

Offshore Crabs of the Family Xanthidae and Some Related Families (Crustacea, Decapoda, Brachyura) from the Ogasawara Islands, Japan

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Abstract. Crabs of the families Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae, and Pilumnidae dredged off the Ogasawara Islands are recorded, with some taxonomic and biogeographic notes. Of 43 species (26 of the Xanthidae, 1 of the Domeciidae, 1 of the Trapeziidae, 1 of the Pinnotheridae, and 14 of the Pilumnidae) recorded in the present paper, 8 species are new to Japanese waters, and one species is new to science. The new species of the Pilumnidae, *Nanopilumnus modestus*, is described with photographs and line drawings. The biogeographic characteristics of these crab groups off the Ogasawara Islands are briefly discussed at the taxonomic comments of the species examined.

Key words: Crustacea, Decapoda, Brachyura, Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae, Pilumnidae, Ogasawara Islands, Japan

Introduction

The aim of the present paper is to record the offshore crabs of the families Xanthidae, Domeciidae, Trapeziidae and Pinnotheridae dredged at the sea around the Ogasawara Islands during the research cruises of R/Vs *Koyo* (2008–2010 cruises) of the Tokyo Metropolitan Ogasawara Fisheries Center and *Tansei Maru* (KT-09-2 cruise) of the Japan Agency for Marine-Earth Science and Technology (JAMSTEC), and TR/Vs *Shin'yo Maru* (2009 cruise) and *Seiyo Maru* (1995 cruise) of the Tokyo University of Marine Science and Technology.

Altogether 73 species of 16 families were already enumerated from the above collections by Komatsu (2011), in which 3 species were described as new to science and 42 species were recorded as new to the Ogasawara Islands. Also, Komatsu and Takeda (2011) described a new species of the family Xanthidae, *Meractaea takunan*, based on the specimen collected by the R/V *Tansei Maru*, KT-09-2 cruise. The present paper

deals with the species of the families Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae, and Pilumnidae. The present collections are mostly composed of the small species and many juvenile or young specimens. On close examination, 41 species were definitely identified to the specific level and 2 species are to the generic level. Of 43 species in all, 1 species of the Pilumnidae is new to science, 8 species new to Japanese waters and 13 species new to the Ogasawara Islands.

Komatsu (2011) made a list of all the shore and offshore crabs from the Ogasawara Islands known to date, with a brief summary of the history of the researches on the crabs of the Ogasawara Islands. The present paper becomes the supplementary notes on the Ogasawaran crabs.

All the specimens examined are registered under NSMT-Cr S and deposited at the Showa Memorial Institute, National Museum of Nature and Science, Tsukuba.

Sampling Stations

The present paper is based on the collections of R/V *Koyo*, 2008–2010 cruises, R/V *Tansei Maru*, KT-09-2 cruise, TR/V *Seiyo Maru*, 1995 cruise and TR/V *Shin'yo Maru*, 2009 cruise. Sampling gears are the biological dredge of 50 cm or 1 m span opening or the rocky dredge of 50 cm span opening.

The exact localities of the sampling stations, from which the crabs of the families Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae and Pilumnidae were collected, are recorded in the following lines. The maps showing the survey area around the Ogasawara Islands are referred to Komatsu (2011, fig. 1), with some stations being located outside the maps.

In the following list of the sampling stations (1, R/V *Koyo*, 2008–2010 cruises; 2, R/V *Tansei Maru*, KT-09-2 cruise; 3, TR/V *Shin'yo Maru*, 2009 cruise; 4, TR/V *Seiyo Maru*, 1995 cruise), the species collected are recored at each station.

1) R/V Koyo, 2008, 2009, 2010 cruises

- KY-08-11: West of Chichi-jima I. (27°03.62'N, 142°08.89'E–27°03.66'N, 142°08.88'E, 56–62 m deep), 27 October 2008—*Pseudactaea corallina*
- KY-08-15: West of Chichi-jima I. (27°04.55'N, 142°09.16'E–27°04.73'N, 142°09.31'E, 83–81 m deep), 28 October 2008—*Gaillardiel-lus rueppelli*, *Lophoplax sextuberculata*, *Lybia leptochelis*
- KY-08-20: East of Chichi-jima I. (27°04.23'N, 142°15.19'E–27°04.22'N, 142°15.06'E, 54–52 m deep), 29 October 2008—*Cranaothus deforgesii*, *Nanocassiope granulipes*, *N. tridentata*, *Paraxanthodes cumatodes*, *Vellumnus pygmaeus*, *Visayax osteodityon*
- KY-08-21: East of Chichi-jima I. (27°03.84'N, 142°15.44'E–27°03.70'N, 142°15.23'E, 95–98 m deep), 29 October 2008—*Actio-mera boninensis*
- KY-08-25: West of Nishi-jima I. (27°07.31'N, 142°07.70'E–27°07.03'N, 142°07.64'E, 129–127 m deep), 30 October 2008—*Actumnus*

forficigerus, *A. setosiareolatus*, *Xanthias maculatus*

- KY-08-26: West of Chichi-jima I. (27°04.84'N, 142°08.93'E–27°04.98'N, 142°09.15'E, 84–87 m deep), 30 October 2008—*Lobiactaea lobipes*, *Pseudactaea multiareolata*
- KY-09-05: West of Minami-jima I. (27°01.47'N, 142°07.59'E–27°01.58'N, 142°07.49'E, 140.5–139.9 m deep), 10 July 2009—*Miersiella cavifrons*
- KY-09-07: West of Minami-jima I. (27°01.72'N, 142°07.39'E–27°01.93'N, 142°07.28'E, 138.2–136 m deep), 10 July 2009—*Xanthias maculatus*
- KY-09-08: North of Haha-jima I. (26°45.20'N, 142°06.44'E–26°45.38'N, 142°06.55'E, 98.3–102.4 m deep), 13 July 2009—*Miersiella cavifrons*
- KY-09-09: North of Haha-jima I. (26°45.64'N, 142°05.75'E–26°45.87'N, 142°05.88'E, 102–118.2 m), 13 July 2009—*Miersiella cavifrons*, *Paraxanthodes cumatodes*, *Xanthias cherbonnieri*
- KY-09-13: South of Haha-jima I. (26°34.10'N, 142°10.79'E, 96.5 m deep), 14 July 2009—*Actumnus setosiareolatus*, *Liomera rubra*, *Paractaeopsis tumulosus*
- KY-09-14: South of Haha-jima I. (26°34.03'N, 142°10.80'E–26°34.04'N, 142°10.81'E, 92–93.1 m deep), 14 July 2009—*Liomera caelata*, *Vellumnus pygmaeus*, *Xanthias maculatus*
- KY-09-21: Northwest of Ototo-jima I. (27°13.09'N, 142°09.19'E–27°13.19'N, 142°09.23'E, 135.8–135.5 m deep), 15 July 2009—*Cranaothus deforgesii*
- KY-09-27: East of Ani-jima I. (27°06.29'N, 142°13.88'E–27°06.28'N, 142°14.01'E, 81–83.4 m deep), 15 July 2009—*Hepatoporus guinotae*
- KY-09-28: East of Nishi-jima I. (27°07.05'N, 142°10.68'E–27°07.02'N, 142°10.69'E, 52.1–52 m deep), 15 July 2009—*Actumnus setosiareolatus*, *Calvactaea tumida*, *Cranaothus deforgesii*, *Gaillardiel-lus rueppelli*, *Hepatoporus guinotae*, *Mertonia*

- lanka*, *Pilumnus* sp.
- KY-09-29: South of Nishi-jima I. (27°06.59'N, 142°10.25'E–27°06.58'N, 142°10.21'E, 60.7–60.3 m deep), 16 July 2009—*Chlorodiella laevisima*, *Lobiactaea lobipes*, *Miersiella cavifrons*, *Xanthias maculatus*
- KY-09-30: East of Nishi-jima I. (27°07.22'N, 142°10.60'E–27°07.28'N, 142°10.58'E, 51.6–49.9 m deep), 16 July 2009—*Actumnus setosiareolatus*, *Chlorodiella laevisima*, *Cranaothus deforgesii*, *Gaillardiellus rueppelli*, *Liomera caelata*, *Lobiactaea lobipes*, *Nanocassiope tridentata*, *Palapedia integra*, *Pilodius paumotensis*, *Vellumnus pygmaeus*, *Viaderiana* aff. *aranea*
- KY-09-34: West of Minami-jima I. (27°02.34'N, 142°07.52'E–27°02.55'N, 142°07.34'E, 138.9–140.9 m deep), 16 July 2009—*Xanthias maculatus*
- KY-10-02: East of Haha-jima I. (26°41.44'N, 142°10.33'E–26°41.33'N, 142°10.39'E, 115.3–114.8 m deep), 5 July 2010—*Actumnus setosiareolatus*
- KY-10-03: North of Haha-jima I. (26°45.32'N, 142°05.99'E–26°45.30'N, 142°06.28'E, 105.6–91.7 m deep), 5 July 2010—*Vellumnus pygmaeus*
- KY-10-04: North of Haha-jima I. (26°45.08'N, 142°05.94'E–26°45.05'N, 142°06.20'E, 100.6–97.7 m deep), 5 July 2010—*Actumnus setosiareolatus*, *Pseudactaea corallina*, *Vellumnus pygmaeus*
- KY-10-05: North of Haha-jima I. (26°44.27'N, 142°06.07'E–26°44.30'N, 142°06.36'E, 81.8–73 m deep), 5 July 2010—*Actumnus setosiareolatus*
- KY-10-06: North of Haha-jima I. (26°44.29'N, 142°06.23'E–26°44.29'N, 142°06.37'E, 76–72.9 m deep), 5 July 2010—*Alainodaeus nuku*, *Cranaothus deforgesii*, *Palapedia integra*, *Paraxanthodes cumatodes*, *Vellumnus pygmaeus*
- KY-10-07: South of Ane-jima I. (26°31.60'N, 142°08.85'E–26°31.60'N, 142°08.94'E, 104.7–99 m deep)—*Gaillardiellus rueppelli*, *Xanthias cherbonnieri*, *X. maculatus*
- KY-10-19: West of Chichi-jima I. (27°04.82'N, 142°08.95'E–27°04.75'N, 142°09.06'E, 86.9–90.5 m deep), 7 July 2010—*Mertonia lanka*, *Miersiella cavifrons*
- KY-10-24: East of Nishi-jima I. (27°07.23'N, 142°10.70'E–27°07.14'N, 142°10.73'E, 47.4–50.8 m deep), 8 July 2010—*Cranaothus deforgesii*
- KY-10-25: Futami Bay, Chichi-jima I. (27°04.77'N, 142°11.68'E–27°04.76'N, 142°11.73'E, 42.2–41.6 m deep), 9 July 2010—*Lophoplax takakurai*
- KY-10-27: South of Nishi-jima I. (27°06.65'N, 142°10.42'E–27°06.61'N, 142°10.29'E, 59–60.1 m deep), 9 July 2010—*Cranaothus deforgesii*, *Gaillardiellus rueppelli*, *Lobiactaea lobipes*, *Nanocassiope granulipes*, *Pseudactaea corallina*, *Vellumnus pygmaeus*
- KY-10-31: West of Chichi-jima I. (27°05.18'N, 142°08.48'E–27°05.12'N, 142°08.39'E, 96.8–96.5 m deep), 9 July 2010—*Actumnus setosiareolatus*, *Miersiella cavifrons*
- 2) R/V Tansei Maru, KT-09-2 cruise**
- TW1-1: West of Chichi-jima I. (27°01.40'N, 142°07.41'E–27°01.36'N, 142°07.47'E, 145.2–138.6 m deep), 19 March 2009—*Paractaeopsis tumulosus*, *Xanthias maculatus*
- TW1-5: West of Chichi-jima I. (27°01.44'N, 142°06.14'E–27°01.38'N, 142°06.18'E, 173.1–188.3 m deep), 19 March 2009—*Glyptocarcinus lophopus*
- TW2-1: West of Chichi-jima I. (27°03.01'N, 142°04.84'E–27°03.01'N, 142°04.87'E, 191.1–190.2 m deep), 19 March 2009—*Nanopilumnus modestus* sp. nov.
- TW2-4: West of Chichi-jima I. (27°02.94'N, 142°07.17'E–27°02.95'N, 142°07.25'E, 140.7–151.5 m deep), 19 March 2009—*Gorgonariana sodalis*, *Miersiella cavifrons*, *Xanthias maculatus*
- KK1-2 (1): Kaikata Seamount (26°40.00'N, 140°55.54'E–26°39.99'N, 140°55.63'E, 172.5–165 m deep), 16 March 2009—*Glyp-*

tocarcinus lophopus, *Meractaea takunan*

3) TR/V Shin'yo Maru, 2009 cruise

SY-09-01: East of Muko-shima I. (27°44.05'N, 142°09.19'E–27°44.01'N, 142°09.15'E, 109–108m deep), 16 November 2009—*Mertonia lanka*

SY-09-02: East of Muko-shima I. (27°44.55'N, 142°09.69'E–27°44.47'N, 142°09.76'E, 122–123m deep), 16 November 2009—*Actumnus intermedius*, *Pilumnus izuogasa-waraensis*

SY-09-03: East of Muko-shima I. (27°44.86'N, 142°10.17'E–27°44.72'N, 142°10.21'E, 146–144m deep), 16 November 2009—*Xanthias maculatus*

SY-09-04: East of Muko-shima I. (27°44.99'N, 142°10.52'E–27°44.79'N, 142°10.40'E, 159–152m deep), 16 November 2009—*Calmania balssi*, *Glyptocarcinus lophopus*, *Xanthias maculatus*

SY-09-08: East of Muko-shima I. (27°41.06'N, 142°10.58'E–27°41.05'N, 142°10.40'E, 106–98.7m deep), 16 November 2009—*Actimera boninensis*, *Mertonia lanka*

SY-09-09: East of Muko-shima I. (27°41.13'N, 142°11.11'E–27°41.00'N, 142°10.88'E, 124–112m deep), 16 November 2009—*Actinomera boninensis*, *Actumnus setosiareolatus*, *Xanthias maulatus*

SY-09-10: East of Muko-shima I. (27°41.61'N, 142°11.88'E–27°41.54'N, 142°11.61'E, 148–139m deep), 16 November 2009—*Actumnus setosiareolatus*

SY-09-11: East of Muko-shima I. (27°42.02'N, 142°12.46'E–27°42.16'N, 142°12.07'E, 172–161m deep), 16 November 2009—*Nanopilumnus modestus* sp. nov.

SY-09-17: West of Chichi-jima I. (27°06.17'N, 142°08.69'E–27°06.12'N, 142°08.83'E, 110–104m deep), 18 November 2009—*Gorgonariana sodalis*, *Quadrella coronata*

SY-09-18: West of Chichi-jima I. (27°06.11'N, 142°08.89'E–27°06.07'N, 142°09.06'E, 101–98m deep), 18 November 2009—*Gorgonariana sodalis*

4) TR/V Seiyō Maru, 1995 cruise

D-1: West of Ani-jima I. (27°06.53'N, 142°10.78'E–27°07.61'N, 142°10.92'E, 62–41m deep), 17 June 1995—*Actumnus setosiareolatus*, *Cranaothus deforgesi*, *Liomera nigrimanus*, *Nanocassiope tridentata*, *Palmyria palmyrensis*, *Tetrias fisheri*, *Vellumnus pygmaeus*, *Viaderiana affinis*

D-2: West of Ani-jima I. (27°06.88'N, 142°10.86'E–27°06.88'N, 142°10.86'E, 51–57m deep), 17 June 1995—*Gaillardiiellus rueppellii*, *Liomera caelata*, *Nanocassiope tridentata*

D-5: South of Chichi-jima I. (27°01.19'N, 142°12.43'E–27°01.11'N, 142°12.31'E, 126–130m deep), 19 June 1995—*Nanopilumnus modestus* sp. nov.

D-6: South of Minami-jima I. (27°01.18'N, 142°10.94'E–27°01.17'N, 142°10.10'E, 69–81m deep), 19 June 1995—*Vellumnus pygmaeus*

Taxonomic Accounts of the Species

Family Xanthidae

Genus *Actimera* Ng, Guinot & Davie, 2008

Actimera boninensis (Odhnér, 1925)

[Japanese name: Ogasawara-beni-ohigani]

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-21, east of Chichi-jima I, 1 young ♀ (5.8 × 3.5 mm), NSMT-Cr S 1157.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-08, east of Muko-shima I., 1 young ♂ (5.4 × 3.8 mm), NSMT-Cr S 1158; sta. SY-09-09, east of Muko-shima I., 1 ♂ (6.2 × 4.6 mm), NSMT-Cr S 1159.

