

Aegidae (Isopoda: Crustacea) from Australia with descriptions of three new species

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Introduction

The family Aegidae has not been reported on from Australian waters since the time of Hale (1925, 1940, 1952). The only accounts of aegid isopods from the Indo-Pacific since Hale's publications are the Siboga Expedition report of Nierstrasz (1931), and a note by Stephenson (1980) reporting a new record for New Zealand. This article reports on new species from Australian coasts, new records, and also resolves some new synonymies within the genus *Aega*. In addition two species that do not belong to the Australian fauna are briefly described and figured to allow separation from the closely related Australian species.

Because of the inadequacy of previous descriptions, where necessary, detailed figures have been given for the species dealt with. Those species that are easily recognized, or have been previously described (*Aega nodosa*, *Aega serripes*), are more briefly treated. Fish names used have been taken from Carcasson (1977) and Coleman (1981).

Type material and non-type specimens are held at the Australian Museum, Sydney (A.M.), the Queensland Museum, Brisbane (Q.M.), the National Museum of Victoria, Melbourne (N.M.V.), the Western Australian Museum, Perth (W.A.M.), and the United States National Museum, Washington (U.S.N.M.).

Systematics

Family **AEGIDAE** Dana

Genus ***Aega*** Leach

Aega Leach, 1815: 369.—Schioedte and Meinert, 1879: 334.—Hansen, 1890: 316.—Sars, 1899: 58.—Stebbing, 1905: 20.—Barnard, 1914: 361; 1936: 157.—Hale, 1925: 168.—Menzies, 1962: 117.—Menzies and George, 1972: 17.—Kensley, 1978: 56.—Kussakin, 1979: 231.—Brusca (in press).

Type species: Aega psora (Linnaeus, 1758)

Remarks: The genus has generally been distinguished from others in the family by the presence of 5 articles to the maxilliped palp. The frontal lamina is relatively large when compared to other genera, and there is usually a posteriorly directed rostral process that lies between the antennule bases. Brusca (in press) discussed the history and taxonomy of the genus, and gave diagnoses to the genus, and to the subgenera *A.* (*Aega*) and *A.* (*Rhamphion*). Brusca also catalogued all species within their respective subgenera. All species treated here, except for *Aega serripes*, belong to the subgenus *Rhamphion* Brusca, (in press).

In Australia the family is represented by twelve species including those recorded by Hale (1925, 1940).

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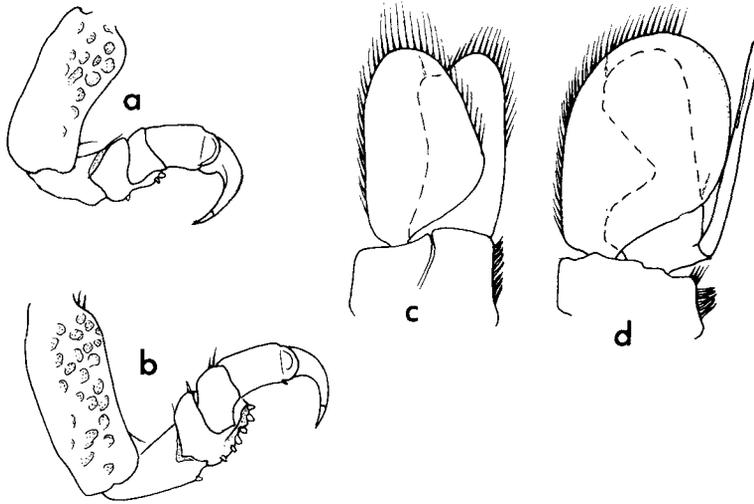


FIG. 1. *Aega (Aega) serripes*. (a, b) ♀ 35.3 mm; (c, d) ♂ 16.5 mm. (a) pereopod 1; (b) pereopod 2; (c) pleopod 1; (d) pleopod 2.

***Aega (Aega) serripes* Milne-Edwards (Fig. 1)**

Aega serripes Milne-Edwards, 1840: 241.—Schioedte and Meinert, 1879: 355. pl. VIII, figs. 1-4.—Thielemann, 1910: 26.—Hale, 1925: 171. figs. 19, 21: 1929: 253 figs. 246, 247; 1940: 295.—Nierstrasz, 1931: 182.—Moreira and Sadowsky, 1978: 99.—Coleman, 1977: 121 and fig. *Aega meinerti* Miers, 1884: 305.—Hale, 1925: 181.—Nierstrasz, 1931: 182.—Ellis, 1981: 123. *Aega (Aega) serripes*: Brusca (in press)
Aega (Aega) meinerti: Brusca (in press)

Material: ♂ (16.5 mm), King George Sound, Western Australia, H.M.S. 'Alert', coll. F. M. Payner, (Holotype of *Aega meinerti*; (B.M. (N.H.) Reg. No. 1858: 172). ♀ (35.3 mm), Lakes Entrance, Victoria, June 1955 from stomach of *Platycephalus* sp. (Fam. Platycephalidae).

Types: Held at the Museum Nationale d'Histoire Naturelle, Paris.

Type locality: Australia.

Descriptive notes: Penes opening flush on sternite 7. Pleopods 3-5 with transverse suture across exopod; endopods of pleopods 3 and 4 scarcely setose, with just few setae at medial distal angle.

Remarks: Miers (1884) referred to *Aega meinerti* as '... very nearly allied to *Aega cyclops* Haswell ...'. As *Aega lethrina* sp. nov. appeared also very similar to *A. cyclops*, it seemed necessary to examine Mier's holotype. On examination the species proved in no way separable from Australian specimens of *A. serripes*, and agreed well with the figures of Schioedte and Meinert (1879). Menzies (1962) doubtfully included *A. serripes* as a junior synonym of *Aega semicarinata* Miers, 1875.

Menzies (1962) also included in this synonymy *Aega punctulata* Miers, 1881, and *Aega bicavata* Nordenstam, 1930. Menzies did not discuss these synonymies, nor did he appear to have checked specimens of the species involved. His diagnosis and description of *A. semicarinata* do not allow comparison to *A. serripes*, and at present it seems likely that the two species are best considered distinct. *A. bicavata* was well described (Nordenstam 1930) and the pereopods, lack the distinct serrations of *A. serripes*, while the appendix masculina is distinctly shorter. The description of *A. punctulata* Miers does not allow comment.

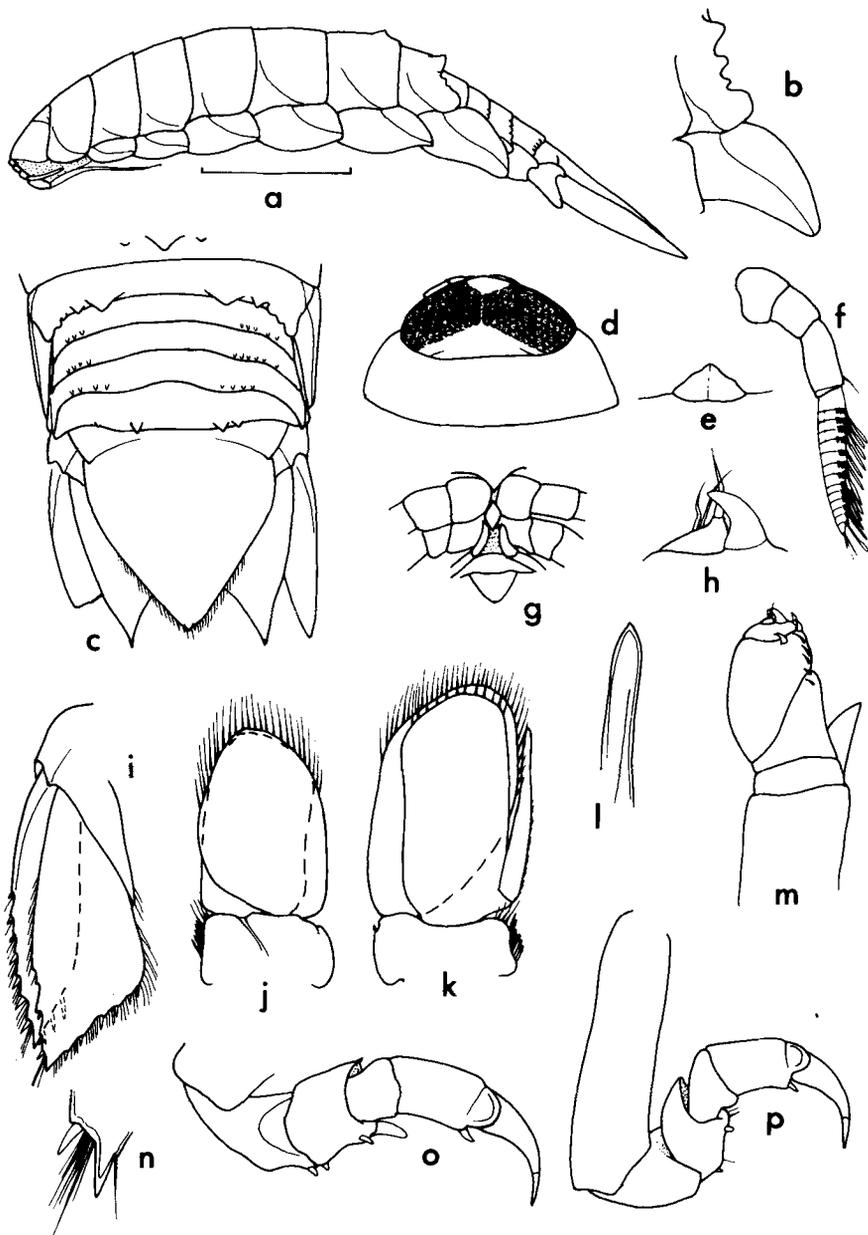


FIG. 2. *Aega (Rhamphion) nodosa*. (*a, g, i, m, l*) ♂ 13.8 mm remainder ♂ 14.0 mm. (*a*) lateral view; (*b*) pereonite 7, lateral view; (*c*) pleon and pleotelson, dorsal view; (*d*) cephalon. pereonite 1; (*e*) penes; (*f*) antennule; (*g*) clypeal region; (*h*) maxilliped palp, distal articles; (*i*) uropod; (*j*) pereopod 1, (*k*) pleopod 2; (*l*) appendix masculina, apex; (*m*) maxilliped; (*n*) uropod exopod, apex; (*o*) pereopod 2; (*p*) pereopod 1. Scale line represents 3.0 mm.

Distribution: Southern coasts of Australia, and Japan (Schioedte and Meinert 1879, Thielemann 1910).

Aega (Rhamphion) nodosa Schioedte and Meinert (Fig. 2)

Aega nodosa Schioedte and Meinert, 1879: 367 Pl. IX, figs. 1-3.—Hale 1925: 178, fig. 25; 1929: 254, fig. 249; 1940: 300; 1952: 27.—Nierstrasz, 1931: 182.

Rocinela spongicola Thomson, 1892: 157, pl. iii figs 3-8.—Richardson, 1898: 9.

Aega spongicola: Stebbing, 1905: 24.—Hale, 1925: 182.—Nierstrasz, 1931: 82.

Aega (Rhamphion) nodosa: Brusca (in press)

Material: 4♂ (10.5, 11.3, 13.8, 14.0 mm), 3 manca (5.9, 6.2, 8.5, 8.7 mm), Bass Strait, 40°22'2"S, 145°17'0"E, 3.xi.1980, 40 m, sand bottom, coll. G. C. B. Poore.

Types: Zoologisk Museum, University of Copenhagen.

Type locality: Bass Strait (Schioedte and Meinert 1879).

Descriptive notes: Cephalon with rostral process; eyes meeting at mid-line of cephalon but not totally coalesced, facets distinct, eyes black. Pereonite 6 with prominent median tubercle; pereonite 7 with sub-lateral tubercles. Coxae of pereonites 6 and 7 strongly produced posteriorly. Pleon with small sub-lateral tubercle along posterior margin of pleonites 2-4, pleonite 5 with more prominent tubercles. Pleotelson with fused sixth pleonite strongly indicated, apex acute, with two sub-apical spines.

Frontal lamina ovate, narrow, anterior and posterior apices acute. Mouthparts generally similar to those of other species; maxilliped palp article 2 with abundant stiff setae on distal half of lateral margin.

Pereopods as figured.

Fused penes present on sternite 7.

Pleopods 3-5 with transverse suture across exopods; endopods of pleopods 3 and 4 scarcely setose, endopod of pleopod 5 naked. Pleopod 2 appendix masculina arising basally, not reaching full length of endopod; distal one third abruptly narrowed to bluntly rounded apex.

Uropodal rami with sub-bifid apices. Exopod narrow, lanceolate, distal half of lateral margin with setae and 7 spines, medial margin with 3 spines. Endopod lateral margin sinuate, distal one third serrate, with 2 spines; medial margin with posterior two-thirds slightly concave, provided with 6 spines.

Female: No females were present in the material examined, but as in small males and manca, the sculpting of the pereon and pleon is absent; otherwise largely similar to the male.

Colour: Tan in alcohol, eyes black.

Size: Hale reported lengths up to 15 mm, largest male 14.0 mm.

Remarks: The sculpting of mature males makes their recognition easy. The shape of the pleotelson and uropods allows for easy recognition of immature males, females and manca. Other useful characters include details of the antennule flagellum, penes, pleopods and cephalon.

Hale (1925) remarked that the status of both *A. meinerti* and *A. spongicola* was unsatisfactory. The status of *A. spongicola* is still in some doubt. Thomson's (1892) rather inadequate description and figures leave little doubt that his species is a junior synonym of *A. nodosa* as concluded Hale (1952). Unfortunately this cannot be confirmed by examination of Thomson's specimen, as all attempts to locate it have failed.

Distribution: Bass Strait, southeastern Australia.

