

FIG. 4. (A) *Ixoides cornutus* MacGilchrist, 1905, male (28.9 × 29.8, 60.3); (B) *Ixoides cornutus* MacGilchrist, 1905, male (32.0 × 35.4, 55.5); (C) *Leucosia craniolaris* (Linnaeus, 1758), male (17.7 × 14.7); (D) *Leucosia galantua* Ovaere, 1988, female (11.8 × 11.0); (E) *Leucosia vittata* Stimpson, 1858, juvenile (11.2 × 9.2); (F) *Myra acutidens* Ihle, 1918, female (11.7 × 10.0, 12.3); (G) *Randallia pila* sp. n. Paratype female (10.0); (H) *Randallia pila* sp. n., Holotype male (13.1 × 15.1).

*Material examined.* **Philippines.** Stn 5477, 29 July 1909, coll. USBF, APE, 1 ♂ (28.9 × 29.8, 60.3), Stn 5097, coll. USBF, APE, 1 ♂ (32.0 × 35.4, 55.5).

*Diagnosis.* Carapace with 2 lateral projections sometimes tapering to a point, other times, rounding off, dorsal surface smooth, subhepatic region with tubercle, posterior margin with two large lobes constricted at base; front broadly bidentate. Ischium of 3rd maxillipeds with longitudinal grooves on inner border. Chelipeds slender, fingers slightly < 0.5 length of palm; dactyli of ambulatory legs fringed with hairs on anterior and posterior margins. Male G1 slender, about 4 × longer than G2, G1 with tip gradually tapering to distal end, base of tip setose.

*Remarks.* Chen (1989: fig. 21a–c) illustrates the variation in structure of the carapace lateral projection in an immature male and a mature male. The lobes on the posterior margin of the carapace are also variable according to Dai and Yang (1991). However, in the specimens examined, the proportion of the G1 relative to the G2 is the same for both specimens and the structure of the tip of the G1 is also basically similar for the two. As with Chen's specimens (1989), the smaller male here has the lateral projections tapering to a point whilst those in the larger specimen are stubby and rounded at the ends. An account of this kind of variation in this species is given in Serène and Lohavanijaya (1973).

*Distribution.* China (South China Sea and East China Sea), Taiwan, Japan, Vietnam, Persian Gulf. Philippines (Serène and Lohavanijaya, 1973; Chen, 1989).

*Leucosia* Weber, 1795

*Leucosia craniolaris* (Linnaeus, 1758)

(Figs 3m–q, 4C)

*Cancer craniolaris* Linnaeus, 1758: 626.

*Material examined.* **Philippines.** Nasugbu, December 1921, coll. D. Villadolid, 3 ♂ (16.6 × 13.9, 17.7 × 14.7, 17.3 × 14.3).

*Diagnosis.* Carapace hexagonal, thoracic sinus filled with hair, finely granular when denuded, with row of small granules continuous with epimeral edge; front with median triangular tooth. Propodus and dactylus of ambulatory legs compressed, carinate at margins. G1 4 × longer than G2. Colours in spirit: Bluish-grey with two pairs of white spots on dorsal surface of carapace, legs yellowish.

*Remarks.* The differences between *L. craniolaris* and the two species most closely related to it, *L. rhomboidalis* de Haan, 1850, and *L. vittata* Stimpson, 1858, are discussed in the remarks for the latter two species. Bell (1855: 283) adds that it is distinguished by the '... paucity of tubercles on the arm'. This is a new record for Philippines.

*Distribution.* Japan, China, Taiwan, Hong Kong, Gulf of Thailand, Borneo, India, northwest of Australia (Sakai, 1976), Philippines (present record).

*Leucosia galantua* Ovaere, 1988

(Figs 5a, 4D)

*Leucosia galantua* Ovaere, 1988: 95–98, figs. 1–3.

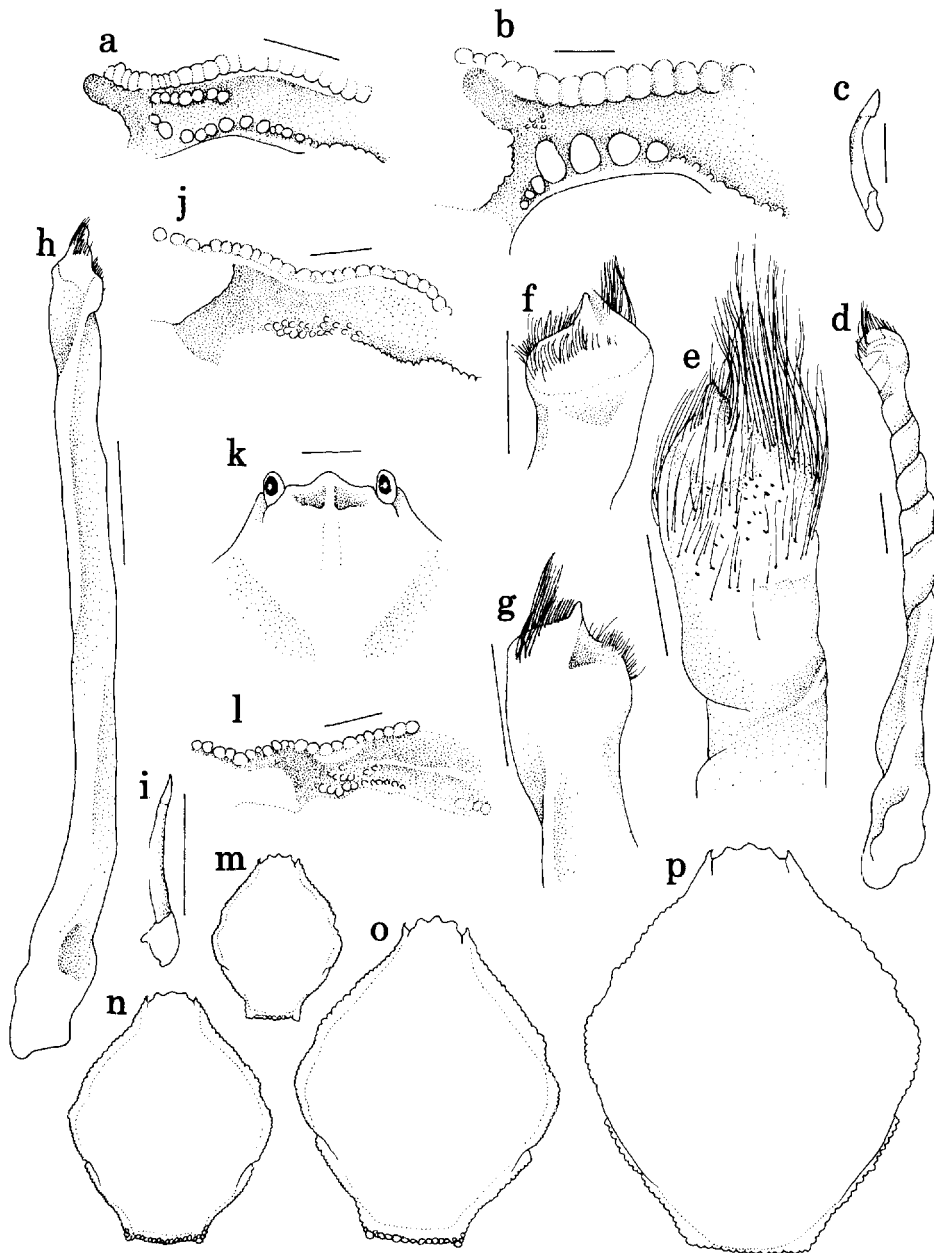


FIG. 5. *Leucosia galantua* Ovaere, 1988, female: (a) right thoracic sinus. *Leucosia perlata* de Haan, 1841, male: (b) right thoracic sinus; (c) right G2; (d) right G1; (e) tip of right G1. *Leucosia rhomboidalis* de Haan, 1850, male: (f), (g) tip of right G1; (h) right G1; (i) right G2; (j) right thoracic sinus; (k) front, dorsal view. *Leucosia vittata* Stimpson, 1858, juveniles: (l) right thoracic sinus; (m)-(p), carapace, dorsal view, showing variation with increasing size. Scales: e-g = 0.5 mm; all others = 1.0 mm.

*Material examined.* **Philippines.** Stn 5159, USBF, APE, 1 ♀ (10.9 × 10.1). Zambales Province, Nasasa Bay, 11–33 m, sandy bottom, coll. 1960, 1 ovig. ♀ (11.8 × 11.0) (acc. no. 23464).

*Diagnosis.* Carapace urn shaped, slightly longer than broad, anterolateral margin with semi-circular notch posteriorly caused by intrusion of dorsal arm of thoracic sinus, epimeral edge visible throughout entire extent, posterior margin slightly rounded, intestinal region weakly raised to form small mound, area below true posterior margin smooth; thoracic sinus filled with hair, with two large granules anteriorly, row of about seven granules on anterior roof of sinus, row of granules just above base of cheliped ending at beginning of epimeral margin; front broadly, weakly bilobed, slightly deflexed. Merus of chelipeds with patch of fur at base, fingers meeting only at tips, slightly shorter than palm. Colours in spirit: greyish brown with central lighter region, two reddish brown spots on each posterior margin just above first pair of walking legs.

*Remarks.* Ovaere (1988: 96) distinguished *L. galantua* from its closest congener *L. angulata* (Rathbun, 1911) by '... the form of tubercles on the anterior margin of the merus of the chelipeds, these tubercles being flat and tooth-like in *L. angulata*, while rounded and pearl-shaped in the new species [*L. galantua*]. The ornamentations of the thoracic sinus are different in both species: one large mushroom-shaped tubercle in *L. angulata* versus 2–3 large rounded tubercles in *L. galantua*'. In the two specimens examined, there are no hairs scattered on the carapace although they were observed by Ovaere (1988) for the holotype. Also, the tooth in the middle of the intestinal region present in the holotype is absent in both specimens. In its place is a slightly raised mound, which is barely discernible. The presence or absence of such a tooth on the intestinal region may be variable in the species and this was mentioned by Ovaere (1988). Ovaere (1988) also stated that the abdomen and underparts of the holotype had small reddish spots. This condition is absent in both the specimens examined.

*Distribution.* Western Australia, Papua New Guinea (Ovaere, 1988); Philippines (present record).

*Leucosia perlata* de Haan, 1841

(Figs 5b–e)

*Leucosia perlata* de Haan, 1841: 134.