Remarks. This species was portrayed by Odhnér (1925) as *Carpilodes lophopus* var. *boninensis*, Sakai (1939) as *C. lophopus boninensis*, Sakai (1965) as *Liomera lophopa boninensis*, and Sakai (1976) as *L. boninensis*, and its first male pleopod was figured by Takeda and Miyake (1968a) as that of *L. boninensis*. The young specimens examined at present agree well with the figure of immature specimen given by Sakai (1935) as *C. lophopus boninensis*.

Ng *et al.* (2008) transferred this species from the genus *Liomera* Dana, 1851, to a new genus *Actimera* proposed substitutionally for the

genus *Actites* Lanchester, 1902, which was preoccupied by a name for a bird. The genus *Actites* was a replacement name of the genus *Actaeopsis* Lanchester, 1900, preoccupied by a name of fossil crustacean. The genus *Actaeopsis* had long been treated as a synonym of *Liomera*, but resurrected with generic reevaluation and renamed *Actiomera* by Ng *et al.* (2008) as mentioned above.

The genus *Actiomera* is known by three species, *A. boninensis* (Odhner, 1925), *A. erythra* (Lanchester, 1902) and *A. lophopa* (Alcock, 1898).

Distribution. Restricted to Japanese waters and its vicinity, being recorded from the Bonin (= Ogasawara) Islands (type locality), Sagami Bay, the vicinity of Kii Peninsula, and the East China Sea, 15–300 m deep. The bathymetric range of the present study is 98–124 m.

Genus *Alainodaeus* Davie, 1992

Alainodaeus nuku Davie, 1997

[Japanese name: Daidai-ohgigani]

Material examined. R/V *Koyo*, 2010 cruise, sta. KY-10-06, north of Haha-jima I., 1 ♂ (3.7 × 2.7 mm), NSMT-Cr S 1160.

Remarks. In the male specimen examined the carapace is roundish quadrilateral, the dorsal surface of the carapace and the anterior margins of the ambulatory meri and carpi are roughened with larger tubercles, and two anterolateral teeth behind the external orbital angle are more or less tuberculated with obtuse tips. These differences may be referred to the small size of the specimen examined.

Distribution. Ryukyu, Izu and Ogasawara Islands in Japanese waters, 30–145 m deep (Komai, 2014); Marquesus and Austral Islands in French Polynesia, 100–400 m deep (Davie, 1997). The bathymetric range of the present study is 73–76 m.

Genus *Calvactaea* Ward, 1933

Calvactaea tumida Ward, 1933

[Japanese name: Maru-tama-ohgigani]

Material examined. R/V *Koyo*, 2009 cruise, sta.

KY-09-28, east of Nishi-jima I., 1 ♂ (14.4 × 11.4 mm), NSMT-Cr S 1161.

Remarks. This species was repeatedly figured by Sakai (1937, 1939, 1965, 1976), having the globular carapace covered with a thick tomentum. Although the carapace of the male at hand is somewhat deformed at the right gill chamber with infection of isopod parasite, there is no problem in the identification to the monotypical representative of the genus *Calvactaea*. In Japan this species is well known by divers as an obligate commensal with alcyonarians.

Distribution. Known from Japan and Australia, without any intervening locality; Pacific coast of central Japan from Sagami Bay to the vicinity of Kii Peninsula, and Port Jackson, Queensland (Ward, 1933) and Freycinet Reach, southwestern Australia (Balss, 1935, as *Atergatis* (?) *globosa* sp. nov.). Marumura and Kosaka (2003) recorded this species from Tatsumi Bay, Chichi-jima Island in the Ogasawara Islands, 60 m deep. The known bathymetric range is from 25 to 60 m. The bathymetric range of the present study is 52 m.

Genus *Chlorodiella* Rathbun, 1897

Chlorodiella laevis (Dana, 1852)

[Japanese name: Tenaga-ohgigani]

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-29, south of Nishi-jima I., 1 ovig. ♀ (4.8 × 3.3 mm), NSMT-Cr S 1162; sta. KY-09-30, east of Nishi-jima I., 1 ♀ (4.4 × 2.8 mm), NSMT-Cr S 1163.

Remarks. This species and a close relative, *Chlorodiella cytherea* (Dana), were finely depicted by Forest and Guinot (1961). In this species the carapace is armed with four distinct anterolateral teeth, the last two of which are typically armed each with a procurved spine. The first male pleopod is the most effective criterion to distinguish both species regardless of the variable anterolateral armature of the carapace.

Both of the specimens examined are female and typical of the *Chlorodiella* species in size, agreeing with the specimens from the Ryukyu Islands in the shape and armature of the carapace and chelipeds.

Distribution. Widely distributed in the Indo-West Pacific as a common coral reef inhabitant. This is the first record from the Ogasawara Islands, with the bathymetric range of 50–61 m.

Genus *Cranaothus* Ng, 1993

Cranaothus deforgesi Ng, 1993

[New Japanese name: Nise-shiwa-ohigigani]

(Figs. 1A, 2A)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 young ♀ (5.2×3.8 mm), NSMT-Cr S 1164; 2009 cruise, sta. KY-09-21, northwest of Ototo-jima I., 1 ovig. ♀ (5.4×4.0 mm), NSMT-Cr S 1165; sta. KY-09-28, east of Nishi-jima I., 1 ♂ (5.6×4.0 mm), NSMT-Cr S 1166; sta. KY-09-30, east of Nishi-jima I., 4 ♀ ♀ (4.1×3.1 – 5.0×3.8 mm), NSMT-Cr S 1167; 2010 cruise, sta. KY-10-06, north of Haha-jima I., 1 ♂ (6.2×4.5 mm), 1 ♀ (5.5×4.3 mm), NSMT-Cr S 1168; sta. KY-10-24, east of Nishi-jima I., 1 young ♂ (4.3×3.2 mm), NSMT-Cr S 1170; sta. KY-10-27, south of Nishi-jima I., 1 juv. (4.5×3.5 mm), NSMT-Cr S 1171.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 young ♀ (4.2×3.2 mm), NSMT-Cr S 1172.

Remarks. All the specimens from the Ogasawara Islands (4.1×3.1 mm– 6.2×4.5 mm) are slightly smaller than the holotype male (8.0×5.9 mm) that is the only known specimen, but agree well in all respects with the elaborate description by Ng (1993b) who also discussed the close similarity to *Paramedaeus noelensis* (Ward, 1934) which was later designated as the type species of the genus *Danielea* by Ng and Clark (2003).

The carapace (Figs. 1A, 2A) is generally fun-shaped, with the arched and irregularly toothed anterolateral borders, the strongly retreated, concave posterolateral borders, and the advanced lamellar front. The dorsal areolation of the carapace is distinct, but not sharply delimited, being covered with eroded, short and vermiculated ridges. The front is strongly produced forward as a whole, divided into two lobes by a median deep notch that is extended onto the frontal dorsal surface as a longitudinal groove; each frontal lobe is most strongly produced at the inner end just outside of the median notch; the frontal lobe is truncated or rather concave and oblique toward the obtusely angulated outer end. The anterolateral

margin of the carapace is strongly arched and armed typically with four tubular teeth and irregular smaller teeth; the anterior end of the anterolateral margin is directed toward the anterolateral corner of the buccal cavern, forming the truncated facet at the hepatic and subhepatic regions behind the orbit. The chelipeds are unequal, comparatively large and heavy: the outer and upper surfaces of the carpus and palm are reticulated and eroded. The ambulatory legs are rather long, with the stout meri, carpi and propodi; the anterior margins of each carpus and propodus of the first three pairs are armed with three and one humps, respectively.

The specimens examined are somewhat different from the holotype in which the anterolateral margin of the carapace is armed with more or less tuberculated teeth (apparently more irregular in the holotype) and the humps of the anterior margins of the ambulatory legs are more strongly developed (less pronounced in the holotype).

As discussed by Ng (1993b), this species is evidently close to *Danielea noelensis* in the general appearance of the carapace, chelipeds and ambulatory legs. Especially the close affinity is stressed by the formation of the anterolateral margin of the carapace directed to the anterior corner of the buccal cavern and the slender first male pleopod having the subterminal long setae. In *D. noelensis* the dorsal surface of the carapace is smooth and has no reticulated vermiculations. There seems to be no special reason to keep the two species in the different genera, although this paper follows Ng (1993b) who hesitated to synonymize both genera.

Ng (1993b) considered that the record of *Paramedaeus noelensis* from the Sulu Archipelago, the Philippines, by Serène and Umali (1972) is probably due to misidentification of *C. deforgesi*. It is, however, not accepted here, because in the specimens from the Philippines the dorsal surface is sharply separated into regions by the linear furrows, the anterolateral teeth are sharply triangular in dorsal view, and the ambulatory meri are armed with series of spines along both margins.

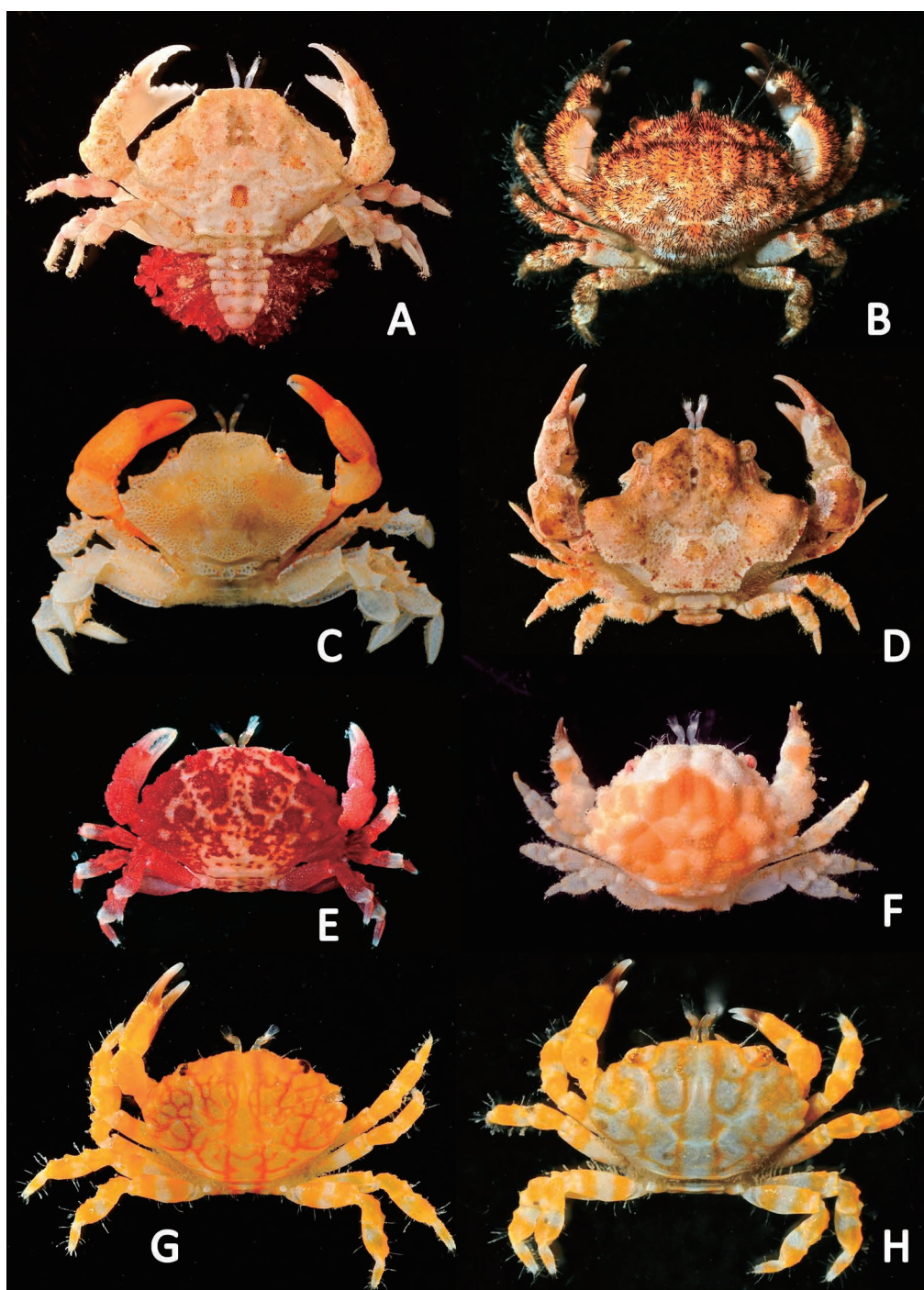


Fig 1. A: *Cranaothus deforgesi* Ng, ovig. ♀ (NSMT-Cr S 1165; 5.4 × 4.0 mm). B: *Gaillardiiellus rueppelli* (Krauss), ♂ (NSMT-Cr S 1176; 7.4 × 7.2 mm). C: *Glyptocarcinus lophopus* Takeda, ♀ (NSMT-Cr S 1179; 8.0 × 5.7 mm). D: *Hepatoporus guinotae* (Zarenekov), ♂ (NSMT-Cr S 1182; 10.2 × 7.4 mm). E: *Liomera caelata* (Odhner), ♂ (NSMT-Cr S 1184; 5.0 × 3.1 mm). F: *Paractaeopsis tumulosus* (Odhner), ♂ (NSMT-Cr S 1209; 5.1 × 3.8 mm). G, H: *Xanthias cherbonnieri* Guinot, ♂ (NSMT-Cr S 1220; 6.2 × 4.2 mm) (G), and ♀ (NSMT-Cr S 1221; 4.2 × 2.8 mm) (H).

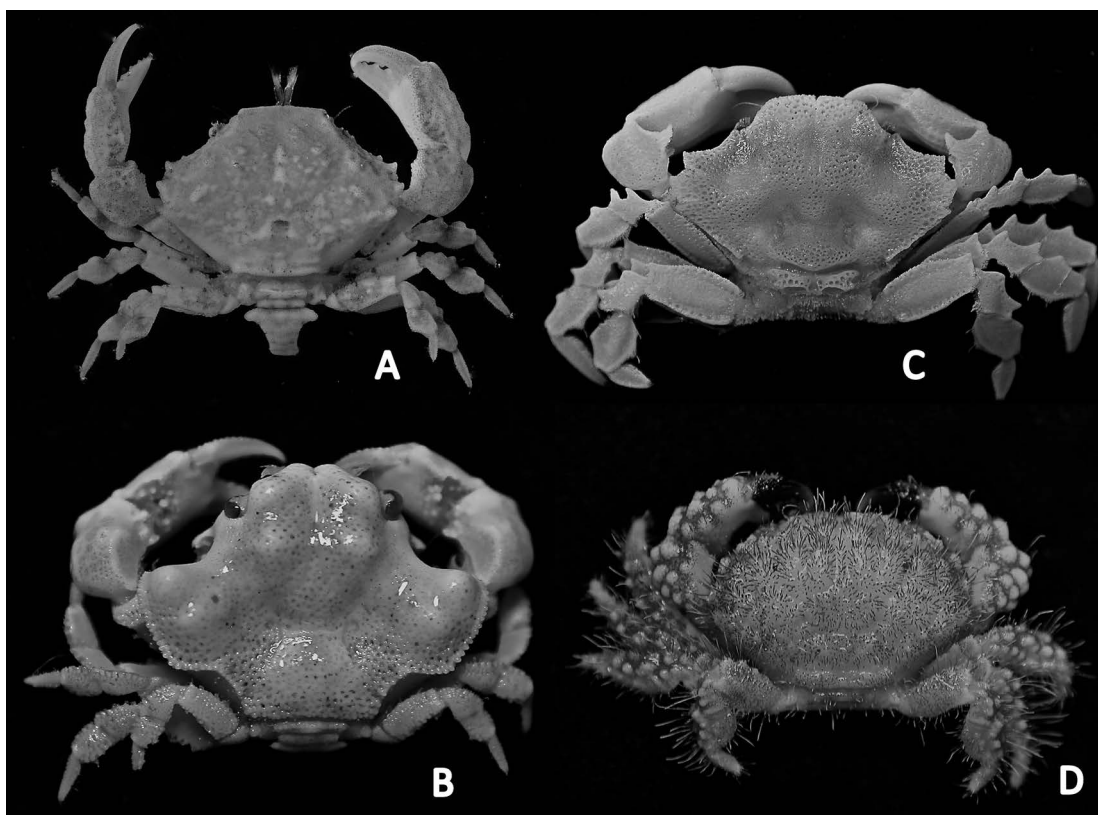


Fig 2. A: *Cranaothus deforgesi* Ng, ♂ (NSMT-Cr S 1165; 5.4×4.0mm). B: *Hepatoporus guinotae* (Zarenkov), ♂ (NSMT-Cr S 1182; 10.2×7.4mm). C: *Glyptocarcinus lophopus* Takeda, ♀ (NSMT-Cr S 1179; 8.0×5.7mm). D: *Lobiactaea lobipes* (Odhner), ♂ (NSMT-Cr S 1190; 9.2×6.7mm).

Distribution. Originally reported from the Chesterfield Island in the Coral Sea, ca. 50m deep. This is the first record from the Japanese waters with bathymetric range of 41–136m.

