

SIX BOPYRID SHRIMP PARASITES (ISOPODA, EPICARIDEA)
NEW TO THE AUSTRALIAN FAUNA

BY

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INTRODUCTION

Until recently the epicaridean fauna known from Australia consisted of only a single species of branchial bopyrid parasitizing the Natantia Caridea, *Bopyrina miyakei* Shiino, found on a pontoniine shrimp *Conchodytes meleagrinae* Peters from Bathurst Island, Northern Territory (Shiino, 1942). But since then, Bourdon (1980) has reported upon three species of *Bopyrella* parasitizing alpheid shrimps, *B. elongata* Shiino, *B. barnardi australiensis* Bourdon and *B. indica* Chopra; and the present authors (Bourdon & Bruce, 1983) described *Probynia obstipa* on the pontoniine shrimp *Periclimenaeus hecate* Nobili and *Typton wasini* Bruce.

Through the kindness of Dr. J. K. Lowry we have been able to examine the unidentified bopyrids from caridean shrimps in the collections of the Australian Museum, to which have been added further collections made by one of us (A.J.B.). This note refers to six of these species. The specimens are deposited in the collections of the Australian Museum (AM) and Northern Territory Museum (NTM).

***Bopyrella essingtoni* sp. nov.** (figs. 1-2)

Material. — 1 holotype, 1 ♂ allotype, Stn. CP/13, Coral Bay, Port Essington, Cobourg Peninsula, Northern Territory, Australia, 11°11.3'S 132°3.75'E, intertidal, 20 July 1981, coll. A. J. Bruce, NTM Cr. 00067 (a and b respectively).

Description. — Female. Cephalon almost entirely recessed in first thoracic segment and completely fused with it; anterior border regularly convex, without digitation or lateral notch. Eyes absent. Antennules separated, with three segments; antennae same size, apparently two-segmented. Maxillipeds with a rounded palp, ornamented with 17 setae. Posteroventral border with two pairs of smooth lamellae, external larger than internal; median portion straight.

Pereion with segments II-VII distinctly separated throughout length. Lateral bosses I-IV feebly visible, mainly on deformed side. Coxal plates very narrow on same somites. Lateral border of last three thoracomeres entire and sinuous. Marsupium open. First oostegite with anterior border feebly concave, posterior border ending in a large straight lobe, ciliated on the internal border; ventral crest with four proximal tubercles and a rounded lamella distally. Other marsupial plates of increasing length, with the second and third pairs

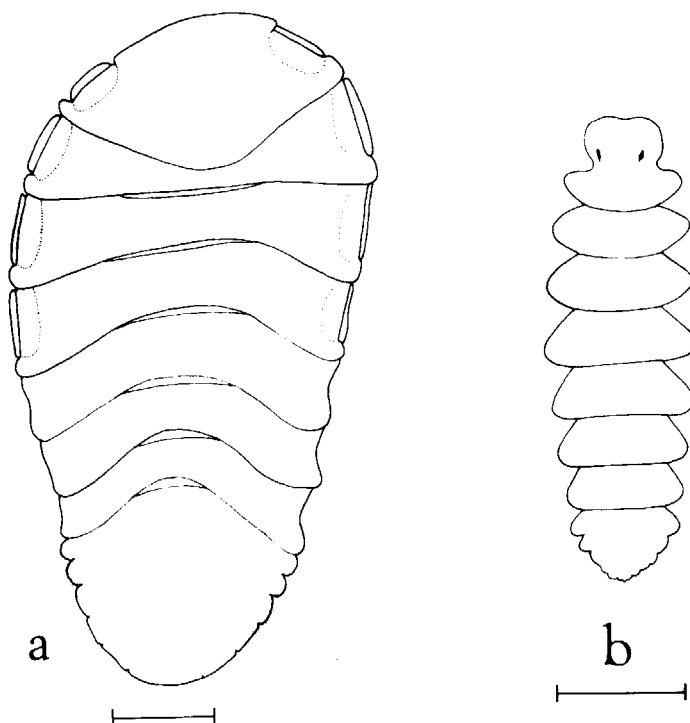


Fig. 1. *Bopyrella essingtoni* sp. nov., Port Essington, Northern Territory, Australia. a, holotype female, dorsal; b, allotype male. Scales, a = 1.0 mm, b = 0.5 mm.

