

**CIROLANID ISOPODS FROM THE ANDAMAN SEA OFF PHUKET, THAILAND,
WITH DESCRIPTION OF TWO NEW SPECIES**

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ABSTRACT

Four species of cirolanid isopod from the collections of the Phuket Marine Biological Center BIOSHELF–Andaman Sea program and collections made in Phuket Province are recorded. Two new species are described—*Cirolana bruscai* sp. nov. and *Cirolana rachanoi* sp. nov. The poorly-known genus *Conilorpheus* Stebbing, 1905 is rediagnosed for the first time, and the type species, *C. herdmani* Stebbing, 1905, is described from new material collected off Phuket Province. The widespread species *Excirolana orientalis* is recorded from Cape Panwa. A key to the recorded, observed and expected genera of Cirolanidae from the region is given. A bibliography listing all titles recording isopods from Thailand, the Andaman Sea and north-eastern Indian Ocean is provided.

INTRODUCTION

The isopod fauna of the north-eastern Indian Ocean is, in common with most peracarid orders, very little studied. The Isopoda of the region have never received substantive treatment, and the Cirolanidae are no exception in this regard. The only recent reports that include cirolanids from Thailand are those of Bowman and Iliffe (1991) recording the cirolanid species *Annina fustis* Bowman and Iliffe, 1991 and Keable (1999) recording *Dolicholana porcellana* (Barnard, 1936) from the Phuket region. Bruce (1997) has given general account of the common species of widespread cirolanid genera (and also other isopod families) for the Western Indian Ocean, with most of the genera illustrated occurring throughout the Indo-Pacific region, including the north-eastern Indian Ocean. Most recently Kensley (2001) has provided an overview on the biogeography of

Indian Ocean isopods and also provided a complete checklist of all Isopoda known from the region.

Collections made from coral-reef habitats around Phuket Island and nearby islands made by NLB in 1995, and also the BIODEEP program yielded more cirolanids than are here described, including a species of the '*Cirolana parva* complex', other species of *Cirolana* and species of the genera *Bathynomus*, *Eurydice*, *Metacirolana* and *Natatolana* (namely *Natatolana insignis* Hobbins and Jones, 1993; S.J. Keable, personal communication).

ABBREVIATIONS

Material is deposited in the Reference Collection at the Phuket Marine Biological Center (PMBC) and at the Zoologisk Museum, University of Copenhagen (ZMUC). CP – circumplumose; CPS – circumplumose setae; PMS – plumose marginal setae; TL – total length.

* Authors names are presented alphabetically.

TAXONOMY

Family Cirolanidae

Key to the marine and estuarine Cirolanidae from Thailand

Note: This key includes the genera recorded herein and the observed or predicted (*e.g. Anopsilana*) occurrence of some widespread and common genera. It is likely that further genera will be found to occur, but the most commonly encountered genera are here included. Descriptions and diagnoses to these genera can be found in Bruce (1986), Brusca *et al.* (1995), Kensley and Schotte (1989); recent accounts of *Annina* have been given by Bowman and Iliffe (1991), Jones (1983) and Schotte (1994).

1. Adults large in size (10–30 cm); pleopod peduncles with branchiae.....*Bathynomus*
— Adults moderate in size (3–40 mm); pleopod peduncles without branchiae.....2
2. Clypeus ventral surface flat.....6
— Clypeus ventral surface projecting.....3
3. Head with prominent rostral process separating antennule bases.....4
— Head with minute rostral process not separating antennule bases.....5
4. Pleonites 1 and 2 not markedly narrower than 3–5; males without cephalic or pereonal processes; antennal peduncle articles not enlarged.....*Excirolana*
— Pleonites 1 and 2 markedly narrower than 3–5; males with cephalic or pereonal processes; antennal peduncle articles enlarged.....*Annina*
5. Antennule peduncle article 2 set at right angles to article 1; frontal lamina slender; uropod peduncle not produced long medial margin of endopod.....*Eurydice*
— Antennule peduncle articles 1 and 2 colinear; frontal lamina anteriorly widest; uropod peduncle produced long medial margin of endopod.....*Metacirolana*
6. Pereopods 1–3 ischium and merus with anterodistal angles markedly produced.....7
— Pereopods 1–3 ischium and merus anterodistal angles not markedly produced.....8
7. Pleopods 3 and 4 endopods about equal to or slightly smaller than exopod, with plumose marginal setae.....*Cirolana*
— Pleopods 3 and 4 endopods distinctly smaller than exopod, without plumose marginal setae.....*Anopsilana*
8. Pereopods 5–7 with flattened articles, with abundant long plumose setae on margins; basis margins with PMS.....9
— Pereopods 5–7 articles not flattened, ambulatory, without flattened articles, with abundant long plumose setae on margins; basis margins without PMS.....*Conilorpheus*
9. Frontal lamina with posterior third ventrally projecting.....*Dolicholana*
— Frontal lamina with posterior third flat.....*Natatolana*

Genus *Cirolana* Leach**Restricted synonymy**

Cirolana.– Bruce, 1986: 7.– Brusca, Wetzer and France, 1995: 4.

Remarks

Species of this genus are found throughout the world oceans, as well as in estuarine habitats. Diagnoses to the genus are to be found in Bruce (1986), Brusca *et al.* (1995), and Kensley and Schotte (1989). Kensley and Schotte (2001) and Brusca *et al.* (1995) both provide a list of all the species of *Cirolana*.

***Cirolana bruscai* sp. nov.**

(Figs 1–4)

Material examined

Holotype: PMBC 16165, male, 8.9 mm, between Maithon Island and Racha Yai Island, 07°42.989'N, 098°24.077'E, Ockelman sledge, 45 m, coarse sand, coll. N.L. Bruce and G. Dinesen, 03.12.1997.

Paratypes: PMBC 16166, 1 male, 10.0 mm, dissected, 1 female, 5.5 mm, Surin Island, Andaman Sea, 09°26.40'N, 097°50.00'E, baited overnight trap, coll. T. Jansen, 19.04.1996; PMBC 16167, 1 male, 6.5 mm, 08°59.640'N, 098°02.063'E, Ockelman sledge, 41 m, muddy sand, coll. S. Bussarawit and C. Aungtonya, 17.02.1998; PMBC 16168, 1 female, 8.3 mm, 06°48.584'N, 099°20.746'E, Ockelman sledge, 39 m, muddy sand with shell fragments, coll. S. Bussarawit and C. Aungtonya, 24.02.1998; PMBC 16169, 1 male, 7.8 mm, between Hi Island and Maithon Island, 07°44'N, 098°24'E, Ockelman sledge, 40 m, coarse sand, coll. N. Bruce and G. Dinesen, 09.12.1997; PMBC 16170, 1 imm., 4.5 mm, 07°59.554'N, 098°12.119'E, Ockelman sledge, 49 m, sandy mud, coll. S. Bussarawit and C. Aungtonya, 20.02.1998.

Description of male

Body about 2.5 times as long as greatest width; widest at pereonites 5 and 6. Cephalon anterior margin overriding antennule bases, weakly

depressed just posterior to margin; submarginal anterior suture present. Pereonites 1–4 posterior margins each with fine submarginal suture; pereonite 1 lateral margins with fine longitudinal submarginal suture; pereonite 7 posterolateral margins each with short indistinct ridge; coxae 5–7 with oblique carina, posterolateral angles of coxae 5–7 acute. Pleon about 13% TL; pleonite 1 almost entirely concealed in dorsal view; pleonite 2 unornamented; pleonite 3 posterior margin with 8–10 small tubercles on either side of midpoint, median region without tubercles; pleonite 4 posterior margin with 6 tubercles on either side of slightly larger median tubercle; pleonite 5 posterior margin with sub-lateral group of 3 small tubercles on each side; pleonites 3 and 4 epimera posterior margin indented, epimera of pleonite 4 large extending to uropod peduncle. Pleotelson about 12% TL, 57% as long as greatest width, dorsal surface flat, granular, lateral and posterior margin with about 45 short PMS, posterior margin subtruncate, with 6 robust setae set among the PMS.

Antennule peduncle articles 1 and 2 fused; article 3 as long as articles 1 and 2 combined; flagellum slightly shorter than peduncle, extending to anterior of pereonite 1, with 11 articles, article 1 of which longest. Antenna peduncle articles 1–3 combined lengths about 0.9 as long as article 4; article 5 subequal to article 4; flagellum with 21 articles, extending to pereonite 4; articles 1–7 with setal brush.

Frontal lamina pentagonal, anterior margin not projecting, about twice as long as basal width, lateral margins parallel. Mandible spine row with 8 robust setae surrounded by slender setae; molar process distal and posterior margins setose, with about 17 spines along anterior margin. Maxillule lateral lobe with 13 stout robust setae on gnathal surface, medial lobe with 3 stout CP robust setae. Maxilla lateral lobe with 4 setae, middle lobe with 7, medial lobe with 10 CPS and distally 1 simple seta. Maxilliped palp articles 2–5 with both margins setose, those of lateral margins being longer than those of medial margins; palp articles 2–5 lateral margins with 1, 10, 5 and 5 setae respectively; palp articles 2–4 medial margins with 8, 16 and 9 setae respectively; palp article 5 distal margin with