Genus *Gaillardiiellus* Guinot, 1976
Gaillardiiellus rueppelli (Krauss, 1843)
 [Japanese name: Awatsubu-ohgigani]
 (Fig. 1B)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-15, west of Chichi-jima I., 1 ♂ (6.4×5.3mm), NSMT-Cr S 1173; 2009 cruise, sta. KY-09-28, east of Nishi-jima I., 2 ♂♂ (7.5×5.7mm; 7.3×5.4mm), 1 ♀ (8.2×5.6mm), NSMT-Cr S 1174; sta. KY-09-30, east of Nishi-jima I., 1 ♂ (7.8×5.4mm), NSMT-Cr S 1175; 2010 cruise, sta. KY-10-07, south of Ane-jima I., 1 ♂ (7.4×7.2mm), NSMT-Cr S 1176; sta. KY-10-27, south of Nishi-jima I., 2 ♀♀ (9.7×7.2mm; 6.3×5.0mm), NSMT-Cr S 1177.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-2, west of Anijima I., 1 ♂ (9.0×5.8mm), 1 ♀ (6.3×5.0mm), NSMT-Cr S 1178.

Remarks. The carapace is strongly vaulted and deeply sculptured, and the carapace, chelipeds and ambulatory legs are wholly and uniformly covered with short, stiff black setae. The general image of this species is finely depicted by Odhner (1925), Sakai (1939, 1965, 1976) and Guinot (1976). The general appearance of the carapace, chelipeds and ambulatory legs is similar to that of *Gaillardiiellus bocki* (Odhner, 1925) that was originally reported from Sagami Bay, north of Kyushu and the Taiwan Straits. *Gaillardiiellus bocki* was repeatedly recorded and figured by Sakai (1939, 1965, 1976) as *Actaea*, being characterized by the dark-colored palm of the chelipeds and undivided protogastric region

(2M). Although Guinot (1976) deeply discussed the relation of this species to the genus *Forestia* Guinot, 1976, but made no mention of the genus *Gaillardiiellus* Guinot, 1976. Following these results, it is reasonable that Ng *et al.* (2008) kept *Actaea bocki* in the list of the genus, although Takeda (1997) transferred this species to *Gaillardiiellus*. It is noted at present that *Actaea bocki* is congeneric with *Gaillardiiellus rueppelli* except for having the undivided protogastric region (2M), and thus the scientific name should be *Gaillardiiellus bocki* (Odhner, 1925) as proposed by Takeda (1997).

Distribution. This species was originally reported from Natal, South Africa, and then recorded from shallow water of many localities in the whole Indo-West Pacific. The bathymetric range of the present study is 50–105 m.

Genus *Glyptocarcinus* Takeda, 1973

Glyptocarcinus lophopus Takeda, 1973

[Japanese name: Hira-ashi-komachigani]

(Figs. 1C, 2C)

Material examined. R/V *Tansei Maru*, 2009 cruise, sta. TW1-5, west of Chichi-jima I., 1 ♂ (10.8 × 7.4 mm), 1 young ♀ (8.0 × 5.7 mm), NSMT-Cr S 1179; sta. KK-1-2 (1), Kaikata Seamount, 1 ♂ (9.7 × 6.0 mm), NSMT-Cr S 1180.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-04, east of Muko-shima I., 1 young ♂ (7.9 × 5.7 mm), NSMT-Cr S 1181.

Remarks. The frontal and gastric regions of the carapace are prominently reticulated, and otherwise a transverse broad ridge running from each epigastric tooth to the gastric region, a cardiac transverse ridge, and a pair of transverse plate just above the posterior margin of the carapace are also reticulated. The postfrontal, postorbital and cardiac surfaces are sunken and smooth. The reticulation along the anterolateral and posterolateral margins of the carapace is somewhat variable; in the male (NSMT-Cr S 1180) the reticulation is restricted to the true margins. In the holotype specimen (female, 12.2 × 8.6 mm), the whole surface is distinctly reticulated, and therefore the variation of the reticulation is not developmental, but individual. The transverse

plate above the posterior margin of the carapace is also subject to variation.

Another representative of the genus, *Glyptocarcinus politus* Ng & Chia, 1994, from New Caledonia, is characteristic in having the smooth carapace. Marumura and Kosaka (2003) recorded a male identified as *G. politus* from off the south-east of Kuro-shima Island in the southern Ryukyu Islands, with a color photograph. In spite of the detailed discussion of Ng and Chia (1994), the distinction of the two species, *G. lophopus* and *G. politus*, is not always clear in considering the developmental and individual variations. Marumura and Kosaka (2003) also recorded *Cyrtocarcinus truncatus* (Rathbun, 1906) from Minabe, Kii Peninsula. The identification of a male specimen must be followed the contribution of Ng and Chia (1994), but should be reconfirmed, because *Harrovia truncata* Rathbun recorded by Sakai (1974, 1976) is referred to *G. lophopus*. *Cyrtocarcinus truncatus* is excluded from the Japanese carcinological fauna for the time being.

Distribution. This species was established on a female specimen obtained off Yome-shima Island, Ogasawara Islands, 180 m deep. The bathymetric range of the present study is 152–188 m.

Genus *Hepatoporus* Serène, 1984

Hepatoporus guinotae (Zarenkov, 1971)

[Japanese name: Kushimoto-horagani]

(Figs. 1D, 2B)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-27, east of Ani-jima I., 1 ♂ (10.2 × 7.4 mm), NSMT-Cr S 1182; sta. KY-09-28, east of Nishi-jima I., 1 ovig. ♀ (13.0 × 9.7 mm), NSMT-Cr S 1183.

Remarks. The genus *Hepatoporus* is represented by five species from the Indo-West Pacific, *H. orientalis* (Sakai, 1935), *H. guinotae* (Zarenkov, 1971), *H. distinctus* (Takeda & Nagai, 1986), *H. asper* Davie & Turner, 1994 and *H. pumex* Mendoza & Ng, 2008, but Davie and Turner (1994) is of opinion that *H. distinctus* is synonymous with *H. guinotae*. The synonymization is reasonable, because the only difference in size, depth and shape of the hepatic cav-

ity in the two species is exposed to the individual and developmental variation as seen in the figures given by Serène (1984) and Davie and Turner (1994).

The specimens from the Ogasawara Islands are without doubt identified as *H. guinotae*; the dorsal surface of the carapace (Figs. 1D, 2B) is uneven, with the regions convex and separated by the wide depressions, wholly reticulated, with the distinct granulated rim; the supraorbital, protogastric and branchial regions are produced to be an obtuse tubercle. The front is divided into two lobes and most strongly developed at each side of the median wide notch. In both of two specimens examined the hepatic cavity is very large, but not so deeply excavated posteriorly and dorsally.

Distribution. Known from the Red Sea, Kenya, Madagascar, and northwestern Australia, 42–52 m deep. *Hepatoporus distinctus*, which is synonymous with *H. guinotae* as mentioned above, was reported from the vicinity of Kii Peninsula, Pacific coast of central Japan, 20–100 m deep. This is the first record from the Ogasawara Islands with the bathymetric range of 52–83 m.

Genus *Liomera* Dana, 1851

Liomera caelata (Odhner, 1925)

[Japanese name: Fukuro-beni-ohgigani]

(Fig. 1E)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-14, south of Haha-jima I., 1 ♂ (5.0 × 3.1 mm), NSMT-Cr S 1184; sta. 09-30, east of Nishi-jima I., 1 ♂ (5.4 × 3.5 mm), 1 ovig. ♀ (6.1 × 3.8 mm), 1 ♀ (5.3 × 3.5 mm), 1 juv. (4.3 × 2.9 mm), NSMT-Cr S 1185.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-2, west of Ani-jima I., 1 young ♀ (6.0 × 48 mm), NSMT-Cr S 1186.

Remarks. This small species was represented by Odhner (1925, as *Carpilodes*), Sakai (1976), Takeda (1976) and Serène (1984), and listed by Marumua and Kosaka (2003), being characterized by the deeply sculptured dorsal surface of the carapace, with the U-shaped protogastric region (2M). In life (Fig. 1E), the characteristic protogastric region is seemingly inconspicuous against the intricate red and white color of the carapace.

Distribution. West Pacific from the vicinity of Kii Peninsula, Pacific coast of central Japan to Indonesian waters, from coral reef to 75 m deep. According to Serène (1984), the record from Mayotte in the western Indian Ocean by Guinot (1958) was due to misidentification of *Liomera monticulosa* (A. Milne-Edwards). The bathymetric range of the present study is 50–93 m.

Liomera nigrimanus Davie, 1997

[New Japanese name: Udewa-beni-ohgigani]

(Fig. 4D)

Material examined. TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 ♀ (11.3 × 7.0 mm), NSMT-Cr S 1187.

Remarks. The female specimen examined is an empty shell after ecdysis, with some detached segments of the ambulatory legs. It is referred to the typical *Liomera* species, having the transverse, smooth, well-areolated carapace (Fig. 4D). The anterior and marginal areolae are convex and nodular; the epigastric region (1M) is swollen and separated by the shallow depressions from the thickened frontal and supraorbital margins and the protogastric region (2M); 2M is divided into two branches for most of length, but not completely, by a longitudinal furrow; the inner branch of 2M is nearly flattened, while the anterior part of the outer branch of 2M is swollen dorsally, slightly exceeding the level of the inner branch; the mesogastric region (3M) is surrounded by linear furrows, but the delimitation from the posterior part of 2M is rather obsolete; of the branchial subregions (1L–5L), 1L is confluent with the lateral part of the supraorbital margin, being placed just above the first anterolateral tooth; 2L and 3L are nodular and independent, while 4L and 5L are confluent with the third and fourth anterolateral teeth, respectively. The anterolateral margin of the carapace is cut into four rounded, thick teeth; the first is the smallest and placed just below 1L; the following three teeth are somewhat different from each other in shape and size.

The female specimen examined agrees well with the original photographs of *Liomera nigrim-*

anus by Davie (1997) based on a male (14.7×9.0 mm) from New Caledonia, and also with the photographs of *L. virgata* Rathbun, 1906, given by the original author, Odhner (1925) and Serène (1984). In the present specimen, the color is entirely faded, so that it is impossible to compare with the black color of the palms in both species, but as mentioned by Davie (1997), the areolae 2L and 3L are distinct unlike in the specimens from the Hawaiian Islands (Rathbun, 1906; Edmondson, 1962).

Distribution. Known from New Caledonia, and otherwise recorded from the Amirante Islands in the western Indian Ocean, and the Holothuria and Macclesfield Banks in the South China Sea. The bathymetric range is from 45 to 367 m. This is the first record from the Japanese waters with the bathymetric range of 41–62 m.

***Liomera rubra* (A. Milne-Edwards, 1865)**

[Japanese name: Shirosoji-beni-ohgigani]

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-13, south of Haha-jima I., 2 juvs (4.2×2.7 mm; 5.0×3.0 mm), NSMT-Cr S 1188.

Remarks. Although both specimens are still juvenile, but the dorsal areolation of the carapace divided by linear furrows agrees well with that of the adult specimen (A. Milne-Edwards, 1865; Odhner, 1925; Edmondson, 1962; Serène and Luom, 1960; Sakai, 1976; Serène, 1984).

Distribution. Widely distributed in the Indo-West Pacific from the vicinity of Kii Peninsula, central Japan and the Hawaiian Islands to the South Pacific, and westward to Madagascar and Mauritius in the western Indian Ocean. Marumura and Kosaka (2003) recorded this species from Chichi-jima Island, Ogasawara Islands, 60 m deep. The bathymetric range of the present study is 96.5 m.

Genus *Lobiactaea* Sakai, 1983

***Lobiactaea lobipes* (Odhner, 1925)**

[Japanese name: Mikado-awatsubu-ohgigani]

(Figs. 2D, 3A)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-26, west of Chichi-jima I., 1 young ♀ (8.8×6.0

mm), NSMT-Cr S 1189; 2009 cruise, sta. KY-09-29, south of Nishi-jima I., 1 ♂ (9.2×6.7 mm), 1 ♀ (7.4×5.5 mm), NSMT-Cr S 1190; sta. KY-09-30, east of Nishi-jima I., 1 young ♀ (8.4×5.9 mm), NSMT-Cr S 1191; 2010 cruise, sta. KY-10-27, south of Nishi-jima I., 1 young ♂ (5.6×4.0 mm), 1 young ♀ (6.3×4.5 mm), NSMT-Cr S 1192.

Remarks. This species has been recorded from off Shimoda, western part of Sagami Bay as the second record since the original description (Odhner, 1925, as *Actaea*) by Sakai (1980) who transferred it to the genus *Gaillardiellus* Guinot, 1976. Subsequently Sakai (1983) established a new genus *Lobiactaea* to accommodate this species.

The carapace (Figs. 2D, 3A) is strongly vaulted dorsally, deeply sculptured into the regions by furrows, with the regions being provided with pearly granules and covered with short stiff setae. The general appearance is similar to that of *G. rueppelli* (Krauss), but four anterolateral teeth of the carapace are replaced with warty nodules of nearly same size, and the outer surfaces of the cheliped carpus and palm are covered also with warty nodules of good size covered with minute granules and interspaced with short dark-colored setae, the anterior margin of each ambulatory merus is armed with a subterminal tooth, and the anterior margins and upper surfaces of the ambulatory carpi and propodi are provided with some warty granules or rather sharp tubercles or outgrowths of variable sizes. Sakai (1983) considered the characteristic tuberculation mentioned above as generic criteria.

Distribution. Originally reported from the Macclesfield Bank in the South China Sea, 40–75 m deep, and later from Shimoda (Sakai, 1980, 1983) and Ito (Marumura and Kosaka, 2003), the western part of Sagami Bay, the Pacific coast of central Japan. This is the first record from the Ogasawara Islands with the bathymetric range of 50–87 m.

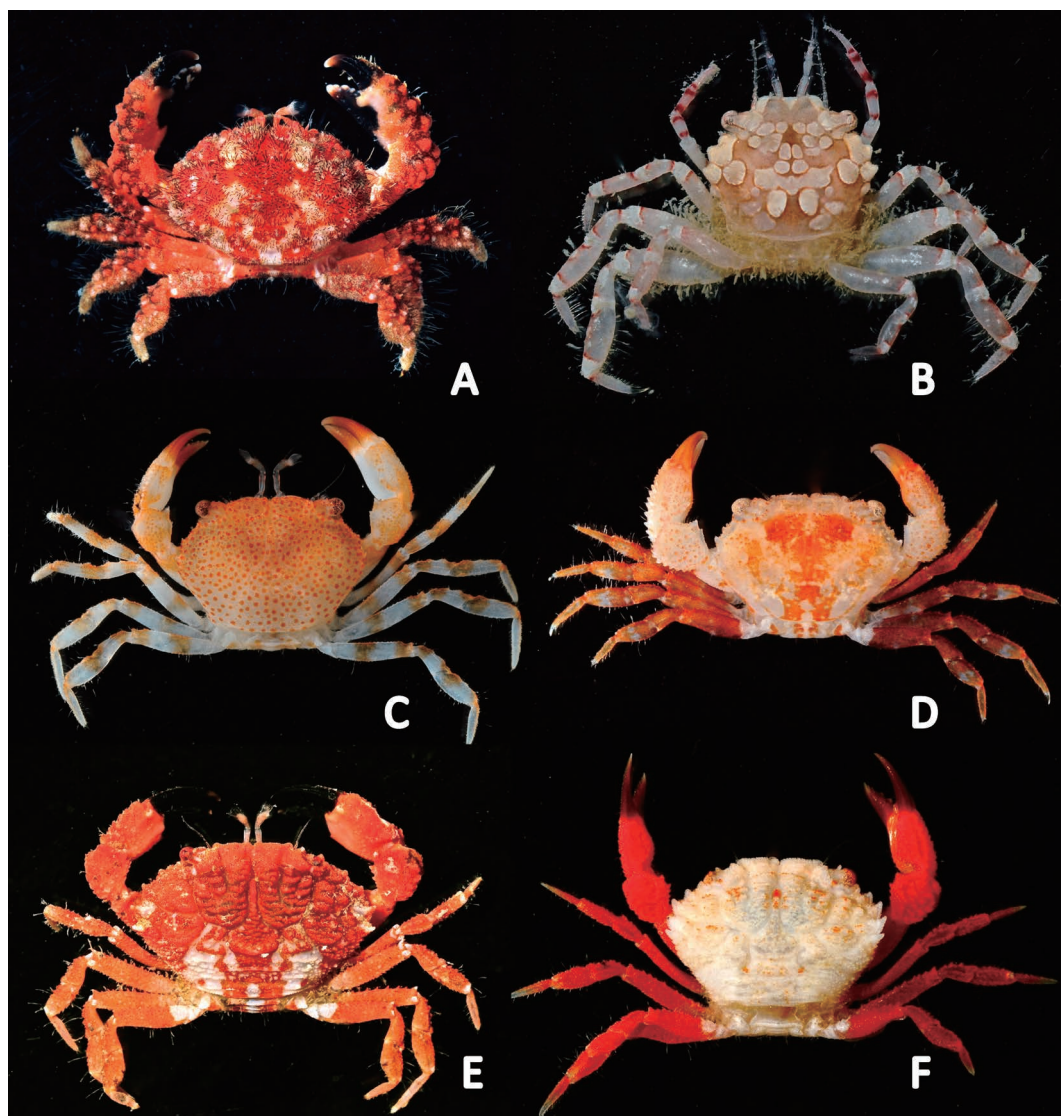


Fig 3. A: *Lobiactaea lobipes* (Odhner), ♂ (NSMT-Cr S 1190; 9.2 × 6.7 mm). B: *Lybia leptochelis* (Zehntner), ♂ (NSMT-Cr S 1193; 3.8 × 3.4 mm). C: *Miersiella cavifrons* Takeda, ♀ (NSMT-Cr S 1198; 6.6 × 4.6 mm). D: *Nanocassiope granulipes* (Sakai), juv. (NSMT-Cr S 1204; 3.4 × 2.7 mm). E, F: *Paraxanthodes cumatodes* (MacGilchrist), ♀ (NSMT-Cr S 1211; 12.0 × 7.6 mm) (E), and juv. (NSMT-Cr S 1213; 5.8 × 4.0 mm) (F).