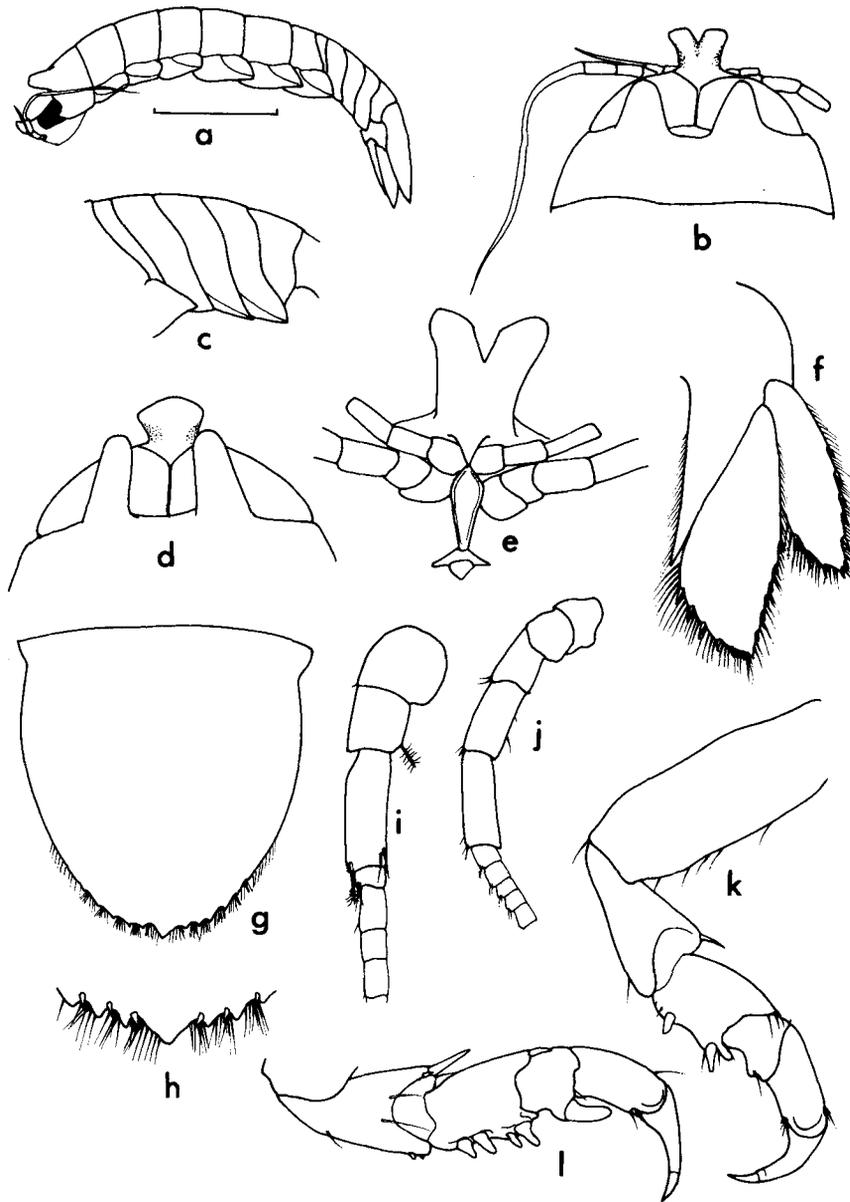


FIG. 3. *Aega (Rhamphion) vigilans*. (*a, b, c, e*) ♂ Heron Island, remainder ♂ Western Australia. (*a*) lateral view; (*b*) cephalon and pereonite 1; (*c*) pleon, lateral view; (*d*) cephalon and pereonite 1; (*e*) clypeal region; (*f*) uropod; (*g*) pleotelson; (*h*) pleotelson, posterior margin in ventral view; (*i*) antennule peduncle; (*j*) antennal peduncle; (*k*) pereopod 1; (*l*) pereopod 2. Scale line represents 4.0 mm.

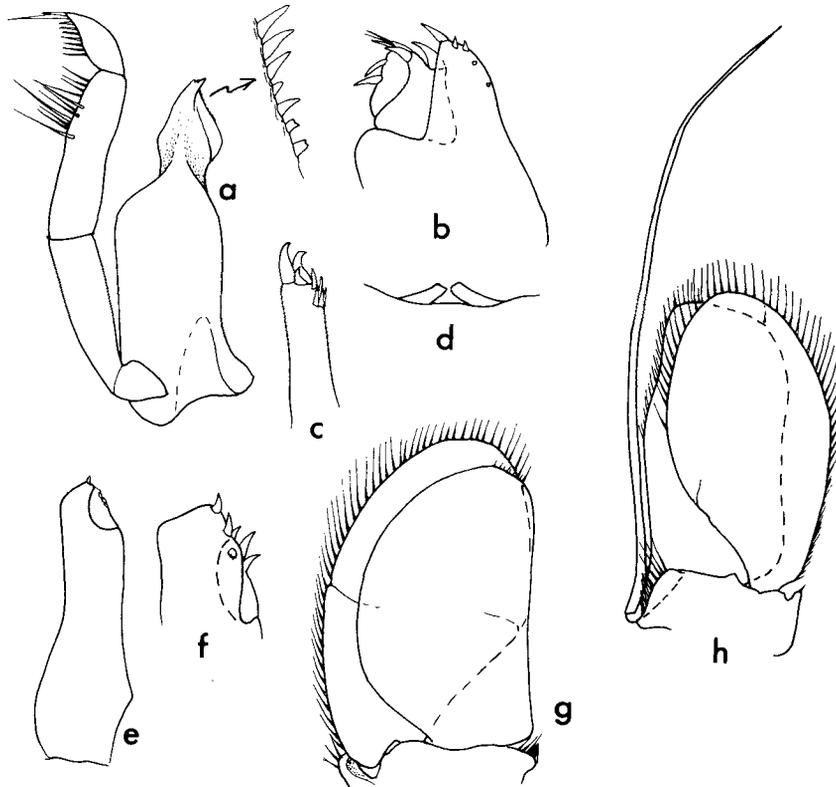


FIG. 4. *Aega (Rhamphion) vigilans*. All figs. of ♂ Western Australia. (a) mandible and detail of molar; (b) maxilliped, distal articles; (c) maxillule; (d) penes; (e) maxilla (f) maxilla, detail; (g) pleopod 4; (h) pleopod 2.

***Aega (Rhamphion) vigilans* (Haswell) (Figs. 3, 4)**

Rocinela vigilans Haswell, 1881: 472, pl. 16, fig. 2; 1882 b: 285.—Miers, 1884: 304.—Richardson, 1898: 9.

Aega ommatophylax Stebbing, 1905: 21, pl. IV, VA; 1910: 101, pl. IX B.—Nierstrasz, 1931: 183.—Barnard, 1936: 158, fig. 4.

Aega dubia Richardson, 1910: 12, fig. 12.

Aega vigilans: Hale, 1925: 174, fig. 23; 1933, 559; 1940: 300.—Nierstrasz, 1930: 4, fig. 2; 1931: 180.

Aega (Rhamphion) vigilans: Brusca, in press.

Material: ♀ (22.1 mm) HOLOTYPE (P 3312), Holborn Is., Qld, 36 m. ♂ (19.5 mm), Southwest of Geraldton, W.A., 29° 5'S, 113° 15'E, 16.ii. 1964, 127–146 m, coll. CSIRO. ♂ (12.00 mm), Heron Island–Wistari Reef Channel, Great Barrier Reef, Qld, 23.xi.1978, night plankton, coll. D. Fisk. 5 imm. (7.8, 8.8, 9.5, 10.2, 11.2 mm), Lizard Island, Qld, 21.i.1980, night vertical plankton haul, 6 m, coll. J. Leis and P. Schmitt. ♂ (15.8 mm) Heron Island, Great Barrier Reef, Qld, 7.viii.1981, in crevice beneath bommie, coll. R. C. Willan.

Types: Holotype held at the Australian Museum, Sydney, Reg. No. P 3312.

Type locality: Holborn Island, Queensland.

Descriptive notes: Hale (1925) and Stebbing (1905) have given detailed descriptions of this species. The notes given here only supplement these previous descriptions.

Eye occupying entire dorsal surface of cephalon except for small median triangle; male median rostral process entire or bifid. Pereonite 1 with two prominent anteriorly directed processes in adult male only. Pleotelson strongly domed, posterior margin serrate, with 12 spines set in somewhat ventral position; partially concealed in dorsal view by projecting setae. Penes present on sternite 7 as two medially inclined lobes about 3 times longer than wide.

Pleopod 2 appendix masculina greater than twice length of endopod; medial margin of exopod with trace of suture. Exopods of pleopods 3–5 with incomplete transverse suture; endopods of pleopods 3 and 4 with 6–8 short setae; endopod of pleopod 5 naked. Uropods with medial margin of peduncle and margins of both rami setose; exopod lateral margin with 7 spines, medial with 4; endopod lateral and medial margins with 6 spines each; neither ramus apex bifid.

Development: The characteristic shape of the appendix masculina develops with size, only the largest male examined here showing the full attainable length. The cephalic and pereonal processes are only present on mature males, but do not necessarily increase in size with increasing size of the animal. Barnard's (1936) specimens were smaller than the largest male examined here, yet had larger processes. Sexes also appear to differentiate at a fairly large size. The smallest recognizable male measured 12.0 mm. The specimens from Lizard Island have fully developed seventh pereopods, and may have all been female, but it was not possible to determine their sex.

Size: Males range from 12.0 mm to nearly 20 mm. Largest female, 22.1 mm.

Colour: Tan in alcohol, dorsal surfaces densely covered by black chromatophores giving an overall dark appearance.

Remarks: The similarity between *Aega vigilans* and *A. ommatophylax* has been remarked on by previous workers (Hale 1925, Nierstrasz 1930, 1931, Barnard 1936). All records of *A. vigilans* have been of females and all records of *A. ommatophylax* other than that of Stebbing (1910) have been of males. Examination of an immature male *A. vigilans* and a mature male of '*A. ommatophylax*' from the same locality strongly suggested that the two species were one. Comparison of fresh material to the holotype confirmed that *A. ommatophylax* is a junior synonym of *A. vigilans*. Immature specimens and females can be identified by cephalic morphology, details of the pleotelson and uropods, and by the shape of the frontal lamina.

Distribution: Known from Sri Lanka (Stebbing 1905), Western Indian Ocean (Stebbing 1910), Philippines (Richardson 1910), Andaman Islands, India (Barnard 1936) and in tropical Australia, from the Barrier Reef to off Geraldton, Western Australia to a depth of 146 m.

***Aega (Rhamphion) laevis* (Studer) (Figs. 5, 6)**

Cirolana laevis Studer, 1883: 21, pl. ii, fig. 8.—Hale, 1925: 145.—Nierstrasz, 1931: 157.—Bruce, 1981: 961.

Aega (Rhamphion) laevis: Bruce, in press.

Material: ♂ (9.7 mm), HOLOTYPE, Ostlich von Queensland 'Gazelle', 27.x.1875. 90 Faden.

Types: Held at Museum für Naturkunde, Berlin. Catalogue No. 5498.

Type locality: Queensland.

Description: Body slightly more than twice as long as wide, without sculpting. Cephalon with rostral process separating antennular bases; eyes well separated. Pereonite 1 with single horizontal furrow; coxae of pereonites 2–7 each with entire

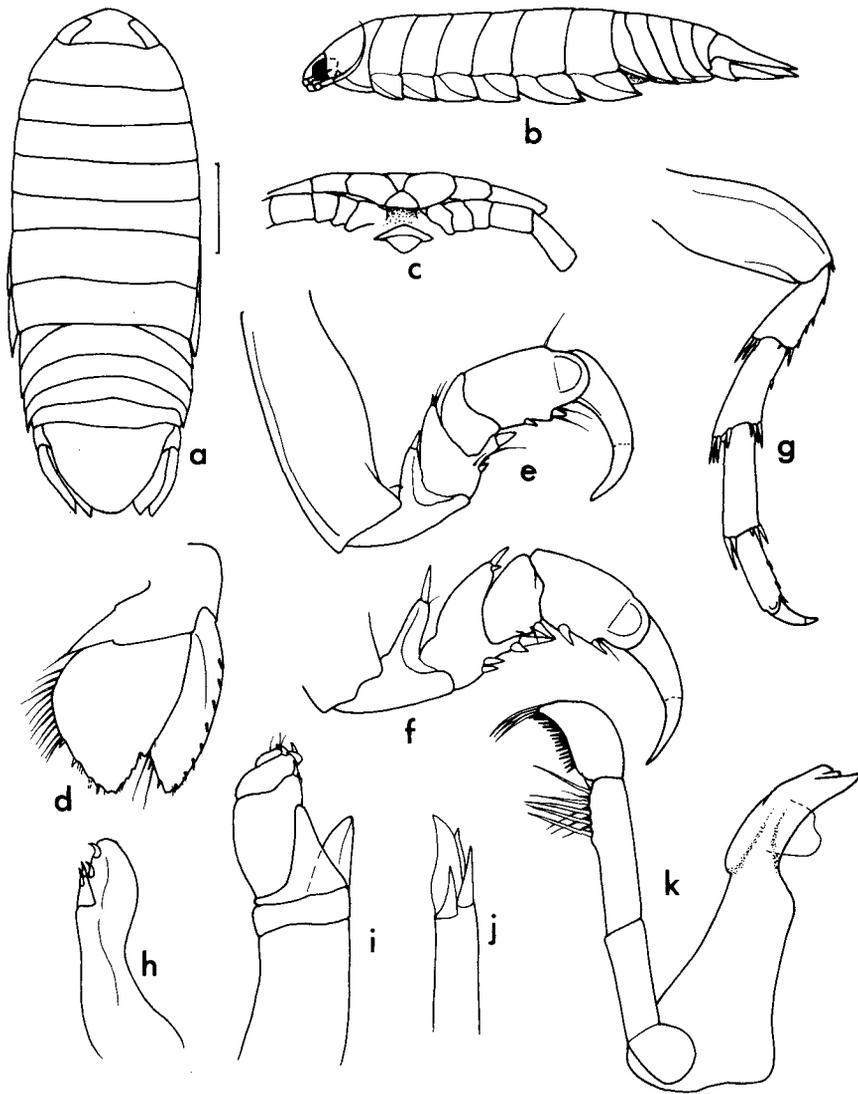


FIG. 5. *Aega (Rhamphion) laevis*. All figs. of HOLOTYPE. (a) dorsal view; (b) lateral view; (c) clypeal region; (d) uropod; (e) pereopod 1; (f) pereopod 2; (g) pereopod 7; (h) maxilla; (i) maxilliped, (j) maxillule apex; (k) mandible. Scale line represents 2.0 mm.

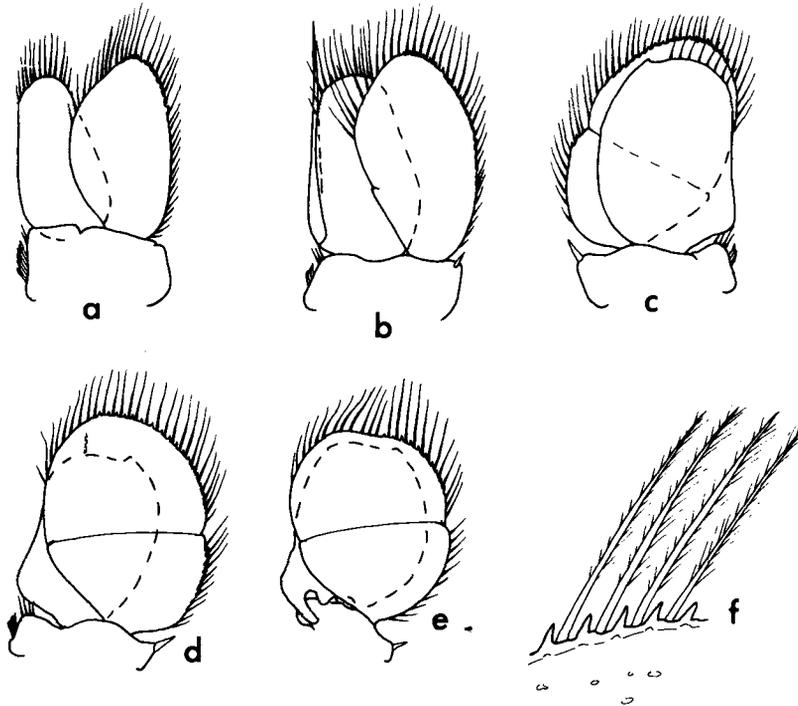


FIG. 6. *Aega* (*Rhamphion laevis*). All figs. of HOLOTYPE. (a)–(e) pleopods 1–5 respectively; (f) pleopod 2, distal margin of exopod.

diagonal furrow. All pleonites visible. Pleotelson lateral margins convex, converging smoothly to broadly rounded apex; posterior margin finely serrated, provided with short marginal setae, without spines.