heart-shaped, the rest rectangular and fifth overlapping and with a fringe of setae. Pereiopods on short side of the body with boss on anterior border of basipodite, becoming pointed on P5-P7. A small digitation present near these last appendages.

Pleon with six segments distinct laterally but completely indiscernible dorsally; last segment posteriorly convex, with width equal to one third of anterior width of abdomen. Lateral plates rounded on first three pleomeres, indicated by a simple notch on fourth and fifth pleomeres, none ventrally folded. Pleopods: five pairs, biramous, decreasing strongly in size posteriorly, all with lanceolate rami, smooth and subequal. Uropods absent.

Male. — Cephalon entirely fused with thorax, with anterior border indented. Eyes present. Antennules separated, with three segments; antennae with two only, their distal setae replaced by denticles. Maxillipeds absent.

Pereion widening slightly towards central region, lateral borders of segments well separated. Pereiopods: P1-P2 with ventral border of propod deeply excavate; dactyl long, curved; basipodite short; P3-P7, propod changing from triangular to oval; dactyl short, basipodite of increasing length posteriorly. Medioventral tubercles absent.

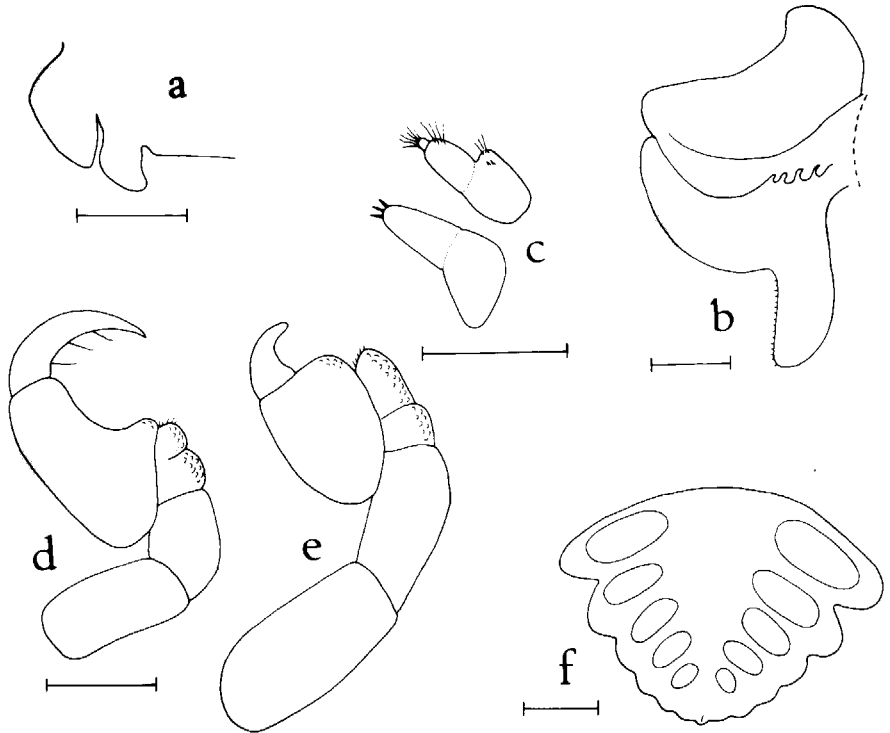


Fig. 2. *Bopyrella essingtoni* sp. nov. a, b, holotype female. a, posteroventral border of cephalon; b, first oostegite. c-f, allotype male. c, antennule and antenna; d, first pereiopod; e, seventh pereiopod; f, pleon. Scales, a, b = 0.5 mm, c-f = 0.1 mm.