Genus *Lybia* H. Milne Edwards, 1834

Lybia leptochelis (Zehntner, 1894)

[New Japanese name: Kotsume-kinchakugani]

(Fig. 3B)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-15, west of Chichi-jima I., 1 ♂ (3.8 × 3.4 mm), NSMT-Cr S 1193.

Remarks. The general shape of the carapace,

with two obtuse anterolateral teeth, the number and arrangement of the recurved teeth on the cutting edges of the fingers, and the stout and bilobed male first pleopod agree with the elaborate figures of the holotype given by Guinot (1976).

The coloration is characteristic, as shown in Fig. 3B. In the closest congener, *L. plumosa* Bar-

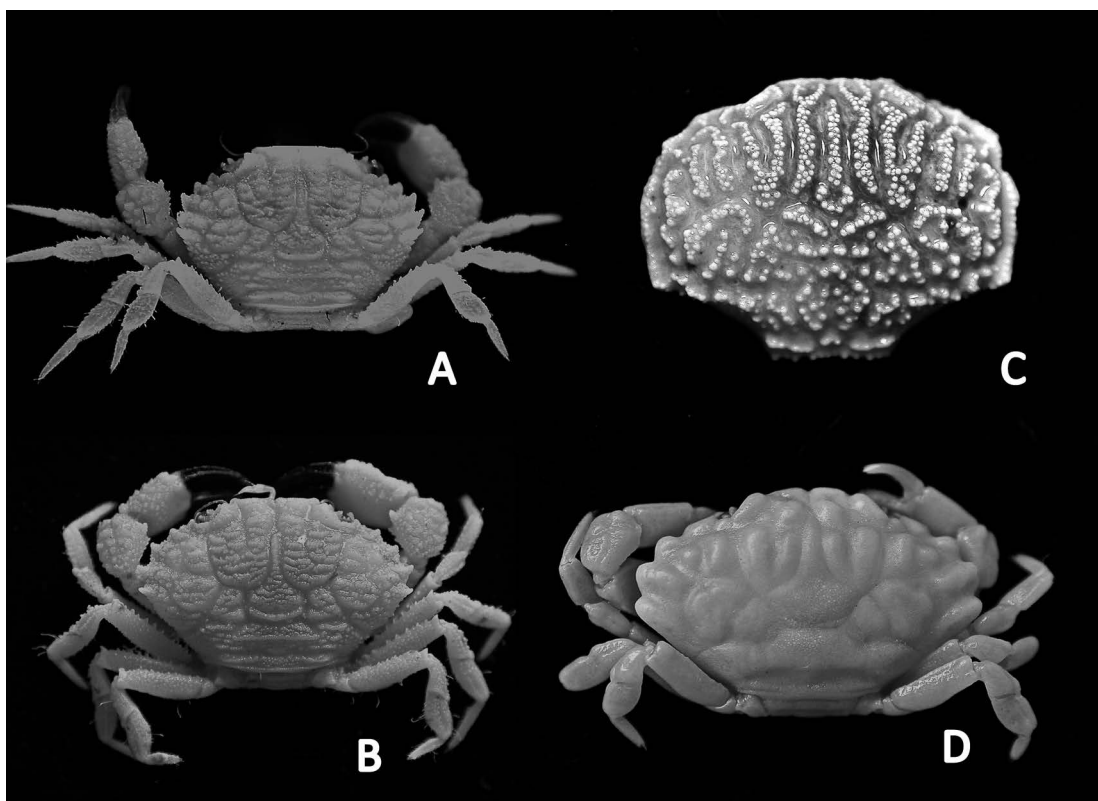


Fig 4. A, B: *Paraxanthodes cumatodes* (MacGilchrist), juv. (NSMT-Cr S 1213; 5.8×4.0 mm) (A), and ♀ (NSMT-Cr S 1211; 12.0×7.6 mm) (B). C: *Pseudactaea multiareolata* Takeda & Marumura, carapace (NSMT-Cr S 1218; 14.5×11.0 mm). D: *Liomera nigrimanus* Davie, ecdysis, ♀ (NSMT-Cr S 1187; 11.3×7.0 mm).

nard, there is no ocellate marking on the carapace.

Distribution. This species is very rare and known only by some records from the Indo-West Pacific waters, without intervening locality. The type locality is Ambon, Indonesia. Then, Barnard (1950) reported from Delagoa Bay, South Africa, but the record of occurrence in Fiji (Balss, 1938) was doubted by Guinot (1976). This is the first record from the Japanese waters with the bathymetric range of 81–83 m.

Genus *Meractaea* Serène, 1984

Meractaea takunan Komatsu & Takeda, 2011

[Japanese name: Kuroshio-awatsubu-gani]

Material examined. R/V *Tansei Maru*, KT-09-2 cruise, sta. KK1-2 (1), Kaikata Seamount, 1 ♂ (11.2×7.3 mm), holotype, NSMT-Cr S 1141.

Remarks. The male specimen re-examined is the holotype of the new species recently described by Komatsu and Takeda (2011) based on several specimens from the sea along the Kuroshio Warm Current off southern and central Japan. This species is the fourth in the genus *Meractaea* that has been composed of three species, *M. brucei* Serène, 1984 from East Africa, *M. tafai* Davie, 1992 from French Polynesia, and *M. multidentata* Davie, 1997 from New Caledonia. Their morphological differences are referred to the key prepared by Komatsu and Takeda (2011).

Distribution. The distributional range is from the Ryukyu Islands northeastwards to the Izu and Ogasawara Islands along the Kuroshio Current and its counter current, with the bathymetric range from 81 to 173 m.

Genus *Miersiella* Guinot, 1967

Miersiella cavifrons Takeda, 1989

[Japanese name: Amami-shin-ohgigani]

(Fig. 3C)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-05, West of Minami-jima I., 1 young ♂ (5.7×4.5 mm), NSMT-Cr S 1194; sta. KY-09-08, north of Haha-jima I., 1 juv. (4.4×3.3 mm), NSMT-Cr S 1195; sta. KY-09-09, north of Haha-jima I., 2 juvs (3.3×2.7 mm; 3.4×2.7 mm), NSMT-Cr S 1196; sta. KY-09-29, south of Nishi-jima I., 2 juvs (3.0×2.5 mm; 3.4×2.8 mm), NSMT-Cr S 1197; 2010 cruise, sta. KY-10-19, west of Chichi-jima I., 1 ♀ (6.6×4.6 mm), NSMT-Cr S 1198; sta. KY-10-31, west of Chichi-jima I., 1 juv. (3.2×2.7 mm), NSMT-Cr S 1199.

R/V *Tansei Maru*, KT-09-2 cruise, sta. TW2-4, west of Chichi-jima I., 1 juv. (3.2×2.8 mm), NSMT-Cr S 1200.

Remarks. The genus *Miersiella* is represented by the type species, *Medaeus haswelli* Miers, 1886, and the second species, *Miersiella cavifrons* Takeda, 1989. Of some differences between the two species, the most remarkable is that the median part of the frontal margin is concave in the newly added species. The fine photographs of these two species were recently given by Mendoza and Ng (2010) who examined many specimens from the Bohol Sea, with the comment that *M. cavifrons* is one of the most abundant euxanthine crabs at the sea concerned.

Most of the specimens examined are very young or juvenile; the carapace (Fig. 3C) is narrowly quadrate, flattened and armed with two anterolateral spines. The fine drawing of the syntype specimen of *M. haswelli* was given by Guinot (1967), from which the juvenile specimens are considerably different in the contour of the carapace. In the specimens examined, the carapace is flattened and granulated only along the anterolateral and frontal margins, and distinctly quadrate, with proportionally larger eyes; the anterolateral margin of the carapace is armed with first larger and second smaller spines and a vestigial third tooth. These differences are attributed to the juvenile stage of the specimens, and may be referred both to *M. haswelli* and *M. cavifrons*. In the juvenile and young specimens examined, the frontal margin is deflexed downward and divided into two lobes, and the median

part of the frontal margin including the median notch is distinctly or sometimes obscurely concave, just like the adult specimens characteristic for *M. cavifrons*.

As rightly indicated by Mendoza and Ng (2010), *M. haswelli* reported from the South China Sea by Serène and Vadon (1981) is to be corrected to *M. cavifrons*.

Distribution. The known localities of *M. haswelli* are New South Wales, Australia (Miers, 1886, as *Medaeus*; McNeill, 1953, as *Medaeus*), Kermadec Islands (Takeda and Webber, 2006, as *Miersiella*), Christmas Islands in the Indian Ocean (Calman, 1911, as *Xanthias*), Sagami Bay, Japan (Balss, 1922, as *Platypilumnus*), while *M. cavifrons* is recorded from Japan (vicinity of Kii Peninsula in the Pacific coast of central Japan, and Oshima Passage in Amami-Oshima Island, 40–70 m deep), the Bohol Sea, 25–400 m (Mendoza and Ng, 2010), and the South China Sea, 96–107 m (Serène and Vadon, 1981, as *M. haswelli*). This is the first record from the Ogasawara Islands with the bathymetric range of 60–152 m.

Genus *Nanocassiope* Guinot, 1967

Nanocassiope granulipes (Sakai, 1939)

[Japanese name: Sagami-hime-ohgigani]

(Fig. 3D)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 young ♂ ($4.3 \times \text{ca } 3.0$ mm; posterior part of carapace and abdomen broken), NSMT-Cr S 1201-1; 2010 cruise, sta. KY-10-27, south of Nishi-jima I., 1 juv. (3.4×2.7 mm), NSMT-Cr S 1204.

Remarks. The genus *Nanocassiope* now contains six species (Davie, 1995), with close similarities in the general shape of the carapace with *Alainodaeus* Davie, 1992, *Caralliope* Guinot, 1967 and some related genera. In the present genus, however, the male first pleopod is characteristic in having some stout, recurved spinules at apical part.

In the specimens examined the dorsal surface of the carapace is shallowly divided into regions by linear furrows and roughened with vesicular granules. The frontal margin is fringed with a

series of many small granules and followed dorsally with a line of larger granules. The anterolateral margin of the carapace is armed with four teeth, but the fourth is variable in their sizes from distinct teeth slightly smaller than the median two teeth to the distinct, but minute teeth; the median two teeth are always prominent, triangular in dorsal view and sharp at their tips. The chelipeds are heavy and slightly different in size, the outer surfaces of the carpus and palm being entirely covered with conical tubercles. The male first pleopod is twisted and armed with characteristic recurved spinules at distal end as figured by the original author.

Distribution. Probably endemic to Japanese waters, with a doubtful record from South Africa by Serène (1964). Although Takeda and Kurata (1977, 1984) recorded this species with question from the Ogasawara Islands, Davie (1995) corrected these records as *N. tridentata*. Thus, this is the first true record of this species from the Ogasawara Islands, with the bathymetric range of 54–60 m.

***Nanocassiope tridentata* Davie, 1995**

[New Japanese name: Mitsuha-hime-ohgigani]

(Fig. 5A)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 young ♀ (4.8 × 3.4 mm), NSMT-Cr S 1201-2; 2009 cruise, sta. KY-09-30, east of Nishi-jima I., 1 ♂ (5.0 × 3.5 mm), NSMT-Cr S 1203.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 ♂ (5.8 × 3.9 mm), NSMT-Cr S 1279; sta. D-2, 1 juv. (4.0 × 2.6 mm), NSMT-Cr S 1205.

Remarks. This species can be easily distinguished from the congener by having only three anterolateral teeth of the carapace. The present specimens agree well with the original description and illustration by Davie (1995).

Distribution. Previously known only from Ambon, Indonesia (Davie, 1995) and Amami-oshima Island, Japan (Takeda and Komatsu, 2005). This is the first record from the Ogasawara Islands with the bathymetric range of 41–136 m.

Genus *Palapedia* Ng, 1993

***Palapedia integra* (De Haan, 1835)**

[Japanese name: Goishigani]

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-30, east of Nishi-jima I., 1 young ♂ (6.2 × 5.6 mm), NSMT-Cr S 1206; 2010 cruise, sta. KY-10-06, north of Haha-jima I., 1 young ♂ (7.6 × 6.6 mm), 1 young ♀ (6.8 × 6.0 mm), NSMT-Cr S 1207.

Remarks. The genus *Palapedia* is known by 13 Indo-West Pacific species, most of which had been referred to the genus *Kraussia* Dana in the family Atelecyclidae. This group is now placed in the family Xanthidae by Ng (1993a). The identification of these young specimens is followed the keys prepared by Serène (1972) and Sakai (1939).

Distribution. Indo-West Pacific, ranging from Japan and Hawaii to the western Indian Ocean. The bathymetric range of the present study is 50–76 m.

Genus *Paractaeopsis* Serène, 1984

***Paractaeopsis tumulosus* (Odhner, 1925)**

[Japanese name: Ko-awatsubu-ohgigani]

(Fig. 1F)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-13, south of Haha-jima I., 1 juv. (5.0 × 4.5 mm), NSMT-Cr S 1208.

R/V *Tansei Maru*, KT-09-2 cruise, sta. TW1-1, west of Chichi-jima I., 1 juv. (4.6 × 3.5 mm), NSMT-Cr S 1210.

