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**Taxonomic revision of the genus *Paramunida* Baba, 1988
(Crustacea: Decapoda: Galatheidae): a morphological and molecular approach**

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Abstract

The genus *Paramunida* belongs to the family Galatheidae, one of the most species rich families among anomuran decapod crustaceans. In spite of the genus has received substantial taxonomic attention, subtle morphological variations observed in numerous samples suggest the existence of undescribed species. The examination of many specimens collected during recent expeditions and morphological and molecular comparisons with previously described species have revealed the existence of eleven new lineages. All of them are distinguished by subtle and constant morphological differences, which are in agreement with molecular divergences reported for the mitochondrial markers ND1 and 16S rRNA. Here, we describe and illustrate the new species, providing brief redescriptions for the previously known species, and a dichotomous identification key for all species in the genus.

Key words: New species, squat lobster, morphology, molecular data, Galatheidae, *Paramunida*

Introduction

The galatheid squat lobsters of the genus *Paramunida* Baba, 1988 are distributed across the Indian and Pacific Oceans and are commonly found living on the continental shelf and slope between 200 and 500 m (Baba *et al.* 2008; Macpherson *et al.* 2010). The genus was established in 1988 by Baba to include several species previously ascribed to the genus *Munida* (Leach 1820), and currently the genus is included in the family Galatheidae Samouelle 1819. Species of *Paramunida* are characterized by having a short rostrum, reduced transverse ridges or striae on the carapace, the antennal peduncle with a well developed anterior prolongation of segment 1 and the male gonopods absent from the first abdominal somite. Subsequently, a phylogenetic study including numerous species of the genus showed that the group is monophyletic (Machordom & Macpherson 2004).

Baba (1988) included 7 species in *Paramunida*: *P. granulata* (Henderson 1885), *P. hawaiiensis* (Baba 1981), *P. longior* Baba, 1988, *P. proxima* (Henderson 1885), *P. scabra* (Henderson 1885), *P. setigera* Baba, 1988 and *P. tricarinata* (Alcock 1894). The genus was substantially enlarged after the large sampling effort carried out in waters around the Philippines, Indonesia and New Caledonia (Macpherson 1993; Baba 2005), Wallis and Futuna (Macpherson 1996), eastern Australia (Ahyong & Poore 2004), Fiji and Tonga (Macpherson 2004), French Polynesia (Macpherson 2006), New Zealand (Ahyong 2007), Taiwan and Japan (Baba *et al.* 2009; Macpherson & Baba 2009), and the Solomon Islands (Cabezas *et al.* 2009). At present 26 species are known (Baba *et al.* 2008, 2009; Cabezas *et al.* 2009) and, although the status of most of them is clear, the variability of several morphological characters (e.g. length and shape of antennal spines) suggests the existence of additional unrecognized species (Macpherson 2006). Previous works have shown the existence of additional unrecognized species within the family Galatheidae, e.g. *Agononida* Baba & de Saint Laurent 1996, *Babamunida* Cabezas, Macpherson & Machordom 2008, *Munida* (Macpherson & Machordom 2005; Macpherson & Baba 2009; Schnabel *et al.* 2009). Hence a reexamination of the morphological and molecular characters among the species of *Paramunida* is strongly recommended.

In the present work, the study of numerous representatives of *Paramunida* obtained during recent expeditions to Vanuatu, New Caledonia, Chesterfield Islands, Philippines and the southwestern Indian Ocean has revealed the existence of additional species. Here, we describe and illustrate 11 new species of *Paramunida* and provide a diagnosis of the previously known species of the genus. The most important morphological characters are emphasized in combination with molecular data from two mitochondrial markers (16S rRNA and ND1) to support the taxonomic status of each species.

Material and methods

Sampling and identification. We have studied unidentified material collected in expeditions to southwestern Indian Ocean between 1976 and 2009 (MD08, MAINBAZA), Chesterfield Islands in 2005 (EBISCO), Philippines in 2005 (PANGLAO), and Vanuatu in 2006 (SANTO). Moreover, we have also examined material from previous cruises carried out in the Philippines, Taiwan, Indonesia, Solomon Islands, Vanuatu, New Caledonia, Fiji, Tonga, Wallis, Futuna and French Polynesia deposited in the Muséum national d'Histoire naturelle, Paris (MNHN) (see references cited above). For most of the species, the type material and topotypic specimens were examined (with the exceptions of *P. granulata*, *P. longior*, *P. thalie* and *P. tricarinata*). For *P. antipodes* we did not examine any material, so we just provide the diagnosis from Ahyong & Poore (2004). The size of the carapace is indicated as the postorbital carapace length measured along the dorsal midline from the posterior margin of the orbital to the posterior margin of the carapace. The terminology used mainly follows Baba *et al.* (2009). The abbreviations used are: Mxp3 = third maxilliped, P1 = first pereopod (cheliped), P2–4 = second to fourth pereopods (first to third walking legs), M = male, F = female, ov. F = ovigerous female, juv = juvenile. The length of the antennular and antennal segments are always measured excluding distal spines, and along their lateral margins; the width is measured at midlength of each segment. We defined “mucronated spine” as a spine not evenly tapering, distally indented to form a spine-like process.

All specimens, including the types of the new species are deposited in the Muséum national d'Histoire naturelle, Paris (MNHN), and the collection of the National Taiwan Ocean University (NTOU).

Molecular analyses. Total genomic DNA was isolated from muscle tissue of pereopods using the magnetic Charge Switch gDNA Micro Tissue Kit (Invitrogen). Two mitochondrial markers were amplified (16S rRNA and ND1). Amplification reactions were performed in a final volume of 50 µl, the PCR mix contained 2 ml of DNA template, 0.16 mM of both primers, 0.2 mM of each dNTP, 5 ml of buffer (containing a final concentration of 2 mM MgCl₂), 0.5 ml of BSA (10 mg/ml), 1.5 U of Taq DNA polymerase (Biotools) and ddH₂O. The partial 16S rRNA was amplified using the new forward designed primer 16S rRNAF3 5'-AAA GGC CGC GGT ATA TTA A-3' and the reverse primer 16S rRNAbr-H from Palumbi *et al.* (1991). For the ND1, the primers ND1 af-P and ND1ar-P from Pérez-Barros *et al.* (2008) were used. Thermal cycling conditions consisted of an initial denaturation step of 94°C for 4 min followed by 39 cycles at 94°C for 30 s, an annealing temperature of 45.5°C (16S rRNA) and 40.5° (ND1) for 1 min, 72°C for 1 min, and a final extension at 72°C for 10 min. Samples were cycle-sequenced using the ABI Prism BigDye Terminator, and subsequently were run on an ABI 3730 Genetic Analyzer (Applied Biosystems, ABI). Sequences for the 16S rRNA from previous works were used (Machordom & Macpherson 2004; Cabezas *et al.* 2009). New sequences are available in GenBank under accession numbers GU814955–GU815088 and HM173357–HM173530.

Results

The eleven new species can be identified on the basis of subtle and constant morphological differences, which match clear differences in molecular sequences from the markers 16S rRNA and ND1. The divergences between each pair of taxa ranged from 1.18% to 13.25% for the 16S rRNA and from 2.06% to 20.66% for the ND1 (Table 1).

Material from *P. spatula* and *P. antipodes* could not be molecularly analysed, and species DNA from *P. hawaiiensis* and *P. marionis* failed amplification because material was preserved in formalin. The taxonomic status of the specimens named as *P. aff. longior* and *P. aff. setigera* (see under Material examined of *P. longior* and *P. tenera*, respectively) could not be assessed with confidence because they were so damaged that morphological characters were hardly visible. Although molecular divergence values suggest that they could represent new lineages, we do not take any formal decision until more specimens can be analyzed.

Systematic account

Genus *Paramunida* Baba, 1988

Paramunida Baba, 1988: 175. — Poore 2004: 239. — Baba 2005: 197. — Baba *et al.* 2008: 171. — Baba *et al.* 2009: 277.

Type species. *Paramunida setigera* Baba, 1988, by original designation. Gender: feminine.

Diagnosis. (from Baba *et al.* 2009) Carapace covered with spinules or granules, transverse striae indistinct. Rostrum short, basally subtriangular, distally ending in spine. Supraocular spines short and stout, usually remote from rostrum. Abdominal somites with 2 main transverse ridges, each with spines in regular arrangement. Antennular segment 1 with distomesial and distolateral spines, both small; lateral spines obsolescent. Antennal peduncle with strong anterior prolongation on segment 1, flagellum of no great length. P1–4 squamous; P2–4 propodi successively longer posteriorly; dactyli slender, curved and somewhat twisted, with flexor margin entire. Gonopod 1 absent in males.

Remarks. Prior to the present study, the genus comprised 26 species distributed across the Indo-West Pacific (Baba *et al.* 2008; Cabezas *et al.* 2009; Macpherson & Baba 2009). Most species are distributed in the western part, two of which also occur in the Indian Ocean (*P. scabra*, *P. tricarinata*) and with 3 species occurring in the central Pacific (*P. hawaiiensis*, *P. pictura*, *P. spatula*). In general, they exhibit a distribution positively restricted to single islands or archipelagos, with few species widely distributed (see Baba *et al.* 2008). Bathymetrically, the genus is typically recorded in transitional depths (200–500 m), with few of them distributed in the continental shelf or in the upper bathyal depths (Baba 2005). The present paper adds 11 new species to the genus, for a total of 37, which are presented here in alphabetical order.

Key to species of the genus *Paramunida*

1. Anterior prolongation of antennal segment 1 spatulate *P. spatula* Macpherson, 2006
- Anterior prolongation of antennal segment 1 spiniform..... 2
2. Rostral spine smaller or at most equal to supraocular spines 3
- Rostral spine larger than supraocular spines..... 7
3. Margin between rostral and supraocular spines clearly convex *P. curvata* Macpherson, 2004
- Margin between rostral and supraocular spines straight or slightly concave 4
4. Antennal segment 2 with minute distomesial spine..... *P. microrrhina* **n. sp.**
- Antennal segment 2 with well developed distomesial spine 5
5. Mesogastric region with 3 well-developed spines in midline..... *P. hawaiiensis* (Baba, 1981)
- Mesogastric region with minute spines. 6
6. Sternal plastron with numerous striae. Bundle of setae at base of carpus of P1 present..... *P. setigera* Baba, 1988
- Sternal plastron with few striae on each side of sternites 5–7. Bundle of setae at base of carpus of P1 absent.....
..... *P. tenera* **n. sp.**
7. Distomesial spine of antennal segment 2 almost reaching end of anterior prolongation of segment 1
..... *P. granulata* (Henderson, 1885)
- Distomesial spine of antennal segment 2 far falling short of end of anterior prolongation of segment 1 8
8. P2–4 propodi slender, about 20 times as long as broad..... *P. longior* Baba, 1988
- P2–4 propodi 7–14 times as long as broad 9
9. Distomesial spine of antennal segment 2 mucronated or bluntly produced 10
- Distomesial spine of antennal segment 2 spiniform 22
10. Mesogastric region with 1 (rarely 2) spine 11
- Mesogastric region with a median row of 3 or 4 distinct spines 13
11. Sternal plastron with numerous striae..... *P. proxima* (Henderson, 1885)
- Sternal plastron with few striae on each side of sternites 5–7 12
12. Distomesial spine of antennal segment 2 clearly overreaching antennal peduncle..... *P. belone* Macpherson, 1993
- Distomesial spine of antennal segment 2 nearly reaching end of antennal peduncle.....
..... *P. antipodes* Ahyong & Poore, 2004
13. Distomesial spine of antennal segment 2 slightly or clearly overreaching antennal peduncle..... 14
- Distomesial spine of antennal segment 2 never reaching end of antennal peduncle..... 19
14. Lateral margin of antennular segment 1 with distal slender portion as long as proximal inflated portion
..... *P. spica* **n. sp.**
- Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion ...
..... 15
15. Distolateral spine of antennal segment 2 exceeding antennal segment 3.....
..... *P. salai* Cabezas, Macpherson & Machordom, 2009
- Distolateral spine of antennal segment 2 not reaching end of antennal segment 3 16
16. Mesial margin of antennal segment 2, including distal spine, straight. Rostrum triangular or spiniform..... 17
- Mesial margin of antennal segment 2, including distal spine, convex. Rostrum spiniform..... 18
17. Rostrum triangular. *P. ascella* **n. sp.**
- Rostrum spiniform *P. mozambica* **n. sp.**
18. Distomesial spine of antennal segment 2 shorter than rest of segment 2. Gastric region with short striae. Antennal segment 3 about 1.5 times longer than broad..... *P. stichas* Macpherson, 1993
- Distomesial spine of antennal segment 2 as long as rest of segment 2. Gastric region with moderately-sized striae. Antennal segment 3 about twice longer than broad..... *P. lophia* Cabezas, Macpherson & Machordom, 2009
19. Mesogastric region without well developed spines *P. parvispina* **n. sp.**
- Mesogastric region with a row of 3 or 4 distinct spines 20

20. Sternal plastron with numerous striae. Segment 2 of antennal peduncle bluntly produced distomesially *P. evexa* Macpherson, 1993
 - Sternal plastron with few striae, sternites 5–7 with few striae on each side. Segment 2 of antennal peduncle produced distomesially ending in distinct spine 21
21. Rostrum triangular. Propodus of walking legs more than 1.5 times dactylus length *P. echinata* Macpherson, 1999
 - Rostrum spiniform. Propodus of walking legs slightly longer than dactylus *P. labis* Macpherson, 1996
22. Rostrum with thick dorsal carina *P. cristata* Macpherson, 2004
 - Rostrum with thin dorsal carina 23
23. Distomesial spine of antennal segment 2 clearly exceeding antennal peduncle *P. leptotes* Macpherson & Baba, 2009
 - Distomesial spine of antennal segment 2 not reaching or at most slightly exceeding antennal peduncle 24
24. Mesogastric region with 1 (rarely 2) spine 25
 - Mesogastric region with a row of 3 or 4 distinct spines 28
25. Median cardiac region with 1 spine *P. pronoe* Macpherson, 1993
 - Median cardiac region with a row of 3 or 4 spines 26
26. Tufts of long and dense setae along anterior branch of cervical groove *P. crinita* **n. sp.**
 - Few and short setae along anterior branch of cervical groove 27
27. Sternal plastron with few striae, sternites 5–7 only with few striae on each lateral side
 *P. polita* Macpherson, 1993
 - Sternal plastron with numerous striae *P. scabra* (Henderson, 1885)
28. Sternal plastron with numerous striae 29
 - Sternal plastron with few striae, sternites 5–7 only with few striae on each lateral side 30
29. Antennal segment 3 twice as long as broad. Few and short setae along anterior branch of cervical groove
 *P. thalie* Macpherson, 1993
 - Antennal segment 3 slightly longer than broad. Tufts of long and dense setae along anterior branch of cervical groove *P. tricarinata* (Alcock, 1894)
30. Distomesial spine of antennal segment 2 reaching or overreaching end of antennal peduncle. Distolateral spine of antennal segment 2 reaching or slightly exceeding end of antennal segment 3 *P. marionis* **n. sp.**
 - Distomesial spine of antennal segment 2 not reaching end of antennal peduncle. Distolateral spine of antennal segment 2 not reaching end of antennal segment 3 31
31. Antennal segment 3 more than twice longer than broad *P. amphitrita* Macpherson, 1996
 - Antennal segment 3 as long as broad 32
32. Antennal segment 2 as long as or more than 3 times longer than broad 33
 - Antennal segment 2 at most twice longer than broad 34
33. Distomesial spine of antennal segment 2 reaching or slightly overreaching end of antennal segment 3. Spinules on gastric and hepatic regions mostly forming groups arising from scale-like striae *P. pictura* Macpherson, 1993
 - Distomesial spine of antennal segment 2 not reaching end of antennal segment 3. Spinules on gastric and hepatic regions mostly not in groups, lacking scaly striae *P. poorei* **n. sp.**
34. Antennal segment 2 slightly longer than broad *P. cretata* Macpherson, 1996
 - Antennal segment 2 twice longer than broad 35
35. Row of small epigastric spines behind rostral spine absent *P. luminata* Macpherson, 1996
 - Row of small epigastric spines behind rostral spine present 36
36. P2–4 propodi less than 10 times longer than high. Merocarpal articulation of P3 clearly exceeding end of anterior prolongation of antennal segment 1 *P. antares* **n. sp.**
 - P2–4 propodi more than 10 times longer than high. Merocarpal articulation of P3 slightly exceeding end of anterior prolongation of antennal segment 1 *P. achernar* **n. sp.**

***Paramunida achernar* n. sp.**

(Figs. 1, 12A)

Paramunida cretata Macpherson 2004: 283 (Tonga, 371–497 m) (not *P. cretata* Macpherson, 1996).

Material examined. *Holotype*: Tonga. BORDAU 2. Stn CP1643, 21°04.54'S, 175°22.50'W, 22 June 2000, 487 m: ov. F 9.7 mm (MNHN-Ga7468).

Paratypes: Tonga. BORDAU 2. Stn CP1510, 21°04.65'S, 175°22.52'W, 31 May 2000, 461–497 m: 3 M 9.0–10.7 mm, 3 F 8.9–9.8 mm (MNHN-Ga7469). — Stn 1545, 21°17.46'S, 175°17.18'W, 05 June 2000, 444–447 m: 2 M 10.4–11.2 mm. — Stn 1586, 18°34.20'S, 173°54.93'W, 13 June 2000, 440–487 m: 1 ov. F 11.5 mm. — Stn 1596, 19°06.46'S, 174°18.19'W, 14 June 2000, 371–437 m: 2 ov. F 9.1–9.5 mm. — Stn CP1643, 21°04.54'S, 175°22.50'W, 22 June 2000, 487 m: ov. F 10.2 mm.

Etymology. The name *achernar* refers to one of the stars of the southern hemisphere (constellation of Eridanus); used as a noun in apposition.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; with median row of spinules behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others. Anterior branch of cervical groove with short setae. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, exceeding or reaching sinus between rostral and supraocular spines. Rostrum spiniform, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 1A, B).

Sternum: Thoracic sternites 4–6 with few arcuate striae; sternite 7 smooth (Fig. 1C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 1A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and slightly shorter than distolateral; twice longer than wide and with fringe of long setae along lateral margin; distal slender portion about half as long as proximal inflated portion (Fig. 1D).

Antenna: Anterior prolongation of segment 1 slightly overreaching antennular segment 1 by about one-fourth of its length. Segment 2 about twice length of segment 3 and twice longer than wide, ventral surface with scales; distomesial spine spiniform, not exceeding antennal peduncle, reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 nearly 1.5 times longer than wide and unarmed (Fig. 1D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 1E).

Pereopod 1: Long and slender, squamate, between 4.8–4.9 times carapace length; carpus about as long as palm, 5.9–6.5 times longer than height; palm 1.2–1.3 times finger length. Base of carpus without bundle of setae (Fig. 1F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.1–3.2 times carapace length, merus 1.5–2.0 times longer than carapace, about 12 times as long as high, 4.5 times as long as carpus and 1.5–1.7 times as long as propodus; propodus 11–14 times as long as high, 1.7 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margin. Carpus with some small dorsal spines, distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus slightly shorter than P2 merus; propodus and dactylus as long as those of P2. P4 as long as P2; merus 1.5–2.2 times carapace length; propodus and dactylus as long as those of P3; merocarpal articulation slightly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 1G–I).

Remarks. The new species is morphologically very close to *P. antares* n. sp. from New Caledonia and *P. cretata* from the Wallis Islands, Waterwitch Bank and Fiji (see Remarks for those species).

Distribution. Tonga, between 371 and 497 m.

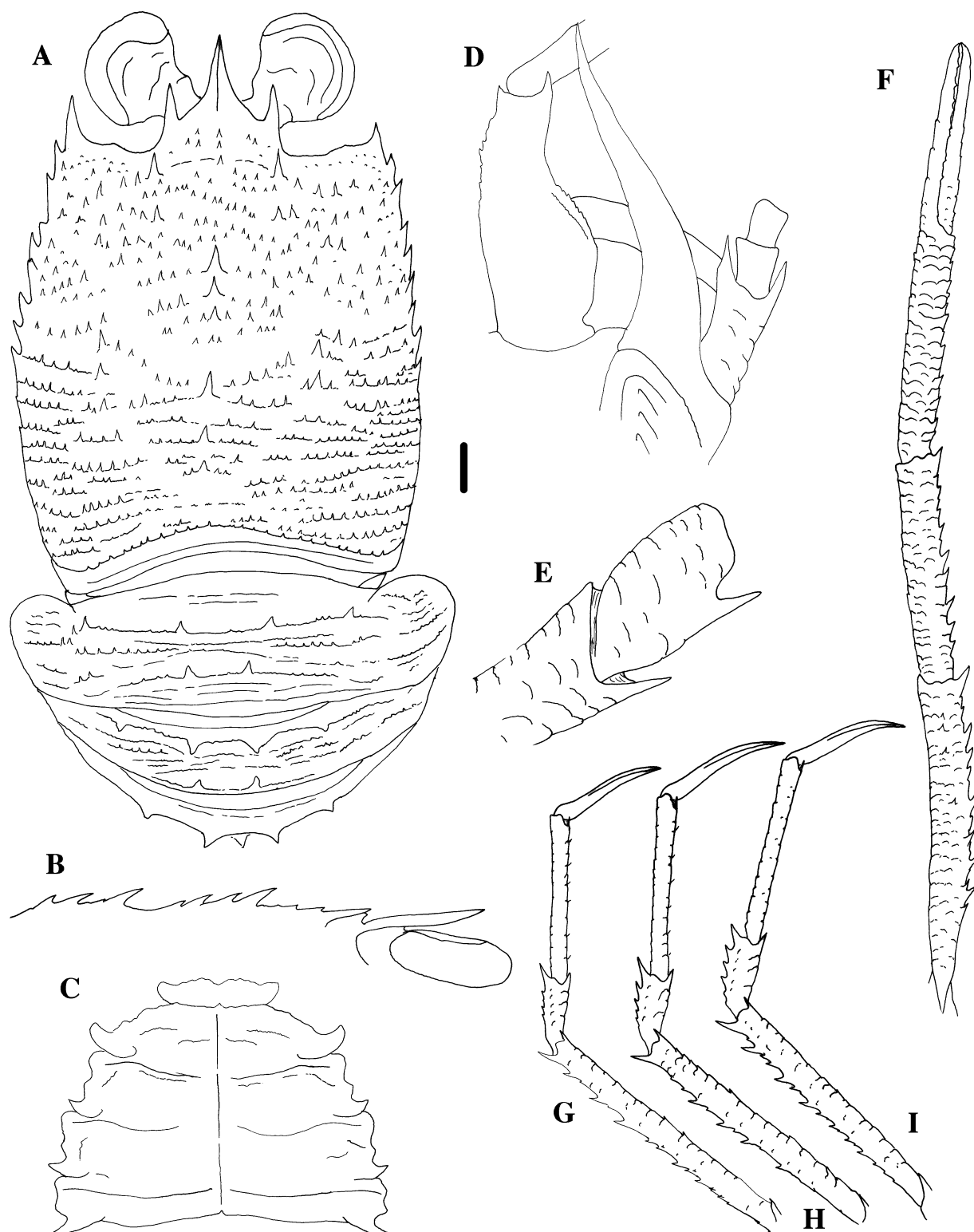


FIGURE 1. *Paramunida achnar* n. sp. ovigerous female holotype, 9.7 mm (MNHN-Ga7468). Tonga. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, left P1, dorsal view. G, right P2, lateral view. H, right P3, lateral view. I, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

***Paramunida amphitrita* Macpherson, 1996**

(Figs. 12B, 16A)

Paramunida amphitrita Macpherson, 1996: 409, fig. 7 (Futuna Island, 233–235 m); 2004: 282 (in part) (Fiji and Tonga, 327–410 m). — Baba 2005: 301 (key, synonymies). — Baba *et al.* 2008: 171 (list of occurrences).