*Material examined.* **Philippines.** Lubana, coll. 1934, 1 ♂ (17.8 × 15.5), 2 ♀ ♀ (19.0 × 16.6, 18.9 × 16.7) (acc. no. 204997).

*Diagnosis.* Carapace longer than broad, hepatic margin sinuous, thoracic sinus with three small granules anteriorly, four larger, pearly granules posteriorly; front tridentate. Outer edges of movable finger and palm of cheliped cristate; propodus and dactylus of ambulatory legs flattened, with anterior and posterior edges cristate. Male G1 about 4 × longer than G2, distal half coiled, tip with long setae, central chitinous projection present. Colour in spirit: mottled lavender grey anteriorly, two brownish spots posteriorly on either side of median line.

*Remarks.* In the description and figure given by Tyndale-Biscoe and George (1962), the G1 of the male is distally coiled  $7 \times$ . In the specimen examined in this study, there were only five coils. This may be due to individual variation related to age of the specimen. In other aspects, the specimen fits their description. The specimen matches Alcock's description (Alcock, 1896: 222–223) of *L. pallida* well. His record was later synonymized with *L. perlata*. This is a new record for the Philippines.

*Distribution.* 'Moluccensis' (type locality), Andamans, Persian Gulf, New Guinea, Thursday Is., Hong Kong, Indian Archipelago (Ihle, 1918), Philippines (present record).

*Leucosia rhomboidalis* de Haan, 1841

(Figs 5f–k)

*Leucosia rhomboidalis* de Haan, 1841: 134, pl. 33.

*Material examined.* **Philippines** Stn 5426, 3 April 1909, coll. USBF, APE, 1 ♀ (12.8 × 10.9). Stn 5107, 9 January 1909, coll. USBF, APE, 1 ♂ (13.5 × 10.8). Stn 5104, 8 January 1908, coll. USBF, APE, 1 ♂ (13.5 × 10.9).

*Diagnosis.* Carapace rhomboidal, longer than broad, dorsal surface of carapace just behind front with two triangular indentations on either side of median line, antero- and posterolateral margin lined by granules, posterior margin almost straight; front tridentate, median tooth largest, dorsal surface convex and broadly carinate towards median line; thoracic sinus filled with hair, with cluster of small granules just above base of arm. Ischium of third maxillipeds smooth, distal portion of exopod and merus finely granular, anterior border of exopod setose. Chelipeds stout, patch of spongy pubescence at base of arm not completely encircling arm, fingers slightly longer than palm. Abdominal segments 2–3 and 4–6 fused, fused piece of segments 4–6 with median denticle. G1  $5 \times$  longer than G2, weakly twisted along distal third, apex bulbous, setose, ending in small, conical projection. Colours in spirit: carapace greyish-brown on anterior two-thirds, colour gradually fading to ivory posteriorly. Arms of chelipeds similar greyish-brown as carapace, fading to ivory distally. Base of fingers chrome yellow, tips white.

*Remarks.* This species is very similar to *L. craniolaris* (Linnaeus, 1758), as noted by Alcock (1896: 323). *L. rhomboidalis* differs from *L. craniolaris* by the following: (1) the size is much smaller, usually about 14 mm in length, never exceeding 16 mm (specimens of *L. craniolaris* are about 20 mm or more in length); (2) the sides of the front are subparallel, thereby forming an abrupt angle with the anterolateral borders of the carapace (the anterolateral margins and the front converge gradually in *L. craniolaris*); (3) the front ends in three teeth, with the middle one large and prominent and the two lateral ones small and deflexed, giving the impression that the front ends in a sharp point when viewed by the naked eye (in *L. craniolaris*, the front is truncate triangular, ends in five prongs and is broader than long); (4) the anterior boundary of the thoracic sinus is smooth and almost straight (convex in *L. craniolaris*, with the thoracic sinus ending in two notches of equal size); (5) the inner surface of the carpus of the cheliped is bound above and below by a line of granules (in *L. craniolaris*, the surface of the wrist is quite smooth, except for two or three granules along the inner surface) (after Alcock, 1896: 235). The colour in spirit of the specimens is rather variable and cannot be the sole character in distinguishing the species for Alcock (1896)

says, 'carapace and dorsal surface of chelipeds blue-black, the carapace with 2 divergent crescents of dark red spots in its anterior half, following the anterior boundary of the epibranchial regions; tips of arms, hands and fingers sometimes nearly white, bases of fingers sometimes yellow ...' whilst the present specimens are greyish brown anteriorly and ivory posteriorly, without any crescents of red on anterior half.

An interesting character in *L. rhomboidalis* is the presence of two triangular indentations on the dorsal surface of the carapace just behind the front (snout), giving the surface a keeled appearance (Fig. 3k). This has never been mentioned before but is clearly seen in the figure provided by Chen (1989: fig. 30b-c).

*Distribution.* Coromandal Coast, Trincomali, Andaman Is., Hong Kong, Japan, Indian Archipelago (Ihle, 1918), China (South China Sea and East China Sea), Indonesia, Philippines (Chen, 1989).

*Leucosia vittata* Stimpson, 1858

(Figs 5l-p, 6a-d)

*Material examined.* **Philippines.** Manila Bay, outside breakwater, coll. USBF, APE, 12 December 1907, 6 juveniles ( $4.5 \times 3.5$ ,  $6.8 \times 5.5$ ,  $8.8 \times 7.0$ ,  $8.9 \times 7.2$ ,  $9.2 \times 7.7$ ,  $11.2 \times 9.2$ ).

*Diagnosis.* Carapace roughly hexagonal, dorsal surface just behind front convex, anterolateral border with emargination just above chelipeds due to intrusion by dorsal arm of thoracic sinus, epimeral edge visible throughout almost its entire extent, posterior margin straight in adults, with two lateral angles in juveniles; thoracic sinus filled with hair, a few small granules present just above base of cheliped; front tridentate, teeth rounded. Fingers of chelipeds slightly longer than palm, anterior edge of movable finger sharp; anterior edge of carpus and propodus of ambulatory legs carinate, dactylus flattened dorso-ventrally. G1 slender,  $2.9 \times$  longer than G2, apex setose, with two lobes, one larger than the other. Colours in spirit: largest male (young) has longitudinal white patch on dorsal surface of the carapace just behind front, anterior three-fourths greyish brown, gradually fading to ivory posteriorly, branchial region with two pairs of white spots, anterior posterolateral margin with two short brown stripes going diagonally towards the centre, outer surface of maxillipeds dark brown, base of meri and fingers brown, tips of fingers ivory. Smaller specimens have dorsal surface of carapace either 0.75 greyish brown fading to ivory posteriorly or only with snout greyish brown and rest of body ivory, outer surface of third maxillipeds light brown. A small specimen ( $6.88 \times 5.53$ ) has the brown stripes on posterolateral margin as in largest specimen.

*Remarks.* *Leucosia vittata* closely resembles *L. craniolaris* but is distinguished from the latter species particularly by the presence of an emargination at the posterior anterolateral margin due to encroachment by the dorsal arm of the thoracic sinus. In addition, the cheliped palm is appreciably longer than broad and the fingers are as long as or longer than the palm. According to Alcock (1896), the colour in spirit of the two species is also different. 'The colours in spirit are: carapace blackish blue, or nearly black, with flame-coloured stripes; chelipeds from the distal fourth of the arm to near

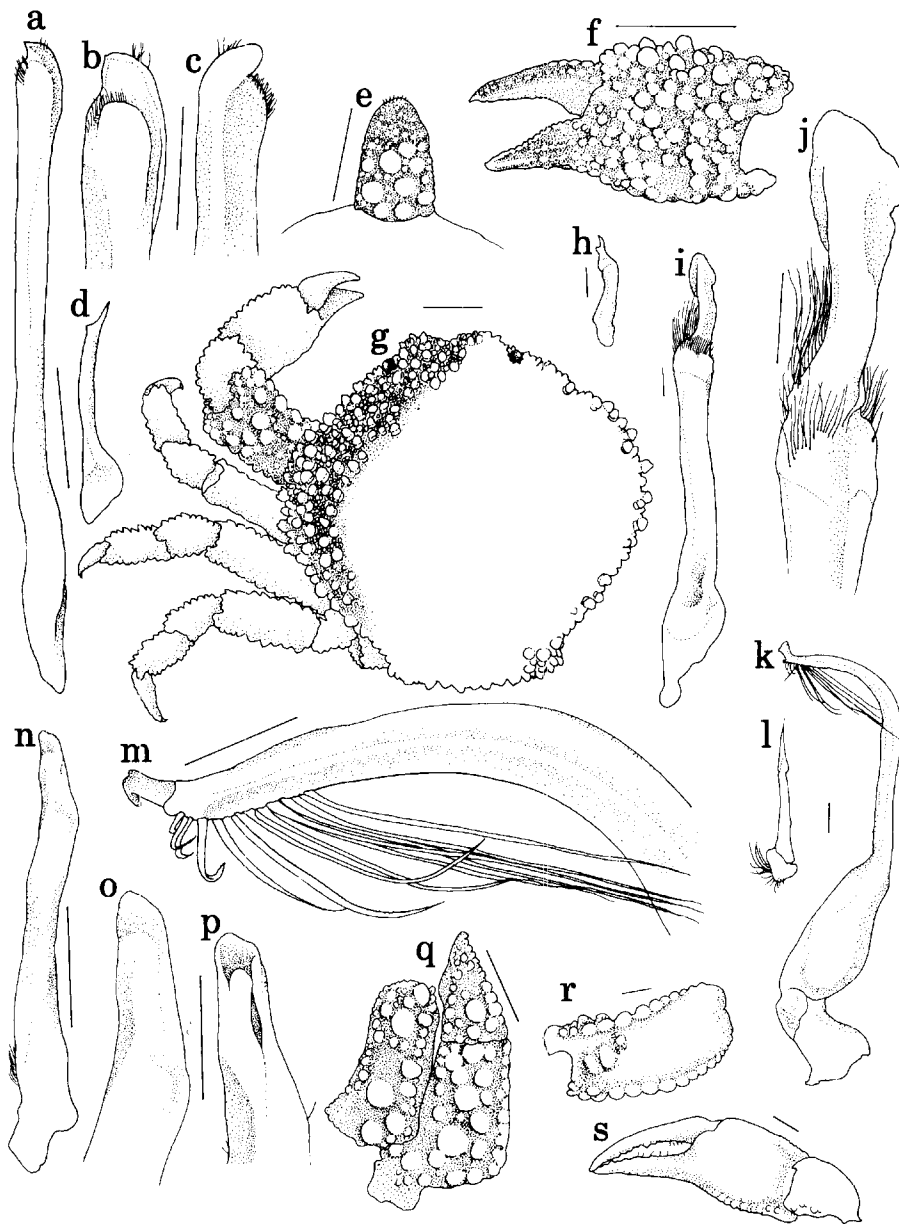


FIG. 6. *Leucosia vittata*, young male: (a) right G1; (b), (c) tip of right G1; (d) right G2. *Nucia tuberculosa* A. Milne Edwards, 1874, female: (e) telson; (f) right cheliped, upper surface; (g) carapace. *Myra fugax* (Fabricius, 1798), male: (h) right G2; (i) right G1; (j) tip of right G1. *Praebebalia septemspinosa* Sakai, 1983. (k) right G1; (l) right G2; (m) tip of right G1. *Myra acutidens* Ihle, 1918, young male: (n) right G1; (o), (p) tip of right G1. *Nucia tuberculosa* A. Milne Edwards, 1874, female: (q) right 3rd maxilliped. *Pseudophilyra* sp, juvenile: (r) right cheliped merus, upper surface; (s) right cheliped, upper surface. Scales: b, c, j, m, o, p = 0.5 mm, all others = 1.0 mm.

