the color photographs were given by Mendoza *et al.* (2014, fig. 2E) and Mendoza (2023, fig. 4F).

Distribution. So far known from Babeldaob Island (the Palau Islands) in the Micronesia, Christmas Island and the Cocos Keeling Islands in the eastern Indian Ocean, and Mombasa (Kenya) in the western Indian Ocean. The close congener, *E. demani*, is widely distributed in the Indo-West Pacific including the Ryukyu Islands (cf. Takeda, 1972b).

***Euryxanthops flexidentatus* Garth and Kim, 1983**

[Jn: Usuiro-hira-ougigani]

(Fig. 2D)

Material examined. Kaikata Seamount—486 m, 1 ♂ (NSMT-Cr 31519; cb 22.3 × cl 16.4 mm), 1 ♀ (NSMT-Cr 31520; cb 17.5 × cl 12.5 mm), 15-VII-1991, *Shinkai 2000*, #558, JAMSTEC leg.

Nikko Seamount—460 m, 1 ♂ (NSMT-Cr 31521; cb 28.3 × cl 19.9 mm), 19-IX-1992, *Shinkai 6500*, #144, JAMSTEC leg.

Remarks. This species, one of six congeners of the genus *Euryxanthops* Garth and Kim, 1983, was originally described on the basis of a single male specimen from off northwestern Mindanao,

the Philippines (Garth and Kim, 1983, p. 678, fig. 3). Recently, additional specimens were recorded and remarked on the variations by Davie (1997), Ng and McLay (2007), Kuo *et al.* (2015), Mendoza *et al.* (2021), and Sato and Aiba (2022). This species is characteristic in the thin and weakly upturned anterolateral margins of the carapace, with keys prepared by Davie (1997) and Ng and McLay (2007). In these keys, the shape of the first anterolateral tooth is considered as the important criterion to distinguish the species, but Mendoza *et al.* (2021) showed that the original illustrations are not always accurate in the proportion and first anterolateral tooth of the carapace, and that the G1 of the holotype is damaged at its tip. The G1 of the present specimens (NSMT-Cr 31519, 31521) agrees well with the figure of Kuo *et al.* (2015, fig. 2), having several long hairs at the subterminal part. Although, in the published photographs and line drawings, the carapace dorsal areolation is not always clearly shown, but it is remarked at present in all the present specimens that a deep, strongly curved gutter was engraved at each side of the transverse depression between the median gastric and cardiac regions.

Distribution. Known from the Philippines (type locality, northern Mindanao, 327.6 m), southern Taiwan (265–300 m), Indonesia (Sunda Strait and southwestern Java, 234–281 m), and Japan (Off Miyazaki Prefecture, Kyushu, 350 m). As Sato and Aiba (2022) already mentioned, *Euryxanthops* sp. from Sagami Bay, 220–280 m, recorded by Ikeda (1998, fig. 10) is referred to this species. Xanthidae gen. et sp. recorded by Fujikura *et al.* (2008, fig. 11.35) from Kaikata, Nikko, Daini-Kasuga, and Daikoku seamounts, Ogasawara-Mariana Arc, 400–500 m, is also probably referred to this species.

***Garthiella aberrans* (Rathbun, 1906)**

[New Jn: Gahsu-toge-ougigani]

(Fig. 2F)

Material examined. Haha-jima Is.—Mukoh-jima I., diving site *Maguro-ana* (26°36'37"N,

142°07'46"E), 1 young ♀ (NSMT-Cr 31522; cb 7.5 × cl 5.2 mm), 5-VII-2015, H. Komatsu leg.; Mei-jima I., west coast (26°34'08"N, 142°13'40"E), 10m, 2 ♀♀ (NSMT-Cr 31523; cb 8.2 × cl 5.6 mm, cb 10.3 × cl 6.4 mm), 11-VII-2016, H. Komatsu leg.; Hira-shima I., diving site *Sasao-ne* (26°35'07"N, 142°09'45"E), 1 ♀ (NSMT-Cr 31524; cb 8.5 × cl 5.6 mm), 3-VII-2015, H. Komatsu leg.; Imoto-jima I., diving site *Blue ribbon* (26°34'03"N, 142°12'48"E), 15–17 m, 1 juv. (NSMT-Cr 31525; cb 4.8 × cl 3.6 mm), 11-VII-2016, H. Komatsu leg.; Haha-jima I., diving site *Uentoro* (26°39'28"N, 142°10'35"E), 12–20 m, 1 ♀ (cb 7.8 × cl 5.7 mm), 1 juv. (cb 3.5 × cb 4.9 mm), NSMT-Cr 31526, 12-VII-2016, H. Komatsu leg.