Remarks. This characteristic small species has been represented by Odhner (1925), Sakai (1939), Serène and Lang (1959) as *Actaea*, and Serène (1984) as *Paractaeopsis*. The dorsal surface of the carapace (Fig. 1F) is strongly vaulted, thickly covered with rounded or obtusely pointed granules and deeply separated into convex regions; the protogastric region (2M) is completely separated into two; the frontorbital region is sunken before the transverse furrow between the first anterolateral teeth of both sides. The anterolateral margin of the carapace is cut into four subequal teeth; the first is confluent with the external orbital angle and not convex; the second and third teeth are convex weakly and strongly, respectively; the last is sharp and directed almost

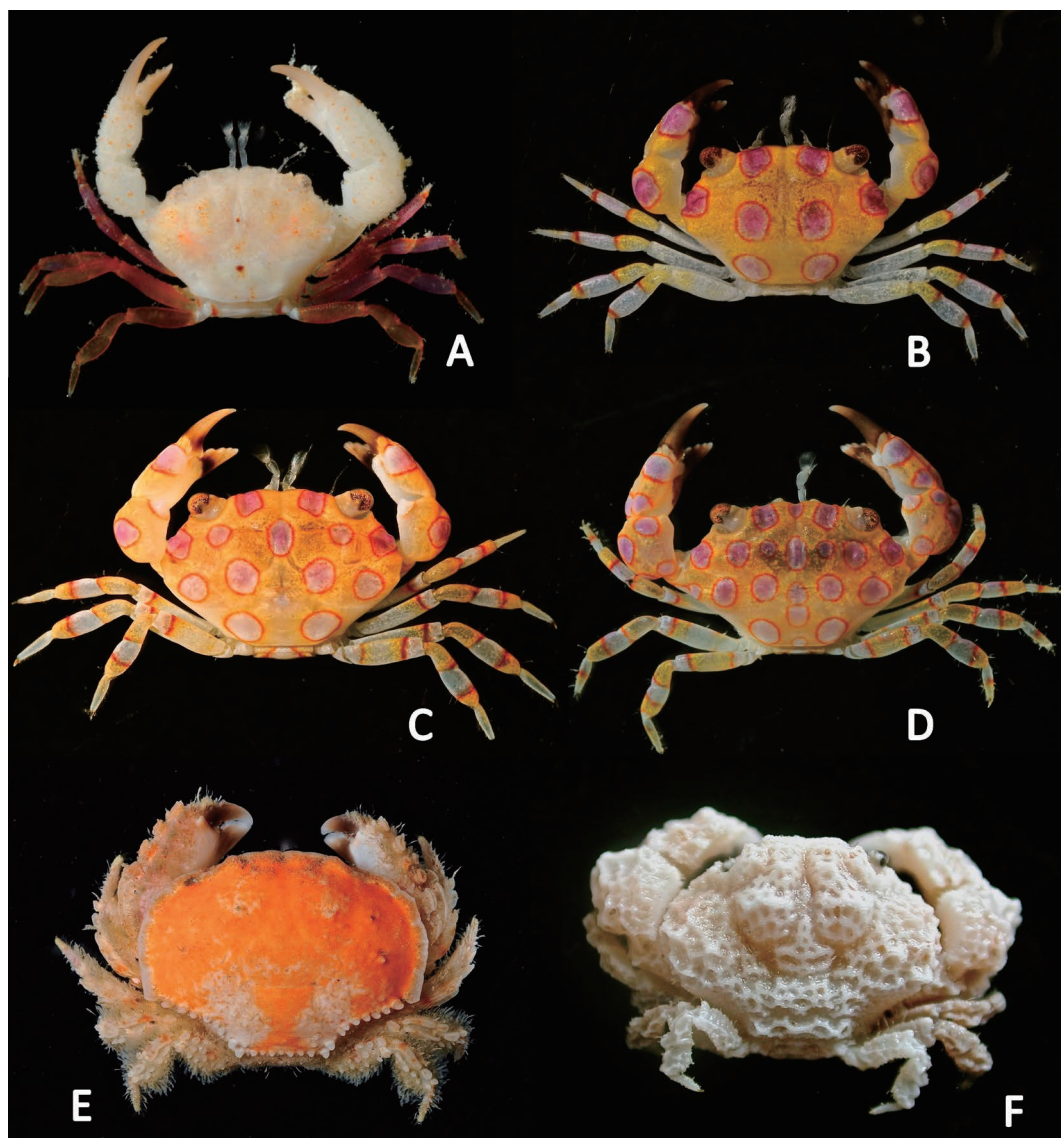


Fig 5. A: *Nanocassipe tridentata* Davie, ♂ (NSMT-Cr S 1203; 5.0 × 3.5 mm). B–D: *Xanthias maculatus* Sakai, showing variation of number, size and color of ocelli. B, ♂ (NSMT-Cr S 1233; 5.5 × 3.5 mm); C, ♀ (NSMT-Cr S 1232; 7.3 × 4.8 mm); D, ♂ (NSMT-Cr S 1234; 7.2 × 4.6 mm). E: *Pseudactaea corallina* (Alcock), ♀ (NSMT-Cr S 1216; 12.4 × 9.2 mm). F: *Visayax oateodictyon* Mendoza & Ng, ♂ (NSMT-Cr S 1219; 9.2 × 6.5 mm).

laterally. The chelipeds and ambulatory legs are thickly covered with subacute granules and sparsely with longish hairs; the chelipeds are short, and the outer surface of the carpus is divided into some convex regions. The ambulatory legs are short and stout.

Another representative of the genus, *P. quadri-*

areolatus (Takeda & Miyake, 1968), is differentiated in having each protogastric region subdivided into four areolets.

Distribution. Known from Dar-es-Salaam and Madagascar in the western Indian Ocean, and Fiji, Tahiti, Indonesia, Viet Nam, and Japan (Marumura and Kosaka, 2003, Shionomisaki, Kii

Peninsula, 10m deep) in the Pacific Ocean. This is the first record from the Ogasawara Islands with the bathymetric range of 52–145 m.

Genus *Paraxanthodes* Guinot, 1968

Paraxanthodes cumatodes (MacGilchrist, 1905)

[New Japanese name: Toge-oh-hime-ohgigani]
(Figs. 3E–F, 4A–B)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 ♀ (12.0 × 7.6 mm), NSMT-Cr S 1211; 2009 cruise, sta. KY-09-09, north of Haha-jima I., 1 juv. (4.9 × 3.6 mm), NSMT-Cr S 1212; 2010 cruise, sta. KY-10-06, north of Haha-jima I., 1 juv. (5.8 × 4.0 mm), NSMT-Cr S 1213.

Remarks. This species represents the genus *Paraxanthodes* together with *P. obtusidens* (Sakai, 1965) and *P. polynesiensis* Davie, 1992, being characteristic in having the typical euxanthine carapace, with the distinct regions divided by linear furrows, and provided with many, short transverse rows of vesicular granules. Each protogastric region (2M) is longitudinally subdivided and prominently rugose with transverse rows of vesicular granules. The anterolateral margin of the carapace is armed with four, more or less tuberculated teeth (Figs. 3E, 4B); in the juvenile specimens (Figs. 3F, 4A) the teeth are directed obliquely forward more strongly than in the larger specimen. The outer surfaces of the cheliped carpus and palm are covered with vesicular granules. The ambulatory legs are slender, and the anterior margin of each merus is armed with several erect, equidistant spinules; the anterior margins of the carpi and propodi are fringed with several conical tubercles directed distally.

Distribution. Known from the Red Sea, 168 m deep (Balss, 1929, as *Xanthias*), the Persian Gulf, 95 m deep (MacGilchrist, 1905, as *Xanthodes*), New Caledonia, 65–210 m deep (Davie, 1997), and Panglao Island in the Philippines, 83–102 m deep (Mendoza and Ng, 2010). This is the first record from the Japanese waters with the bathymetric range of 52–118 m.

Pilodius paumotensis Rathbun, 1907

[Japanese name: Tsuamotsu-ohgigani]

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-30, east of Nishi-jima I., 1 juv. (5.4 × 3.8 mm), NSMT-Cr S 1214.

Remarks. The specimen examined is juvenile, but can be identified as this species based on the characters mentioned as follows: 1) The carapace is covered uniformly with short setae and symmetrically with long bristles, 2) the supraorbital border is irregularly armed with sharp conical granules, and a cleft close to the external orbital spine is very deep, 3) the external orbital angle is armed with a sharp spine followed with two subsidiary spinules of good size at left side and one spinule at right side, 4) the anterolateral margin of the carapace is armed with three sharp spines at left side and two at right side, and these spines are directed obliquely forward; the anterior and posterior margins of first tooth are armed each with a subsidiary spinule, 5) the frontal margin is cut into two by a median U-shaped notch, 6) the outer surfaces of the cheliped carpus and palm are strongly spinose, 7) both fingers are deeply followed, with the horse-shoe tips, 8) the chelipeds and ambulatory legs are similarly hairy like the carapace, 9) the upper surfaces of the carpi and propodi of first two ambulatory legs are armed with spinules, both margins of the meri of all the pairs are fringed with a series of several recurved spines, the anterior margins of the carpi and propodi are also armed with a series of some sharp spines, and the posterior margin of each dactylus is armed with some small teeth along the whole length and a subdistal large tooth close to horny large terminal claw.

Most of these characters are not much different from those of the adult specimens from the Ryukyu Islands.

Distribution. This species was described from the Tuamotu Islands (Rathbun, 1907), and then recorded from the Chagoas Archipelago (Rathbun 1911), the Gilbert Islands (Balss, 1938), the Marshall Islands (Holthuis, 1953), the Maldive Islands (Guinot, 1962), the Ryukyu

Islands (Takeda and Miyake, 1968b), and the Ogasawara Islands (Imajima, 1970). The bathymetric range of the present study is 50–52 m.

Genus *Pseudactaea* Serène, 1962

Pseudactaea corallina (Alcock, 1898)

[Japanese name: Shikaku-awatsubu-gani]
(Fig. 5E)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-11, west of Chichi-jima I., 1 ♀ (13.1 × 9.6 mm), NSMT-Cr S 1215; 2010 cruise, sta. KY-10-04, north of Haha-jima I., 1 ♀ (12.4 × 9.2 mm), NSMT-Cr S 1216; sta. KY-10-27, south of Nishi-jima I., 1 ♀ (10.0 × 7.0 mm), NSMT-Cr S 1217.

Remarks. This species is known from Japan, with figures, by Takeda and Koyama (1974), Sakai (1976), and Takeda and Marumura (2002). The dorsal surface of the carapace is ill-defined contrary to the deeply sculptured surface of two other congeners, *P. multicristata* (Zehntner, 1894) and *P. multiareolata* Takeda & Marumura (2002).

Distribution. Indo-West Pacific from Japan to Madagascar through the Philippines, Indonesia and Sri Lanka, 26–150 m deep. This is the first record from the Ogasawara Islands with the bathymetric range of 56–101 m.

Pseudactaea multiareolata Takeda & Marumura, 2002

[New Japanese name: Meiro-awatsubu-gani]
(Fig. 4C)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-26, west of Chichi-jima I., 1 carapace (14.5 × 11.0 mm), NSMT-Cr S 1218.

Remarks. The specimen examined is the carapace as shown in Fig. 4C, and the sex is not distinguished. It agrees very well with the original description and photographs. The outline of the carapace is close to that of *P. corallina* (Alcock), but the dorsal surface is characteristically sculptured with deep narrow grooves to make complex, symmetrical labyrinth, making a kind of image of brain coral, *Platygyra*. The bottoms of grooves are smooth, but the tops of the walls are covered with small pearly granules. The frontorbital and anterolateral margins are fringed with

more or less thickened crest.

The genus *Pseudactaea* was revised by Takeda and Marumura (2002), in which this species was described as the third addition to *P. corallina* (Alcock, 1898) and *P. multicristata* (Zehntner, 1984).

Distribution. Previously known from the coast of Wakayama Prefecture, Kii Peninsula, Pacific coast of central Japan, 20–30 m deep. This is the second record of the species with the bathymetric range of 84–87 m.

Genus *Visayax* Mendoza & Ng, 2008

Visayax osteodictyon Mendoza & Ng, 2008

[New Japanese name: Abata-ohgigani]
(Fig. 5F)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 ♂ (9.2 × 6.5 mm), NSMT-Cr S 1219.

Remarks. Due to the original detailed description and fine figures, there is no doubt in the identification of this male specimen to the type species, *Visayax osteodictyon*, one of two representatives of the genus *Visayax*. The dorsal areolation of the carapace is very strong (Fig. 5F), with the raised protogastric regions and the deep interregional furrows, and the distinct reticulation and erosion of the dorsal surface and thoracic sternum of the carapace, the outer surfaces of the cheliped carpus and palm, the abdomen and the upper surfaces of the ambulatory legs are quite distinct and close to those of the holotype, only with minor differences in details.

Distribution. Known from some localities in the Bohol Sea, central Philippines, 3–25 m deep. This is the second record since the original description. The present male specimen was collected at 52–54 m deep off Chichi-jima Island.

Genus *Xanthias* Rathbun, 1897

Xanthias cherbonnieri Guinot, 1964

[Japanese name: Ginoh-hime-ohgigani]
(Figs. 1G–H)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-09, north of Haha-jima I., 1 ♂ (6.2 × 4.2 mm), NSMT-Cr S 1220; 2010 cruise, sta. KY-10-07, south of

Ane-jima I., 1 young ♀ (4.2×2.8mm), NSMT-Cr S 1221.

Descriptive notes on the specimens examined. Carapace transversely oval, weakly convex in both directions; dorsal surface obscurely areolated, microscopically granulated and pitted. Frontal, supraorbital and anterolateral margins more or less thickened for their entire lengths. Frontal margin separated into two lobes by a median small notch; each lobe deflexed, weakly convex. Anterolateral margin armed with four obtuse-tipped teeth behind undeveloped external orbital angle; first tooth small and low, but distinct from external orbital angle; second tooth largest of all, its anterior and posterior margins equal in length, weakly directed outward; third tooth similar to the second in shape, with tip more directed outward than the second, its posterior margin being much longer than the anterior; last tooth small, about half of preceding two teeth. Both chelipeds slightly different in size and shape; outer surface of carpus nodular; smaller palm tapers toward tips of fingers, larger palm weakly inflated, with fingers grooved inside; in both chelae basal half of movable finger and distal part and basal half of immovable finger dark brown. Ambulatory legs stout, not long; anterior margin of each merus serrulated, with a subterminal interruption; anterior margin of each carpus provided with some prominent nodules and a submarginal furrow; anterior margin of each propodus with two humps.

Remarks. In the young specimens examined, the anterolateral teeth are obtuse and somewhat different from the holotype female figured by the original author, in which all the teeth are rather acute. The characteristic color pattern agrees basically with original figure of the holotype from the western Indian Ocean and a female reported by Takeda (1977) from the Ogasawara Islands. As seen in the smaller female specimen (Fig. 1G), the carapace, chelipeds and ambulatory legs are pale yellow, with symmetrical lines of darker color connecting frontal, gastric, cardiac, intestinal, hepatic and branchial regions close to the figure of the holotype given by the

original author. In the larger male (Fig. 1H), however, more or less reticulated pattern is formed with many branches from the basic symmetrical lines. In both specimens the ambulatory legs are provided with whitish wide bands.

Distribution. Aldabra and Réunion in western Indian Ocean, 20m deep (Guinot, 1964; Serène, 1984); Ogasawara Is., 80m deep (Takeda, 1977). The bathymetric range of the present study is 99–118m.

Xanthias maculatus Sakai, 1965

[Japanese name: Ruri-mon-gani]

(Fig. 5B–D)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-25, west of Nishi-jima I., 6 juvs (2.4×1.8mm–3.4×2.4mm), NSMT-Cr S 1222; 2009 cruise, sta. KY-09-07, west of Minami-jima I., 1 juv. (2.6×2.0mm), NSMT-Cr S 1223; sta. KY-09-14, south of Haha-jima I., 1 ♂ (5.5×4.7mm), NSMT-Cr S 1225; sta. KY-09-29, south of Nishi-jima I., 1 juv. (2.5×2.0mm), NSMT-Cr S 1227; sta. KY-09-34, west of Minami-jima I., 2 juvs. (2.4×1.9mm; 2.6×2.2mm), NSMT-Cr S 1228; 2010 cruise, sta. KY-10-07, south of Ani-jima I., 1 juv. (2.5×2.0mm), NSMT-Cr S 1229.

R/V *Tansei Maru*, KT-09-2 cruise, sta. TW1-1, west of Chichi-jima I., 1 juv. (3.6×2.5mm), NSMT-Cr S 1230; sta. TW2-4, west of Chichi-jima I., 1 ♂ (5.0×3.4mm), 1 ♀ (5.2×3.5mm), NSMT-Cr S 1231.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-03, east of Muko-jima I., 1 ♂ (7.3×4.8mm), NSMT-Cr S 1232; sta. SY-09-04, east of Muko-jima I., 1 ♂ (5.5×3.5mm), NSMT-Cr S 1233; sta. SY-09-09, east of Muko-jima I., 1 ♂ (7.2×4.6mm), NSMT-Cr S 1234.

Remarks. Mendoza (2013) described a new species of the genus *Xanthias* from the Philippines, *X. joanneae*, and compared it with the type specimen of *X. maculatus* Sakai from Japan. Both species are very close in general shape of the carapace, chelipeds and ambulatory legs, but quite distinct in coloration with characteristic ocelli on the carapace, chelipeds and ambulatory legs. The original description of *X. joanneae* is complete to depict the distinction of both species, with emendation of the inaccurate illustrations of *X. maculatus* by Sakai (1965), and also pointed the misidentification of an ovigerous specimen from Amami-Oshima Island by Takeda and Komatsu (2005). As rightly considered by Men-

doza (2013), the ovigerous female having many small ocelli on the carapace, chelipeds and ambulatory legs are, without doubt, not referred to *X. maculatus*, but to *X. joanneae*. Therefore, hereafter, *X. joanneae* is to be known as the West Pacific species ranging from Amami-Oshima Island in the northern Ryukyu Islands southward to the Philippines.

A detailed examination of the fresh specimens obtained during the present researches revealed that *X. maculatus* shows the remarkable variation in the size and number of the ocelli on the carapace, chelipeds and ambulatory legs, as three photographs reproduced in Fig. 5B–D. This color variation may be not developmental, but individual.

Distribution. Endemic to Japanese waters, from the Sagami Sea and the Ogasawara Islands to Amami-Oshima Island in the Ryukyu Islands along the Pacific coast. This is the first record from the Ogasawara Islands with the bathymetric range of 60–172 m.

Family Domeciidae

Genus *Palmyria* Galil & Takeda, 1986

Palmyria palmyrensis (Rathbun, 1923)

[Japanese name: Toge-marudibiagani]

Material examined. TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 ♂ (4.3 × 3.2 mm), NSMT-Cr S 1276.

Remarks. This small species is a monotypic representative of the genus *Palmyria*, being distinguished from the genus *Jonesius* Sankaran-kutty, 1962 by the first three thoracic sternites forming an ogive, the ischium of the third maxilliped having its anterior angle produced, the finger of the smaller chela with few unequal teeth on cutting edges instead of the knife-like edges, and the first male pleopod being stout, sinuous and subtruncated at the tip different from the strongly tapering and curved pleopod of *Jonesius*.