Not *Paramunida amphitrita* Macpherson 2004: 282 (Fiji, in part, one specimen from Stn CP1412 = *P. cretata* Macpherson, 1996).

Material examined. Futuna Island. MUSORSTOM 7. Stn 517, 14°13.4'S, 178°10.4'W, 12 May 1992, 233–235 m: F 7.7 mm (holotype, MNHN-Ga3650), 1 F 8.9 mm, (MNHN-Ga3741).

Fiji Islands. BORDAU 1. Stn 1394, 16°45.19'S, 179°59.19'E, 23 February 1999, 416 m: 2 ov. F 11.4–13.0 mm. — Stn 1410, 16°05.51'S, 179°27.76'W, 26 February 1999, 400–410 m: 1 M 12.2 mm, 1 ov. F 10.5 mm. — Stn 1412, 16°05.52'S, 179°28.05'W, 26 February 1999, 400–407 m: 1 ov. F 11.2 mm.

Tonga Islands. BORDAU 2. Stn 1583, 18°36.72'S, 174°02.84'W, 13 June 2000, 327–360 m: 1 juv. 4.8 mm.

New Caledonia. Lifou Island. LIFOU. Stn DW1650, 20°54.15'S, 167°01.7'E, 15 November 2000, 120–250 m: 1 M 9.2 mm, 2 ov. F 10.4–10.5 mm.

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron smooth, few striae on sternite 4. Lateral margin of antennular segment 1 with distal slender portion slightly shorter than proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 nearly twice longer than broad, with distomesial spine spiniform, clearly overreaching end of segment 3 but not reaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 more than twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 18 times as long as wide, and about 1.4 times dactylus length.

Remarks. *Paramunida amphitrita* is related to *P. cretata* from Waterwitch Bank, Wallis Islands and Fiji and *P. thalie*, from Vanuatu, New Caledonia, Loyalty Islands, Chesterfield Islands, Fiji and Queensland (see below under Remarks for those species).

Distribution. Futuna, Fiji, Tonga and New Caledonia, between 233 and 410 m.

***Paramunida antares* n. sp.**

(Figs. 2, 12C)

Paramunida luminata Machordom & Macpherson 2004: 262 (table) (not *P. luminata* Macpherson, 1996).

Material examined. *Holotype*: New Caledonia. NORFOLK 1. Stn DW1694, 24°40'S, 168°39'E, 24 June 2000, 575–582 m: M 9.0 mm (MNHN-Ga7470).

Paratypes: New Caledonia. NORFOLK 1. Stn CP1670, 23°39'S, 167°59'E, 21 June 2000, 382–384 m: 1 M 5.0 mm, 1 F 9.2 mm (MNHN-Ga7471).

Etymology. The name *antares* refers to one of the stars of the southern hemisphere (constellation of Scorpius); used as a noun in apposition.

Description. *Carapace*: Slightly longer than broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine, with median row of spines behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others.

Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, slightly exceeding sinus between rostral and supraocular spines. Rostrum triangular, slightly larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 2A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–7 smooth (Fig. 2C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 2A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and shorter than distolateral; twice longer than wide, with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 2D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about 1.4 times length of segment 3 and 1.5 times longer than wide, ventral surface with scales; distomesial spine spiniform, reaching end of segment 3, not reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 nearly twice longer than wide and unarmed (Fig. 2D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 2E).

Pereopod 1: Missing chelipeds on type material.

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.3 times carapace length, merus 1.5 times longer than carapace, about 12 times as long as high, 4.4 times as long as carpus and 1.7 times as long as propodus; propodus about 9 times as long as high, and 1.6 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margin. Carpus with some small dorsal spines, distal spine on dorsal and ventral margins. Propodus with some small movable ventral spinules. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. P3 with similar spination and segment proportions than P2; merus as long as P2 merus; propodus and dactylus slightly longer than those of P2. P4 as long as or slightly shorter than P2; merus about 1.4 times carapace length; propodus and dactylus slightly shorter than those of P3; merocarpal articulation clearly exceeding end of anterior prolongation of first segment of antennal peduncle (Figs. 2F–I).

Remarks. *Paramunida antares* n. sp. from New Caledonia is very close to *P. achernar* n. sp. from Tonga. The two species can be distinguished by the following characters:

— The P2–4 propodi are more than 10 times longer than high in *P. antares* and less than 10 times in *P. achernar*.

— The merocarpal articulation of P3 clearly exceeds the anterior prolongation of the antennal segment 1 in *P. antares*, only slightly exceeding the anterior prolongation in *P. achernar*.

The genetic divergences between *P. achernar* and *P. antares* were 3.67% (16S rRNA) and 9.69% (ND1).

The new species is also related to *P. luminata* from Tuscarora Bank, Wallis Islands, Alofi Bank, Bayonnaise Bank and *P. echinata* from the French Polynesia (see under Remarks for those species).

The specimens identified as *P. luminata* by Machordom and Macpherson (2004) belong to the present new species.

Distribution. New Caledonia, between 382 and 582 m.

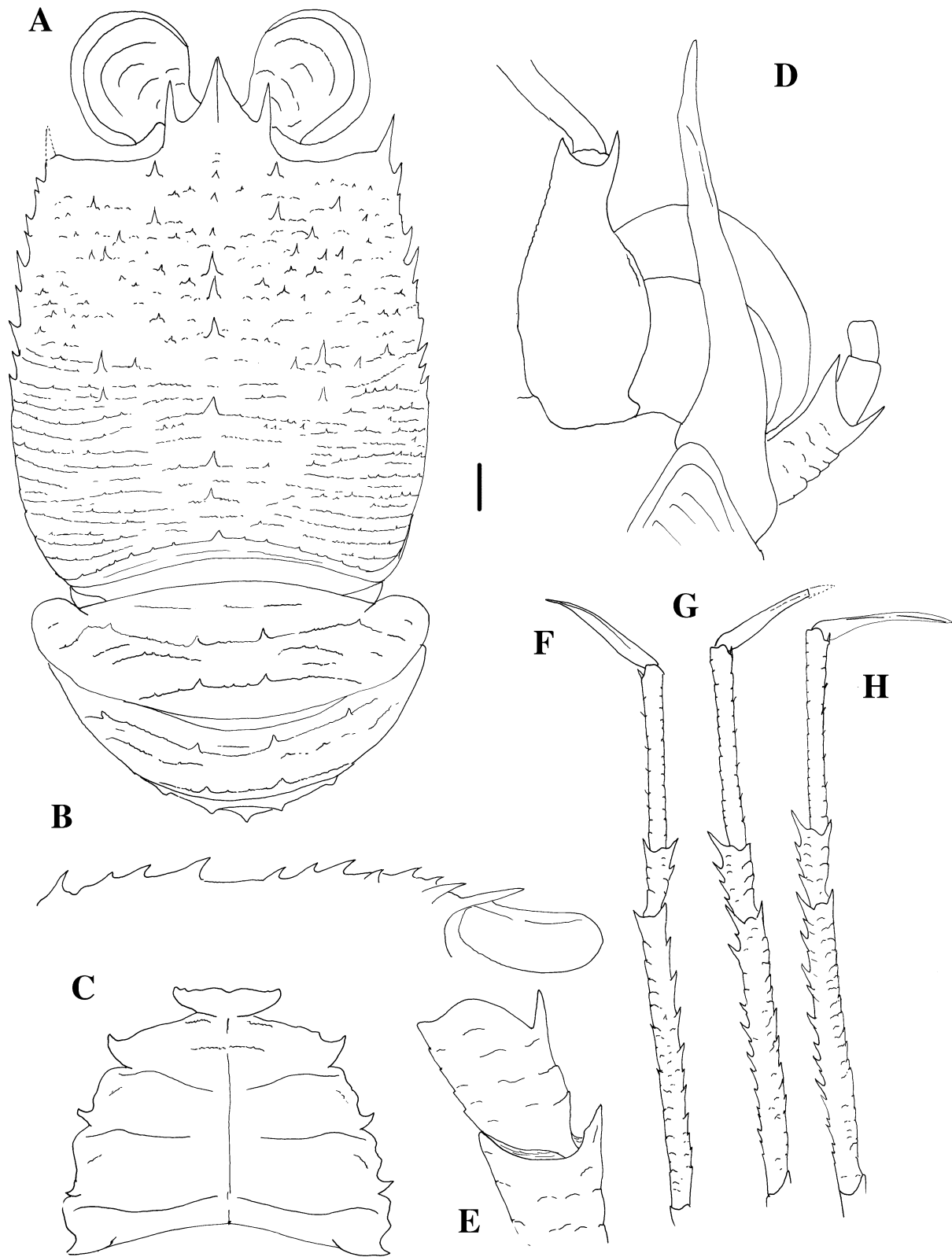


FIGURE 2. *Paramunida antares* n. sp. male holotype, 9.0 mm (MNHN-Ga7470). New Caledonia. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, left P2, lateral view. G, right P3, lateral view. H, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–H = 2 mm.

***Paramunida antipodes* Ahyong & Poore, 2004**

(Fig. 16B)

Paramunida antipodes Ahyong & Poore, 2004: 65, fig. 16 (Queensland and New South Wales, 420–549 m). — Poore 2004: 238, fig. 66a (compilation). — Baba 2005: 301 (key, synonymies). — Baba *et al.* 2008: 171 (list of occurrences).

Diagnosis. (from Ahyong & Poore 2004) Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines slightly concave. Mesogastric region with 1 distinct spine. Median cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron smooth, with few median striae on sternite 4, and some short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine mucronated, clearly overreaching end of segment 3 and nearly reaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 1.5 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 9 times as long as wide, and about 1.4 times dactylus length.

Remarks. The species resembles *P. parvispina* n. sp. from the Chesterfield Islands and *P. evexa* from Indonesia (see below under Remarks for those species).

Distribution. Queensland and New South Wales, between 420 and 549 m.

***Paramunida ascella* n. sp.**

(Figs. 3, 12D)

Material examined. *Holotype:* Vanuatu. SANTO. Stn AT 9, 15°41.5'S, 167°01.3'E, 17 September 2006, 481 m: M 10.9 mm (MNHN-Ga7472).

Paratypes: Vanuatu. MUSORSTOM 8. Stn CP 1119: 15°08'S, 166°53'E, 09 October 1994, 254–300 m: 1 ov. F 10.7 mm (MNHN-Ga7473). — Stn CP 1134, 15°39'S, 167°02'E, 11 October 1994, 230–287 m: 1 M 10.0 mm, 1 ov. F 8.5 mm, 1 F 8.1 mm (MNHN-Ga7474). SANTO. Stn AT 9, 15°41.5'S, 167°01.3'E, 17 September 2006, 481 m: 3 M 7.8–10.9 mm, 12 ov. F 9.8–11.9 mm (MNHN-Ga7475). — Stn AT 11, 15°39.5'S, 167°01.5'E, 17 September 2006, 272–286 m: 1 ov. F 11.5 mm (MNHN-Ga7476). — Stn AT 63, 15°39.6'S, 167°01.3'E, 04 October 2006, 290–334 m: 5 M 10.6–12.2 mm, 6 ov. F 9.9–12.3 mm, 1 F 8.7 mm (MNHN-Ga7477).

Etymology. The name *ascella* refers to one of the stars of the southern hemisphere (constellation of Sagittarius); used as a noun in apposition.

Description. *Carapace:* As long as broad. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine, without median row of spines behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others (third spine very reduced in some specimens). Cervical groove distinct, with long setae along anterior branch. Cardiac and anterior branchial regions circumscribed. Cardiac region with median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, exceeding sinus between rostral and supraocular spines. Rostrum triangular; larger than supraocular spines; margin between rostral and supraocular spines straight or slightly concave (Figs. 3A, B).

Sternum: Thoracic sternite 4 with some arcuate striae; sternites 5–6 with some striae on each lateral side, sternite 7 smooth (Fig. 3C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (broken in holotype) (Fig. 3A).

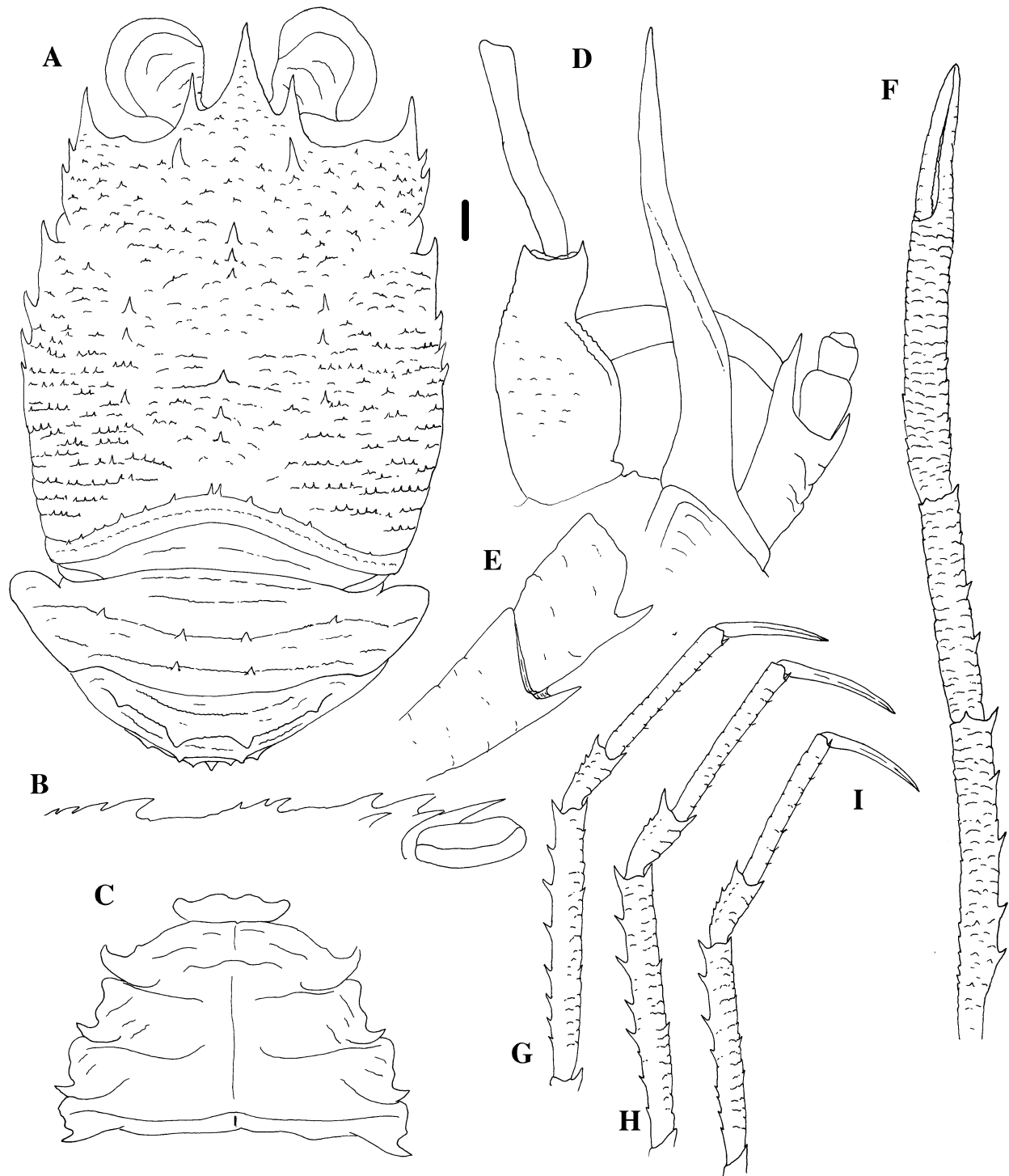


FIGURE 3. *Paramunida ascella* n. sp. male holotype, 10.9 mm (MNHN-Ga7472). Vanuatu. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, dorsal view. G, right P2, lateral view. H, right P3, lateral view. I, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and slightly shorter than distolateral; twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 3D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by one half of its length. Segment 2 about 2.5 times length of segment 3 and less than twice longer than wide, ventral surface

with scales; mesial margin, including distal spine, straight; distomesial spine mucronated, reaching end of antennal peduncle, not reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 1.5 times longer than wide and unarmed (Fig. 3D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 3E).

Pereopod 1: Long and slender, squamate, 4.6–5.2 times carapace length; carpus 0.8–1.1 times palm length, and 5.5–6.2 times longer than height; palm 1.2–2.0 times fingers length. Base of carpus without bundle of setae (Fig. 3F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 2.9–3.1 times carapace length, merus 1.3–1.4 times longer than carapace, 8.3–10.0 times as long as high, 2.4–3.8 times as long as carpus and 1.6–2.4 times as long as propodus; propodus 8.2–10.0 times as long as high, and 1.6–2.0 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; few small spines along ventrolateral margin. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margins. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carina along mesial and lateral sides, ventral border unarmed. End of P2 carpus not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus as long as P2 merus; propodus and dactylus slightly longer than those of P2. P4 shorter than P2; merus 1.1–1.3 times carapace length; propodus and dactylus slightly shorter than those of P3; merocarpal articulation not reaching end of anterior prolongation of segment 1 of antennal peduncle. P3–P4 dactylus with longitudinal carinae along lateral and mesial margin (Figs. 3G–I).

Remarks. *Paramunida ascella* **n. sp.** is related to *P. crinita* **n. sp.** from the Philippines, and *P. mozambica* **n. sp.** from Mozambique (see under Remarks for those species).

Distribution. Vanuatu, between 230 and 481 m.

Paramunida belone Macpherson, 1993

(Figs. 12E, 16C)

Paramunida belone Macpherson, 1993: 448, figs 1, 12 (Loyalty Islands, 250–437 m); 1996: 410 (Futuna Island, 245–395 m); 2004: 282 (Fiji and Tonga, 321–487 m). — Baba 2005: 197, 302 (key, synonymies, Bali Sea, 450 m). — Baba *et al.* 2008: 171 (list of occurrences).

Material examined. New Caledonia. NORFOLK 2. Stn CP2118, 23°22.87'S, 168°00.86'E, 01 November 2003, 242 m: 1 M 14.2 mm, 2 ov. F 10.5–11.5 mm.

Loyalty Islands. MUSORSTOM 6. Stn DW398, 20°47.19'S, 167°05.65'E, 13 February 1989, 370 m: 1 F broken. — Stn CP464, 21°02.3'S, 167°31.6'E, 21 February 1989, 430 m: 1 M 15.0 mm (holotype, MNHN-Ga2853), 1 M 17.8 mm (MNHN-Ga3014).

Vanuatu. MUSORSTOM 8. Stn CP963, 20°20.10'S, 169°49.08'E, 21 September 1994, 400–440 m: 18 M 8.2–14.8 mm, 6 ov. F 10.8–13.4 mm, 1 F 5.9 mm. — Stn CP980, 19°21.02'S, 169°25.22'E, 22 September 1994, 430–450 m: 4 M 12.3–13.4 mm, 2 F 10.3–14.6 mm. — Stn CP1091, 15°10.24'S, 167°13.01'E, 06 October 1994, 344–350 m: 2 M 7.9–11.7 mm, 1 ov. F 10.2 mm. SANTO. Stn AT1, 15°32.4'S, 167°16.4'E, 14 September 2006, 167–367 m: 2 M 12.5–12.7 mm. — Stn AT48, 15°33.8'S, 167°18.9'E, 30 September 2006, 330–341 m: 2 ov. F 10.6–11.7 mm. — Stn AT49, 15°33.8'S, 167°18.9'E, 30 September 2006, 266–328 m: 1 ov. F 8.6 mm.

Tonga. BORDAU 2. Stn CP1511, 21°07.83'S, 175°22.38'W, 31 May 2000, 384–402 m: 3 M 10.0–10.9 mm, 5 ov. F 8.2–11.5 mm.

Futuna Island. Stn 505, 14°19.5'S, 178°04.3'W, 11 May 1992, 245–400 m: 8 M 9.3–12.9 mm, 7 ov. F 8.0–10.9 mm, 4 F 8.4–9.3 mm (MNHN-Ga3743).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 (rarely 2) well-developed spine. Median cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron smooth, with some median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 more than 2.5 times longer than broad, with distomesial spine of segment 2 mucronated, clearly overreaching antennal peduncle, distolateral spine reaching end of segment 3; segment 3 1.5 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 13 times as long as wide, and about 1.4 times dactylus length.

