

***Aega sheni*, a new species of Aegidae (Crustacea: Isopoda: Cymothoidea) from southern China and Australia**

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Abstract

Aega sheni sp. nov. from Chinese and Australian waters, is described and figured. This species is characterized by the plate-like expansion of antennule peduncle articles 1 and 2, very large eyes (nearly making contact), numerous robust setae on the inferior margins of the ischium of pereopods 2 and 3, large distal lobe on the propodus of pereopods 1–3, shape and setation of the uropods, and the rounded pleotelson posterior margin. *Aega sheni* has been recorded at depths of 300–435 metres.

Key words: Isopoda, Aegidae, *Aega*, South China Sea, Coral Sea, China, Australia, Pacific Ocean, Indian Ocean

Introduction

The family Aegidae is relatively diverse compared to many other isopod families, containing approximately 138 species at present, and has a world-wide distribution (Kensley *et al.* 2006). While the family is reasonably well known in the Pacific (e.g. Bruce 1983, 1996, 1997, 2004, 2005; Brusca 1983; Brusca & France 1992) there are very few records from the northwestern Pacific other than those of Richardson (1910), reporting primarily on the region around the Philippines, and those from the Japanese literature (summarized by Saito *et al.* 2000).

The marine isopod fauna of Chinese waters is particularly poorly known, with correspondingly few records of Aegidae. Four aegid species have been identified from the collections in the Institute of Oceanology, Chinese Academy of Sciences but these records require verification. The greater region of the northwestern Pacific has numerous species, many of which could also be expected to occur in Chinese waters.

This contribution reports on a new species of *Aega* from the Pacific and Indian Oceans, with a distribution that ranges from the vicinity of the subtropical island of Hainan to tropical waters of eastern and western Australia.

Types are deposited in the Institute of Oceanology, Chinese Academy of Sciences (IOCAS); additional specimens are held at the Queensland Museum, Australia (QM), National Institute of Water and Atmospheric Research, New Zealand (NIWA), and the Museums and Art Gallery of the Northern Territory, Darwin, Australia (NTM).

Methods

Specimens were examined and drawn with a dissection microscope (Zeiss Stemi SVII Apo). Whole body length was measured in dorsal view using a micrometer eyepiece, from the anterior margin of head to the posterior of pleotelson; measurements of appendages were recorded with the software Axiovision 4.1. The species description was prepared using a DELTA (Descriptive Language for Taxonomy: Dallwitz *et al.* 1997) character set.

Abbreviation: RS—robust setae.

Taxonomy

Suborder Cymothoida Wägele, 1989

Family Aegidae White, 1850

Genus *Aega* Leach, 1815

Brusca (1983) and Kensley & Schotte (1989) have given diagnoses to the genus, and generic-level characters have been omitted from the description. Brusca (1983) erected two subgenera, the nominate subgenus and *Ramphion* Brusca, 1983. Bruce (2004) suggested that as the status and differentiation of subgenera were ambiguous, few subsequent authors have applied these subgeneric names. The species described here is not placed in either of the subgenera.

Aega sheni sp. nov.

(Figures 1–3)

Material examined

Holotype: ♂ (28 mm), 8 Jan 1960, northern South China Sea, 19°00'N, 112°50'E, sandy bottom, 300 m, coll. Shen Shoupeng (IOCAS K122B-64).