Distribution. Widely distributed in the Indo-West Pacific coral reefs, Aldabra Island (Guinot, 1964), La Réunion (Serène, 1984), Indonesia (Serène *et al.*, 1976), Palmyra Island (Rathbun,

1923; Edmondson, 1923), Kuro-shima Island in the southern Ryukyu Islands (Marumura and Kosaka, 2003) and Japan (Sakai, 1967), without intervening localities. This is the first record from the Ogasawara Islands with the bathymetric range of 41–62 m.

Family Trapezidae

Genus *Quadrella* Dana, 1851

Quadrella coronata Dana, 1852

[Japanese name: Usuiro-sangogani]

Material examined. TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-17, west of Chichi-jima I., 1 young ♀ (6.4 × 6.0 mm), NSMT-Cr S 1277.

Remarks. The Japanese *Quadrella* species were revised by Galil and Takeda (1985), in which the occurrence of four species in Japanese waters was confirmed. The characteristic features of this species are the neatly spinose merus and two spined carpus of the cheliped, the tuberculate supraorbital angle, and the oblique anterolateral margins of the carapace. Galil and Takeda (1985) mentioned the color of the Ogasawara Islands specimens as the entirely semitransparent creamy white.

Distribution. Widely distributed in the Indo-West Pacific from Japan to South Africa as an obligate commensal of anthozoans. The present specimen is associated with gorgonian *Solenocaulon* sp. and the first record from the Ogasawara Islands with the bathymetric range of 98–101 m.

Family Pinnotheridae

Genus *Tetrias* Rathbun, 1898

Tetrias fisheri (A. Milne-Edwards, 1867)

[Japanese name: Minami-yokonaga-pinno]

Material examined. TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 ♂ (5.2 × 3.8 mm), NSMT-Cr S 1278.

Distribution. This species has already been recorded from Takinoura Bay in Ani-jima Island and Futami Bay in Chichi-jima Island, 45 and 42 m deep, respectively, by Takeda (1977). The geographical range is from Japan to New Caledonia in the West Pacific and the Andaman Islands in

the eastern Indian Ocean. The bathymetric range is from coral reef to 45 m deep.

Family Pilumnidae

Genus *Actumnus* Dana, 1851

Actumnus forficigerus (Stimpson, 1858)

[Japanese name: Ibotegani-modoki]

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-25, west of Nishi-jima I., 1 ♂ (5.2 × 3.8 mm), NSMT-Cr S 1236.

Remarks. The male specimen at hand seems to be not fully developed, because the pleopods are semitransparent, with the tips being not strongly recurved as in the figure represented by Takeda and Miyake (1969). The dorsal surface is rather even and ill-defined into the regions, being thickly covered with microscopic tomentum. The frontal margin is deflexed downward, divided into two lobes by a median V-shaped notch; each lobe is convex near the median notch and concave near the lateral end that is separated from the supraorbital angle by a distinct depression. The external orbital angle is triangle in dorsal view, being tipped with a horny spine; three anterolateral teeth behind the external orbital tooth are similar in shape to the external orbital tooth, but smaller and diminish the size posteriorly. The chelipeds and ambulatory legs are densely covered with long silky hairs. The chelipeds are heavy, unequal and thickly covered with conical granules of good size; most of the granules on the outer surfaces of the carpi and palms are armed each with the procurved horny tip. The meri of the anterior three pairs of the ambulatory legs are roughened by several microscopic tubercles along both margins.

The characteristic armature of the cheliped palm is not mentioned in the literature, but Takeda and Miyake (1969) gave the comment in the key to the species of the genus *Actumnus* dealt with by them. Recently, in describing a new *Actumnus*, *A. tsurukaii* from the Ryukyu Islands, Takeda and Komatsu (2017) mentioned this armature as one of the diagnostic feature of *A. forficigerus*.

Distribution. According to Takeda and

Miyake (1969), this species ranges from Sagami Bay to Amami-Oshima Island and the East China Sea. They recorded this species also from off Muko-shima Island in the Ogasawara Islands. Its bathymetric range is from 35 to 200 m. The specimen examined was obtained at the depth of 109–127 m.

Actumnus intermedius Balss, 1922

[Japanese name: Mizo-ibotegani]

(Fig. 6D)

Material examined. TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-02, east of Muko-shima I., 1 ♂ (6.0 × 4.8 mm), NSMT-Cr S 1237.

Remarks. The specimen is probably not fully developed, because Takeda and Miyake (1969) recorded the carapace breadth of the largest male and female as 24.8 and 21.4 mm, respectively. Most part of the carapace is of squamose appearance, with pavement of the depressed granules, and each posterolateral part of the carapace is deeply sunken and covered with entangling soft hairs.

Distribution. Japanese waters from Ibaraki Prefecture southwards to the west and north coasts of Kyushu along the Pacific coast, 18–150 m deep, and Takeda and Manuel (2000) recorded four specimens from Bohol, the Philippines. The recorded depth of the present specimen examined is 122–123 m.

Actumnus setosiareolatus Takeda, 1977

[New Japanese name: Ogasawara-ibotegani]

(Fig. 6F)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-25, west of Nishi-jima I., 2 juvs (3.6 × 2.7 mm; 3.8 × 3.2 mm), NSMT-Cr S 1238; 2009 cruise, sta. KY-09-13, south of Haha-jima I., 1 ovig. ♀ (7.6 × 5.9 mm), 1 ♀ (5.5 × 4.3 mm), NSMT-Cr S 1239; sta. KY-09-28, east of Nishi-jima I., 1 ovig. ♀ (12.5 × 9.0 mm), NSMT-Cr S 1240; sta. KY-09-30, east of Nishi-jima I., 5 juvs (3.2 × 2.6 mm–3.8 × 3.0 mm), NSMT-Cr S 1241; 2010 cruise, sta. KY-10-04, north of Haha-jima I., 1 ovig. ♀ (9.6 × 6.8 mm), NSMT-Cr S 1243; sta. KY-10-31, west of Chichi-jima I., 1 ♂ (6.1 × 4.5 mm), 1 ovig. ♀ (6.3 × 4.8 mm), NSMT-Cr S 1245.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-09, east of Muko-shima I., 1 young ♂ (4.4 × 3.6 mm), 1 young ♀

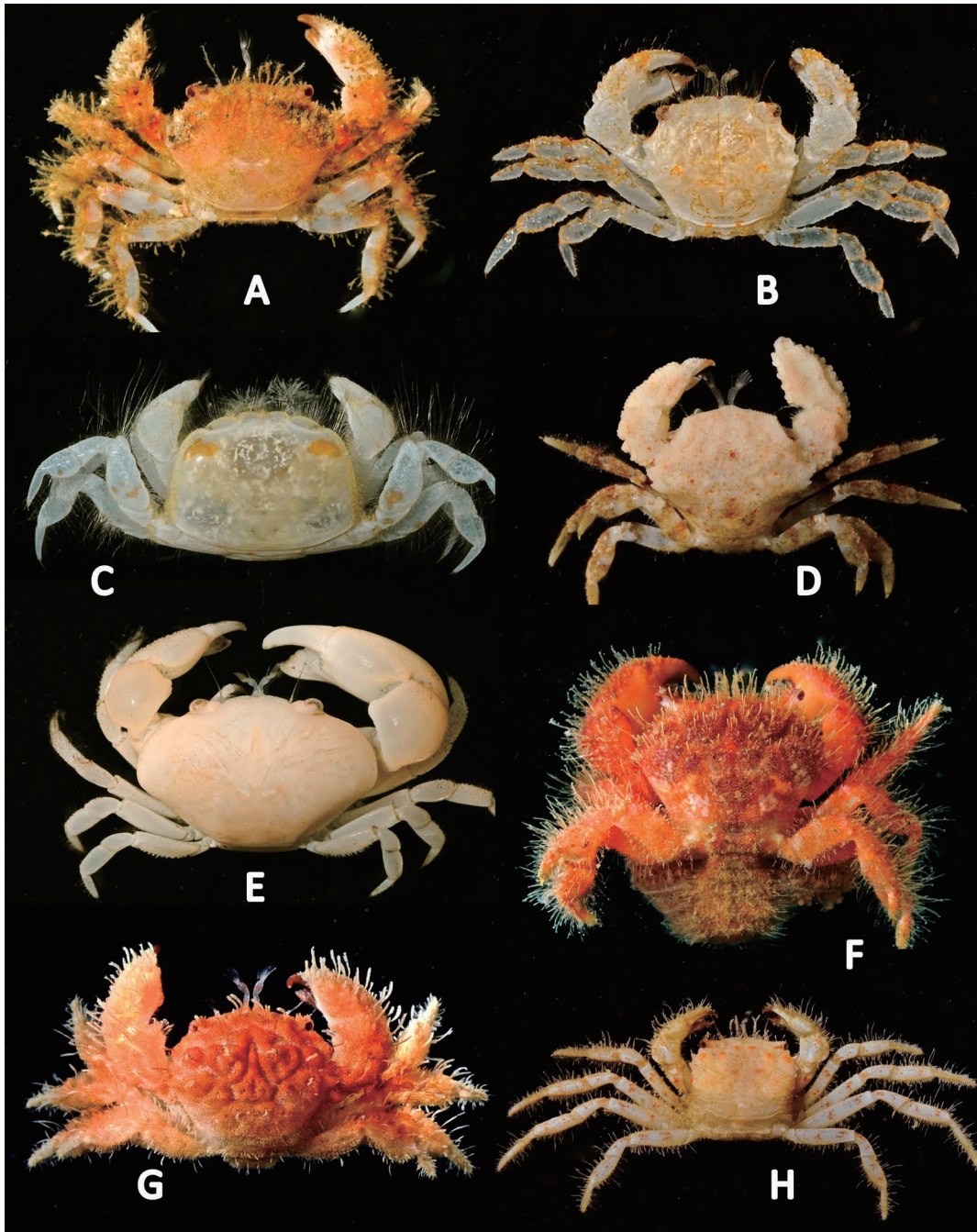


Fig 6. A: *Nanopilumnus modestus* sp. nov., paratype, ♀ (NSMT-Cr S 1259; 5.0×3.5mm). B: *Calmania balssi* (Sakai), young ♀ (NSMT-Cr S 1249; 3.8×3.0mm). C: *Mertonia lanka* Laurie, young ♀ (NSMT-Cr S 1257; 4.8×3.5mm). D: *Actumnus intermedius* Balss, ♂ (NSMT-Cr S 1237; 6.0×4.8mm). E: *Gorgonariana sodalis* (Alcock), ovig. ♀ (NSMT-Cr S 1250; 13.0×8.4mm). F: *Actumnus setosiareolatus* Takeda, ovig. ♀ (NSMT-Cr S 1240; 12.5×9.0mm). G: *Vellumnus pygmaeus* (Takeda), ♀ (NSMT-Cr S 1268; 4.5×3.5mm). H: *Lophoplax sextuberculata* Takeda & Kurata, ♂ (NSMT-Cr S 1253; 4.0×3.2mm).

(4.7×3.7mm), 1 juv. (3.5×3.0mm), NSMT-Cr S 1246; sta. SY-09-10, east of Muko-shima I., 1 ♂ (6.5×4.8mm), NSMT-Cr S 1247.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 young ♀ (5.1×4.2mm), NSMT-Cr S 1248.

Remarks. These specimens agree with the original description and figures, having the deeply areolated carapace covered with characteristic spongy tomentum and long stout setae on each areola. Even in the juvenile or young specimens the areolation and tomentum are very similar to those of the adult specimens.

Distribution. Three males (holotype and paratypes) were dredged up from Takinoura Bay, Ani-jima Island in the Ogasawara Islands, 47m deep. The bathymetric range of the present study is 41–148m.

Genus *Calmania* Laurie, 1906

Calmania balssi (Sakai, 1935)

[Japanese name: Barusugani]

(Fig. 6B)

Material examined. TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-04, east of Muko-shima I., 1 young ♀ (3.8×3.0mm), NSMT-Cr S 1249.

Remarks. This species has been described as a species of the genus *Ralumia* Balss, 1933, that is now known as a synonym of the genus *Calmania* Laurie, 1906. The general shape of the carapace and chelipeds of the specimen at hand (Fig. 6B) is close to that of the type species, *C. prima* Laurie, 1906, but the carapace is thick and different from the thin frontal and anterolateral margins of the carapace in *C. prima*, and thus the specimen is to be identified as *C. balssi*.

The carapace, chelipeds and ambulatory legs are rather sparsely but uniformly covered with long simple hairs; the anterolateral margin of carapace is armed with two prominent obtuse lobes and a much smaller lobe behind them. The chelipeds are covered with warty granules of good size on the outer surfaces of the carpus and palm; the granules on the palm are arranged to about five longitudinal rows. The ambulatory legs are armed with spinules on both margins of each article.

Distribution. Hitherto been known from Sagami Bay and the vicinity of Kii Peninsula, Pacific coast of central Japan, 35–100m deep. This is the first record from the Ogasawara Islands at the depth of 152–159m.

Genus *Gornonariana* Galil & Takeda, 1988

Gornonariana sodalis (Alcock, 1898)

[New Japanese name: Utsuroyagi-yadorigani]

(Fig. 6E)

Material examined. R/V *Tansei Maru*, KT-09-2 cruise, sta. TW2-4, west of Chichi-jima I., 1 juv. (5.3×3.7mm), NSMT-Cr S 1252.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-17, west of Chichi-jima I., 1 ovig. ♀ (13.0×8.4mm), NSMT-Cr S 1250; sta. SY-09-18, west of Chichi-jima I., 1 juv. (3.7×2.9mm), NSMT-Cr S 1251.

Remarks. This species is a monotypical representative of the genus *Gornonariana* Galil & Takeda, having the unique characters such as the smooth carapace, chelipeds and ambulatory legs, and the strongly spinose posterior margin of the fifth ambulatory merus. In the juvenile specimens examined, the anterolateral margin of the carapace is separated into three low lobes contrary to the undivided margin in the adult specimens, and the palms of both chelipeds are distinctly different in size like the adult specimens, but the larger palm is armed with sharp tubercles quite different from the smooth, shining, longer palm of the adult specimens.

This species was first added to the carcinological fauna of Japan by Odhner (1925) as *Pilumnus sodalis* based on the specimen from the Bonin (= Ogasawara) Islands, then transferred to the genus *Glabropilumnus* Balss by Takeda and Miyake (1968c), and finally designated as the type species of the new genus *Gornonariana* by Galil and Takeda (1988). According to Galil and Takeda (1988), *Liomera spinipes* Borradaile, 1902 from the Maldives Islands is synonymous with this species.

The present specimens were found in the hollow stem of the gorgonian, *Solenocaulon* sp., just like the previous records by Alcock (1898), Takeda and Miyake (1968c), and Galil and Takeda (1988).

Distribution. Indo-West Pacific from central Japan through the East China Sea and the Philippines to Sri Lanka and the Maldive Islands, central Indian Ocean. The bathymetric range recorded in this study is 98–191.1 m.

Genus *Lophoplax* Tesch, 1918

Lophoplax sextuberculata Takeda & Kurata,
1984

[New Japanese name: Akahoshi-takogani]

(Fig. 6H)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-15, west of Chichi-jima I., 1 ♂ (4.0 × 3.2 mm), NSMT-Cr S 1253.

Remarks. The present specimen is much smaller than the holotype female (8.2 × 6.3 mm) and paratype males (5.2 × 3.8 mm) obtained from stomach contents of sidespot goatfish, *Parupeneus pleurostigma* from Ani-jima Island, and also from paratype male (5.5 mm in carapace breadth) from Tanega-shima Island, southwestern Japan. The present specimen agrees well with the original description and figures in the general shape, hairiness and ornamentation, even in having six bare, raised areolets behind the frontorbital margin. The carapace is proportionally narrower, the bare areolets are larger, and two anterolateral teeth are sharper than in the type specimens. These discrepancies are considered to be the developmental variation due to the smaller size. Takeda and Marumura (1995) published a paper amending the original description, because they examined some fresh specimens from the vicinity of Kii Peninsula, central Japan, having eight denuded areolets marked with dark brick red. The additional two areolets are bare, without hairs, but hardly raised. The present specimen is completely discolored, and the additional areolets are not distinguished.

Distribution. Endemic to Japan, known from the Ogasawara Islands, the vicinity of Kii Peninsula, and Tanega-shima Island in the south of Kyushu. The known bathymetric depth is ca. 70 m deep at the east of Tanega-shima Island, and in this study the specimen was obtained from the depth of 81–83 m.

Lophoplax takakurai Sakai, 1935

[Japanese name: Takogani]

(Fig. 7)

Material examined. R/V *Koyo*, 2010 cruise, sta. KY-10-25, Futami Bay, Chichi-jima I., 1 ♂ (5.0 × 4.2 mm), NSMT-Cr S 1254.

