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 anatome (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, Ethalia 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 antennular 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 menis 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 dorso lateral 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 laciniate 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; pereiopodal 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 antennular segment operculiform, rugose, entirely sealing...

**Colour.** Carapace whitish, post-frontal pits and para-intestinal grooves darker; pereiopodal propodi 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.

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*Alox ornatum* (Ihle, 1918)  
(Fig. 1C)

_Oreophorus (Oreophorus) ornatum_ 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, pereiopodal carpi, propodi with orange spot proximally on upper surface (Fig. 1C).

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

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*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–I, 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.

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

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

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*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)


**Colour.** Carapace orange-red, slightly paler laterally, posterior spines white; chelipeds orange-red proximally, paler distally; pereiopodal 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 septemspinosa var. gracilis Henderson, 1893: 403.  

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)

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

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).
Arcania septemspinosa (Fabricius, 1787)  
(Fig. 2A)

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; pereiopods pale. The "large red bar on cardiac region; cheliped meri rimmed with orange-red, carpi, propodi paler distally; pereiopods 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 undecimspinosa De Haan, 1841

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


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.

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


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

Material examined. – Maribohoc Bay, Bohol: 3 males, 1 female (ZRC 2007.0550), 200–300 m, tangle nets, Nov.2003–Mar.2004; 1 male (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),
Euclosia scita Galil, 2003

Euclosia scita 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).

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 pereiopods pale, pale rust spots distally on pereiopodal meri (Fig. 2D).

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

Leucosia punctata Bell, 1855


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, 2–4 m, 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, 2–3 m, 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; Komsotz 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 (CL 38.6 mm), 1 female (CL 42.1 mm) (ZRC 2001.0575), 50–500 m, 28 Nov. 2001; 15 males (CL 20.9–29.9 mm), 1 female (CL 43.1 mm) (NMCR), 200–300 m, Jun. 2002.

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

*Myra elegans* Bell, 1855

(Fig. 2F)


**Material examined.** – 1 male (CL 15.2 mm), 4 ogiverous 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.


**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; Komsotz 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; Komsotz 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)

Colour. – See Fig. 3A.
**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°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 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 3; Tan, 1996: 1023; Komatsu et al., 2005: 106. (see Chen & Sun, 2002: 374, for synonymy)


**Colour.** – Carapace and chelipeds dull red, granules somewhat paler; pereiopods 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)


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

**Pariphiculus mariannae** (Herklots, 1852)

*Iliia mariannae* Herklots, 1852: 36, Fig. 2.


**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).

**Praebalbia septemspinosa** Sakai, 1983

*Praebalbia 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.


**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.


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. conicalifera Galil, 2001c.

Fig. 3. Leucosiids from Panglao Island, the Philippines: A, Myra tumidospina Galil, 2001, juvenile (CL 10.6 mm) (ZRC 2007.0575); B, Pariphisicus agariciferus Ihle, 1918, female (CL 18.1 mm) (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.


**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.](image-url)

**Tokoyo eburnea** (Alcock, 1896)  
*(Fig. 4)*

*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)  
*Tokyo trilobata* Komatsu, Manuel & Takeda, 2005: 116, Figs. 5, 6, 7a–c, g, 8C, D.
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 “Tokyo 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 unsutured, 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. Efferent channel 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 granulate but for smooth patch medially on lower surface; anterior, posterior margins bearing conical 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 pereiopod prominently carinate. Pereiopodal carpi prominentely 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, mediadly denticate; 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 cumingii** 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 pereiopods. 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).

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**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.

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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.


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, 1045. 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 35.5 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).

ACKNOWLEDGEMENTS

The study started as a collaborative study of the Philippine crab fauna by the second author and Lawrence Liao (University of San Carlos, Cebu City, USC), and we are grateful for all the kind help he has rendered over the years. Father Florante Camacho, President of the Holy Name University in Bohol, was also instrumental in his support of the work. The 2004 and 2005 expeditions were conducted as a joint exercise between the Musèum national d’Histoire Naturelle (MNHN, Paris), University of San Carlos, Bureau of Fisheries and Research (BFAR, Manila), National Museum
of the Philippines (NMP, Manila), and the National University of Singapore. We thank Philippe Bouchet (MNHN), Danilo Largo (USC), Ludi Luďivěna (BFAR) and Marirene Manuel (PNM) for all their kind help. Philippe Bouchet’s support and persistence in realizing these very successful expeditions has been vital in the project’s success. Bertrand Richer de Forges (Institut de Recherche pour le Développement, Noumea) was key in helping us obtain many of the deeper water fauna, and sorting many of the small taxa in the field. We also thank Tan Swee Hee, Lai Chiu Yun, Chan Tin Yam, Lin Chia-Wei and Ristyo Rahayu for the many hours spent in the field sampling, sorting and photographing the thousands of specimens during the 2004 and 2005 expeditions. We also thank Hironori Komatsu and Tohru Naruse for carefully reading the manuscript and suggesting many useful changes. For the 2004 and 2005 expeditions, we acknowledge the kind financial assistance of the TOTAL Foundation, and the strong support of Bernard Tramier. The study has been partially supported by a research grant from the National University of Singapore. The first author thanks a Raffles Museum research fellowship for funding her stay in Singapore, and the entire laboratory personnel for making her stay in Singapore memorable. Tohru Naruse, Hironori Komatsu and an anonymous reviewer kindly read and made many useful comments on the manuscript.

LITERATURE CITED


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