Remarks. *Paramunida belone* is morphologically related to *P. lophia* and *P. salai* from the Solomon Islands, *P. spica* n. sp. from Vanuatu and *P. proxima* from the Philippines, off Zamboanga, Mindanao, north of the Admiralty Islands, Indonesia, Kei Islands, Solomon Islands and Vanuatu (see Remarks for those species).

Distribution. New Caledonia, Loyalty Islands, Vanuatu, Tonga, Fiji, Wallis and Futuna and Bali Sea, between 250 and 487 m.

Paramunida cretata Macpherson, 1996

(Figs. 12F, 16D)

Paramunida cretata Macpherson, 1996: 411, figs 8, 23 (SW Pacific, Waterwitch Bank and Wallis Islands, 300–365 m).

— Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 171 (list of occurrences).

Paramunida amphitrita Macpherson 2004: 282 (in part, one specimen from Stn CP1412, not *P. amphitrita* Macpherson, 1996).

Not *Paramunida cretata* Macpherson 2004: 283 (Tonga, 371–497 m) (= *P. achernar* n. sp.).

Material examined. Waterwitch Bank. MUSORSTOM 7. Stn 569, 12°30.0'S, 176°51.2'W, 21 May 1992, 300–305 m: 1 ov. F 11.5 mm (holotype, MNHN-Ga 3651), 4 F 7.4–10.5 mm (MNHN-Ga3744).

Wallis Islands. MUSORSTOM 7. Stn 583, 13°11.1'S, 176°14.2'W, 22 May 1992, 330–365 m: 2 M 10.0–11.4 mm, 1 ov. F 10.0 mm (USNM). — Stn 605, 13°21.3'S, 176°08.4'W, 26 May 1992, 335–340 m: 1 F 6.0 mm (MNHN-Ga3745).

Fiji. BORDAU 1. Stn CP1412, 16°05.52'S, 179°28.05'W, 26 February 1999, 400–407 m: 1 ov. F 10.5 mm.

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Median cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron smooth, with some median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 slightly longer than broad, with distomesial spine spiniform, overreaching end of segment 3 but not reaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 10 times as long as wide, and about 1.5 times dactylus length.

Remarks. This species resembles *P. achernar* n. sp. from Tonga from which it can be distinguished by the following characters:

— The strong anterior prolongation on the antennal segment distinctly overreaches the antennular peduncle in *P. cretata*, whereas this prolongation slightly overreaches the antennular segment 1 in *P. achernar*.

— The antennal segment 2 is twice longer than wide in *P. achernar* and slightly longer than wide in *P. cretata*.

— The P2 propodus is 10 times as long as high in *P. cretata* and 11–14 times as long as high in *P. achernar*.

The genetic divergences between *P. achernar* and *P. cretata* were 2.83% (16S rRNA) and 7.57% (ND1).

Paramunida cretata is also related to *P. amphitrita* from Futuna, Fiji, Tonga and New Caledonia islands. The two species can be easily differentiated by the shape of segment 3 of the antennal peduncle and the length of the distomesial spine of segment 2. Segment 3 is as long as broad in *P. cretata*, whereas it is more than twice longer than broad in *P. amphitrita*. The distomesial spine of segment 2 is nearly as long as the rest of the segment in *P. amphitrita*, whereas this spine is clearly much shorter than the rest of the segment in *P. cretata*. The genetic divergences between *P. amphitrita* and *P. cretata* were 5.12% (16S rRNA) and 13.68% (ND1).

Distribution. Waterwitch Bank, Wallis Islands and Fiji, 300–497 m.

***Paramunida crinita* n. sp.**

(Figs. 4, 12G)

Paramunida scabra Macpherson, 1993: 462 (in part, only specimens from the Philippines, MUSORSTOM 1, 2 and 3).

Material examined. *Holotype*: Philippines. MUSORSTOM 2, Stn CP80, 13°45'N, 120°38'E, 01 December 1980, 178–205 m: M 7.8 mm (MNHN-Ga7478).

Paratypes: Philippines. MUSORSTOM 2, Stn CP80, 13°45'N, 120°38'E, 01 December 1980, 178–205 m: 15 M 6.4–10.2 mm, 11 ov. F 6.7–10.2 mm, 1 F 6.0 mm (MNHN-Ga, 3437, 7479). MUSORSTOM 3. Stn CP90, 14°00'N, 120°19'E, 31 May 1985, 195 m: 13 M 8.3–10.2 mm, 4 F 9.2–10.6 mm (MNHN-Ga3444, 7480).

Etymology. From the Latin *crinis*, hair, in reference to the long setae along the cervical groove.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Long and dense setae along anterior branch of cervical groove. Epigastric region with 2 spines, each behind supraocular spine, with median row of minute spinules behind rostral spine. Mesogastric region with one median spine. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, clearly exceeding sinus between rostral and supraocular spines. Rostrum spiniform, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 4A, B).

Sternum: Thoracic sternites 4–6 with some arcuate striae, sternite 7 smooth (Fig. 4C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 4A).

Eyes: Maximum corneal diameter about one-third distance between bases of anterolateral spines.

Antennule: Segment 1 exceeding corneae, with distomesial spine small and slightly shorter than distolateral; about twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion. (Fig. 4D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about twice length of segment 3 and twice longer than wide, ventral surface with scales; distomesial spine spiniform, not exceeding antennal peduncle, overreaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 about as long as wide and unarmed. Distomesial spine segment 2 shorter than the rest of the segment (Fig. 4D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin with distal spine (Fig. 4E).

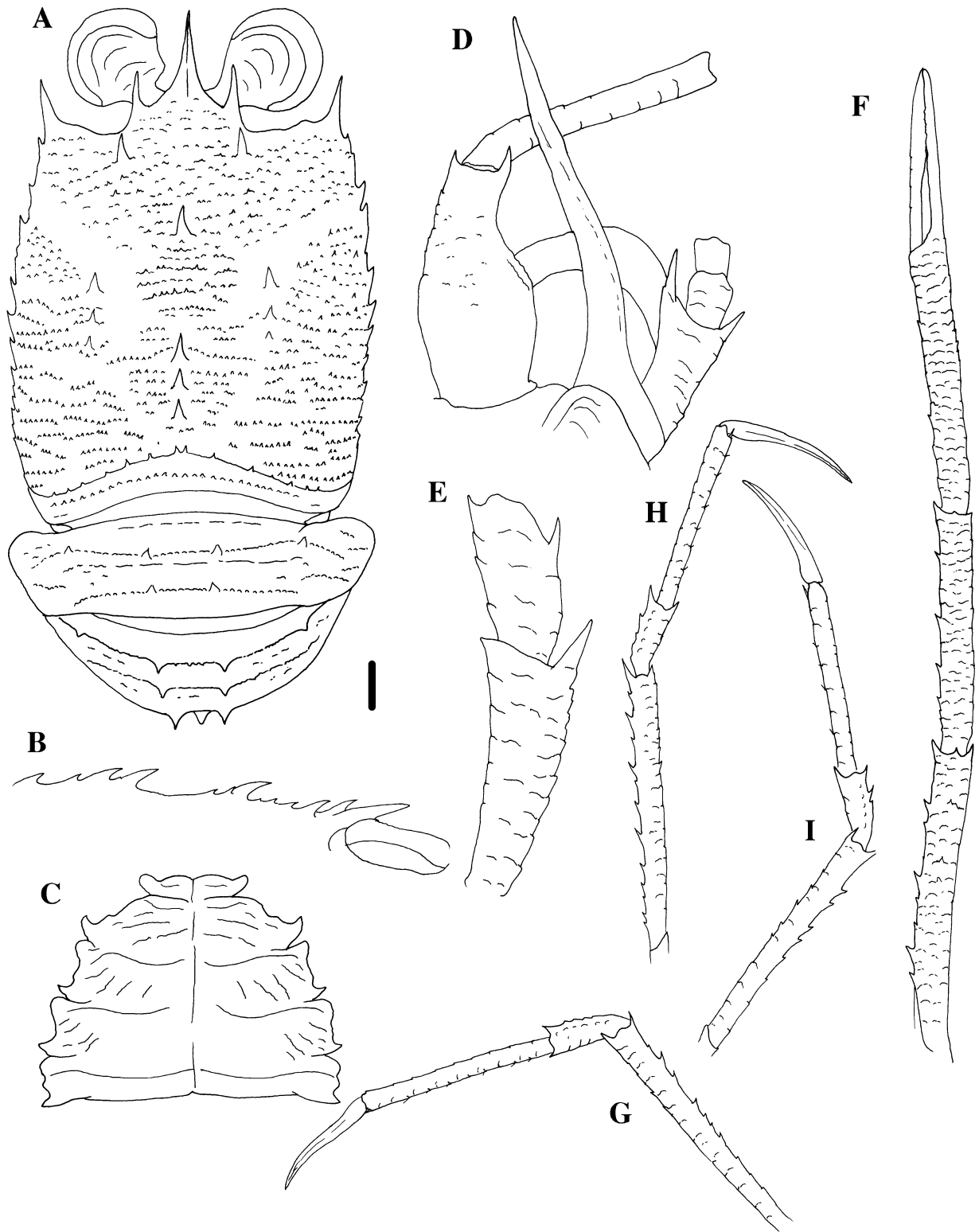


FIGURE 4. *Paramunida crinita* n. sp. male holotype, 7.8 mm (MNHN-Ga7478). Philippines. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, dorsal view. G, left P2, lateral view. H, right P3, lateral view. I, left P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Pereopod 1: Long and slender, squamate, 5.0–5.7 times carapace length; carpus 0.8 times palm length, and 7.2–7.7 times longer than height; palm 1.5 times fingers length. Base of carpus without bundle of setae (Fig. 4F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.1–3.7 times carapace length, merus 1.4–1.5 times longer than carapace, 10–11 times as long as high, 3.6–4.1 times as long as carpus and 1.5–1.7 times as long as propodus; propodus 10.3–11 times as long as high, and 1.4–1.8 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margins. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus nearly reaching end of P1 merus. P3 with similar spination and segment proportions than P2; merus as long as P2 merus; propodus and dactylus slightly longer than those of P2. P4 slightly shorter than P2; merus 1.2–1.4 times carapace length; propodus and dactylus slightly shorter than those of P3; merocarpal articulation slightly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 4G–I).

Remarks. *Paramunida crinita* n. sp. resembles *P. ascella* n. sp. from Vanuatu. The two species can be differentiated by the presence of one mesogastric spine in *P. crinita* in contrast to the 3 spines presented in *P. ascella*. Furthermore, the distomesial spine of the antennal segment 2 is mucronated in *P. ascella*, whereas this spine is spiniform in *P. crinita*.

The genetic divergences between *P. ascella* and *P. crinita* were 1.18% (16S rRNA) and 2.51% (ND1).

Distribution. Philippines, between 178 and 205 m

Paramunida cristata Macpherson, 2004

(Figs. 12H, 16E)

Paramunida cristata Macpherson, 2004: 283, fig. 13 (Fiji and Vanuatu, 390–513 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 172 (list of occurrences). — Baba *et al.* 2009: 278, fig. 254 (Taiwan, 390–403 m).

Material examined. Fiji Islands. BORDAU 1. Stn CP 1395, 16°45.13'S, 179°59.20'E, 23 February 1999, 423–500 m: 1 M 10.6 mm, 1 ov. F 10.6 mm. — Stn 1433, 17°19.93'S, 178°42.89'W, 02 March 1999, 488–500 m: 1 M 9.8 mm. — Stn CP 1447, 16°145.23'S, 179°59.13'E, 04 March 1999, 420–513 m: 3 M 10.2–11.8 mm. — Stn 1451, 16°44.74'S, 179°59.53'E, 04 March 1999, 400–460 m: 1 M 11.1 mm. — Stn 1452, 16°43.88'S, 179°59.70'E, 420–508 m: 2 M 8.4–10.8 mm.

Vanuatu. MUSORSTOM 8. Stn 1044, 16°53'S, 168°22'E, 30 September 1994, 444–469 m: 1 M 11.5 mm.

Taiwan. Stn CP269, 24°30.55'N, 122°05.78'E, 02 September 2004, 397–399 m: 1 F 10.1 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thick dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 well-developed spine. Cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine spiniform, overreaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 slightly longer than broad. Base of P1 carpus without bundle of setae. P2 propodus 9–10 times as long as wide, and about 1.3 times dactylus length.

Remarks. *Paramunida cristata* is morphologically related to *P. scabra* from the western Pacific and Indian Oceans (but see Remarks for *P. scabra*).

Distribution. Fiji, Vanuatu, and Taiwan, between 390 and 513 m.

***Paramunida curvata* Macpherson, 2004**

(Figs. 12I, 16F)

Paramunida curvata Macpherson, 2004: 285, fig. 14 (Fiji, 229–417 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. Vanuatu. BOA 0. Stn CP2326, 15°39.83'S, 167°01.9'E, 18 November 2004, 260–313 m: 7 M 8.7–9.8 mm, 8 ov. F 8.1–9.9 mm, 2 F 5.3–9.1 mm. SANTO. Stn AT34, 15°35.9'S, 167°17.1'E, 23 September 2006, 234–270 m: 1 ov. F 9.6 mm. — Stn AT47, 15°35.0'S, 167°18.3'E, 30 September 2006, 250–309 m: 4 M 8.3–10.0 mm, 1 ov. F 8.6 mm. — Stn AT121, 15°38.7'S, 167°01.2'E, 19 October 2006, 275–290 m: 3 M 8.0–9.8 mm, 4 ov. F 7.9–8.8 mm, 2 F 5.3–9.1 mm.

Fiji. MUSORSTOM 10. Stn 1389, 18°18.58'S, 178°04.73'E, 19 August 1998, 241–417 m: 1 M 10.3 mm (holotype, MNHN-Ga4568), 3 ov. F 8.1–8.3 mm, 2 F 6.3–7.5 mm. — Stn 1390, 18°18.59'S, 178°05.10'E, 19 August 1998, 234–361 m: 4 M 5.1–10.0 mm, 2 ov. F 9.9–10.0 mm, 3 F 8.0–8.8 mm.

Diagnosis. Rostrum smaller than or at most equal to supraocular spines, with small thin dorsal carina; margin between rostral and supraocular spines clearly convex. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region without distinct spines. Median cardiac region with small spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with few short striae on sternite 4, smooth on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine spiniform and curved, overreaching end of antennal peduncle, distolateral spine not reaching midlength of segment 3; segment 3 elongate, 4 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 15 times as long as wide, and about 1.5 times dactylus length.

Remarks. *Paramunida curvata* belongs to the group of species with the rostral spine smaller than the supraocular spines. However, *P. curvata* can be differentiated from the other species of the group (*P. hawaiiensis*, *P. microrhina*, *P. setigera*, and *P. tenera*) by having the margin between rostral and supraocular spines clearly convex, whereas this margin is straight or slightly concave in the other species.

Genetically the closest relative is *P. scabra* from Hong Kong, East and South China Sea (Dongsha), Indonesia, Philippines, Taiwan, Japan, and Australia (off Central Queensland). The differences were 6.66 % (16S rRNA) and 9.22 % (ND1).

Distribution. Fiji and Vanuatu, between 229 and 417 m.

***Paramunida echinata* Macpherson, 1999**

(Figs. 13A, 16G)

Paramunida echinata Macpherson, 1999: 420, fig. 2 (Marquesas Islands, 102–430 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. French Polynesia. Marquesas Islands. MUSORSTOM 9. Stn 1154, 07°58.5'S, 140°43.7'W, 23 August 1997, 102 m: 1 M 13.3 mm (holotype, MNHN-Ga4365). — Stn CP1176, 08°45.8'S, 140°14.5'W, 25 August 1997, 260 m: 17 M 10.8–13.4 mm, 13 ov. F 10.8–12.7 mm, 1 F 9.1 mm (MNHN-Ga4367).

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron smooth, with some short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion

about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 more than twice longer than broad, with distomesial spine mucronated, overreaching end of segment 3, distolateral spine not reaching end of segment 3; segment 3 1.5 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 10 times as long as wide, and slightly longer than dactylus.

Remarks. *Paramunida echinata* is related to *P. labis* from the Futuna and Wallis Islands, Fiji, Tonga, Chesterfield Islands, and New Caledonia (see below under Remarks for that species) and *P. antares* n. sp. from New Caledonia.

Paramunida echinata and *P. antares* can be easily distinguished by the shape of the distomesial spine of the antennal segment 2, which is slightly mucronated in *P. echinata* and spiniform in *P. antares*. The genetic divergences between *P. echinata* and *P. antares* were 2.80% (16S rRNA) and 10.92% (ND1).

Distribution. French Polynesia, Marquesas Islands, between 102 and 430 m.

***Paramunida evexa* Macpherson, 1993**

(Figs. 13B, 16H)

Paramunida evexa Macpherson, 1993: 450, fig. 2 (Indonesia, 174–226 m). — Baba 2005: 198, 302 (key, synonymies, Ambon Sea, 128–238 m). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. Indonesia. Kei Islands. KARUBAR. Stn CP 67, 08°58.59'S, 132°07.20'E, 01 November 1991, 233–246 m: 2 M 10.2–11.3 mm, 1 ov. F 9.0 mm. — Stn CP 82, 09°32'S, 131°02'E, 4 November 1991, 215–219 m: 1 ov. F 11.9 mm. — Stn CP 86, 09°26'S, 131°13'E, 04 November 1991, 223–225 m: 1 F 10.4 mm (holotype, MNHN-Ga3214), 6 M 9.4–10.6 mm, 2 ov. 11.5–11.7 mm, 4 F 8.4–11.0 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 3 or 4 well-developed spines. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron squamate, with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine of segment 2 bluntly produced, overreaching end of segment 3, small distolateral spine not reaching midlength of segment 3; segment 3 as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 8 times as long as wide, and 1.3–1.4 times longer than dactylus.

Remarks. *Paramunida evexa* is related to *P. antipodes* from Eastern Australia. The two species can be easily differentiated by the following characters: the mesogastric region has only one spine (rarely 2) in *P. antipodes*, whereas there is a row of 3 or 4 mesogastric spines in *P. evexa*; the distomesial spine of the antennal segment 2 is bluntly produced in *P. evexa*, whereas it ends in a distinct spine in *P. antipodes*; the sternal plastron has numerous striae in *P. evexa*, being smooth in *P. antipodes*.

Paramunida evexa is also close to *P. scabra* from Hong Kong, East and South China Sea (Dongsha), Indonesia, Philippines, Taiwan, Japan, and Australia (off Central Queensland) (see under Remarks for that species).

Distribution. Indonesia (Ambon, Kei Islands), between 128 and 246 m.

***Paramunida granulata* (Henderson, 1885)**

(Figs. 13C, 16I)

Munida granulata Henderson, 1885: 409 (S of the Fiji Islands, 549 m); 1888: 133, pl. 14, figs 3, 3a, 3b (off Matuku, Fiji, 576 m).

Paramunida granulata Baba 1988: 176, fig. 72 (Moluccas off W coast of Halmahera, 545 m). — Macpherson 1993: 452, figs 3, 13 (New Caledonia, Loyalty Islands and Indonesia; reexamination of type material; 439–650 m); 1996: 412 [SW Pacific (Futuna Island, Wallis Islands, Bayonnaise Bank), 400–450 m]; 2004: 287 (Fiji and Tonga, 395–592 m). — Ahyong & Poore 2004: 68 (Queensland, 548 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. Tonga. BORDAU 2. Stn CP1640, 21°09.14'S, 175°23.96'W, 21 June 2000, 564–569 m: 2 M 9.6–10.2 mm, 2 ov. F 9.8–12.7 mm.

Vanuatu. MUSORSTOM 8. Stn CP1027, 17°53.05'S, 168°39.35'E, 28 September 1994, 550–571 m: 6 M 7.0–12.4 mm, 1 F 10.8 mm.

Loyalty Islands. MUSORSTOM 6. Stn DW468, 21°05.86'S, 167°32.98'E, 21 February 1986, 600 m: 1 M 11.5 mm (MNHN-Ga 3218).

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 well-developed spine. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron squamate, with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine long, almost reaching end of anterior prolongation of segment 1, distolateral spine nearly reaching end of segment 3; segment 3 1.5 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus 7–8 times as long as wide, and 1.2–1.3 times longer than dactylus.

Remarks. *Paramunida granulata* is morphologically and genetically very different from the other species of the genus. This species is unique in having the distomesial spine of antennal segment 2 very long, almost reaching the end of the anterior prolongation of segment 1. This distomesial spine is always much shorter in the other species of *Paramunida*.

The genetic divergences between *P. granulata* and the other species of *Paramunida* are always greater than 8% (16S rRNA) and 16% (ND1).

Distribution. Philippines, Indonesia, Queensland, New Caledonia, Loyalty Islands, Fiji, Tonga, Futuna Island, Vanuatu, Wallis Islands and Bayonnaise Bank, between 395 and 650 m.

***Paramunida hawaiiensis* (Baba, 1981)**

(Figs. 13D, 17A)

Munida hawaiiensis Baba, 1981: 288, figs 1, 2 (Hawaiian Islands between Laysan and Hawaii Island, 115–439 m); 2005: 302 (key, synonymies). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. Hawaii Islands, off Honolulu. Cronwell Cruise, Stn 61–1967: 2 M 8.8–9.3 mm (MNHN-Ga1103).

Diagnosis. Rostrum spiniform, smaller than or at most equal to supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short

median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with long distomesial spine of segment 2 reaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 10 times as long as wide, and about 1.5 times longer than dactylus.

Remarks. *Paramunida hawaiiensis* belongs to the group of species with the rostral spine smaller than the supraocular spines. *P. hawaiiensis* is closely related to *P. microrhina* n. sp. from the Chesterfield Islands, but they can clearly be differentiated from each other (see below under Remarks of the latter species).

Distribution. Hawaiian Islands, between 115 and 439 m.