Remarks. Only two females are known since the original description in 1935. The original description is not thorough for the subsequent identification, and the original colored figure was merely reproduced in the following papers (Sakai, 1939, 1965).

The specimen examined is a male, so that there may be certain sexual differences as for the shape of the chelipeds in addition to the primary sexual characters. As noted in the following lines, the male specimen at hand is somewhat different from the original description in the anterolateral armature of the carapace, but agrees well in having the characteristic two rows of calluses on the outer surface of the cheliped carpus. The following is a supplementary description of the male.

The carapace (Fig. 7A) is distinctly quadrate, and its dorsal surface is wholly covered densely with short shaggy hairs, sparsely with stiff setose hairs and pearly granules; the areolation is made obscure by the hairs, but on denudation the dorsal surface is divided into the protogastric, mesogastric, cardiac and branchial regions by the linear shallow furrows; the anterolateral margin is only weakly convex, nearly longitudinal and armed with five tubercles including the one at the external orbital angle; they are directed obliquely forward and upward; the second and third tubercles are larger than the others, and the last is much smaller than the others. The frontal area is smooth, without hairs, perpendicularly deflexed, with a distinct median notch; each lobe is most strongly developed near the median notch: its outer end is angled as the inner supraorbital angle; the inner part of the supraorbital margin is deeply excavated inward to constrict the frontal area.

Both chelipeds are quite different in size and shape, with the right cheliped much larger than

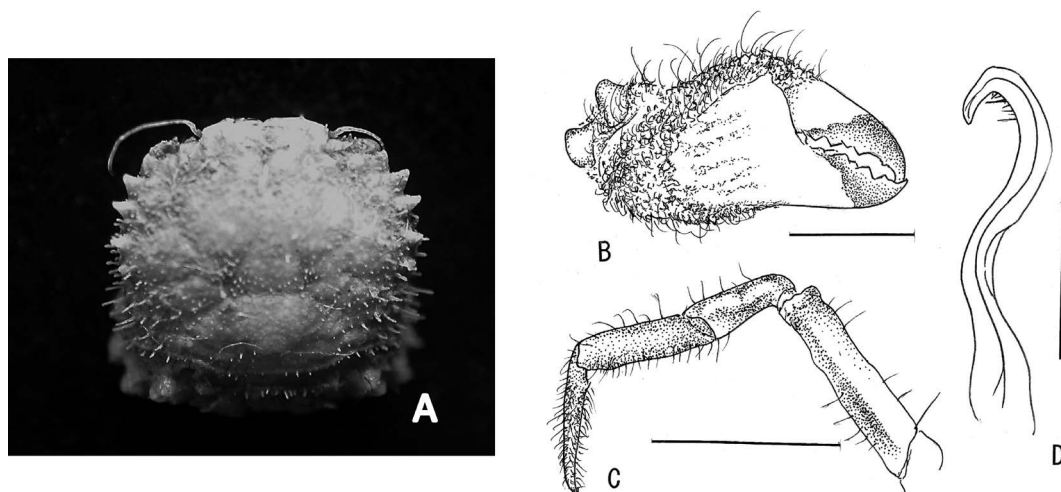


Fig 7. *Lophoplax takakurai* Sakai, ♂ (NSMT-Cr S 1254; 5.0 × 4.2 mm). Carapace (A), right chela in outer view (B), left third ambulatory leg in dorsal view (C), left first pleopod in ventral view (D). Scale for B = 5 mm, C = 3 mm, D = 1 mm.

the left in the male at hand; in the larger cheliped the merus, carpus and palm are covered with shaggy hairs and stiff setae similar to those covering the carapace; the upper margin of the merus is armed with a conical subterminal tooth, with the distal margin thickened; the outer surface of the carpus is furnished with two longitudinal, parallel, smooth calluses; the palm (Fig. 7B) is high and compressed, with the whole upper surface and the basal half of the outer surface covered with shaggy hairs, stiff setae and pearly granules, but the distal half of the palm is quite smooth and shining, without hairs and granules; the fingers are sharply toothed, with dark color on the teeth and distal halves of the fingers; the smaller cheliped is slender, with similar armature and hairiness, but the palm is narrow, with shaggy hairs and pearly granules on the whole surface, close to the original figure.

The ambulatory legs (Fig. 7C) are tubercular, slender, and hairy like the carapace and chelipeds; each upper surface of the carpi is weakly raised to form a longitudinal callus. The male abdomen is seven-segmented; the first male pleopod (Fig. 7D) is distinctly *Pilumnus*-type, strongly curved at the middle and armed with some setaceous hairs at the base of the beak.

Distribution. Hitherto been reported from Sagami and Mikawa bays, Pacific coast of central Japan, 50–100 m deep. The recorded depth of the present specimen is 41.6–42.2 m in Futami Bay, Chichi-jima Island.

Genus *Mertonia* Laurie, 1906

Mertonia lanka Laurie, 1906

[Japanese name: Merutogani]

(Fig. 6C)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-28, east of Nishi-jima I., 1 ♀ (4.3 × 3.2 mm), NSMT-Cr S 1255; 2010 cruise, sta. KY-10-19, west of Chichi-jima I., 1 juv. (3.0 × 2.2 mm), NSMT-Cr S 1256.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-01, east off Muko-shima I., 2 young ♀♀ (4.8 × 3.5 mm; 4.4 × 3.2 mm), NSMT-Cr S 1257; sta. SY-09-08, east off Muko-shima I., 1 ♀ (5.0 × 3.8 mm), NSMT-Cr S 1258.

Remarks. This characteristic small species is the type species and one of the two representatives of the genus *Mertonia* Laurie, repeatedly figured by Sakai (1939, 1965, 1976) from Japanese waters.

Distribution. Hitherto been recorded from Japan and Sri Lanka, 35–50 m deep. Marumura and Kosaka (2003) recorded this species from Chichi-jima Island, the Ogasawara Islands, 100 m deep. The present bathymetric records in the

Ogasawara Islands are from 52.1 to 109 m.

Genus *Nanopilumnus* Takeda, 1974

Nanopilumnus modestus sp. nov.

[New Japanese name: Ko-kawari-kebukagani]

(Figs. 6A, 8A, B, 9)

Material examined. TR/V *Shin'yo Maru*, 2003 cruise, sta. 20, north of Hachijo-jima I., Izu Is. (33°27.3' N, 139°42.6'E–33°27.7' N, 139°42.4'E, 200–211 m deep), 1 ♂ (5.0 × 3.7 mm), holotype, NSMT-Cr S 587, 21 October 2003, H. Komatsu leg.

R/V *Tansei Maru*, KT-09-2 cruise, sta. TW2-1, west of Chichi-jima I., 1 juv. ♀ (right side of carapace, damaged; length of carapace, 2.4 mm), non-type, NSMT-Cr S 1260.

TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-11, east of Muko-shima I., 1 ♀ (5.0 × 3.5 mm), paratype, NSMT-Cr S 1259.

TR/V *Seiyo Maru*, 1995 cruise, sta. D-5, south of Chichi-jima I., 1 ♂ (3.3 × 2.5 mm), 2 ovig. ♀♀ (4.7 × 3.6 mm; 4.8 × 3.8 mm), 2 ♀♀ (4.7 × 3.9 mm; 5.0 × 3.9 mm), paratypes, NSMT-Cr S 1261, and 3 juvs (2.4 × 1.9 mm; 2.7 × 2.0 mm; 2.7 × 2.1 mm), non-type, NSMT-Cr S 1262.

Description of holotype male. General shape and hairiness with typical *Pilumnus*-type, with ca.1.4 in ratio of carapace breadth to length. Carapace (Figs. 8A, 9A) strongly convex fore and aft, wholly covered with soft club-shaped hairs of various lengths; on denudation, its dorsal surface smooth, ill-defined; gastric and cardiac regions distinguished, but not convex; hepatic region also barely traceable as low rounded mound behind orbit.

Frontal region directed obliquely downward, forming lamellar truncated margin; median notch of frontal margin small, the lateral end continuous with supraorbital margin without distinct depression or bight. Supraorbital margin separated into two parts by median small notch; inner part of supraorbital margin weakly raised, while outer part distinctly raised and weakly convex forward along inner two thirds and shallowly concave near the external orbital angle that is strongly developed as a more or less depressed tooth with a sharp horny tip.

Anterolateral margin of carapace armed with three prominent teeth behind external orbital angle (Figs. 8A, 9A); first tooth tubercular in dorsal view, but distinctly depressed and lobular,

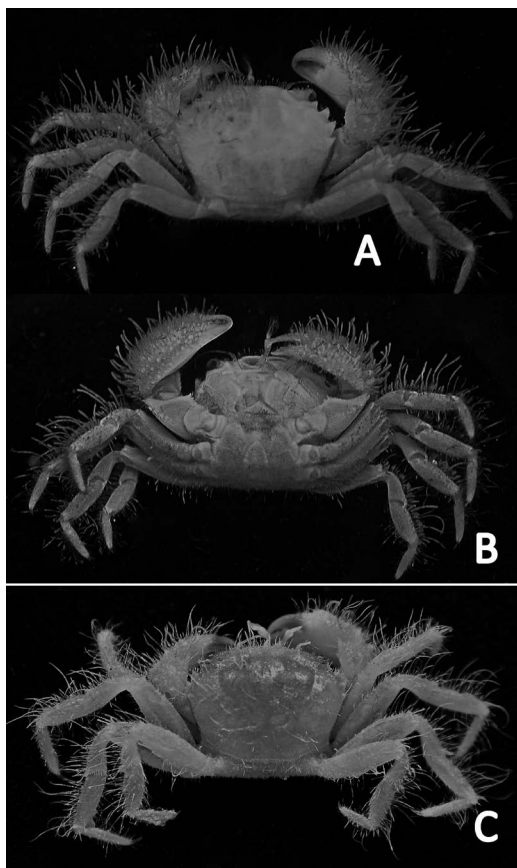


Fig 8. A, B: *Nanopilumnus modestus* sp. nov., holotype, ♂ (NSMT-Cr S 587; 5.0 × 3.7 mm). C: *Viaderiana* aff. *aranea* (Tesch), young ♀ (NSMT-Cr S 1275; 7.8 × 5.7 mm).

with horny tip, about twice as large as external orbital tooth; first tooth more distinctly directed forward than external orbital tooth, with convex outer margin; second tooth as large as first tooth, similarly depressed for most part, but more or less thickened at base; its outer margin almost straight, obliquely directed forward; first and second teeth generally on level of anterolateral margin of carapace, but oblique to dorsal surface of carapace; basal part of anterior margin of each tooth on dorsal surface of carapace, while basal part of posterior margin just on level of anterolateral margin of carapace; last tooth similar to first and second teeth in dorsal view, but smaller and tuberculated, both of anterior and posterior margins being strictly on level of anterolateral mar-

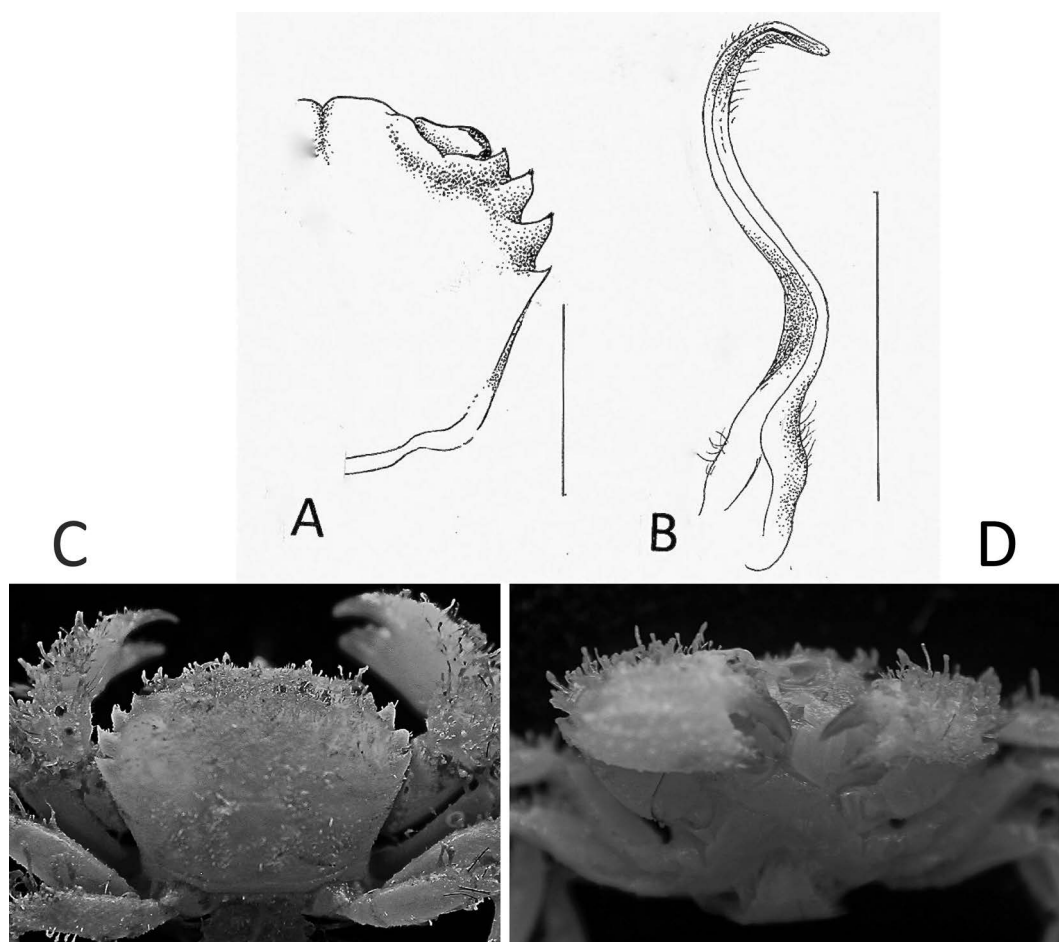


Fig 9. *Nanopilumnus modestus* sp. nov. A, B: Holotype, ♂ (NSMT-Cr S 587; 5.0 × 3.7 mm). Right half of carapace (A), denuded to show the anterolateral teeth, and left first pleopod (B) in ventral view. Scale for A = 2 mm, for B = 1 mm. C, D: Paratype, ♀ (NSMT-Cr S 1259; 5.0 × 3.5 mm).

gin of carapace.

Chelipeds unequal, right being larger; whole surfaces of carpus and palm thickly covered with club-shaped shaggy hairs of variable lengths and conical granules of good size; larger palm inflated, with short and stout fingers.

Ambulatory legs (Fig. 8A, B) comparatively long, thickly covered with long club-shaped hairs of variable lengths; anterior margin of each meri of first two pairs armed with conical small granule in middle.

Abdomen (Fig. 8B) narrow and seven-segmented as usual in pilumnid crabs. First pleopod (Fig. 9B) distinctly *Pilumnus*-type, strongly

curving and winding, with long beak.

Notes on paratype specimens. A paratype male in NSMT-Cr S 1261 is much smaller than the females and probably immature. Its first pleopod is long and similar to that of the holotype, but semitransparent and weak.

A live color of a female (NSMT-Cr S 1259) is reproduced together with a photograph of the same specimen long preserved in spirit (Figs. 6A, 9C). The general formation of the carapace agrees quite well with that of the holotype, with the tip of the right second teeth being snapped off. The chelipeds (Fig. 9D) are also close to those of the holotype, but the outer surface of the

larger (right) palm is almost denuded; the conical granules are of good size and rather arranged into four or five longitudinal rows. The armature of the ambulatory meri is vestigial, but really armed with a small conical granule.

Two ovigerous females and one non-ovigerous female in NSMT-Cr S 1261 are generally more hairy than the holotype, and the carapace is wholly covered with a short soft tomentum and long club-shaped hairs, and the anterolateral armature of the carapace is entirely disguised by them.

Notes on non-type specimens. In four juvenile specimens (NSMT-Cr S 1260, 1262), the carapace, chelipeds and ambulatory legs are covered with a soft tomentum much more thickly than in the type specimens. They represent the specific characters as for the anterolateral lateral margin of the carapace, but are too small and fragile to designate as the paratypes.

Remarks. At a first glance, this small *Pilumnus*-type species is not so characteristic in its general appearance, but the armature of the anterolateral margin of the carapace is distinctive for the species. As described above, the bases of the first and second teeth are not horizontal toward the true anterolateral margin of the carapace, with its anterior margin directed toward the dorsal surface of the carapace.

The genus *Nanopilumnus* is, as listed by Ng *et al.* (2008), represented by *N. barbatus* (A. Milne-Edwards, 1873), *N. boletifer* (Monod, 1956), *N. coralliophilus* (Takeda & Miyake, 1969), *N. heterodon* (Sakai, 1939) and *N. rouxi* (Balss, 1935). All the species are small in size, armed with three stout, sometimes lobate anterolateral teeth of carapace, and the dorsal surface of the carapace is divided into regions obscurely or shallowly, with more or less distinct hepatic areola. Among the five congeneric species this new species is most close to *N. barbatus* and *N. heterodon*.