Remarks. The carapace dorsal areolation and anterolateral armature of this species are most close to those of *Epiactaea nodulosa* (White, 1847) (cf. Serène, 1984) and generally to some species of the genera *Actaea* and *Pilodius*. The peculiarity of the genus *Garthiella* erected by Titgen (1986) to accommodate *Chlorodopsis aberrans* Rathbun, 1906, has been already noticed and named this species as *aberrans* by Rathbun (1906). It is sure that the fingers of both chelae are sharply pointed, differing from the hollowed tips in the species of the related genera.

Rathbun (1906), Edmondson (1962), and Serène and Nguyen (1959) dealt with this species with figures as *Chlorodopsis aberrans*, Serène (1984) took this species in the key to the genus *Pilodius*, and Mendoza and Manuel-Santos (2012) explained and illustrated in detail as *Garthiera* based on the holotype from northwestern Hawaiian Islands and several additional specimens from French Polynesia. The specimens from the Ogasawara Islands agree well with the figures and photographs in the literature, having the carapace and chelipeds roughened with sharp tubercles, the carapace anterolateral margin armed with four sharp spiniform teeth weakly covered forwards, and the anterior margins of the ambulatory segments fringed with a line of the equidistant spiniform teeth.

The second species of the genus *Garthella*, *G.*

sikatuna reported by Mendoza and Manuel-Santos (2012), from the Philippines, is distinguished from *G. aberrans* most readily by the less coarse granulation of the carapace and chelipeds among the differences mentioned in the original paper.

Distribution. Hitherto been known from the Hawaiian Islands and French Polynesia. This species is new to the carcinological fauna of Japanese waters.

Juxtaxanthias lividus (Latreille, in Milbert, 1812)

[Jn: Murasaki-hime-ougigani]

(Fig. 2E)

Material examined. Chichi-jima Is.—Chichi-jima I., Futami Bay, 1 ♂ (NSMT-Cr 31527; cb 46.6 × cl 31.0 mm), date unknown, Ogasawara Fisheries Center leg.

Remarks. *Juxtaxanthias lividus* (Latreille, in Milbert, 1812), one of three representatives of the genus *Juxtaxanthias* Ward, 1942, is close to *J. tetraodon* (Heller, 1861) in the general appearance of the carapace, chelipeds and ambulatory legs. Forest and Guinot (1961) extensively studied and distinguished these two species known as the *Xanthias* species, but did not approve of the generic validity of *Juxtaxanthias*. Sakai (1976) and Serène (1984) followed this synonymization in their monographic works, but the validity of *Juxtaxanthias* is at present generally accepted (Ng *et al.*, 2008), with the three species attaining to much larger size than all the *Xanthias* species.

According to the precedent studies, the important characters to distinguish *J. lividus* from *J. tetraodon* is the proportional difference of the carapace (carapace broader, with breadth ca. 1.65 times length, in *J. lividus*; carapace narrower, with ca. 1.55, in *J. tetraodon*), and the difference of the first two anterolateral teeth (rounded lobular first tooth followed by the angular second tooth, in *J. lividus*; angular first lobe, with the pointed second tooth, in *J. tetraodon*). The present specimen is closer to *J. tetraodon* in the carapace proportion and the anterolateral teeth are also closer to *J. tetraodon*, but finally identified

as *J. lividus*, agreeing well with the photograph given by Balss (1938, pl. 2 fig. 1) and the colored figure by Sakai (1976). These characters seem to be not always strong enough to distinguish the two species with individual and developmental variations.

Distribution. In Japanese waters, the known localities are Kagoshima Bay and Northern Daito-jima Island (Sakai, 1939, as *Xanthias tetraodon*), Yoron-to Island (Sakai, 1976, as *Xanthias lividus*). Nagai and Nomura (1988) published the colored photograph of a dried specimen from the Ryukyu Islands without exact locality. This species is otherwise known from Mauritius, the Chagos Islands, the Lakshadweep Islands and Sumatra in the Indian Ocean, and the Marshall Islands in the West Pacific (Forest and Guinot, 1961; Suvarna Devi *et al.*, 2019).

Lophozozymus dodone (Herbst, 1801)

[Jn: Hime-hiroha-ougigani]

(Fig. 3A–B)

Material examined. Chichi-jima Is.—Chichi-jima I., Futami Bay, in front of the Ogasawara Fisheries Center, 1 ♂ (NSMT-Cr 31528; cb 8.3 × cl 6.4 mm), 11-IV-1975, Y. Kurata leg.; Futami Bay, on buoy, 1 ♂ (NSMT-Cr 6857; cb 11.7 × cl 7.9 mm), 17-V-1975, Y. Kurata leg.; Futami Bay, Kaname-iwa Islet (27°04'45"N, 142°12'06"E), 1 ♂ (NSMT-Cr 31529; cb 7.3 × cl 4.9 mm), 9-XI-2013, H. Tachikawa leg.; Hyotan-jima I. (27°07'46"N, 142°10'48"E), 15–20 m, 1 ♀ (NSMT-Cr 31530; cb 8.6 × cl 6.0 mm), 28-VI-2014, H. Komatsu leg.