Pleon greatly reduced equal to 0.15 of total body length, with six segments fused dorsally and ventrally, but indicated by lateral undulations, progressively less marked posteriorly. Pleopods: five pairs, oval and feebly projecting. Uropods absent.

Measurements. — ♀: length 6.7 mm, width 3.5 mm, pleon 2.0 mm; asymmetry 9°. ♂: length 1.8 mm, width 0.6 mm, pleon 0.3 mm.

Host. — *Alpheus bucephalus* Coutière (Alpheidae).

Remarks. — The bilaterally indicated pleonites, the last with a convex posterior margin, and the scarcely visible lateral thoracic bosses are the

primary characteristics of the female described above, which are shared by three other species of the genus *Bopyrella* (Bourdon, 1980). The present species may be distinguished from these by the following features: *B. angusta* Shiino (1936) has the cephalon much less recessed in the thorax, the distal lobe of the first oostegite very acute and the lateral plates of the short side of the body ventrally folded. *B. setoensis* Shiino (1939) lacks coxal plates and its abdomen is distinctly less broad than the pereion. *B. tanyensis* Bourdon (1979) possesses a reduced pleotelson; in addition, the male has all the pereopods of the same structure and the pleon of a particular form (*Synsynella* type). These distinctive features indicate the Australian *Bopyrella* from *Alpheus bucephalus* to be a new species.

***Bopyrina platylobae* Bourdon**

Bopyrina platylobae Bourdon, in press.

Material. — 1♂, 1♀, Port Denison, on *Anchistus custos* (Forskål), Queensland, in *Pinna* sp., coll. E. Rainford, 1924, AM P 31780.

Remarks. — This parasite appears conspecific with *Bopyrina platylobae* Bourdon (in press), because the female (4.9 mm long) has its cephalon and the lateral bosses well distinct, particularly with the distal lobe of first oostegite more developed than in the holotype, a typical character among the *Bopyrina* of the *brachytelson* group. The only differences are the depressed frontal lamina on the short side and the dorsal delimitation of the six pleonites which remain disclosed.

***Bopyrina ocellata* (Czerniavsky, 1868)**

Bopyrus ocellatus Czerniavsky, 1868: 63, pl. 6 figs 1-3.

Material. — (i) 1♀, Myora, Moreton Bay, Queensland, on *Hippolyte* sp., 28 July 1946, coll. J. Hynd, AM P 21778. (ii) 1♀ (with *Cabirops*) NE of Seal Rocks, Port Curtis, Queensland, on *Hippolyte* sp., 7-8 fms, 2 September 1946, coll. J. Hynd, AM P 21779. (iii) 1♀, Heron Island Queensland, on *Hippolyte* cf. *commensalis* Kemp, on *Aglaophenia*, 17 April 1978, coll. A. J. Bruce, NTM Cr. 00139. (iv) 4♂, 5♀, Dunwich, Moreton Bay, Queensland, on *Hippolyte* cf. *ventricosa* from *Sargassum*, 19 July 1978, coll. A. J. Bruce, NTM Cr. 00140.

Remarks. — It is with reservations that we identify these specimens with *B. ocellata* (Czerniavsky) for, although all the other morphological details shown by both sexes correspond exactly to this very characteristic species, the female shows an important diminution in the number of pleopods, as in the majority of specimens only the first on the deformed size of the body is developed. However, Chopra (1923), Shiino (1934) and Bourdon (1968) have indicated that this character is subject to variation. A statistical study is desirable to show if the tendency to reduction of the number of pleopods which appears to occur in *B. ocellata* in Australia would justify their treatment as a distinct subspecies.

