

LEUCOSIID CRABS FROM PANGLAO, PHILIPPINES, WITH DESCRIPTIONS OF THREE NEW SPECIES (CRUSTACEA: DECAPODA: BRACHYURA)

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ABSTRACT. – Thirty-eight species of leucosiid crabs are reported from Panglao in Bohol, the Central Philippines. Of these, three are new to science: *Alox bothros*, *A. chaunos*, and *Urnalana cristata*, while five constitute new records for the Philippines: *Leucosia rubripalma* Galil, 2003, *Myra tumidospina* Galil, 2001, *Urnalana elata* (A. Milne-Edwards, 1874), *U. pulchella* (Bell, 1855) and *U. whitei* (Bell, 1855). The new species are described and illustrated, and their affinities with allied taxa discussed *Tokoyo triloba* Komatsu, Manual & Takeda, 2005, is also synonymised with *T. eburnea* (Alcock, 1896)

KEY WORDS. – Crustacea, Decapoda, Brachyura, Leucosiidae, *Alox*, *Urnalana*, new species, Philippines.

INTRODUCTION

The Philippines have featured prominently in our growing knowledge of the Leucosiidae of the Indo-West Pacific. The leucosiid crab material from the U.S. Exploring Expedition (1838–1842), *Challenger* Expedition (1873–1876), *Siboga* Expedition (1899–1900), *Albatross* Expedition (1907–1910), and the three *MUSORSTOM* expeditions conducted under the aegis of the Muséum national d’Histoire naturelle, Paris (1976, 1980, 1985) have been studied in part or whole and yielded numerous new and rare species (Bell, 1855a–c; Miers, 1886; Ihle, 1918; Serène & Vadon, 1981; Chen, 1989; Tan, 1996; Tan & Ng, 1995; Galil, 2001a, b, 2003a–c, 2005a, b). The studies by Philippine carcinologists Roxas (1930) and Estampador (1937, 1959) have also added many new records. Two recent contributions by Komatsu et al. (2004, 2005) are also noteworthy for the Philippines.

Since early 2000, the Raffles Museum of Biodiversity Research (RMBR), Singapore, has been conducting studies of the crab fauna of Balicasag Island and the nearby Panglao area in Bohol, the Philippines, with the University of San Carlos (Cebu, the Philippines). Between 2004 and 2005, the Raffles Museum RMBR joined with the Muséum national d’Histoire naturelle (Paris, France) and Philippine National Museum (Manila) to conduct two expeditions to Panglao (including Balicasag Island). The expedition material from

Panglao and around Balicasag Island was obtained mostly by trawls and dredges, with specimens also coming from coral-brushings (from rubble collected by divers), diving as well as hand-collections from intertidal areas. A good part of the material from Balicasag Island, however, was collected by local shell fishermen using tangle nets set to depths of 500 m (see also McLay & Ng, 2005). These collections and expeditions resulted in extensive series of specimens of leucosiid crabs. On the basis of the studied material, 38 species have been identified to date. Of these, three are new to science: *Alox bothros*, *A. chaunos*, and *Urnalana cristata*, and five constitute new records for the Philippines: *Leucosia rubripalma* Galil, 2003, *Myra tumidospina* Galil, 2001, *Urnalana elata* (A. Milne-Edwards, 1874), *U. pulchella* (Bell, 1855), and *U. whitei* (Bell, 1855).

The present study complements the previous report on the leucosiid crabs from Balicasag Island by Komatsu et al. (2005) which reports 28 species, two of which were described as new. Interestingly, the present study and that by Komatsu et al. (2005) have only 15 species in common. The greater number of the genera and species reported in this study can be explained by the more extensive sampling in more areas and habitats. Together, the two studies highlight the very rich crustacean diversity present in this part of the Philippines. It must also be emphasised that not all the leucosiid specimens from the present series of collections and expeditions have

been studied. We have on hand specimens which in the older literature would have been identified as “*Leucosia anatum* (Herbst, 1783)” but as this group of species is now being studied as part of a larger revision of the genus *Leucosia* sensu lato (see Galil, 2003b, c, 2005a, b, 2006a, b), it is excluded for the present work. In addition, there are still many lots of very small leucosiids (notably *Nursia* and allies, *Cryptocnemus*, *Ebalia* etc.) which have not yet been studied, and will certainly include more new species and new records. These are being consolidated for a follow-up study by H. Komatsu and his collaborators.

In the present paper, a checklist of the 38 species is presented. As many species have been previously reported from the Philippines, short notes are provided for the new records, and colour descriptions where none was available before; while the new species are fully described and illustrated.

Holotype specimens examined are deposited in the National Museum Carcinological Reference Collection (NMCR) of the National Museum of the Philippines. Other specimens will be separated at a later date and deposited in the NMCR; Zoological Reference Collection (ZRC) of the Raffles Museum of Biodiversity Research, National University of Singapore; and Muséum national d’Histoire naturelle, Paris (MNHN). Comparative material from the Zoological Museum Amsterdam (ZMA), Universiteit van Amsterdam, was also examined. The following abbreviations are used: CL – carapace length, measured along longitudinally across the median line of the carapace; coll. – collected by; G1 – male first pleopod; G2 – male second pleopod.

TAXONOMY

Alox bothros, new species

(Figs. 1A, 5A, B)

Material examined. – Holotype, male (CL 9.0 mm) (NMCR), station S8, Momo Beach, Panglao, 09°36.5'N 123°45.6'E, 28–32 m, caves in reef wall, 10 Jul.2004.

Description. – Carapace subpentagonal, 1.6 times as wide as long. Dorsal surface of carapace prominently and irregularly sculpted. Front produced, up-curved, margin bilobed, bearing granulated pit medially. Anterior margin of carapace vertical, basal antenular segment operculiform, rugose, entirely sealing ovate antennular fossa. Antennae folded in orbital hiatus without gap. Orbits small, rounded, visible in dorsal view; cornea visible when eye retracted into orbit; outer orbital margin with 2 sutures. External maxillipeds concealing trapezoid buccal opening, rugose; endognathal meri visible in anterior view. Postfrontal region laterally with irregularly pitted trench, pits surfaced with flattened granules. Anterolateral margin distinctly rimmed, with lozenge-shaped indentation medially. Subhepatic margin with large granulate denticle medially, visible in dorsal view. Lateral margins of carapace expanded, anteriorly trilobate, bearing swollen auriculate carina. Posterior margin bearing triangular denticle submedially, obscurely bilobate medially. Branchial regions

prominent, irregularly indented. Longitudinal median ridge minutely granulate, extending from frontal margin to granulate cardiac region. Swollen intestinal region, separated from branchial regions by deep, irregularly granule-lined grooves. Chelipeds subequal, robust. Cheliped merus trigonal in cross-section; upper surface proximally with cluster of granules; posterior margin distally bilobed. Palm obscurely granulate, pitted; fingers twice as long as palm; dactylus slightly widened distally, upper margin carinate, closely granulate; lower margin of pollex distally carinate, granulate. Pereiopods stocky, short; meri with single granulate row on dorsal margin, two rows on ventral margin; carpi, propodi, dactyli minutely granulate. Thoracic sternum with transverse ridges, with 3 granule-lined grooves between them. Male abdominal sulcus deep, reaching buccal cavity; lateral margin bearing distinct ridge fitting into suture between abdominal segments. Abdomen closely covered with flattened granules; male abdominal segments 1 and 2 slender, horizontal; segments 3–5 fused; segment 6 large, trapezoid, as long as lacinate telson. Shaft of G1 angled distad, medially setose. G2 short, slender, apex scoop-like.

Colour. – Carapace white, carapacial pits and grooves lined with orange markings; meral-carpal joint of cheliped bearing a pair of reddish spots, fingers red-spotted; pereopodal meri with orange marbling proximally (Fig. 1A).

Remarks. – *Alox bothros*, new species, is distinguished from the closely related *A. somphos* Tan & Ng, 1995, in having a more prominent denticle on subhepatic margin, the dorsal surface of carapace being relatively less pitted, in having an auriculate carapace rim laterally, and in the much stouter form of the G1 (cf. Tan & Ng, 1995). Tan & Ng (1995) did not illustrate the G1 of *A. somphos* but merely described it as a long and slender structure. Together with the male abdomen, it is figured here (Fig. 5C–G) for comparisons. The distal part of the G1 of *A. somphos* is damaged (Fig. 5C, D) but the broken part was still present and has also been figured together with the rest of the structure (Fig. 5E).

Etymology. – *bothros* Greek, “trench, pit”.

Distribution. – This species is known only from type location, Panglao Island.

Alox chaunos, new species

(Figs. 1B, 5H, I)

Material examined. – Holotype: male (CL 6.8 mm) (NMCR), station M7, Momo Beach, Panglao, 09°36.1'N 123°45.2'E, 0–3m, reef platform with seagrass, 1 Jun.2004. – Paratype: 1 ovigerous female (CL 9.8 mm) (ZRC), Pontod Islet, Panglao, station D4, soft bottom with sea-grass, 0–2 m, 5 Jun.2004.

Description. – Carapace subpentagonal, about 1.3 as wide as long. Dorsal surface of carapace closely granulate, pitted, prominently sculpted. Front produced, up-curved, margin bilobed, swollen. Anterior margin of carapace vertical, basal antenular segment operculiform, rugose, entirely sealing

subtriangular antennular fossa. Antennae folded in orbital hiatus without gap. Orbits small, rounded, visible in dorsal view; when retracted, ocular peduncle seals orbit; outer orbital margin bisutured. External maxillipeds concealing trapezoid buccal opening, closely set with flattened granules; endognathal meri visible in anterior view. Postfrontal region laterally concave. Anterolateral margin indistinctly rimmed, with shallow indentation medially. Sigmoid, granule-lined groove stretching from postfrontal ridge to branchial region. Subhepatic margin with triangular facet medially, visible in dorsal view. Lateral margins of carapace expanded, slightly constricted medially. Posterior margin horizontal submedially, obscurely bilobate medially. Branchial regions swollen, irregularly pitted, a pair of nostril-like cavities submedially on anterior margin. Cardiac region surfaced with flattened granules. Intestinal region well demarcated, separated from branchial regions by granule-lined groove. Chelipeds subequal, robust. Cheliped merus trigonal in cross section; upper surface proximally with cluster of granules; posterior margin distally bilobed. Palm obscurely granulate, pitted; fingers as long as palm, closely granulate, obscurely carinate. Pereiopods stocky, short; meri with single granulate row on dorsal margin, 2 rows on ventral margin; carpi, propodi, dactyli minutely granulate. Thoracic sternum closely granulate, horizontally ridged, ridges interspaced with 3 granule-lined grooves. Male abdominal sulcus deep, reaching buccal cavity. Abdomen closely covered with flattened granules; male abdominal segments 1 and 2 slender; segments 3–5 fused; segment 6 trapezoid; telson narrow, elongate, distinctly longer than segment 6. Shaft of G1 almost straight, tapering, distally setose. G2 short, slender, apex scoop-like.