Haha-jima Is.—Haha-jima I., diving site *Shihon-iwa North* (26°38'56"N, 142°08'37"E), 1 ♂ (NSMT-Cr 31531; cb 7.4 × cl 4.8 mm), 2-VII-2015, H. Komatsu leg.; Imoto-jima I., Hirane (26°34'08"N, 142°12'49"E), 20–25 m, 1 ♂ (NSMT-Cr 31532; cb 15.6 × cl 10.4 mm), 14-VII-2016, H. Komatsu leg.

Remarks. The fine figures and photographs were given by Adams and White (1849, in 1848–1849, pl. 8 fig. 1, as *Atergatis lateralis* Adams

and White), Dana (1855, pl. 8 fig. 4, as *Xantho nitidus* Dana), Heller (1865, pl. 1 fig. 3, as *Atergatis elegans* Heller), De Man (1888, in 1887–1888, pl. 10 fig. 2), Edmondson (1962, fig. 3f), Guinot (1979, pl. 8 fig. 1), Serène (1984, pl. 24 fig. 1), Sakai (1976, pl. 146 fig. 2), and Maenosono (2022c, fig. 7A–C). According to Serène (1984), *L. dodone* recorded by Forest and Guinot (1961) is really referable to *L. glaber* Ortmann, 1893. This species was first reported from Japanese waters by Sakai (1965), with a colored figure, in which the main part of the carapace dorsal surface is dark brick red. Recently, Mendoza (2023) gave three color photographs (Fig. 31B–D) to show the remarkable color variation in the specimens from Madagascar. The basic color pattern of the carapace of one of the three is similar to one of two photographs of the specimens from the Ogasawara Islands, bright reddish brown (Fig. 2B, present paper) vs dark chochorate brown (Mendoza, 2023, fig. 31D) with the whitish anterolateral surfaces of both sides. The photograph taken in the field of Hachijo Island, north of the Ogasawara Islands (Kato and Okuno, 2001, p. 127, 1 unnumbered fig.) shows also the similar color pattern with the specimen from the Ogasawara Islands.

Distribution. Widely distributed in the whole Indo-West Pacific, from the western Indian Ocean to the western and southern Pacific.

Lophozozymus pulchelus Milne-Edwards, 1867

[Jn: Beni-hiroha-ougigani]

(Fig. 3C–D)

Material examined. Haha-jima Is.—Mukou-jima I., diving site *Nishi-hana* (26°36'40"N, 142°07'40"E), 1 ♀ (NSMT-Cr 31533; cb 11.9 × cl 6.8 mm), 4-VII-2015, H. Komatsu leg.; Ane-jima I., diving site *Nihon-iwa* (26°32'34"N, 142°09'22"E), 20 m, 1 ♂ (NSMT-Cr 31534; cb 6.8 × cl 4.5 mm), 13-VII-2016, H. Komatsu leg.

Remark. In the original description (Milne-Edwards, 1867), the figure was not presented, but in the later work (Milne-Edwards, 1873), the fine