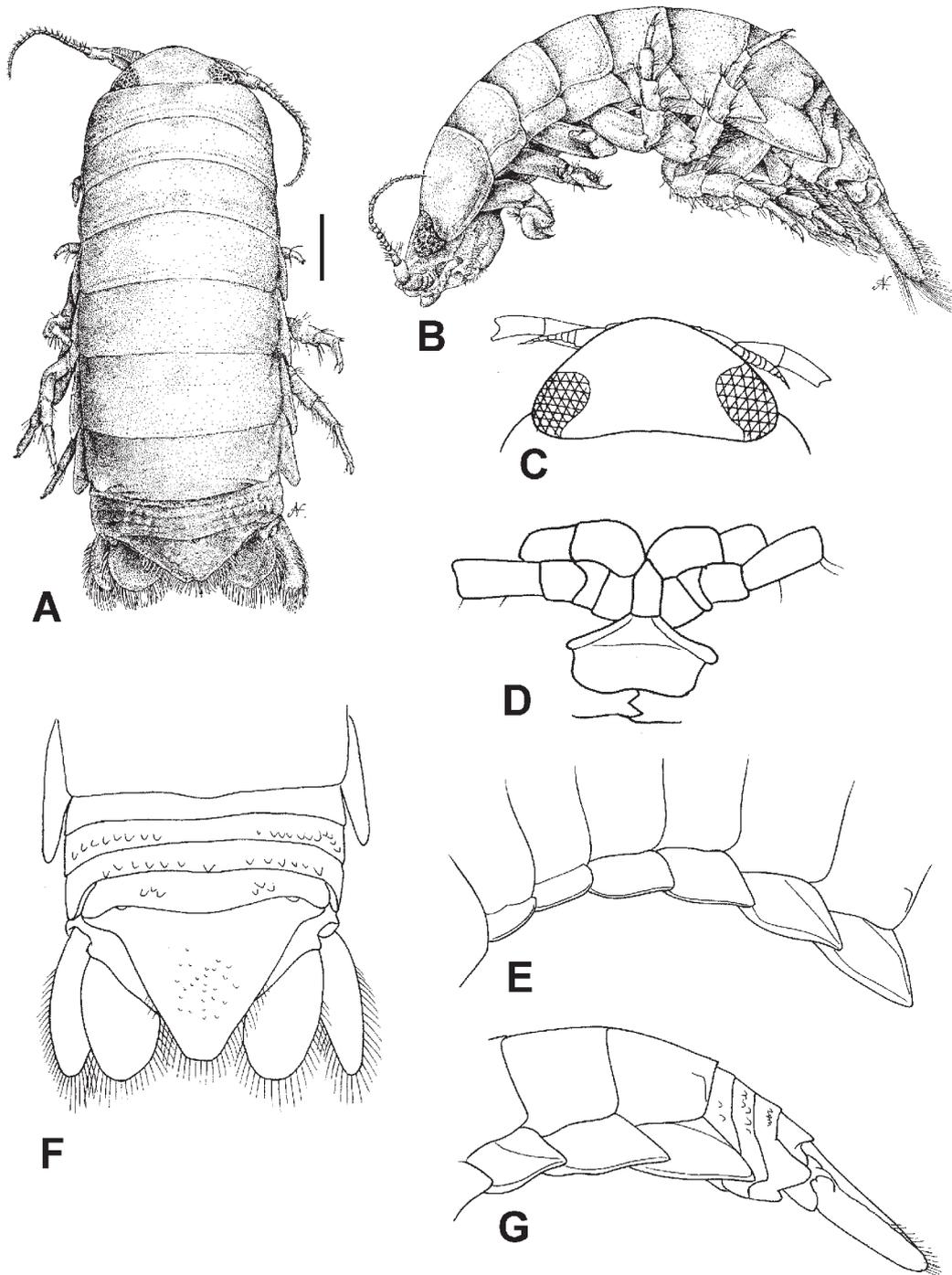


Figure 1 *Cirolana bruscai* sp. nov. A–D, holotype, remainder paratype (PMBC 16166). A, dorsal view; B, lateral view; C, head, dorsal view; D, frons; E, coxae; F, pleon and pleotelson, dorsal view; G, posterior pereonites, pleon and pleotelson. Scale bar 1 mm.

6 setae some of which serrate; endite with 2 coupling hooks and 4 CPS.

Pereopod 1 basis with cluster of 8 long slender simple setae at inferodistal angle; ischium superior distal angle with 4 long slender simple setae, anterodistal margin with row of 4 simple setae, distal half of inferior margin with about 6 short

simple setae, distal angle with 2 acute robust setae; merus superior distal angle with about 5 long slender simple setae, anterior medial margin with 2 short simple setae, inferior margin with 7 blunt robust setae interspersed with about 10 short slender setae; carpus with 3 short and 2 long slender simple setae at inferodistal angle; propodus about

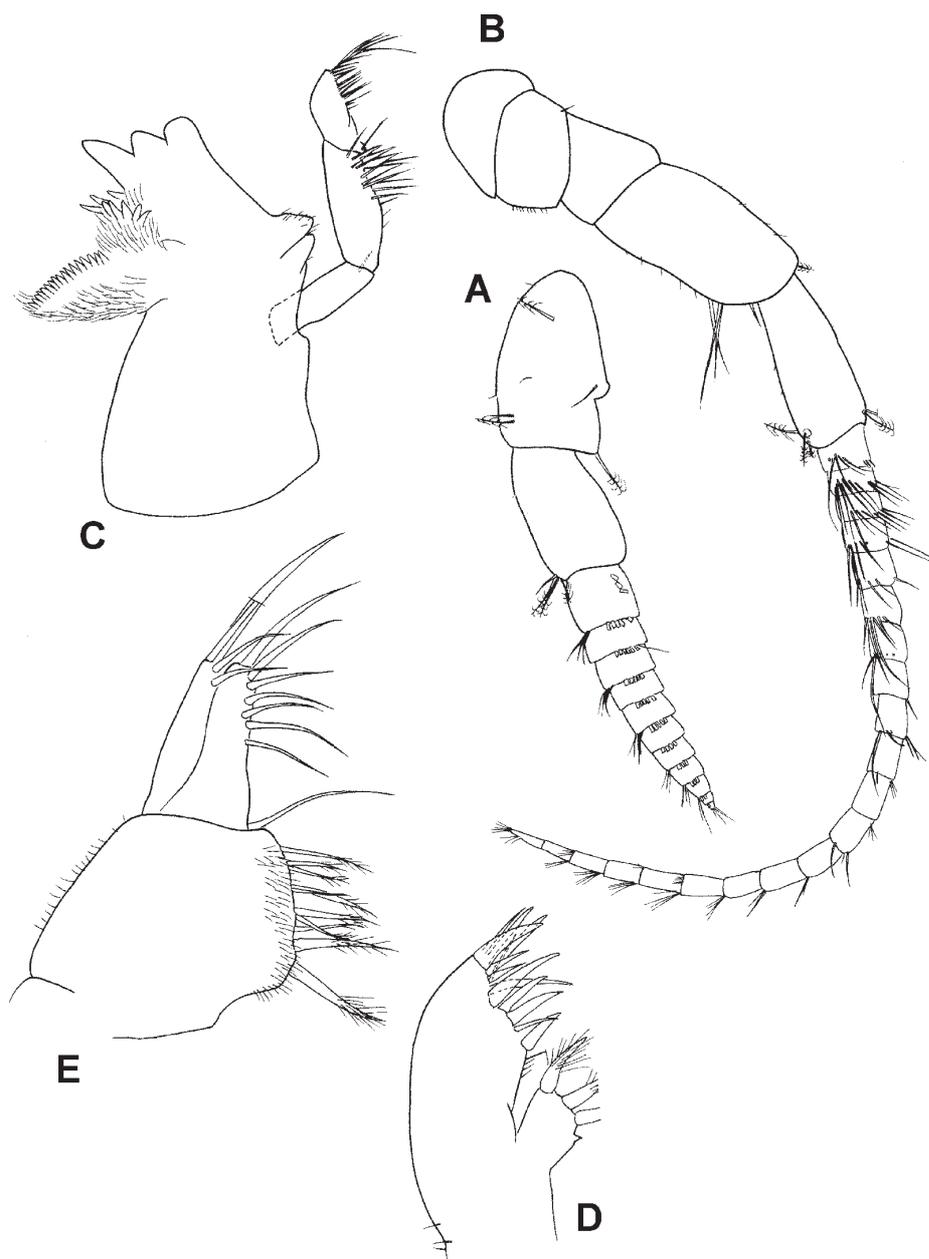


Figure 2 *Cirolana bruscai* sp. nov. Paratype (PMBC 16166). A, antennule; B antenna; C, mandible; D, maxillule; E, maxilla.

2.5 times as long as wide, with 4 slender setae becoming progressively longer distally, with 3 short slender setae at inferodistal angle, prominent unornamented blunt spine opposing dactylus, further 2 setae at anterodistal margin; dactylus about 55% length of propodus and about 2.8 as long as basal width. Pereopod 2 largely similar to pereopod 1; ischium with 2 blunt robust setae at inferior distal margin; merus with 5 blunt robust

setae at posterior margin, these being longer than those of pereopod 1, superior distal angle with long robust seta, anterior margin with 2 small close-set robust setae. Pereopod 6 basis superior margin with row of about 16 setae and 6 lateral setae, inferodistal angle with about 10 long slender simple setae; ischium inferior margin serrated with 5 small submarginal robust setae, 3 acute marginal robust setae set within serration and about 11 slender