Sankarankutty (1962) and Takeda and Miyake (1969) followed Balss (1938) who considered that *N. heterodon* is synonymous with *N. barbatus*. Later, however, Sakai (1976) resurrected *N.*

heterodon on direct comparison of the specimens from New Caledonia and Japan, because in *N. barbatus*, the first anterolateral tooth is placed on higher level than the true anterolateral margin of the carapace, the second tooth is lobular, not tuberculiform, and the dorsal surface of the carapace is rather well separated into regions. Takeda and Manuel (2000) identified the Philippine specimen as *N. heterodon*. It is true that in *N. heterodon* the first anterolateral tooth is horizontal and on the higher level than the true anterolateral margin and in *N. barbatus* the third tooth is figured to be tuberculiform in the original description.

In the new species the first anterolateral tooth is oblique in position and neither horizontal nor on the higher position unlike in both species, and the third anterolateral tooth is not tuberculiform as in *N. barbatus*, but also not lobate as in *N. heterodon*.

Etymology. The specific name of the new species is derived from the Latin, *modestus*, because this species is the small and inconspicuous among the pilumnoid crabs.

Distribution. The known localities are the Izu and Ogasawara Islands off the Pacific coast of central Japan, 125–210 m deep. The close relative, *N. barbatus*, is known from New Caledonia, and the geographical range of another relative, *N. heterodon*, is from Japan to the Nicobar Islands through some localities in the Philippines, the Palau Islands and Singapore.

Genus *Pilumnus* Leach, 1815

Pilumnus izuogawasawaraensis Takeda & Ng, 1997

[New Japanese name:

Izu-Ogasawara-kebukagani]

Material examined. TR/V *Shin'yo Maru*, 2009 cruise, sta. SY-09-02, east of Muko-shima I., 1 juv. (3.6 × 2.7 mm), NSMT-Cr S 1263.

Remarks. The specimen examined is juvenile, with carapace breadth 3.6 mm, but agrees with the original description. The carapace is rather rounded, not convex, covered with rather scant long hairs, with the regions poorly defined, armed with three small spiniform teeth on the

anterolateral margin of the carapace. As mentioned in the original description, this species bears a superficial resemblance to the species of the genus *Viaderiana* Ward, but the last anterolateral tooth is distinct and the ambulatory meri are unarmed.

Distribution. Originally reported from the northeast of Ototo-jima Island in the Ogasawara Islands, and Kurose, submarine bank off the Izu Islands, 130–190 m deep. The juvenile specimen examined was obtained at the depth of 122–124 m.

***Pilumnus* sp.**

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-28, east of Nishi-jima I., 1 juv. (4.0 × 3.0 mm), NSMT-Cr S 1264.

Remarks. This specimen is characterized by that (1) the dorsal surface of the carapace is convex, weakly areolated and covered uniformly with short setae and sparsely with longish setae at the frontal region, (2) the frontal margin is directed downward and separated into two by a large V-shaped notch, (3) the external orbital angle is strongly developed, tipped with a spinule, and similar in shape and size with the first two anterolateral teeth, (4) the third anterolateral tooth is sharp and similar to the proceeding two, but slightly smaller, (5) the chelipeds are heavy, unequal, covered with setae of variable lengths and conical or rather sharper teeth, (6) both palms of the chelipeds are inflated, especially in the larger palm, (7) the fingers are rather short, strongly toothed and curved, and (8) the ambulatory legs are unarmed and covered with setae of variable lengths.

In the specimen examined, in spite of its juvenile stage, it is remarkable that the inflated larger palm, with short and curved fingers, is similar to the chelipeds of adult forms of some species. The specimen is not referred to the known species from Japanese waters, but too small for the definite identification to the species.

Genus *Vellumnus* Ng, 2010

***Vellumnus pygmaeus* (Takeda, 1977)**

[New Japanese name: Chibi-meiro-kebukagani]
(Fig. 6G)

Material examined. R/V *Koyo*, 2008 cruise, sta. KY-08-20, east of Chichi-jima I., 1 young ♀ (3.5 × 3.0 mm), NSMT-Cr S 1265; 2009 cruise, sta. KY-09-14, south of Haha-jima I., 2 ♂♂ (5.2 × 4.1 mm; 4.5 × 3.3 mm), 1 ovig. ♀ (4.5 × 3.4 mm), NSMT-Cr S 1266; sta. KY-09-30, east of Nishi-jima I., 2 ♀♀ (5.7 × 4.2 mm; 5.0 × 3.6 mm), 2 juvs (3.8 × 3.0 mm; 3.7 × 3.0 mm), NSMT-Cr S 1267; 2010 cruise, sta. KY-10-03, north of Haha-jima I., 1 ♀ (4.5 × 3.5 mm), NSMT-Cr S 1268; sta. KY-10-04, north of Haha-jima I., 2 ♂♂ (5.5 × 3.8 mm; 4.0 × 3.0 mm), NSMT-Cr S 1269; sta. KY-10-06, north of Haha-jima I., 3 ♂♂ (3.7 × 2.8 mm–5.0 × 4.0 mm), 1 ♀ (4.0 × 2.9 mm), NSMT-Cr S 1270; sta. KY-10-27, south of Nishi-jima I., 1 ♂ (4.4 × 3.5 mm), 2 young ♀♀ (3.5 × 2.6 mm–3.8 × 2.8 mm), NSMT-Cr S 1271.

R/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 ♂ (4.0 × 3.4 mm), NSMT-Cr S 1272; Sta. D-6, south of Minami-jima I., 1 ♂ (6.5 × 5.2 mm), NSMT-Cr S 1273.

Remarks. Ng (2010) established a new genus, *Vellumnus*, to accommodate three species of the genus *Pilumnus* Leach, *P. vermiculatus* A. Milne-Edwards, 1873, *P. labyrinthicus* Miers, 1884 and *P. penicillatus* Gordon, 1930, and two species referred to the genus *Planopilumnus* Balss, *P. minabensis* Sakai, 1969 and *P. pygmaeus* Takeda, 1977. The type species is *P. labyrinthicus* known from Australia and Singapore.

This species is small in size, resembling to *P. labyrinthicus* in having the labyrinth-like pattern of setae on the carapace, but the details of the labyrinth-like pattern are rather simple, the sculpture of the areolae are shallower, and the anterolateral teeth are not so sharp as in *P. labyrinthicus*.

Distribution. Hitherto known only by the type specimens from the north of Nishi-jima Island in the Ogasawara Islands, 75 m deep. The bathymetric range of the present study is 41–105.6 m.

Genus *Viaderiana* Ward, 1942

Viaderiana affinis (Tesch, 1918)

[Japanese name: Hime-okinagani-modoki]

Material examined. TR/V *Seiyo Maru*, 1995 cruise, sta. D-1, west of Ani-jima I., 1 young ♀ (5.5 × 4.0 mm), NSMT-Cr S 1274.

Remarks. The carapace and ambulatory legs of this young female are covered with silky hairs typical for the genus *Viaderiana*, although both chelipeds and all of the ambulatory legs of right side are missing. The carapace is rounded quadrangular and covered with sparse short hairs, with the gastric and cardiac regions hardly distinguished from the branchial regions. The frontal regions are strongly deflexed downward, with a median V-shaped notch on the frontal margin. The orbit is as wide as each frontal lobe, with the supraorbital margin weakly raised as a narrow rim; inner half of the supraorbital margin is excavated, and the median part is weakly convex forward. The external orbital angle is merely indicated as an extension of the supraorbital rim. The anterolateral margin of the carapace is armed with three small teeth tipped each with a horny spine; the first two are directed forward and subequal, or the preceding is slightly larger; the last is apparently smaller, but distinct. The ambulatory legs are seemingly slender, but moderate in length for the *Viaderiana* species, being densely fringed with long silky hairs along both margins; in each of the meri of the first two pairs, the anterior margin is armed with two or three small, rather vestigial tubercles or granules along the anterior margin, but in the posterior two pairs the meri are quite unarmed.

The discrepancy between the original description and this young female is that in this specimen the dorsal surface of the carapace is smooth without microscopic granules different from the description, and that the first two ambulatory meri of this species are armed with two or three minute, obtuse tubercles contrary to the wholly unarmed meri in the original description.

Distribution. Originally reported from the south of Saleyer Island in the Flores Sea and Paternoster Islands in the north of Sumbawa,

Indonesia, 8–36 m deep. This is the first record from the Japanese waters at the depth of 41–62 m.

Viaderiana aff. *aranaea* (Tesch, 1918)

(Fig. 8C)

Material examined. R/V *Koyo*, 2009 cruise, sta. KY-09-30, east of Nishi-jima I., 1 young ♀ (7.8 × 5.7 mm), NSMT-Cr S 1275.

Remarks. In spite of the deep discussion on the representative species of the genus *Viaderiana* Ward by Ng (1987) and Takeda and Manuel (2003), the genus is still heterogenous, and some species should be transferred to the related genera such as *Parapilumnus* and *Heteropilumnus*, or vice versa.

The specimen examined is a young female, with insufficiently developed pleopods. The general shape of the carapace is similar to the species of *Viaderiana* or *Pilumnus*, but the dorsal surface is ill-defined, only with longitudinal linear furrows separating protogastric and mesogastric regions, covered sparsely with long hairs of variable lengths, the well developed bilobed front, and two long and one short anterolateral spines. Of three anterolateral spines, first two are subequal and strongly directed obliquely forward, and the third is smaller, but distinctly and more strongly directed forward just along the anterolateral margin. The external orbital angle is armed with a spinule. The antennal flagellum is more than three fourths as long as the frontorbital breadth, being fringed with some long silky hairs. The chelipeds are unequal and hairy just like the carapace; in large cheliped, the outer distal part of the palm is smooth, without hairs and granules, but the main part of the palm and the outer surfaces of carpus are armed with conical or rather elongated granules. The ambulatory legs are slender, with hairs like the carapace and chelipeds; the longest second pair is about 1.5 times as wide as carapace; in the first three pairs each merus is armed with two or three sharp spines on the distal half of the anterior margin and a terminal spine; in the last leg the spines on the anterior margin are indistinct, but the termi-

nal spine is distinct; in all pairs each carpus is armed with a terminal spine.

As noted above, the specimen examined has the long antennal flagellum like the species of *Viaderiana*, the third anterolateral spine is smaller than the proceedings, but distinct and strongly directed forward along the carapace margin, and in all the ambulatory legs each carpus is armed with a strong terminal spine. Among 15 known species enumerated by Takeda and Manuel (2003), the spine on each ambulatory carpus is present only in *V. aranea* (Tesch). The discrepancy is the seemingly wider carapace and the shorter and stouter ambulatory legs in comparison with the original figures. The general shape of the carapace and the armature of its anterolateral margin, and the length of the ambulatory legs may be subject to the individual or developmental variation. Adult specimens are needed for the definite identification of the Ogasawaran species to *V. aranea*.

Distribution. *Viaderiana aranea* was originally reported as *Litocheira aranea* from near south point of Halmahera, Kur Island in the Kei Islands, and southeast coast of Timor, 30–45 m deep. There is no additional record since the original description in 1918.

Discussion

In the present report, the offshore crabs of the families Xanthidae (26 species), Domeciidae (1 species), Trapeziidae (1 species), Pinnotheridae (1 species), and Pilumnidae (14 species) are recorded from the Ogasawara Islands, with brief notes on some taxonomic and geographic problems. One species of the genus *Nanopilumnus* was described as new to science under the name of *N. modestus* as the sixth representative of the genus. The juvenile specimen of the genus *Pilumnus* is characteristic in having the inflated larger palm and the short fingers like the adult forms, but not identified to the species in spite of the new addition to the carcinological fauna of Japan. A young female referable to the genus *Viaderiana* is closely related to *V. aranea* (Tesch)

having a strong terminal spine on each ambulatory carpus, but not definitely identified to the species due to the young stage of the sole specimen.

In the following lines the biogeographic notes on the offshore crabs of the families Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae, and Pilumnidae are briefly discussed. Altogether 26 species of the Xanthidae, 1 species of the Domeciidae, 1 species of the Traeziidae, 1 species of the Pinnotheridae, and 14 species of the Pilumnidae are recorded by the present study, and 22 of 43 species recorded in this report are new to the Ogasawara Islands listed in the following lines.

XANTHIDAE—*Chlorodiella laevisissima*, *Cranaothus deforgesi*, *Hepatoporus guinotae*, *Liomera nigrimanus*, *Lobiactaea lobipes*, *Lybia leptochelis*, *Miersiella cavifrons*, *Nanocassiope granulipes*, *Paractaeopsis tumulosus*, *Paraxanthodes cumatodes*, *Pseudoactaea corallina*, *P. multiareolata*, *Visayax osteodictyon*, *Xanthidas maculatus*
 DOMECIIDAE—*Palmyria palmyrensis*
 TRAPEZIIDAE—*Quadrella coronata*
 PILUMNIDAE—*Calmania balssi*, *Lophoplax takakurai*, *Nanopilumnus modestus* sp. nov., *Pilumnus* sp., *Viaderiana affinis*, *V. aff. aranea*

In the above list of the species new to the Ogasawara Islands, 9 boldfaced species including one new species are new to the carcinological fauna of Japan. Even if *Hepatoporus guinotae* is enumerated in the list as new to the Ogasawara Islands, it should be mentioned that *H. guinotae* has been known from Japan as *H. distinctus* (Takeda & Nagai, 1986) that was decidedly synonymized with *H. guinotae*. It is otherwise noted at present that *Pilumnus izuogawarensis* Takeda & Ng, 1997 which was overlooked by Komatsu (2011) should be added to the Ogasawaran crab fauna, and that *Xanthias joanneae* Mendoza, 2013 should be added to the carcinological fauna of Japan as a result of the correction of the misidentification of Takeda and Kom-

atsu (2005) by Mendoza (2013). Its known locality in Japan is the vicinity of Amami-Oshima Island in the northern Ryukyu Islands.

Komatsu (2011) made the biogeographic notes on 73 offshore species of 16 families studied by him except for xanthoid and pilumnoid crabs recorded in this report. Three distributional patterns, viz., Indo-West Pacific, East Asian, and endemic, were distinguished, and all the species were referred to these three elements, with 61 Indo-West Pacific species (84%), 8 East Asian elements (11%) and 4 endemic elements (5%). As the Ogasawara Islands are oceanic and located in the northern part of the Mariana Back Arc, the endemic elements are to be confirmed by the further faunal researches of the neighboring areas. It is reasonable that most of the species are classified into the Indo-West Pacific elements widely distributed in the West Pacific and Indian Oceans.

A total of definitely identified 41 species of the families Xanthidae, Domeciidae, Trapeziidae, Pinnotheridae and Pilumnidae were classified into three distributional patterns following Komatsu (2011). The Indo-West Pacific elements are 26 species (63.4%), the East Asian elements are 11 species (26.8%), and the endemic elements are 4 species (9.7%). The percentage of the Indo-West Pacific elements is rather lower than the previous study by Komatsu (2011), and contrary to this, the low percentage of the endemic elements is high in the pilumnid crabs (3 of 12 species; 25%). The reason for the latter is mostly due to the unfamiliar groups of crabs that are generally small and close to each other. There may be some difficulties in collecting the specimens living in the interstices of rocks and corals in shallow water and also in identification of the species. In due course the percentage of the Indo-West Pacific elements of the Ogasawara Islands will be raised to the reasonable level after further researches in the tropical and subtropical islands.

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小笠原諸島近海産オウギガニ類

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小笠原諸島近海からドレッジにより採集されたオウギガニ科，ドメシアガニ科，サンゴガニ科，カクレガニ科，およびケブカガニ科カニ類について分類学的検討を行った。その結果，43種のカニ類（オウギガニ科26種，ドメシアガニ科1種，サンゴガニ科1種，カクレガニ科1種，ケブカガニ科14種），が記録された。そのうち以下の8種が日本新記録である：*Cranaothus deforgesi* ニセシワオウギガニ（新称），*Liomera nigrimanus* ウデワベニオウギガニ（新称），*Lybia leptochelis* コツメキンチャクガニ（新称），*Paraxanthodes cumatodes* トゲオオヒメオウギガニ（新称），*Visayax osteodictyon* アバタオウギガニ（新称）（オウギガニ科），*Pilumnus* sp., *Viaderiana affinis* ヒメオキナガニモドキ（新称），*Viaderiana aff. aranea*（ケブカガニ科）。また，ケブカガニ科の1新種 *Nanopilumnus modestus* コカワリケブカガニ（新称）を記載した。得られたカニ類について，その生物地理学的特徴を簡単に議論し，各種に分類学的コメントを加えた。