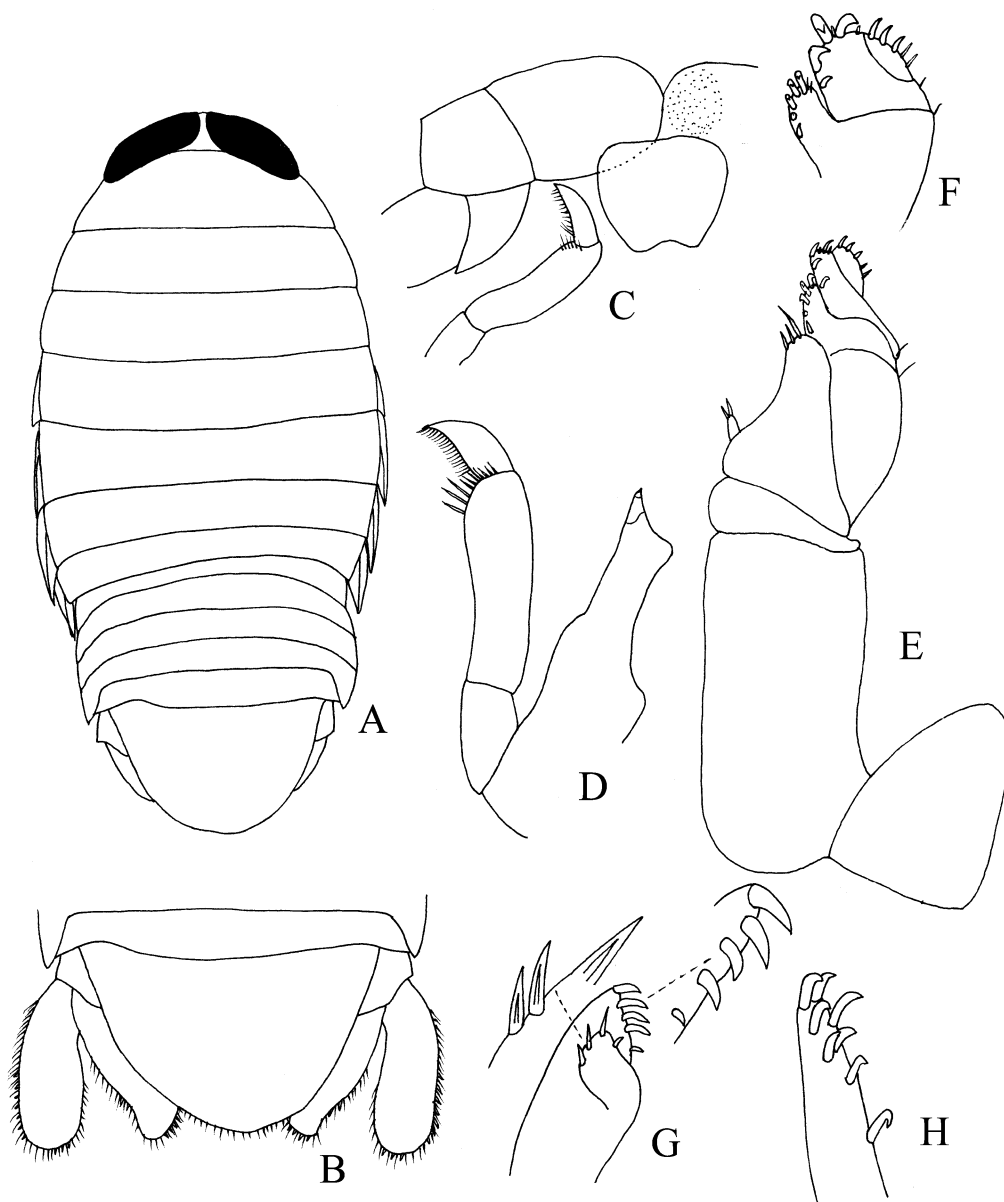


FIGURE 1. *Aega sheni* sp. nov. Holotype. A, body, dorsal view; B, pleotelson, dorsal view; C, frontal lamina, ventral view; D, mandible; E, maxilliped; F, maxilliped palp articles 3–5; G, maxilla; H, maxillule. Scale 5.8 mm.

Paratypes: 2 manca (15 mm, 14 mm), data as for holotype (IOCAS K122B-64B).

Additional material: **Indian Ocean**, Australia, Western Australia. ♀ (non-ovig. 42 mm), Rowley Shoals, 17°12.5'S, 119°18.0'E, 5 Nov 1985, 435 m, coll. W. Houston on KJV Fisheries *Comac Endeavour* (NTM Cr.003436). **Pacific Ocean**, Australia, Queensland. ♂ (29 mm), east of Rockhampton, 23°59'S, 152°59'E, 380 m, coll.