Bopyrina ocellata, common in European seas, is also well known to India and Japan, parasitic upon a variety of *Hippolyte* species and also on *Spirontocaris geniculata* (Stimpson).

***Bopyrina lobata* sp. nov. (fig. 3)**

Material. — 1 adult female (holotype), 3 subadult ♀, 3 cryptoniscus larvae, Bribie Passage, off Caloundra, Queensland, 26/29 May 1947, coll. J. Hynd, AM P 21772.

Description. — Female, adult. Cephalon fused to first thoracic segment. Eyes present. Frontal lamella more or less distinct, not forming lateral digitation. Maxillipeds apparently without palp. Posterior border with single pair of poorly developed lamellae only.

Pereion with segments II-VII distinctly separated. Lateral bosses and coxal plates not defined. Except the deformed side of pereionites I-IV, which present a small lobe or a light fissure, the lateral border of the segments is entire. On ventral part of short side, pereionites III-VII very swollen and extending beyond lateral margin of body as voluminous lobes. Marsupium open. First pair of oostegites with two rather unequal appendices, forming large posterior lobe; fifth pair not overlapping, that of deformed side too short and its homologue directed posteriorly. Pereiopods provided with feebly projecting boss on superior border of basipodite.

Pleon with six segments, largely fused mediodorsally and on short side. Lateral plates rudimentary on first five somites, triangular or rounded. Five pairs of uniramous lamellar pleopods, of decreasing size posteriorly. Uropods absent.

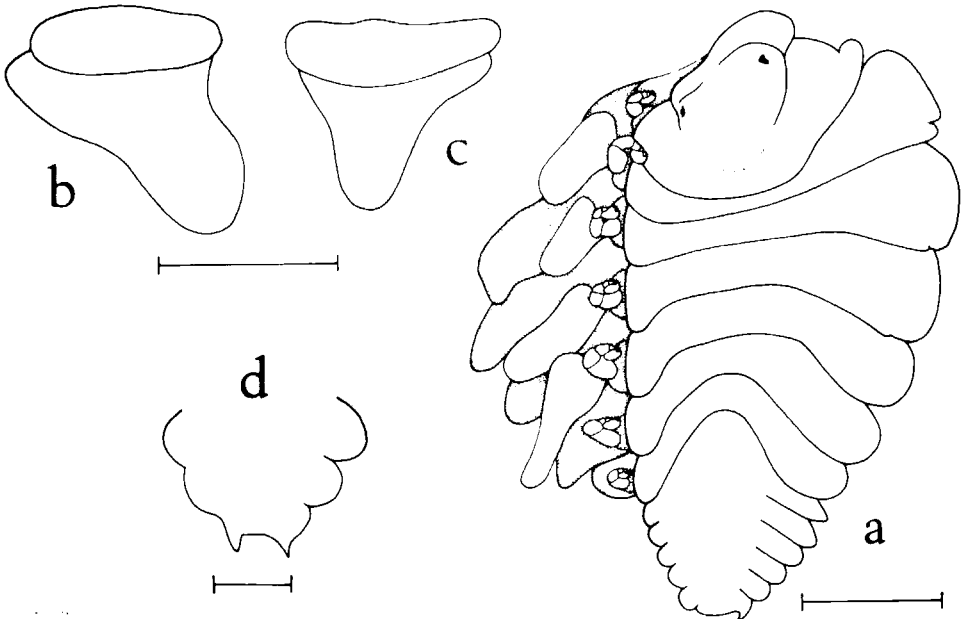


Fig. 3. *Bopyrina lobata* sp. nov., Bribie Passage, Queensland. a, holotype female, dorsal; b, c, first pair of oostegites; d, pleotelson of subadult paratype female. Scales a, b, c = 0.5 mm, d = 0.1 mm.