Paramunida labis Macpherson, 1996

(Figs. 13E, 17B)

Paramunida labis Macpherson, 1996: 413, figs 9, 24 [SW Pacific (Futuna Island and Wallis Islands), 245–440 m]; 2004: 287 (Fiji and Tonga, 229–443 m). — Baba 2005: 302 (key, synonymies). — Ah Yong 2007: 41, fig. 20A (Norfolk Ridge, 322–337 m). — Baba *et al.* 2008: 172 (list of occurrences).

Material examined. Chesterfield Islands. EBISCO. Stn DW2521, 22°45.38'S, 159°19.041'E, 08 October 2005, 310–313 m: 1 M 6.1 mm. — Stn DW2619, 20°06.084'S, 160°23.544'E, 20 October 2005, 490–550 m: 1 ov. F 8.5 mm.

Vanuatu. MUSORSTOM 8. Stn CP971, 20°18.87'S, 169°53.12'E, 21 September 1994, 250–351 m: 1 F 8.3 mm. — Stn CP1025, 17°49.01'S, 168°39.37'E, 28 September 1994, 385–410 m: 5 M 7.6–9.0 mm, 4 ov. F 8.4–8.8 mm, 5 F 7.7–9.6 mm. SANTO. Stn AT1, 15°32.4'S, 167°16.4'E, 14 September 2006, 167–367 m: 1 M 9.6 mm, 3 ov. F 8.7–10.4 mm, 1 F 9.6 mm. — Stn AT18, 15°41.3'S, 167°02.6'E, 21 September 2006, 321–336 m: 1 ov. F 11.0 mm. — Stn AT34, 15°35.9'S, 167°17.1'E, 23 September 2006, 234–270 m: 2 M 8.9–9.2 mm, 1 ov. F 8.0 mm, 3 F 6.5–10.2 mm. — Stn AT 48, 15°33.8'S, 167°18.9'E, 30 September 2006, 330–341 m: 2 ov. F 7.0–10.1 mm. — Stn AT 50, 15°36.8'S, 167°14.1'E, 30 September 2006, 140–153 m: 1 ov. F 10.1 mm.

Fiji. MUSORSTOM 10. Stn CP1390, 18°18.59'S, 178°05.10'E, 19 August 1998, 234–361 m: 2 M 9.0–10.4 mm, 1 ov. F 9.8 mm.

Tonga. BORDAU 2. Stn CP1572, 19°42.31'S, 174°31.35'W, 11 June 2000, 391–402 m: 2 ov. F 8.0–8.5 mm.

Futuna Island. MUSORSTOM 7. Stn 505, 14°19.5'S, 178°04.3'W, 11 May 1992, 245–400 m: 1 ov. F 6.9 mm (holotype, MNHN-Ga3652), 1 M 5.6 mm, 2 ov. F 8.0–8.2 mm, 2 F 5.4–6.7 mm (MNHN-Ga3751).

Wallis Islands. MUSORSTOM 7. Stn 612, 13°21.4'S, 176°08.9'W, 26 May 1992, 255 m: 1 M 7.0 mm, 4 F 4.1–5.6 mm (MNHN-Ga3753).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, with distomesial spine mucronated and with bundle of terminal setae, slightly overreaching end of segment 3, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 10 times as long as wide, slightly longer than dactylus.

Remarks. The species is closely related to *P. echinata* from French Polynesia. The two species can be easily differentiated by the following characters: rostrum is triangular in *P. echinata*, whereas it is spiniform in *P. labis*; the P2–4 propodi are more than 1.5 times dactylus length in *P. echinata*, whereas they are slightly longer than dactyli in *P. labis*.

Paramunida labis also resembles *P. antares* n. sp. from New Caledonia. These species can be differentiated by the shape of the distomesial spine of the antennal segment 2, which is mucronated in *P. echinata* and spiniform in *P. antares*.

The genetic divergences between *P. echinata* and *P. labis* were 3.17% (16S rRNA) and 8.49% (ND1).

Distribution. Futuna Island and Wallis Islands, Fiji and Tonga, Vanuatu, Chesterfield Islands, New Caledonia and Norfolk Ridge, between 229 and 443 m.

***Paramunida leptotes* Macpherson & Baba, 2009**

(Figs. 13F, 17C)

Munida proxima Baba 1982: 110, fig. 4 (Izu Shoto, 430 m). — Baba in Baba *et al* 1986: 173, 291, fig. 124 (Kyushu-Palau Ridge and off Amami-oshima of the Ryukyus, 320–400 m). — Wu *et al* 1998: 143, figs 40, 42F (Taiwan). — Baba 2005: 199 (remarks) (not *Paramunida proxima* (Henderson, 1885)).

Paramunida leptotes Macpherson & Baba, 2009: 63, figs. 5, 6 (Izu Shoto, 430 m, Kyushu-Palau Ridge and off Amami-oshima of the Ryukyus, 320–400 m, Taiwan, 300 m). — Baba *et al.* 2009: 279, figs. 255–256 (Taiwan, 456 m).

Material examined. TAIWAN. NE Taiwan, Stn CD 380, 24°38.598'N, 122°10.436'E, 25 July 2007, 456 m: 1 M 10.3 mm (holotype, NTOU A00891). NE Taiwan, Su-ao, Yilan County, 22 May.1990: 1 ov. F 12.8 mm (paratype, NTOU A00892).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 well-developed spine. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron squamate, with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad with distomesial spine spiniform, clearly exceeding antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus 9.5–10 times as long as wide, and 1.3–1.4 times dactylus length.

Remarks. The species resembles *P. proxima* from the Philippines, off Zamboanga, Mindanao, north of the Admiralty Islands, Indonesia, Kei Islands, Solomon Islands and Vanuatu, and *P. polita* from Indonesia, Philippines, Kei Islands and Moro Gulf off Zamboanga (see below under Remarks for those species).

Distribution. Izu Shoto, Kyushu-Palau Ridge and off Amami-oshima of the Ryukyus, Taiwan and Japan, between 320 and 456 m.

***Paramunida longior* Baba, 1988**

(Figs. 13G, 17D, E)

Paramunida longior Baba, 1988: 177, fig. 73 (Moluccas off W coast of Halmahera and South China Sea off SW Luzon, 340–485 m). — Macpherson 1993: 454, figs 3, 13 (New Caledonia and Indonesia, 250–502 m). — Komai 2000: 360 (list). — Macpherson 2000: 2004: 287 (Fiji and Tonga, 384–520 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 173 (list of occurrences).

Material examined. New Caledonia. MUSORSTOM 4. Stn 173, 19°02.50'S, 163°18.80'E, 17 September 1985, 250–290 m: 1 M 5.5 mm (MNHN-Ga3221). — Stn 243, 22°02.80'S, 167°07.70'E, 02 October 1985, 435–450 m: 5 M 7.1–8.0 mm, 17 F 4.8–8.6 mm (MNHN-Ga3222). — Stn. 245, 22°07.00'S, 167°11.00'E, 03

October 1985, 415–435 m: 3 M 7.9–8.2 mm, 4 ov. F 8.2–8.7 mm, 1 F 7.4 mm. BATHUS 2, Stn CP 742, 22°33.45'S, 166°25.86'E, 13 May 1993, 340–470 m: 4 M 8.1–9.6 mm, 5 ov. F 8.2–9.3 mm, 2 F 7.7–8.2 mm. HALIPRO 1. Stn. CP 864, 21°29' S, 166°19' E, 22 March 1994, 430 m: 5 M 8.9–9.7 mm (one specimen with broken carapace), 1 ov. F 11.4 mm, 2 F 7.7–9.4 mm.

Solomon Islands. SALOMON 2, Stn CP 2199, 7°43.3'S, 158°29.6'E, 25 October 2004, 296–304 m: 1 ov. F 10.6 mm. — Stn CP 2272, 8°32.12'S, 157°44.38'E, 05 November 2004, 380–537 m: 2 M 7.9–9.8 mm, 1 ov. F 8.3 mm, 1 F 8.1 mm.

Fiji. BORDAU 1, Stn CP 1505, 18°12,29'S, 178°37,34'W, 13 March 1999, 420–450 m: 1 M 10.2 mm (specimen *P. aff. longior*, possible new species).

Tonga. BORDAU 2, Stn CP 1511, 21°08'S, 175°22'W, 31 May 2000, 384–402 m: 1 M 10.3 mm, 8 ov. F 7.8–10.1 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, without thin dorsal longitudinal carina, margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric and cardiac regions without median row of spines. Thoracic sternites 4–5 with few arcuate striae; sternites 6–7 smooth. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Anterior prolongation of antennal segment 1 slightly overreaching antennular segment 1; segment 2 about 1.5 times length of segment 3 and nearly twice longer than wide, distomesial spine spiniform, slightly overreaching antennal peduncle; segment 3 nearly three times longer than wide and unarmed. Base of P1 carpus without bundle of setae. P2 propodus 23–24 times as long as high, and 1.9–2.0 times dactylus length.

Remarks. The present material agrees quite well with the original description and illustrations (Baba 1988), as well as the additional illustrations of the holotype (Fig. 17E) kindly provided by K. Baba. However, in the present material the distomesial spine of the antennal segment 2 is slightly smaller than in the types. It will be interesting to collect additional topotypic material in order to confirm the constancy of this difference. The male collected in Fiji (BORDAU 1, Stn CP 1505) is genetically very different from the other specimens (1.99% divergence in 16S rRNA and 7.39% in ND1), suggesting the existence of a different species. Unfortunately this specimen is seriously damaged, preventing an adequate description.

Paramunida longior is closely related to those species having very long and slender walking legs, e.g. *P. curvata*, *P. setigera* and *P. tenera*. However, *P. longior* has the supraocular spines shorter than the rostral spine instead of subequal to or larger than the rostral spines. The P2–4 propodi are particularly slender in *P. longior*, whereas they are less slender in the other species (20 times versus 7–14 times as long as high). The genetic divergences between *P. longior* and the other species were always larger than 6% (16S rRNA) and 12% (ND1).

Distribution. Moluccas off W coast of Halmahera and South China Sea off SW Luzon, Indonesia, New Caledonia, Fiji, Tonga and Solomon Islands, between 250 and 537 m.

***Paramunida lophia* Cabezas, Macpherson & Machordom, 2009** (Figs. 13H, 17F)

Paramunida lophia Cabezas, Macpherson & Machordom, 2009: 478, fig. 6 (Solomon Islands, 135–325 m).

Material examined. Solomon Islands. SALOMON 1, Stn 1831, 10°12.1'S, 161°19.2'E, 05 October 2001, 135–325 m: 1 M 10.2 mm (holotype, MNHN-Ga6512), 2M 13 mm (paratypes, MNHN-Ga6513). SALOMON 2, Stn 2191, 08°23.8'S, 159°27.1'E, 24 October 2004, 300 m: 1 ov. F 10.2 mm (paratype, MNHN-Ga6514). — Stn 2199, 7°43.3'S, 158°29.6'E, 25 October 2004, 296–304 m: 3 M 9.1–11.8 mm (paratypes, MNHN-Ga6515).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Few spinules on gastric and hepatic regions arising from striae. Mesogastric region with 3 distinct spines. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 nearly twice longer than broad with distomesial spine mucronated, clearly overreaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus 9.5–10 times as long as wide; 1.2–1.4 times dactylus length.

Remarks. This species is closely related to *P. belone* from New Caledonia, Loyalty Islands, Vanuatu, Tonga, Fiji, the Wallis and Futuna. The two species can be distinguished by the following aspects:

- The number of mesogastric spines is one (rarely 2) in *P. belone* and 3 or 4 spines in *P. lophia*.
- The distolateral spine overreaches the end of the segment 3 in *P. belone*, whereas this spine only reaches midlength of the segment 3 in *P. lophia*.
- The distomesial spine of the antennal segment 2 reaches or slightly overreaches the end of the antennular segment 1 in *P. belone*; however, this spine clearly does not reach the end of the antennular segment 1 in *P. lophia* (see Cabezas *et al.* 2009).

The genetic divergences between *P. belone* and *P. lophia* were 1.71% (16S rRNA) and 4.56% (ND1).

Distribution. Solomon Islands, between 135 and 325 m.

***Paramunida luminata* Macpherson, 1996**

(Figs. 13I, 17G)

Paramunida luminata Macpherson, 1996: 415, figs 10, 25 (SW Pacific, Tuscarora Bank, Wallis Islands, Alofi Bank, Bayonnaise Bank, 400–440 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 173 (list of occurrences).

Not *Paramunida luminata* Machordom & Macpherson 2004: 262 (table) (= *P. antares* **n. sp.**).

Material examined. Wallis Islands. MUSORSTOM 7. Stn 606, 13°21.4'S, 176°08.3'W, 26 May 1992, 420–430 m: 1 M 12.2 mm (holotype, MNHN-Ga3653), 13 M 8.2–12.9 mm, 5 ov. F 10.6–11.3 mm, 10 F 6.7–11.2 mm (MNHN-Ga3755).

Bayonnaise Bank. MUSORSTOM 7. Stn 629, 11°53.7'S, 179°32.3'W, 29 May 1992, 400–420 m: 3 M 11.8–12.6 mm, 2 F 10.1–12.3 mm (MNHN-Ga3757).

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Cardiac region with 3 or 4 well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 twice longer than broad, distomesial spine spiniform, reaching end of segment 3, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 9 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida luminata* is closely related to *P. antares* **n. sp.** from New Caledonia. However, they can be differentiated by the presence of a median row of small spines behind the rostral spine in *P. antares*, whereas this row is absent in *P. luminata*. Furthermore, the gastric and hepatic regions have numerous spines (other than mesogastric and epigastric spines) in *P. antares* (Fig. 12C), whereas these spines are nearly absent in *P. luminata* (Fig. 13I). The genetic divergences were 1.90% (16S rRNA) and 5.49% (ND1).

Distribution. Tuscarora Bank, Wallis Islands, Alofi Bank and Bayonnaise Bank, between 400 and 440 m.

Paramunida marionis n. sp.

(Figs. 5, 14A)

Material examined. *Holotype*: SW Indian Ocean, S of Madagascar. MD08, CP47, 33°11'S, 44°00'E, 16 March 1976, 620–637 m: M 10.7 mm (MNHN-Ga7481).

Paratypes: SW Indian Ocean, S of Madagascar. MD08, CP47, 33°11'S, 44°00'E, 16 March 1976, 620–637 m: 6 M 8.6–11.4 mm, (MNHN-Ga7482).

Etymology. The name refers to the Research Vessel “Marion Dufresne”.

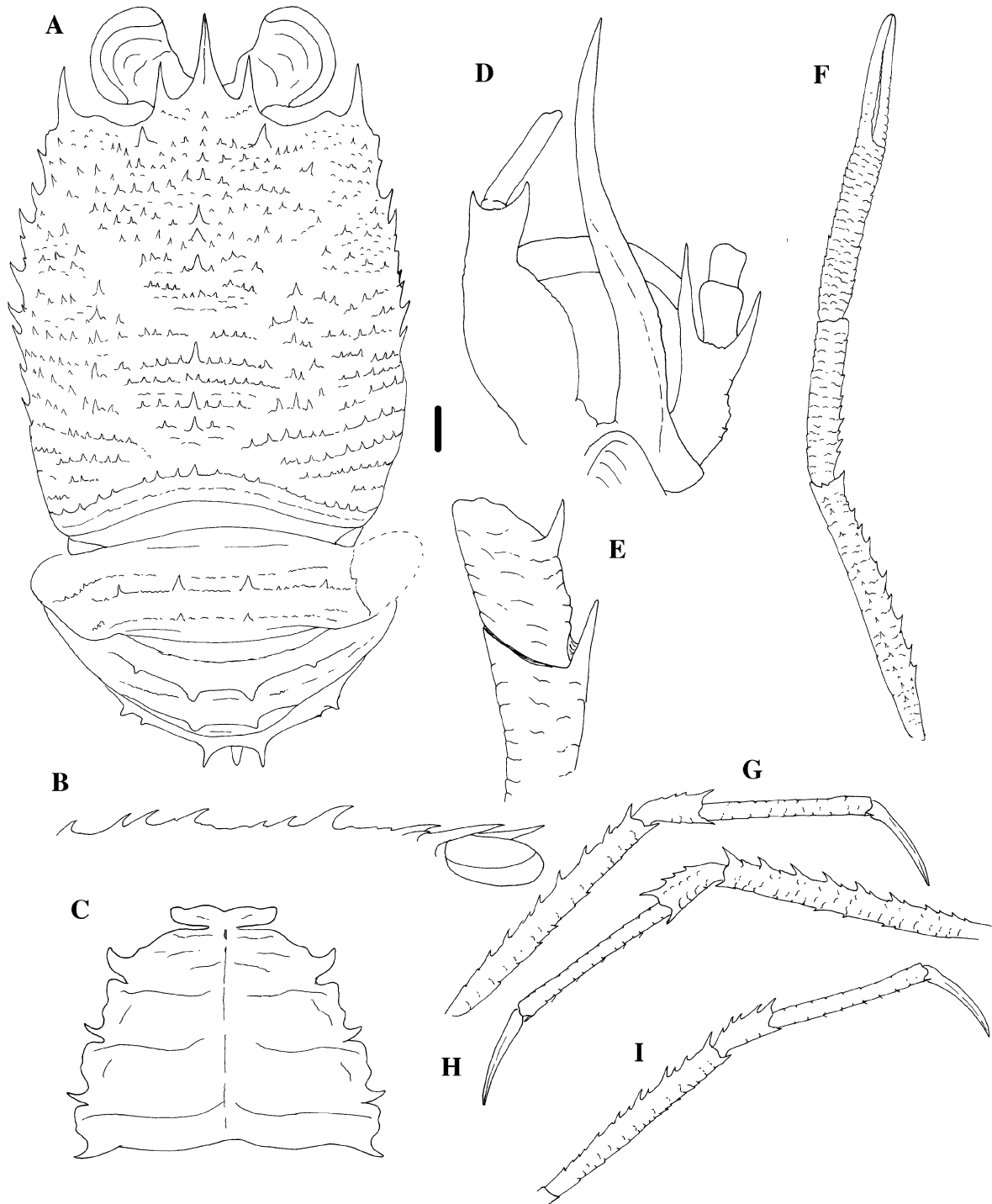


FIGURE 5. *Paramunida marionis* n. sp. male holotype, 10.7 mm (MNHN-Ga7481). Madagascar. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, left P1, dorsal view. G, right P2, lateral view. H, left P3, lateral view. I, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; usually with median row of small spines behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and setae on anterior half. Anterolateral spine well developed, clearly exceeding sinus between rostral and supraocular spines. Rostrum spiniform, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 5A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–6 with a few striae on each lateral side, sternite 7 smooth (Fig. 5C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4–6 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 5A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and slightly shorter than distolateral; more than twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 5D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about half of its length. Segment 2 about 1.5 times length of segment 3 and twice longer than wide, ventral surface with few scales; distomesial spine spiniform, nearly reaching end of antennal peduncle, reaching midlength of anterior prolongation of segment 1, distolateral spine reaching end of segment 3; third segment 1.5 times longer than wide and unarmed (Fig. 5D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 5E).

Pereopod 1: Long and slender, squamate, 4.2–4.6 times carapace length; carpus 0.9–1.0 times palm length, and 5.2 times longer than height; palm 1.2–1.3 times fingers length. Base of carpus without bundle of setae (Fig. 5F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.1–3.2 times carapace length, merus 1.3–1.5 times longer than carapace, 9.6–11 times as long as high, 3.5–4.0 times as long as carpus and 1.5–1.6 times as long as propodus; propodus 9–11 times as long as high, and 1.5–1.9 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margins. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus as long as P2 merus; propodus and dactylus slightly longer than those of P2. P4 shorter than P2; merus 1.1–1.2 times carapace length; propodus and dactylus slightly shorter than those of P3; merocarpal articulation reaching end of anterior prolongation of segment 1 of antennal peduncle (Figs. 5G–I).

Remarks. The new species is closely related to *P. tricarinata* (Alcock, 1894) from the Arabian Sea, Maldives Islands, Andaman Sea, Taiwan and the Philippines (see under Remarks for that species).

Distribution. Only known from the type locality, south of Madagascar, between 620 and 637 m.

Paramunida microrhina n. sp.

(Figs. 6, 14B)

Material examined. *Holotype*: Chesterfield Islands. EBISCO, CP2562, 20°30.108'S, 158°42.035'E, 13 October 2005, 196–213 m: ov. F 5.1 mm (MNHN-Ga7483).