Queensland Fisheries Service on MV *Southern Intruder* (QM W18824). ♀ (ovig. 40 mm), east of Rockhampton, 23°21'S, 152°23'E, 30 Nov 1983, 410 m, MV *Southern Intruder* (QM W11323). ♀ (non-ovig. 41 mm), east of Townsville, 17°31'S, 149°40'E, 400 m (QM W14267). ♀ (28 mm), east of Mackay, 22°41.2'S, 154°05.7'E, 17 Nov 1985, 416–419 m, coll. *Soela* 0685-5 (NIWA 22834).

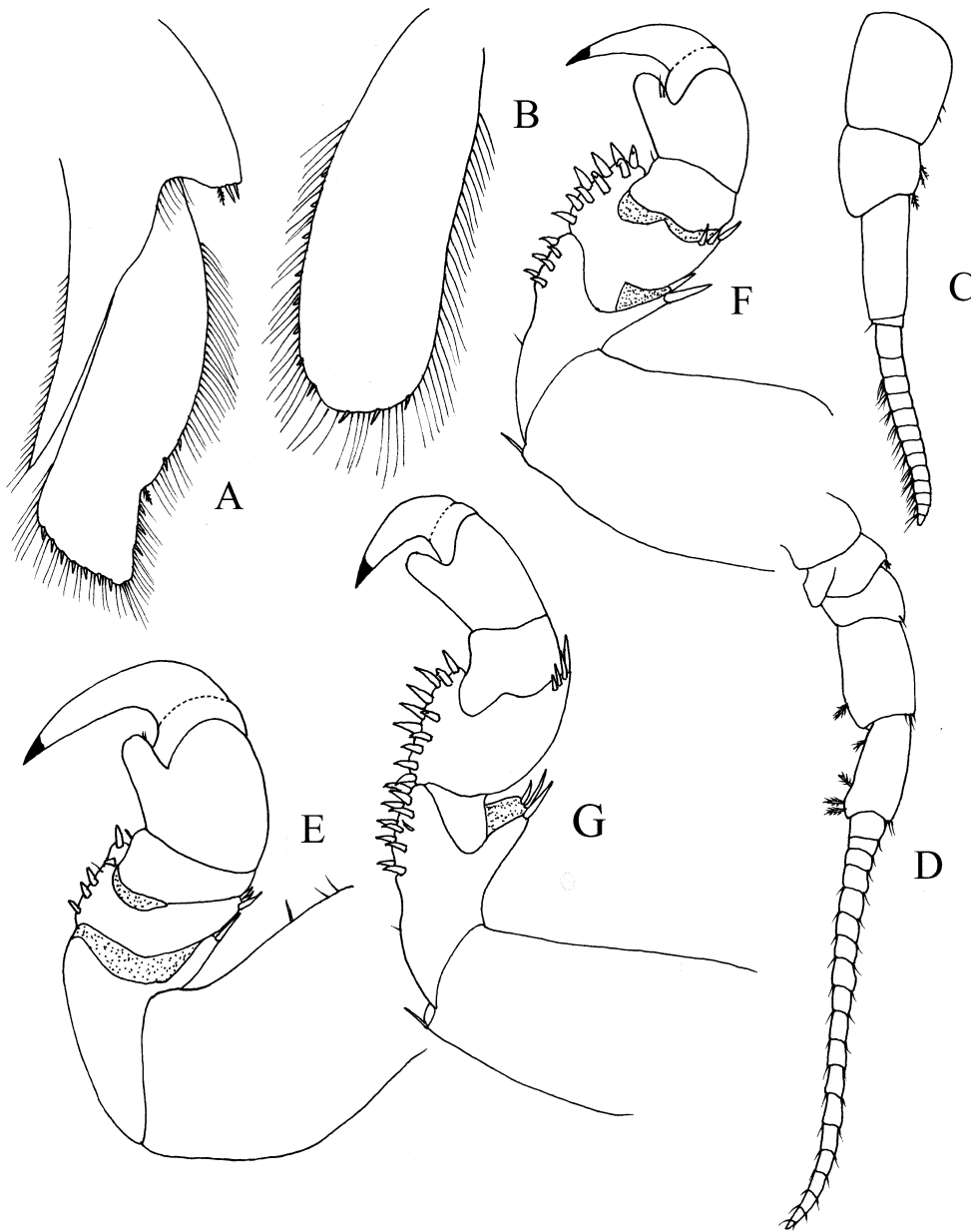


FIGURE 2. *Aega sheni* sp. nov. Holotype. A, uropod endopod; B, uropod exopod; C, antennule; D, antenna; E, pereopod 1; F, pereopod 2; G, pereopod 3.