Female, subadult. Pleotelson notched, with two acute lateral processes, (only one on adult holotype). Each accompanied by cryptoniscan larva, with pygidium posteriorly bifid, length 0.9 mm, which shows a surprisingly close resemblance to that of *Cumoechus insignis* Hansen in the narrowness of the body, 5.0 times longer than wide, and the elongated cephalon, 1.4 times longer than wide.

Measurements. — Adult female, length 2.2 mm, width 1.2 mm, pleon 0.7 mm; asymmetry 28°.

Host. — *Tozeuma* sp. (Hippolytidae).

Remarks. — Although there is no doubt that this form represents a new species, its generic position will remain uncertain until the male has been found. We place its provisionally in *Bopyrina* because the female shows distinct analogies with that of *B. ocellata* (Czerniavsky) the type species of the genus, and in particular, an unusual hypertrophy of certain pereionites previously known and only in a lesser degree, from this last species. *B. lobata* is readily distinguished by the structure of the abdomen, of which all segments are clearly indicated bilaterally and not only on the deformed side, and also by the very characteristic cryptoniscan larva.

***Parabopyrus kiiensis* Shiino, 1934 (fig. 4)**

Parabopyrus kiiensis Shiino, 1934: 268-269, fig. 5.

Material. — 1♂, 1♀, Bustard Bay, Queensland, 25 August 1946, coll. J. Hynd, AMP 21773.

Description. — Female. Cephalon distinct from thorax. Frontal lamella fairly well defined posteriorly, forming rounded lateral lobe on short side. Eyes absent. Antennae apparently two-segmented. Maxillipeds without palp, posterior border with only single pair of smooth lamellae.

Pereion with first segment medially fused. Lateral bosses indistinguishable. Coxal plates narrow, visible on deformed size of pereionites II-IV. Lateral border of last three thoracomeres entire. Marsupium open. First pair of oostegites unequal and dissimilar, on short side elongating to form large distal lobe, while the posterior part of its homologue is rounded. Other oostegites rudimentary, fifth shortest. Pereiopod all with boss on superior border of basipodite.

Pleon rectangular, width decreasing posteriorly and pleotelson truncate; six-segmented, segments distinct laterally but more or less fused dorsomedially. Lateral plates reduced, convex on short side, straight on deformed side. Five pairs of uniramous pleopods, directed medially, too feebly developed to reach midline, with posteromedian part advanced. Uropods absent.

Male. — Cephalon distinct from thorax. Eyes indistinct. Two pairs of antennae very unequal, larger pair two-segmented with proximal segment expanded. The two pairs of antennae are placed one above the other in the

prepared male specimen and it is not possible to discern whether it is the antennules or the antennae that are better developed. Maxillipeds not distinguished.

Pereion with pereiopods subequal, dactyl equal to about half propod length. Medioventral tubercle present in pereionite VII.

Pleon six-segmented, first continuous with width of thorax, last posteriorly bilobed. Pleopods oval, visible only after clearing specimen. Uropods absent.