Antennule and antenna not dissected, generally similar to others of sub-genus. Antenna peduncle 5-articulate, flagellum extending to pereonite 2.

Frontal lamina triangular, anterior margins convex. Mandible incisor tridentate, molar present; palp 4-articulate, with setae at distal lateral margin of article 3 and along entire length of lateral margin of article 4. Maxillule with 1 broad, 3 slender terminal spines. Maxilla with 2 recurved spines on endopod and exopod respectively. Maxilliped endite prominent; palp article 2 with medial margin produced; article 3 with 1 large and 2 small hooks, article 4 with 3 prominent hooks; article 5 with single spine and a few setae.

Pereopod 1 with single spine on anterior distal angle of ischium, and merus; posterior margin of merus with medial spine and robust spine at distal angle; carpus without spines; propodus with single spine on palm, and 1 at base of dactylus. Pereopods 2 and 3 similar to pereopod 1, but with proportionally longer carpus, and additional spines present on posterior margin of merus. Pereopod 7 with groups of spines at distal angles of ischium, merus and carpus, and additional spines along posterior margins of ischium, merus and propodus.

Vasa deferentia opening flush to surface of sternite 7.

Pleopods 3–5 with complete transverse suture; exopod of pleopod 2 with indication of suture on medial margin; all exopods with digitiform processes between setae (fig. 6 (f)). Pleopod 1 endopod tapering distally; peduncle with 6 coupling

hooks. Pleopod 2 appendix masculina attached basally, tapering smoothly to acute apex; extending beyond endopod by one third of its length.

Uropods extending slightly beyond apex of pleotelson, rami subequal in length. Lateral margin of exopod convex, with 8 spines, medial margin with 4 spines; apex obscurely bifid. Endopod with 4 spines on medial margin, at least 2 spines on lateral margin. All rami with marginal setae, but most are missing from specimen.

Colour: The holotype is brown in alcohol.

Size: 9.7 mm.

Remarks: The description and figures given by Studer (1883) were succinct, and precluded any assessment of the true character of the species.

Examination of the holotype revealed that the species was an undoubted *Aega*, which, while lacking any striking morphological characters, appears to be valid. The combination of characters best used in identifying this species are the relatively small eyes (for the family), the shape of frontal lamina, details of the pleotelson, uropods, and of the anterior pereopods.

The digitiform processes on the pleopods have not previously been recorded for the genus and may prove useful in separating *A. laevis* and related species from others.

Distribution: Studer (1883) gave no data other than '... Queensland, 90 Faden' (162 metres).

***Aega (Rhamphion) lethrina* sp. nov.** (Figs. 7, 8)

Part *Aega cyclops*: Hale, 1940: 298 (Non *Aega cyclops* (Haswell, 1882 a) of Hale: 1925: 180, fig. 26: 1926: 223, fig. 20: 1937: 18: 1952: 27).

Material: Capricorn Group, Great Barrier Reef series: ♂ (6.9 mm) Sykes Reef, 5.xii.1978, from nostrils of *Plectropoma leopardus*, 10 m, coll. D. Uzell. ♂ (6.7 mm) Wistari Reef, 29.xii.1978, from *Lethrinus nebulosus*, 27–30 m, coll. D. Fisk. ♀ (8.8 mm) Heron Island, 4.iv.1979, nostril of *Lutjanus sebae*, southeastern reef. ♀ (8.2 mm) Heron Island, 20.xi.1979, from *Lethrinus chrysostomus*, Heron-Wistari channel, coll. N. L. Bruce. ♂ (7.5 mm), ♀ (9.5 mm), Heron Island, 16.xi.1979, nasal passage of *Plectropoma leopardus*, coll. N. L. Bruce. ♂ (6.0, 6.3, 6.4, 6.4 mm), ♀ (6.9 mm), 2 manca (3.2, 4.5 mm), Heron Island, 1.xi.1979, nasal passage of *Cromileptes altivelis*, coll. N. L. Bruce. 5 ♂ (5.1, 6.3, 6.9, 7.0, 8.2 mm), 7 ♀ (5.2, 5.8, 6.4, 6.9, 7.0, 8.5, 9.1 mm), 4 manca (3.2, 3.2, 3.4, 3.5 mm), Wistari Reef, 30.xi.1980, from head and nasal passage of several *Lethrinus chrysostomus*, south eastern corner of reef, coll. N. L. Bruce. 4 ♂ (6.1, 6.3, 6.8, 7.0 mm), ♀ (7.5 mm), Heron Island, 14.viii.1981, taken from *Lethrinus chrysostomus*, coll. R. C. Willan.

2 ♀ (8.2 ovig, 8.4 mm), 4 manca (3.5, 3.7, 3.7, 3.9 mm), Mrove Reef, Coral Sea, 30.xii.1976, from sponges, coll. D. Fisk. ♂ (6.2 mm), Long Island, Chesterfield Reefs, Coral Sea, 19° 53'S, 158° 19'E, 6.v.1949, from *Lethrinella miniata*, 17 m, coll. N. L. Bruce.

♂ (5.5 mm), Motupore Island, Papua New Guinea, 9° 32'S, 147° 17'E, 3.xi.1980, from sponge *Leucetta microraphis* (Haeckel), coll. J. Lowry. ♀ (7.3 ovig, 6.4 mm), Horseshoe Reef, Motupore Island, Papua New Guinea, 9° 36'S, 147° 17.9'E, 2.xi.1980, unidentified sponge, 13 m, coll. A. J. Bruce.

Myrmidon Reef, Great Barrier Reef, 18° 16.2'S, 147° 23.4'E, series: ♂ (5.0 mm), from *Lutjanus bohar*; ♀ (7.2 mm) from *Cheilinus undulatus*; ♂ (6.2 mm), from nasal passage of *Plectropoma leopardus*: ♂ (5.2 mm); ♀ (6.1 mm) from nasal passage of *Variola louti*; 3 ♂ (5.6, 6.3, 6.9 mm), 3 ♀ (7.4, 7.5, 7.5 mm) from orbits of *Lethrinus chrysostomus*: 5.v.1982, 30–40 m, all coll. N. L. Bruce, D. Fisk.

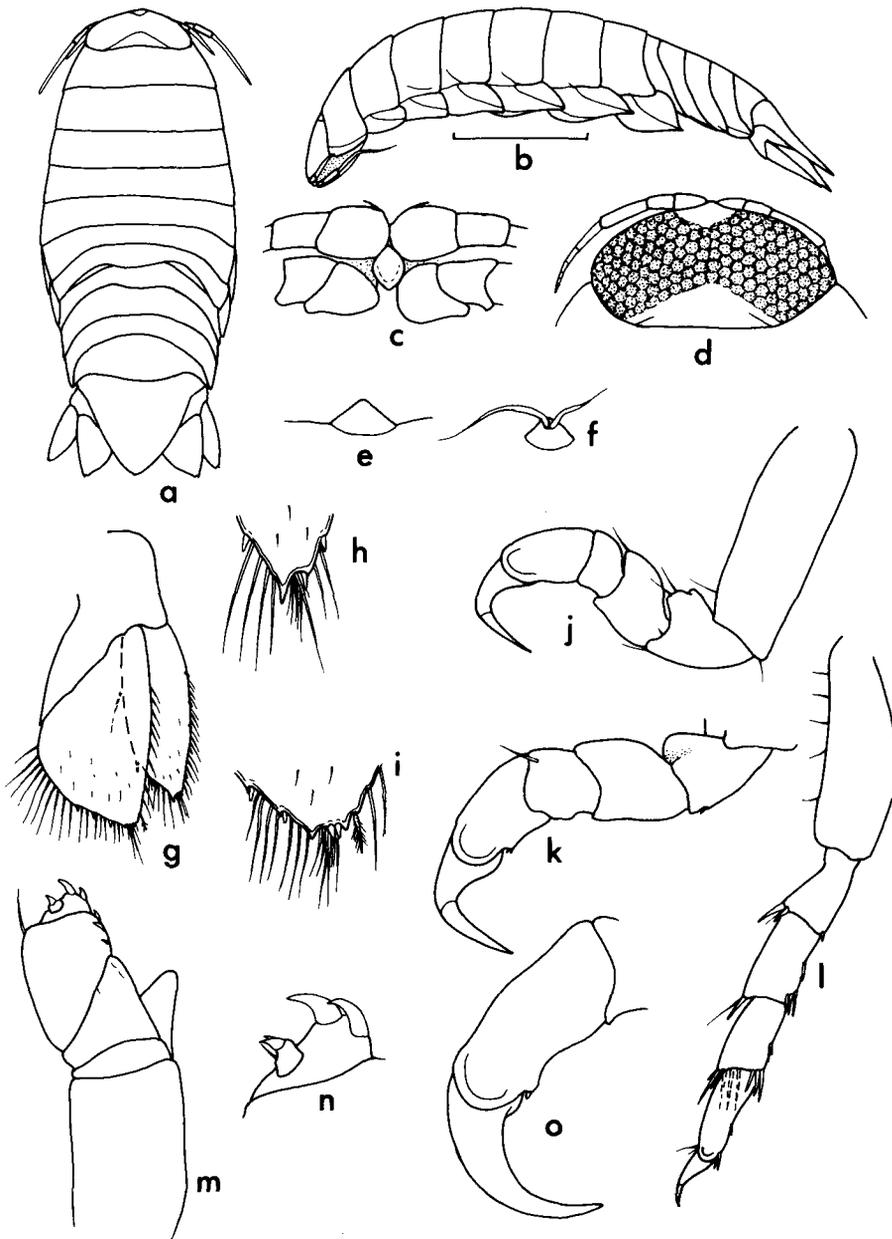


FIG. 7. *Aega (Rhamphion) lethrina* sp. nov. (*b, c-e*) HOLOTYPE, remainder ♀ PARATYPE. (*a*) dorsal view; (*b*) lateral view; (*c*) clypeal region; (*d*) cephalon; (*e*) penes; (*f*) penes; (*g*) uropod; (*h*) uropod exopod, apex; (*i*) uropod endopod, apex; (*j*) pereopod 1; (*k*) pereopod 2; (*l*) pereopod 7; (*m*) maxilliped (*n*) maxilliped palp, articles 4, 5. *Aega cyclops* Hale. (*o*) pereopod 1, distal articles. Scale line represents 2.0 mm.

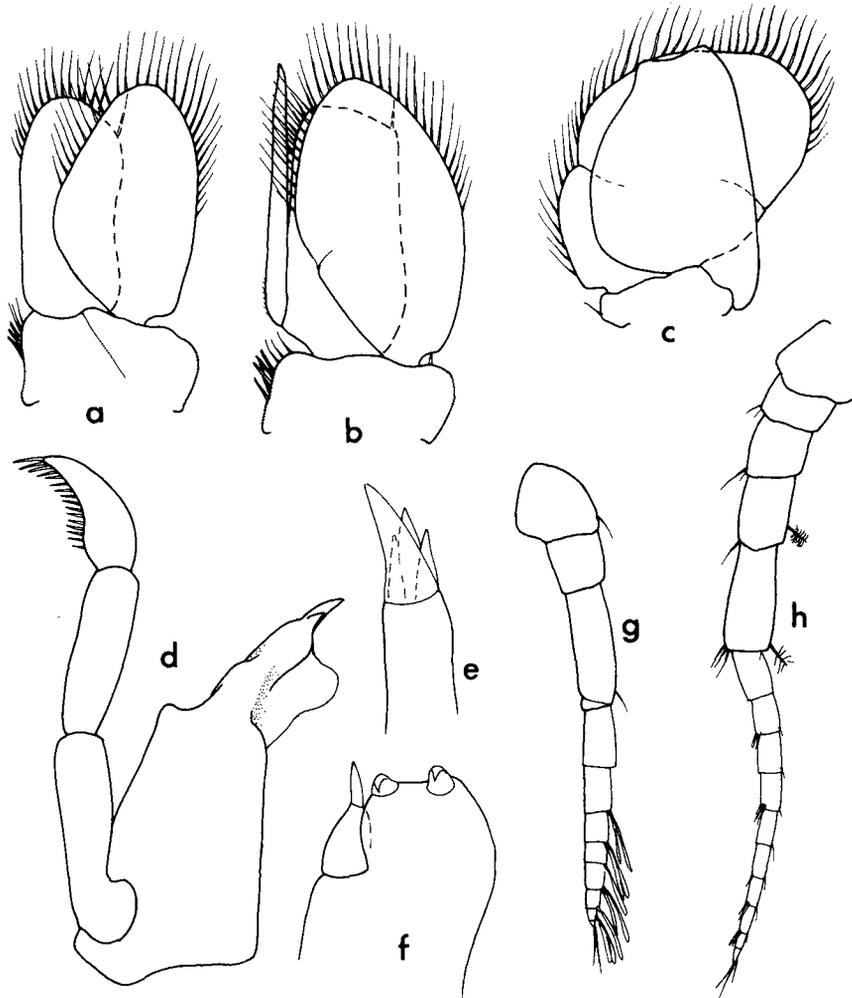


FIG. 8. *Aega (Rhamphion) lethrina* sp. nov. All figs. of ♂ PARATYPE. (a) pleopod 1; (b) pleopod 2; (c) pleopod 5; (d) mandible; (e) maxillule; (f) maxilla; (g) antennule; (h) antenna.

Also examined: Hale's 1925 specimens from Hummocky Island, Queensland.

Types: HOLOTYPE: Q.M. Reg. No. W9968. PARATYPES: Q.M. Reg. No. W9969–9982; A.M. Reg. No. P.33548–33549.

Type locality: Heron Island, Capricorn Group, Great Barrier Reef, 23° 26'5"S, 151° 54'5"E.

Description of male: Body slightly more than twice as long as wide. Cephalon with median rostral process, but not separating antennular bases. Eye occupying most of dorsal surface of cephalon, both eyes manifestly united at mid line; facets large, distinct; eye at median line occupies half length of cephalon.