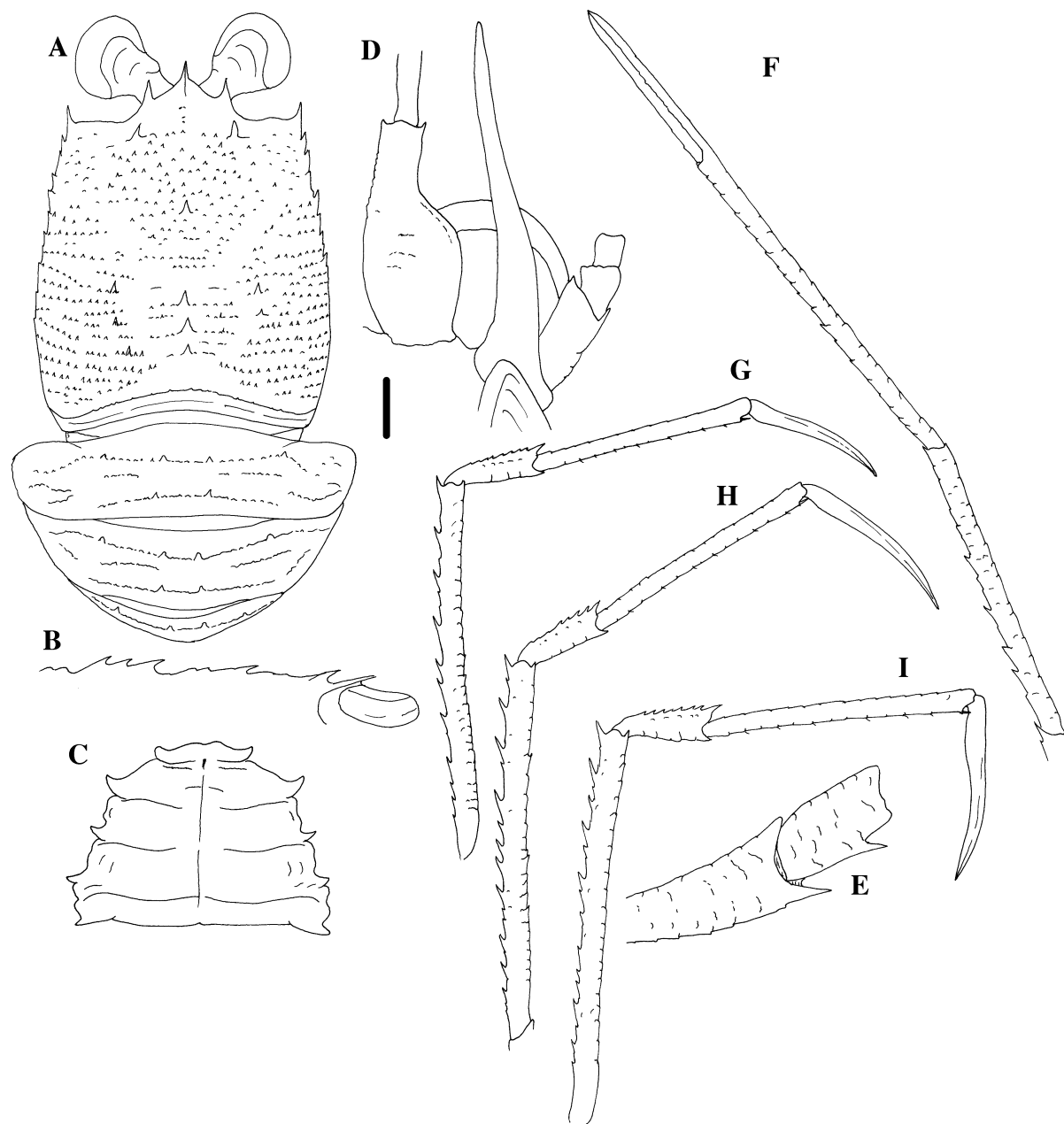


FIGURE 6. *Paramunida microrhina* n. sp. ovigerous female holotype, 5.1 mm (MNHN-Ga7483). Chesterfield Islands. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, dorsal view. G, right P2, lateral view. H, right P3, lateral view. I, right P4, lateral view. Scales: A–C, F–I = 1 mm; D–E = 0.5 mm.

Paratypes: Chesterfield Islands. EBISCO, CP2562, 20°30.108'S, 158°42.035'E, 13 October 2005, 196–213 m: 5 ov. F 4.8–5.3 mm, 1 F 6.1 mm (MNHN-Ga7484). — Stn CP2563, 20°28.900'S, 158°41.400'E, 13 October 2005, 235–280 m: 1 ov. F 5.8 mm, 1 F 7.3 mm (MNHN-Ga7485).

Etymology. From the Greek, *rhinos*, nose, and *micros*, small, referring to the small rostral spine.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind

supraocular spine; without median row of spines behind rostral spine. Mesogastric region with small median spine. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with row of moderately-sized spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral small spine, nearly reaching sinus between rostral and supraocular spines. Rostrum short and triangular, with thin dorsal longitudinal carina; supraocular spines as long as the rostrum; margin between rostral and supraocular spines straight or slightly concave (Figs. 6A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–6 with few striae on each lateral side (Fig. 6C).

Abdomen: Abdominal somites 2–3 each with 4 moderate-sized spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4–6 spines on anterior ridge; posterior ridge without distinct single median spine (Fig. 6A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 exceeding corneae, with distomesial spine as long as the distolateral; about twice longer than wide, with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion.(Fig. 6D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about twice length of segment 3 and 1.5 times longer than wide, ventral surface with small scales; distomesial spine very small, clearly not reaching midlength of segment 3, and clearly not reaching midlength of anterior prolongation of segment 1, distolateral spine small, not reaching midlength of segment 3; segment 3 as long as wide and unarmed(Fig. 6D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing one spine; merus with small median spine on flexor margin; extensor margin unarmed (Fig. 6E).

Pereopod 1: Long and slender, squamate, 6.6–7.0 times carapace length; carpus 0.8–0.9 times palm length, and 14.5–15.1 times longer than height; palm nearly twice finger length. Base of carpus without bundle of setae (Fig. 6F).

Pereopods 2–4: Long and slender, with scales on ventrolateral sides of meri and carpi and few scales on propodi; scales with short setae. P2 4.0–4.1 times carapace length, merus 1.7–1.8 times longer than carapace, 16–19 times as long as high, 4.2–4.4 times as long as carpus and 1.5–1.7 times as long as propodus; propodus 12–14 times as long as high, and 1.6–1.7 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margin. Carpus with some small dorsal spines, distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus slightly longer than P2 merus; propodus and dactylus longer than those of P2. P4 as long as P2 length; merus 1.9–2.0 times carapace length; propodus and dactylus slightly longer than those of P3; merocarpal articulation clearly exceeding end of anterior prolongation of first segment of antennal peduncle (Figs. 6G–I).

Remarks. The new species is close to *P. hawaiiensis* from the Hawaiian Islands, from which it can be easily differentiated by the following characters:

— The antennal segment 2 has a minute distomesial spine in the new species, whereas this spine is well developed in *P. hawaiiensis*.

— The distolateral spine of the antennal segment 2 falls short the end of the antennal segment 3 in the new species, whereas this spine almost reaches the end of the antennal segment 3 in *P. hawaiiensis*.

— The antennal segment 3 is as long as wide in the new species, whereas is twice longer than wide in *P. hawaiiensis*.

— The mesogastric region has a median row with 3 well-developed spines in *P. hawaiiensis*, whereas this region only has a small median spine in the new species.

Distribution. Chesterfield Islands, between 196 and 280 m.

***Paramunida mozambica* n. sp.**

(Figs. 7, 14C)

Material examined. *Holotype:* Mozambique, MAINBAZA. Stn CC3162, 35°42'07"S, 24°04'10"E, 15 April 2009, 344 m: ov. F 6.9 mm (MNHN-Ga7486).

Paratypes: Mozambique, MAINBAZA. Stn CC3162, 35°42'07"S, 24°04'10"E, 15 April 2009, 344 m: 1 M 7.6 mm, 2 ov. F 6.9–7.8 mm, 1 F 6.3 mm (MNHN-Ga7487).

Etymology. From Mozambique, in reference to the area of occurrence of the species.

Description. *Carapace:* As long as broad. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; with median row of spines behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, exceeding sinus between rostral and supraocular spines. Rostrum spiniform, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 7A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–6 with few lateral arcuate striae, sternite 7 smooth (Fig. 7C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 7A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and as long as distolateral; twice longer than wide and with few setae; with distal slender portion about half as long as proximal inflated portion (Fig. 7D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about twice length of segment 3 and twice longer than wide, ventral surface with scales; distomesial spine mucronated with lateral margin with iridescent long setae, barely or nearly reaching end of antennal peduncle, reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 nearly twice longer than wide and unarmed (Fig. 7D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing spine; merus with well developed median spine on flexor margin; extensor margin with distal spine (Fig. 7E).

Pereopod 1: Long and slender, squamate, 4.5–4.8 times carapace length; carpus 1.1 times palm length, and 5.2–6.1 times longer than height; palm 1.2–1.3 times fingers length. Base of carpus without bundle of setae (Fig. 7F).

Pereopods 2–4: Long and slender, with scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.2–3.3 times carapace length, merus 1.4 times longer than carapace, 11–13 times as long as high, 3.6–4.3 times as long as carpus and 1.5–1.6 times as long as propodus; propodus 8–11 times as long as high, and 1.3–1.7 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margin. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margins. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus as long as P2 merus; propodus and dactylus

slightly longer than those of P2. P4 slightly longer than P2; merus 1.3–1.4 times carapace length; propodus and dactylus similar in length as those of P3; merocarpal articulation slightly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 7G–I).

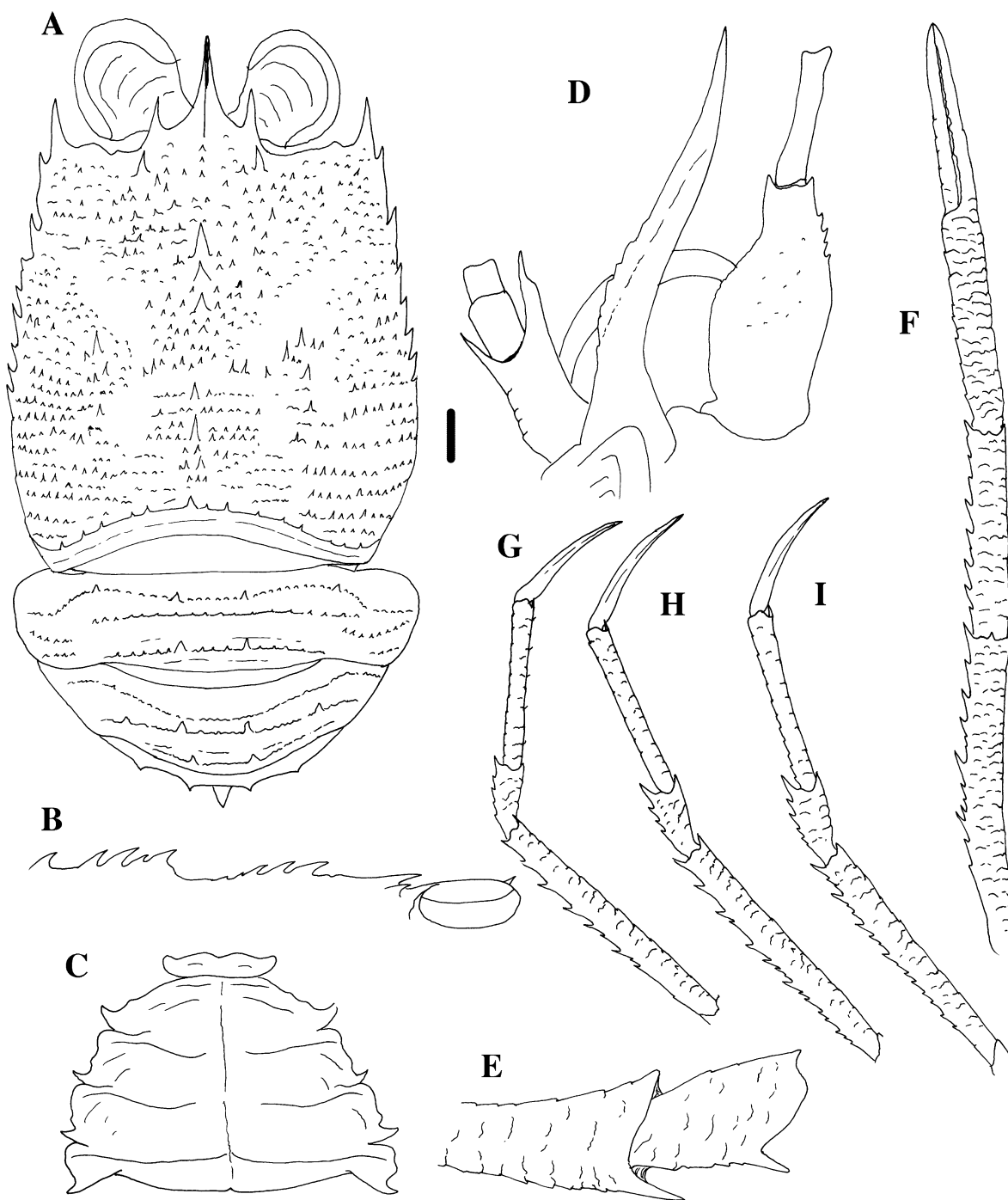


FIGURE 7. *Paramunida mozambica* n. sp. ovigerous female holotype, 6.9 mm (MNHN-Ga7486). Mozambique. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, right antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, dorsal view. G, right P2, lateral view. H, right P3, lateral view. I, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Remarks. The new species is closely related *P. ascella* n. sp. from Vanuatu. The two species can be differentiated by the following characters:

- The rostrum is triangular in *P. ascella*, but spiniform in *P. mozambica*.
- The gastric region has more spinules in *P. mozambica* than in *P. ascella*.

The genetic divergences between *P. ascella* and *P. mozambica* were 7.90% (16S rRNA) and 11.47% (ND1).

The species is also close to *P. scabra* (see below under Remarks for that species).

Distribution. Mozambique, 344 m.

***Paramunida parvispina* n. sp.**

(Figs. 8, 14D)

Material examined. *Holotype*: Chesterfield Islands. EBISCO, Stn CP2571, 20°26.15'S, 158°45.06'E, 14 October 2005, 298–309 m: ov. F 7.0 mm (MNHN-Ga7488).

Paratypes: Chesterfield Islands. EBISCO, Stn CP2571, 20°26.15'S, 158°45.06'E, 14 October 2005, 298–309 m: 11 M 6.5–8.2 mm, 13 ov. F 7.0–7.4 mm, 2 F 7.3–8.3 mm (MNHN-Ga7489).

Etymology. From the Latin *parvus*, little, in reference to the small median gastric spine.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; without median row of spines behind rostral spine. Mesogastric region with small median spine. Cervical groove feebly discernible. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 small spines, first thicker than others. Each branchial region with row of small spines near cardiac region. Frontal margin slightly concave. Lateral margins slightly convex, with some spines and setae on anterior half. Anterolateral spine well developed, reaching sinus between rostral and supraocular spines. Rostrum triangular, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 8A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–6 smooth or with 1 or 2 short striae on each lateral side, sternite 7 smooth (Fig. 8C).

Abdomen: Abdominal somites 2–3 each with 4 small spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 small spines on anterior ridge; posterior ridge with small but distinct small median spine (Fig. 8A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 slightly exceeding corneae, with distomesial spine small and slightly shorter than distolateral; twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 8D).

Antenna: Anterior prolongation of segment 1 overreaching antennular segment 1 by one-fourth of its length. Segment 2 about twice length of segment 3 and twice longer than wide, ventral surface with few scales; distomesial spine mucronated ending in small distal point, reaching end of segment 3, nearly reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; third segment 1.5 times longer than wide and unarmed (Fig. 8D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing one spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 8E).

Pereopod 1: Long and slender, squamate, 6.2–6.6 times carapace length; carpus 0.8–1.1 times palm length, and 10–11.6 times longer than height; palm 1.4–1.5 times fingers length. Base of carpus without bundle of setae (Fig. 8F).

Pereopods 2–4: Long and slender, with scales on lateral sides of meri and carpi and few scales on propodi; scales with short setae. P2 3.7–4.1 times carapace length, merus 1.7–1.8 times longer than carapace, 13–17 times as long as high, 3.5–4.0 times as long as carpus and 1.5–1.8 times as long as propodus; propodus 11–15 times as long as high, and 1.6–2.1 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small

spines along ventrolateral margins. Carpus with some small dorsal spines, distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus as long as P2 merus; propodus and dactylus as long or slightly longer than those of P2. P4 slightly shorter than P2; merus 1.4–1.5 times carapace length; propodus and dactylus similar in length to those of P3; merocarpal articulation clearly exceeding end of anterior prolongation of first segment of antennal peduncle (Figs. 8G–I).

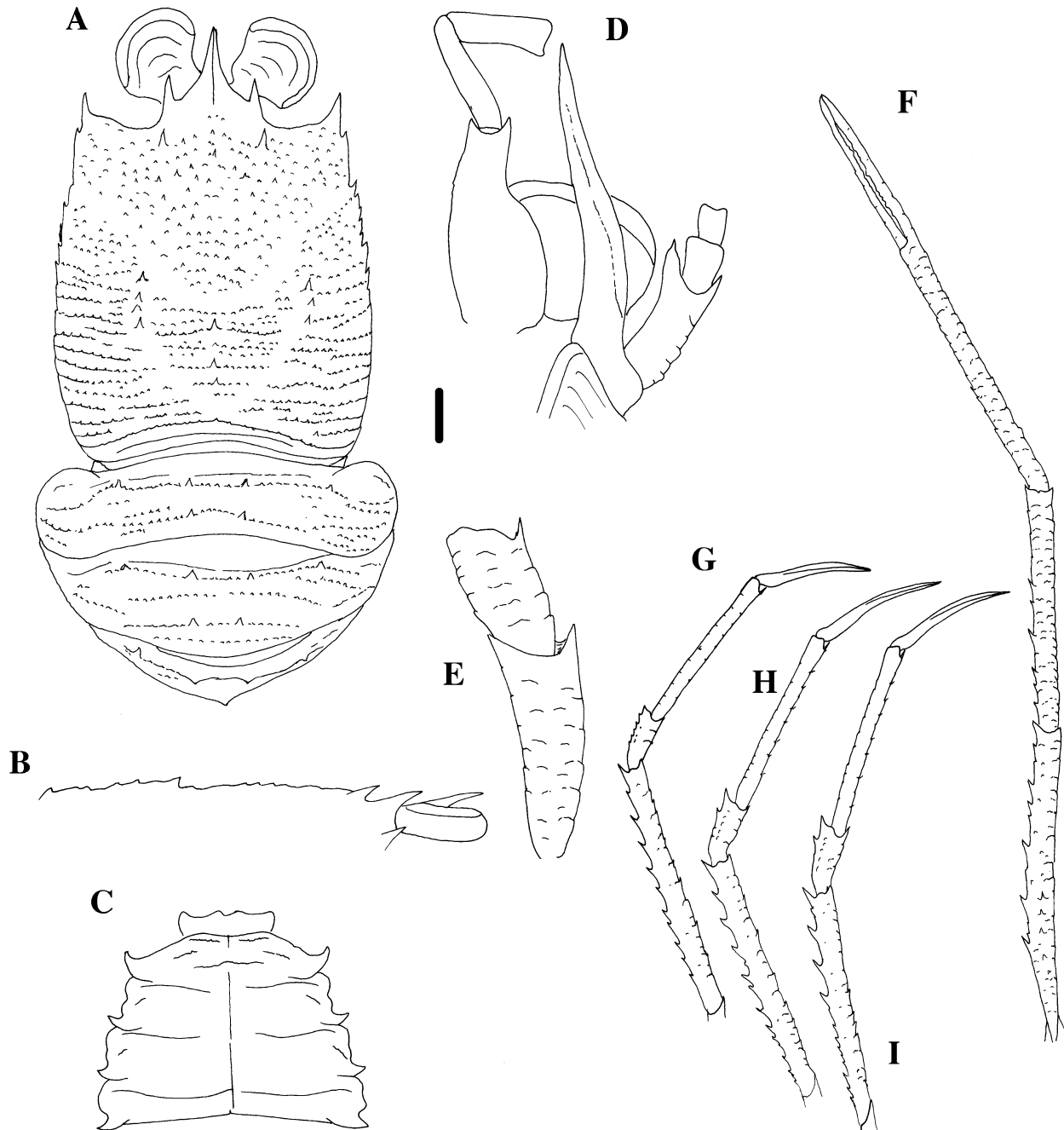


FIGURE 8. *Paramunida parvispina* n. sp. ovigerous female holotype, 7.0 mm (MNHN-Ga7488). Chesterfield Islands. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, dorsal view. G, right P2, lateral view. H, right P3, lateral view. I, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Remarks. The species resembles *P. antipodes* from eastern Australia but both can be differentiated by the following characters:

— *P. antipodes* has one well-developed mesogastric spine (rarely two), whereas this spine is very small in *P. parvispina*.

— The distomesial spine of the antennal segment 2 clearly overreaches the end of the antennal segment 3 in *P. antipodes*, whereas this spine only reaches the end of the segment 3 in *P. parvispina*.

Distribution. Chesterfield Islands, between 298 and 309 m.

***Paramunida pictura* Macpherson, 1993**

(Figs. 14E, 17H)

Paramunida pictura Macpherson, 1993: 454, figs 4, 14 (Chesterfield Islands, New Caledonia, Loyalty Islands, and Matthew & Hunter Islands, 205–600 m); 1996: 416 [SW Pacific (Wallis Islands), 255–340 m]; 2004: 289 (Fiji and Tonga, 310–710 m). — Baba 2005: 302 (key, synonymies). — Baba *et al.* 2008: 173 (list of occurrences).

Not *Paramunida pictura* Macpherson 2006: 325 (French Polynesia, Austral Archipelago, 200–500 m (= *P. poorei* **n.sp.**)).

Material examined. Fiji. BORDAU 1. Stn DW1417, 16°27'S, 178°55'W, 27 February 1999, 353 m: 2 M 8.7–10.0 mm, 2 ov. F 8.5–9.4 mm, 5 F 7.6–8.9 mm.

Vanuatu. MUSORSTOM 8. Stn CP963, 20°20.10'S, 169°49.08'E, 21 September 1994, 400–440 m: 1 ov. F 8.2 mm, 1 F 8.6 mm. — Stn CP1025, 17°49.01'S, 168°39.37'E, 28 September 1994, 385–410 m: 4 M 9.1–9.8 mm, 2 ov. F 7.9–8.0 mm.

New Caledonia. NORFOLK 1. Stn CP1721, 23°19'S, 168°01'E, 26 June 2001, 416–430 m: 2 M 8.8–10.2 mm.

Loyalty Islands. MUSORSTOM 6. Stn DW479, 21°09.13'S, 167°54.95'E, 22 February 1989, 310 m: 1 M 11.2 mm, 1 ov. F 9.2 mm, 2 F 8.3–8.5 mm.

Chesterfield Islands. MUSORSTOM 5, Stn 307, 22°11.1'S, 159°24.1'E, 12 October 1986, 345–350 m: 1 M 9.5 mm (holotype, MNHN-Ga3235), 14 M 6.8–9.5 mm, 14 ov. F 7.3–7.7 mm, 8 F 6.8–7.2 mm (MNHN-Ga3236). EBISCO. Stn CP2522, 22°45.92'S, 159°19.53'E, 09 October 2005, 310–318 m: 1 M 8.4 mm. — Stn CP2632, 21°03.655'S, 160°44.673'E, 21 October 2005, 297–378 m: 2 ov. F 7.4–7.5 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 3 well-developed spines. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with few short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 more than 3 times longer than broad with distomesial spine spiniform, reaching or slightly overreaching end of segment 3, distolateral spine not reaching end of segment 3; segment 3 about 1.5 times as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 8 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida pictura* is closely related to *P. poorei* **n.sp.** from French Polynesia (Austral Islands) (see below under Remarks for *P. poorei*).