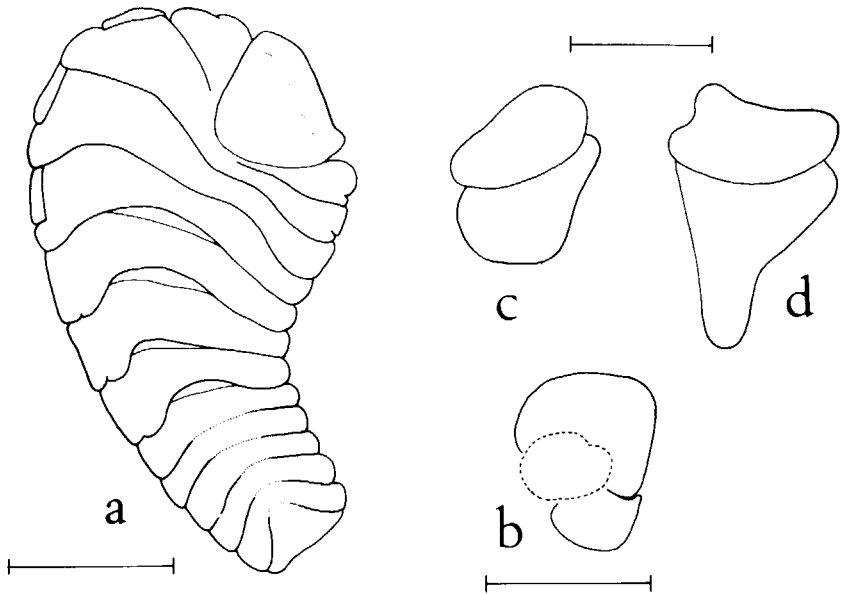


Fig. 4. *Parabopyrus kiiensis* Shiino, Bustard Bay, Queensland. a, female dorsal; b, maxilliped; c, d, first pair of oostegites. Scale a = 1.0 mm, b, c, d = 0.5 mm.

Measurements. — Female: length 3.4 mm, width 2.0 mm, pleon 1.2 mm; asymmetry very pronounced, 95°. Male: length ca. 0.65 mm.

Host. — *Athanas* sp. (Alpheidae).

Remarks. — This parasite corresponds exactly to the diagnosis of *Parabopyrus kiiensis* Shiino (1934) which is one of the easiest representatives of the subfamily Bopyrinae to recognize. If its generic position presents no problems, its specific identity cannot be confirmed without some reservations as we are ignorant of some important details of taxonomic interest in the type specimens, known from a single pair only, found in association with a shrimp of a different family, *Hippolysmata* sp. (Hippolytidae), from Japan. We have therefore described the Australian pair and illustrated the female in order to facilitate subsequent confirmation if they truly correspond to this form or if they differ.

Gareia gen. nov.

Diagnosis. — Female. Cephalon distinct from thorax, lacking frontal lamella and maxillipedal palp, with two pairs of narrow posteroventral lamellae. Pereion with metamerization distinct, first four segments with feebly indicated dorsolateral bosses, coxal plates reduced, present on deformed side only. Marsupium open. First oostegite without posterior lobe, fifth pair overlapping. Pleon segments almost completely fused. Lateral plates completely absent. Five pairs of biramous pleopods, exopodites lamellar and well developed, endopodites 2-5 rudimentary on short side. Uropods simple.

Male. Cephalon fused to thorax. Pereiopods with propod and dactyl almost subequal. Medioventral tubercles absent. Pleon segments fused, without appendages.

Etymology. — Anagram of *Argeia*, the most closely related genus.

Type species. — *Gareia arafuræ* sp. nov.

Host. — Decapoda, Alpheidae.

Remarks. — This branchial epicaridean belongs to a small group of the Bopyridae for which Markham (1977) created the subfamily Argeiinae. Although the establishment of this subfamily is probably justified, his primary criterion, lateral plates and uniramous pleopods in the female, is an assertion that requires demonstration, for the majority of diagnoses relating to the species therein homologize these lamellae as being biramous pleopods, some even with the simultaneous presence of pleural plates. However, it is a point to be discussed shortly by one of the authors (R.B.) and of secondary importance for the determination of the Australian alpheid parasite described below.

For the moment the important feature is that the female of the present specimens has the abdominal segments fused whereas the nine other Argeiinae have the six pleonites distinctly separated. This morphological character, of major taxonomic importance, renders the designation of the new genus *Gareia* essential.

Gareia arafuræ sp. nov. (figs. 5-6)

Material. — 1 ovigerous ♀ holotype, 1 ♂ allotype, Dudley Point, Darwin, Northern Territory, Stn. AJB/3, 12°25.0'S 130°49.1'E, intertidal, LWS, 18 September 1981, coll. A. J. Bruce, NTM Cr. 00055 (a and b, respectively).