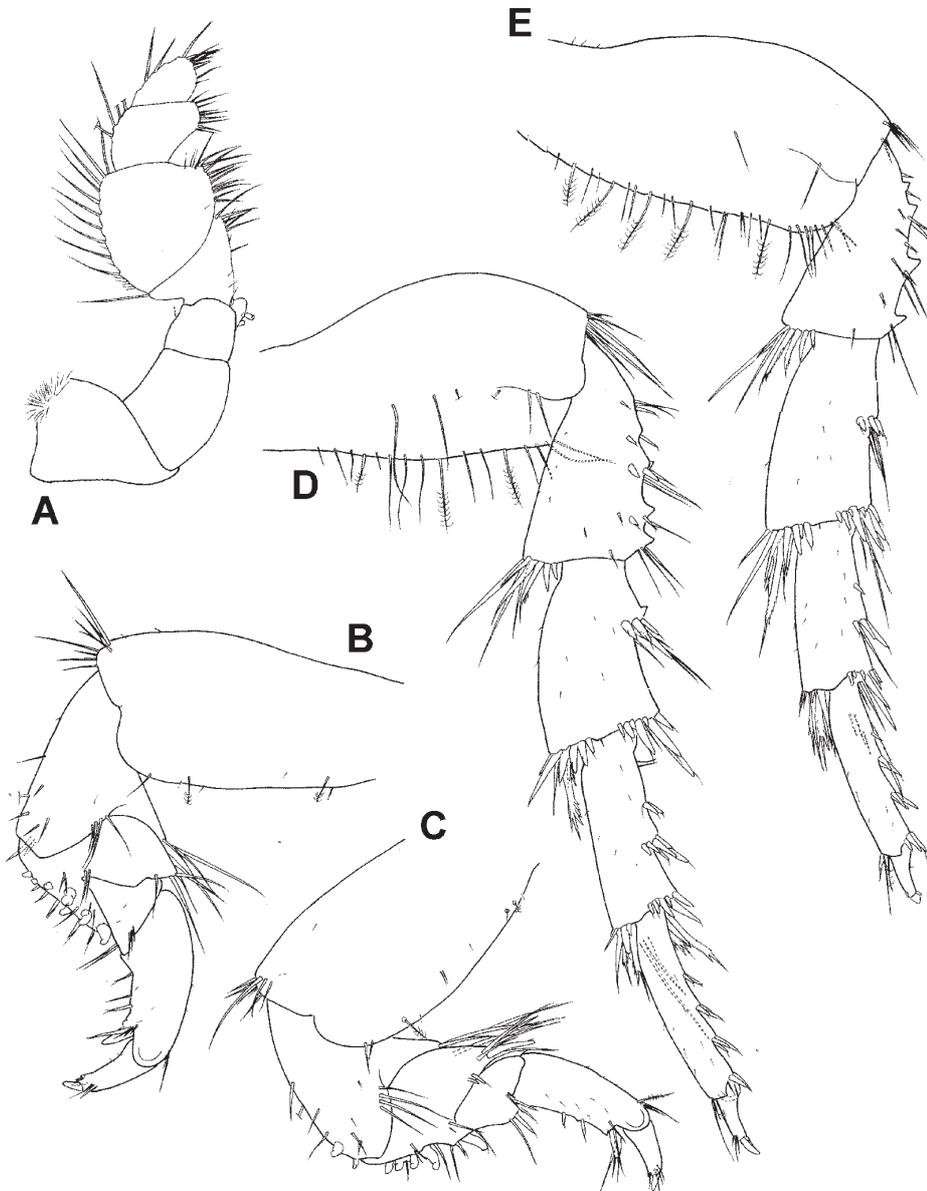


Figure 3 *Cirolana bruscai* sp. nov. Paratype (PMBC 16166). A, maxilliped; B–E, pereopods 1, 2, 6 and 7 respectively.

setae, superior distal angle with 2 small robust setae and 6 slender setae, some of which are serrate; merus inferior margin with cluster of 4 robust setae and 4 long slender setae, superior distal angle with 5 simple blunt robust setae and 4 acute robust setae 2 of which are biserrate, inferodistal angle 10 robust setae; carpus inferior margin with a group of 2 robust setae and a group of 6 robust setae, superior distal angle with 2 blunt robust setae and 4 acute robust setae 2 of which are biserrate, inferodistal

angle with 9 robust setae, 2 of which are elongate and biserrate; propodus with 3 clusters of 2, 4 and 3 robust setae evenly spaced along inferior margin; 2 robust setae opposing dactylus. Pereopod 7 largely similar to pereopod 6, but superior distal angles of ischium, merus and carpus with more and longer biserrate robust setae.

Vasa deferentia opening flush with surface of sternite.

Pleopod 1 exopod wide, with about 42 PMS,

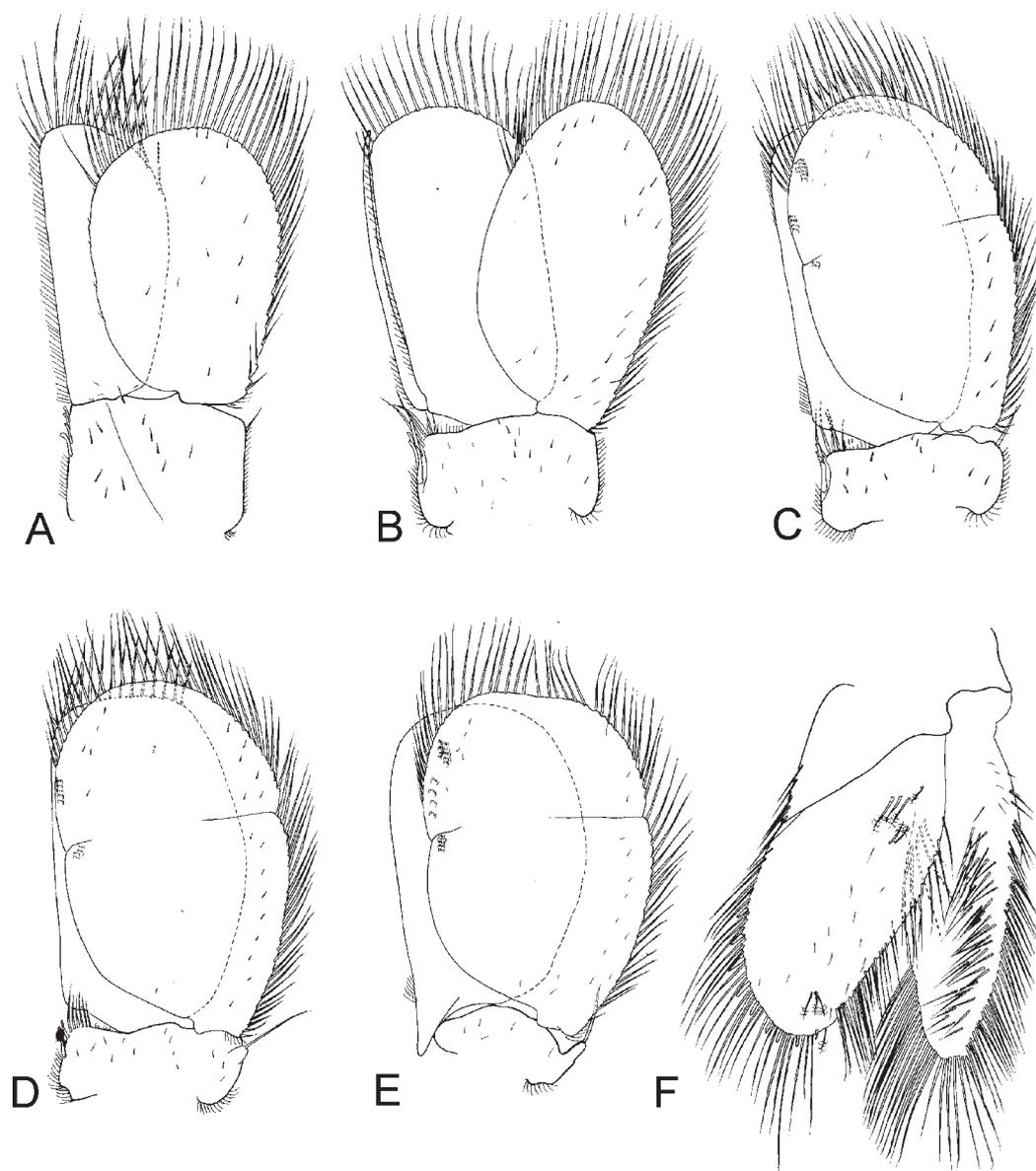


Figure 4 *Cirolana bruscai* sp. nov. Paratype (PMBC 16166). A–E, pleopods 1–5 respectively; F, uropod.

lateral, medial and distal margins evenly rounded; endopod with about 17 PMS, 0.62 as wide as exopod, medial margin straight with dense microtrichs, medial margin evenly convex, peduncle with 4 coupling hooks. Pleopod 2 exopod and endopod with about 57 and 19 PMS respectively; peduncle with 4 coupling hooks; appendix masculina straight, slender, subequal in length to endopod, not extending beyond distal margin of endopod. Pleopods 3 and 4 similar to each other, exopod suture distinct. Pleopod 3 and 4 exopod and endopod with about 58 and 18 PMS respectively, peduncle with 4 coupling hooks. Pleopod 5 exopod with about 56 PMS; peduncle without coupling hooks. Uropod exopod 3.2 times as long as greatest width, about as long as endopod, without robust setae, with numerous slender setae, these forming dense mass on lateral margin and sub-lateral dorsal surface, with single small sub-distal robust seta; endopod 2 times as long as greatest width, lateral margin convex at proximal half, medial margin evenly rounded, with 8 acute robust setae and numerous PMS; apices of both rami not bifid.

Female

Similar to the male but, in addition to the sexual characters, females lack the setal brush on the antenna and also the massed setae on the uropodal exopod, as well having weaker nodules and having the anterior margin of the head less strongly produced.

Size

Males 6.5 to 10 mm, females 5.5 to 8.3 mm.

Distribution

Recorded at depths from 39 to 49 metres on muddy sand, coarse sand and shell grit bottoms, from Surin Islands, Racha Islands and islands around southern Phuket Island.

Remarks

Several characters serve to identify this distinctive species: the shape of the anterior margin of the head, which is weakly produced and overrides the antennule bases, and is medially depressed

just posterior to the anterior margin; the serrate inferior margins of pereopods 6 and 7; and the heavily setose uropod exopod of the mature males.

Etymology

We take pleasure in naming this species for Richard C. Brusca, in recognition of his great and ongoing contribution to cirolanid systematics and to knowledge of the Isopoda.

Cirolana rachanoi, sp. nov. (Figs 5–7)

Material examined

Holotype: PMBC 16171, male, 5.6 mm, Racha Noi Island, south-eastern corner of southern island, 07°29'N, 098°18'E, SCUBA, dead coral, base of rock boulders, 10 m; on rocky slope to 23–26 m, strong current, abundant gorgonians and whip corals, coll. N.L. Bruce, 30.11.1995.