Colour. – Carapace whitish, post-frontal pits and para-intestinal grooves darker; pereopodal propodus with a brown spot proximally (Fig. 1B).

Remarks. – *Alox chaunos*, new species, is distinguished from all congeners (see Tan & Ng, 1995) in having the male telson distinctly longer than segment 6. All other *Alox* species, the telson is subequal in length to segment 6 (see Tan & Ng, 1995; Naruse & Ng, 2006; present Fig. 5G). In general carapace form, *A. chaunos* is perhaps closer to *A. rugosum* (Stimpson, 1858) and *A. uru* Naruse & Ng, 2006. *Alox chaunos* can easily be separated from *A. uru* by its less protruded front, lower gastric regions and more produced hepatic region and a relatively longer and more slender G1 in which the median part is not visibly dilated and the tip more tapering (Naruse & Ng, 2006: Figs. 1a, 2a, c, d, g, h). *Alox chaunos* can be separated from *A. rugosum* by its more eroded lateral carapace regions, more strongly produced posterior margin of carapace and intestinal region, relatively shorter and more elongate cheliped fingers, relatively stouter and shorter G1 (see Tan & Ng, 1995: Pls. 6D–F, 7, Fig. 12C, H, I).

Etymology. – The species name is the Greek word for “porous, spongy”, *chaunos*, used as a noun in apposition.

Distribution. – Known only from type locations at Panglao Island.

Alox ornatum (Ihle, 1918)

(Fig. 1C)

Oreophorus (*Oreophorus*) *ornatus* Ihle, 1918: 214, Fig. 122; Chen, 1989: 193, Figs. 32 c, d, Pl. VI 6.
Alox ornatum, Tan & Ng, 1995: 125, Fig. 10, pl. 5; Tan, 1996: 1022. (see Tan & Ng, 1995: 125 for synonymy)

Material examined. – 1 female (CL 5.4 mm) (ZRC 2007.0530), station T14, Maribohoc Bay, Bohol, 09°41.5'N 123°49.3'E, 101–110 m, mud with shells, 17 Jun.2004.

Colour. – Carapace white with bright orange marbling, postfrontal pits and para-intestinal grooves dark orange colour; chelipeds white, fingers bright red tipped with white, pereopodal carpi, propodi with orange spot proximally on upper surface (Fig. 1C).

Distribution. – Australia, Indonesia, Moluccas, the Philippines, Japan (Tan & Ng, 1995).

Arcania cornuta (MacGilchrist, 1905)

(Fig. 1D)

Ixoides cornutus MacGilchrist, 1905: 255.
Ixoides cornutus, Serène & Vadon, 1981: 124; Chen, 1989: 227, Pls. 1(11), 4(4), Fig. 21 a–c; Tan, 1996: 1033, Fig. 3 j–l, 4a–b.
Arcania cornuta, Galil, 2001a: 173, Figs. 1b, 4b; Komatsu et al., 2005: 106. (see Galil, 2001a: 173 for synonymy)

Material examined. – 1 male (CL 12.4 mm), 1 broken female (ZRC 2007.0531), station T28, Biking-Catamaran, Panglao, 09°35.0'N 123°51.4'E, 80 m, fine sand and mud, 1 Jul.2004.

Distribution. – Fiji Islands, New Caledonia, Papua-New Guinea, Japan, China, the Philippines, Vietnam, Persian Gulf, Madagascar, Mozambique Channel (Galil, 2001a).

Arcania elongata Yokoya, 1933

(Fig. 1E)

Arcania undecimspinosa var. *elongata* Yokoya, 1933: 133, Fig. 47.
Arcania elongata, Tan, 1996: 1022, 1024, Figs. 1B, 2K–O. (see Galil, 2001a: 176 for synonymy)

Material examined. – 2 males (CL 21.6 mm, 21.8 mm) (ZRC 2007.0532), Balicasag Island, tangle nets, Feb.2004; 3 males (ZRC 2007.0533), 2 Jun.2002. – 1 female (CL 11.7 mm) (MNHN), station T19, Maribohoc Bay, Bohol, 09°42.2'N 123°50.8'E, 10–26m, mud, 20 Jun.2004.

Colour. – Carapace orange-red, slightly paler laterally, posterior spines white; chelipeds orange-red proximally, paler distally; pereopodal meri pale orange, carpi, propodi, dactyli white (Fig. 1E).

Distribution. – New Caledonia, Australia, Japan, the Philippines, South China Sea (Galil, 2001a).

Arcania gracilis (Henderson, 1893)
(Fig. 1F)

Arcania gracilis, Galil 2001a: 184, Figs. 2c, 5d; Komatsu et al., 2005: 106. (see Galil 2001a: 184 for synonymy)

Arcania septemspinosa var. *gracilis* Henderson, 1893 : 403.
Arcania quinquespinosa, Serène & Vadon, 1981: 124; Chen, 1989: 208, Pl. I 7; Tan, 1996: 1022, 1028, Figs. 2b–e, 7f.

Material examined. – 1 male (CL 8.0 mm) (MNHN), station T6, west of Baclayon, Bohol, 09°35.1'N 123°51.2'E, 34–82 m, sandy-mud with large sponges, 2 Jun.2004; 1 male (CL 10.4 mm) (ZRC

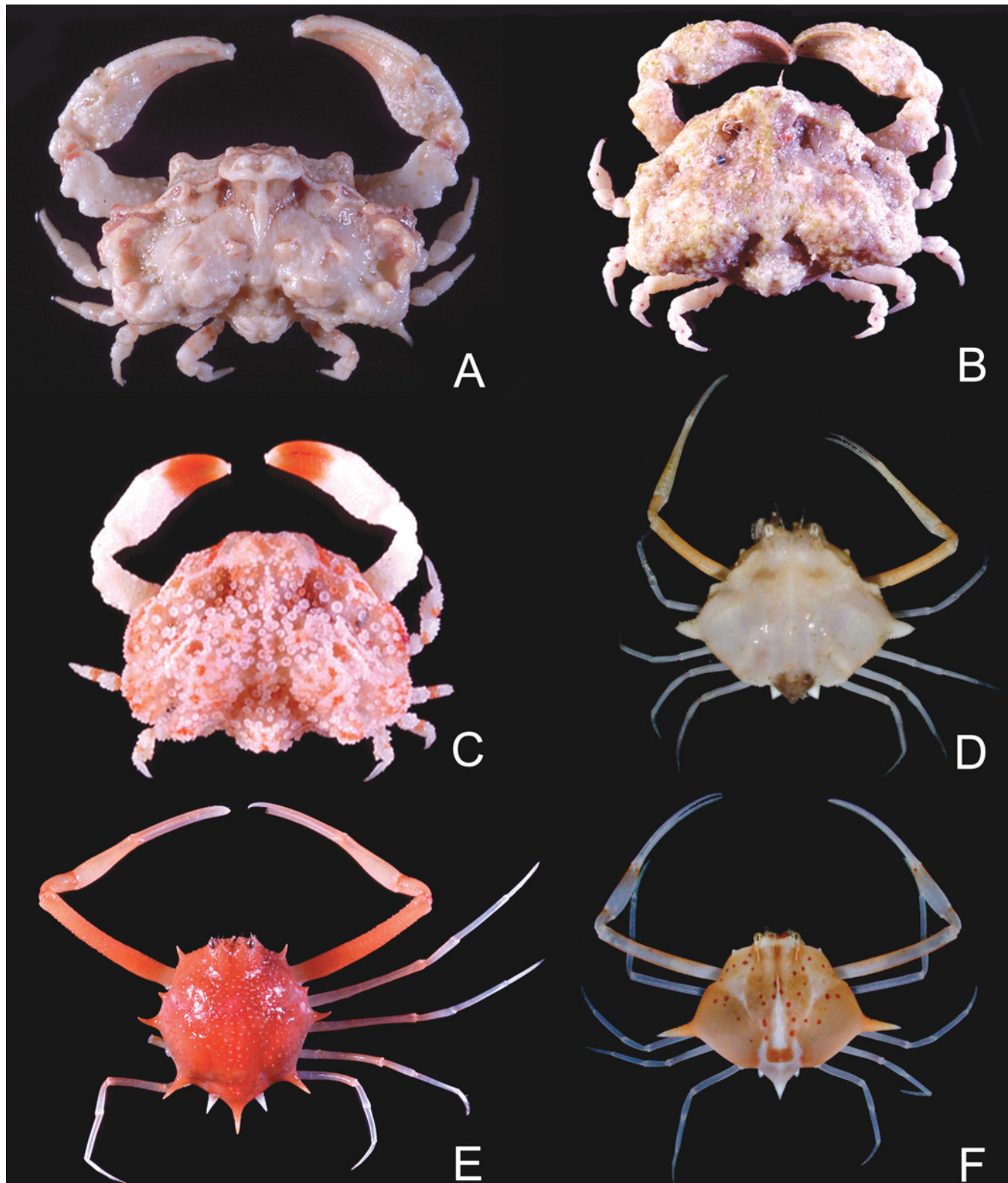


Fig. 1. Leucosiids from Panglao Island, the Philippines: A, *Alox bothros*, new species, holotype male (CL 9.0 mm) (NMCR); B, *Alox chaunos*, new species, paratype female (CL 9.8 mm) (ZRC); C, *Alox ornatum* (Ihle, 1918), female (CL 5.4 mm) (ZRC 2007.0530); D, *Arcania cornuta* (MacGilchrist, 1905), male (CL 12.4 mm) (ZRC 2007.0531); E, *Arcania elongata* Yokoya, 1933, female (CL 11.7 mm) (MNHN); F, *Arcania gracilis* (Henderson, 1893), male (CL 8.0 mm) (MNHN).

2007.0534), station T26, Cortes, Bohol, 09°43.3'N 123°48.8'E, 123–135 m, muddy, 24 Jun.2004; 1 female (CL 9.5 mm) (ZRC 2007.0535), station T33, Baclayon, Bohol, 09°36.0'N 123°53.7'E, 67–74 m, sand, 3 Jul.2004; 1 male (ZRC 2007.0536), station T23, Cortes, Bohol, 09°42.2'N 123°50.6'E, 35–45 m, 21 Jun.2004; 1 male, 1 female (NMCR), station T28, Biking–Catarman, Panglao, 09°35.0'N 123°51.4'E, 80 m, muddy sand, 1 Jul.2004.

Color (young specimen). – Carapace orange-red, dotted with dark red spots anteriorly; cardiac, intestinal regions white, red bar on cardiac region; cheliped meri rimmed with orange-red, carpi, propodi paler distally; pereopods pale. The “large bright red milk-white-edged ocellus” (Alcock, 1896: 266) so characteristic of the adult, appears as a rectangular bar in the young (Fig. 1F).

Distribution. – Vanuatu, New Caledonia, Australia, Indonesia, the Philippines, Japan, China, Singapore, India, Sri Lanka, Laccadives, Persian Gulf, Madagascar, Red Sea (Galil, 2001a).