the tips of the fingers, smoky flame-coloured on both surfaces, as are also the legs; under surface of body ruddy brown' (Alcock, 1896: 232). The colour of the carapace of the specimens examined in this study was a rather uniform grey, fading to white at the edges. This difference may be attributed to the fact that the specimens which he examined were mostly adults, whilst those examined in this study were all juveniles. This a new record for the Philippines.

*Distribution.* Andaman Sea, Japan, China (Dai and Yang, 1991), Philippines (present record).

*Leucosia whitei* Bell, 1855

*Leucosia whitei* Bell, 1855: 289–290, pl. 31, fig. 2.

*Material examined.* **Philippines.** Stn 5181, coll. USBF, APE, 27 March 1909, 1♂ (12.1 × 10.8).

*Diagnosis.* Carapace urn-shaped, hepatic region with transverse patch of granules, dorsal surface of carapace directly behind front convex, pubescence on posterolateral margin; front sharply tridentate, deflexed; thoracic sinus filled with hair, with row of small granules visible when denuded. Outer surface of 3rd maxillipeds completely smooth. Chelipeds robust, base of arm with patch of spongy fur, fingers short, meeting only at tip. Abdomen of male with basal median depression on penultimate piece. G1 stout, 2.5 × longer than G2, with big, bulbous apex covered with setae, apex made up of two rounded lobes enclosing straight, central chitinous projection.

*Remarks.* Arnold and George (1987) established *L. whitei* as a species distinct from *L. cheverti* Haswell, 1880, on the basis of the carapace and cheliped colour, the tubercle arrangement on the cheliped wrist and palm and on the epibranchial region of the carapace, and structure of the G1 (Ovaere, 1987). Previous authors (e.g. Tyndale-Biscoe and George, 1962; McNeill, 1968; Griffin and Standbury, 1970) had synonymized the two as they considered Haswell's (1880) separation of *L. cheverti* from *L. whitei* as doubtful (Arnold and George, 1987). The present specimen only differs from the description given by Arnold and George (1987), in that the hepatic region granules are coalesced, instead of being distinct, large, and pearly. Also, the specimen was bleached and colour could not be used in this case.

*Distribution* Andamans, Australia, Cape Grenville and Darnley Is. (type locality) (Ihle, 1918), Indonesia, Philippines and Papua New Guinea (Ovaere, 1987).

*Myra* Leach, 1817

*Myra acutidens* Ihle, 1918

(Figs 6n–p, 4F)

*Myra acutidens* Ihle, 1918: 260–261, fig. 139.

*Material examined.* Stn 5158, coll. USBF, APE, 1 young ♂ (7.6 × 6.5, 9.1) 1♀ (11.7 × 9.7, 12.9). Stn 5159, coll. USF, APE, 1 juvenile (8.1 × 7.4, 9.6), 2♀ (11.1 × 9.5, 13.0; 11.7 × 10.0, 12.3).



*Diagnosis.* Carapace ovoid, lateral borders not defined by line of small granules, posterior margin with three projections, middle one being pointed and on higher plane, 2 on either side petaloid, dorsal surface of carapace with clumps of granules forming 'constellation'; front indistinctly bilobed; antennules folding obliquely. Ischium of third maxilliped more coarsely granular than merus. Chelipeds more than twice length of carapace, fingers longer than palm. Abdomen in female with segments 4-6 fused.

*Remarks.* This species was originally recognized as a variety of *Myra kessleri* Paul'son, 1875, by Ihle (1918). Ovaere (1986) records *M. acutidens* from Papua New Guinea and provides a redescription (Ovaere, 1986: 121-122, figs. 1-4). He also discusses its validity as a species distinct from *M. kessleri*. The 'constellation' of granules on the dorsal surface of the carapace, even in juveniles or small specimens, appears to be diagnostic, though the character may vary to a certain degree. A discussion of the variation encountered in different sized specimens is given by Ovaere (1986). The distal lobe of the G1 in the young male examined by the first author is not as expanded as that in the adult male figured in Ovaere (1986: fig. 2). It clearly differs from the G1 of *M. kessleri* figured by Tyndale-Biscoe and George (1962: fig. 7.9) in being more slender and having a proportionately longer tip. The specimens from the two different stations differ slightly in that the colour in spirit: one is light brown (Stn 5159) whilst the other is ivory (Stn 5158). Also, the 'constellation' appears to be more obvious and well-developed on the carapace of the specimens from Stn 5159. Otherwise the two lots are identical. A diagnosis of the male abdomen could not be given as it was badly damaged.

*Distribution.* Indonesia, Kei Is., Banda Sea (type locality), Papua New Guinea (Ovaere, 1986), Philippines (present record).

#### *Myra affinis* Bell, 1855

*Myra affinis* Bell, 1855: 296, pl. 32, fig. 2

*Material examined.* **Philippines.** Stn 5146, 16 February 1908, coll. USBF, APE, 1 juvenile (12.0 × 10.7, 12.9).

*Diagnosis.* Carapace ovoidal, surface covered with widely-spaced, coarse granules, margins of carapace delimited by row of sharp granules, hepatic facet demarcated by row of granules dorsally and ventrally. Anterior edges of 3rd maxillipeds without setae. Chelipeds about 1.5 × longer than carapace (excluding posterior median spine).

*Remarks.* This species differs from *M. fugax* by the following (after Alcock, 1896: 205): (1) the carapace surface is covered by coarse granules visible to the naked eye, the longitudinal carina is persistent and granular, the posterior spines are shorter and more blunt; (2) the chelipeds are shorter and stouter, being < 2 × the carapace length (excluding spine); the hand is particularly shorter and stouter, being < 0.5 the length of the carapace and; (3) the penultimate piece of the male abdomen has a strong tooth. Alcock (1896) also mentions that in young specimens, a denticle or enlarged granule is present on either side of the posterolateral margin above the last pair of legs. This was found to be present in the specimen examined.

*Distribution.* Philippines (type locality), Arakan, Mergui, Andamans, Ganjam Coast, India (Alcock, 1896), Red Sea, Japan, Australia, Indian Archipelago (Ihle, 1918).

*Myra elegans* Bell, 1855

*Myra elegans* Bell, 1855: 297, pl. 32, fig. 4.

*Material examined.* **Philippines.** Stn 5358, 7 January 1909, coll. USBF, APE, 1 young ♀ (14.1 × 9.6, 17.1).

*Diagnosis.* Carapace narrowly elongate, rather compressed dorso-ventrally, row of granules on mid-line, hepatic facet demarcated by faint row of granules dorsally and ventrally, setose, margins of carapace delimited by row of granules, posterior region with three spines, median spine longest, slightly curved at tip, lateral spines shorter, on lower level than median spine; front clearly bilobed, with setae on margin, buccal cavern not visible beyond front. Outer surface of 3rd maxillipeds smooth, anterior edges setose. Chelipeds slender, shorter than length of carapace, fingers slightly longer than palm; ambulatory legs slightly more slender than chelipeds, anterior and posterior edges of propodus and dactylus setose. Abdomen in female with segments 1–3 and 7 free.

*Remarks.* This is perhaps the most unusual and elegantly-shaped of the *Myra* species. It is easily distinguished from its congeners by the elongate, flattened carapace.

*Distribution.* 'Oriental seas' (type locality), Philippines, Indonesia, Thailand, Myanmar, India (Chen, 1989).

*Myra fugax* (Fabricius, 1798)

(Figs 6h–j)

*Leucosia fugax* Fabricius, 1798: 351.

*Material examined.* Stn 5181, 27 March 1908, coll. USBF, APE, 1 young ♀ (20.2 × 17.8, 22.8). Stn 5448, 4 June 1909, coll. USBF, APE, 1 juvenile (20.9 × 17.9, 25.0), 1 ♂ (25.5 × 22.2, 31.1).

*Diagnosis.* Carapace ovoidal, longer than broad (excluding spine), with widely spaced fine granules, hepatic facet clearly demarcated by row of granules dorsally and ventrally, margin of carapace delimited by row of granules, posterior anterolateral border with wide notch just above base of chelipeds, posterior region with three spines, median one longest with upwardly curving tip, lateral spines conical, on lower level than median spine; front broadly bilobed, slightly setose. Anterior margins of third maxillipeds setose, outer surface of third maxillipeds with fine granules. Chelipeds about 3 × as long as carapace (exclusive of posterior median spine), stouter than ambulatory legs; dactylus of ambulatory legs longer than propodus, anterior and posterior margins fringed with setae. Abdomen in male with segments 3–6 fused, distal end of fused piece with median denticle; G1 4 × longer than G2, apex with long petaloid structure with tufts of setae at base.

*Remarks.* The proportions of parts of the chelipeds vary a great deal according to age and sex of the specimens. This may be seen from the figure given by Chen (1989: fig. 18a, b). Chen (1989: 223) also provides a table of comparison to differentiate

between young specimens of the two species. With regards to the Atlantic distribution of this species, Manning and Holthuis (1985: 57) list it as an Indo-west Pacific immigrant to the eastern Mediterranean via the Suez Canal.