Paratypes: PMBC 16172, 1 male, 3.0 mm, dissected, Racha Noi Island, south-eastern end of northern island, plantation bay, 07°29'N, 098°18'E, SCUBA, dead coral from bommie, 3–12 m; on shallow clean sand, with patch reefs and bommies, gently sloping to 12 m at edge of steep slope, coll. N.L. Bruce, 30.11.1995; PMBC 16173, 2 males, 3.4 and 5.3 mm, 3 females, 3.3, 4.8 and 6.7 mm, Racha Yai Island, southern anchorage, eastern side, SCUBA, 10–15 m, dead coral rock, coll. N.L. Bruce, 05.12.1995; PMBC 16174, 3 females, 2–3 mm, Lon Island, south side, small central bay, 07°46.84'N, 98°22.16'E, SCUBA, 3.5–7.0 m, dead coral at several localities; very silty reef with *Porites* and *Turbinaria* coral, abundant whip corals, coll. N.L. Bruce, 23.11.1995; PMBC 16175, 1 imm., 2 mm, Hi Island, south side, small central bay, western side of beach, 07°44'N, 098°22'E, SCUBA, dead coral on small sand/grit, various positions, 5–7 m, coll. N.L. Bruce, 03.12.1995; PMBC 16176, 1 female, 5.6 mm, south-eastern corner of Patong Bay, 07°53'N, 098°17'E, snorkel, dead coral along edge of fringing reef, 2–3 m, coll. N.L. Bruce, 16.11.1995; PMBC 16177, male, 3.0 mm, Pump Station beach, PMBC, Cape Panwa, coral rubble at beach behind PMBC, coll. T. Jansen,

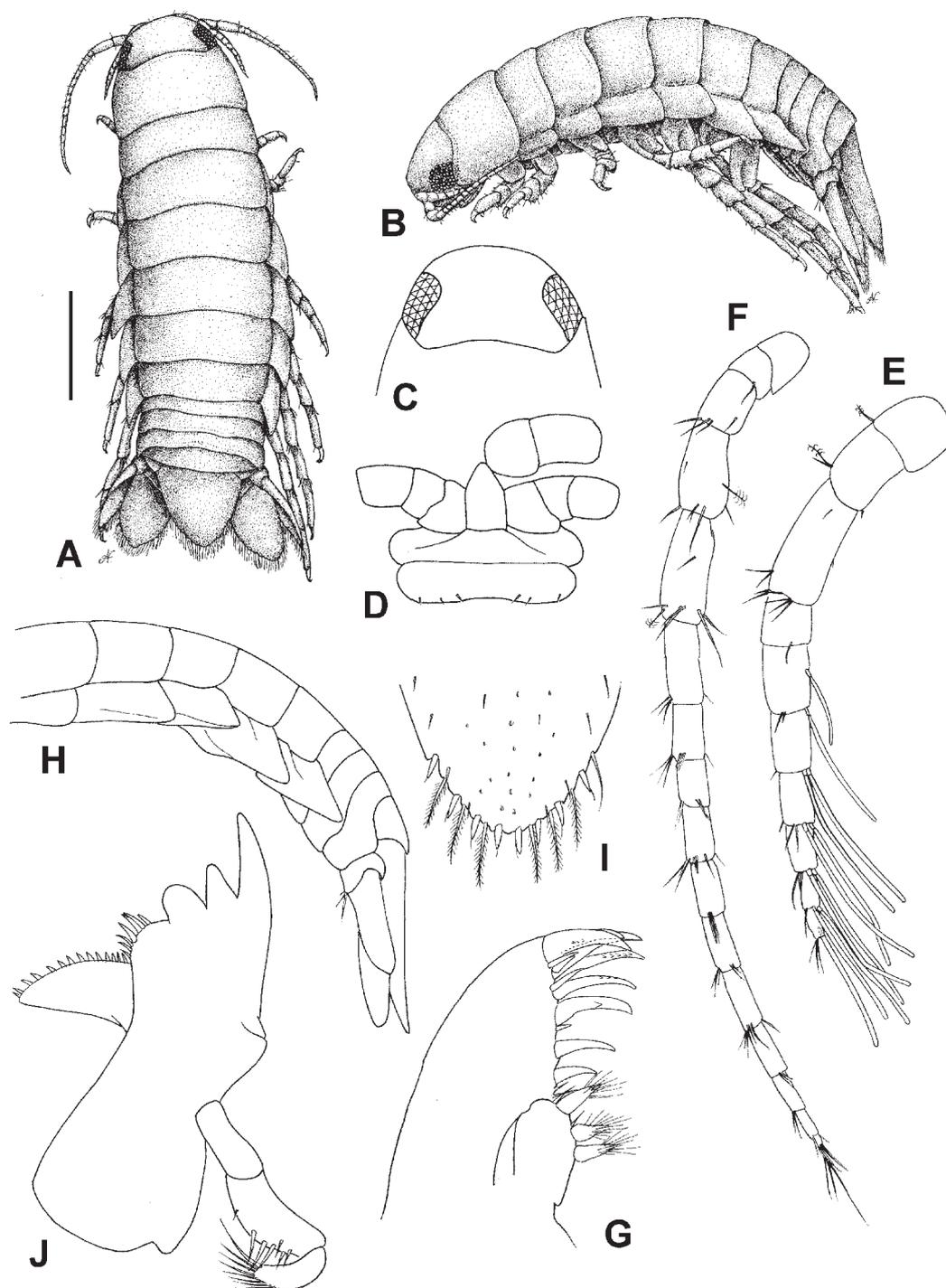


Figure 5 *Cirolana rachanoi* sp. nov. A–C, holotype, remainder paratype (PMBC 16172). A, dorsal view; B, lateral view; C, head, dorsal view; D, frons; E, antennule; F, antenna; G, maxillule; H, posterior pereonites, pleon and pleotelson; I, posterior margin of pleotelson; J, right mandible. Scale bar 1 mm.

J. Svavarsson, G. Dinesen and N.L. Bruce,
08.12.1998.

Description of male

Body about 3.9 times as long as wide; all pereonites of approximately same width. Cephalon anterior margin evenly rounded, without rostral points; inter-ocular carinae or sutures absent.

Coxae 3–7 conspicuous in dorsal view, posterolateral angles of coxae 5–7 acute. Pleon with 4 or 5 visible segments; pleonite 1 visible or concealed, pleonite 2 epimera weakly produced posteriorly; pleonite 3 epimera not extending to posterior margin of pleonite 3, posteriorly indented; pleonite 4 epimera overlapping 5, posteriorly deep with wide indentation. Pleotelson about 16% BL,

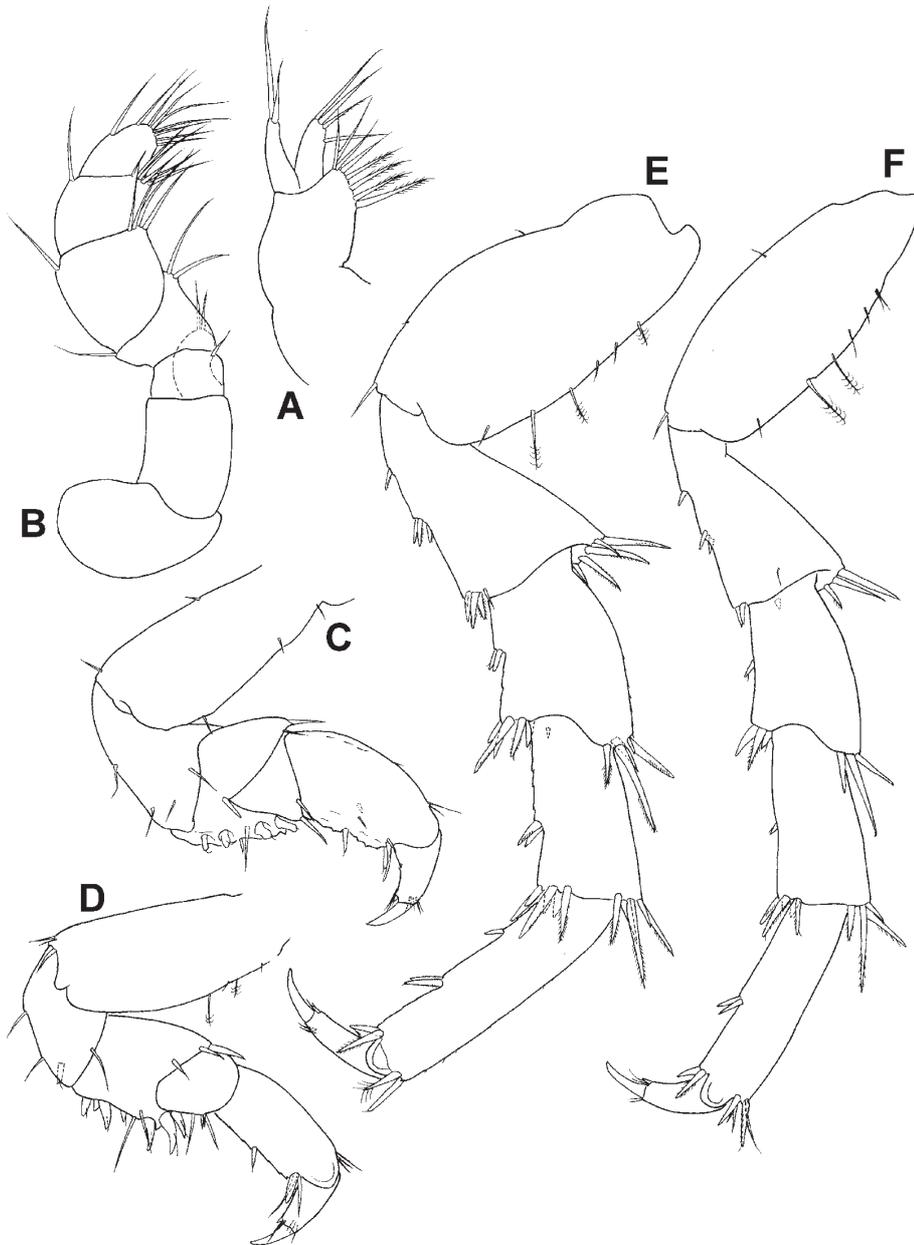


Figure 6 *Cirolana rachanoi* sp. nov. Paratype (PMBC 16172). A, maxilla; B, maxilliped; C–F, pereopods 1, 2, 6 and 7 respectively.