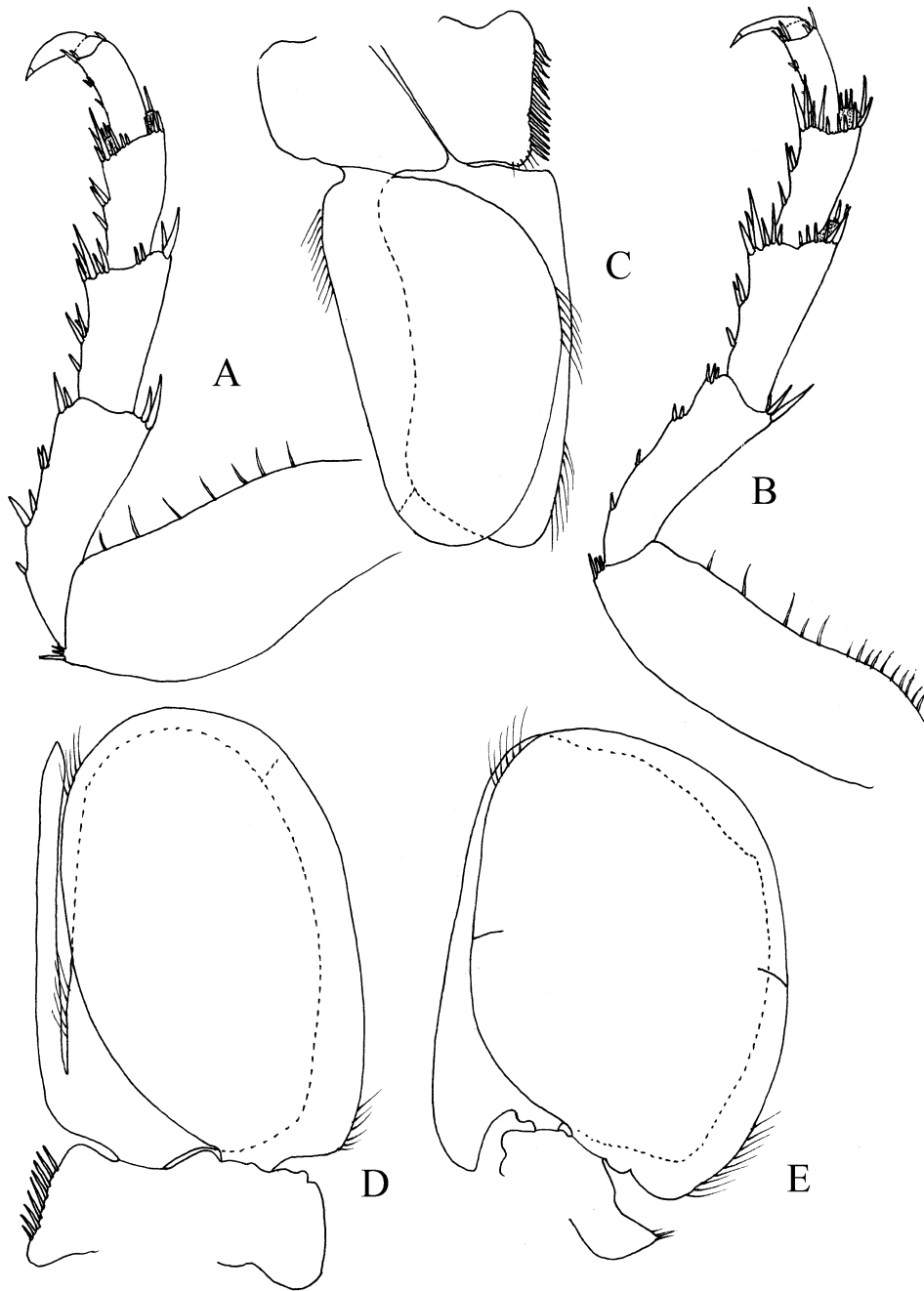


FIGURE 3. *Aega sheni* sp. nov. Holotype. A, pereopod 6; B pereopod 7; C–E, pleopods 1; 2 and 5 respectively.

Description of male holotype

Body twice as long as greatest width, dorsal surface smooth, widest at pereonite 5. Rostral point projecting anteriorly, not ventrally folded. Eyes large, not medially united,

separated by about 2% width of head; each eye made up of 29 transverse rows of ommatidia, each row with 18 ommatidia, eye colour brown. *Pereonite* 1 and coxae 2–3 each with posteroventral angle rounded; coxae 5–7 with entire oblique carina. Pleonite 1 partly covered by pereonite 7, pleonites 2–4 subequal in length and width, pleonite 4 with posterolateral margins extending clearly beyond posterior margin of pleonite 5. *Pleotelson* 0.7 times as long as anterior width, dorsal surface without longitudinal carina, lateral margins convex, smooth, posterior margin rounded, with fine marginal setae.

Frontal lamina flat, as long as wide, lateral margins converging posteriorly, anterior margin rounded (with minute median indentation), without small median point, posterior margin not abutting clypeus.

Mandible without molar process, palp article 2 with 13 distolateral setae, palp article 3 with 22 setae. *Maxillule* with 8 terminal RS (falcate). *Maxilla* mesial lobe with 5 curved RS, lateral lobe with 3 straight, acute RS and 1 small setae. *Maxilliped* endite with 2 slender apical setae; palp article 2 with 3 straight RS; article 3 with 5 curved robust and 2 straight RS; article 4 with 4 curved RS and 2 straight setae; article 5 with 3 curved robust and 2 straight RS.