*Distribution.* China, Taiwan, Japan, New Caledonia, Indonesia, Gulf of Thailand, Singapore, Philippines, Mergui Archipelago, Madagascar, East and South Africa, Red Sea, eastern Mediterranean (Dai and Yang, 1991).

*Myrodes* Bell, 1855

*Myrodes eudactylus* Bell, 1855

*Myrodes eudactylus* Bell, 1855: 299.

*Material examined.* Stn 5133, 6 February 1908, coll. USBF, APE, 1 juvenile (9.2 × 8.3, 9.9).

*Diagnosis.* Carapace ovoidal, covered with sharp granules, median line marked by row of rounded granules, margins lined with sharp granules, subhepatic region with upward-curving spine, intestinal region with central tubercle and posterior triangular lobe, posterior margin with two triangular lobes on either side; front broadly bilobed. Fingers of cheliped about 2 × length of palm, hooked at ends, cutting edges finely denticulate.

*Remarks.* This specimen corresponds well with Bell's figure (Bell, 1855: Pl. 32, fig. 6 a–e), except that the carapace appears narrower in Bell's specimen.

*Distribution.* Philippines (type locality), Andamans, Siam Bay, Arafura Sea, Darnely Is., Torres Strait, New Caledonia, Western Australia (Tyndale-Biscoe and George, 1962).

*Nucia* Dana, 1852

*Nucia tuberculosa* A. Milne Edwards, 1874

(Figs 6e–g, q)

*Nucia tuberculosa* A. Milne Edwards, 1874: 44, pl. 2, fig. 5

*Material examined.* **Philippines.** Sulu Archipelago, Tawi Tawi group, off Jolo Lt., 06°03'45"N 120°57'00"E, Stn 5174, dredge, 36.6 m, 5 March 1908, coll USBF, APE, 1 ♀ (6.1 × 6.6) (USNM 134205).

*Diagnosis.* Carapace almost globular, covered with fairly high, bluntly conical tubercles; front broadly bilobed, slightly produced anteriorly. Merus of 3rd maxillipeds with distal tip sharp. Chelipeds stout, fingers shorter than palm, opening in vertical plane. Female abdomen with terminal segment elongate.

*Remarks.* This species resembles *N. perlata* (Sakai, 1963) in that the entire body is densely covered with tubercles. The general proportions of the carapace are also rather similar. However, *N. tuberculosa* differs from *N. perlata* in having the fingers of the chelipeds shorter than the palm (longer than the palm in *N. perlata*) and the terminal segment of the female abdomen more narrow and elongate. The fingers open in a vertical plane and might warrant the transfer of this species to the genus *Heteronucia*. A. Milne

Edwards (1874) commented that it is a rare species in New Caledonia. This is a new record for the Philippines.

*Distribution.* New Caledonia (type locality), Aden, Pulau Jedan, Gulf of Thailand, Indonesia (Ihle, 1918).

### *Nursilia*

#### *Nursilia dentata* Bell, 1855

*Nursilia dentata* Bell, 1855: 309, pl. 34, fig. 6.

*Material examined.* **Philippines.** Quezon Province, Cabaleta Is., 32.9–58.6 m, sand and mud bottom, 21–25 April 1959, coll. F. G. Dayrit and J. E. Norton, 2 ovig. ♀♀ (7.4 × 7.5, 7.6 × 7.9). Anima Sola Is., between Burias and Luzon, Stn 5218, 36.6 m, 22 April 1908, coll. USBF, APE, 1 ♀ (10.4 × 10.4) (USNM 65383). Sulu Archipelago, Tawi Tawi group, off Tinakata Is., 05°12'00"N 119°54'30"E, Stn 5158, 22 m, dredge, coll. USBF, APE, 21.ii.1908, 1 ♀ (10.4 × 11.0) (USNM 134206).

*Diagnosis.* Carapace edges, cristate dorsal surface with blunt spines and lobes on either side of median line, median line with three spines posteriorly; front bidentate. Longitudinal ridge present on ischium of 3rd maxillipeds. Palm of chelipeds rather swollen at base, fingers very slender, hooked at tips, cutting edges finely denticulate. Base of terminal segment of female abdomen slightly buried in tip of penultimate segment.

*Remarks.* Chen (1989: 203) tabulates the differences amongst the three known species of *Nursilia*: *N. dentata* Bell, 1855, *N. tonsor* Alcock, 1896, and *N. sinica* Chen, 1982. Alcock (1896: 261) also lists the differences between *N. dentata* and *N. tonsor*. Ihle (1918) confirms Stimpson's statement (1858) that this species exhibits sexual dimorphism in the form of the 3rd maxillipeds. The inner margins of the 3rd maxillipeds in males meet and the longitudinal ridge on the ischium is non-setose. In females, however, the strongly developed longitudinal ridge on the ischium is highly setose, setae being directed medially. This is a new record for the Philippines.

*Distribution.* Indian Ocean (type locality), China, Japan, Indonesia, Fiji Is., Australia, Thailand, India, Sri Lanka, Maldives, Seychelles, South Africa, Red Sea (Dai and Yang, 1991).

#### *Nursilia tonsor* Alcock, 1896

*Nursilia tonsor* Alcock, 1896: 261.

*Material examined.* **China Sea.** near Hong Kong, 21°42'N 114°50'E, Stn 5302, agassiz trawl, 69.5 m, 9 August 1909, coll. USBF, APE, 1 ♀ (6.9 × 77.8).

*Diagnosis.* Carapace dorsal surface with pointed spines on either side of median line, median line with three spines posteriorly; front bidentate. Ischium of 3rd maxillipeds with longitudinal ridge. Outer edge of merus of chelipeds with rough, mushroom-shaped tubercles, fingers longer than palm, palm moderately swollen at base, fingers very slender, hooked at tips.

*Remarks.* Sexual dimorphism similar to that in *N. dentata* is found in this species (Ihle, 1918).

*Distribution.* China (South China Sea), Japan, Philippines, Thailand, Indonesia, Sri Lanka, and India (Chen, 1989).

*Parilia* Wood-Mason and Alcock, 1891

*Parilia major* Sakai, 1961

(Figs 7f–k)

*Parilia major* Sakai, 1961: 137, pl. 3, fig. 5.

*Material examined.* **Philippines.** Stn 5183, 30 March 1908, 1 young ♂. Stn 5198, 9 April 1908, coll. USBF, APE, 1 juvenile (24.2 × 26.1, 27.8). Stn 5374, 1♂ (46.1 × 48.8), 2 March 1909, coll. USBF, APE. Stn 5397, 15 March 1909, 2 juveniles. Stn 5402, 16 March 1909, coll. USBF, APE, 3 juveniles. Stn 5403, 16 March 1909, coll. USBF, APE, 8♂♂, 9♀♀. Stn 5406, 17 March 1909, coll. USBF, APE, 1 juvenile. Stn 5407, 17 March 1909, coll. USBF, APE, 1 juvenile (21.8 × 24.0, 24.4). Stn 5410, 18 March 1909, coll. USBF, APE, 1 juvenile (30.3 × 32.8, 33.8). Stn 5412, 23 March 1909, coll. USBF, APE, 2 young ♂♂, 1♀. Stn 5417, 25.iii.1909, coll. USBF, APE, 1 young ♂. Stn 5419, 25 March 1909, coll. USBF, APE, 1 young ♂, 1♂, 2♀♀. Stn 6502, 4 August 1909, coll. USBF APE, 1 juvenile. Stn 5506, 5 August 1909, coll USBF, APE, 1♂ (68.4 × 73.1).

*Diagnosis.* Carapace globular, broader than long (length excluding intestinal spine), finely granular with widely spaced granules, regions ill-defined, posterior part of anterolateral margins with three projections, increasing in size posteriorly, posterolateral margin with spine, posterior margin with two spines on either side of median line, posterior intestinal region drawn out to form upward curving spine; front bidentate. Exopod of third maxillipeds rather expanded, broader than ischium. Merus and hand of chelipeds very long, fingers < 0.5 length of hand. Male abdomen consisting of five pieces, fused piece of segments 3–5 with median transverse excavation close to base; G1 3 × longer than G2, with bifurcated tip.

*Remarks.* The genus *Parilia* Wood-Mason and Alcock, 1891, at present consists of four species: *P. alcocki* Wood-Mason and Alcock, 1891, *P. major* Sakai, 1961, *P. tuberculata* Sakai, 1961, and *P. ovata* Chen, 1984. According to Sakai (1976), *P. major* is very similar to *P. alcocki*, but differs in having the narrower exopod on the 3rd maxilliped, the hepatic regions not inflated and the epistome not projecting much beyond the front. A male specimen of *P. alcocki* obtained as a gift from the Indian Museum in the Smithsonian collection was used for comparison and I have found that Sakai's (1976) points are valid. The G1's of the three species, *P. alcocki*, *P. major* and *P. ovata* are very similar, each being bifid at the apex, with the edges of each branch being serrated. *P. major* is one of the largest leucosiid species, with the largest male examined here measuring 68.1 mm in length and 73.1 mm in width.

*Distribution.* Japan (Sakai, 1961; 1976); Phillipines (Chen, 1989).