Arcania septemspinosa (Fabricius, 1787)

(Fig. 2A)

Cancer septemspinus Fabricius, 1787: 325. (see Galil 2001a: 193 for synonymy)

Arcania heptacantha, Serène & Vadon, 1981: 124.

Arcania septemspinosa, Chen, 1989: 206, Fig. 9, Pl. II 6; Tan, 1996: 1022, 1029, Figs. 2a, 1d; Galil 2001a: 193, Figs. 3b, 7b. (see Galil 2001a: 193 for synonymy)

Material examined. – 1 male (CL 19.8 mm) (ZRC 2007.0537), 1 male (CL 15.2 mm) (NMCR), station T22, Cortes, Bohol, 09°42.5'N 123°50.7'E, 11–20 m, very muddy, 21 Jun.2004.

Colour. – Carapace pinkish, with median carina and lateral spines orange-red; cheliped meri orange-red, carpi, propodi pale orange; pereopodal meri pale orange, carpi, propodi, whitish, dactyli pale pink (Fig. 2A).

Distribution. – Fiji, Australia, Indonesia, the Philippines, Gulf of Thailand, India, Madagascar, Mozambique Channel, South Africa, Persian Gulf, Gulf of Aden, Red Sea (Galil, 2001a).

Arcania undecimspinosa De Haan, 1841

Arcania undecimspinosa De Haan, 1841: 135, Pl. 33 fig. 8.

Arcania undecimspinosa, Ihle, 1918: 265; Estampador, 1937: 512, 1959: 64; Serène & Vadon, 1981: 124; Chen, 1989: 204, fig 8, Pl. II 4; Tan, 1996: 1022; Galil, 2001a: 197, Figs. 3D, 7D; Komatsu et al., 2005: 106. (see Galil, 2001a: 197 for synonymy)

Material examined. – Balicasag Island, in deep slopes, with tangle nets: 2 males, 1 ovigerous female (ZRC 2001.0397), Dec.2000; 4 males (CL 18.6–20.8 mm), 1 broken female (ZRC 2001.0398), Dec.2000; 7 males (CL 15.4–21.4 mm), 6 females (CL 17.4–21.9 mm) (ZRC 2001.0576), 50–500 m, 28 Nov.2001; 10 males (CL 15.6–21.8 mm), 5 females (CL 19.2–25.2 mm), 3 ovigerous females (CL 20.4–23.2 mm) (ZRC 2001.0583), 50–500 m, 28 Nov.2001; 3 males (CL 21.4–23.3 mm), 5 females (CL 23.9–28.9 mm), 6 ovigerous females (CL 23.5–27.3 mm) (ZRC 2007.0538), 200–300

m, Jun.2002; 4 males (CL 18.2–18.3 mm), 1 female (ZRC 2007.0539), Mar.2004; 7 males, 3 ovigerous females, 7 females (ZRC 2007.0540), 20 Nov.2003; 4 males (ZRC 2007.0541), 20 Dec.2003; 1 male, 2 females (ZRC 2007.0542), May 2004; 1 male, 2 females (NMCR), May 2004; 6 males (CL 17.6–21.2 mm), 1 female (CL 21.1 mm), 2 ovigerous females (CL 21.5, 21.8 mm) (MNHN), Nov.2003; 2 males (CL 19.6, 20.4 mm), 1 ovigerous female (CL 24.4 mm) (NMCR), Jan.2004; 1 female (CL 24.1 mm) (NMCR), Feb.2004; 1 female (CL 21.6 mm) (NMCR), Apr.2004; 2 males (ZRC 2007.0543), Apr. 2004; 1 male (CL 19.8 mm), 1 female (CL 16.8 mm) (ZRC 2007.0544), 29 May.2004; 7 males (CL 18.5–20.5 mm 4 females (ZRC 2007.0545), station P3 (= P4), 09°31.1'N 123°41.5'E, ca. 100 m, 31 May 2004–2 Jul.2004; 1 male (CL 19.9 mm) (MNHN), station P1, Maribohoc Bay, Bohol, 009°36.1'N 123°45.0'E, 150–200 m, 30 May.2004; 1 male (CL 20.1 mm) (MNHN), station P2, Maribohoc Bay, Bohol, 09°39.0'N 123°43.8'E, 400 m, 30 May 2004; 6 males (CL 18.4–23.1 mm), 3 ovigerous females (CL 21.8–26.9 mm), 3 females (CL 21.1–25.5 mm) (ZRC 2007.0547), 100–300 m, Maribohoc Bay, Bohol, Nov.2003–Apr.2004; 2 males (CL 23.5 mm) (ZRC 2007.0546), station P5, Pamilacan Island, 09°30.0'N 123°54.6'E, ca. 100 m, 3 Jun.2004; 1 male (ZRC 2007.0548), station T17, Cortes, Bohol, 09°41.8'N 123°49.1'E, muddy bottom with sponges, 132–137 m, 19 Jun.2004.

Distribution. – Marquesas Islands, Loyalty Islands, Australia, Japan, Korea, China, Taiwan, the Philippines, India, Andamans, Seychelles, Mascarene Basin, South Africa (Galil, 2001a).

Cateios frontalis (Miers, 1884)

(Fig. 2B)

Oreophorus frontalis Miers, 1884: 254, Pl. 26 fig. B.

Oreophorus (Oreotlos) angulatus, Chen, 1989: 194, pl. VI 2.

Cateios frontalis, Tan & Ng, 1995: 135, Fig. 14, pl. 9b-f; Tan, 1996: 1022. (see Tan & Ng, 1995: 135 for synonymy)

Material examined. – 1 male (CL 4.8 mm) (ZRC 2007.0549), 1 female (CL 5.6 mm) (MNHN), station T1, Bolod, Panglao, 09°32.4'N 123°47.3'E, 83–102 m, 30 May 2004.

Color. – Carapace whitish, pale-orange laterally; cheliped carpus with orange-red spot proximally on upper margin; fingers with pale orange marbling (Fig. 2B).

Distribution. – Australia, Japan, Indonesia, the Philippines (Tan & Ng, 1995).

Euclosia crosnieri (Chen, 1989)

(Fig. 2C)

Leucosia obtusifrons, Serène & Vadon, 1981: 125.

Leucosia crosnieri Chen, 1989: 236, Figs. 25, 26 a–e, Pl. I 8.

Euclosia crosnieri, Galil 2003c: 335, Figs. 1B, 3 B, 6B; Komatsu et al., 2005: 106.

Material examined. – Maribohoc Bay, Bohol: 3 males, 1 female (ZRC 2007.0550), 200–300 m, tangle nets, Nov.2003–Mar.2004; 1 female (CL 21.9 mm) (ZRC 2007.0554), station P1, 009°36.1'N 123°45.0'E, 90–200 m, 30 May.2004. – Balicasag Island, tangle nets: 1 female (CL 30.2 mm) (ZRC 2007.0555), station P3 (= P4),

09°31.1'N 123°41.5'E, 100 m, 31 May.2004; 1 female (ZRC 2007.0556), Jun.2002; 17 males (CL 21.8–32.3 mm), 4 ovigerous females (CL 29.6–32.1 mm), 14 females (CL 20.3–31.6 mm) (ZRC 2001.0565), 50–500 m, 28 Nov.2001; 9 males, 14 females (ZRC 2007.0551), Jun.2002; 3 males (CL 30.6, 31.1, 30.0 mm), 2 females (CL 29.7, 29.9 mm) (ZRC 2007.0552), Nov.2003; 3 males (CL 30.6–32.3 mm), 1 female (CL 29.9 mm) (MNHN), 100–300 m, 11 Mar.–4 Apr.2004; 2 males (CL 22.8, 32.1 mm) (NMCR), 2 Mar.2004; 1 male (CL 31.0 mm), 1 ovigerous female (CL 31.2 mm), 1 juvenile female (CL 21.3 mm) (NMCR), May.2004; 1 ovigerous female (CL 32.6 mm) (MNHN), 28 May.2004; 1 male (CL 31.6 mm), 1 female (CL 30.2 mm) (ZRC 2007.0553), 29 May.2004.

Colour. – “In young specimens there are many oblique and longitudinal stripes which are not present in full grown specimens” (Chen, 1989: 236). Carapace of young specimen pinkish, with deep orange lines; cheliped merus, carpus and proximal part palm and fingers reddish; pereopods white ringed in bright red (Fig. 2C).

Distribution. – Australia, Indonesia, the Philippines (Galil, 2003c).

Euclosia scitula Galil, 2003

Euclosia scitula Galil, 2003c: 339, Figs. 2a, 4c, 6g; Komatsu et al., 2005: 106.

Material examined. – Balicasag Island, tangle nets: 2 males (CL 27.2, 27.0 mm), 3 juvenile females (CL 20.5–20.9 mm) (ZRC 2001.0574), 50–500 m, 28 Nov.2001; 4 males (CL 26.5–28.0 mm), 4 females (CL 26.4–27.7 mm) (NMCR), 200–300 m, Jun.2002; 2 males (CL 21.0, 30.1 mm) (MNHN), Nov.2003; 4 males, 1 female (ZRC 2007.0558), Jan.–May 2004; 1 male, 1 female (ZRC 2007.0559), Mar.2004; 3 males (CL 26.1–28.9 mm), 1 female (CL 24.4 mm) (MNHN), 2 Mar.2004; 3 males (CL 28.5–30.2 mm) (MNHN), Apr.2004; 1 male (CL 31.3 mm), 1 female (CL 30.3 mm), 2 juveniles (CL 20.2, 20.9 mm) (MNHN), 29 May.2004; 2 males (CL 29.3, 30.7 mm) (ZRC 2007.0560), station P3 (= P4), 09°31.1'N 123°41.5'E, 100 m, 31 May.2004; 1 female (ZRC 2007.0561), station P3 (= P4), 09°31.1'N 123°41.5'E, 100 m, 31 May.2004; 2 males (ZRC 2007.0557), 100–300 m, Maribohoc Bay, Bohol, tangle nets, Nov.2003–Apr.2004.

Distribution. – The Philippines, Thailand (Galil, 2003c).

Euclosia unidentata (De Haan, 1841)

Euclosia unidentata De Haan, 1841: 133, Pl., 33 Fig. 3.
Euclosia unidentata, Komatsu et al., 2005: 106. (see Galil, 2003c: 342 for synonymy)

Material examined. – Balicasag Island, tangle nets: 2 females (CL 28.9, 20.5 mm) (ZRC 2001.0574), 50–500 m, 28 Nov.2001; 1 male (CL 28.8 mm) (ZRC 2007.0562), 200–300 m, Jun.2002; 1 male (CL 31.6 mm), 1 ovigerous female (CL 29.5 mm) (NMCR), Nov.2003.

Distribution. – Japan, China, Gulf of Tonkin, Taiwan, Indonesia (Galil, 2003c), the Philippines (Komatsu et al., 2005).