Distribution. Chesterfield Islands, New Caledonia, Loyalty Islands, Matthew & Hunter Islands, Vanuatu, Fiji, Tonga and Wallis Islands, between 205 and 710 m.

***Paramunida polita* Macpherson, 1993**

(Figs. 14F, 17I)

Paramunida polita Macpherson, 1993: 456, fig. 5 (Indonesia, 281–502 m). — Baba 2005: 198, 302 (key, synonymies, Kei Islands and Moro Gulf off Zamboanga, 200–366 m). — Baba *et al.* 2008: 173 (list of occurrences).

Material examined. Indonesia. Kei Islands. KARUBAR. Stn CP06, 05°49'S, 132°21'E, 22 October 1991, 287–298 m: 1 F 12.0 mm (holotype, MNHN-Ga3354), 8 M 8.7–14.2 mm, 7 F 8.2–13.0 mm (MNHN-Ga3399). — Stn CP25, 05°30'S, 132°52'E, 26 October 1991, 336–346 m: 2 M 10.4–11.6 mm, 3 F 9.6–10.6 mm. — Stn CP35, 06°08'S, 132°45'E, 27 October 1991, 390–502 m: 1 M 11.6 mm, 1 ov. F 12.4 mm, 1 F 10.4 mm (MNHN-Ga3405).

Philippines. MUSORSTOM 1. Stn 20, 13°59'N, 120°20'E, 21 March 1976, 208–222 m: 1 ov. F 7.0 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; with row of small epigastric spines behind rostral spine; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 well-developed spine. Median cardiac region with 3 or 4 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with few short median striae on sternite 4, and few short lateral striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 about 1.3 times longer than broad with distomesial spine spiniform, slightly overreaching end of segment 3, distolateral spine nearly reaching end of segment 3; segment 3 about 1.5 times as long as broad. Base of P1 carpus without bundle of setae. P2 propodus 6–7 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida polita* is closely related to *P. leptotes* from Japan and Taiwan. These species can be easily distinguished by the length of the distomesial spine of the antennal segment 2, which clearly exceeds the antennal peduncle in *P. leptotes*, whereas this spine at most slightly exceeds the antennal peduncle in *P. polita*. In addition, the segment 3 of the antenna is more slender in *P. leptotes*; as the length of the segment is more than half instead of less than half the breadth; and the breadth of the segment 3 is less than instead of more than half that of the segment 2. The genetic divergences between *P. leptotes* and *P. polita* were 3.84% (16S rRNA) and 12.81% (ND1).

Distribution. Indonesia, Kei Islands, Philippines and Moro Gulf off Zamboanga, between 200 and 502 m.

***Paramunida poorei* n. sp.**

(Figs. 9, 14G)

Paramunida pictura Macpherson 2006: 325 (not *P. pictura* Macpherson, 1993).

Material examined. *Holotype*: French Polynesia. BENTHAUS, Stn DW 1999, 22°24.81'S, 151°22.17'W, 23 November 2002, 270–500 m: M 9.3 mm (MNHN-Ga7490).

Paratypes: French Polynesia. BENTHAUS. Stn DW 1973, 23°23.49'S, 150°43.87'W, 21 November 2002, 200–350 m: 1 M 7.4 mm (MNHN-Ga7491). — Stn DW 1995, 22°28.96'S, 151°21.85'W, 23 November 2002, 212–450 m: 1 ov. F 8.8 mm, 1 F 4.0 mm (MNHN-Ga7492).

Etymology. This species name is dedicated to Gary Poore, for his contributions to crustacean taxonomy.

Description. *Carapace*: As long as broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; with median row of small spines behind rostral spine. Mesogastric region with median row of 3 spines, first thicker than others. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with row of spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, nearly reaching sinus between rostral and supraocular spines. Rostrum triangular, larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 9A, B).

Sternum: Thoracic sternite 4 with few and small arcuate striae; sternites 5–7 smooth (Fig. 9C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct median spine (Fig. 9A).

Eyes: Maximum corneal diameter about one-third distance between bases of anterolateral spines.

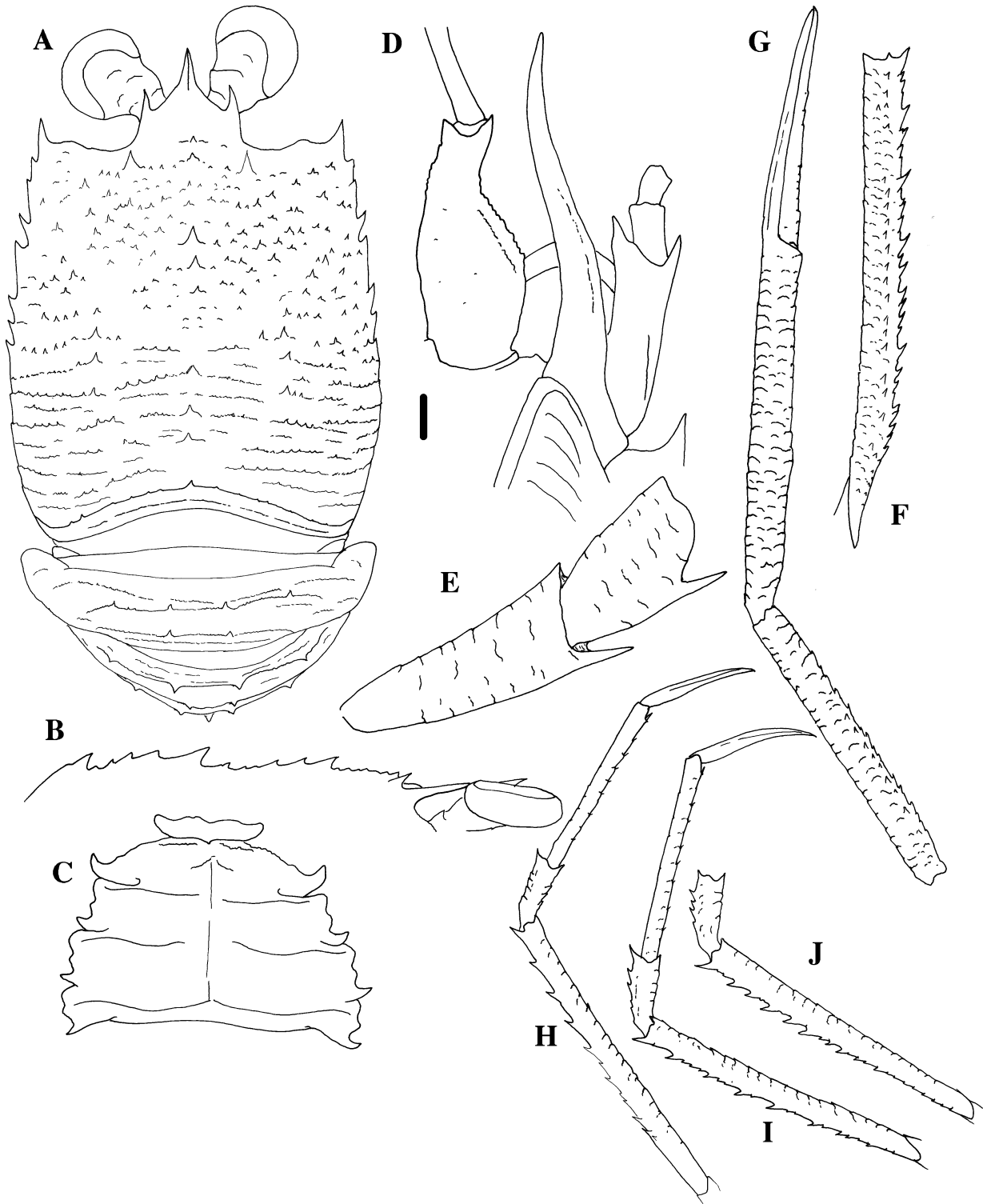


FIGURE 9. *Paramunida poorei* n. sp. male holotype, 9.3 mm (MNHN-Ga7490). French Polynesia. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, left P1, merus, dorsal view. G, left P1, carpus, palm and fingers, dorsal view. H, right P2, lateral view. I, right P3, lateral view. J, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

Antennule: Segment 1 exceeding corneae, with distomesial spine small and slightly shorter than distolateral; twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 9D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about 2.6 times length of segment 3 and three times longer than wide, ventral surface without scales; distomesial spine spiniform, not reaching end of segment 3, reaching midlength of anterior prolongation of segment 1, distolateral spine not reaching end of segment 3; segment 3 twice longer than wide and unarmed (Fig. 9D).

Maxilliped 3: Ischium about 1.5 times length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 9E).

Pereopod 1: Long and slender, squamate, 6.8–7.9 times carapace length; carpus 0.8–0.9 times palm length, and 8.5–9 times longer than height; palm 1.5–1.6 times fingers length. Base of carpus without bundle of setae (Fig. 9F).

Pereopods 2–4: Long and slender, with some scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.6–3.7 times carapace length, merus 1.7–1.8 times longer than carapace, 14–15 times as long as high, 4.5–4.6 times as long as carpus and 1.6–1.7 times as long as propodus; propodus 10–12 times as long as high, and 1.6–1.8 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margins. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus clearly reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus slightly shorter than P2 merus; propodus and dactylus slightly longer than those of P2. P4 slightly shorter than P2; merus about 1.5–1.7 times carapace length; merocarpal articulation clearly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 9G–I).

Remarks. The new species is closely related to *P. pictura* from New Caledonia, Chesterfield, Loyalty, Matthew & Hunter, Vanuatu, Fiji, Tonga and Wallis Islands (Macpherson 1993, 1996). The two species can be distinguished each other by the length of the distomesial spine of the antennal segment 2 which reaches or slightly overreaches the end of the antennal segment 3 in *P. pictura*, whereas it never reaches the end of segment 3 in *P. poorei*. Furthermore, the spinules on the gastric and hepatic regions usually do not form groups and lack scaly striae in *P. poorei* (Fig. 14G); whereas most of these spinules form groups arising from scale-like striae in *P. pictura* (Fig. 14E).

The genetic divergences between these two species were 2.72% (16S rRNA) and 9.76% (ND1).

Distribution. French Polynesia, Austral Islands, between 200 and 500 m.

***Paramunida pronoe* Macpherson, 1993**

(Figs. 14H, 18A)

Paramunida pronoe Macpherson, 1993: 458, fig. 6 (New Caledonia, 500–510 m). — Macpherson 2004: 289 (Tonga, 439–497 m). — Baba 2005: 303 (key, synonymies). — Baba *et al.* 2008: 173 (list of occurrences).

Material examined. New Caledonia. MUSORSTOM 4. Stn 238, 22°13.0'S, 167°14.0'E, 02 October 1985, 500–510 m: F 7.0 mm (holotype, MNHN-Ga3410), 1 M 7.8 mm, 1 ov. F 11.0 mm, 4 F 6.1–11.5 mm (MNHN-Ga3411). BATHUS 3. Stn CP833, 23°02.75'S, 166°58.23'E, 30 November 1993, 441–444 m: 1 F 4.9 mm. NORFOLK 1. Stn CP1670, 23°39'S, 167°59'E, 21 June 2001, 382–386 m: 3 M 7.5–7.7 mm, 6 ov. F 6.6–8.3 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Few spinules on gastric and hepatic regions, arising from striae. Mesogastric region with 1 small median spine. Cardiac region with 1 median well-developed median spine. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 1.1–1.3 times longer than broad, distomesial spine spiniform, slightly overreaching end of segment 3, distolateral spine nearly reaching end of segment 3; segment 3 1.2–1.4 times as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 8 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida pronoe* belongs to the group of species with the rostral spine longer than the supraocular spines and only one distinct spine on the mesogastric region. The species is easily differentiated from the other species of the group having only one instead of 3 or 4 spines on the median cardiac region. Genetically the divergences between *P. pronoe* and other species were always larger than 5% (16S rRNA) and 10% (ND1).

Distribution. New Caledonia and Tonga, between 439 and 510 m.

Paramunida proxima (Henderson, 1885)

(Figs. 14I, 18B)

Munida proxima Henderson, 1885: 410 (N of the Admiralty Islands, 275 m); 1888: 135, pl. 13, figs 2, 2a, 2b (N of Papua, 275 m). — Tirmizi 1975: 305, figs 1–8 (designation and description of lectotype).

Paramunida proxima Macpherson 1993: 460, fig. 7 (Philippines and Indonesia; reexamination of syntypes (= 2 paralectotypes), 210–306 m). — Komai 2000: 360 (list). — Baba 2005: 199, 303 (key, synonymies, Moro Gulf off Zamboanga and Mindanao, 293–366 m). — Baba *et al.* 2008: 173 (list of occurrences).

Not *Munida proxima* Baba 1982: 110, fig. 4 (Izu Shoto, 430 m). — Baba *in* Baba *et al.* 1986: 173, 291, fig. 124 (Kyushu-Palau Ridge and off Amami-oshima of the Ryukyus, 320–400 m). — Wu *et al.* 1998: 143, figs 40, 42F (Taiwan) (= *P. leptotes* Macpherson & Baba 2009).

Material examined. Philippines. MUSORSTOM 1. Stn 40, 13°57'N, 120°18'E, 23 March 1976, 265–287 m: 1 ov. F 10.5 mm. MUSORSTOM 3. Stn 119, 12°00'N, 121°13'E, 03 June 1985, 320–337 m: 1 ov. F 11.7 mm.

Indonesia. Kei Islands. KARUBAR. Stn CP25, 05°30'S, 132°52'E, 26 October 1991, 336–346 m: 1 M 10.6 mm, 1 ov. F 11.1 mm, 1 F 9.4 mm.

Vanuatu. MUSORSTOM 8. Stn CP1107, 15°05.64'S, 167°15.31'E, 07 October 1994, 397–402 m: 2 ov. F 9.0–9.4 mm.

Solomon Islands. SALOMON 1. Stn CP1831, 10°12.1'S, 161°19.2'E, 05 October 2001, 135–325 m: 1 M 11.6 mm.

Diagnosis. Rostrum triangular, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with 1 (rarely 2) distinct spine. Cardiac region with 3 median well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 about twice longer than broad with distomesial spine slightly mucronated, reaching or slightly exceeding antennal peduncle, distolateral spine nearly reaching end of segment 3; segment 3 as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 9 times as long as wide, and less than 1.5 times dactylus length.

Remarks. *Paramunida proxima* is closely related to *P. belone* from New Caledonia, Loyalty Islands, Vanuatu, Tonga, Fiji, Wallis and Futuna. These species are easily differentiated by the number of striae on the thoracic sternites: numerous striae on sternites 4–7 in *P. proxima*, whereas there are only some arcuate striae

on sternite 4 in *P. belone*. Furthermore, the distomesial spine of the antennal segment 2 exceeds far beyond the antennal peduncle in *P. belone*, whereas this spine only reaches or slightly exceeds the antennal peduncle in *P. proxima*. The genetic divergences between both species were 5.53% (16S rRNA) and 10.94% (ND1).

Paramunida proxima also resembles *P. leptotes* from Japan and Taiwan. The two species can be easily distinguished by the following aspects: the distomesial spine of the antennal segment 2 is long, and distinctly overreaching the antennal peduncle by the length of segment 3 in *P. leptotes*, whereas this spine terminates at the distal end of the peduncle in *P. proxima*; the antennal segment 3 in *P. leptotes* is more elongate, being 1.5–1.7 times longer than wide instead of being as long as wide in *P. proxima*. The genetic divergences between *P. leptotes* and *P. proxima* were 5.27% (16S rRNA) and 11.06% (ND1).

Genetically the closest relative of this species is *P. polita* from Indonesia and the Philippines. These species can be easily distinguished by the length of the distomesial spine of the antennal segment 2 which clearly exceeds the antennal peduncle in *P. leptotes*, whereas this spine at most slightly exceeds the antennal peduncle in *P. polita*. The genetic divergences between *P. leptotes* and *P. polita* were 3.84% (16S rRNA) and 12.81% (ND1).

Finally, *P. proxima* is also related to *P. stichas* from Solomon Islands, Vanuatu, New Caledonia, Fiji, Field Bank, Wallis Islands, and Bayonnaise Bank (see below under Remarks for *P. stichas*).

Distribution. Philippines, off Zamboanga, Mindanao, N of the Admiralty Islands, and Indonesia, Kei Islands, Solomon Islands and Vanuatu, between 135 and 402 m.

***Paramunida salai* Cabezas, Macpherson & Machordom, 2009** (Figs. 15A, 18C)

Paramunida salai Cabezas, Macpherson & Machordom, 2009: 480, fig. 7 (Solomon Islands, 135–325 m).

Paramunida stichas Macpherson, 1993: 465 (in part, only specimens from Indonesia), (not *P. stichas* Macpherson, 1993).

Material examined. Solomon Islands. SALOMON 1, Stn 1831, 10°12.1'S, 161°19.2'E, 05 October 2001, 135–325 m: 93 M 6.4–11.5 mm, 49 ov. F 8.2–10.7 mm, 1 ov. F 8.6 mm (holotype, MNHN-Ga6517), 21 F 6.7–8.8 mm (paratypes, MNHN-Ga6516). — Stn 1834, 10°12.2'S, 161°17.8'E, 05 October 2001, 225–281 m: 2 ov. F 8.8–9.0 mm (MNHN-Ga6518).

Indonesia. Kei Islands. KARUBAR. Stn DW15, 05°17'S, 132°41'E, 24 October 1991, 212–221 m: 1 M 11.2 mm, 1 F 9.5 mm (POLIPI and MNHN-Ga7495). — Stn CP36, 06°05'50''S, 132°44'29''E, 27 October 1991, 210–268 m: 1 M 10.5 mm (MNHN-Ga3476).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with median row of 3 well-developed spines. Cardiac region with 3 median well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short striae on sternite 4, and few lateral short striae on sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 about twice longer than broad, distomesial spine mucronated, exceeding antennal peduncle, distolateral spine exceeding end of segment 3; segment 3 nearly twice longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 10 times as long as wide, and 1.2–1.4 times dactylus length.

Remarks. *Paramunida salai* belongs to the group of species having the rostral spine longer than the supraocular spines and the distomesial spine of antennal segment 2 mucronated. The closest relative is *P. belone* from New Caledonia, Loyalty Islands, Vanuatu, Tonga, Fiji, Wallis and Futuna.

The two species can be distinguished by the number of distinct mesogastric spines, one (rarely 2) in *P. belone* and 3 or 4 spines, first thicker than others, in *P. salai*. Furthermore, the distomesial spine of the anten-

nal segment 2 clearly exceeds the end of the antennal peduncle and reaches or slightly overreaches the antennular segment 1 in *P. belone*; however, this spine only slightly overreaches the end of the antennal peduncle, never reaching the end of the antennular segment 1 in *P. salai* (Cabezas *et al.* 2009).

The genetic divergences between *P. belone* and *P. salai* were 1.30% (16S rRNA) and 3.87% (ND1), respectively.

Distribution. Solomon Islands and Indonesia, between 135 and 325 m.

***Paramunida scabra* (Henderson, 1885)**

(Figs. 15B, 18D)

Munida scabra Henderson, 1885: 409 (off the Kei Islands, 236 m); 1888: 134, pl. 15, figs 4, 4a, 4b (off Little Kei Islands, 256 m). — Yokoya 1933: 63 (S of Inuboe-zaki, Sagami Bay, E of Miyazaki, W of Muroto-zaki, Bungo Strait, vicinity of Goto I., E of Chejudo, S of Tsushima, 106–393 m). — Yanagita 1943: 30, figs 9, 10 (off Miya, Aichi Prefecture, 360 m). — Miyake & Baba 1967: 242, fig. 13 (East China Sea, 100–158 m). — Baba 1969: 49 (East China Sea, 310 m). — Kim 1973: 178 (no record). — Miyake 1982: 149, pl. 50, fig. 2 (E of Koshiki-jima, Kagoshima, 300–350 m). — Baba in Baba *et al.* 1986: 175, 292, fig. 125 (Okinawa Trough and Tosa Bay, 150–550 m).

Paramunida scabra Baba 1988: 180 (off NE Borneo, Balabac Strait off N Borneo, Sulu Archipelago, off N Mindanao, off Pacific coast of S Luzon, South China Sea off SW Luzon, off Hong Kong and off SW Formosa, 70–1630 m). — Baba 1990: fig. 15a (reexamination of type material). — Macpherson 1993: 462, fig. 8 (in part, Philippines and Indonesia, 143–1075 m). — Baba 1994: 19 (off Central Queensland, 497–503 m). — Komai 2000: 360 (list). — Davie 2002: 66 (no record). — Baba 2005: 199, 303 (key, synonymies, Japan and Kei Islands, 180–325 m). — Baba *et al.* 2008: 174 (list of occurrences). — Baba *et al.* 2009: 281, figs. 257–258 (Taiwan, 520–640 m).

Not *Paramunida scabra* Wu *et al.* 1998: 145, figs 41, 42G (Taiwan) — Macpherson 1993: 462 (in part) (= *P. tricarinata* (Alcock, 1894)).

Dubious identity:

Munida scabra var. *longipes* Borradaile 1900: 422 (type locality: Talili Bay, New Britain Talili Bay, New Britain; 3 syntypes not located).

Paramunida scabra Tirmizi & Javed 1993: 131, figs 58, 59 (off Tanzania and off Mozambique, 100–347 m).

Material examined. Taiwan. Dasi fishing port, Yilan County, 03 December 1984: 1 ov. F 10.8 mm. — 09 November 1995, 1 M 8.0 mm. — Stn CP120, 24°51.79'N, 122°02.54'E, 31 July 2001, 520–640 m: 1 M 5.2 mm (NTOU).