Description. — Female. Cephalon distinctly enlarged, clearly delimited from thorax, anterior border regularly convex, without visible frontal lamella or lateral lobe. Eyes present. Antennules separated, apparently three-segmented; antennae larger, with four segments. Maxillipeds without palp but with a long seta surrounded by shorter setae at anterolateral angle; posterior border with two pairs of narrow squamous lamellae, inner shorter than outer; median part straight, smooth.

Pereion with all segments distinct. Dorsolateral bosses on first four segments, feebly developed. Coxal plates reduced only on deformed side of segments I-IV. Lateral border of pereionites V-VII entire, except for segments V-VI on deformed side which are deeply notched. Marsupium open. First oostegite with internal crest without tubercles and posterior margin rounded. Oostegites 2-4 triangular, subequal, not covering ventral surface of thorax, those of deformed side slightly better developed than on opposite side, fifth pair overlap extensively and bear a dozen posterior setae; all with external surface granular. Pereiopods approximately equal; superior border of basipodite feebly swollen.

Pleonites almost entirely fused, dorsal metamerization with six segments particularly difficult to discern, even after clearing and staining. Lateral plates absent, but abdominal contour still distinguishable dorsally. Five pairs of biramous pleopods; exopodites lamellar and well developed, increasing slightly in size posteriorly, particularly on deformed side; endopodites shorter, last four on non-deformed side extremely reduced. Uropods simple, slightly longer than other pleonal appendages.

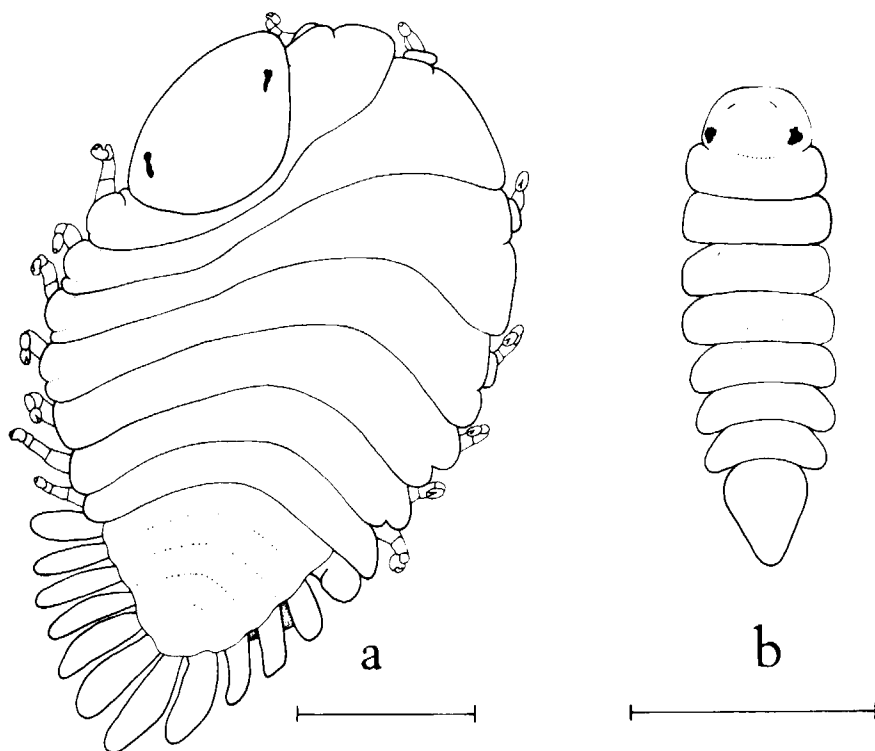


Fig. 5. *Gareia arafuriae* gen. nov., sp. nov., Darwin, Northern Territory. a, female, dorsal; b, male. Scales = 0.5 mm.

Male. Cephalon fused to thorax, anterior border straight. Eyes present. Antennules separated, with three segments; right antenna with four segments, left with three. Maxillipeds not distinguished.