Iphiculus spongiosus Adams & White, 1848

Iphiculus spongiosus Adams & White, 1848: 57, Pl. 15 Fig. 5; Estampador, 1937: 512; Estampador, 1959: 64; Serène & Vadon, 1981: 124; Chen, 1989: 233, Figs. 4 c–f, Pl. IV 5. (see Chen & Sun, 2002: 372 for synonymy)
Iphiclus spongiosus, Tan, 1996: 1022. (incorrect spelling)

Material examined. – 3 males (CL 10.4–11.2 mm), 2 females (CL 10.7 mm) (ZRC 2007.0563), station T10, off San Isidro, Panglao, 09°33.4'/09°33.8'N 123°49.6'/123°51.5'E, 117–124 m, fine sand, 15 Jun.2004; 3 males (CL 6.3–7.4 mm), 1 female (CL 11.3 mm) (MNHN), station T19, Cortes, Bohol, 09°42.2'N 123°50.8'E, 10–26 m, muddy bottom, 20 Jun.2004; 3 males (CL 8.6–12.0 mm) (ZRC 2007.0564), station T22, Cortes, Bohol, 09°42.5'N 123°50.7'E, 11–20 m, muddy bottom, 21 Jun.2004; 1 male (ZRC 2007.0565), station T25, Cortes, Bohol, 09°41.1'N 123°49.3'E, 160–210 m, fine sand and mud, 24 Jun.2004; 1 male (CL 10.1 mm), 1 female (CL 10.4 mm) (NMCR), station T27, between Panglao and Pamilacan Islands, 09°33.4'N 123°51.0'E, 106–137 m, fine sand and mud, 21 Jun.2004; 1 male (ZRC 2007.0566), station T7, west of Baclayon, Bohol, 09°36.1'N 123°53.3'E, muddy fine sand, 61–62m, 3 Jun.2004; 1 male, 1 female (NMCR), station T24, 09°42.3'N 123°50.3'E, mud and wood, 35–57 m, 23 Jun.2004.

Distribution. – Arafura Sea, Indonesia, the Philippines, China Seas, Japan, Gulf of Thailand, Singapore, Bay of Bengal, Red Sea (Chen, 1989).

Leucosia craniolaris (Linnaeus, 1758)

(Fig. 2D)

Cancer craniolaris Linnaeus, 1758: 626.
Leucosia perlata, Estampador, 1937: 512; Estampador, 1959: 62; Tan, 1996: 1023, 1037, Figs. 5b–e.
Leucosia craniolaris, Galil, 2003b: 184, Figs. 1a, 2a, b. (see Galil, 2003b: 184 for synonymy)

Material examined. – 1 male (CL 19.7 mm) (MNHN), station M11, Sungcolan Bay, Panglao, 09°38.3'N 123°49.6'E, 0–3 m, rocks, mangrove, seagrasses, 6 Jun.2004; 1 male (CL 19.0 mm) (ZRC 2007.0567), station M3 (= M25), Danao, Panglao, 09°32.5'N/09°33.1'N 123°44.7'E/123°45.5'E, intertidal, muddy-sand, seagrasses, 31 May – 17 Jun.2004.

Colour. – Carapace whitish, marbled anteriorly with pale khaki color, two pairs of pale spots laterally on gastric regions, a pair of prominent rust-coloured spots near base of last pair of legs. Chelipeds and pereopods pale, pale rust spots distally on pereopodal meri (Fig. 2D).

Distribution. – Palau Islands, Caroline Islands, Ryukyu Islands, Indonesia, the Philippines, Malaysia (Galil, 2003b).

Leucosia punctata Bell, 1855

Leucosia punctata Bell, 1855a: 362; Estampador, 1937: 512; Estampador, 1959: 62; Galil, 2003b: 187, Figs. 1c, 2e, f. (see Galil, 2003b: 187 for synonymy)

Material examined. – 1 male (CL 19.0 mm) (NMCR), station D12, channel between Tagbilaran town (Bohol) and Panglao, 09°38.5'N

123°51.0'E, 2–4m, muddy bottom, shells and asteroids, 28 Jun.2004. – 2 males (CL 19.5, 14.1 mm), 1 female (CL 16.4 mm) (ZRC 2007.0568), station D13, Tagbilaran channel, 09°38.0'N 123°51.4'E, 2–3m, sandy bottom, oyster shells, 29 Jun.2004.

Colour. – “Greyish-brown, with two darker spots on the branchial regions” (Bell, 1855b: 287).

Distribution. – Australia, Indonesia, the Philippines (Galil, 2003b).

***Leucosia rubripalma* Galil, 2003**
(Fig. 2E)

Leucosia rubripalma Galil, 2003b: 188, Figs. 1d, 2g, h.

Material examined. – 1 male (CL 21.2 mm) (ZRC 2007.0569), station R24, Bingag, Panglao, coral platform, 09°37.5'N 123°46.8'E, 0–2 m, coral rocks, 6 Jun.2004.

Colour. – Carapace ochre-coloured, paler posteriorly, a pair of red spots on the branchial regions, a pair of prominent orange-coloured spots near base of the last pair of legs. Chelipeds pale ochre, with bright-orange patch on inner surface of palm. Pereiopods white, orange spots distally on upper margin of meri 1-3, proximally on propodi 1–3 (Fig. 2E).

Distribution. – New Caledonia, Indonesia, Singapore (Galil, 2003b), the Philippines (new record).

***Myra curtimana* Galil, 2001**

Myra curtimana Galil, 2001b: 421, Figs. 1f, 9; Komatsu et al., 2005: 106.

Material examined. – Balicasag Island, tangle nets: 1 female (CL 24.9 mm) (ZRC 2001.0405), Dec.2000; 1 male (CL 25.8 mm), 1 female (CL 27.1 mm) (ZRC 2001.0407), Dec.2000; 2 males (CL 21.2, 19.5 mm), 3 females (CL 30.1–32.2 mm) (ZRC 2001.0569), 50–500 m, 28 Nov.2001; 2 females (CL 31.5, 26.8 mm) (ZRC 2001.0570), 50–500 m, 28 Nov.2001; 4 males (CL 23.6–25.3 mm) 1 female (NMCR), 200–300 m, Jun.2002; 1 male (MNHN), May.2004.

Distribution. – Fiji, New Caledonia, Australia, Indonesia, the Philippines (Galil, 2001b).

***Myra elegans* Bell, 1855**
(Fig. 2F)

Myra elegans Bell, 1855a: 364; Serène & Vadon, 1981: 124; Chen, 1989: 223, Figs. 19, Pl. I 12; Tan, 1996: 1023, 1043; Galil, 2001b: 423, Figs. 2a, 10. (see Galil, 2001b: 423 for synonymy)

Material examined. – 1 male (CL 15.2 mm), 4 ovigerous females (CL 16.2–18.2 mm) (ZRC 2007.0570), station T19, Cortes, Bohol, 09°42.2'N 123°50.8'E, 10–26 m, muddy, 20 Jun.2004; 1 male (CL 15.8 mm) (ZRC 2007.0571), station T21, Cortes, Bohol, 09°42.8'N 123°50.6'E, 12 m, dead coral, 21 Jun.2004; 1 male (CL 18.0 mm), (MNHN) station T22, Cortes, Bohol, 09°42.5'N 123°50.7'E, 11–20

m, dead coral, 21 Jun.2004; 1 male (NMCR), station T23, Cortes, Panglao, 09°42.2'N 123°50.6'E, 35–45 m, black mud, 21 Jun.2004.

Colour. – Carapace ruby-red but for tip of posterior spine; cheliped whitish but for red merus; pereiopods reddish proximally, pale distally (Fig. 2F).

Distribution. – Australia, Papua New Guinea, Indonesia, the Philippines, South China Sea, Gulf of Thailand, Myanmar, Bay of Bengal (Galil, 2001b).

***Myra eudactyla* (Bell, 1855)**

Myrodes eudactylus Bell, 1855a: 364; Bell, 1855b: 299, Pl. 32 Fig. 6; Bell, 1855c: 13; Estampador, 1937: 512; Estampador, 1959: 63; Tan, 1996: 1023, 1044.

Myra eudactyla, Galil, 2001b: 425, Figs. 2b, 11; Komatsu et al., 2005: 106.

Material examined. – Balicasag Island, tangle nets: 2 males (CL 32.1–30.7 mm), 1 female (CL 38.5 mm), 1 ovigerous female (CL 41.4 mm) (ZRC 2007.0572), 200–300 m, Jun.2002; 1 male (CL 39.0 mm) (ZRC 2001.0572), 50–500 m, 28 Nov.2001. Singapore: 1 male (ZRC 1998.1217), off Katong, Singapore, dredge, coll. P. K. L. Ng, 1990s.

Colour. – The Singapore specimen (ZRC 1998.1217) was an uneven chocolate-brown on all dorsal surfaces when fresh, with the ventral surfaces dirty white.

Distribution. – New Caledonia, Australia, Torres Straits, New Guinea, Indonesia, the Philippines, Tonkin Bay, Gulf of Thailand, Andamans, Gulf of Aden (Galil, 2001b). A specimen (ZRC 1998.1217) collected represents a new record for Singapore.

***Myra grandis* Zarenkov, 1990**

Myra grandis Zarenkov, 1990: 65, pl. 6, Figs. 8–12; Galil, 2001b: 429, Figs. 2d, 13; Komatsu et al., 2005: 106, 109, Fig. 1E, 2a–c.

Material examined. – Balicasag Island, tangle nets: 1 male (CL 30.8 mm) (ZRC 2001.0403), Dec 2000; 1 male (CL 32.9 mm) (ZRC 2001.0561), 50–500 m, 28 Nov.2001; 1 male (CL 38.6 mm), 1 female (CL 42.1 mm) (ZRC 2001.0575), 50–500 m, 28 Nov. 2001; 1 female (CL 43.1 mm) (NMCR), 200–300 m, Jun. 2002.

Distribution. – Marquesas Islands, Madagascar, Kenya, the Philippines (Galil, 2001b; Komatsu et al., 2005).

***Myra tumidospina* Galil, 2001**
(Fig. 3A)

Myra tumidospina Galil, 2001b: 433, Figs. 3b, 17.

Material examined. – Balicasag Island, tangle nets: 2 females (CL 27.3, 31.6 mm) (ZRC 2001.0407), Dec.2000; 15 males (CL 20.9–29.9 mm), 2 females (CL 28.4, 28.5 mm) (ZRC 2001.0570), 50–500 m; 14 males (CL 21.0–29.9 mm), 9 females (CL 23.6–32.9 mm)

(MNHN), 200–300 m, Jun.2002; 2 females (CL 25.1, 27.3 mm), 2 males (CL 25.6, 27.0 mm) (NMCR), Mar.2004; 2 males (CL 29.1, 26.4 mm) (ZRC 2007.0573), 2 Mar.2004; 2 males (CL 23.1–24.4 mm) (ZRC 2007.0574), 29 May.2004; 1 male (NMCR), Dec.2003; 1 male (MNHN), Maribohoc Bay, Bohol, Nov.2003–Apr.2004; 1

juvenile (CL 10.6 mm) (ZRC 2007.0575), station T6, west of Baclayon, Bohol, 09°35.1'N 123°51.2'E, coarse muddy sand with large sponges, 34–82 m, 2 Jun.2004.