70% as long as greatest width, dorsally with scattered small simple setae, more abundant towards posterior; posterior margin provided with about 7 PMS and 8 robust setae.

Antennule peduncle articles 1 and 2 not fused; article 2 1.2 times as long as 1, article 3 1.4 times

as long as 4, 0.8 times as long as combined lengths of articles 1 and 2; flagellum 1.4 times as long as peduncle with 7 articles, article 2 of which is longest, extending to anterior of pereonite 2. Antenna peduncle article 3 about as long as lengths of articles 1 and 2 combined, articles 4

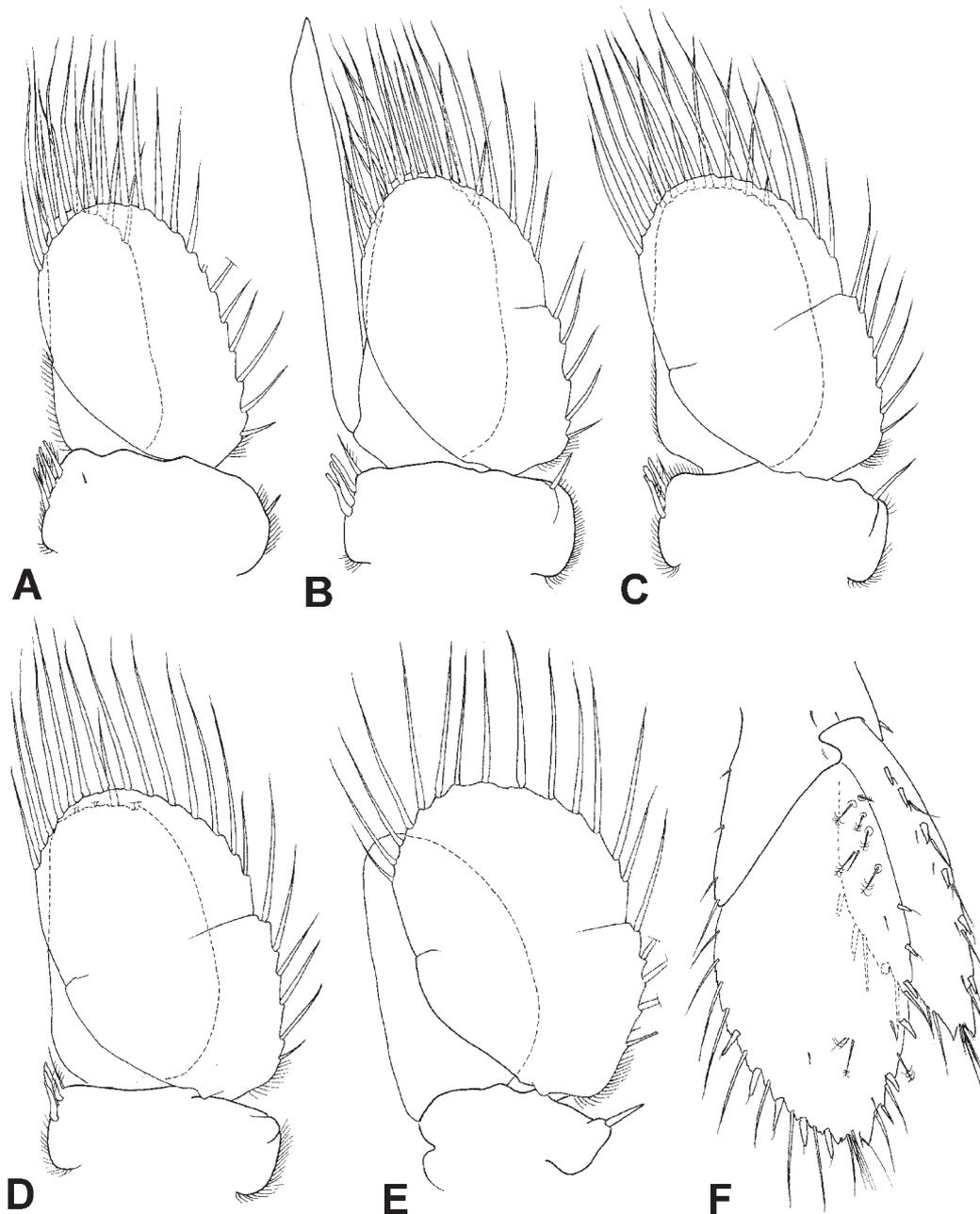


Figure 7 *Cirolana rachanoi* sp. nov. Paratype (PMBC 16172). A–E, pleopods 1–5 respectively; F, uropod.

and 5 equal in length, each 1.4 times as long as article 3; flagellum with of 11 articles, extending to posterior of pereonite 4.

Frontal lamina pentagonal, anterior margin not projecting, about 1.6 as long as basal width, lateral margins parallel. Mandible spine row with 7 robust setae; molar process smooth, without proximal cluster of setae, with about 14 spines along anterior margin. Maxillule lateral lobe with 12 stout robust setae on gnathal surface, medial lobe with 3 stout CPS robust setae. Maxilla lateral lobe with 2 simple setae, middle lobe with 4, medial lobe with 4 CPS setae and distally 4 simple seta. Maxilliped palp articles 2–5 each with 1 seta on lateral distolateral angle; mediolateral angle of article 1–4 with 1, 2 setae, 4 setae, and 6 setae respectively; distal margin of article 5 with about 8 setae; endite with 3 setae, coupling hooks absent.

Pereopod 1 basis superior margin with 2 small widely-spaced simple setae, inferior margin and 3 small simple setae; ischium distomedial margin with 1 simple seta, inferior margin with 2 short simple setae and 1 submarginal simple seta; merus superior distal angle with 2 simple setae, distomedial margin with short acute robust seta, inferior margin with 4 blunt robust setae and 2 short slender setae; carpus with 2 simple setae at inferodistal angle; propodus robust about 1.6 times as long as wide, with 1 small robust seta at middle of inferior margin and 2 simple slender setae and 1 robust seta at inferodistal angle, further 3 small setae at superior distal margin; dactylus about 66 % length of propodus and about 1.9 times as long as basal width. Pereopod 2 similar to pereopod 1 but ischium inferodistal angle with single short robust seta, merus inferior margin with notably larger robust setae, and propodus with spine opposing dactylus larger. Pereopod 6 basis superior margin with 3 small simple setae and 3 palmate setae, inferior margin with 2 minute simple setae, inferodistal angle with 1 simple setae; ischium inferior margin (from proximal to distal) with 1 robust seta, 1 cluster of 1 simple robust seta and 2 biserrate robust setae, inferodistal angle with 1 small simple seta and 3 biserrate robust setae, superior distal angle with 2 short acute simple robust setae and 3 long biserrate robust setae;

merus inferior margin with 2 small robust setae, inferodistal angle with 3 simple robust setae and 2 biserrate robust setae, superior distal angle with 2 short simple robust setae and 3 biserrate robust setae; carpus inferior margin slightly serrate, with 2 paired short robust setae, inferodistal angle with 4 short simple robust setae and 2 biserrate robust setae, superior distal angle with 2 short simple robust setae and 3 long biserrate robust setae; propodus posterior margin with (from proximal to distal) 1 short acute robust seta, 2 robust setae, inferodistal angle with 1 simple and 1 biserrate robust setae opposing dactylus, superior distal angle with 1 simple and 1 biplumose robust setae. Pereopod 7 is largely similar to pereopod 6, but slightly shorter and with fewer setae; propodus lacks single proximal robust seta at inferior margin, with 3 additional setae at superior distal angle.

Vasa deferentia opening flush with surface of sternite 7.

Pleopod 1 exopod with about 19 PMS, endopod narrow with about 9 PMS, 0.53 as wide as exopod, medial margins straight lateral margin weakly concave; peduncle with 4 coupling hooks. Pleopod 2 exopod and endopod with about 21 and 8 PMS respectively; peduncle with 3 coupling hooks and one seta; appendix masculina stout, long, straight, 11 times as long as wide, parallel sided with oblique truncate at tip, 1.5 times as long as endopod. Pleopods 3 and 4 similar to each other, exopod suture distinct; exopod and endopod of each with about 21 and 8 PMS respectively, peduncle with 3 coupling hooks. Pleopod 5 exopod with about 19 PMS. Uropod exopod 2.8 times as long as greatest width, 1.1 times as long as endopod, both rami with deeply bifid apices; exopod lateral margin with 6 robust setae, medial margin with 3; endopod 1.8 as long as greatest width, lateral margin with 5 robust setae, medial margin with 5 robust setae.

Females

Similar to males, but for the sexual characters.

Size

Males 3.0 to 5.6 mm, one presumed female 5.6 mm; immature specimen 2.0 mm.

Variation

Robust setae counts for all specimens yielded: pleotelson 8; uropod exopod lateral margin/medial margin 6/8, endopod lateral margin/medial margin 6/5.

Remarks

At first glance this smooth-bodied species appears similar to species of the '*Cirolana parva*-group' (see Bruce, 1995 for a list of species). However there are numerous differences including the elongate and distinctly parallel-sided body shape, lack of a small medial rostral point (which in the '*Cirolana parva*-group' is recurved to meet or overlap the frontal lamina), and notably the epimera of pleonites 3 and 4 which in this species are deep, not strongly produced and are medially indented. In all '*Cirolana parva*-group' species the epimera of pleonites 3 and 4 are strongly posteriorly produced, those of pleonite 4 usually extending well past the posterior margin of pleonite 5, sometimes those of pleonite 3 also extending beyond pleonite 4, and are posteriorly acute or narrowly rounded rather than truncate or medially indented.