Antennule peduncle with 3 articles, 4th fused terminal article present on article 3; flagellum extends to pereonite 1, composed of 8 articles, first 2 distinctly longer than remaining 6. Antenna peduncle with 5 distinct articles, article 5 longer than 4; flagellum extends to posterior of pereonite 2, composed of 10 articles.

Frontal lamina with lateral margins convex, anterior and posterior apices acute. Mandible palp with 16 stiff setae on lateral margin of terminal article. Maxillule with

4 broad terminal spines on exopod. Maxilla with single straight spine on endopod, 2 hooked spines on exopod. Maxilliped palp with 2 hooked spines at distal lateral angle of palp article 4; palp article 5 small, lobe like, with 2 spines and seta; palp article 3 with 3 hooked spines on medial margin.

Pereopod 1 without spines, dactylus strongly recurved; pereopods 2 and 3 similar to 1, but merus and carpus slightly longer; small spines present at posterior distal angle of ischium and propodus. Pereopod 7 with 5 setae on anterior margin of basis; remaining articles with spines at their distal angles; merus, carpus and propodus with medial spine on posterior margin.

Penes fused to form posteriorly directed triangular lobe on sternite 7.

Pleopods with all rami setose, except endopod of pleopod 5 which is naked; exopods of pleopods 3-5 with indistinct transverse suture. Pleopod 1 endopod with lateral margin concave. Pleopod 2 appendix masculina extending slightly beyond endopod; narrows gradually from base to bluntly rounded apex.

Uropods reaching to apex of pleotelson. Exopod with both margins convex, with setae along distal three-quarters of their length; lateral margin with 5 spines, medial with 2; apex sub-bifid, with dense cluster of setae and 7 small spines. Endopod lateral margin nearly straight, marginal setae along distal half of its length, without spines; medial margin with setae along entire length, provided with 3 spines; apex shallowly bifid, with dense cluster of setae and 2 small spines.

Female: Apart from primary sexual characters, similar to male; often slightly narrower.

Variation: Of the specimens examined here, many had damaged pleotelsons and uropods. Examining a series of 15 specimens revealed that none had pleotelson spines, and that the most common spination on the uropods was: exopod lateral margin 5 (63.6%), medial margin 2 (68%), 1 and 3 also occurring; endopod lateral margin without spines (100%) medial margin with 2 (45.5%), or with 1 or 3 (each 18.2%).

Colour: In life translucent, with 3 longitudinal bands of ochreous chromatophores, one median, and two sublateral. Eyes black, with interocelli spaces brilliant white.

Size: Largest male 8.2 mm, largest female, 9.1 mm; largest ovigerous female 7.3 mm, largest manca 4.5 mm.

Remarks: This specimen bears a close resemblance to several species of *Aega* which have eyes that extend across the cephalon. Of these species *Aega cyclops* is undoubtedly the closest. Hale (1925) described and figured Haswell's (1881) holotype, and later (Hale 1926) figured a male specimen from Sydney. The holotype has apparently been lost, only two slides (A.M. G. 5326) remaining. Neither of the two descriptions given by Hale (1925, 1926) appear to be of *A. lethrina*. Comparison of the specimens treated here to the figures given by Hale (1925) and the remaining holotype appendages of *A. cyclops* force me to conclude that the two species have to be considered as separate. The eye of *Aega cyclops* occupies a far greater proportion of the cephalon than does the eye of *A. lethrina*, the frontal lamina of the two species can be seen readily as distinct, while the dactylus of the anterior pereopods of the two species differ, that of *A. lethrina* being strongly, and abruptly recurved, that of *A. cyclops* being shorter, and smoothly curved (fig. 70).

Unfortunately, the loss of the holotype renders the status and distribution of *Aega cyclops* as somewhat dubious. The records of Hale (1925, 1926, 1937, 1952) suggest a distribution from southern Western Australia, to around southeastern

Australia. The identity of Hale's later records (1926, 1937, 1952) must remain in some doubt in view of the other closely similar species in the genus. *Aega cyclops* may have to be relegated to *species inquirenda*.

Host species: *Aega lethrina* occurs commonly on reef fishes, especially on lethrinids and coral trout (*Plectropoma leopardus*) where it is commonly found in the nasal passage along with the isopod *Argathona macronema* (Bleeker) (Bruce 1982).

On *Lethrinus* the species is generally taken from between the eye and its orbit, or behind the lips of the fish. The isopods are generally active, and crawl over the host's body soon after it has been removed from the water. Host species are: Lethrinidae: *Lethrinus chrysostomus*, *L. nebulosus*, *Lethrinella miniata*; Serranidae: *Plectropoma leopardus*, *Cromileptes altivelis*, *Variola louti*; Lutjanidae: *Lutjanus sebae*, *L. bohar*. Labridae: *Cheilinus undulatus*.

Distribution: From Heron Island, southern Great Barrier Reef, along the reef to southern Papua New Guinea, eastwards to the Chesterfield Reefs, Coral Sea.

Etymology: The epithet is derived from the genus *Lethrinus* on which this species occurs most abundantly.

***Aega (Rhamphion) coroo* sp. nov.** (Figs. 9, 10)

! *Aega cyclops*: Hale, 1926, 223, fig. 20.

Material: ♂ (10.9 mm), off Sydney, N.S.W., 33° 59'S, 151° 35'E, 9.viii.1973, depth 198 m. ♀ (8.5 mm), N.S.W., no other data. ♂ (6.5 mm), 3 manca (3.2–3.5 mm), off Sydney, N.S.W., 33° 47'S, 151° 43'E, 5.xii.1977, depth 192 m, coll. 'Kapala'.

Types: HOLOTYPE: A.M. Reg. No. P.33558. PARATYPES: A.M. Reg. No. P.31713, P.33556, P.33559.

Type locality: Off Sydney, N.S.W., 33° 47'S, 151° 43'E.

Description of male: Body about 2.5 times longer than greatest width. Cephalon with median rostral process. Eye occupying most of cephalon (see remarks). All coxae with complete furrow. Pleon with all pleonites visible. Pleotelson broadly rounded, slightly shorter than maximum width; posterior margin serrate, provided with plumose setae, but no spines.

Antennule peduncle 3-articulate, article 3 about as long as the combined lengths of articles 1 and 2; flagellum extending to pereonite 1, composed of 8 articles. Antenna peduncle articles 1–3 short, article 4 slightly longer than 2, article 5 distinctly longest; flagellum composed of 12 articles, extending to pereonite 3.

Frontal lamina diamond shaped, posterior margins very slightly convex. Mandible palp with 5 stiff setae at lateral distal angle of article 2; article 3 with about 15 stiff setae on medial margin. Maxillule with 3 flat terminal spines. Maxilla with 2 hooked spines on endopod; 3 hooked spines on distal margin of exopod. Maxilliped palp with 3 hooked spines on distal medial margin of article 3, article 4 with single hooked spine at medial margin, article 5 with 3 hooked spines.

Pereopod 1 with no spines; dactylus smoothly curved, exceeding propodus in length. Pereopods 2 and 3 similar to 1 but merus and carpus proportionally longer, posterior margin of merus and carpus with spines. Pereopod 7 with spines along posterior margins of ischium to prosopodus, and clusters of spines at distal angles of ischium, merus and carpus; basis with 5 setae on anterior margin.

Vasa deferentia opening flush to surface of sternite 7.

Pleopods with all rami setose except endopod of pleopod 5; exopods of pleopods 3–5 with indistinct transverse suture; all exopods with intersetae digitiform

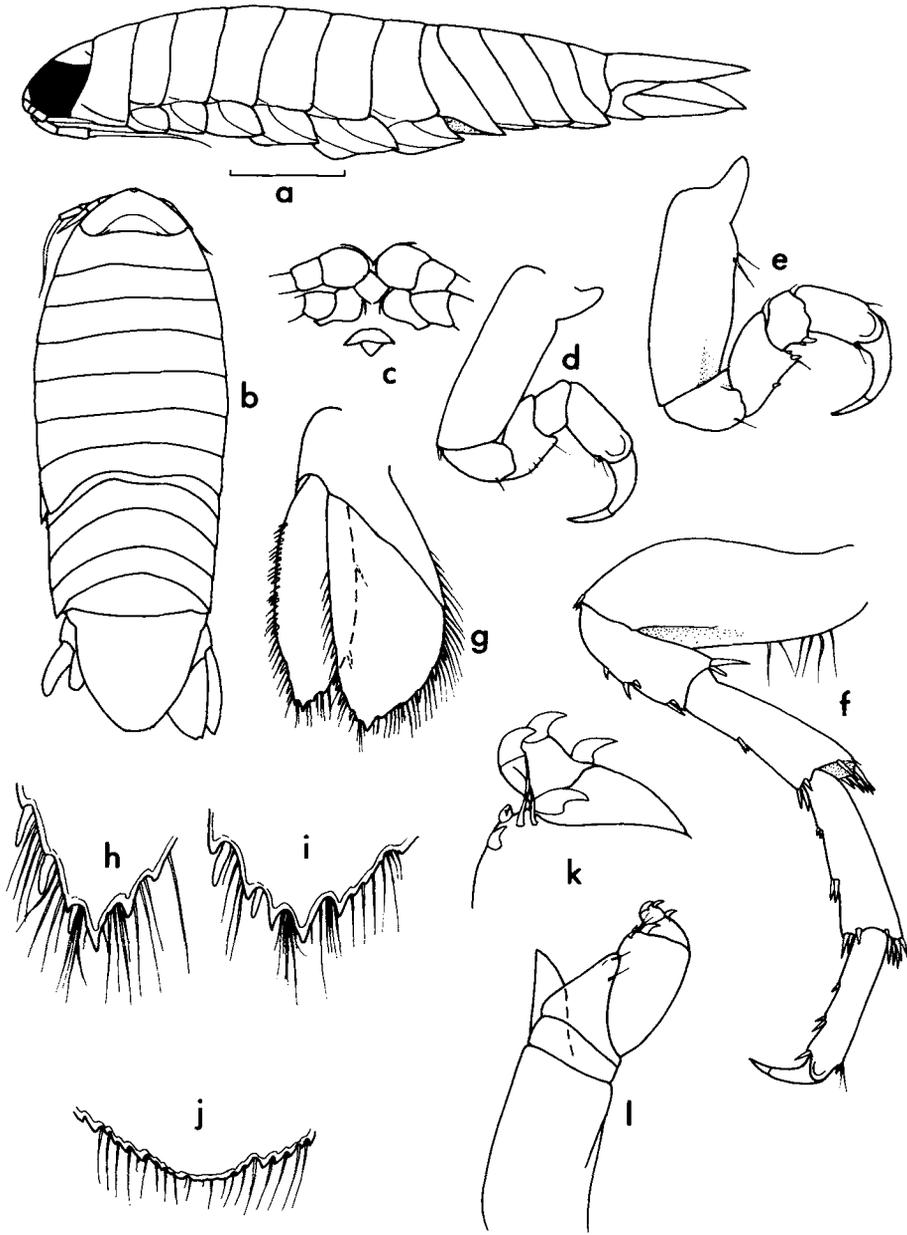


FIG. 9. *Aega (Rhamphion) coroo* sp. nov. Figs. (a, c) HOLOTYPE. (b) ♀ 8.3 mm. remainder ♀ PARATYPE. (a) lateral view; (b) dorsal view; (c) clypeal region; (d) pereopod 1, (e) pereopod 2; (f) pereopod 7; (g) uropod; (h) uropod exopod, apex; (i) uropod endopod, apex; (j) pleotelson, apex; (k) maxilliped palp articles 4 and 5; (l) maxilliped. Scale line represents 1.0 mm.

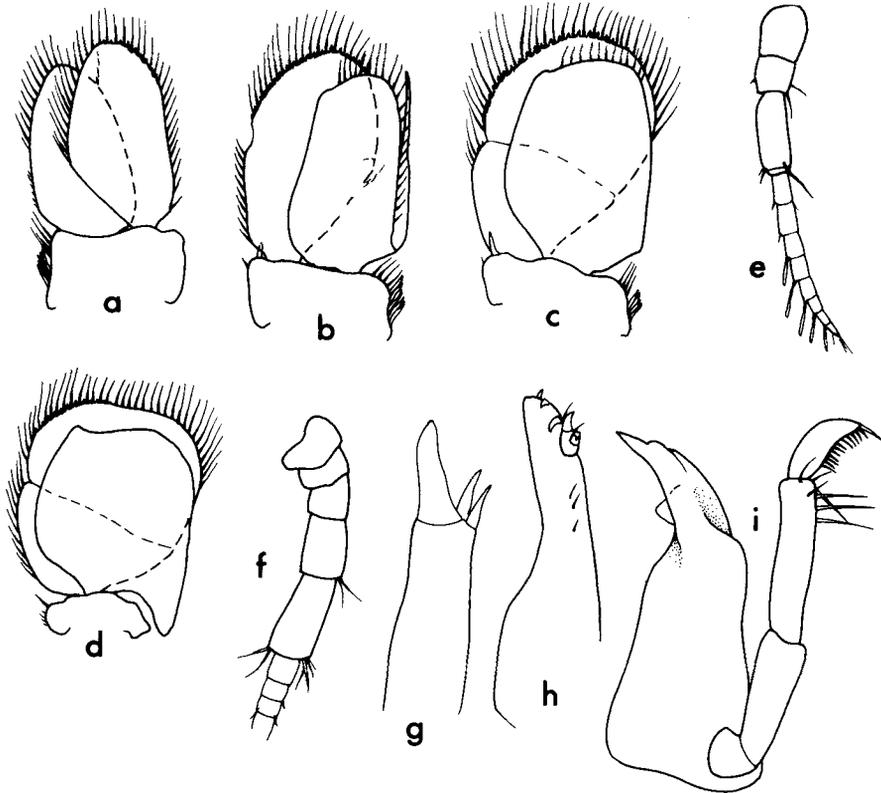


FIG. 10. *Aega (Rhamphion) coroo* sp. nov. All figs. of ♂ PARATYPE. (a-d) pleopods 1, 2, 3, 5 respectively; (e) antennule; (f) antennal peduncle; (g) maxillule; (h) maxilla; (i) mandible.

extensions. Pleopod 1 with medial and lateral margin tapering smoothly to apex; exopod with spine at proximal lateral corner. Pleopod 2 exopod medial margins with trace of suture; appendix masculina slightly longer than endopod, distal half tapering abruptly.

Uropods extending to apex of pleotelson. Exopod lateral margin with 9 spines, medial with 2; apex sub-bifid, with dense cluster of setae and lateral spine. Endopod lateral margin nearly straight, with 3 spines, medial with 3; apex bifid, medial process prominent. All rami with plumose marginal setae.

Female: Similar to male.