Colour. – See Fig. 3A.

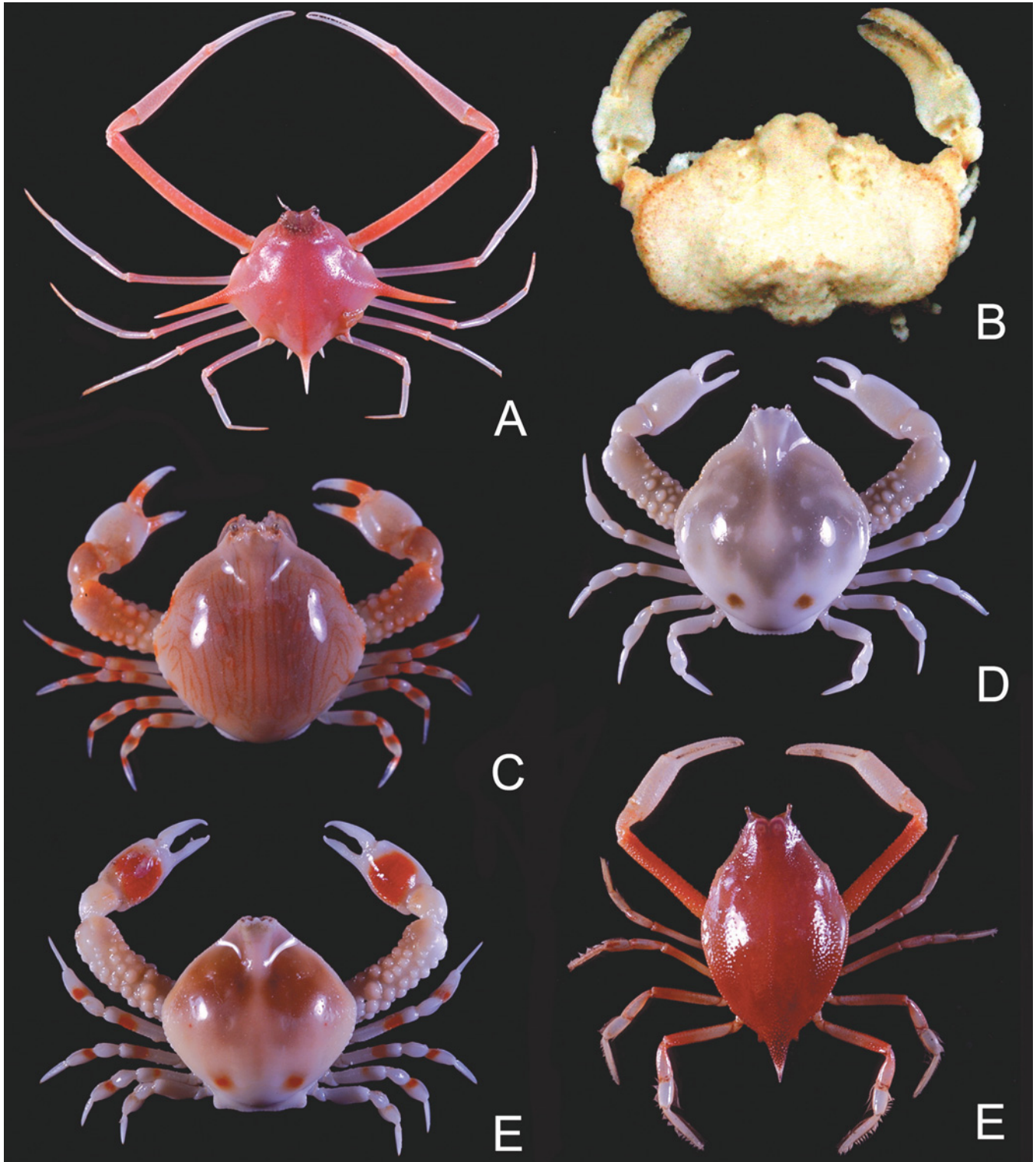


Fig. 2. Leucosiids from Panglao Island, the Philippines: A, *Arcania septemspinosa* (Fabricius, 1787), male (CL 19.8 mm) (ZRC 2007.0537); B, *Cateios frontalis* (Miers, 1884), male (CL 4.8 mm) (ZRC 2007.0549); C, *Euclosia crosnieri* (Chen, 1989), 1 ♀ (CL 21.9 mm) (ZRC 2007.0554); D, *Leucosia craniolaris* (Linnaeus, 1758), male (CL 19.7 mm) (MNHN); E, *Leucosia rubripalma* Galil, 2003, 1 ♂ (CL 21.2 mm) (ZRC 2007.0569); F, *Myra elegans* Bell, 1855, male (CL 15.2 mm) (ZRC 2007.0570).

Distribution. – Fiji, New Caledonia, Vanuatu, Indonesia (Galil, 2001b), the Philippines (new record).

***Parilia major* Sakai, 1961**

Parilia major Sakai, 1961: 137, Pl. 3; Serène & Vadon, 1981:124; Chen, 1989: 233, Fig. 24, Pl. II 1; Tan, 1996: 1023, 1046, Figs. 7 f–k; Komatsu et al., 2005: 106. (see Chen & Sun, 2002: 365, for synonymy)

Material examined. – Balicasag Island, tangle nets: 1 male (CL 43.7 mm), 1 ovigerous female (CL 46.7 mm), 1 female (CL 46.3 mm) (ZRC 2001.0406), Dec. 2000; 2 males, 2 ovigerous females, 4 females (ZRC 2001.0370), Dec.2000; 3 females (CL 21.9–30.6 mm) (ZRC 2007.0576), Dec.2003; 3 males (CL 30.3–46.9 mm), 3 females (CL 43.8–45.8 mm) (ZRC 2007.0577), Nov.2003; 4 females (CL 31.1–44.7 mm) (ZRC 2007.0580), Mar.2004; 1 ovigerous female (CL 42.3 mm) (ZRC 2007.0581), May.2004; 4 males (CL 44.7–61.3 mm), 4 ovigerous females (CL 42.4–46.8 mm), 4 females (CL 30.4–44.2 mm) (ZRC 2007.0582), 28 May.2004; 2 males, 2 females (NMCR), Balicasag Island, Feb.2004; 1 male, 2 females (ZRC 2007.0585), Jan.2004; 4 males (CL 47.8–65.8 mm), 2 females (CL 41.6, 43.6 mm) (ZRC 2007.0583), 300 m, soft bottom with sponges, 27 May.2004; 3 males, 3 females (ZRC 2007.0578), station P2, Maribohoc Bay, Bohol, 09°39.0'N 123°43.8'E, Oct.2003; 32 males, 22 ovigerous females, 19 females. (ZRC 2007.0579), Maribohoc Bay, Bohol, 100–300 m, tangle nets, Nov.2003–Apr.2004; 2 males (CL 63.9, 58.9 mm) (ZRC 2007.0584), Momo Beach, Panglao, 350 m, tangle net, 2 Jun.2004; 5 males (CL 42.5–61.4 mm), 1 ovigerous female (CL 43.0 mm) (MNHN), 7 Jul.2004; 1 female (ZRC 2007.0586), station P1, Maribohoc Bay, Bohol, 009°36.1'N 123°45.0'E, 90–200 m, 30 May.2004; 2 males, 1 female (ZRC 2007.0587), station P1, Maribohoc Bay, Bohol, 009°36.1'N 123°45.0'E, 90–200 m, 30 May.2004; 4 males (MNHN), station P2, Maribohoc Bay, Bohol, 009°36.1'N 123°45.0'E, 400 m, 30 May.2004.

Distribution. – Indonesia, the Philippines, Japan (Tan, 1996).

***Pariphiculus agariciferus* Ihle, 1918**

(Fig. 3B)

Pariphiculus agariciferus Ihle, 1918: 250, Fig. 230; Serène & Vadon, 1981: 124; Chen, 1989: 231, Figs. 21 d–g, Pl. II 5; Tan, 1996: 1023; Komatsu et al., 2005: 106. (see Chen & Sun, 2002: 374, for synonymy)

Material examined. – Balicasag Island, tangle nets: 1 female (CL 18.1mm) (MNHN), station P2, 9°0.039'N 123°0.044'E, 400 m, 30 May.2004; 1 female (NMCR), station P1, 30 May.2004; 1 male (MNHN), station P3 (= P4), 2 Jul.2004; 3 males, 1 female (ZRC 2007.0588), Nov.2003; 1 male (ZRC 2007.0589), May.2004; 1 male, 1 female (MNHN), Jun.2002; 1 male, 1 female (ZRC 2001.0559), 28 Nov.2001; 1 male, 1 female (ZRC 2007.0590), 2 Mar.2004.

Colour. – Carapace and chelipeds dull red, granules somewhat paler; pereopods dull red but for white ring distally on merus (Fig. 3B).

Distribution. – Indonesia, the Philippines, South China Sea, Japan (Chen, 1989).

***Pariphiculus coronatus* (Alcock & Anderson, 1894)**

Pariphiculus coronatus, Serène & Vadon, 1981: 124; Chen, 1989: 229, Fig. 22, Pls. I 3, III 5; Tan, 1996: 1023, 1048; Komatsu et al., 2005: 106.

Material examined. – Balicasag Island, tangle nets: 2 males (CL 23.3, 24.3 mm), 4 females (CL 23.4–24.5 mm), 1 ovigerous female (CL 26.3 mm) (ZRC 2001.0571), 28 Nov.2001; 1 male (CL 24.3 mm), 1 female (CL 26.5 mm), ZRC 2001.0573, 28 Nov.2001; 1 female (CL 25.8 mm) (ZRC 2001.0339), Dec.2000, 3 males (CL 23.7–25.6 mm), 4 females (CL 19.7–25.9 mm) (ZRC 2007.0591), Jun.2002; 1 male (CL 24.9 mm), 1 female (CL 25.3 mm) (ZRC 2007.0592), 2 Mar.2004; 1 male, 1 female (NMCR), Nov.2004, 2 males, 1 female (MNHN), Nov.2004; 3 males, 2 females, 1 ovigerous female (ZRC 2007.0593), Feb.2004; 1 male, 1 female (ZRC 2007.0594), Mar.2004; 1 juvenile (CL 6.9 mm) (ZRC 2007.0595), T25, Cortes, Bohol, 09°41.1'N 123°49.3'E, fine sand and mud, 160–210 m, 24 Jun.2004.

Distribution. – Indonesia, the Philippines, China Seas, Vietnam, Japan, Bay of Bengal, Persian Gulf, Red Sea (Tan, 1996).