The shape of the epimera of pleonites 3 and 4 is unique within the genus (although a similar epimeron shape is seen in some Corallanidae), and together with the lack of dorsal ornamentation, the lack of a rostral point, unambiguously distinguish this species from all others.

Distribution

Cirolana rachanoi is locally widespread and tolerates a wide range of silt conditions, being found in dead coral rock in the highly turbid conditions at Cape Panwa and Lon Island to the clear-water habitats of the off-shore Racha Islands; recorded at depth between 2 and 15 metres.

Etymology

Named from the type locality (noun in apposition).

Genus *Conilorpheus* Stebbing

Conilorpheus Stebbing, 1905: 13; 1908: 47.–
Barnard, 1920: 352; 1955:56.– Bruce, 1986:
221.

Type species

Conilorpheus herdmani Stebbing, 1905, by monotypy (the whereabouts of the type material is not known).

Description

Cephalon broad, more than 80% as wide as pereonite 1; with minute rostral point. Body about 5 times as long as greatest width, surfaces smooth, without tubercles. Pereonite 1 about 1.7 times as long as pereonite 2; pereonite 2 shortest about 0.6 times as long as pereonite 1, pereonite 7 about 2.6 times as long as pereonite 2. Pleon with 5 unfused segments, largely concealed by pereonite 7; pleonite 3 epimera not enlarged, not extending posteriorly to pleonite 4; pleonite 5 laterally overlapped by pleonite 4. Pleotelson dorsal surface smooth; PMS and robust setae present.

Antennule peduncle articles colinear, not fused; peduncular article 2 not at right angles to article 1; article 3 well developed; subequal to articles 1 and 2; flagellum shorter than peduncle; without callynophore. Antenna peduncle comprised of 5 articles, peduncular articles 1 and 2 shortest, article 3 longest, articles 4 and 5 shorter than article 3; article 4 about 0.66 as long as article 3 and 1.2 as long as article 5; inferior margin of peduncle article 4 with 3 long simple setae, distal inferior angle of article 5 with pappose seta and long simple seta.

Frontal lamina approximately 7 times as long as basal width, anteriorly dilated; ventral surface flat, not projecting anteroventrally from posterior. Clypeus ventral surface not projecting relative to frontal lamina. Mandible incisors wide, right incisor tricuspidate; spine row with 7 robust setae. Maxillule medial lobe with 4 CP robust setae. Maxilliped palp articles 3 and 4 medial margin weakly lobed; lateral margins of articles 2 and 4 with long simple setae; article 3 distal margin width

greater than proximal margin of article 4; article 4 distal margin width greater than proximal margin of article 5; endite with 2 coupling hooks.

Pereopods 1–7 dactylus with secondary unguis present. Pereopods 1 and 2 with ischium anterodistal angle produced; pereopod 1 merus anterodistal angle produced to distal half of carpus, pereopod 2 merus anterodistal angle of merus produced to merus mid-point; dactylus shorter than propodus. Pereopod 7 basis not noticeably broader in distal half compared to proximal half; margins with few discontinuous setae; medial carina without setae; superior distal angle with cluster of long plumose setae; ischium merus and carpus not flattened or expanded, superior margins with long setae at distal angle only, inferior margin with simple setae and acute robust setae.

Pleopods 1 rami lamellar, exopod large, operculate, 1.3 times as long as wide, endopod 0.35 as wide as exopod, 0.8 as long as exopod; peduncle quadrate 0.9 times as long as wide. Pleopod 2 appendix masculina slender, arising medially (Stebbing, 1905, Pl IIA) shorter than endopod, apex extending beyond distal margin. Pleopods 1–5 with PMS present on all rami except endopod of pleopod 5. Uropod peduncle medial margin strongly produced extending along entire length of endopod medial margin; rami not extending beyond pleotelson; endopod and exopod margins with PMS; exopod lateral margin not excised.

Composition

In addition to the type species — *Conilorpheus scutifrons* Stebbing, 1908, and *Conilorpheus blandus* Barnard, 1955; both species are known only from South Africa.

Remarks

Both the genus *Conilorpheus* and its species have remained little known since first described by Stebbing (1905). The material reported on here provides the first opportunity to revise the diagnosis for the genus.

The principle reason for inclusion of the later described species *Conilorpheus scutifrons* Stebbing, 1908, and *Conilorpheus blandus*

Barnard, 1955 in the genus appears to be the presence of a strongly projecting frontal lamina. Barnard (1920, 1955) was aware that this character was not unique as there are a number of species of *Cirolana* in which the frontal lamina anterior margin does project (e.g., *Cirolana rugicauda* Heller, 1861, *Cirolana sulcicauda* Stebbing, 1904, and, amongst others, the later described species *Cirolana corrugis* Jones, 1976, and *Cirolana magdalaina* Bruce, 1980). However in none of these species does the frontal lamina project as strongly as in the South African species currently housed in *Conilorpheus*. Furthermore the frontal lamina in *Conilorpheus herdmani* is at best only weakly projecting.

There are several characters shown by the type species that suggest the genus may be related to genera such as *Conilera* Leach, 1818, *Natatolana* Bruce, 1981, *Odysseylana* Malyutina, 1995 and *Politolana* Bruce, 1981. These include the diagnostic characters of the antennule morphology and the morphology of the anterior pereopods which have the superior distal margin produced on both the ischium and merus. In addition antennal peduncle article 4 has a row of prominent long setae on the inferior margin, a character state shared with *Conilera*, *Odysseylana* and *Politolana* as well as the proportions of the pleopod 1 rami also being similar in those genera. However, this characteristic antennule and pereopod morphology is not shown by *Conilorpheus scutifrons* and is unrecorded for *C. blandus*, although in both of these species the appendix masculina is in a medial position. The possibility that these two species are not congeneric with *C. herdmani* has to be considered. Given the lack of data for the other species of the genus, and that the type species is ultimately the arbiter if what constitutes the genus concept, the diagnosis offered here is based solely on the type species, *Conilorpheus herdmani*.

A revised description to the genus *Conilera* was given by Brusca *et al.* (1995), and from that revision and also the figures given by George and Longerbeam (1997) it can be seen that very little separates *Conilorpheus* and *Conilera*, only that in *Conilorpheus* the shape the pleopod 1 exopod is

sub-circular, pleopod 1 is not indurate and that the maxillule medial lobe has four circum-plumose robust setae rather than the more common three.

***Conilorpheus herdmani* Stebbing**
(Figs 8–10)

Conilorpheus herdmani Stebbing, 1905: 13, pl IIA.

Material examined

PMBC 16178, 2 females, 5.5, 6.0 mm, BIOSHELF St. C1, 09°00'N, 098°02'E, Ockelman sledge, 41 m, muddy sand, coll. S. Bussarawit and C. Aungtonya, 17.02.1998.

Description

Body about 4.5 times as long as greatest width; greatest width at pereonite 5. Pereonite 1 > 2 > 3 < 4 < 5 < 6 < 7; pereonite 2 shortest; pereonite 7 longest, posteriorly produced into 4 large spines, and over-riding pleon. Coxae 2–3 with incomplete horizontal suture; coxae 4–7 without suture; posterior margins of coxae 2–6 posteriorly rounded or subtruncate (coxae 2), coxae of pereonite 7 weakly produced forming posteroventral point. Pleonites 1 and 2 not visible in dorsal or lateral view, pleonite 3 largely concealed in dorsal and lateral view. Pleotelson about as long as greatest width, posterior margin evenly rounded, with about 27 long PMS and 7 robust setae.

Antennule peduncle flagellum 0.75 length of peduncle, with 7 articles, article 1 of which is longest, extending to middle of eye. Antenna peduncle article 3 with 3 short simple setae at superior distal angle; article 4 inferior margin with 3 prominent simple setae extending to flagellum article 3, each seta about twice as long as article, distal superior angle with 3 simple setae one of which is plumose; article 5 inferior distal margin with pappose setae and long prominent simple seta, superior distal angle with one sensory seta and 1 short simple seta; flagellum 8-articled, extending to pereonite 4.

Mandible spine row with 8 spines surrounded by numerous setae of varying length; molar process setose with about 15 spines along anterior

margin. Maxillule lateral lobe with 12 stout robust setae on gnathal surface. Maxilla lateral lobe with 4 slender CPS, middle lobe with 9, medial lobe with about 17 CPS. Maxilliped palp articles 2–5 with both margins setose, those of lateral margins being longer than those of medial margins; articles 2–4 lateral margins with 2, 17 and 3 setae respectively; articles 2–4 medial margins with 11, 11 and 12 setae respectively; article 5 distal margin with about 14 setae; endite with two coupling hooks; lamina vibrans present.