Variation: The smaller male specimen lacked spines on the uropodal endopods, the female had only one undamaged uropod, otherwise the spination is the same as described.

Colour: Tan in alcohol, with faint traces of reddish chromatophores. Eyes appear red.

Size: Largest male 10.7 mm, female 8.5 mm, largest manca 3.5 mm.

Remarks: This species is similar not only to *A. cyclops*, and *A. lethrina* but also to *A. synopthalma* Richardson. It is easily separated from *A. synopthalma* in having broader uropods, shorter propodus on pereopod 1 and lacking pleotelson spines. *Aega cyclops* has been discussed in the remarks given for *A. lethrina* and separation of

A. cyclops is at present achieved by *A. coroo* having a shorter eye at the median part of the cephalon and a distinct frontal lamina. Abundant features separate *A. lethrina* including the morphology of the frontal lamina, pereopod, pleopods and uropods, and *A. lethrina* having fused penes. Unfortunately the eyes of *A. coroo* could not be figured in detail. In all specimens the eyes had contracted away from the exoskeleton, making location of the boundaries difficult. The eyes appear totally united medially, and are probably essentially the same as those of *A. lethrina*. To enable species separation the holotype of *A. synopthalma* has been briefly figured and described (p. 777, fig. 14).

Distribution: Known only off Sydney, New South Wales, taken at depths from 192 and 198 metres.

Etymology: Coroo is an Aboriginal word for eye.

***Aega (Rhamphion) beri* sp. nov. (Figs. 11, 12)**

Material: ♂ (45.3 mm), East of Port Jackson, N.S.W., 33° 38'36"S, 152° 05'09"E, 9.xii.1980, dredged from between 945–972 m, coll. R. Springthorpe, P. Coleman.

Types: HOLOTYPE: A.M. Reg. P 31572.

Type locality: East of Port Jackson, N.S.W., 33° 38'36"S 152° 05'09"E.

Description: Body about 3 times longer than wide; without sculpting. Cephalon with minute rostral process. Eyes large, not meeting each other, in dorsal view not making contact with anterior margin of cephalon. Pereonites each with partial transverse furrows; coxae becoming more acute posteriorly, each with complete oblique furrow. Pleonites all visible; horizontal submarginal furrow present on pleonites 2–3. Pleotelson broad, lateral margin convex, with posterior margins serrate, each side with 6 spines, each set within serration, and with short marginal setae; apex with truncate excision.

Antennule peduncle article 3 longest, fused 4th article present; flagellum with 18 articles, longer than peduncle, extending to pereonite 1. Antenna with peduncle articles 1–3 short, 4 and 5 long; flagellum extending to pereonite 3.

Frontal lamina with posterior part narrow, anterior roughly diamond shape with median transverse ridge. Mandible incisor tridentate, molar process present; palp 4-articulate; lateral margin of article 3 angled, distal part of margin with stiff setae. Maxillule with 1 broad triangular spine and 5 slender spines. Maxilla with 3 curved spines on endite; exopod with 4 large hooks. Maxilliped with single spine at lateral margin and several small spines and setae at medial margin of palp article 3; article 4 with 4 large hooks; article 5 with 3 stiff setae and single hook; endite broad, scarcely tapered, with about 3 setae.

Pereopod 1 with 2 small spines at posterodistal angle of carpus; propodus with small spines adjacent to base or large, smoothly curved dactylus. Pereopods 2 and 3 similar to 1. Pereopod 7 with setae on anterior margin of basis; posterior margins of ischium, merus and carpus scalloped, with spines; spines present on distal margin of merus and carpus.

Penes in form of 2 small, elliptical nodules, distinctly separate.

Pleopods with endopod of pleopod 5, naked, endopod of pleopods 3 and 4 sparsely setose; exopods of pleopods 3–5 with complete suture. Pleopod 2 appendix masculina inserted sub-basally, not reaching apex of endopod. Pleopod 1 with 10 coupling hooks on medial margin of peduncle. Lateral distal angles of endopod of pleopods 2–5 with small acute process.

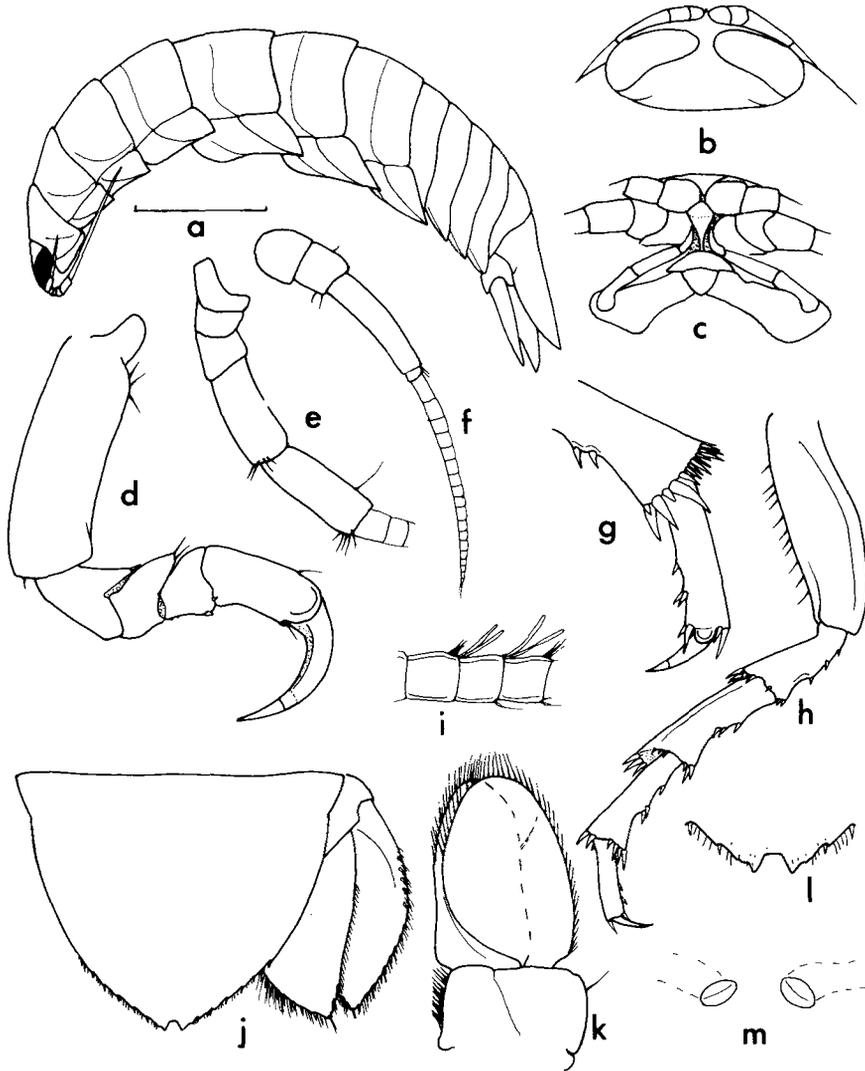


FIG. 11. *Aega (Rhamphion) beri* sp. nov. All figs. of HOLOTYPE. (a) lateral view; (b) cephalon dorsal view; (c) clypeal region; (d) pereopod 1; (e) antennal peduncle; (f) antennule; (g) pereopod 7, lateral side of carpus and propodus; (h) pereopod 7; (i) antennule flagellum, articles 7-9; (j) pleotelson and uropod; (k) pleopod 1; (l) pleotelson, apex; (m) penes. Scale line represents 12.3 mm.

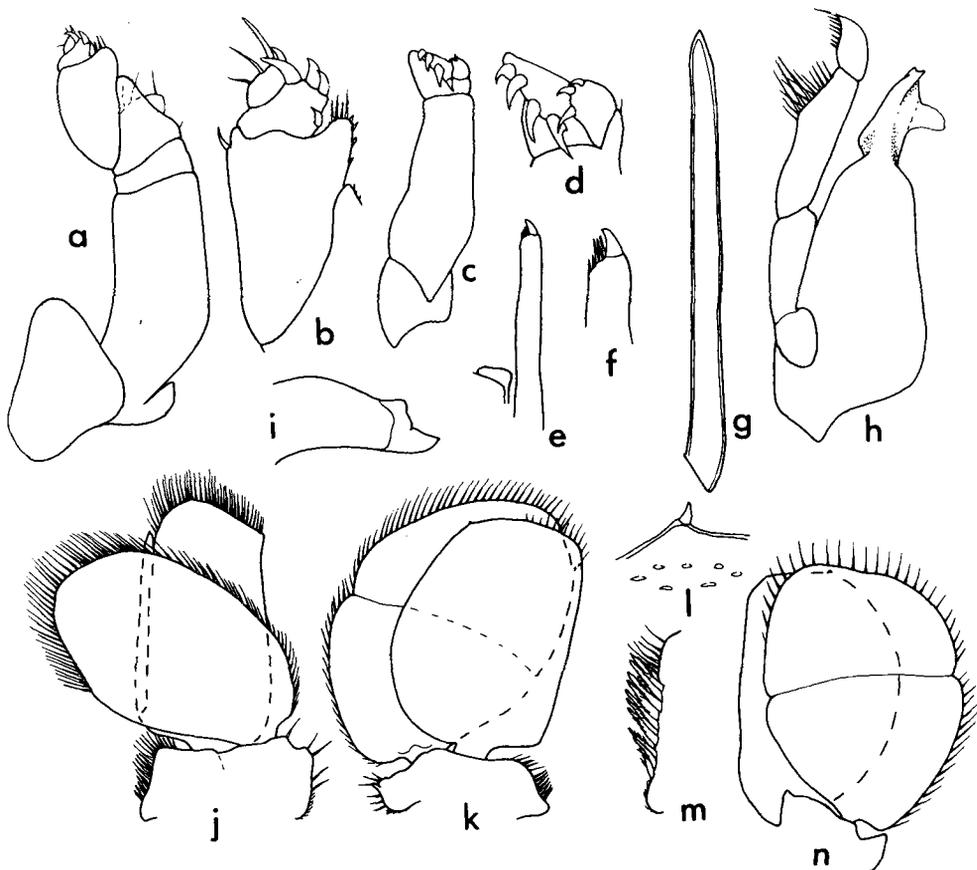


FIG. 12. *Aega (Rhamphion) beri* sp. nov. All figs. of HOLOTYPE. (a) maxilliped; (b) maxilliped palp articles 3-5; (c) maxilla; (d) maxilla apex; (e) maxillule; (f) maxillule exopod, apex; (g) appendix masculina; (h) mandible; (i) mandible, incisor; (j) pleopod 2; (k) pleopod 4, (l) pleopod 4, endopod detail of lateral distal angle; (m) pleopod 1, peduncle medial margin; (n) pleopod 5.

Uropods not extending beyond apex of pleotelson rami sub-equal in length. Exopod lateral margins convex, armed with 11 spines set amongst marginal setae; medial margin with 7 spines and continuous marginal setae; distal half of lateral margin serrate. Endopod lateral margin slightly sinuate, with marginal setae and 2 spines; medial margin smoothly curved, serrate, provided with 10 spines set amongst marginal setae; apices of both rami feebly bifid.

Colour: Tan in alcohol, eyes reddish brown. Chromatophores not apparent.

Size: 45.3 mm.

Remarks: The species is readily recognized by the details of the cephalic morphology, uropods, unique pleotelson shape, position of the penes, and shape of the appendix masculina. The very similar *Aega quadratisinus* Richardson has smaller eyes, the penes set closer together, and an obviously distinct appendix masculina. To enable easy species separation the holotype of *A. quadratisinus* has here been figured with descriptive notes (p. 776, fig. 13).

Distribution: Known only from the type locality.

Etymology: Beri is an Aboriginal word for claw, and alludes to the maxilliped spines.

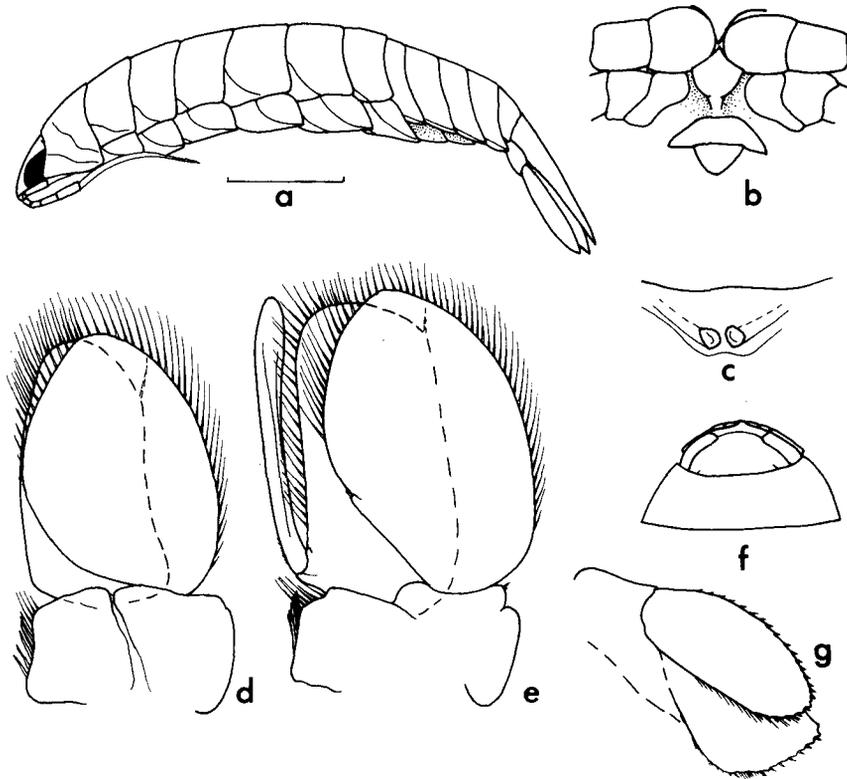


FIG. 13. *Aega (Rhamphion) quadratisinus*. All figs. of HOLOTYPE. (a) lateral view; (b) clypeal region; (c) peneal openings; (d) pleopod 1; (e) pleopod 2; (f) cephalon, pereonite 1, dorsal view; (g) uropod, ventral view, drawn *in situ*. Scale line represents 4.0 mm.

***Aega (Rhamphion) quadratisinus* Richardson (Fig. 13)**

Aega quadratisinus Richardson, 1903: 819, fig. 1; 1904: 672, figs. 23–26.—Nierstrasz, 1931: 183.

Aega (Rhamphion) quadratisinus: Brusca, in press.

Material: ♂ (21.4 mm) HOLOTYPE, vicinity of Kauai Island, Hawaii, Albatross Stn 4181, 1902, depth 1207–1459 m.

Types: HOLOTYPE held at the U.S.N.M. Washington, Reg. No. 38971.

Type locality: Kauai Island, Hawaii.