***Pariphiculus mariannae* (Herklots, 1852)**

Ilia mariannae Herklots, 1852: 36, Fig. 2.

Pariphiculus mariannae, Serène & Vadon, 1981: 124; Chen, 1989: 231, Figs. 23, Pl. IV 3; Tan, 1996: 1023, 1049.

Material examined. – 1 female (CL 30.1 mm) (ZRC 2007.0596), Balicasag Island, 84–95 m, tangle nets, 26 Oct.-2003.

Distribution. – Indonesia, the Philippines, South China Sea, Myanmar, India, Arabian Sea (Tan, 1996, Tirmizi & Kazmi, 1988).

***Praebebalia septemspinosa* Sakai, 1983**

Praebebalia septemspinosa Sakai, 1983: 625, Figs. 2d–h; Chen, 1989: 192; Tan, 1996: 1023, 1050, Figs. 6k–m; Galil, 2001d: 273, Figs. 4a–c, 5d; Komatsu et al., 2005: 106.

Material examined. – Balicasag Island, tangle nets: 3 males (CL 13.5–13.8 mm), 1 ovigerous female (CL 13.5 mm) (ZRC 2001.0402), Dec. 2000; 4 males (CL 13.2–14.8 mm) (ZRC 2001.0557), 50–500 m, 28 Nov.2001; 1 ovigerous female (CL 12.5 mm) (ZRC 2001.0558), 50–500 m, 28 Nov.2001; 2 females (CL 12.7, 14 mm) (NMCR), 200–300 m, Jun.2002; 1 male (CL 13.8 mm), 1 ovigerous female (CL 14.2 mm) (ZRC 2007.0598), 2 Mar.2004; 1 male (MNHN), Nov.2003; 15 males (CL 11.5–15.5 mm), 5 ovigerous females (CL 12.5 mm) (ZRC 2001.0558), 50–500 m, 28 Nov.2001; 2 females (CL 11.5–13.5 mm) (ZRC 2007.0597), Maribohoc Bay, Bohol, 100–300 m, Nov.2003–Apr.2004; 2 males, 1 ovigerous female (ZRC 2007.0599), station P1, 009°36.1'N 123°45.0'E, 30 May.2004; 3 males, 1 ovigerous female (MNHN), Maribohoc Bay, Bohol, Nov.2003.

Distribution. – The Philippines (Sakai, 1983; Komatsu et al., 2005).

Raylilia intermedia Komatsu, Manuel & Takeda, 2005

Raylilia intermedia Komatsu, Manuel & Takeda, 2005: 109, Figs. 3, 4, 8A, B.

Material examined. – 1 female (CL 13.1 mm) (ZRC 2007.0600), Balicasag Island, tangle nets, Feb.-2004.

Remarks. – This species was described on the basis of one male and one female from Balicasag Island, and we add another female to the known specimen list. The species, according to Komatsu et al. (2005) is intermediate between *Raylilia mirabilis* (Zarenkov, 1990) and *R. coniculifera* Galil, 2001c.

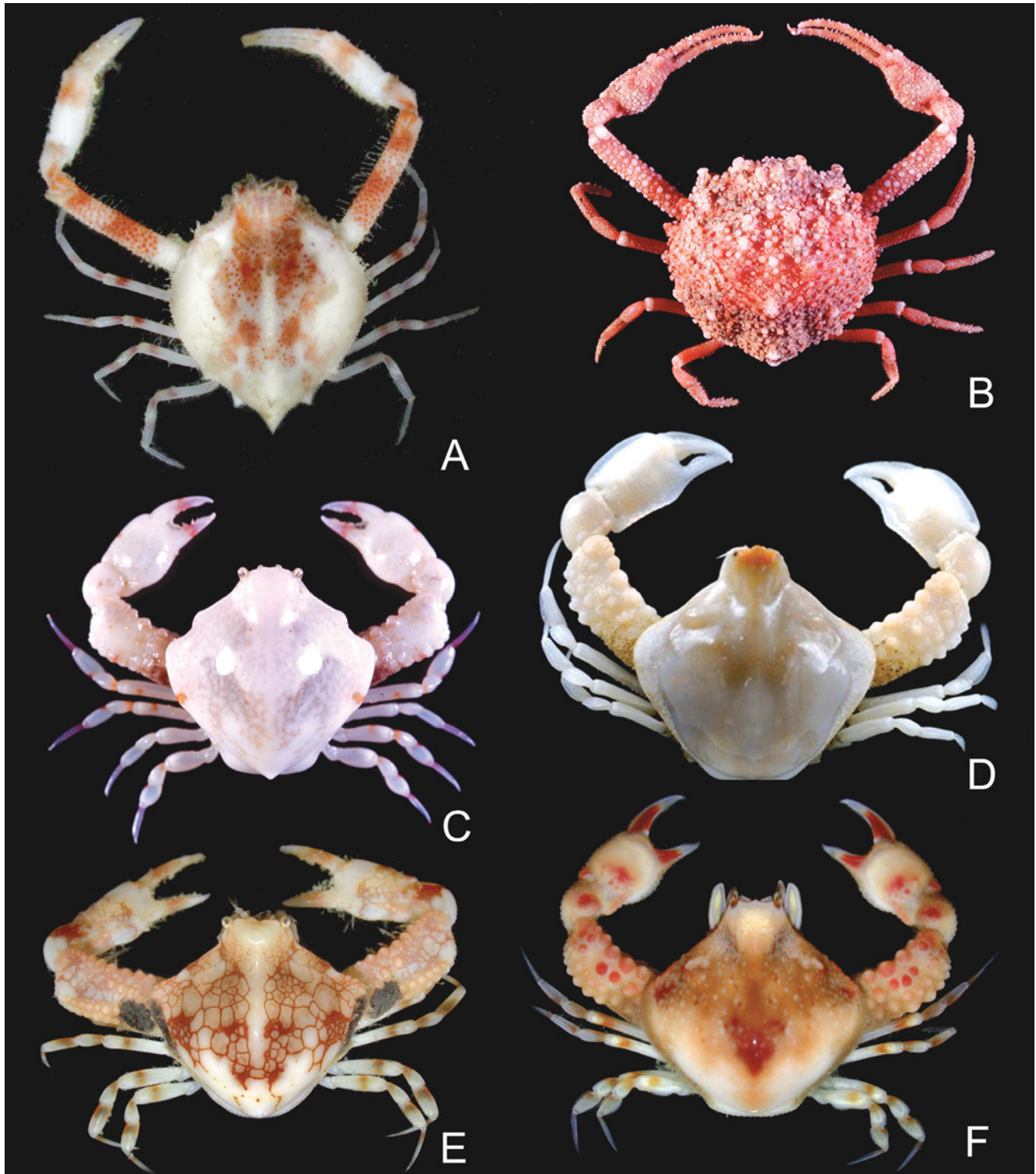


Fig. 3. Leucosiids from Panglao Island, the Philippines: A, *Myra tumidospina* Galil, 2001, juvenile (CL 10.6 mm) (ZRC 2007.0575); B, *Pariphiculus agariciferus* Ihle, 1918, female (CL 18.1mm) (MNHN); C, *Urnalana cumingii* (Bell, 1855), male (CL 9.4 mm) (ZRC 2007.0624); D, *Urnalana cristata*, new species, holotype male (CL 11.1 mm) (NMCR); E, *Urnalana pulchella* (Bell, 1855), male (CL 9.2 mm) (ZRC 2007.0628); F, *Urnalana whitei* (Bell, 1855), male (CL 8.0 mm) (ZRC 2007.0629).

Distribution. – Known only from the Philippines thus far (Komatsu et al., 2005).

***Seulocia cristata* Galil, 2005**

Leucosia rhomboidalis, Chen, 1989: 240, Fig. 30 b-c.
Seulocia cristata Galil, 2005b: 46, Fig. 1c.

Material examined. – 2 females (CL 13.9–14.1 mm) (NMCR), station R52, Bingag, Panglao, 09°37.4'N 123°46.9'E, 3–20 m, coral plateau with sand, 19 Jun.2004; 5 males (CL 9.2–13.3 mm), 4 females (CL 13.1–13.4 mm) (ZRC 2007.0601), station T19, Cortes, Bohol, 09°42.2'N 123°50.8'E, 10–26 m, muddy, 20 Jun.2004; 2 males (CL 12.8–13.7 mm) (MNHN), station T21, Cortes, Bohol, 09°42.8'N 123°50.6'E, 12 m, dead coral, 21 Jun.2004; 2 males (CL 12.9, 13.4 mm), 2 ovigerous females (CL 13.5, 13.7 mm), 1 female (CL 12.6 mm) (ZRC 2007.0602), station T22, Cortes, Bohol, 09°42.5'N 123°50.7'E, 11–20 m, dead coral, 21 Jun.2004; 2 males (CL 12.2, 12.3 mm), 1 ovigerous female (CL 13.0 mm), 1 female (CL 13.3 mm) (ZRC 2007.0603), station T23, Cortes, Bohol, 09°42.2'N 123°50.6'E, 35–45 m, black mud, 21 Jun.2004; 1 female (MNHN), station S20, Manga, Bohol, 09°41.8'N 123°51.1'E, mud, 8–10 m, 20 Jun.2004.

Distribution. – Indonesia, the Philippines, Japan, Singapore, Thailand (Galil, 2005b).

Tanaoa pustulosus

(Wood-Mason, in Wood-Mason & Alcock, 1891)

Randallia pustulosa Wood-Mason, in Wood-Mason & Alcock, 1891: 246;
Serène & Vadon, 1981: 124; Chen, 1989: 217, Fig. 15, Pl. IV 1;
Tan, 1996: 1023, 1054.
Tanaoa pustulosus, Galil, 2003a: 404, Figs. 1d, 3g, h; Komatsu et al., 2005: 106. (see Galil, 2003a: 404 for synonymy)

Material examined. – Balicasag Island, tangle nets: 3 males (CL 33.4–34.7 mm), 3 females (1 parasitized) (CL 28.3–34.8 mm), 1 ovigerous female (CL 34.5 mm) (ZRC 2001.0567), 50–500 m, 28 Nov.2001; 1 male, 1 ovigerous female (CL 29.7 mm) (ZRC 2007.0604), 100–300 m, Nov.2003–Apr.2004; 2 males (CL 30.8, 32.1 mm) (ZRC 2007.0605), Mar.2004; 1 female (CL 31.4 mm) (ZRC 2007.0606), 2 Mar.2004; 1 male (CL 33.7 mm) (ZRC 2007.0607), 28 May.2004.

Distribution. – Fiji, New Caledonia, New Zealand, Caroline Islands, Japan, Taiwan, Indonesia, the Philippines, Andaman Sea, Laccadive Sea, Seychelles, Comoro Islands, Madagascar, East Africa (Galil, 2003a).