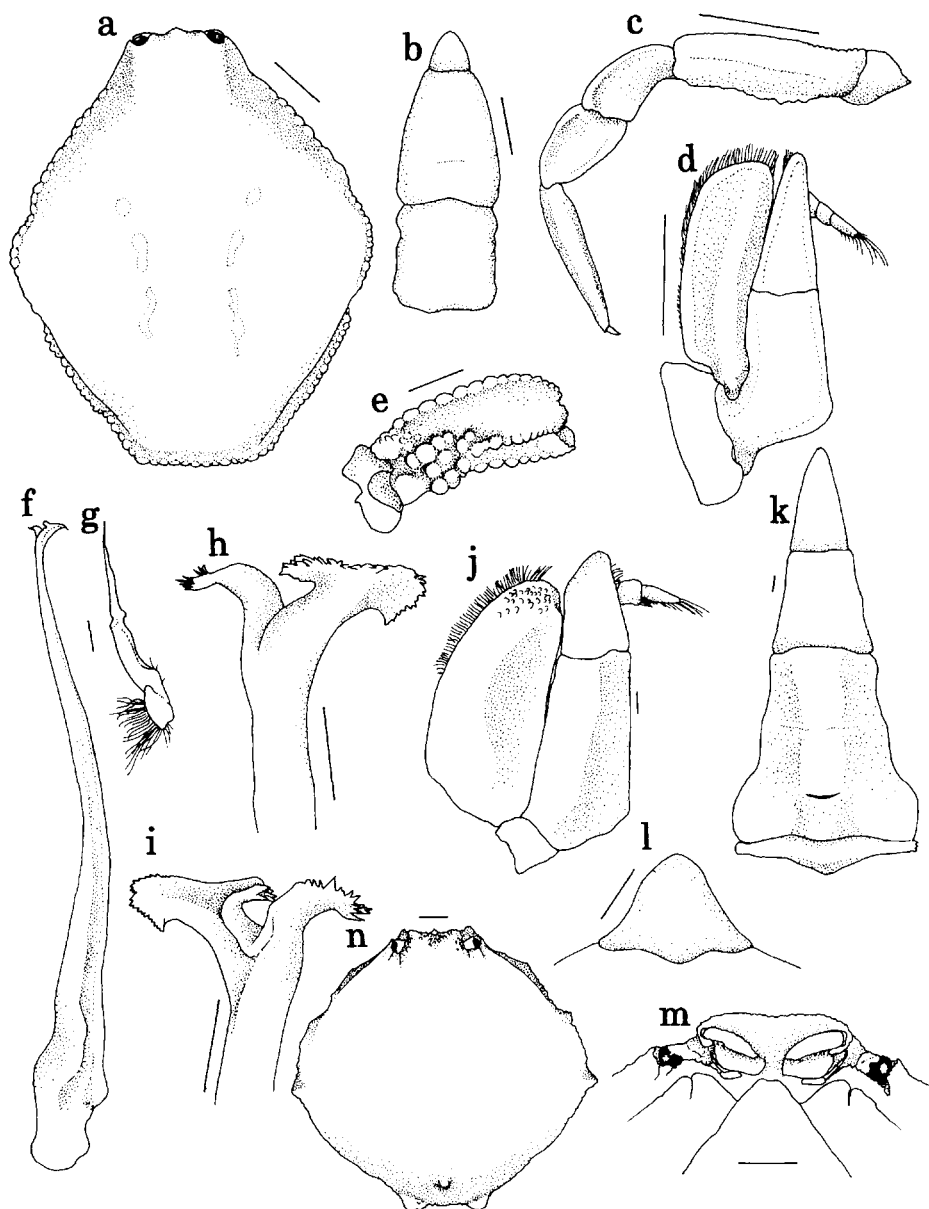


FIG. 7. *Pseudophilyra* sp., juvenile. (a) carapace; (b) abdomen; (c) left last ambulatory leg; (d) right third maxilliped; (e) underside of right cheliped merus. *Parilia major* Sakai, 1961, male: (f) right G1; (g) right G2; (h) (i) tip of right G1; (j) right 3rd maxilliped; (k) abdomen, excluding segment 1. *Randalliapila* sp. nov. Paratype female: (l) telson; (m) frontal view; (n) carapace dorsal view. Scales: h, i = 0.5 mm, all others = 1.0 mm.

*Parilia ovata* Chen, 1984

*Parilia ovata* Chen, 1984: 482–486, figs. 1–6.

**Material examined. Philippines.** Stn 5188, 1 April 1908, coll. USBF, APE, 1 juvenile (10.3 × 9.2, 11.8).

**Diagnosis.** Carapace ovoid, anterolateral margins with three broad teeth, the middle one being the weakest, posterior intestinal region with upward curving spine, posterior margin with a tooth on either side of median line, shorter than and on lower plane than intestinal spine; front with two truncate lobes, subhepatic region slightly convex. Exopod of merus of 3rd maxilliped expanded only slightly, particularly at base; chelipeds long, fingers about as long as hand.

**Remarks.** The carapace of this juvenile specimen is longer than broad and definitely not as broad as that seen in *Parilia alcocki* Wood-Mason and Alcock, 1891. The specimen differs from the one figured by Chen (1984) in that the lateral margin has three broad, indistinct teeth instead of one, and the three teeth on the posterior region of the carapace are of equal length instead of the median one being the longest. Little is known about the variation exhibited by specimens of different ages of *Parilia* although variation in the number of lateral teeth in *Parilia major* Sakai, 1961 has been reported by Chen (1989). However, the diagram given in Chen (1989: fig. 30d) resembles the present specimen more closely in terms of the posterior dentition. Her specimen is 14.0 × 12.2 mm and is a juvenile.

**Distribution.** China (South China Sea), Philippines (Chen, 1989).

*Pariphiculus* Alcock, 1896*Pariphiculus coronatus* (Alcock and Anderson, 1894)

*Randallia coronatus* Alcock and Anderson, 1894: 177.

**Material examined. Philippines.** Capitancillo Is. Lt., between Cebu and Leyte, Stn 5403, 333.1 m, coll. USBF, APE, 16 March 1909, 1 ♂ (USNM 65342); East Negros, Pescador Is., Stn 5188, 547.2 m, 1 April 1908, coll. USBF, APE, 1 juvenile (USNM 65343); Luis Pt Lt., between Cebu and Bohol, Stn 5417, 302 m, 25 March 1909, coll. USBF, APE, 1 ♂ (USNM 65385); Luis Pt Lt., between Cebu and Bohol, Stn 5411, 265.4 m 23 March 1909, coll. USBF, APE, 1 ♀ (USNM 65386); Marindique Is., Tayabas Lt., Stn 5369, 194 m, coll. USBF, APE, 24.ii.1909, 1 juvenile (USNM 65422), 2 ♂ ♂ (USNM 65423); Capitancillo Is. Lt., between Cebu and Leyte, Stn 5408, 291 m, 18 March 1909, coll. USBF, APE, 1 ♀; Capitancillo Lt., between Cebu and Leyte, Stn 5403, 333.1 m, 16 February 1909, coll. USBF, APE, 3 ♂ ♂ (USNM 65424); Marinduque Is., Tayabas Lt., Stn 5371, 151.9 m, 24.ii.1909, coll. USBF, APE, 1 ♂, 1 ♀ (USNM 65425); Apo I., between Negros and Siquijor, Stn 5537, 464.4 m, 19.viii.1909, USBF APE, 1 ♀ (USNM 65426). **China Sea.** Stn 5402, 16.iii.1909, coll. USBF, APE, 2 ♀ ♀.

**Diagnosis.** Carapace broader than long, covered with coarse granules and dense tomentum, with large tubercles on subhepatic, cardiac, intestinal and branchial regions, antero-, posterolateral, and posterior margins, cardiac and intestinal regions demarcated by shallow grooves; front bidentate. Fingers of chelipeds longer than palm, palm slightly swollen at base. Female abdomen with all seven segments free. Male abdomen made up of five pieces; G1 with sinuous distal portion.

*Remarks.* This species is easily separated from its closest congener *Pariphiculus mariannae* (Herklots, 1852) by the broader than long carapace (longer than broad in *P. mariannae*), the tubercle on the cardiac region and one on either side of the branchial region (these regions are unarmed in *P. mariannae*), the less swollen base of the cheliped palm, the more elongate and narrow terminal segment of the male abdomen, the almost hairless fingers of the chelipeds (in *P. mariannae*, the denticulations on the fingers are obscured by a thick growth of short colourless hairs), and the rather straight structure of the distal portion of the male G1 (the distal portion of the male G1 in *P. mariannae* is bent at an angle). Serène and Lohavanijaya (1973) provides a key to distinguish the species of *Pariphilculus*.

*Distribution.* Bay of Bengal (type locality), China (South China Sea and East China Sea), Japan, Indonesia, Red Sea (Serène and Lohavanijaya, 1973; Chen, 1989).

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

*Illa mariannae* Herklots, 1852: 36–37, fig. 2

*Material examined.* **China Sea.** Stn 5303, 62.2 m, 9 August 1908, coll. USBF, APE, 1 juvenile (USNM 65339); **Philippines.** Marindique Is., Tayabas Lt., Stn 5376, 164.7 m, 2 March 1909, coll. USBF, APE, 1 juvenile (USNM 65340); East Luzon, South Miguel Pt, Stn 5448, 86 m, 4.vi.1909, coll. USBF, APE, 1 juvenile (USNM 65341); Badian Is., off West Samar, Stn 5206, 58.6 m, 14. April 1908, coll. USBF, APE, 1 juvenile (USNM 65387); West Luzon, South Fernando Pt Lt., Stn 5442, 82.4 m, coll. USBF, APE, 11 May 1909, 1 young ♀ (USNM 65433).

*Diagnosis.* Carapace longer than broad, covered with coarse granules and dense tomentum, lateral margins, subhepatic and intestinal regions with large tubercles, cardiac region and either side with large tubercles; front acutely bidentate. Fingers of chelipeds longer than palm, cutting edges finely denticulate, with fine hairs, palm rather swollen at base. Female abdomen with seven segments free.

*Remarks.* Nobili (1906) synonymized *P. rostratus* Alcock, 1896, with *P. mariannae*. Serène and Lohavanijaya (1973) noted that abdominal segmentation varied amongst individuals examined by previous authors (Ihle, 1918 (R + T); Doflein, 1904 (1 + 2 + R + 6 + T)) and suggested that it may be 'individual variation related to the age of the specimens ...' (Serène and Lohavanijaya, 1973: 38). The specimens I examined are all juveniles which have the abdominal segmentation pattern 1 + 2 + R + 6 + T. It is possible that fusion of additional abdominal segments occurs in older specimens. This can only be ascertained when a large series of specimens of different ages are examined. The differences between *P. mariannae* and *P. coronatus* are enumerated under the remarks for *P. coronatus*.

*Distribution.* China (South China Sea), Indonesia, Myanmar, India, Philippines (Serène and Lohavanijaya, 1973; Chen, 1989).

***Philyra*** Leach, 1817

***Philyra platychira*** de Haan, 1841

*Philyra platychira* de Haan, 1841: 132, pl. 33, fig. 6.



*Material examined.* **Philippines.** Lubig Bay, Port Binanga; near Mariveles, Luzon, 8 January 1908, 1 ♀ (USNM 65350), coll. Albert M. Reese.

*Diagnosis.* Carapace depressed, regions ill-defined, surface with scattered granules, margins beaded, hepatic facets lined with granules; front obscurely bilobed, anterior edge of the epistome projecting beyond edge of front, edge of epistome deeply cleft below eye. Chelipeds in adult male about  $2.5 \times$  length of carapace, palm flattened, fingers thin, curved, cutting edges sharp and entire, cutting edge of immobile finger thickly fringed with short hairs. Abdomen of male with telson free, groove between segments 5 and 6 distinct; G1 stout, apex rounded, with setae.