Descriptive notes: Eyes large, rectangular, well separated. Frontal lamina with anterior margins concave, posterior margins convex, surface flat. Pereonites 1–5 with sinuate impressed line on lateral surface. Coxae of pereonites 2–5 rectangular, those of pereonites 6 and 7 projecting slightly beyond posterior of segment; all coxae with complete furrow. Pleotelson with 8 spines on either side of terminal excision.

Pereopods similar to those of *Aega beri*.

Penes set in form of two slight nodules, set close together on lobe-like projection on sternite 7. (This may be an artefact due to contraction of tissue).

Pleopods similar to those of *Aega beri*, but endopod of pleopod 1 with lateral margin concave, and pleopod 2 appendix masculina fractionally longer than endopod, broadening distally.

Uropod exopod with 16 spines on margin, 5 on medial; endopod with 4 spines on lateral margin, 8 on medial; all rami with continuous marginal setae.

Remarks: From Richardson's (1903) Description *Aega beri* appeared indistinguishable from *A. quadratisinus*. Details of the pleotelson, uropods and pereopods appeared to be almost entirely similar. However, the two species can be easily separated by differences of the morphology of the cephalon, coxae, penes and the first two pairs of pleopods.

Distribution: Known only from the type locality.

***Aega (Rhamphion) synopthalma* Richardson (Fig. 14)**

Aega synopthalma Richardson, 1909: 81, fig. 8.—Nierstrasz, 1931: 182.

Material: ♀ (15.1 mm) HOLOTYPE, U.S.N.M. Reg. No. 39500 at Joga Shima Light, Uruga Strait, Gulf of Tokyo, 26.x.1906, 354.6 m (Richardson, 1909).

Types: HOLOTYPE held at U.S.N.M., Reg. No. 39500.

Type locality: Jogo Shima Light, 35° 04' 10"N, 139° 38' 12"E (Richardson, 1909).

Descriptive notes: Cephalon with eyes meeting at mid point, ocelli small (the eyes of the specimen have contracted away from the exoskeleton making detailed comment on their morphology difficult). Frontal lamina with anterior margins concave, posterior broadly rounded. Coxae of pereonites 2-7 each with complete impressed line. Pleotelson slightly shorter than wide, posterior margin serrate with 7 spines set between marginal setae.

Pereopods generally with very few spines.

Pleopods with marginal setae on all rami except endopod of pleopod 5 which is naked; exopods of pleopods 3-5 with complete suture; rami without digitations.

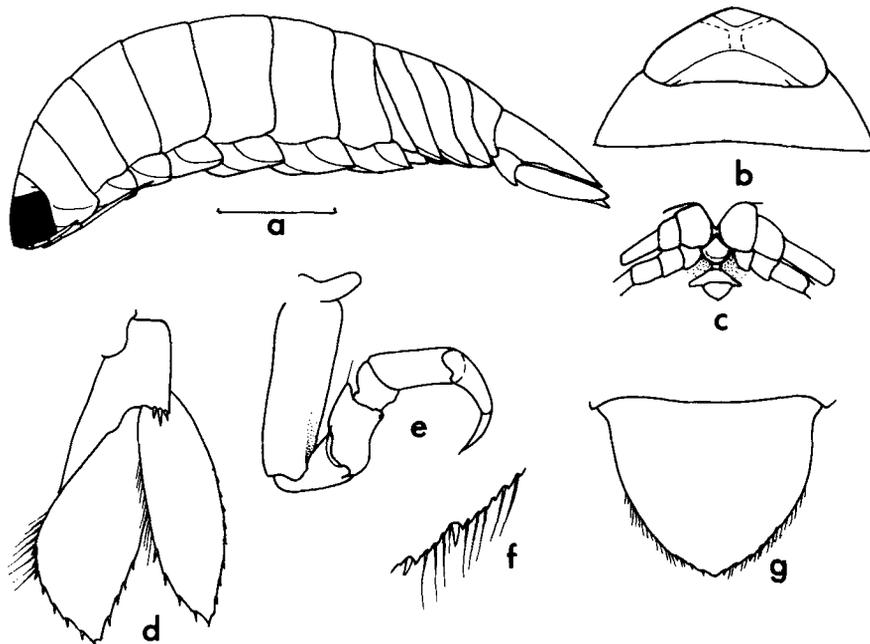


FIG. 14. *Aega (Rhamphion) synopthalma*. All figs. of HOLOTYPE. (a) lateral view; (b) cephalon, pereonite 1, dorsal view; (c) clypeal region; (d) uropod, ventral view; (e) pereopod 1; (f) pleotelson, detail of lateral margin; (g) pleotelson. Scale line represents 3.0 mm.

Uropod exopod lateral margin with 8 spines, medial margin with 4; endopod lateral margin with 4 spines, medial margin with 7; all rami with marginal setae.

Remarks: This species is known only from the female holotype. The general appearance and somatic morphology are very similar to that of *Aega coroo*. Differences in details of the frontal lamina, pleotelson spination and relative length of the propodus of pereopod 1 readily separate the two species.

Distribution: Known only from the type locality.

Genus *Rocinela* Leach

Rocinela Leach, 1818: 348.—Schioedte and Meinert, 1879: 380.—Richardson, 1898: 8; 1905: 190.—Sars, 1899: 65.—Stebbing, 1905: 23.—Barnard, 1914: 367.—Hale, 1925: 182.—Menzies, 1962: 118.—Menzies and George, 1972: 12.—Menzies and Glynn, 1968: 45.—Kensley, 1978: 59.—Kussakin, 1979: 251—Brusca, 1980: 229.

Type species: Rocinela danmoiniensis Leach, 1815.

Remarks: Generic diagnoses have frequently referred to the maxilliped palp as having two articles (Richardson 1905, Menzies 1962, Menzies and George 1972, Brusca 1980). This is not always the case as Kussakin (1979) figures *Rocinela cornuta* Richardson, 1898, with 3 maxilliped palp articles, and *R. oculata* figured here also has a small third maxilliped palp article.

There are two ways by which the number of maxilliped palp articles may be reduced, by loss of the terminal article, or by coalescence of articles. The latter is shown by the corallanid genus *Argathona* in which palp articles 2 and 3 show varied states between full articulation and total coalescence (Bruce 1982). In *Rocinela* most species appear to have lost the small terminal article.

As so many of the species of *Rocinela* are inadequately known, previous diagnoses lack precision. Characters by which the genus can be identified include the 2- or 3-articled maxilliped palp. (*Aega* has 5 maxilliped palp articles), the anterior margin of cephalon covering the antennule bases, anterior pereopods with the propodus usually expanded, with spines, and the frontal lamina small and narrow.

Only two species have previously been recorded from Australia, by Hale (1925), *R. orientalis* Schioedte and Meinert, and *R. sila* Hale.

Rocinela oculata Harger (Figs 15, 16)

Rocinela oculata Harger, 1883: 97, Pl. 111, figs. 2-2 a, Pl. iv, fig. 1.—Richardson, 1898: 9; 1900: 219; 1901: 523; 1904: 29; 1905: 191, fig. 175.—Schultz, 1969: 199, fig. 314.

Material: ♀ (45.0 mm) East of Broken Bay, N.S.W., 33°25–30'S, 152°03–07'E, 19.viii.1975, 630 m, from fish taken in trawl. ♀ (51.6 mm), off Taree, N.S.W., 32°46'S, 152°46'E, 7.v.1971, 486–540 m, prawn trawl, sandy mud. ♂ (41.6 mm), 2 ♀ (37.8, 44.2 mm), East of Woolli, N.S.W., 29°52'S, 153°43'E, 23.viii.1977, 495 m, prawn trawl. 5 ♂ (27.7, 32.1, 41.5, 42.8, 46.0 mm), 2 ♀ (45.3, 50.5 mm), East of Clarence River mouth, N.S.W. 29°25–20'S, 153°49–50'E, 12.x.1975, 450 m, prawn trawl. All specimens taken by N.S.W. State Fisheries on F.R.V. 'Kapala'. ♂ (46.5 mm), off Cape Moreton, Moreton Island, Southeastern Qld., 27°17'S, 153°54'E, 2–3.x.1982, trawled 500–540 m, coll. Qld. State Fisheries. HOLOTYPE, immature, 13.3 mm, off Georgia, U.S.A. (Harger 1883).

Types: HOLOTYPE held at Museum of Comparative Zoology, Harvard University, Reg. No. MCZ 3910.

Type locality: Off Georgia, U.S.A., Cambridge Massachusetts, U.S.A. 32°18'20"N, 78°43'W (Harger 1883).

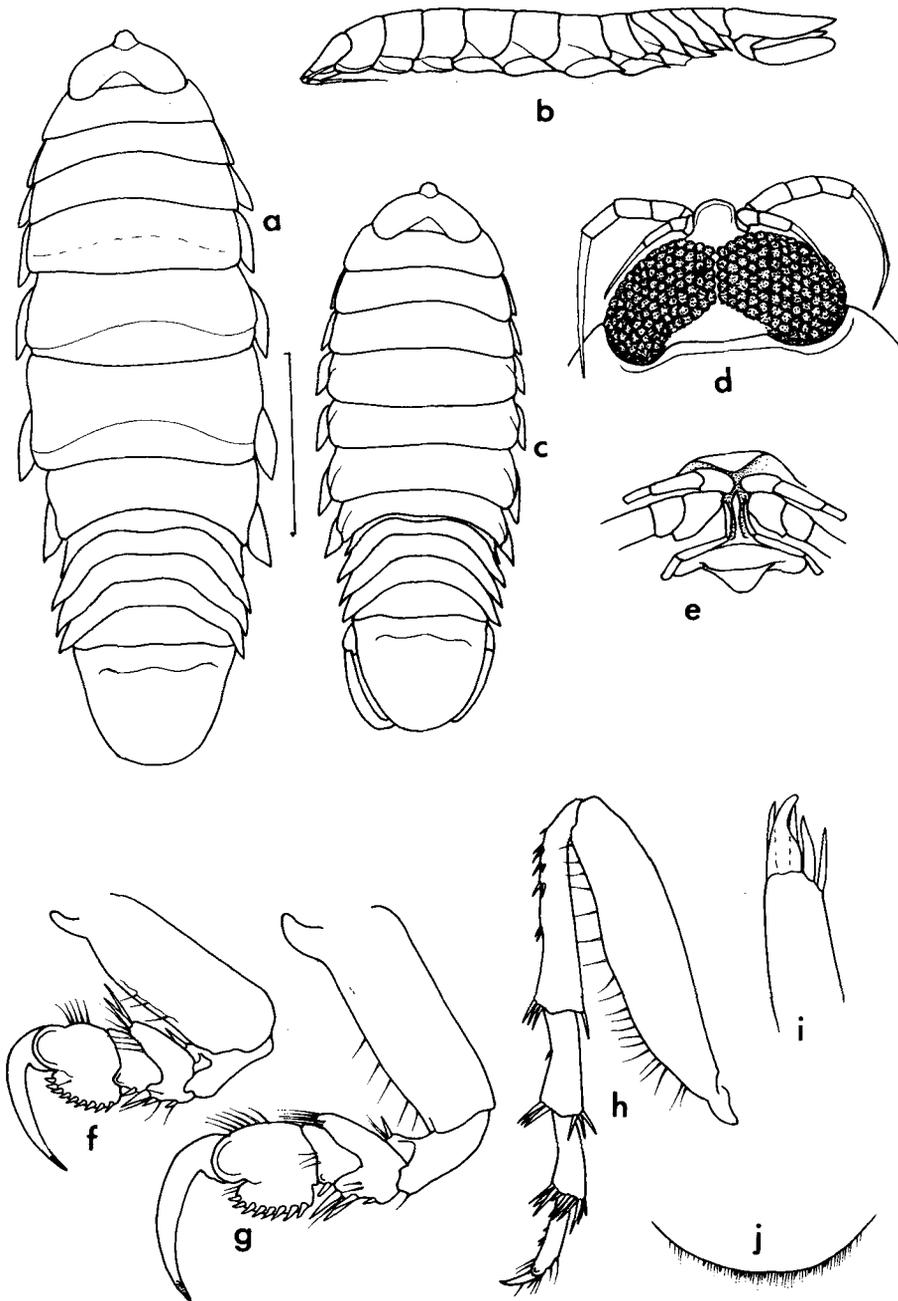


FIG. 15. *Rocinela oculata*. All figs. of ♂ (41 mm) except where indicated. (a) dorsal view; (b) lateral view (♂ 27.7 mm); (c) dorsal view (♂, 27.7 mm); (d) cephalon, dorsal view; (e) clypeal region; (f) pereopod 1; (g) pereopod 2; (h) pereopod 7; (i) maxillule, apex; (j) pleotelson, posterior margin. Scale line represents 10.0 mm.

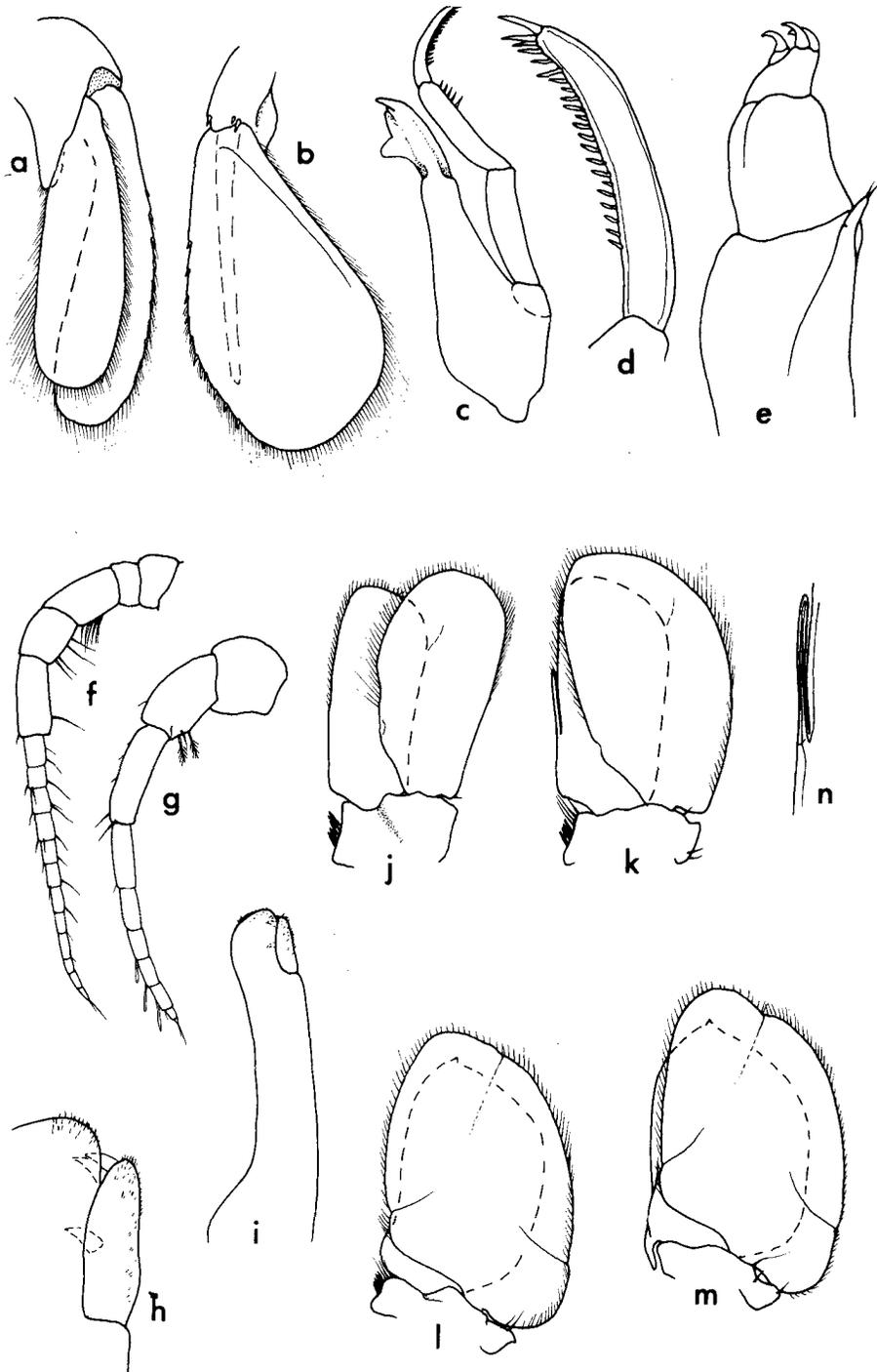


FIG 16. *Rocinela oculata*. All figs. ♂ 41 mm. (a) uropod, dorsal view; (b) uropod, lateral view; (c) mandible; (d) mandibular palp, terminal article; (e) maxilliped; (f) antenna; (g) antennule; (h) maxilla, endite detail; (i) maxilla; (j-m) pleopods 1-3, 5 respectively; (n) appendix masculina.