***Tokoyo eburnea* (Alcock, 1896)**

(Fig. 4)

Randallia eburnea Alcock, 1896: 197; Serène & Vadon, 1981: 124; Chen, 1989: 212, Figs. 12, 13.
Tokoyo eburnea, Galil, 2003a: 408, Figs. 1f, 4d–f; Komatsu et al., 2005: 106, Figs. 7d–f, h, 8D. (see Galil, 2003a: 408 for synonymy)
Tokoyo trilobata Komatsu, Manuel & Takeda, 2005: 116, Figs. 5, 6, 7a–c, g, 8C, D.

Material examined. – Balicasag Island, tangle nets: 2 males (ZRC 2001.0564), 28 Nov.2001; 19 males (CL 16.6–28.1 mm), 14 ovigerous females (CL 16.0–20.5 mm) (ZRC 2001.0566), 50–500 m, 28 Nov.2001; 1 male, 4 females (ZRC 2001.0371), Dec.2000; 3 males, 1 ovigerous female (MNHN), Nov.2003; 4 males (CL 18.1–19.2 mm) (ZRC 2007.0608), Dec.2003; 5 males (CL 17.2–19.3 mm), 1 ovigerous female (CL 17.9 mm) (ZRC 2007.0609), station P2, 20 Jan.2004; 11 males (CL 15.2–20.6 mm), 2 ovigerous females (CL 20.7 mm) (NMCR), Mar.2004; 1 male (ZRC 2007.0610), 2 Mar.2004; 3 males, 3 ovigerous females (ZRC 2007.0611), May.2004; 1 male, 3 ovigerous females (MNHN), Feb.2004; 1 male (ZRC 2007.0614), Jan.2004; 1 ovigerous female (ZRC 2007.0615), 28 May.2004; 1 male, 3 ovigerous females (ZRC 2007.0616), station P4, 9°0.031'N 123°0.041'E, 100 m; 4 males, 1 ovigerous female (ZRC 2007.0617), station P3 (= P4), 09°31.1'N 123°41.5'E, 31 May.2004; 1 male (ZRC 2007.0618), station P3 (= P4), 09°31.1'N 123°41.5'E, 31 May.2004; 2 males, 1 female (ZRC 2007.0619), station P3 (=P4), 09°31.1'N 123°41.5'E, 31 May.2004; 1 male (ZRC 2007.0612), station P1, Maribohoc Bay, Bohol, 09°36.1'N 123°45.0'E, 150–200 m, 30 May.2004; 1 male, 1 ovigerous female (ZRC 2007.0613), Maribohoc Bay, Bohol, Nov.2003–Apr.2004; 1 ovigerous female, 1 female (ZRC 2007.0620), station P5, Pamilacan Island, 09°30.0'N 123°54.6'E, tangle nets from local fishermen, ca. 100 m, 3 Jun.2004; 2 females (ZRC 2007.0621), station T10, off San Isidro, Panglao, 09°33.4'N/09°33.8'N 123°49.6'E/123°51.5'E, 117–124 m, fine sand, 15 Jun.2004; 5 males, 1 juvenile (ZRC 2007.0622), station T27, between Panglao and Pamilacan islands, 09°33.4'N 123°51.0'E, 106–137 m, fine sand and mud, 21 Jun.2004. Comparative material. *Tokoyo eburnea*: 13 males (CL 14.7–19.1 mm), 9 ovigerous females (CL 14.8–18.7 mm) (ZRC 2001.0567), Tomioka, Amakusa, Kyushu, Japan, coll. J. C. Y. Lai & S. Arakaki, 3 Sep.2002.

Remarks. – Komatsu et al. (2005: 116) described a new species from the Philippines, *T. trilobata*, which they argued is very close to *T. eburnea* but differing in three main characters: the posterior lobes on the carapace margin are rounded (vs. triangular in *T. eburnea*), the space between the

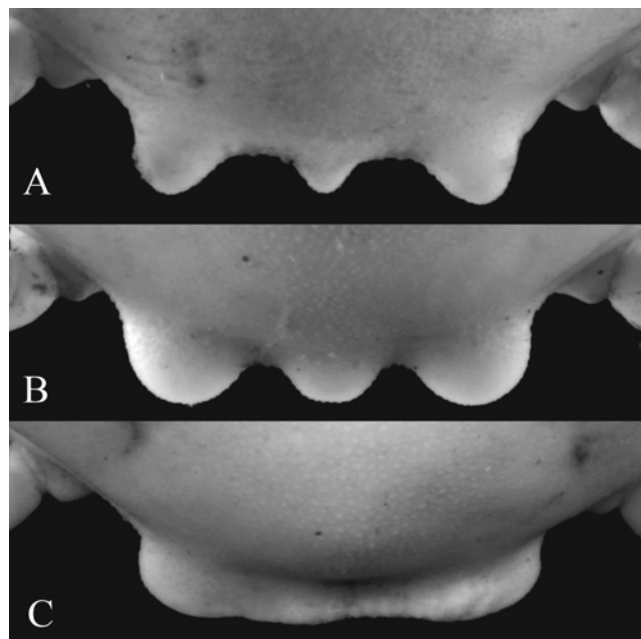


Fig. 4. Posterior carapace margins of *Tokoyo eburnea* showing variation. ZRC 2001.0567, Kyushu, Japan, coll. J. C. Y. Lai & S. Arakaki, 3 Sep.2002. A, sharp teeth, male (CL 18.4 mm); rounded teeth, male (CL 18.4 mm); fused teeth, male (CL 18.1 mm).

posterior carapace lobes was relatively wider (closer together in *T. eburnea*) and the tip of the G1 was more prominently bent upwards. Alcock (1896) described *T. eburnea* (as *Randallia eburnea*) from the Bay of Bengal. His illustration of the species (in Alcock & Anderson, 1897: Pl. 30 Fig. 4) clearly shows the rounded and well spaced lobes on the posterior margin that Komatsu et al. (2005) maintain is a distinguishing character of *T. trilobata*. Comparison of the illustrations provided by Komatsu et al. (2005: Figs. 5, 6, 7a–c, g, 8c, d) with a large series of specimens of *T. eburnea* from Japan, Taiwan, Indonesia, Philippines and western Thailand, convinced us that all the differences can easily be explained by variation. The form of the posterior carapace lobes varies considerably, from rounded to broadly triangular to almost triangular, the tip varying from sharp to round (Fig. 4A, B). The distance between the lobes also varies, from far to close, and in a few cases, they are almost completely fused, forming one lobiform structure (Fig. 4C). With regards to the structure of the tip of the G1, it is usually gently curved upwards (proximally) but in a few specimens, the curvature is more pronounced. The form of the G1 cannot be correlated with the other characters, and it is clear the tip varies more than previously recognized. Komatsu kindly provided us colour figures of what he regarded were two species with the following comments: “We found two color types of “*Tokoyo eburnea*” in the Balicasag collection. One is larger and speckled (= *T. eburnea*), another is simply reddish (= *T. trilobata*). Since there are small morphological differences between them, we described one as new. But that may be a rough and ready conclusion.” (H. Komatsu, in litt. to P. K. L. Ng). Having examined a large series, including many live as well as freshly preserved specimens from Balicasag and elsewhere, we believe that these differences are well within the colour variation we have observed. In summary, we are of the opinion that *T. trilobata* is synonymous with *T. eburnea*.

Distribution. – Australia, Japan, China, Taiwan, Vietnam, Indonesia, the Philippines, Andaman Sea, Laccadive Sea (Galil, 2003a).

***Urnalana cristata*, new species**

(Figs. 3D, 5J–L)

Material examined. – Holotype, male (CL 11.1 mm) (NMCR), station T29, Biking, Panglao, 09°34.5'N 123°50.6'E, 77–84 m, sponges, 1 Jul.2004. Paratype: 1 male, parasitized (CL 11.3 mm) (ZRC 2007.0623), same data as holotype.

Description. – Carapace subpentagonal, globose; regions of carapace indistinct. Dorsal surface of carapace minutely punctuate, obsoletely carinate medially, mostly glabrous, short setae near posterolateral margin. Front produced, prominent, frontal margin unidentate, deflexed, postfrontal region laterally concave. Antennular fossa sealed by basal antennular segment. Outer orbital margin unisutured, anterior margin of efferent branchial channel forms part of lower orbital margin. External maxillipeds lacking setose fringe

lengthwise on endopod of female. Hepatic region bearing oval tumescence, branchial region bearing elongate tumescences. Lateral angle of carapace prominent, overhanging thoracic sinus, margin smooth. Thoracic sinus deep, setose, anteriorly defined by overhanging margin of pterygostomian region; row of granules ventrally. Epimeral ledge visible in dorsal view, continuous with posterior margin, margin beaded. Posterior margin prominent, beaded. Chelipeds subequal, robust. Cheliped merus half as long as carapace; entirely granular but for smooth patch medially on lower surface; anterior, posterior margins bearing conic granules, larger medially; upper surface bearing setose patch proximally. Carpus with row of granules on inner margin. Upper margin of palm with prominent, smooth carina; lower inner margin with scalloped carina extending to proximal part of pollex; outer surface of palm proximally with row of minute granules, parallel with lower margin. Upper margin of dactyl carinate. Pereiopodal meri 1–3 with granulate rows on lower surface, distally carinate on upper surface; upper and lower margins of merus of fourth pereopod prominently carinate. Pereiopodal carpi prominently keeled dorsally; propodi keeled dorsally, ventrally. Male abdominal sulcus deep, nearly reaching buccal cavity; lateral margin bearing distinct ridge fitting into suture between abdominal segments. Male abdomen with segment 2 small; segments 3–5 fused, proximally with median furrow; segment 6 large, trapezoid, medially denticulate; telson triangular. Shaft of G1 short, stout, sinuous, distally setose; cornuted apical process curved, sigmoid. G2 short, curved, apex scoop-like.

Colour. – See Fig. 3D.

Remarks. – *Urnalana cristata*, new species, shares with *U. granulimera* Galil, 2005a, a granulate dorsal surface of cheliped merus, a medially carinate carapace with tumescences on hepatic and branchial regions, and carinate palms. However, it differs from the latter in having prominently carinate pereiopods and in the curved and sigmoid form of the apical process of the first male pleopod (cf. Galil, 2005a, for *U. granulimera*).

Etymology. – *crista* Latin, “crest, carina”, for the boldly carinate palms and pereiopods.

Distribution. – Known only from Panglao Island.

***Urnalana cumingii* (Bell, 1855)**

(Fig. 3C)

Leucosia cumingii White, 1847: 48 (nomen nudum); Bell, 1855b: 290, Pl. 31 Fig. 3.

Leucosia cumingi, Estampador, 1937: 511.

Leucosia galantua, Tan, 1996: 1035, Figs. 4d, 5a.

Urnalana cumingii, Galil, 2005a: 15, Figs. 1c, 4c.

Material examined. – 1 male (CL 9.4 mm) (ZRC 2007.0624), station S38, channel between Tagbilaran town (Bohol) and Panglao, 09°38.1'N 123°51.4'E, 3–3.5 m, sandy bottom with little mud, 30 May 2004.