Pereopod 1 basis superior margin with 4 small simple setae, anterior margin with 2 long slender simple setae and 2 small CPS, superior distal angle with 6 long slender simple setae; ischium inferior margin with row of 8 long slender simple setae and 3–4 small acute robust setae near posterodistal angle, anterodistal angle with 6 long slender simple setae, mediodistal margin with 4 long and 2 short simple slender setae; merus anterodistal angle with about 5 long slender simple setae and 1 robust seta, distomedial angle with 1 short robust seta, inferior margin with 4 blunt robust setae and 4 slender robust setae, each with prominent accessory flagellum; carpus with 1 robust seta and 2 slender robust setae close to posterodistal angle; propodus about 1.9 times as long as wide, inferior margin with 1 robust seta on palm, 1 distally and 1 large robust seta opposing dactylus; with 3 long slender simple setae close to inferodistal angle, superior distal angle with 3 slender setae; dactylus about 90 % length of propodus and about 4 times as long as basal width. Pereopod 2 basis superior margin with 3 long slender simple setae, 2 small CPS and about 7 small simple setae, inferodistal angle with 6 long slender simple setae; ischium inferior margin with row of 8 long slender simple setae and 3–4 small acute robust setae near posterodistal angle and 2 stout blunt robust setae, superior distal angle with 6 long slender simple setae, mediodistal angle with 2 long simple slender setae and 2 robust setae; merus superior distal angle with about 5 long slender simple setae and 1 robust spine, distomedial margin with 1 short spine, distomedial angle with 1 small spine, inferior margin with 4 blunt robust setae and 5 slender simple setae; carpus inferior margin with 2 stout

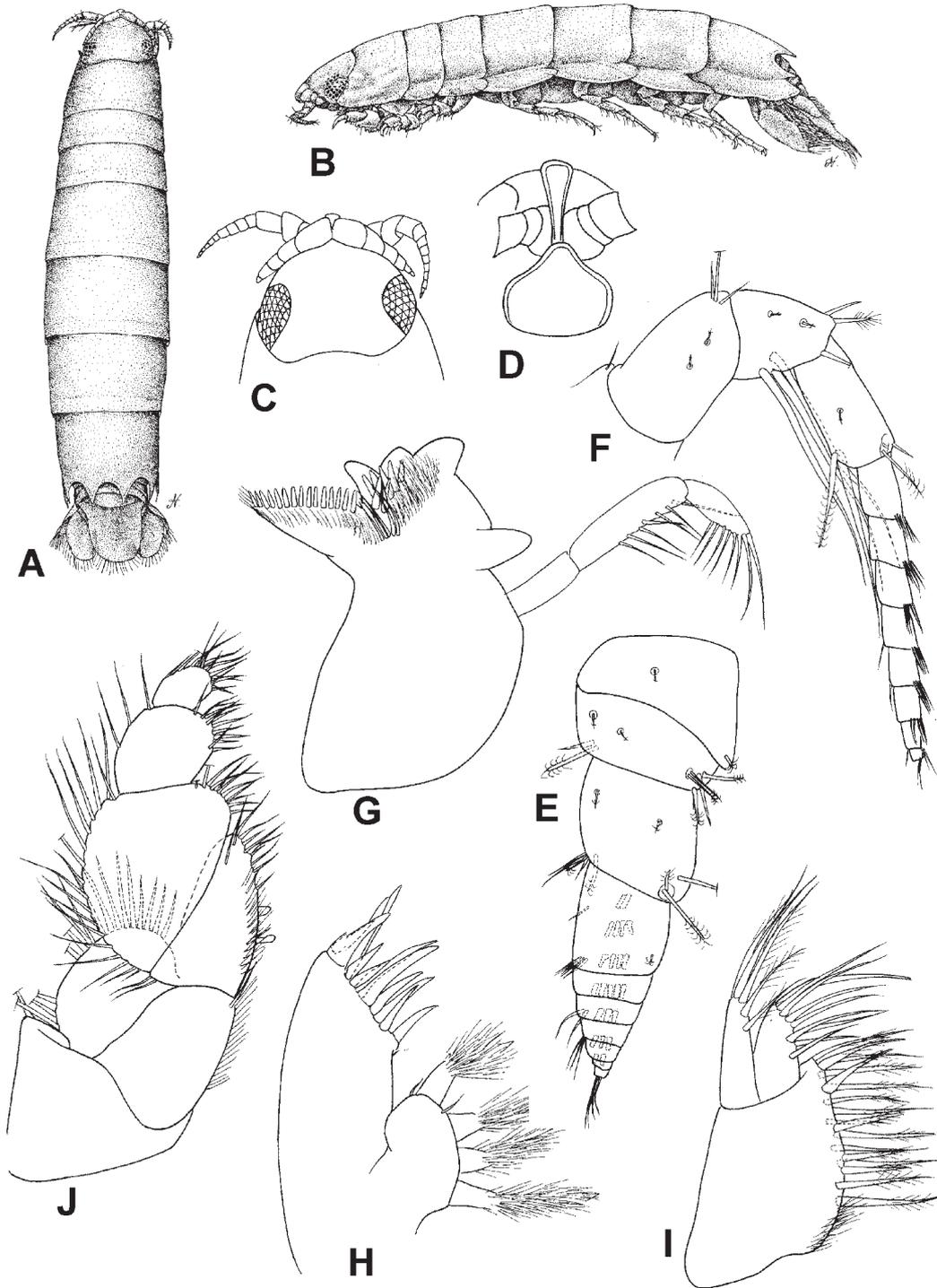


Figure 8 *Conilorpheus herdmani*. A, dorsal view; B, lateral view; C, head, dorsal view; D, frons; E, antennule; F, antenna; G, right mandible; H, maxilla; I, maxillule; J, maxilliped. Scale bar 1 mm.

robust setae and 3 small robust setae; propodus about 2.4 times as long as wide, inferior margin with margin with 2 distal robust setae and 3 slender setae, anterodistal angle with 3 setae; dactylus about 87 % length of propodus and about 3.5 as long as basal width. Pereopod 6 basis inferior margin with 2 long slender simple setae and 6 small setae (2 CP), superior distal angle with 3 long slender simple setae; ischium inferodistal angle with 2 small acute robust setae, superior angle with 2 acute robust setae and 3 slender setae; merus inferior margin with group of 2 robust setae, group 2 robust setae

and 2 long slender setae, inferodistal angle with 2 long and 1 short acute robust setae and 1 long slender seta, superior distal angle with about 10 slender setae; carpus inferior margin with a group of 2 robust setae and 1 long slender seta, inferior distal angle with about 7 setae; propodus posterior margin group of 1 spine and 1 slender seta, inferior distal angle with 1 acute robust seta and 6 slender setae, superior angle with about 5 slender setae. Pereopod 7 is largely similar to pereopod 6, but has generally fewer setae.

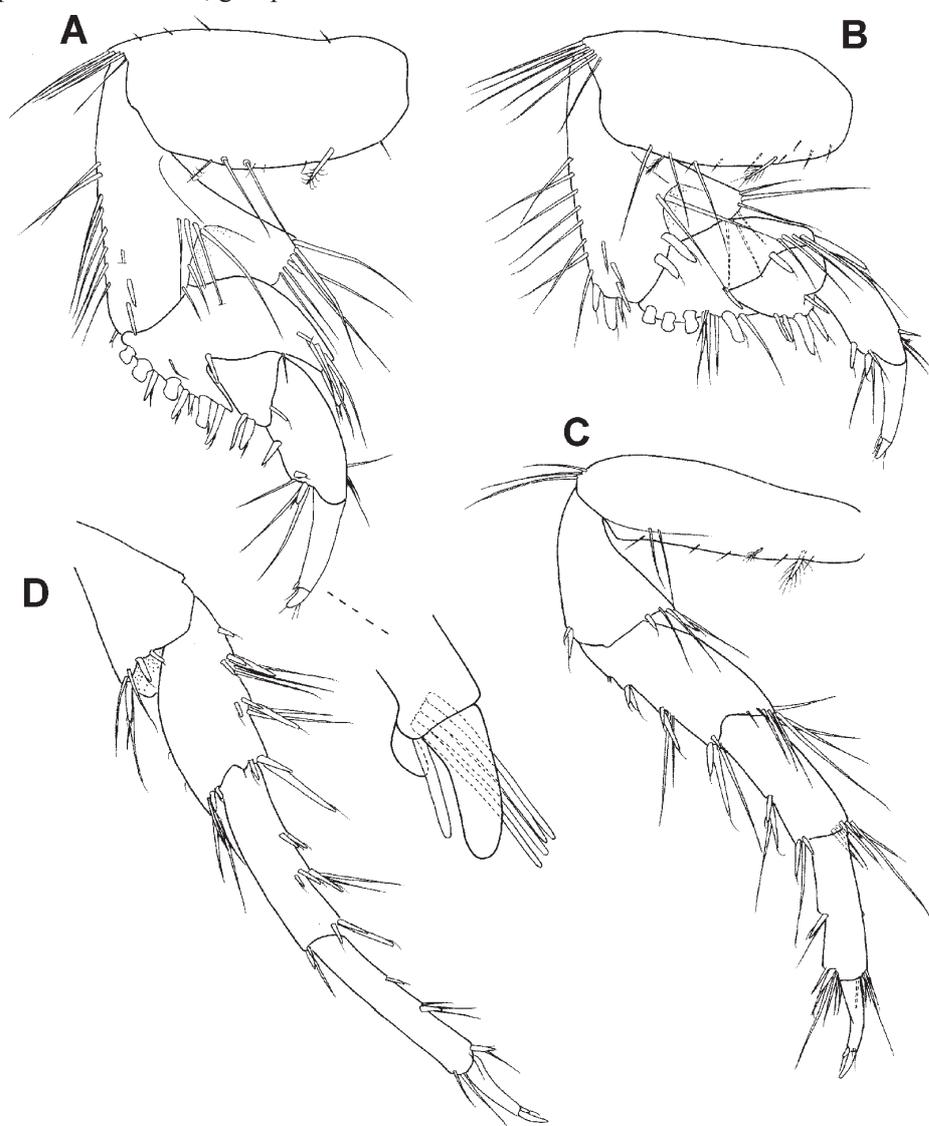


Figure 9 *Conilorpheus herdmani*. A–D, pereopods 1, 2, 6 and 7 respectively.