Philippines. PANGLAO. Stn CP2343, 09°26.6'N, 123°51.3'E, 23 May 2005, 309–356 m: 7 M 10.4–12.2 mm, 2 ov. F 11.2–11.8 mm.

Indonesia. Kei Islands. KARUBAR. Stn DW49, 08°00'S, 132°59'E, 29 October 1991, 206–210 m: 1 M 11.9 mm. — Stn CP82, 09°32'S, 131°02'E, 04 November 1991, 215–219 m: 2 M 9.8–10.6 mm, 1 ov. F 12.2 mm, 3 F 10.9–11.7 mm. — Stn 86, 09°26'S, 131°13'E, 04 November 1991, 223–225 m: 3 M 8.5–10.4 mm, 1 ov. F 11.0 mm, 2 F 9.7–10.0 mm (MNHN-Ga3454).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with well developed median spine. Cardiac region with 3 median well-developed spines in midline. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 nearly twice longer than broad, distomesial spine spiniform, exceeding segment 3, distolateral spine not reaching end of segment 3; segment 3 about 1.5 times longer than broad, base of P1 carpus without bundle of setae. P2 propodus about 8 times as long as wide, and 1.2–1.4 times dactylus length.

Remarks. *Paramunida scabra* is closely related to *P. cristata* from Fiji, Vanuatu, and Taiwan. The two species differ in several constant characters. The longitudinal carina on the rostral spine is clearly thicker in *P.*

cristata than in *P. scabra*. Furthermore, the distomesial spine of the antennal segment 2 slightly overreaches the antennal peduncle in *P. cristata*, whereas this spine only exceeds the segment 3 in *P. scabra*. The genetic divergences between the two species were 4.45% (16S rRNA) and 13.33% (ND1).

Paramunida scabra also resembles *P. mozambica* **n. sp.** from Mozambique, from which it is distinguished by:

— The mesogastric region has 1 (rarely 2) spine in *P. scabra*, instead of a row of 3 or 4 distinct spines in *P. mozambica*.

— The sternal plastron has numerous striae on the sternites 4–7 in *P. scabra*, rather than a few striae on each side of the sternites 5–7.

The genetic divergences between *P. scabra* and *P. mozambica* were 5.49% (16S rRNA) and 9.05% (ND1).

Paramunida scabra also resembles *P. crinita* **n. sp.** from the Philippines. The two species can be differentiated by the presence of numerous tufts of long and dense setae along the anterior branch of the cervical groove in *P. crinita*, whereas these tufts are absent in *P. scabra*. The genetic divergences between *P. crinita* and *P. scabra* were 7.72% (16S rRNA) and 10.23% (ND1).

Finally, *P. scabra* is also related to *P. evexa* from Indonesia. These species can be easily distinguished by the distomesial spine of the antennal segment 2, which is spiniform in *P. scabra* and bluntly produced in *P. evexa* (see also Macpherson 1993). The genetic divergences between *P. evexa* and *P. scabra* were 3.21% (16S rRNA) and 8.26% (ND1).

Distribution. Hong Kong, East and South China Sea (Dongsha), Indonesia, Philippines, Taiwan, Japan, and Australia (off Central Queensland), between 70 and 1630 m. The occurrences along the Eastern Africa (off Tanzania and off Mozambique) are questionable and therefore require confirmation.

Paramunida setigera Baba, 1988

(Figs. 15C, 18E)

Paramunida setigera Baba, 1988: 181, figs 74, 75 (Balabac Strait off N Borneo, Davao Gulf off SE Mindanao, Illana Bay off SW Mindanao, between Cebu and Leyte, E coast of Mindoro, South China Sea off SW Luzon, vicinity of Marinduque off SW Luzon, 183–289 m). — Macpherson 1993: 464 (in part, only specimens from Philippines and Indonesia). — Komai 2000: 360 (list). — Baba 2005: 200, 303 (key, synonymies, Bali Sea, 200 m). — Baba *et al.* 2008: 174 (list of occurrences).

Not *Paramunida setigera* Macpherson 1993: 464 (in part, specimens from New Caledonia). — Macpherson 2004: 289 (Fiji, 210–527 m) (= *Paramunida tenera* **n. sp.**).

Material examined. Philippines. MUSORSTOM1. Stn 20, 13°59'N, 120°20'E, 20 March 1976, 208–222 m: 1 M 7.3 mm, 1 ov. F 8.6 mm. — Stn 51, 13°49'N, 120°04'E, 25 March 1976, 170–200 m: 1 M 9.4 mm, 2 ov. F 8.4–8.5 mm. MUSORSTOM 3. Stn 139, 11°53'S, 122°15'E, 06 June 1985, 240–267 m: 3 M 10.3–11.3 mm, 1 ov. F 10.4 mm. PANGLAO. Stn CP2332, 09°41.214'N, 123°47.32'E, 22 May 2005, 270–396 m: 10 M 9.5–11.7 mm, 11 ov. F 9.4–10.5 mm, 1 F 7.8 mm. — Stn CP2340, 09°30.8'N, 123°46.3'E, 23 May 2005, 231–271 m: 6 M 7.5–12.1 mm, 7 ov. F 9.7–11.8 mm, 7 F 5.6–10.4 mm. — Stn CP2381, 08°41.2'N, 123°18'E, 28 May 2005, 241–259 m: 2 M 9.0–10.9 mm, 12 ov. F 9.0–10.6 mm, 1 F 9.4 mm.

Indonesia. CORINDON. Stn CH273, 01°56.0'S, 119°16.0'E, 07 November 1980, 180–220 m: 3 M 9.5–9.7 mm, 4 ov. F 7.9–9.0 mm, 4 F 5.6–8.4 mm (MNHN-Ga3463). KARUBAR. Stn CP66, 09°01'S, 132°09'E, 01 November 1991, 211–217 m: 3 M 8.1–9.5 mm. — Stn CP79, 09°16'S, 131°22'E, 03 November 1991, 239–250 m: 4 M 10.2–11.3 mm (MNHN-Ga3468).

Diagnosis. Rostrum spiniform, smaller than supraocular spines, with thin dorsal carina; row of small epigastric spines behind rostral spine; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short

uniramous setae. Mesogastric and cardiac regions without well developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 more than twice longer than broad, distomesial spine spiniform, exceeding antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 twice longer than broad. Base of P1 carpus with bundle of setae. P2 propodus 12–14 times as long as wide, and 1.3–1.4 times dactylus length.

Remarks. *Paramunida setigera* is closely related to *P. curvata* from Fiji and Vanuatu. The two species can be easily differentiated by the shape of the rostrum. The margin between the rostral and supraocular spines is clearly convex in *P. curvata*, whereas this margin is straight or slightly concave in *P. setigera*. The genetic divergences were 9.57% (16S rRNA) and 13.37% (ND1).

The species is also related to *P. tenera* **n. sp.** from Fiji, Vanuatu and New Caledonia (see below under Remarks for that species).

Distribution. Philippines and Indonesia, between 170 and 289 m.

***Paramunida spatula* Macpherson, 2006**

(Fig. 18F)

Paramunida spatula Macpherson, 2006: 325, fig. 16 (Austral Archipelago, 480–700 m). — Baba *et al.* 2008: 174 (list of occurrences).

Material examined. French Polynesia. Austral Archipelago. BENTHAUS, Stn DW1897, 27°34.27'S, 144°26.68'W, 08 November 2002, 480–700 m: M 9.4 mm (MNHN-Ga5292).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; row of small epigastric spines behind rostral spine; margin between rostral and supraocular spines straight or slightly concave. Mesogastric region with row of 3 well-developed spines. Cardiac region with 3 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short striae on sternite 4, and few short striae on each side of sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spatulate; segment 2 slightly longer than broad, distomesial spine of segment 2 spiniform, reaching midlength of segment 3, distolateral spine nearly reaching end of segment 3; segment 3 1.5 times longer than broad. P2 propodus about 15 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida spatula* is unique in the genus in having a spatulate anterior prolongation of the antennal segment 1.

Distribution. French Polynesia, Austral Archipelago, between 480 and 700 m.

***Paramunida spica* n. sp.**

(Figs. 10, 15D)

Material examined. *Holotype:* Vanuatu. SANTO, Stn AT34, 15°35.9'S, 167°17.1'E, 26 September 2006, 234–270 m: ov. F 7.1 mm (MNHN-Ga7493).

Paratypes: Vanuatu. SANTO, Stn AT34, 15°35.9'S, 167°17.1'E, 26 September 2006, 234–270 m: 4 M 5.9–7.8 mm, 7 ov. F 6.2–8.6 mm (MNHN-Ga7494).

Etymology. The name *spica* refers to one of the stars from the southern hemisphere (constellation of Virgo).

Description. *Carapace:* As long as broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; with median row of small spines behind rostral spine. Mesogastric region with row of 3 or 4 spines. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 or 4 moderated-sized spines, first thicker than others. Each branchial region

with row of spines near cardiac region. Frontal margin slightly concave. Some spines and iridescent setae on anterior half of frontal margin. Anterolateral spine small, nearly reaching sinus between rostral and supraocular spines. Rostrum triangular, slightly larger than supraocular spines, with thin dorsal longitudinal carina; margin between rostral and supraocular spines straight or slightly concave (Figs. 10A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–7 smooth (Fig. 10C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 small spines on anterior ridge; posterior ridge with distinct median spine (Fig. 10A).

Eyes: Maximum corneal diameter about one-third distance between bases of anterolateral spines.

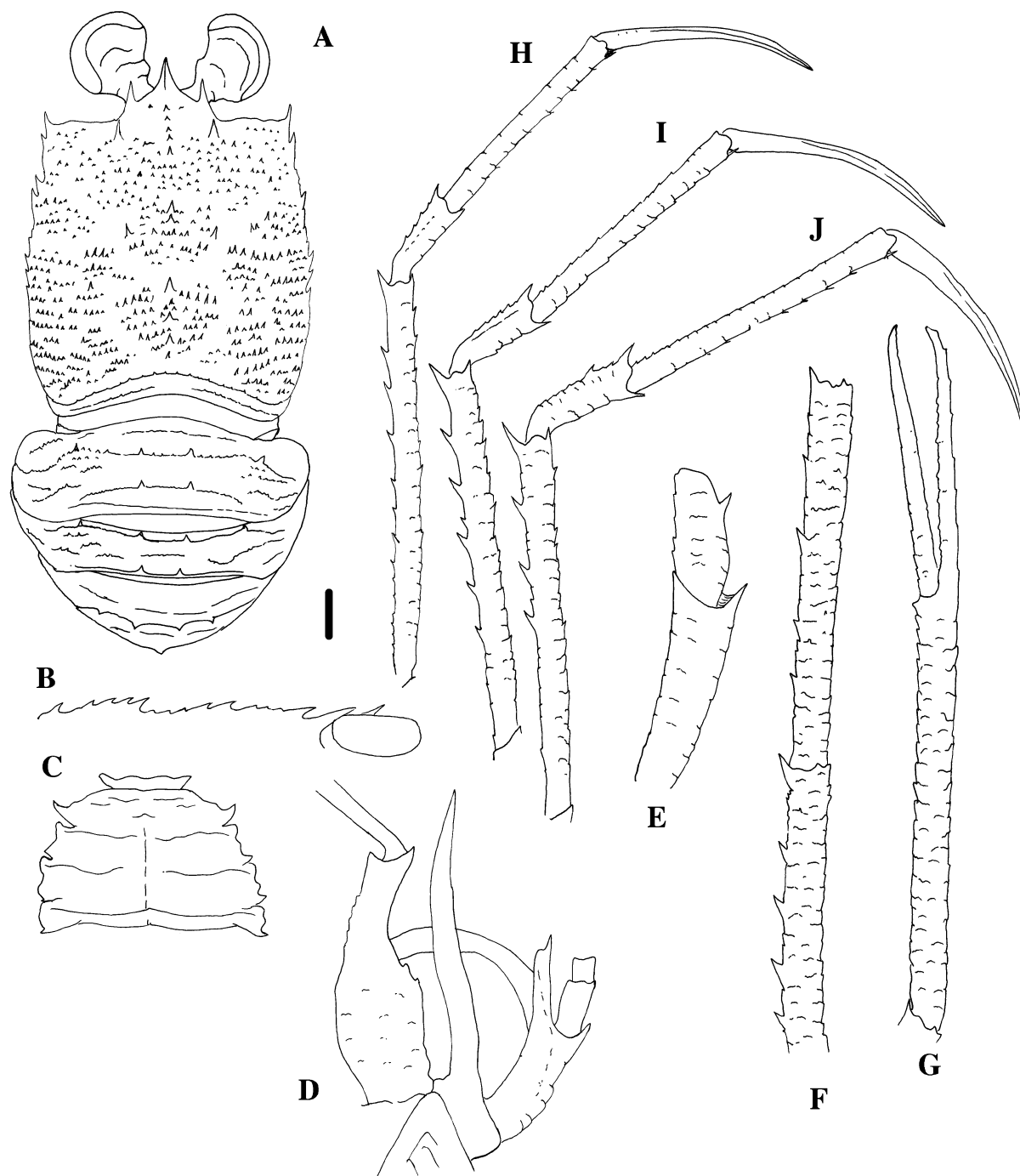


FIGURE 10. *Paramunida spica* n. sp. ovigerous female holotype, 7.1 mm (MNHN-Ga7493). Vanuatu. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1, merus and carpus, dorsal view. G, right P1, palm and fingers, dorsal view. H, right P2, lateral view. I, right P3, lateral view. J, right P4, lateral view. Scales: A–C, F–J = 1 mm; D–E = 0.5 mm.

Antennule: Segment 1 exceeding corneae, with distomesial spine small and slightly shorter than distolateral; about three times longer than wide and with fringe of long setae along lateral margin; lateral margin of antennular segment 1 with distal slender portion as long as proximal inflated portion (Fig. 10D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-fourth of its length. Segment 2 about twice length of segment 3 and twice longer (measured along lateral margin) than wide (measured at midlength of segment), ventral surface with scales; distomesial spine mucronated, overreaching antennal peduncle, overreaching midlength of anterior prolongation of segment 1, distolateral spine nearly reaching midlength of segment 3; segment 3 nearly twice longer than wide and unarmed (Fig. 10D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing one spine; merus with small median spine on flexor margin; extensor margin unarmed (Fig. 10E).

Pereopod 1: Long and slender, squamate, 4.5–6.3 times carapace length; carpus 0.9–1.0 times palm length, and 7–11 times longer than height; palm 1.4–1.8 times finger length. Base of carpus without bundle of setae (Fig. 10F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 3.2–3.5 times carapace length, merus 1.3–1.4 times longer than carapace, about 12–15 times as long as high, 3.8–4.6 times as long as carpus and 1.7 times as long as propodus; propodus about 9–11 times as long as high, and 1.1–1.3 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margins. Carpus with some small dorsal spines, distal spine on dorsal and ventral margin. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus clearly not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus slightly longer than P2 merus; propodus and dactylus slightly longer than those of P2. P4 slightly longer than P2; merus 1.3–1.5 times carapace length; propodus and dactylus slightly longer than those of P3; merocarpal articulation slightly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 10G–I).

Remarks. The new species is closely similar to *P. belone* from New Caledonia, Loyalty Islands, Vanuatu, Tonga, Fiji, Wallis and Futuna. The two species can be easily differentiated by the following characters. The mesogastric region has only one (rarely 2) distinct spine in *P. belone*, whereas there is a row of 3 or 4 moderately-sized spines in *P. spica*; the lateral margin of the antennular segment 1 has the distal slender portion as long as the proximal inflated portion in *P. spica*; whereas this proximal portion is clearly longer than the distal portion in *P. belone*. The genetic divergences between *P. belone* and *P. spica* were 4.26% (16S rRNA) and 10.85% (ND1).

Distribution. Vanuatu, between 234 and 270 m.

***Paramunida stichas* Macpherson, 1993**

(Figs. 15E, 18G)

Paramunida stichas Macpherson, 1993: 465, figs 9, 15 (in part, New Caledonia, Philippines, Fiji and Japan, 210–590 m); 1996: 417 (SW Pacific (Field Bank, Wallis Islands, and Bayonnaise Bank), 400–430 m); 2004: 290 (Fiji and Tonga, 371–591 m). — Baba 2005: 304 (key, synonymies). — Poore *et al.* 2008: 22 (SW Australia, 388–404 m). — Baba *et al.* 2008: 174 (list of occurrences).

Not *Paramunida stichas* Macpherson, 1993: 465 (in part, specimens from Indonesia = *P. salai* Cabezas, Macpherson & Machordom, 2009).

Material examined. New Caledonia. MUSORSTOM 4. Stn 170, 18°57.00'S, 163°12.60'E, 17 September 1985, 485 m: 1 M 10.4 mm, 4 ov. F 8.3–11.2 mm. HALIPRO 1. Stn CP877, 23°03.51'S, 166°59.20'E, 31 March 1994, 464–480 m: 1 M 8.7 mm, 3 ov. F 9.8–11.0 mm. NORFOLK 1. Stn DW1694, 24°40'S, 168°39'E, 24 June 2001, 575–589 m: 1 ov. F 8.6 mm.

Vanuatu. MUSORSTOM 8. Stn CP974, 19°21.51'S, 169°28.26'E, 22 September 1994, 492–520 m: 5 M 7.8–12.6 mm, 1 ov. F 8.6 mm, 1 F 11.3 mm. SANTO. Stn AT11, 15°39.5'S, 167°01.5'E, 17 September 2006, 272–286 m: 1 M 12.5 mm.

Solomon Islands. SALOMON 1. Stn CP1831, 10°12.1'S, 161°19.2'E, 05 October 2001, 135–325 m: 4 M 8.4–12.6 mm, 2 ov. F 8.1–9.6 mm, 2 F 9.4–10.5 mm.

Tonga Islands. BORDAU 2. Stn CP1510, 21°04.65'S, 175°22.52'W, 31 May 2000, 461–497 m: 2 M 9.2–12.7 mm, 3 ov. F 10.9–12.1 mm.

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with row of 3 well-developed spines. Cardiac region with 3 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with some short striae on sternite 4, and few short striae on each side of sternites 5–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 slightly longer than broad with distomesial spine mucronated, clearly overreaching segment 3, distolateral spine nearly reaching end of segment 3; segment 3 1.5 times longer than broad. Base of P1 carpus without bundle of setae P2 propodus about 15 times as long as wide, and 1.5 times dactylus length.

Remarks. *Paramunida stichas* belongs to the group of species with the rostral spine longer than the supraocular spines, and with the distomesial spine of antennal segment 2 mucronated. The species is closely related to *P. proxima* from Philippines, off Zamboanga, Mindanao, north of the Admiralty Islands, Indonesia, Kei Islands, Solomon Islands, and Vanuatu. These species can be differentiated by the number of spines in the mesogastric region: a row of 3 well-developed spines in *P. stichas* and only 1 (rarely 2) well-developed spine in *P. proxima*.

The genetic divergences between *P. stichas* and *P. proxima* were 2.87% (16S rRNA) and 6.47% (ND1). The high degree of intraspecific variability in the species *P. stichas* can lead to misidentification when only morphological characters are used. Therefore, a re-examination of the material from Philippines and Japan (Macpherson 1993) using a combining approach (morphological and molecular information) would be desirable in order to confirm their taxonomic identity.

Distribution. Solomon Islands, Vanuatu, New Caledonia, Fiji, Field Bank, Wallis Islands, Bayonnaise Bank, southwestern Australia, Philippines, and Japan between 135 and 591 m.

Paramunida tenera n. sp.

(Figs. 11, 15F)

Paramunida setigera Macpherson 1993: 464 (in part, specimens from New Caledonia); 2004: 289 (Fiji, 210–527 m) (not *P. setigera* Baba, 1988).

Material examined. *Holotype*: New Caledonia. BATHUS 4. Stn CP946, 20°33' S, 164°58' E, 10 August 1944, 386–430 m: M 8.0 mm (MNHN-Ga7496).

Paratypes: Fiji. MUSORSTOM 10. Stn CP1349, 17°31.07'S, 178°38.79'E, 11 August 1998, 244–252 m: 6 M 7.4–9.3 mm, 5 ov. F 7.8–8.5 mm, 6 F 5.7–9.2 mm (MNHN-Ga7497).

Vanuatu. BOA 0. Stn CP2326, 15°39.83'S, 167°01.9'E, 18 November 2004, 260–313 m: 1 M 9.3–9.4 mm, 3 ov. F 7.7–8.9 mm (MNHN-Ga7498). — Stn CP2327, 15°39.48'S, 167°01.46'E, 18 November 2004, 287–440 m: 18 M 8.5–11.7 mm, 15 ov. F 8.2–10.5 mm (MNHN-Ga7499) (one incomplete male, *P. aff. setigera*, could be a different species). SANTO. Stn AT1, 15°33.8'S, 167°19.5'E, 14 September 2006, 167–367 m: 1 F 8.2 mm (MNHN-Ga7500). — Stn AT2, 15°32.8'S, 167°16.5'E, 14 September 2006, 160–175 m: 1 ov. F 7.5 mm (MNHN-Ga7501). — Stn AT 19, 15°40.8'S, 167°00.5'E, 21 September 2006, 503–600 m: 1 ov. F 8.0 mm (MNHN-Ga7502). — Stn AT27, 15°22.4'S, 167°15.4'E, 23 September 2006, 341–347 m: 1 M 9.6 mm (MNHN-Ga7503).

New Caledonia. BATHUS 4. Stn CP946, 20°33' S, 164°58' E, 10 August 1944, 386–430 m: 4 M 7.9–12.2 mm, 1 ov. F 9.5 mm, 1 F 10.2 mm (MNHN-Ga7504).

Etymology. From the Latin, *tener*, delicate, in reference to the thin and long walking legs.

Description. *Carapace*: Slightly longer than broad. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Epigastric region with 2 spines, each behind supraocular spine; without median row of spines behind rostral spine. Mesogastric region without row of median spines. Cervical groove distinct. Cardiac and anterior branchial regions slightly circumscribed. Cardiac region with a median row of 3 well-developed spines, first thicker than others. Each branchial region with 1 or 2 moderately-sized spines near cardiac region. Frontal margin slightly concave. Lateral margins convex, with some spines and iridescent setae on anterior half. Anterolateral spine well developed, reaching sinus between rostral and supraocular spines. Rostrum spine short, triangular, with thin dorsal longitudinal carina; supraocular spines as long as rostral spine; margin between rostral and supraocular spines straight or slightly concave (Figs. 11A, B).