Antennule peduncle articles 1 and 2 subequal in width; article 1 slightly longer than wide, article 2 slightly wider than long, without anterodistal lobe, articles 3 and 4 0.7 times as long as combined lengths of articles 1 and 2; flagellum with 13 articles, not extending to posterior margin of cephalon. *Antenna* peduncle article 2 inferior surface with distinct groove; article 4 1.7 times as long as wide, about 0.9 times as long as combined lengths of articles 1–3, with longitudinal groove, inferior margin with 1 plumose seta; article 5 not markedly flatter than article 4, twice as long as wide, inferior margin with 4 plumose setae, anterodistal angle with cluster of 3 simple setae; flagellum with 19 articles, extending to middle of pereonite 2.

Pereopod 1 basis 1.5 times as long as greatest width; ischium 0.8 times as long as basis, inferior margin without RS, superior distal margin with 3 acute RS and 1 slender seta; merus inferior margin with 1 slender seta and 5 RS, set as 2 groups (of 3 and 2), superior distal margin with 3 RS; carpus inferior margin with 1 slender seta; propodal palm with large distal lobe; dactylus smooth curved, 1.2 times as long as propodus. *Pereopod 2* ischium inferior margin with 6 RS, set as 2 rows (of 3 and 3), superior distal margin with 3 RS; merus inferior margin with 9 RS, set as 2 rows (of 5 and 4), superior distal margin with 4 RS; carpus similar in size to that of pereopod 1, inferior margin with 1 slender seta; propodus with large distal lobe. *Pereopod 3* similar to pereopod 2; ischium inferior margin with 10 RS, set as 2 rows (of 5 and 5), superior distal margin with 3 RS; merus inferior margin with 11 RS, set as 2 rows (of 5 and 6), superior distal margin with 4 RS, propodus with large distal lobe. *Pereopod 6* similar to pereopod 7. *Pereopod 7* basis 3 times as long as greatest width, inferior margin with 14 palmate setae (or more); ischium inferior margin with 4 RS (set as 1, 1 and 2), superior distal angle with 2 RS, inferior distal angle with 4 RS; merus 0.8 times as long as ischium, 3.1 as long as wide, inferior margin