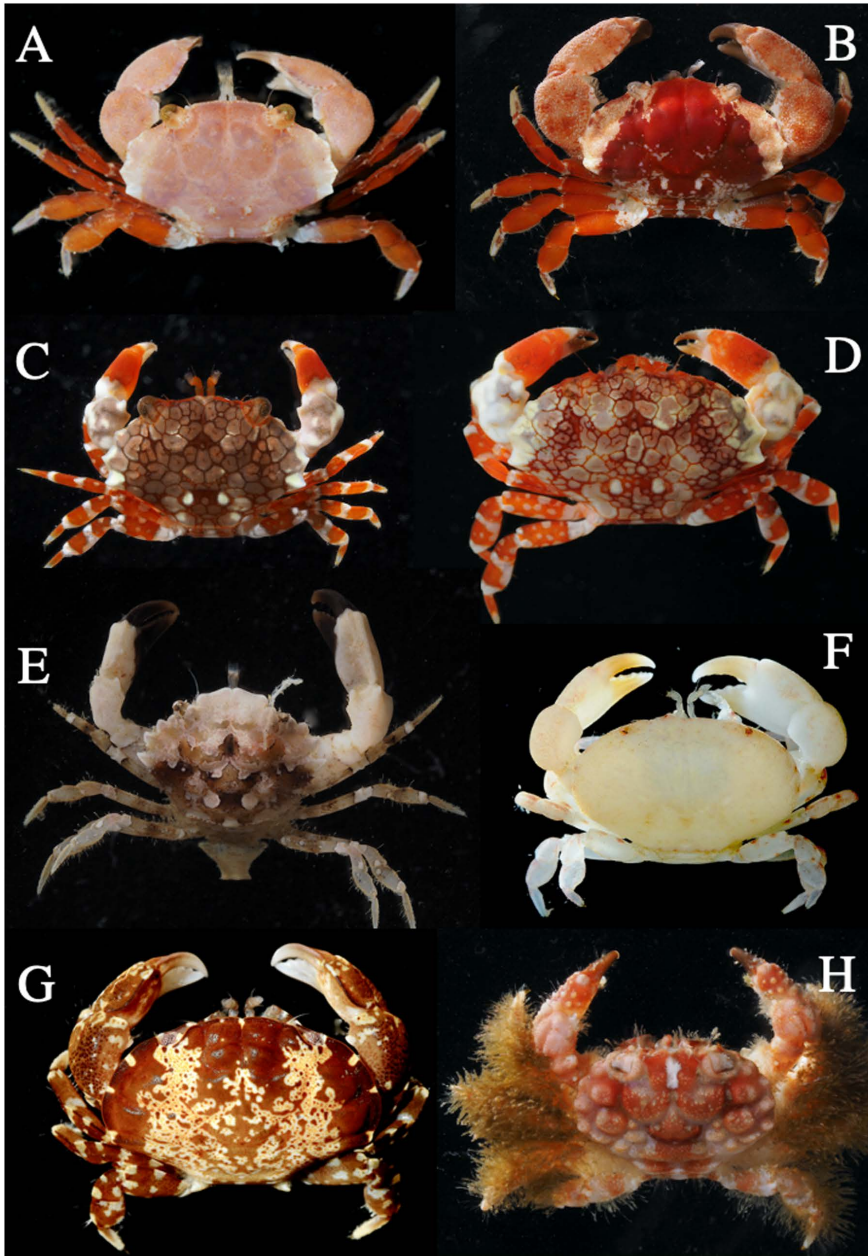


Fig. 3. A–B: *Lophozozymus dodone* (Herbst), ♀ (NSMT-Cr 31530; cb 8.6 × cl 6.0 mm) from Hyotan-jima (A), ♂ (NSMT-Cr 31532; cb 15.6 × cl 10.4 mm) from Haha-jima (B). C–D: *Lophozozymus pulcheles* Milne-Edwards, ♂ (NSMT-Cr 31534; cb 6.8 × cl 4.5 mm) from Katsudori-jima (C), ♀ (NSMT-Cr 31533; cb 11.9 × cl 6.8 mm) from Mukou-jima (D). E: *Metaxanthops acutus* Serène, ♂ (NSMT-Cr 31536; cb 7.7 × cl 5.4 mm) from Haha-jima. F: *Mabui calculus* Naruse, Maenosono and Ng, from Haha-jima. G: *Platypodia anaglypta* (Heller), ♂ (NSMT-Cr 31539; cb 12.5 × cl 8.0 mm) from Miyano-hama, Chichi-jima. H: *Tweedieia odhneri* (Gordon), ♀ (NSMT-Cr 31548; cb 11.5 × cl 8.4 mm) from Haha-jima.

color illustration was provided. This species is especially characteristic in its splendid color with reticulated pattern. The color pattern is not always constant, varying individually and becoming more complex in the larger specimens, but main parts of both palms and each segment of the ambulatory legs are orange red in color (Milne-Edwards, 1873, pl. 6 fig. 3; Sakai, 1976, pl. 146 fig. 1; Poupin *et al.*, 2018, fig. 16B; Maenosono, 2022c, fig. 9D; Present paper, fig. 3C–D). Complex color pattern of a female from the Ogasawara Islands (Fig. 3D) is quite similar to the photograph of a male from Madagascar reported by Mendoza (2023, fig. 31G), while the reticulated color pattern of a male from the Ogasawara Islands (Fig. 3C) is close to the color photograph of a male from the Ryukyu Islands reported by Maenosono (2022c, fig. 9D).

Distribution. Widely distributed in the whole Indo-West Pacific. In Japanese waters, from the Ryukyu Islands northward to the coast of the Kii Peninsula, central Honshu (cf. Takeda, 1989; Maenosono, 2022c).