Description of Australian specimens. Body about 3 times longer than wide. Cephalon with distinct, flat, rostral process, anterior margin of which is shallowly rounded; eyes occupying nearly entire head, except for rostral process, and small triangle at posterior; posterior lateral region of cephalon produced posteriorly; point of juncture of eyes visible as narrow median line. Pereonites 1–3 short, sub-equal in length; pereonite 4–7 long, pereonite 6 being longest; pereonites 4–6 with transverse furrow. Coxae of pereonites 2, 3 and 7 with furrows, 4–6 without; coxae of pereonites 6 and 7 produced beyond posterior of segment. Pleon with posterolateral margin of segments 2–4 produced. Acute lateral margin of pleonite 4 largely encompassing pleonite 5. Pleotelson with posterior 0.75 flat, anterior 0.25 thickened, raised; lateral margins converging smoothly to broadly rounded posterior, provided with 10 small spines set amongst marginal setae.

Antennule peduncle 3-articulate, article 3 very slightly longer than 2; flagellum slightly longer than peduncle composed of 7 articles, which progressively decrease in length. Antenna peduncle 5-articulate, articles 3 and 4 subequal in length, article 5 longest; inferior margin of article 3 and 4 with setae; flagellum composed of 12 articles.

Clypeus narrow, apex slightly swollen, acute. Mandible palp slender, 4-articulate, basal article appearing totally fused to mandible; lateral margin of terminal article provided with row of peg like spines. Maxillule with 1 broad and 4 stout spines. Maxilla distal surfaces covered in microtrichs; endite with 3 hooks. Maxilliped endite small; palp with 3 articles, article 2 with 2 hooked spines, terminal article with single hooked spine.

Pereopod 1 with single spine at anterior distal angle of ischium, 2 spines of posterior distal angle of merus; merus with 3 stout pointed spines on posterior margin, carpus with 1; palm of propodus formed into prominent rounded lobe, bearing 9 spines; dactylus curves abruptly from base. Pereopod 2 similar to pereopod 1, but lacks spines on anterior margin of merus, while those on posterior margin are larger; palm of propodus with 8 spines. Pereopod 7 with setae along anterior margin of basis; spines on distal angles of ischium, merus and carpus; posterior margins of carpus without spines.

Vasa deferentia opening flush with surface of sternite 7.

Pleopods with endopods 3–5 naked; exopods 3–5 with prominent, but incomplete suture; lateral margins of exopods of pleopods 1 and 2 with thin, unkeratinized part. Pleopod 2 appendix masculina inserted sub-medially, thin, about one-third length of ramus.

Uropods extending to apex of pleotelson. Exopod broadly rounded, longer and wider than endopod; lateral margin with 11 spines. Endopod set at right angles to exopod, with continuous marginal setae and single spine. Neither ramus with an obvious apex.

Female: No discernable differences to the male, except lack of appendix masculina.

Development: Smaller specimens (32.1 and 27.7 mm) are proportionally shorter. The difference is caused by the elongation of pereonites 4–7 in the larger specimens. Smaller specimens have fewer spines on the palm of the propodus, the larger specimens with 10, smallest with 8.

Colour: All brown in alcohol.

Size: Largest specimen 51.6 mm.

Remarks: Although these specimens were taken a long way from the type locality,

there seems to be no doubt that they are the same species. Harger's (1883) figures though brief, show good detail, and his description agrees totally with the smaller specimens examined here. Examination of the immature holotype revealed few differences; the shape of the propodial palm of pereopod 2 is more rectangular and has 6 spines, 2 fewer than Australian specimens. Although other aegids, such as *Aega deshayesiana* have wide distributions (Brusca in press), conspecificity of Atlantic and Australian specimens will only be absolutely determined when adult Atlantic material becomes available for examination.

A similar species *Rocinela affinis* has been described from Japan (Richardson 1904) but differs from *R. oculata* in the number of spines on the palm of the anterior pereopods, in the shape of the posterior margin of the cephalon, and in the shape of the pleotelson, which is far more acute in *R. affinis*.

One specimen was recorded as taken from a fish.

Distribution: Harger's specimen was taken off Georgia, U.S.A., at a depth of 453.6 metres. Present material is from off the southeastern Queensland coast, and off the N.S.W. coast from the Clarence River in the north, to Broken Bay in the south, at depths between 450 and 630 metres.

Genus *Alitropus* Milne-Edwards

Alitropus Milne-Edwards, 1840: 245.—Schioedte and Meinert, 1879: 402.—Stebbing, 1911: 180.—Ingle and Fernando, 1964: 105.

Remarks: Ingle and Fernando (1964) reviewed the status of the genus, and concluded that it is valid. It is separated from *Rocinela* by lacking a frontal cephalic projection, and by having the anterior pereopods slender, without a massive propodus. In addition the maxilliped palp has only 3 articles. A feature apparently overlooked by previous workers, is highly reduced coxae on pereonites 5–7 which at once separates *Alitropus* from other aegid genera.

The genus has not previously been recorded from Australia, but is known from India, Sri Lanka, South East Asia and Malaysia (Ingle and Fernando 1964).

Alitropus typus Milne-Edwards (Fig. 17)

Restricted synonymy:

Alitropus typus Ingle and Fernando, 1964: 106, figs. 4.—Pillai, 1967: 280, figs. 7 A–D, P11, figs. 3–4.—Moreira and Sadowsky, 1978: 109.

Material: 2 ♀ (14.2, 19.5 mm), below Wivenhoe Dam, southeastern Queensland, 1981. From *Mugil* sp. (Mugilidae), coll. I. C. Johnston. ♀ (18.0 mm), Elimbah Creek, 5 mls upstream of Pummicestone Passage, southeastern Queensland, 5.v.1982, from polyspecific net haul of Mugilidae, salinity 9‰, coll. E. J. Fields.

Descriptive notes: Frontal lamina minute. Mandible palp longer than mandible. Maxillule with 1 broad and 2 slender terminal spines. Maxilla with 2 hooked spines on endopod, exopod with 1 spine. Maxilliped palp with 3 articles, terminal article with 5 hooked spines.

Pleopod 1 with peduncle nearly as long as wide; rami subequal in length, both with marginal setae. Pleopod 2 with rami subequal in length, pleopods 3–5 with partial suture on exopod.

Remarks: A number of species have been described that have now been synonymized with *A. typus*. Of these, figures of whole specimens are given by Nierstrasz and De Marees van Swinderen (1931), and of most appendages by Chilton

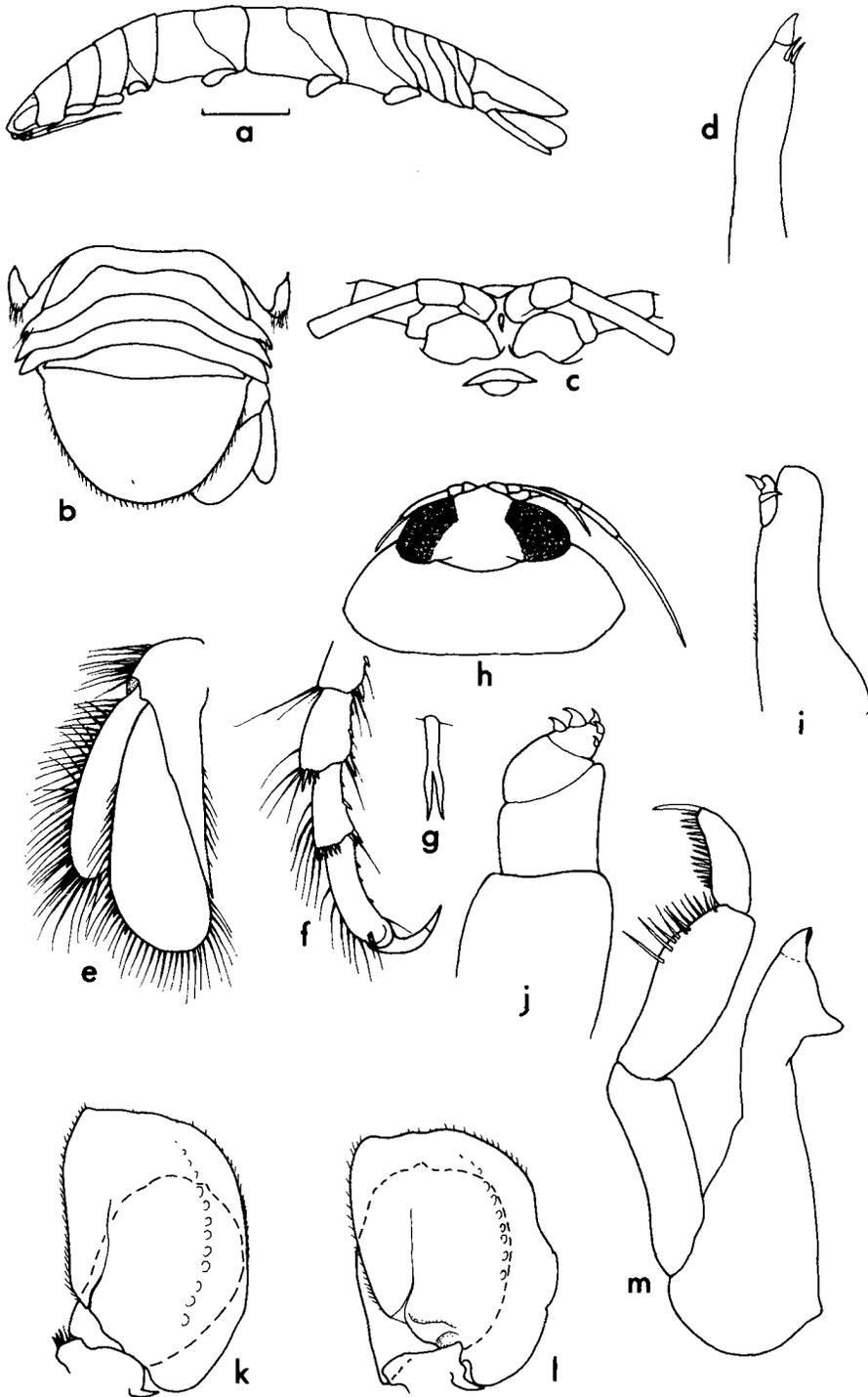


FIG. 17. *Alitropus typus*. (a) lateral view; (b) pleon, pleotelson dorsal view; (c) elypeal region; (d) maxillule; (e) uropod; (f) pereopod 7 distal articles; (g) spine from carpus, pereopod 7; (h) cephalon, pereonite 1; (i) maxilla; (j) maxilliped; (k) pleopod 3; (l) pleopod 5; (m) mandible. Scale line represents 3.0 mm.

(1926) (as *Rocinela simplex*). The mouthparts and pleopods have not been described in detail, and are here figured.

At present only one other flabelliferan isopod is known from Australian freshwater habitats. *Tachaea caridophaga* (Riek 1953) (see Bruce, Brusca and Delaney (1982) for comments on this genus) occurs on freshwater prawns. *Alitropus* is readily distinguished from that species by family characteristics.

Distribution: Widespread, from India Ceylon (Ingle and Fernando 1964) to Thailand (Chilton 1926), Sumatra (Nierstrasz and Marees Van Swinderen 1931), now recorded from eastern Australia. This species has been taken in coastal low salinity habitats both in Australia at Elimbah Creek, (salinity 9‰) and in Thailand (Chilton 1926).

Discussion

The Aegidae is a family fraught with taxonomic and nomenclatural problems. The largest genus *Aega* is plagued by an abundance of named species that have been established with descriptions of a brevity that defies subsequent identification of the species. Of workers publishing this century only Hale (1925, 1926, 1940), Monod (1933) Nierstrasz (1931) and Brusca (in press) can be considered to have given description of Aegidae that were in any way adequate. In most cases, including the more recent works just referred to, the pleopods have not been described, nor the penes, and very often most other appendages were omitted from earlier descriptions. There is consequently a total lack of order within the genera of the family. From the published descriptions of *Aega quadratisinus* and *Aega synopthalma*, those two species could not have been separated from the closely related Australian species described here. *Aega meinerti*, referred to as 'close to *Aega cyclops*' by Miers (1884) when he proposed the species without describing it, is in fact a synonym of *Aega serripes*, a species very different from *A. cyclops*. In treating the species described here, it became apparent that the Aegidae are as rich in morphological characters suitable for species identification as are other isopod families. Brusca (in press) stated that in most cases species within the genus *Aega* are easily separated from one another. This remark should not be taken too literally, as it can be seen from the species treated here, that groups of morphologically similar species do exist. The species *Aega synopthalma*, *A. cyclops*, *A. lethrina* and *A. coroo* are all very similar in general appearance. Similarly *Aega quadratisinus* and *A. beri* are separable by differences of the appendix masculina, penes and pereonal furrowing, and are otherwise effectively identical. Characters useful in species discrimination, and which should in future always be described are details of the eye, clypeus, pereopods (though not always useful), penes, pleopods, uropods and pleotelson. In particular the appendix masculina may give an obvious indication of specific integrity. It should be stressed that recourse to type specimens is the only way by which taxonomic problems within the family will be eventually resolved.