with 4 RS (set as 1 and 3), superior distal angle with 8 RS; propodus 0.4 times as long as ischium, 3.2 times as long as wide, inferior margin angle with 3 RS (set as 1 and 2), superior distal angle with 2 small RS and 1 slender seta, inferior distal angle with 3 RS.

Penes opening flush with surface of sternite 7; penial openings separated by 10% of sternal width.

Pleopods 1–5 exopods each with distolateral margin not deeply serrate; endopods 3–5 each with mediiodistal point, 5 without plumose marginal setae. *Pleopod 1* exopod twice as long as wide, distally narrowly rounded, lateral margin straight, mesial margin convex, with plumose marginal setae from distal one-third; endopod 2.2 times as long as wide, distally subtruncate, lateral margin concave, with plumose marginal setae from on distal angle only, mesial margin with plumose marginal setae, peduncle 1.7 times as wide as long, mesial margin with 14 coupling hooks. *Pleopod 2 appendix masculina* with straight margins, subequal to the length of endopod, apex narrowly rounded.

Uropod peduncle ventrolateral margin with 2 RS and 1 plumose seta, posterior lobe about 0.8 times as long as endopod. Rami not coplanar, exopod at angle of about 135° to endopod; slightly extending beyond pleotelson, marginal setae in single tier, apices narrowly or broadly rounded (endopod narrow, exopod broad). *Endopod* lateral margin proximally convex, with prominent excision positioned about three-quarters along ramus, proximal lateral margin with 2 RS, distal lateral margin with 3 RS. *Exopod* extending beyond end of endopod, 2.5 times as long as greatest width; lateral margin weakly convex, with 7 RS; mesial marginal convex, with 3 RS.

Female. Similar to males except for primary sexual characters.

Variation. Australian specimens pleotelson inconsistent, one specimen with 2 RS remainder without, though all with the apex rubbed; the shape of the margin varies slightly, with the largest female (QM W11323) and the Chinese specimen (holotype) being more evenly rounded, the remainder with gently angled margins and a distinct apex. Uropod exopod ($n = 8$) mesial margin with 1–5 RS, with 4 most frequent (50%); lateral margin 8–10 RS, 8 (38%) or 9 (38%) most frequent; uropod endopod ($n = 10$) mesial margin 4–6 RS with 5 (50%) or 6 (30%) most frequent, lateral margin with 1+2 RS (70%), with one specimen with 0+3 and one ramus with 1+1.

Pereopods 1 and 2 merus with 3+2 RS (80%), 5+4 RS (80%) respectively; merus of pereopod 3 with 9–12 total, arranged as 7+3, 6+4, with 10 (50%) most frequent. The robust seta on the merus inferior margin form an irregular double row, the position of the robust setae being slightly variable.

The eyes are large, usually clearly separated by more than the width of an ommatidium; in one specimen the eyes were separated at one point by less than the width of an ommatidium.

Size

Males 28–29 mm; non-ovigerous females 28–42 mm; ovigerous female 40 mm.