*Remarks.* This species is easily recognizable by the flattened palm and fingers and the thick fringe of setae on the immovable finger of the chelipeds.

*Distribution.* China, Taiwan, Japan, Australia, Philippines, Mergui Archipelago, Andamans, Persian Gulf, and South Africa (Dai and Yang, 1991).

*Praebebalia* Rathbun, 1911

*Praebebalia septemspinosa* Sakai, 1983

(Figs 6k–m)

*Praebebalia septemspinosa* Sakai, 1983: 625, figs 2d–h.

*Material examined.* **Philippines.** Visayan Is., Capitancillo Is., Northeast of Is. Lt.,  $11^{\circ}10'10''\text{N } 124^{\circ}17'15''\text{E}$ , Stn 5403, trawl, 333–1 m, 16 March 1909, coll. USBF, APE, HOLOTYPE ♂ ( $13.3 \times 14.8$ ) (USNM 195061), ALLOTYPE ♀ ( $9.0 \times 10.9$ ) (USNM 195062), PARATYPE ♂ ( $12.5 \times 14.0$ ) (USNM 195063).

*Diagnosis.* Carapace covered with coarse granules, particularly anteriorly, regions well-demarcated by grooves, intestinal region with large pointed tubercle, anterolateral margin with notch in the centre, junction of antero- and posterolateral margins with spine, posterolateral margin with spine, posterior margin with spine on either side of median line; front bidentate. Outer surface of third maxillipeds coarsely granular. Chelipeds very long, palm about  $2.5 \times$  longer than fingers, fingers as thick as ambulatory legs. Male abdomen segments 3–5 fused, G1  $3 \times$  longer than G2; curved distally, distal portion with long hairs, tip unequally bifid.

*Remarks.* This species is an unusual *Praebebalia* in that the carapace is very spiny and granular. Most other *Praebebalia* species have smooth carapaces, including the type species, *P. extensiva* Rathbun, 1911.

*Distribution.* Philippines (type locality)

*Pseudophilyra* Miers, 1879

*Pseudophilyra* sp.

(Figs 6r, s, 7a–e)

*Material examined.* **Philippines.** Manila Harbour at Malate, 9 December 1907, coll. USBF, APE, 1 juvenile ( $7.6 \times 6.4$ ).

*Diagnosis.* Carapace rhomboidal, with margins beaded, anterolateral margin slightly sinuous, posterior margin straight; front tridentate, teeth broad and blunt. Merus of 3rd maxillipeds triangular and elongate, exopod slightly dilated at distal end, edges setose. Merus of chelipeds with patch of spongy pubescence at base, fingers as long as palm; anterior edge of carpus, anterior and posterior edge of propodus and dactylus carinate.

*Remarks.* The absence of a thoracic sinus is the main feature that distinguishes *Pseudophilyra* from *Leucosia*. In many other aspects such as the carapace, form of the chelipeds and form of the 3rd maxillipeds, these two genera are very similar. This present species resembles *Leucosia vittata* in terms of the carapace shape, the straight and beaded posterior margin, the chelipeds and the tridentate front. However, as no traces of a thoracic sinus could be found, the species is tentatively placed in *Pseudophilyra*.

***Randallia* Stimpson, 1857**

*Randallia* Stimpson, 1857a: 471, pl. 20, fig. 3; 1857b: 85.

***Randallia pila* sp. n.**

(Figs 7l–n, 8a–f, 4G, H)

*Material examined.* **Philippines.** Stn 5454, coll. USBF, APE, 7 June 1909, HOLOTYPE ♂ (13.1 × 15.1); Stn 5453, coll. USBF, APE, 7 June 1909, PARATYPE ♀ (10.0 × 10.9).

*Description.* Holotype male. Carapace globular, broader than long, surface finely granular, regions ill-defined, more coarsely granular posteriorly; shallow concavity present between hepatic and anterolateral margins, junction between antero- and posterolateral margins with rounded tubercle, posterior intestinal region with round tubercle, posterior margin with two rounded tubercles on either of median line; front almost straight, with shallow median groove, edge of anterior pterygostomian region extends slightly beyond front. Orbits excavated such that eyes entirely visible from dorsal view, with two shallow fissures. Basal antennule segment plate-like, covering half of antennular fossa.

Ischium of 3rd maxillipeds sparsely covered with coarse granules, edges of merus granular, palp 3-segmented. Chelipeds stouter than ambulatory legs, surface finely granular, palm 2.5 × longer than fingers, fingers stout, cutting edges with denticles. Ambulatory legs finely granular, posterior edge of dactyli with pointed granules, anterior and posterior edges setose.

Male G1 slender, bifid, one branch being reduced to almost a lobe, other branch long, slender, hooked at tip, glabrous, much longer than other branch.

Female paratype. Anterolateral margin with two irregular teeth anterior to tubercle at junction of antero- and posterolateral margins. Telson broadly triangular, basal edge rather sinuous. Non-sexual aspects similar to male.

*Remarks.* *Randallia pila* sp. n. is characterized by its relatively smaller size, the G1 structure, the relatively smooth surface of the carapace, the straight, non-bilobed front and only two tubercles on the posterior margin of the carapace. Characters in *R. pila* sp. n. such as the overall globular shape, the imperfect orbits which barely conceal the eyes, the pattern of tubercles on the carapace, the basic structure of the G1 (long and slender and bent at an angle at the tip) and the terminal segment of the female abdomen (broadly triangular with sinuous margins (Fig. 51) appear to affiliate it with *R. eburnea*

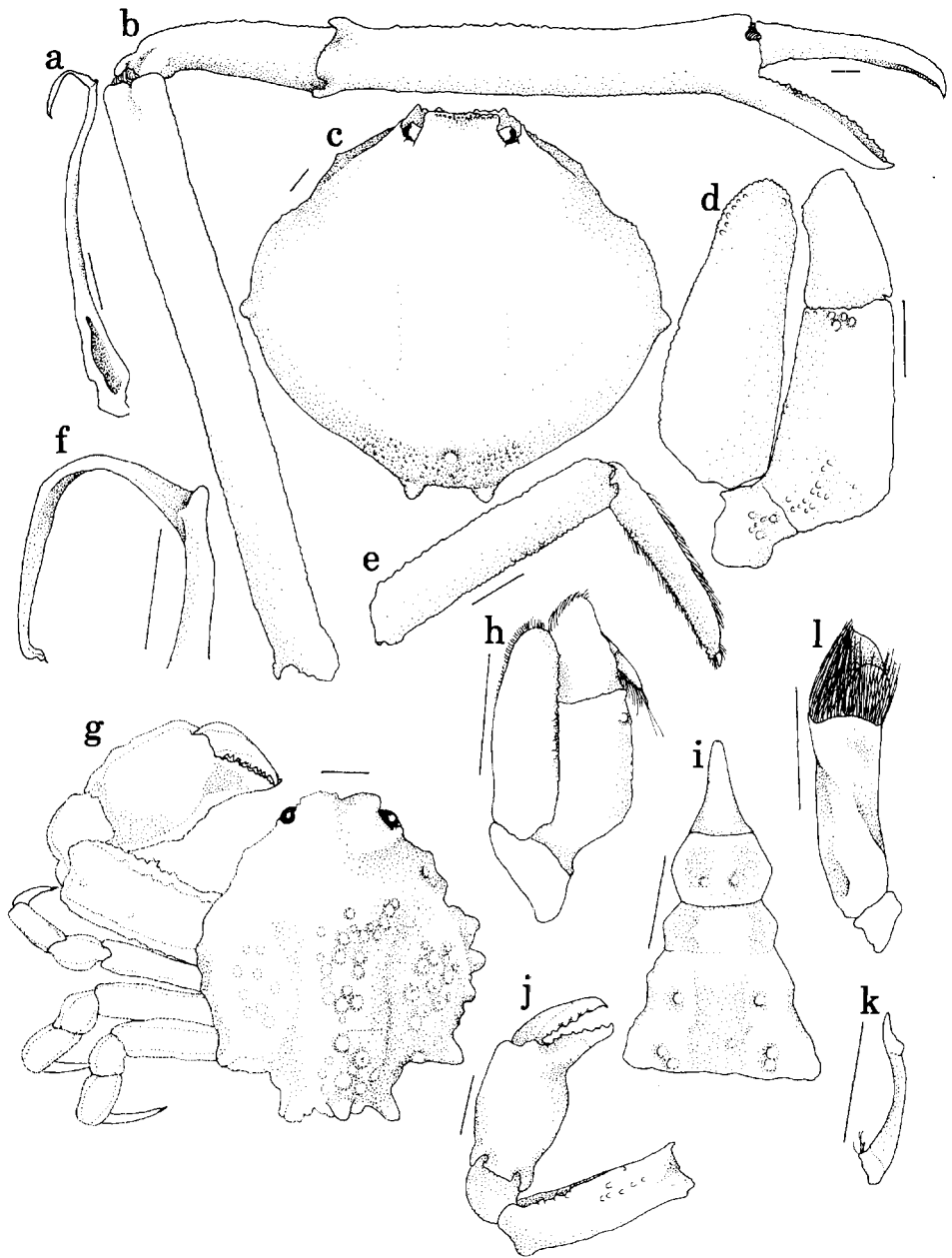


FIG. 8. *Randallia pila* sp. n., Holotype male: (a) right G1; (b) left cheliped upper surface; (c) carapace, dorsal view; (d) right 3rd maxilliped; (e) right ambulatory leg, showing propodus and dactylus; (f) tip of right G1. *Randallia lanata* Alcock, 1896, male: (g) carapace, dorsal view, right side denuded; (h) right 3rd maxilliped, outer surface, denuded; (i) abdomen, excluding segments 1 and 2; (j) left cheliped, denuded; (k) right G2; (l) right G1. Scales: f = 0.5 mm, all others = 1.0 mm.

Alcock, 1896, and *R. trituberculata* Sakai, 1961. It may seem possible to place this species in the genus *Parilia*, due to its highly convex carapace, elongate limbs and form of the G1 (bifid tip). However, it lacks the wide afferent channels of the branchial channels and the expanded ischial exognath so characteristic of *Parilia*. I have thus decided to place this new species in *Randallia*. At present, the genus *Randallia* appears to be heterogeneous and in need of a revision, considering the known variation in G1 structure, abdominal segmentation and carapace features amongst the species of *Randallia* (e.g. *R. lanata* versus *R. trituberculata*). The male abdomen and G2 were missing from the Holotype and could not be figured.