Brusca (in press) largely reviewed the taxonomy of the Aegidae, and split the genus *Aega* into two subgenera, primarily on the basis of antennular morphology. All the species dealt with here except *A. serripes* fall into Brusca's new subgenus *Rhampion*, in which the antennule peduncle is slender. All of these species except two, agree well with Brusca's (in press) diagnosis of *Rhampion*. *Aega lethrina*, which has stout spines on the fifth article of the maxilliped palp, and while possessing a small rostral process, this process does not separate the antennular bases. *Aega coroo* has distinctly hooked spines on the terminal article of the maxilliped palp.

Zoogeography

The most notable range extension is that of *Rocinela oculata*, previously known only from the northwest Atlantic. Its occurrence in Australia is therefore somewhat surprising. *Aega vigilans* is a widespread tropical Indo-Pacific species, having been recorded under a variety of names between East Africa and the Philippines. *Alitropus typus*, a freshwater and low salinity inhabiting species appears to have an Indo-Australian distribution. *Aega serripes* has a southern Australian distribution, and has also been recorded from Japan.

Of the other species *Aega nodosa* has a wide southern Australian distribution, *Aega lethrina* is known from the southern Barrier Reef to Papua New Guinea, while *A. coroo*, *A. beri*, and *A. laevis* are known only from their respective type localities. As there are so few records of aegids from adjacent Indo-Pacific areas, the zoogeographic affinities of the Australian fauna cannot be discussed in any more detail.

Summary

This paper reports new data on Australian aegid isopods of the genera *Aega*, *Rocinela* and, new to Australia, *Alitropus*. *Aega laevis* (Studer) is redescribed. New synonymies reported are *Aega meinerti* (= *A. serripes*), *A. ommatophylax* (= *A. vigilans*) and *A. spongicola* (= *A. nodosa*).

The status of *Aega cyclops* is questioned. The following new species are described: *A. lethrina* sp. nov., *A. coroo* sp. nov., and *A. beri* sp. nov. Descriptive notes and figures are given for *A. quadratisinus* and *A. synopthalma*. *Rocinela oculata* and *Alitropus typus* are recorded for the first time from Australia. Discussion is given on the taxonomy of the family.

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References

- BARNARD, K. H., 1914, Contributions to the crustacean fauna of South Africa. 3. Additions to the marine Isopoda, with notes on some previously incompletely known species, *Annals of the South African Museum*, **10**, 325 a–358 a, 359–442.
- 1936, Isopods collected by R.I.M.S. 'Investigator'.—*Records of the Indian Museum. Calcutta*, **38**, 147–191.
- BRUCE, N. L., 1981, Cirolanidae (Crustacea: Isopoda) of Australia: Diagnoses of *Cirolana* Leach, *Metacirolana* Nierstrasz, *Neocirolana* Hale, *Anopsilana* Paulian and *Debouteville*, and three new genera, *Natatolana*, *Politolana* and *Cartetolana*, *Australian Journal of Marine and Freshwater Research*, **32**, 945–966.
- 1982, Species of *Argathona* Stebbing, 1905 (Crustacea, Isopoda, Corallanidae) new to Australia, with description of two new species. *Crustaceana*, **42**, 12–25.
- BRUCE, N. L., BRUSCA, R. C., and DELANEY, P. M., 1982, The status of the isopod families Corallanidae Hansen, 1890, and Excorallanidae Stebbing, 1904 (Flabellifera), *Journal of Crustacean Biology*, **2**, 464–468.
- BRUSCA, R. C., 1980, *Common intertidal invertebrates of the Gulf of California*. 2nd Edn, Tucson: University of Arizona Press, 513 pp.

- in press, A monograph on the isopod family Aegidae in the tropical eastern Pacific. I. The genus *Aega*. *Occasional papers of the Allan Hancock Foundation*.
- CARCASSON, R. H., 1977, *A Field Guide to the Coral Reef Fishes of the Indian and West Pacific Oceans*. London: Collins, 320 pp.
- CHILTON, C., 1926, The Tanaidacea and Isopoda of Tale Sap (Siam). *Records of the Indian Museum, Calcutta*, **28**, 173–185.
- COLEMAN, N., 1977, *A Field Guide to Australian Marine Life*. Sydney: Rigby, 233 pp.
- 1981, *Australian Sea Fishes North of 30°S*, Sydney and Auckland: Doubleday, 297 pp.
- ELLIS, J., 1981, Some type specimens of Isopoda (Flabellifera) in the British Museum (Natural History) and the isopods in the Linnaean Collection, *Bulletin of the British Museum (Natural History)*, *Zoology*, **40**, 121–128.
- HALE, H. M., 1925, Review of Australian isopods of the cymothoid group. Part 1, *Transactions of the Royal Society of South Australia*, **49**, 128–185.
- 1926, Review of Australian isopods of the cymothoid group Part 2. *Transactions of the Royal Society of South Australia*, **50**, 201–234.
- 1929, The crustaceans of South Australia. Part 2, *Handbook of the Flora and Fauna of South Australia*. Adelaide, British Science Guild, pp. 202–380.
- 1933, Tanaidacea and Isopoda collected by the Great Barrier Reef Expedition, *Annals and Magazine of Natural History, series 10*, **11**, 557–561.
- 1937, Isopoda and Tanaidacea. In: *Australian Antarctic Expedition, 1911–14, Scientific Reports series C2 (2)*, 1–45.
- 1940, Report on the cymothoid Isopoda obtained by the F.I.S. 'Endeavour' on the coasts of Queensland, New South Wales, Victoria, Tasmania and South Australia, *Transactions of the Royal Society of South Australia*, **64**, 288–304.
- 1952, Isopoda, Families Cymothoidae and Serolidae. In: *British, Australian and New Zealand Antarctic Research Expedition, Reports, series B*, **6(2)**: 21–36.
- HANSEN, H. J., 1890, Cirolanidae et familiae nonnullae propinquaе Musei Hauniensis. *Kongeligt Videnskabernes Selskab Skrifter*, 6. Raekke. *Naturvidenskabelig og Mathematisk Afdeling*, **5**, 237–426.
- HARGER, O., 1883, Reports on the results of dredging, under the supervision of Alexander Agassiz, on the East Coast of the United States, during the summer of 1880, by the U.S. Coast Survey Steamer 'Blake', Commander J. R. Bartlett, U.S.N., commanding, *Bulletin of the Museum of Comparative Zoology, Harvard*, **11**, 91–104.
- HASWELL, W. A., 1881, On some new Australian marine Isopoda. Part I, *Proceedings of the Linnaean Society of New South Wales*, **5**, 470–481.
- 1882 a, On some new Australian marine Isopoda, Part II, *Proceedings of the Linnaean Society of New South Wales*, **6**, 181–196.
- 1882 b, *Catalogue of the Australian Stalk- and Sessile-eyed Crustacea*, The Australian Museum, Sydney, i–xxiv, 324 pp.
- INGLE, R. W., and FERNANDO, C. H., 1964, On some fresh and brackish water crustaceans from Ceylon, *Crustaceana*, **6**, 104–109.
- KENSLEY, B., 1978, *Guide to the Marine Isopods of Southern Africa*, Cape Town: South African Museum, 173 pp.
- KUSSAKIN, O. G., 1979, Marine and Brackish Water Isopod Crustacea. Suborder Flabellifera. *Academy of Science, Leningrad*, 470 pp. (In Russian).
- LEACH, W. E., 1815, A tabular view of the external characters of four classes of animals which Linne arranged under the Insecta; with the distribution of the genera composing three of these classes into orders, etc. and descriptions of several new genera and species, *Transactions of the Linnaean Society of London*, **11**, 306–400.
- 1818, Cymothoadeés. In Cuvier, F. (Editor), *Dictionnaire des Sciences Naturelles. Paris and Strasbourg*, **12**, 338–354.
- LINNAEUS, C., von, 1758, *Systeme Naturale*, 10th Edition, 1. Holmiae.
- MENZIES, R. J., 1962, Zoogeography, ecology, and systematics of Chilean marine isopods. Reports of the Lund University Expedition 1948–49, 42. *Lunds Universitets Arskrift*, (n. ser) **(2)** 57 (ii), 1–162.
- MENZIES, R. J., and GEORGE, R. Y., 1972, Isopoda Crustacea of the Peru-Chile Trench, *Anton Bruun Report*, **9**, 1–124.

- MENZIES, R. J., and GLYNN, P. W., 1968, The common marine isopod Crustacea of Puerto Rico. A handbook for marine biologists. *Uitgaven Natuurwetenschappelijke Studiekring voor Suriname en de Nederlandse Antillen*, **51**, 1–133.
- MIERS, E. J., 1875, Descriptions of three additional species of Crustacea from Kerguelen's Land and Crozet Island, with remark upon the genus *Paramoera*. *Annals and Magazine of Natural History, series 4*, **16**, 115–118.
- 1881, Crustacea, In: Günther, Alteil. Account of the zoological collections made during the survey of H.M.S. 'Alert' in the Straits of Magellan and the coast of Patagonia. *Proceedings of the Zoological Society of London*, (1881), 61–80.
- 1884, Crustacea, In: Report of the zoological collections made in the Indo-Pacific Ocean during the voyage of the H.M.S. 'Alert', 1881–1882, *British Museum (Natural History) London*, pp. 178–322.
- MILNE-EDWARDS, A., 1840, *Histoire Naturelle des Crustacés*. 3. Paris: Roret, 638 pp.
- MONOD, T., 1933, Sur trois Crustacés isopodes marins de la région Guyane-Amazone, *Cahiers O.R.S.T.O.M., series Oceanographique*, **7**, 47–68.
- MOREIRA, P. S., and SADOWSKY, V., 1978, An annotated bibliography of parasitic Isopoda (Crustacea) of Chondrichthyes, *Boletim do Instituto Oceanografico, Sao Paulo*, **27**, 95–152.
- NIERSTRASZ, H. F., 1930, Isopoda (excl. Oniscoidea et Epicaridea). In: Resultats scientifiques du voyage aux Index Orientales Neerlandaises de le Aa. Rr. Le Prince et la Princesse Leopold de Belgique. *Memoires du Musée Royal d'Histoire Naturelle de Belgique*, **3**, 1–17.
- 1931, Die isopoden der Siboga-Expedition. 3 Isopoda Genuina. 2. Flabellifera. *Siboga Expeditie*, **32 c**, 123–233.
- NIERSTRASZ, H. F., and DE MAREES VAN SWINDEREN, J. W., 1931, Süßwasser-Isopoden der Deutschen Limnologischen Sund-Expedition. *Tropische Binnengewässer (Archiv für Hydrobiologie) Suppl. Bd.* **9**, 394–402.
- NORDENSTAM, A., 1930, Tanaidacea and marine Isopoda from Juan Fernandez. In, *The Natural History of Juan Fernandez and Easter Island, C. Skottsberg*, **3**, 325–552.
- PILLAI, N. K., 1967, Littoral and parasitic isopods from Kerala. Families Eurydicidae. Corallanidae and Aegidae. 2, *Journal of the Bombay Natural History Society*, **64**, 267–283.
- RICHARDSON, H., 1898, Description of four new species of *Rocinela*, with a synopsis of the genus, *Proceedings of the American Philosophical Society*, **37**, 8–17.
- 1901, Key to the isopods of the Atlantic coast of North America, with descriptions of new and little known species, *Proceedings of the United States National Museum*, **23**, 493–597.
- 1903, Isopods collected at the Hawaiian Islands by the U.S. Fish Commission Steamer 'Albatross', *Bulletin of the United States Fish Commission for 1903*, **23**, 817–826. (Published 1906, as a volume).
- 1904, Contributions to the natural history of the Isopoda VI. Isopods collected at the Hawaiian Islands by the U.S. Fish Commission Steamer 'Albatross'. *Proceedings of the United States National Museum*, **27**, 671–000.
- 1905, A monograph on the isopods of North America. *Bulletin of the United States National Museum*, **54**, 1–727.
- 1909, Isopods collected in the northwest Pacific by the U.S. Bureau of Fisheries Steamer 'Albatross' in 1906. *Proceedings of the United States National Museum*, **37**, 75–129.
- 1910, Marine isopods collected in the Philippines by the U.S. Fisheries Steamer 'Albatross' in 1907–1908. *United States Bureau of Fisheries Document No. 736*, 1–44.
- RIEK, E. F., 1953, A corallanid isopod parasitic on freshwater prawns in Queensland. *Proceedings of the Linnaean Society of New South Wales*, **77**, 259–261.
- SARS, G. O., 1899, *Crustacea of Norway. Vol. 2. Isopoda*. Copenhagen and Bergen, 264 pp.
- SCHIOEDTE, J. C., and MEINERT, 1879, Symbolae ad monographium cymothoarum crustaceorum isopodum familiae. *Naturhistorisk Tidsskrift Ser. 3*, **12**, 321–414.
- SCHULTZ, G. A., 1969, *How to know the Marine Isopod Crustaceans*, Dubuque, Iowa: Wm. C. Brown Co., 359 pp.
- STEBBING, T. R. R., 1905, Report on the Isopoda collected by Professor Herdman, at Ceylon, in 1902. In: *Report to the Government of Ceylon on the pearl oyster fisheries in the Gulf of Manaar*. Editor W. A. Herdman, **4**, suppl. rep. **23**, 1–64.

- 1910, No. VI, Isopoda from the Indian Ocean and British East Africa. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr. J. Stanley Gardiner. Vol. III. *Transactions of the Linnean Society of London, Zoology*, **14**, 83–122.
- 1911, Indian isopods. *Records of the Indian Museum, Calcutta*, **6**, 179–191.
- STEPHENSON, A. B., 1980, *Aega angustata* Whitelegge, 1901 (Isopoda: Aegidae), a new record for New Zealand Waters, *Records of the Auckland Institute Museum*, **17**, 153–155.
- STUDER, T., 1883, Isopoden, gesammelt während der Reise S.M.S. Gazelle um die Erde 1874–76, *Abhandlungen Klasse Preuss der Akademie der Wissenschaften, Berlin* (**1883**), 1–28.
- THIELEMANN, M., 1910, Beiträge zur Kenntnis der Isopoden fauna Ostasiens. *Abhandlungen der mathematisch-physikalischen Klasse der königlich Bayerische Akademie der Wissenschaften, supplementary volume*, **2**, 1–109.
- THOMPSON, G. M., 1892, Notes on Tasmanian Crustacea, with descriptions of new species, *Papers and Proceedings of the Royal Society of Tasmania, Article* **6**, 45–76.