***Lybia caestifera* (Alcock, 1898)**

[Jn: Hime-kinchakugani]

(Fig. 2G)

Material examined. Chichi-jima Is.—Chichi-jima I., Futami Bay, on buoy, 1 ♂ (NSMT-Cr 6856; cb 8.9 × cl 6.8 mm), 17-V-1975, Y. Kurata leg.; Ani-jima I., Takino-ura Bay (27°07'06"N, 142°12'15"E), 1 ♂ (NSMT-Cr 31535; cb 3.6 × cl 3.2 mm), 8-XI-2013, H. Komatsu leg.

Remarks. *Lybia caestifera* was recorded at present as the first occurrence in the Ogasawara Islands, but may be not uncommon in Japanese waters as shown by Takeda, Y. and Ohtsuchi (2020) who collected all the published data in Japan. The color pattern of the specimen examined (Fig. 2G) is almost identical with the images of *L. caestifera* recorded by Kurata (1967, monochrome photograph), Sakai (1976, painting), and Takeda, Y. and Ohtsuchi (2020, in color photograph). In the Ogasawara Islands, the closely

related *Lybia leptochelis* (Zehntner, 1894) has been recorded from the west of Chichi-jima Island, 81–83 m depth, with a color photograph in life, by Takeda and Komatsu (2018). Both species are without doubt close to each other, but clearly different from each other in color pattern.

The records of this species by Rathbun (1906, from Hawaii; 1907, from Tahiti), Bouvier (1915, from Mauritius) and Balss (1924, from the Red Sea) were doubted by Guinot (1976), and the synonymy with *L. pugil* (Alcock, 1898) is uncertain at present.

Distribution. So far as the literature concerned, this species is widely distributed in the Indo-West Pacific from the Red Sea and the western Indian Ocean to Tahiti, Hawaii and Japan in the Pacific. As shortly mentioned by Takeda and Komatsu (2018), the photograph of *L. leptochelis* from Christmas Island in the Indian Ocean given by Mendoza *et al.* (2014) is not referred to *L. leptochelis*, but to *L. caestifera*.

***Mabui calculus* Naruse, Maenosono and Ng, 2021**

[Jn: Mabuigani]

(Fig. 3F)

Material examined. A photograph only. The specimen was collected at the diving site *Shihon-iwa North*, Haha-jima Island, on 2 July, 2015, by H. Komatsu, and photographed, but unfortunately the specimen was missing.

Remarks. The photograph at hand agrees well with the detailed description, photographs and line drawings in the original description (Naruse *et al.*, 2021). The carapace is elliptical in outline, smooth and ill-defined, with the weakly four-lobed anterolateral margins. Although the carapace formation is rather simple and not much different from the related xanthid species, but the original description made clear that the external genital structures are bilaterally asymmetric in both sexes, being exceptional as the crabs.

Distribution. This species is known from some local places of Okinawa-jima Island, the Ryukyu Islands, and said that the type specimens were

collected from the exposed surf zones of rocky coast or the narrow crevasses in shallow-water coral reefs.

***Metaxanthops acutus* Serène, 1984**

[Jn: Togari-usuha-ougigani]

(Fig. 3E)

Material examined. Haha-jima Is.—Imoto-jima I., diving site *Sawaratsuki-ne* (26°33'09"N, 142°12'09"E), 13–20 m, 1 ♂ (NSMT-Cr 31536; cb 7.7 × cl 5.4 mm), 13-VII-2016, H. Komatsu leg.

Remarks. The good photographs are given by the original author (Serène, 1984, pl. 30 figs. D–E), Takeda (1989, pl. 1 fig. C; 2023, fig. 9B), Ng and Clark (2002, fig. 3b), Poupin *et al.* (2018, fig. 16E), and Maenosono (2022a, fig. 2). The carapace is dorsally flattened as a whole and shallowly divided into regions, with the protruded front and the thin, strongly toothed anterolateral margins. The male chelipeds are slightly heterochelous; the upper margin of the palm is strongly ridged through the length in both chelae, and the dark color of the immovable finger extends onto the lower distal half of the palm in both chelae. The color in life (Fig. 3E, present paper) of a male from the Ogasawara Islands is mottled with chocolate brown and white, similar to a male from Kagoshima Prefecture, southern Kyushu, Japan (Maenosono, 2022a, fig. 2A), but somewhat different from a male from Madagascar reported by Mendoza (2023), in which the carapace seems to be wholly creamy white.

Distribution. Known from the western Indian Ocean (Madagascar and the Comoro Is.) and the South and West Pacific (New Caledonia, the Palau Islands, the Philippines, the Ryukyu Islands, and southern Kyushu, Japan).