Colour. – Young specimen. Carapace whitish marbled with ochre, a pair of rust-coloured spots on posterolateral margin above first pereopods. Palm with small rust coloured spot medially on upper margin, fingers with rust stripe medially. Pereiopods white with rust coloured spots, dactyls purple (Fig. 3C).

Distribution. – Australia, Papua New Guinea, Indonesia, the Philippines (Galil, 2005a).

***Urnalana elata* (A. Milne-Edwards, 1874)**

Leucosia elata A. Milne-Edwards, 1874: 41, Pl. 2 Fig. 2.
Urnalana elata, Galil, 2005a: 16, Figs. 1D, 5A.

Material examined. – 1 ovigerous female (CL 9.7 mm) (ZRC 2007.0625), station M7, Momo Beach, Panglao, 09°36.1'N 123°45.2'E, 0–3 m, coral reef and sea-grass, 1 Jun.2004; 1 female (CL 6.3 mm) (MNHN), station S42, Pamilacan Island, 09°30.1'N 123°55.5'E, 15–20 m, sand with this hard layer, 1 Jul.2004.

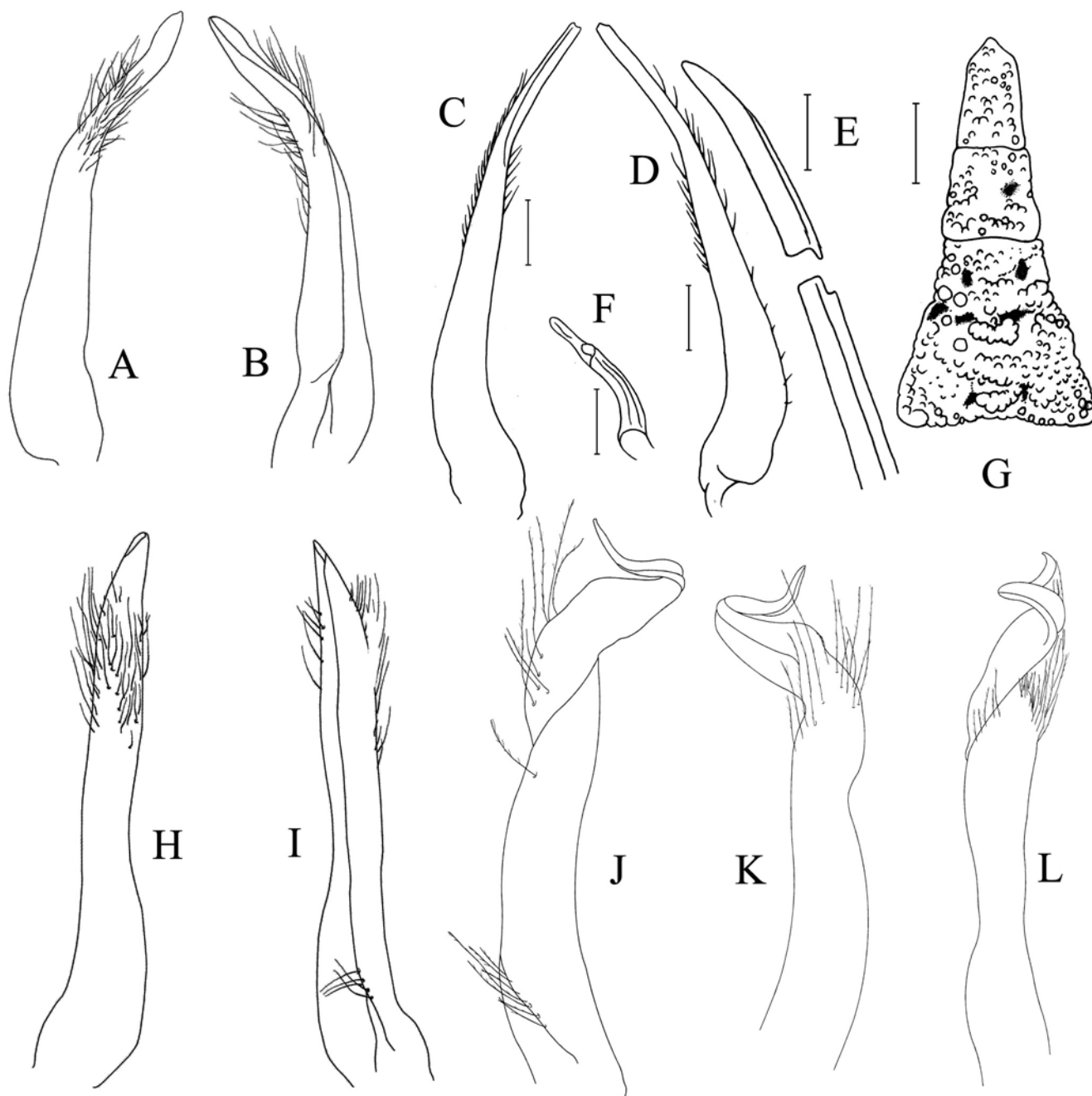


Fig. 5. Gonopods of: A, B, *Alox bothros*, new species, holotype male (CL 9.0 mm) (NMCR); C–G, *Alox somphos*, paratype male (CL 8.7 mm) (ZMA 100.605); H, I, *Alox chaunos*, new species, holotype male (CL 6.8 mm) (NMCR); J–L, *Urnalana cristata*, new species, holotype male (CL 11.1 mm) (NMCR). A, B, H–L, G1s; C, D, G1 with distal part broken off; E, distal part of G1 showing showing breakage point and remaining part of structure; F, G2; G, male abdomen.

Distribution. – Marshall Islands, Samoa, New Caledonia, Australia, Papua New Guinea, Japan, Indonesia, Comoro Islands (Galil, 2005a), the Philippines (new record).

***Urnalana foresti* (Chen, 1989)**

Leucosia foresti Chen, 1989: 240, Fig. 28, pl. 1(10).

Material examined. – 1 males (CL 9.3 mm) (ZRC 2007.0626), station T11, Maribohoc Bay, Bohol, 09°40.9'N 123°50.0'E, 78–95 m, sponges and muddy sand, 16 Jun.2004.

Remarks. – This species was not covered in Galil's (2005a) revision of the genus but it clearly belongs there and is referred here for the first time. Looking at the descriptions of *Leucosia foresti* Chen, 1989, and *L. minuta* Chen & Xu, 1991, we believe the two species are very close, although Chen & Xu (1991: 61, fig. 10) and Chen & Sun (2002 : 450, Fig. 204) argue that there are differences in the form of the carapace and thoracic sinus structures. As both were described by the late H.-L. Chen within two years of each other, are from different localities (*L. minuta*: Nansha Islands = Spratlys, *L. foresti*: the Philippines), and we have not examined the types, it seems best to keep them separate for the time being.

Distribution. – The Philippines (Chen, 1989).

***Urnalana margaritata* (A. Milne-Edwards, 1874)**

Leucosia margaritata A. Milne-Edwards, 1874: 42, Pl. 2 Fig. 3.
Urnalana margaritata, Galil, 2005a: 25, Figs. 2e, 7b.

Material examined. – 2 ovigerous females (CL 6.5, 7.0 mm) (ZRC 2007.0627), station T32, Baclayon, Bohol, 09°36.4'N 123°53.8'E, 60–62 m, muddy-sand, 3 Jul.2004; 1 female (CL 6.0 mm) (NMCR), station S25, Ubajan, Bohol, 09°41.5'N 123°51.0'E, 21 m, 23 Jul.2004.

Distribution. – New Caledonia, Palau Islands, Australia, Papua New Guinea, Indonesia, the Philippines (Galil, 2005a).

***Urnalana pulchella* (Bell, 1855)**
(Fig. 3E)

Leucosia pulchella Bell, 1855a: 363.
Urnalana pulchella, Galil, 2005a: 29, Figs. 3A, 8A. (see Galil, 2005a: 29 for synonymy)

Material examined. – 1 parasitized female (CL 8.1 mm) (MNHN), station T5, west of Baclayon, Bohol, 09°35.3'N 123°52.2'E, 84–86.9 m, sandy mud, 2 Jun.2004; 2 males (CL 8.4, 9.2 mm) (ZRC 2007.0628), station T28, Biking-Catamaran, Panglao, 09°35.0'N 123°51.4'E, 80 m, fine sand and mud, 1 Jul.2004; 1 female (CL 6.0 mm) (NMCR), station T33, Baclayon, Bohol, 09°36.0'N 123°53.7'E, 67–74 m, sand, 3 Jul.2004.

Colour. – See Fig. 3E.

Distribution. – Fiji, Australia, Papua New Guinea, Indonesia, Tonkin Bay, South China Sea, India, Andamans, South Africa, Madagascar, Comoro Islands, Gulf of Aden, Red Sea (Galil, 2005a), the Philippines (new record).

***Urnalana whitei* (Bell, 1855)**
(Fig. 3F)

Leucosia whitei Bell, 1855a: 362.
Urnalana whitei, Galil, 2005a: 32, Figs. 3d, 9b. (see Galil, 2005a: 32 for synonymy)

Material examined. – 1 male (CL 8.0 mm) (ZRC 2007.0629), station T6, west of Baclayon, Bohol, 09°35.1'N 123°51.2'E, 34–82 m, sandy-mud, large sponges, 2 Jun.2004.

Colour. – Carapace brownish, paler posteriorly, dull reddish triangular patch on cardiac region; cheliped merus dun coloured, anteromedian granules bright orange; carpus, propodus with red patch; fingers bright red proximally (Fig. 3F).

Distribution. – Australia, Indonesia (Galil, 2005a), the Philippines (new record).

***Urashima pustuloides* (Sakai, 1961)**

Randallia pustuloides, Sakai, 1961: 135, Pl. 3 Fig. 4; Chen, 1989: 219, Fig. 16; Tan, 1996: 1023, 1054.
Urashima pustuloides, Galil, 2003a: 417, Figs. 2f, 5g, h; Komatsu et al., 2005: 106. (see Galil, 2003a : 417 for synonymy)

Material examined. – Balicasag Island, tangle nets: 1 male (CL 36.5 mm) (ZRC 2001.0372), 200–300 m, Dec.2000; 1 female (CL 36.3 mm) (ZRC 2007.0630), 200–300 m, Jun.2002; 2 males (CL 35.5, 37.0 mm) (ZRC 2001.0568), 50–500 m, 28 Nov.2002; 1 juvenile male (CL 25.8 mm) (ZRC 2007.0631), Dec.2003; 1 male (CL 36.8 mm), 2 females (CL 37.9, 26.9 mm) (NMCR), 28 May.2004; 2 males (CL 35.1, 34.3 mm), 1 female (CL 26.8 mm) (ZRC 2007.0632), Maribohoc Bay, Bohol, 100–300 m, tangle nets, Nov.2003–Apr.2004.

Distribution. – Australia, Japan, Taiwan, Indonesia, the Philippines (Galil, 2003a).

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