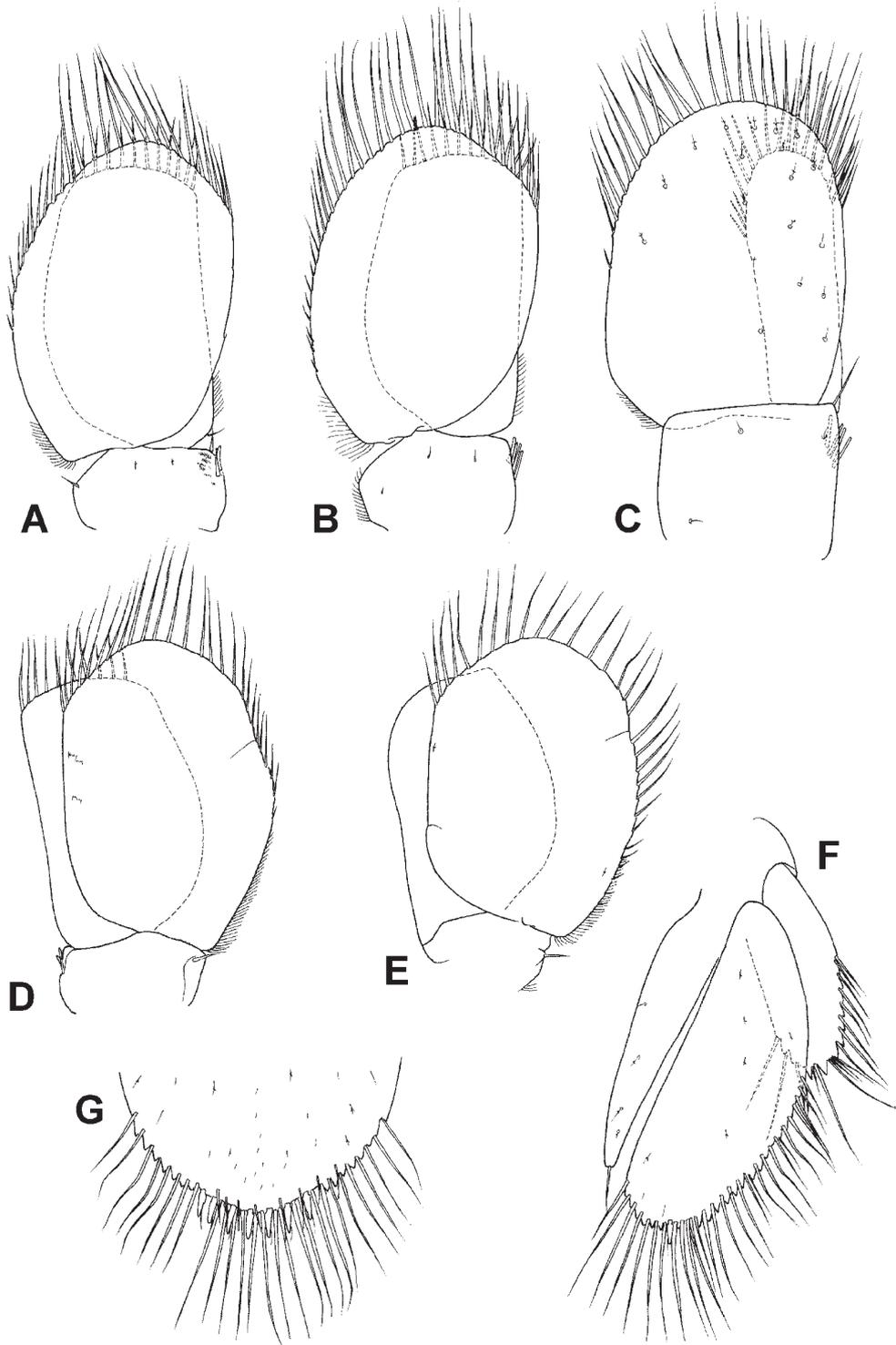


Figure 10 *Conilorpheus herdmani*. A–E, pleopods 1–5 respectively; F, uropod; G, pleotelson, posterior margin.

Pleopod 1 exopod with about 31 PMS, lateral and medial margins evenly rounded, endopod about 16 PMS, margins parallel; peduncle with 4 coupling hooks. Pleopod 2 exopod and endopod with about 35 and 12 PMS respectively; peduncle with 4 coupling hooks. Pleopod 3 and 4 similar to each other, exopod suture distinct. Pleopod 3 and 4 exopod and endopod with about 27 and 11 PMS respectively, peduncle with 3 coupling hooks. Pleopod 5 exopod with about 30 PMS; peduncle without coupling hooks. Uropod exopod 2.4 times as long as greatest width, 0.6 times as long as endopod; exopod without robust setae, lateral margin with 8 PMS, medial margin with 4 PMS, apical notch with cluster of 2 long and 2–3 short simple setae; endopod 2.5 times as long as greatest width, distally evenly rounded, apical notch or point not evident, with 1 robust seta and about 28 PMS.

Male

Figured by Stebbing (1905); no males in the present material.

Size

Present material to 6 mm, Stebbing's male specimen 6 mm.

Distribution

Known only from the type locality, 'northern end of Chilaw Paar', Sri Lanka and from the eastern Andaman Sea, Thailand at depths of about 20 metres (Stebbing, 1905) and 41 metres.

Remarks

The huge spines of the posterior of pereonite 7 immediately distinguishes this species from all others in the family. Stebbing's (1905) specimen was a male indicating that this ornamentation is not a sex-dependent character.

Genus *Excirolana* Richardson

Restricted synonymy

Excirolana.– Bruce, 1986: 39.– Kensley and Schotte, 1989: 149.– Brusca, Wetzer and France, 1995: 47.

Excirolana orientalis (Dana, 1852)

Restricted synonymy

Bruce, 1986: 41, fig. 24.– Brusca, Wetzer and France, 1995: 49.

Material examined

ZMUC CRU3697, 4 specimens, Cape Panwa, Phuket, intertidal sand and rocky shore behind PMBC, coll. J. Olesen and N.L. Bruce, 06.12.1998; AM P46564, several specimens, small cove at western end of point, Cape Panwa, Phuket, 07°48.0'N, 098°24.5'E, coarse sand, coral rubble and rock, coll. S.J. Keable, 16.11.1995; AM P46565, several specimens, just north-west of PMBC wharf, Cape Panwa, 07°48.0'N, 098°24.5'E, intertidal, coarse sand, coral rubble and rock, coll. S.J. Keable, 16–17.11.1995.

Distribution

The species is common and has been recorded at numerous localities from Australia in the East to the coasts of East Africa, and has been recorded from Penang (Jones, 1979), so its occurrence in Phuket is therefore unremarkable.

Remarks

This species is common on the rubble beach at Cape Panwa pumping station, and is also found at other beaches in the vicinity, although not recorded by Dexter (1996).

Recent descriptive accounts have been given by Bruce (1986) and Holdich *et al.* (1981). The species is immediately distinguished from other cirrolanids in this region by the presence of a prominent and anteriorly-dilated rostrum which separates the antennule bases.

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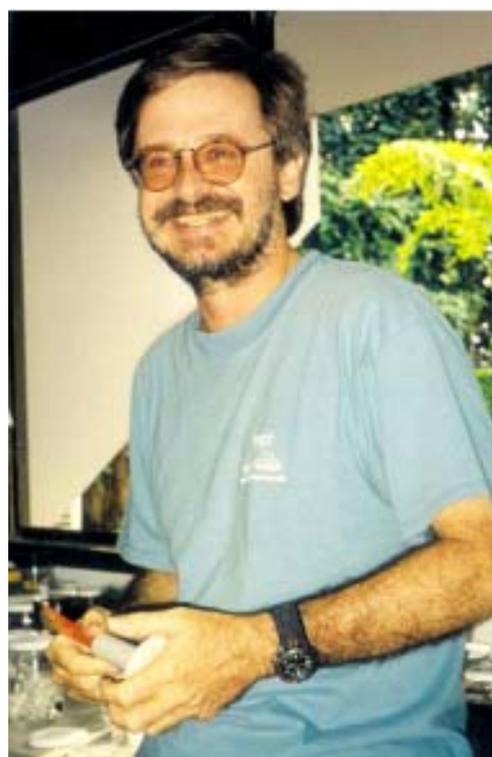
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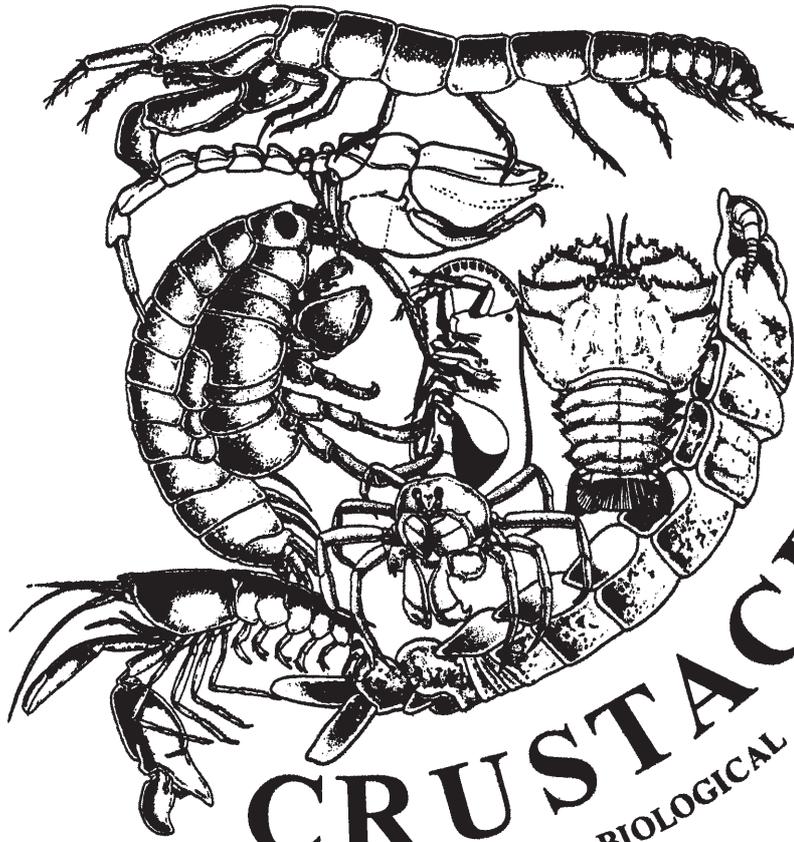
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