Remarks

The characters by which *A. sheni* sp. nov. is most readily identified are the very large eyes (nearly making contact), the dense setation of the ischium of pereopods 2 and 3, the large lobes on the propodus of pereopods 1–3 and the shape and setation of the uropods and pleotelson. This species is similar to the northern Pacific species *Aega maxima* Hansen, 1897 and also to *A. acuminata* Hansen, 1897. *Aega maxima* lacks a distinct lobe on propodus of pereopods 1–3 and *A. acuminata* has the pleotelson posterior margin strongly acuminate. Both *A. maxima* and *A. acuminata* have the eyes more widely separated than *A. sheni*.

Examination of extensive collections of Aegidae from New Zealand and New Caledonia by NLB did not yield further specimens of *A. sheni*, possibly the species is restricted to continental margins within its overall range.

Host

Not known.

Distribution

Western Pacific Ocean—northern South China Sea to the Coral Sea, Australia; eastern Indian Ocean—off tropical Western Australia. At depths of 300 to 435 m.

Etymology

Named in honour of noted Chinese carcinologist, Professor Shen Jiarui (C. J. Shen).

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References

Bruce, N.L. (1983) Aegidae (Isopoda: Crustacea) from Australia with descriptions of three new species. *Journal of Natural History*, 17, 757–788.

- Bruce, N.L. (1996) *Aega komai*, a new species of marine isopod crustacean (Aegidae: Flabellifera) from Japan. *Crustacean Research*, 25, 129–136.
- Bruce, N.L. (1997) A new species of *Syscenus* Harger, 1880 (Crustacea: Isopoda: Aegidae) from eastern Australia with a revised diagnosis to the genus. *Records of the Australian Museum*, 49, 113–120.
- Bruce, N.L. (2004) Reassessment of the isopod crustacean *Aega deshaysiana* (Milne Edwards, 1840) (Cymothoidea: Aegidae) — a world-wide complex of 21 species. *Zoological Journal of the Linnean Society*, 142(2), 135–232.
- Bruce, N.L. (2005) Two new species of the mesopelagic isopod genus *Syscenus* Harger, 1880 (Crustacea: Isopoda: Aegidae) from the southwestern Pacific. *Zootaxa*, 1070, 31–42.
- Brusca, R.C. (1983) A monograph on the isopod family Aegidae in the tropical eastern Pacific. The genus *Aega*. *Allan Hancock Monographs in Marine Biology*, 12, 1–39.
- Brusca, R.C. & France, S.C. (1992) The genus *Rocinela* (Crustacea: Isopoda: Aegidae) in the tropical eastern Pacific. *Zoological Journal of the Linnean Society*, 106, 231–275.
- Dallwitz, M.J., Paine, T.A. & Zurcher, E.J. (1997) *User's guide to the DELTA system. A general system for processing taxonomic descriptions*. 4.08, CSIRO Division of Entomology, Canberra, 1–160 pp.
- Hansen, H.J. (1897) Reports on the dredging operations off the west coast of Central America to the Galapagos, to the west coast of Mexico, and in the Gulf of California, in charge of Alexander Agassiz, carried on by the U.S. Fish Commission Steamer "Albatross", during 1891, Lieut-Commander Z.L. Tanner, U.S.N., commanding. XXII. The Isopoda. *Bulletin of the Museum of Comparative Zoology at Harvard College*, 31(5), 93–129.
- Kensley, B. & Schotte, M. (1989) *Guide to the Marine Isopod Crustaceans of the Caribbean*. Smithsonian Institution Press, Washington, D.C. & London, 308 pp.
- Kensley, B., Schotte, M. & Schilling, S. (2006) World list of marine, freshwater and terrestrial isopod crustaceans. Smithsonian Institution, Washington, DC, USA. Available from <http://www.nmnh.si.edu/iz/isopod/> (accessed 7 April, 2006).
- Richardson, H. (1910) Marine isopods collected in the Philippines by the U.S. Fisheries steamer Albatross in 1907–08. *Bureau of Fisheries Document*, 736, 1–44.
- Saito, N., Itani, G. & Nunomura, N. (2000) A preliminary check list of isopod crustaceans in Japan. *Bulletin of the Toyama Science Museum*, 23(3), 11–107.

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