***Paraxanthias parvus* (Borradaile, 1900)**

[New Jn: Kogata-hime-ougigani]

(Fig. 4A)

Material examined. Chichi-jima Is.—Nishi-

jima I., 8 ♂♂ (cb 5.3 × cl 3.7 mm—cb 6.6 × cl 4.6 mm), 6 ♀♀ (cb 6.3 × cl 4.4 mm—cb 9.4 × cl 6.0 mm), 1 ovig. ♀ (cb 5.1 × cl 3.6 mm), NSMT-Cr 31537, 1 ovig. ♀ (NSMT-Cr 31538; cb 8.5 × cl 5.6 mm), 29-VI-1976, M. Takeda leg.

Remarks. This rare small species has been recorded only by Borradaile (1900, pl. 41 fig. 5, as *Xanthias*), Takeda and Miyake (1969, fig. 1), Paulay *et al.* (2003, in list), and Maenosono (2021, figs. 1F, 2D, H). This species originally referred to the genus *Xanthias* Rathbun, 1897, was designated as one of five congeneric species in the new genus *Paraxanthias* established by Odhner (1925). Rathbun (1930) referred them to the genus *Paraliomera* Rathbun, 1930, but Guinot (1964) doubted their inclusion to the American genus *Paraliomera*, and Takeda and Miyake (1969) followed Odhner (1925).

The specimens examined is of stout appearance in spite of its small size, with the strong chelipeds of remarkably different size; four anterolateral teeth of the carapace are rather angulated, especially the first is obtusely angulated at the middle.

Distribution. This species, one of nine Indo-West Pacific species, is known only from Fiji (Rotuma Island), the northern Mariana Islands, and Japan (Ryukyu Islands and Kagoshima Prefecture).

***Platypodia anaglypta* (Heller, 1861)**

[Jn: Hiraashi-ougigani]

(Fig. 3G)

Material examined. Chichi-jima Is.—Chichi-jima I., Miyano-hama (27°06'16"N, 142°11'39"E), 2–5 m, 1 ♂ (NSMT-Cr 31539; cb 12.5 × cl 8.0 mm), 30-VI-2014, H. Komatsu leg.; Chichi-jima I., Nagasaki (27°05'58"N, 142°13'06"E), 12–14 m, 1 ♂ (NSMT-Cr 31540; cb 18.2 × cl 11.5 mm), 1-VII-2014, H. Komatsu leg.

Haha-jima Is.—Haha-jima I., diving site *Shihon-iwa South* (26°38'49"N, 142°08'36"E), 1 juv. (NSMT-Cr 31541; cb 7.1 × cl 4.3 mm), 6-VII-2015, H. Komatsu leg.; Haha-jima I.,

Waki-hama (26°38'10"N, 142°09'29"E), 1 ♂ (NSMT-Cr 31542; cb 9.3 × cl 6.3 mm), 7-VII-2015, H. Komatsu leg.

Remarks. This species is closer to the *Platypodia* species than the *Lophozoymus* species especially in the armature of the carapace anterolateral teeth. In life, the carapace dorsal surface is chocolate brown mottled with complex whitish pattern camouflaged to the surroundings. Its color pattern is variable individually, but may be one of the characteristics of this species (Sakai, 1976, pl. 144 fig. 2; Kato and Okuno, 2001, p. 126, 1 unnumbered fig., as *Atergatis floridus* (Linnaeus); Mendoza *et al.*, 2014, fig. 4F; Maenosono, 2022c, fig. 10A; present paper, fig. 3G). The carapace dorsal surface is smooth and shallowly separated into regions, with the crested anterolateral margin which is marked with three closed indentations; the last or fourth lobe is small and obtuse, but not isolated from

the anterior lobe different from the formation in *Lophozoymus*. The upper margins of the palms and ambulatory meri, carpi and propodi are strongly crested.

Distribution. Widely distributed in the Indo-West Pacific from the Red Sea to the South Pacific and northwards to the Ryukyu Islands.

Pseudoliomera remota (Rathbun, 1907)

[Jn: Marumi-awatsubu-modoki]

(Fig. 4C–D)

Material examined. Chichi-jima Is.—Chichi-jima I., Miyano-hama, 1 ♂ (NSMT-Cr 31543; cb 6.0 × cl 4.5 mm), 1 ♂ (NSMT-Cr 31544; cb 6.9 × cl 5.0 mm), 29-VI-1974, Ogasawara Fisheries Center leg.