Pereion enlarging slightly towards central portion, lateral border of first four segments truncated. Pereiopods with propods decreasing slightly in size, dactyls equal to about half length of preceding segment. Medioventral tubercles absent.

Pleon segments completely fused, bluntly triangular in shape, narrower than last thoracomere and without traces of appendages.

Measurements. — Female. Length (without uropods) 1.8 mm, width 1.3 mm, pleon 0.5 mm; asymmetry 52° . Male. Length 1.0 mm, width 0.3 mm, pleon 0.2 mm.

Host. — *Pseudathanas darwiniensis* Bruce (Alpheidae).

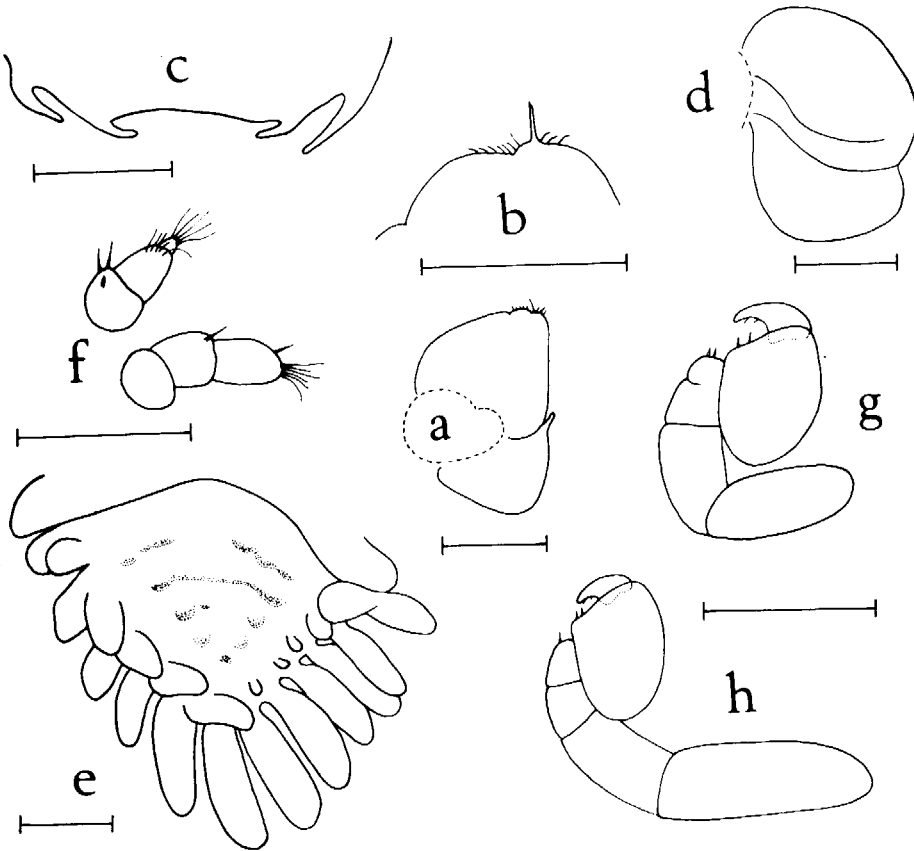


Fig. 6. *Gareia arafuræ* gen. nov., sp. nov. a-e, female, holotype. a, b, maxillipeds; c, posterior border of cephalon; d, first oostegite; e, pereion. f-h, male. f, antennules; g, h, pereiopods. Scales a, c, d, e = 0.2 mm, b, f, g, h = 0.1 mm.

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RÉSUMÉ

Six espèces de bopyres parasites sur des crevettes carides sont signalées comme nouvelles pour la faune australienne. Trois espèces, dont l'une appartient à un genre nouveau, sont décrites: *Bopyrella essingtoni* et *Bopyrina lobata* spp. nov., et *Argeia arafuræ* gen. nov., sp. nov.

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