#### *Etymology*

The Latin 'pila' means 'ball', referring to the swollen, rounded appearance of the animal's carapace. The name is used as a noun in apposition.

*Distribution.* Philippines (present record).

#### *Randallia lanata* Alcock, 1896

(Figs 8g–l)

*Randallia lanata* Alcock, 1896: 193.

*Material examined.* **Philippines.** off South Luzon Is., 14°45'48"N 120°12'20"E, Stn 5104, 60.4 m, trawl, 8 January 1908, coll. USBF, APE, 1 ♂ (7.1 × 5.9) (USNM 128569).

*Diagnosis.* Carapace entirely covered by thick, velvety tomentum, posterior three quarters with large, flat, round granules under tomentum, subhepatic region, intestinal region, antero- and posterolateral margins with large, triangular tubercles of different sizes, posterior margin with small tubercle and large, blunt spine on either side of median line, small granule just below spine; front broadly bilobed. Third maxillipeds rather smooth, with margins slightly granular. Chelipeds robust, surface of merus rather granular, fingers shorter than palm, cutting edges blade-like, with small denticles. Male abdomen consisting of five pieces; G1 very short and stout, 1.8 × longer than G2, tip made up of few flattened lobes covered with long setae.

*Remarks.* *Randallia lanata* is very different from other species of *Randallia* in aspects of the abdomen (Ihle, 1918), the G1 structure and the relative length of the chelipeds to the carapace (chelipeds not much longer than carapace) and its position in the genus should be re-examined. It is possible that a new genus should be created for it. According to Ihle (1918), 'the third and fourth segments are completely fused, whereas a distinct groove is seen between the fourth and fifth segments'. This was true for the specimen examined by the author. This is contrary to Alcock's description (Alcock, 1896: 193) which said '... all seven abdominal terga are plainly and independently recognizable though not all independently movable ...'. *Randallia villosa* Chen, 1989, is very similar to *R. lanata* and the differences between the two species which Chen (1989) stated, i.e., the hexagonal carapace (round, globular in *R. lanata*), the presence of two rounded granules on the posterior border (not mentioned for *R. lanata*), and the convex front (almost straight in *R. lanata*), are rather subjective. The two species may be synonymized when the type of *R. villosa* is examined.

*Distribution.* Andaman Sea (type locality), Indonesia (Ihle, 1918), Philippines (Chen, 1989).

***Randallia pustuloides* Sakai, 1961**

*Randallia pustuloides* Sakai, 1961: 135, pl. 3, fig. 4.

*Material examined.* **Philippines.** Stn 5538, coll USBF, APE, 19 August 1909, 1 ♀ (39.5 × 44.0).

*Diagnosis.* Carapace covered with large flattened tubercles, regions well-defined, antero- and posterolateral margins with pointed tubercles, intestinal region with large tubercle, posterior region with round, pearly granules, posterior margin with two sharp granules; front bilobed. Chelipeds stout, merus with patch of round, pearly granules at distal, ventral surface, fingers slightly shorter than palm, anterior margin of movable finger carinate; ambulatory legs with sharp, pearly granules on posterior edges, edges fringed with setae. Female abdomen with segments 4–6 fused.

*Remarks.* This species bears some resemblance to *R. pustulosa*. The difference between these two species are mentioned under the remarks for *R. pustulosa*.

*Distribution.* Japan (type locality); Philippines (Chen, 1989).

***Randallia pustulosa* Wood-Mason and Alcock, 1891**

*Randallia pustulosa* Wood-Mason and Alcock, 1891: 266.

*Material examined.* **Philippines.** Stn 5203, 10 April 1908, coll. USBF, APE, 1 juvenile (17.2 × 19.6, 20.1).

*Diagnosis.* Carapace globular, regions well-demarcated, covered with coarse granules, margins with large, pointed tubercles, intestinal region with long, backward and upward curving spine, posterior margin with two pointed tubercles on either side of median line just below intestinal spine; front broadly bilobed. Fingers of chelipeds slightly shorter than palm; ambulatory legs finely granular, dactyli fringed with hairs.

*Remarks.* Alcock (1896: 197) remarked that the young *R. pustulosa* bears a strong resemblance to the adult *R. pustulilabris* Alcock, 1896, in terms of the spherical carapace, the spiny edges of the carapace, and the granular surface. Chen (1989) on the other hand, believes that *R. pustulosa* is related to *R. pustuloides* Sakai, 1961. However, in *R. pustuloides* ‘... the dorsal surface of the carapace is studded with tubercles. A large tubercle and some small tubercles are present on the intestinal region. The chelipeds are stouter. The terminal segment of the male abdomen has a conical tooth. The last ambulatory legs (except the dactylus) are irregularly studded with high tubercles’ (Chen, 1989: 219).

*R. pustulosa* has sometimes been incorrectly attributed to Wood-Mason, 1891. However, I have found that the article in which the original description of *R. pustulosa* was published was under the authorship of both Wood-Mason and Alcock (1891). Although Wood-Mason’s name was cited together with the species name (presumably by Alcock), no mention was made that the species’ authorship should be solely given

- FABRICIUS, J. C., 1787, *Mantissa insectorum sistens eorum specis nuper detectas adjectis characteribus genericis, differentiis specificis, emandationibus, observationibus* (Hafniae), **1**, xx + 348 pp.
- FABRICIUS, J. C., 1798, *Supplementum entomologiae systematicae* (Hafniae), 572 pp.
- GRIFFIN, D. J. G. and STANBURY, P. J., 1970, Type specimens in the Mcleay Museum, University of Sydney, V. Decapod crustaceans, *Proceedings of the Linnean Society of New South Wales*, **99**, 122–131.
- HAAN, W. DE, 1833–49, Crustacea, in P. F. von Siebold, *Fauna Japonica sive Descriptio Animalium, quae in Itinere per Japoniam, Jussu et Auspiciis Superiorum, qui Summum in India Batava Imperium Tenet, Suscepto, Annis 1823–1830 Collegit, Notis, Observationibus et Adumbraionibus Illustravit*, i–xvii, i–xxxii, ix–xvi, 1–243, pls A–J, L–Q, 1–55, circ. tab. 2. Ludunin-Batavorum (Leiden).
- HASWELL, W. A., 1880, Contributions towards a monograph of Australian Leucosiidae. *Proceedings of the Linnean Society of New South Wales*, **4**, 44–66, pls 5, 6.
- HENDERSON, J. R., 1893, A contribution to Indian carcinology, *Transactions of the Linnean Society of London*, **5** (2), 325–458, pls 36–40.
- HERKLOTS, J. A., 1852, Notice carcinologique, *Bijdragen tot de Dierkunde*, **1**, 35–37, pl. 1.
- IHLE, J. E. W., 1918, Die Decapoda Brachyura der Siboga-Expedition. 3. Oxystomata: Calappidae, Leucosiidae, Raninidae, *Siboga Expeditie*, **39(b)**, 159–322, figs. 78–148.
- LAURIE, R. D., 1906, Report on the Brachyura collected by Prof. Herdman, at Ceylon, in 1902, in W. A. Herdman, *Report to the Government of Ceylon on the Pearl Oyster Fisheries of the Gulf of Mannaar*, Part V. Supplementary report, **40**, 349–432, Fig. 1–12, pl. 1–2.
- LEACH, W. E., 1815, A tabular view of the external characters of four classes of animals, which Linné arranged under Insecta, with the distribution of the general composing three of these classes into orders, and descriptions of several new genera and species. *Transactions of the Linnaean Society of London*, **11**, 306–400.
- LEACH, W. E., 1817, *The Zoological Miscellany, Being Descriptions of New or Interesting Animals*, Volume 3 (London), vi + 151 pp., pls 121–149.
- LINNAEUS, C., 1758, *Systema Naturae per Regna Tria Naturae, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis*. Edition 10, Volume 1 (Holmiae), iii + 824 pp.
- LUCAS, H. O., 1958, Note monographique sur le genre *Ixa*, Crustacés Brachyures de la famille des Oxystômés et de la tribue des Leucosiens, *Annales de la Société entomologique de France*, series 3, **6** (3), 170–186, pl. 4.
- MACGILCHRIST, A. C., 1905, Natural History notes from the R. M. Indian Survey Steamer 'Investigator', Captain T. H. Heming, R.N., commanding. Ser. III, No. 6. An account of the new and some of the rarer decapod Crustacea obtained during the surveying seasons 1901–1904, *Annals and Magazine of Natural History*, **15** (87), 233–268.
- MANNING, R. B. and HOLTHUIS, L. B., 1981, West African brachyuran crabs (Crustacea: Decapoda), *Smithsonian contributions to Zoology*, No. 306, 379 pp.
- MCNEILL, F. A., 1968, Crustacea, Decapoda and Stomatopoda, *Scientific Report on the Great Barrier Reef Expedition*, **7**, 1–98.
- MIERS, E. J., 1879, On a collection of Crustacea made by Capt H. C. St John, R.N. Corean and Japonica Seas, *Proceedings of the Zoological Society of London*, pp. 18–61.
- MIERS, E. J., 1884, *Crustacea, Report of the zoological collections made in the Indo-Pacific Ocean during the voyage of H.M.S. 'Alert' 1881–2* (London: British Museum (Natural History)), 684 pp., pls 46–52.
- MILNE EDWARDS, A., 1874, Recherches sur la Faune Carcinologique de la Nouvelle-Calédonie, *Nouvelles Archives du Muséum d'Histoire naturelle* (Paris), **10** (3), 39–58, pls 2–3.
- NOBILI, G., 1906, Faune Carcinologique de la Mer Rouge. Décapodes and Stomatopodes, *Annales des Sciences Naturelles; Zoologie*, **4** (9), 1–347, pls 1–11.
- ORTMANN, A., 1892, Die Abtheilungen Hippidea, Dromiidea und Oxystomata: Die Decapoden-Krebse des Stassburger Museums, mit besonderer Berücksichtigung der von Herrn Dr. Döderlein bei Japan und bei den Liu-Kiu-Inseln. gessammelten und z. Z. im Strassburger Museum aufbewarhten Formen. V. Theil, *Zoologische Jahrbücher, Abheilung für Systematik, Geographie und Biologie der Thiere*, **6**, 532–588, pl. 26.

to Wood-Mason. Therefore, the correct citation should be *R. pustulosa* Wood-Mason and Alcock, 1891.