Remarks. This species is close to *Pseudoliomera speciosa* (Dana, 1852), in which the carapace

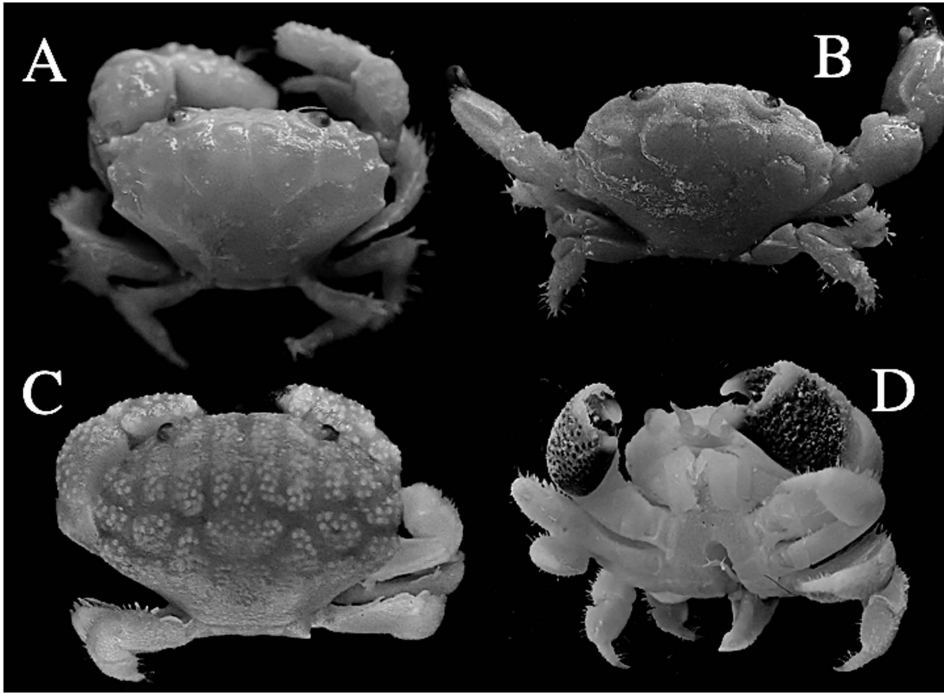


Fig. 4. A: *Paraxanthias parvus* (Borradaile), ovig. ♀ (NSMT-Cr 31538; cb 8.5 × cl 5.6 mm) from Nishi-jima. B: *Zozymodes pumilus* (Hombron and Jacquinot), ♀ (NSMT-Cr 31550; cb 8.5 × cl 6.1 mm) from Nishi-jima. C–D: *Pseudoliomera remota* (Rathbun), ♂ (NSMT-Cr 31544; cb 6.9 × cl 5.0 mm) from Miyano-hama, Chichi-jima.

dorsal surface is sharply divided into regions by deep linear furrows. All the regions are thickly covered with pearly granules of good size, and the interregional furrows are filled only with short setae. There are no long setae on the regions, differing from *P. lata* (Borradaile, 1902) and some related species (cf. Sèrene, 1984). *Pseudoliomera speciosa* is otherwise well known by having the brush-like setae surrounding the horny tip of the first ambulatory leg, and readily distinguished from all the congeners due to this feature.

In the male at hand, as the generic features, both chelipeds are short, heavy and similar in shape, each palm is swollen, and the fingers are remarkably short; the outer surface of the palm is roughened with depressed granules and dark-colored for most of the outer surface; the upper and distal parts of the palm, and distal halves of both fingers are whitish.

Distribution. This species is widely distributed in the Indo-West Pacific from the western Indian Ocean (Serène, 1984, Aldabra; Rathbun, 1911, as *Actaea*, Salomon and Coetivy) and the Red Sea (Klunzinger, 1913, as *Actaea nana* n. sp.) eastwards to Easter Island (Rathbun, 1907, as *Actaea*, type locality), and northwards to Japan (Sakai, 1939, as *Actaea*; Sakai, 1976; Marumura and Kosaka, 2003) and Hawaii (Edmondson, 1962, as *Actaea*). Recently, Maenosono (2018) revised six species from the Ryukyu Islands, with key to the species and good photographs.

Tweedieia odhneri (Gordon, 1934)

[Jn: Oome-ouigani]

(Fig. 3H)

Material examined. Chichi-jima Is.—Nishi-jima I., 1 ♀ (NSMT-Cr 31545; cb 7.7 × cl 5.6 mm), 29-VI-1976, M. Takeda leg.

Haha-jima Is.—Mei-jima I., west coast, 10 m, 1 juv. (NSMT-Cr 31546; cb 4.4 × cl 3.3 mm), 11-VII-2016, H. Komatsu leg.; Imoto-jima I., diving site *Blue ribbon* (26°34'03"N, 142°12'48"E), 12–14 m, 1 ♀ (NSMT-Cr 31547; cb 10.8 × cl

7.9 mm), 1 ♀ (NSMT-Cr 31548; cb 11.5 × cl 8.4 mm), 14-VII-2016, H. Komatsu leg.

Remarks. The genus *Tweedieia* Ward, 1935, was deeply studied by Lasley *et al.* (2022) and Maenosono (2022b) who recognized two species, *T. laysani* (Rathbun, 1906) and *T. odhneri* (Gordon, 1934). As well described in the original descriptions of both species (Rathbun, 1906; Gordon, 1934), these two species are close to each other in the shape and areolation of the carapace dorsal surface, but differ mainly in the carapace shape (ovate and narrower in *T. odhneri*), the carapace anterolateral teeth (triangular and low, with wide and shallow clefts in *T. odhneri*), the frontal median notch (broad in *T. odhneri*), the cheliped carpus (with broad and transverse furrow on outer margin in *T. odhneri*), the movable finger (strongly curved distally in *T. odhneri*), and the palm (nodular granules on outer surface in *T. odhneri*). Maenosono (2022b) applied these and some additional characters to the specimens from the Ryukyu Islands and confirmed the occurrence of the two species. Some characters seem to be variable individually, but at least the ovate and narrower carapace and the granulation of the palm outer surface are effective to identify the Ogasawaran specimens as *T. odhneri*.

Distribution. Lasley *et al.* (2022) concluded that *T. laysani* is only known from the Hawaiian Islands, while *T. odhneri* is widely distributed in the Indo-West Pacific including the Hawaiian Islands. In Japanese waters, two species are known from the Ryukyu Islands as reported by Maenosono (2022b). It is shortly noted here about the specimen identified as *T. laysani* from the unrecorded locality in the Ryukyu Islands by Nagai and Nomura (1988). The present authors examined just that specimen preserved in the Wakayama Prefectural Museum and re-identified it as *Serenius kuekenthali* (De Man, 1902). The data of the specimen is as follows: Nago, Okinawa I., Ryukyu Is., 1 ♀ (WPM-No. 852; cb 13.0 mm, cl 8.6 mm) from coral block of *Pocillopora* entangled with gill-net for lobster; Apr. 1973; S. Nagai leg.

Zozymodes pumilus
(Hombron and Jacquinot, 1846)

[Jn: Guamu-eriashi-ougigani]

(Fig. 4B)

Material examined. Chichi-jima Is.—Nishi-jima I., 1 ♂ (cb 6.0 × cl 4.1 mm), 5 ovig. ♀ ♀ (cb 6.4 × cl 4.5 mm—cb 7.3 × cl 5.4 mm), NSMT-Cr 31549, 1 ♀ (NSMT-Cr 31550; cb 8.5 × cl 6.1 mm), 29-VI-1976, M. Takeda leg.

Remarks. This species is small, but was recorded with good figures by the original authors (Hombron and Jacquinot, 1846, pl. 4 fig. 1, as *Zozymus*), Miyake (1939, fig. 5, pl. 13 fig. 2), Forest and Guinot (1961, fig. 36), Sankarankutty (1962, figs. 5–9), Guinot (1968, figs. 33, 35), Takeda and Miyake (1968, pl. 1 fig. A), Serène (1984, fig. 90, pl. 19 fig. E), Lasley and Ng (2013, fig. 4C–D), and Maenosono (2022c, figs. 13E–F, 14). Otherwise, this species was described and figured as *Leptodius (Xanthodius) cristatus* n. sp. by Borradaile (1902, fig. 51), and later, recorded as *Leptodius cristatus* by Rathbun (1911, pl. 17 fig. 9). The G1 is represented by Miyake (1939, fig. 5), Forest and Guinot (1961, fig. 90), Sankarankutty (1962, fig. 9), Guinot (1968, fig. 35), and Serène (1984, fig. 90).

The carapace dorsal surface is thickly covered with minute granules of uniform size and divided into the weakly raised regions; the anterolateral margin is divided into bluntly crested four teeth, of which the first two are lobate and the last two are obtusely angulated at the tips situated somewhat anteriorly. The chelipeds are stout, similar in shape, but different in size, with a short crest at the carpus inner upper margin and two rows of crests on the upper margin of each palm. Each carpus and propodus of the ambulatory legs are equipped with a deep cavity surrounded by two sharp crests. The relations among the known species including the present species were well discussed by Lasley and Ng (2013) who described the distinct new species, *Z. sculptus*, from Guam.

Distribution. Widely distributed in the Indo-West Pacific from Madagascar in the western Indian Ocean eastwards to the Tuamotu Islands

in the South Pacific and northwards to the Ryukyu Islands in the West Pacific.

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