*Distribution.* Japan, Phillipines, Andaman Sea, Laccadive Sea, Travancore Coast, Great Nicobar Is., East Coast of Africa (Sakai, 1976).

### Acknowledgements

The author wishes to thank the Smithsonian Institution for the opportunity and funding to study the collection at the National Museum of Natural History during the period of her Graduate Student Fellowship there, Dr Raymond B. Manning for his supervision and advice, Dr Rafael Lemaitre, Dr S. Rajaguru and Ms Karen Reed for their much needed assistance, the staff at the Department of Invertebrate Zoology, National Museum of Natural History, Smithsonian Institution for help rendered in one way or another and Dr Peter Ng and Mr N. Sivasothi for their helpful comments on the manuscript. Dr Paul Clark, British Museum (Natural History) kindly reviewed the manuscript. This is contribution number 4/95 of the Ecology/Systematics Laboratory, National University of Singapore.

### References

- ADAMS, A. and WHITE, A., 1848, Crustacea, in A. Adams (ed.), *The Zoology of H.M.S. 'Samarang': under the command of Captain Sir Edward Belcher, C.B., F.R.A.S., F. G. S. During the years 1843–1846: (London: Reeve, Benham and Reeve). 1–66, pl. 1–13.* Published in two parts: Part I (pp. 1–32, pls 1–6) is dated on the cover 1848, Part II (pp. 33–66, i–vii, pls 7–13) has the date 1849 on the front cover.
- ALCOCK, A., 1896, Materials for Carcinological Fauna of India. The Brachyura Oxystomata. No. 2, *Journal of the Asiatic Society of Bengal*, **65** (2), 134–296, pls 6–8.
- ALCOCK, A. and ANDERSON, A. R. J., 1894, Natural History notes from H.M. Indian Survey Steamer *Investigator*, Commander C. F. Oldham, R.N., commanding. Series II, No. 14. An Account of a recent collection of deep sea Crustacea from the Bay of Bengal and Laccadive Sea, *Journal of the Asiatic Society of Bengal*, **63**, 2, (3), 141–185, pl. 9.
- ARNOLD, P. W. and GEORGE, R. W., 1987, Recognition of *Leucosia whitei* Bell and *Leucosia cheverti* Haswell (Decapoda, Brachyura, Leucosiidae), *Crustaceana*, **53** (2), 209–214.
- BELL, TH., 1855, A monograph of the Leucosiidae, with observations on the relations, structure, habits and distribution of the family: a revision of the generic characters and descriptions of new genera and species, Hora Carcinologicae, or Notices of Crustacea, I. *Transactions of the Linnean Society of London*, **21**, 277–314, pls 30–34.
- CHIACE, F. A., JR., 1983, The caridean shrimps (Crustacea: Decapoda) of the *Albatross* Philippine expedition, 1907–1910, part 1: Family Styrodactylidae, *Smithsonian Contributions to Zoology*, no. **381**: iii + 21.
- CHEN, H., 1982, On the genus *Nursilia* (Crustacea: Decapoda: Leucosiidae) of Chinese waters, *Oceanologia et Limnologia Sinica*, **13** (3), 268–272, 2 pls.
- CHEN, H., 1984, A new species of *Parilia* (Crustacea: Brachyura) from the South China sea, *Oceanologia et Limnologia Sinica*, **15** (5), 482–486.
- CHEN, H., 1989, Leucosiidae (Crustacea, Brachyura), in J. Forest (ed.), Résultats des Campagnes MUSORSTOM, Volume 5, *Mémoires du Muséum national d'histoire naturelle* (Paris) Series A, **144**, 181–263.
- CHOPRA, B., 1933, IV. On two new species of oxystomatous crab from the Bay of Bengal, further notes on Crustacea Decapoda in the Indian Museum, *Records of the Indian Museum*, **35**, 77–86, pl. 3.
- DAI, A. and YANG, S., 1991, *Crabs of the China Seas* (Beijing: China Ocean Press), [English edn], iv + 682, pls 1–74.
- DANA, J. D., 1852, *Crustacea, Part 1, United States Exploring Expedition during the years 1838, 1839, 1840, 1841, 1842*, under the command of Charles Wilkes, U. S. N., Philadelphia, C. Sherman, **13**, viii + 685.
- DOFLEIN, R. K., 1904, Brachyura, Wiss. Ergebn, Deutschen Tiefsee-Expedition, *Valdivia*, 1898–1899, **6**: 1–314, figs. 1–86, pls 1–57.

- OVAERE, A. A., 1986, A new record and a redescription of *Myra acutidens* Ihle, 1918 (Brachyura, Leucosiidae) from northern Papua New Guinea, *Bulletin de l'Institut Royal des Sciences naturelles de Belgique*, **56**, 121–124.
- OVAERE, A. A., 1987, The fur-bearing species of the genus *Leucosia* from northern Papua New Guinea, with a description of two new species (Crustacea, Brachyura), *Bulletin de l'Institut Royal des Sciences naturelles de Belgique*, **57**, 185–204.
- OVAERE, A. A., 1988, A new species of the genus *Leucosia* from Australia and Papua New Guinea (Crustacea, Brachyura), *Bulletin de l'Institut Royal des Sciences naturelles de Belgique*, **58**, 95–98.
- PAULSON, O., 1875, *Isledovaniya rakoobraznykh krasnago morya a zamekami otositel'no rakoobraznykh drugikh morei*, xiv + 1–144 pp., pls. 1–21 (1961, Studies on Crustacea of Red Sea with notes regarding other seas. Part I. Podophthalmata and Edriophthalmata (Cumacea). English translation, Jerusalem, the Israel Program for Scientific Translations, translation by F. D. Pory, 1–164, pls 1–21).
- RATHBUN, M. J., 1911, Brachyura of the Percy Sladen Trust Expedition to the Indian Ocean in 1905, *Transactions of the Linnean Society of London (Zoology)*, **14** (2), 191–261, pls 15–20.
- RÜPPELL, E., 1830, *Beschreibung und Abbildung von 24 Arten kurzschwänzigen Krabben als Beitrag zur Naturgeschichte des rothen Meeres* (Frankfurt a. M.: H. L. Bronner), 28 pp.
- SAKAI, T., 1937, Studies on the crabs of Japan, II. Oxystomata, *Science Reports of the Tokyo Bunrika Daigaku*, Section B, Supplement No. 2, **3**, 67–192, pl. 10–19.
- SAKAI, T., 1961, New Species of Japanese Crabs from the Collection of His Majesty the Emperor of Japan, *Crustaceana*, **3**, 131–150, pls 3, 4.
- SAKAI, T., 1963, Description of two new genera and 14 new species of Japanese crabs from the collection of His Majesty the Emperor of Japan, *Crustaceana*, **5** (3), 213–233.
- SAKAI, T., 1976, *Crabs of Japan and the adjacent seas* (Tokyo: Kodansha). [In three volumes: (1) English text, xxxix + 773 pp., figs. 1–379; (2) plates volume, 16 pp., 1–251; (3) Japanese text, 461 pp., figs 1–2.]
- SAKAI, T., 1983, Eight new species of Indo-Pacific crabs from the collections of the Smithsonian Institution, *Proceedings of the Biological Society of Washington*, **96** (4), 623–631.
- SAMOUELLE, G., 1819, *The Entomologist's useful Compendium, or an introduction to the knowledge of British insects* (London) 469 pp.
- SERÉNE, R. and LOHAVANIJAYA, P., 1973, The Brachyura (Crustacea: Decapoda) collected by the NAGA expedition, including a review of the Homolidae, in Scientific results of marine investigations of the South China Sea and the Gulf of Thailand 1959–1961, NAGA Report, **4** (4), 1–186, pl. 1–21, 1 map.
- SHEN, C. J. and CHEN, H., 1978, Description of five new species of *Leucosia* (Crustacea, Decapoda: Leucosiidae) off Chinese waters, *Studia Marina Sinica*, **14**:82–86, pls 1–2.
- STIMPSON, W., 1857a, On the Crustacea and Echinodermata of the Pacific shores of North America, *Boston Journal of Natural History*, **6** (4), 444–532, pls 18–22.
- STIMPSON, W., 1857b, Notices of new species of Crustacea of western North America; being an abstract from a paper to be published in the journal of the society, *Proceedings of the Boston Society of Natural History*, **6**: 84–89.
- STIMPSON, W., 1858, Prodomus descriptionis animalium vertebratorum, quae in Expeditione ad Oceanum Pacificum Septentrionalem a Republica Federata Missa, *Proceedings of the Academy of Natural Sciences of Philadelphia*, **10** (4), 31–163.
- STIMPSON, W., 1907, Report on the Crustacea (Brachyura and Anomura) collected by the North Pacific Exploring Expedition 1858–59, *Smithsonian Miscellaneous Collections*, **49**, 1–240, pl. 1–26.
- TAN, C. G. S. and NG, P. K. L., 1995, A revision of the genus *Oreophorus* Rüppell, 1830 (Crustacea: Decapoda: Brachyura: Leucosiidae), in B. Richer de Forges (ed.), *Le Benthos des fonds meubles des lagons de Nouvelle-Calédonie*, *Etudes and Thèses*, ORSTOM (Paris), **2**, 101–189, 17 pls.
- TYNDALE-BISCOE, M. and GEORGE, R. W., 1962, 8. The Oxystomata and Gymnopleura (Crustacea, Brachyura) of western Australia with descriptions of two new species from western Australia and one from India, *Journal of the Royal Society of Western Australia*, **45** (3), 696.



- WEBER, F., 1795, *Nomenclator entomologicus secundum Entomologiam Systematicam ill. Fabricii adjectis speciebus recens detectis et varietatibus* (Chilonii and Hamburgi), viii + 171 pp.
- WOOD-MASON, J. and ALCOCK, A., 1891, Note on the results of the last season's deep-sea dredging: Natural history notes from H.M. Indian Marine Survey Steamer: 'Investigator', Commander R. F. Hoskyn, R.N., Commanding, No. 21, *Annals and Magazine of Natural History*, series 6, 7, 258–272.
- YOKOYA, Y., 1933, On the distribution of decapod crustaceans inhabiting the continental shelf around Japan, based upon materials collected by S. S. Soyo-Maru, during the years 1923–1930, *Journal of the College of Agriculture, Tokyo Imperial University*, 12 (1), 1–226.