Sternum: Thoracic sternite 4 with few arcuate striae; sternites 5–7 with few and small striae on lateral sides (Fig. 11C).

Abdomen: Abdominal somites 2–3 each with 4 well-developed spines on anterior ridge, posterior ridge with 2 median spines. Abdominal somite 4 with 4 spines on anterior ridge; posterior ridge with distinct single median spine (Fig. 11A).

Eyes: Maximum corneal diameter more than one-third distance between bases of anterolateral spines.

Antennule: Segment 1 reaching or slightly exceeding cornea, with distomesial spine small and shorter than distolateral; twice longer than wide and with fringe of long setae along lateral margin; lateral margin with distal slender portion about half as long as proximal inflated portion (Fig. 11D).

Antenna: Anterior prolongation of segment 1 clearly overreaching antennular segment 1 by about one-third of its length. Segment 2 about 1.5 times length of segment 3 and about twice longer (measured along lateral margin) than wide (measured at midlength of segment), ventral surface with scales; distomesial spine mucronated, overreaching antennal peduncle, overreaching midlength of anterior prolongation of segment 1, distolateral spine reaching midlength of segment 3; segment 3 nearly twice longer than wide and unarmed (Fig. 11D).

Maxilliped 3: Ischium about twice length of merus measured along dorsal margin, distoventrally bearing long spine; merus with well developed median spine on flexor margin; extensor margin unarmed (Fig. 11E).

Pereopod 1: Long and slender, squamate, 6.7–7.1 times carapace length; carpus 0.8 times palm length, and 9.1–11.0 times longer than height; palm 1.4–1.6 times fingers length. Base of carpus without bundle of setae (Fig. 11F).

Pereopods 2–4: Long and slender, with numerous scales on lateral sides of meri, carpi and propodi; scales with short setae. P2 4.1–4.8 times carapace length, merus 1.8–2.1 times longer than carapace, 17–20 times as long as high, 4.2–4.6 times as long as carpus and 1.7–1.8 times as long as propodus; propodus 13–15 times as long as high, and 1.2–1.5 times dactylus length. Merus with well developed spines on dorsal border, increasing in size distally, ventral margin with few spines and one well-developed distal spine; row of small spines along ventrolateral margin. Carpus with some small dorsal spines, well developed distal spine on dorsal and ventral margins. Propodus with small movable ventral spines. Dactylus compressed, slightly curved, with longitudinal carinae along mesial and lateral sides, ventral border unarmed. End of P2 carpus clearly not reaching end of P1 merus. P3 with similar spination and segment proportions as P2; merus as long as P2 merus; propodus and dactylus slightly longer than those of P2. P4 slightly longer than P2; merus 2.0–2.2 times carapace length; propodus and dactylus slightly longer than those of P3; merocarpal articulation clearly exceeding end of anterior prolongation of segment 1 of antennal peduncle (Figs. 11G–I).

Remarks. The new species is closely related to *P. setigera* from the Philippines and Indonesia. These species can be differentiated by the following characters:

— The thoracic sternites have numerous striae in *P. setigera*, whereas there are few striae on sternites 4–7 on the new species.

— A bundle of setae is present at the base of the P1 carpus in *P. setigera*, whereas it is absent in the new species.

The genetic divergences between *P. tenera* and *P. setigera* were 4.85% (16S rRNA) and 9.15% (ND1).

One incomplete male from BOA 0, Stn CP2327 (*P. aff. setigera*), showed a significant genetic divergence with the other specimens, 4.71% (16S rRNA) and 8.90% (ND1), suggesting the existence of an additional cryptic species. Unfortunately, the incomplete specimen prevents a complete description, and additional material is necessary in order to determine its taxonomic status.

Distribution. Fiji, Vanuatu and New Caledonia, between 160 and 600 m.

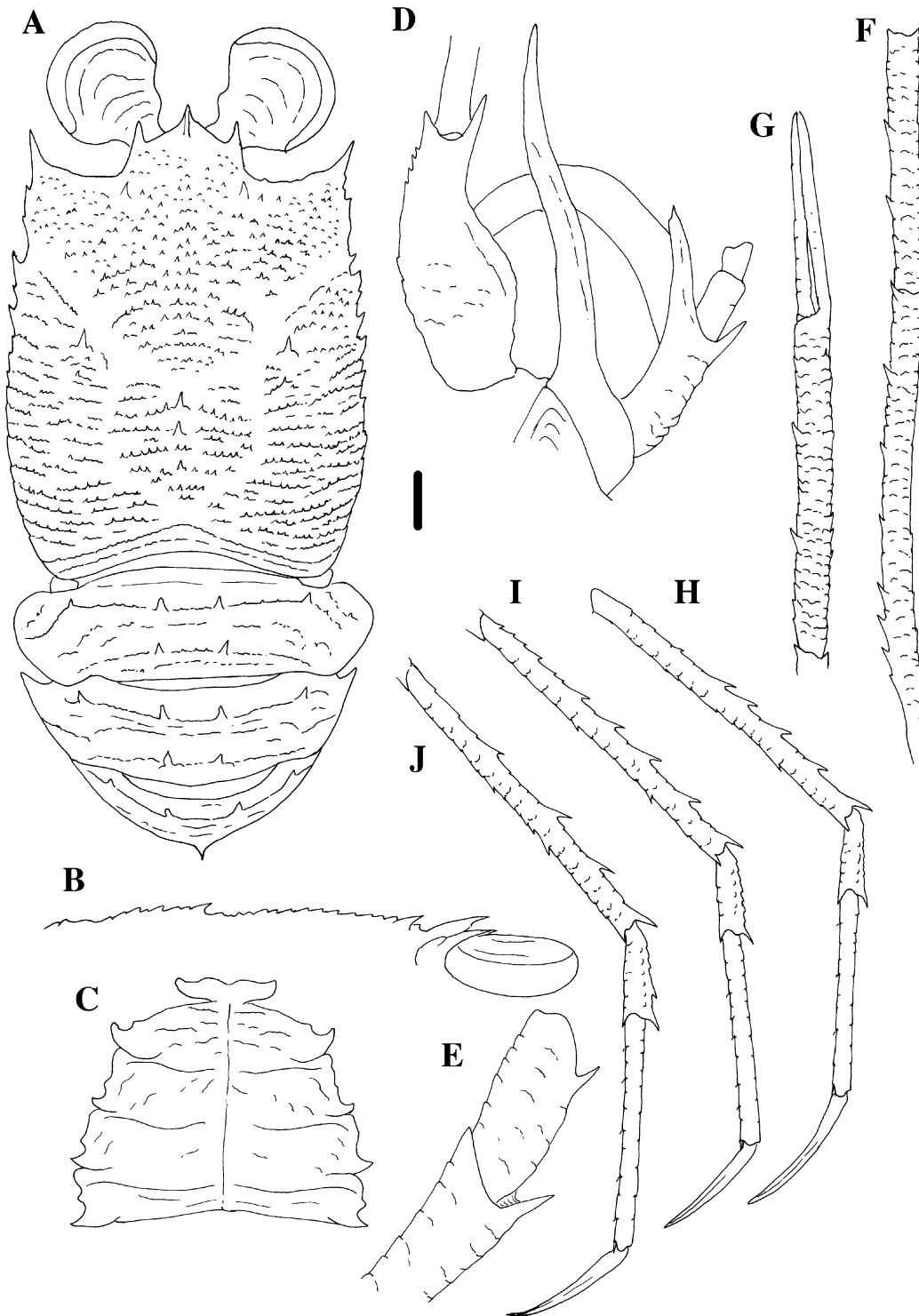


FIGURE 11. *Paramunida tenera* n. sp. male holotype, 8.0 mm (MNHN-Ga7496). New Caledonia. A, carapace and abdomen, dorsal view. B, carapace, lateral view. C, sternum. D, left antennule and antenna, ventral view. E, right maxilliped 3, lateral view. F, right P1 merus and carpus, dorsal view. G, right P1 palm and fingers, dorsal view. H, right P2, lateral view. I, right P3, lateral view. J, right P4, lateral view. Scales: A–C = 1 mm; D–E = 0.5 mm; F–I = 2 mm.

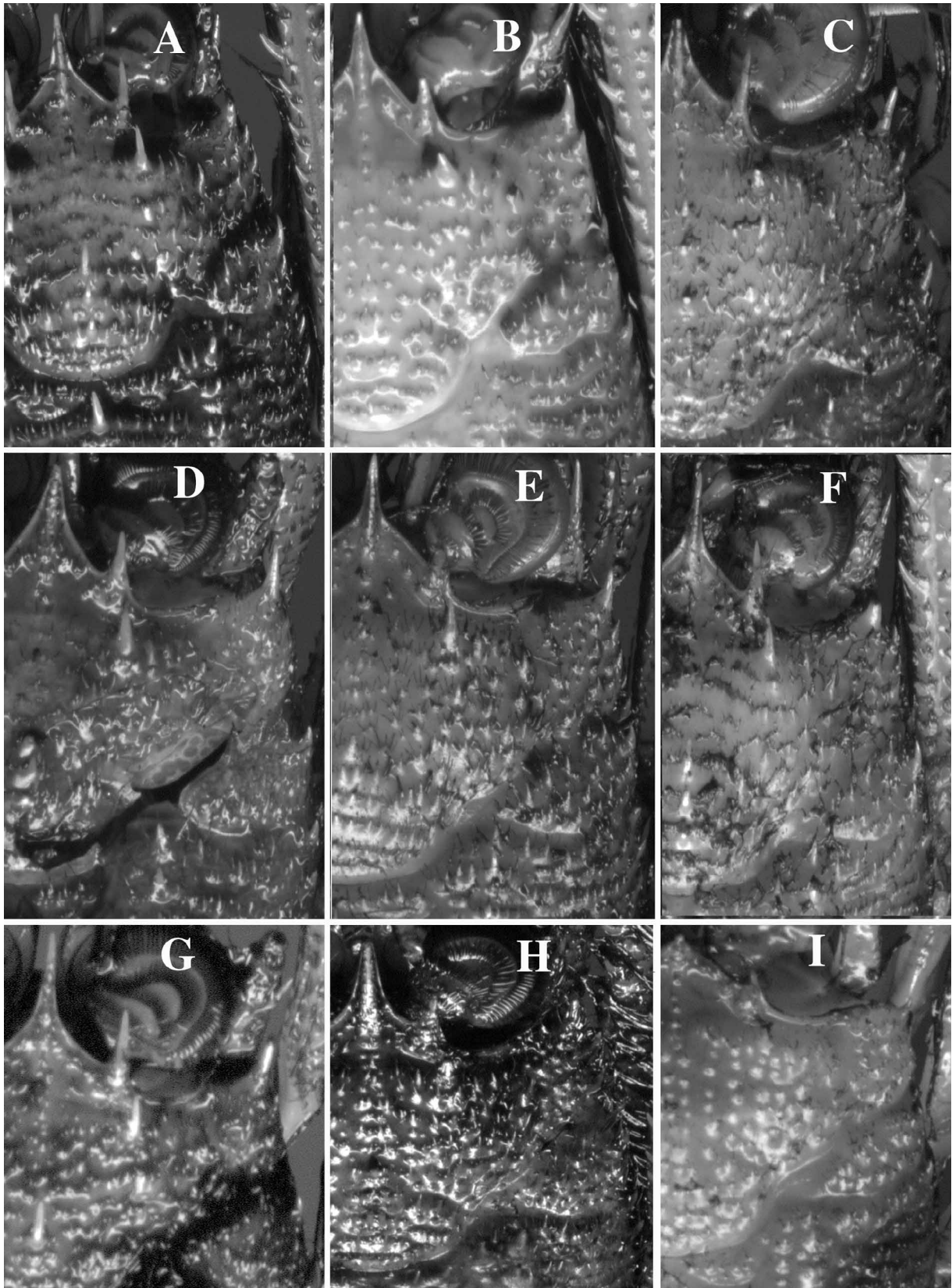


FIGURE 12. Right anterolateral surface of the carapace, dorsal view. A, *Paramunida achnar*, holotype, ovigerous female 9.7 mm. B, *P. amphitrita*, LIFOU, Stn DW1650, male 9.2 mm. C, *P. antares*, holotype, male 9.0 mm. D, *P. ascella*, holotype, male 10.9 mm. E, *P. belone*, MUSORSTOM 8, Stn CP963, male 12.0 mm. F, *P. cretata*, BORDAU 1, Stn CP1412, ovigerous female 10.9 mm. G, *P. crinita*, holotype, male 7.8 mm. H, *P. cristata*, Taiwan, Stn CP269, female 10.1 mm. I, *P. curvata*, MUSORSTOM 10, Stn CP1389, ovigerous female 8.8 mm.

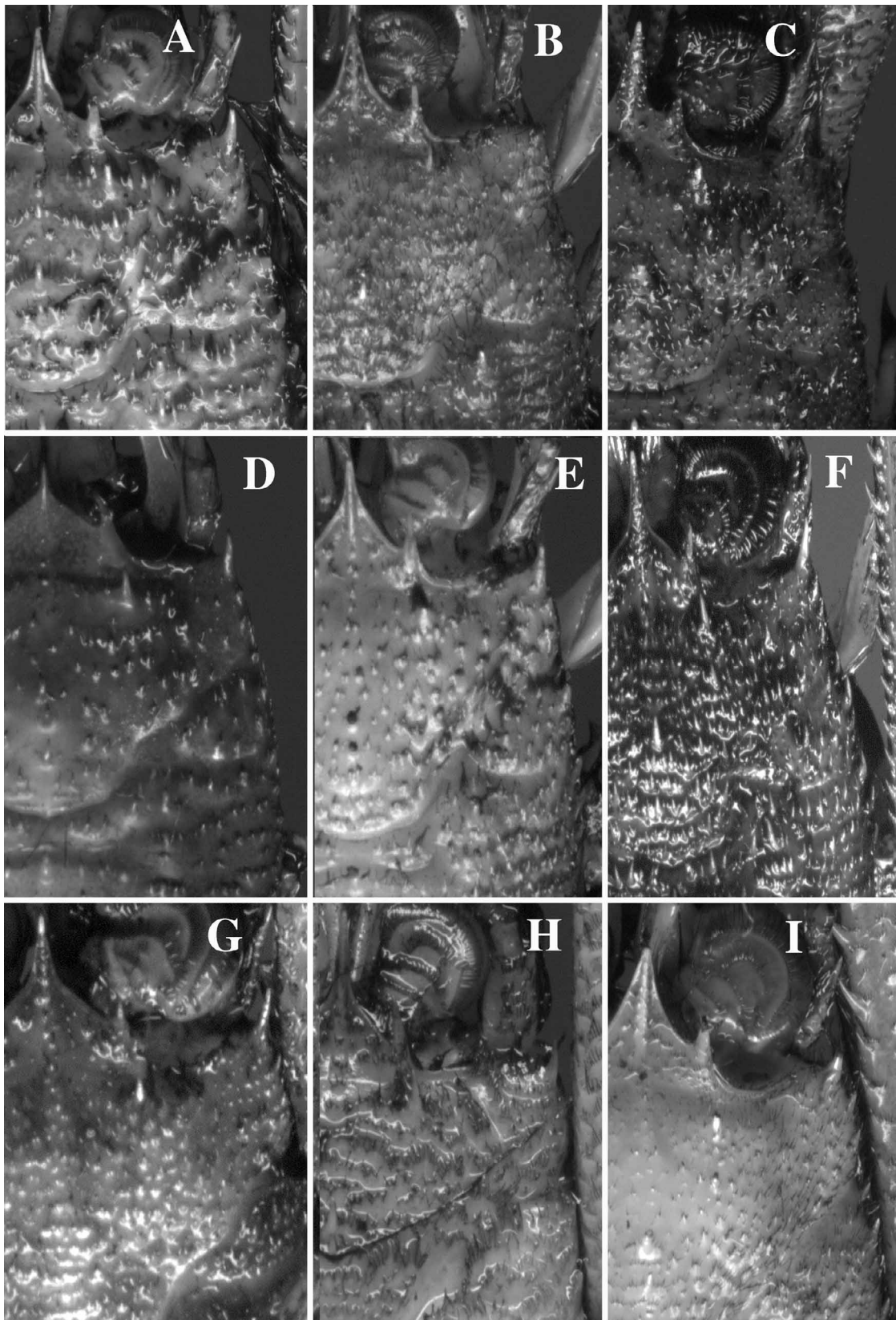


FIGURE 13. Right anterolateral surface of the carapace, dorsal view. A, *Paramunida echinata*, MUSORSTOM 9, Stn CP963, male 12.0 mm. B, *P. evexa*, KARUBAR, Stn CP86, male 9.1 mm. C, *P. granulata*, MUSORSTOM 8, Stn CP971, male 8.3 mm. D, *P. hawaiiensis*, Hawaii, male 9.3 mm. E, *P. labis*, MUSORSTOM 8, Stn CP1027, male 12.0 mm. F, *P. leptotes*, Taiwan, Stn CD380, holotype, male 10.3 mm. G, *P. longior*, BATHUS, Stn CP742, male 9.4 mm. H, *P. lophia*, SALOMON 2, Stn 2199, male 9.7 mm. I, *P. luminata*, MUSORSTOM 7, Stn 629, male 12.6 mm.

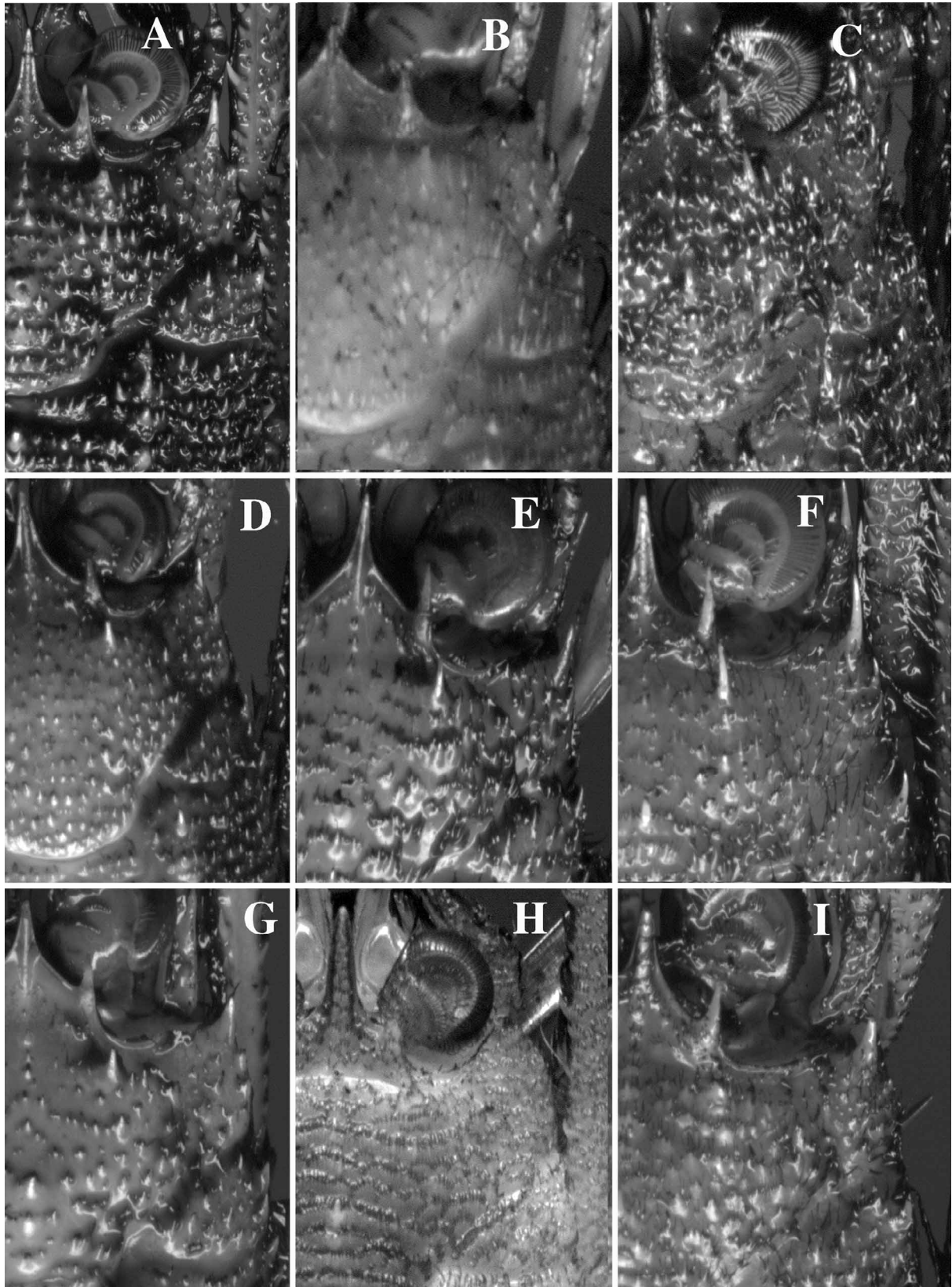


FIGURE 14. Right anterolateral surface of the carapace, dorsal view. A, *Paramunida marionis*, holotype, male 10.7 mm. B, *P. microrrhina*, holotype, ovigerous female 5.1 mm. C, *P. mozambica*, holotype, ovigerous female 6.9 mm. D, *P. parvispina*, holotype, ovigerous female 7.0 mm. E, *P. pictura*, MUSORSTOM 8, Stn CP1025, male 8.7 mm. F, *P. polita*, KARUBAR, Stn CP35, female 12.6 mm. G, *P. poorei*, holotype, male 9.3 mm. H, *P. pronoae*, NORFOLK 1, Stn CP1670, ovigerous female 7.7 mm. I, *P. proxima*, SALOMON 1, Stn CP1831, male 11.8 mm.

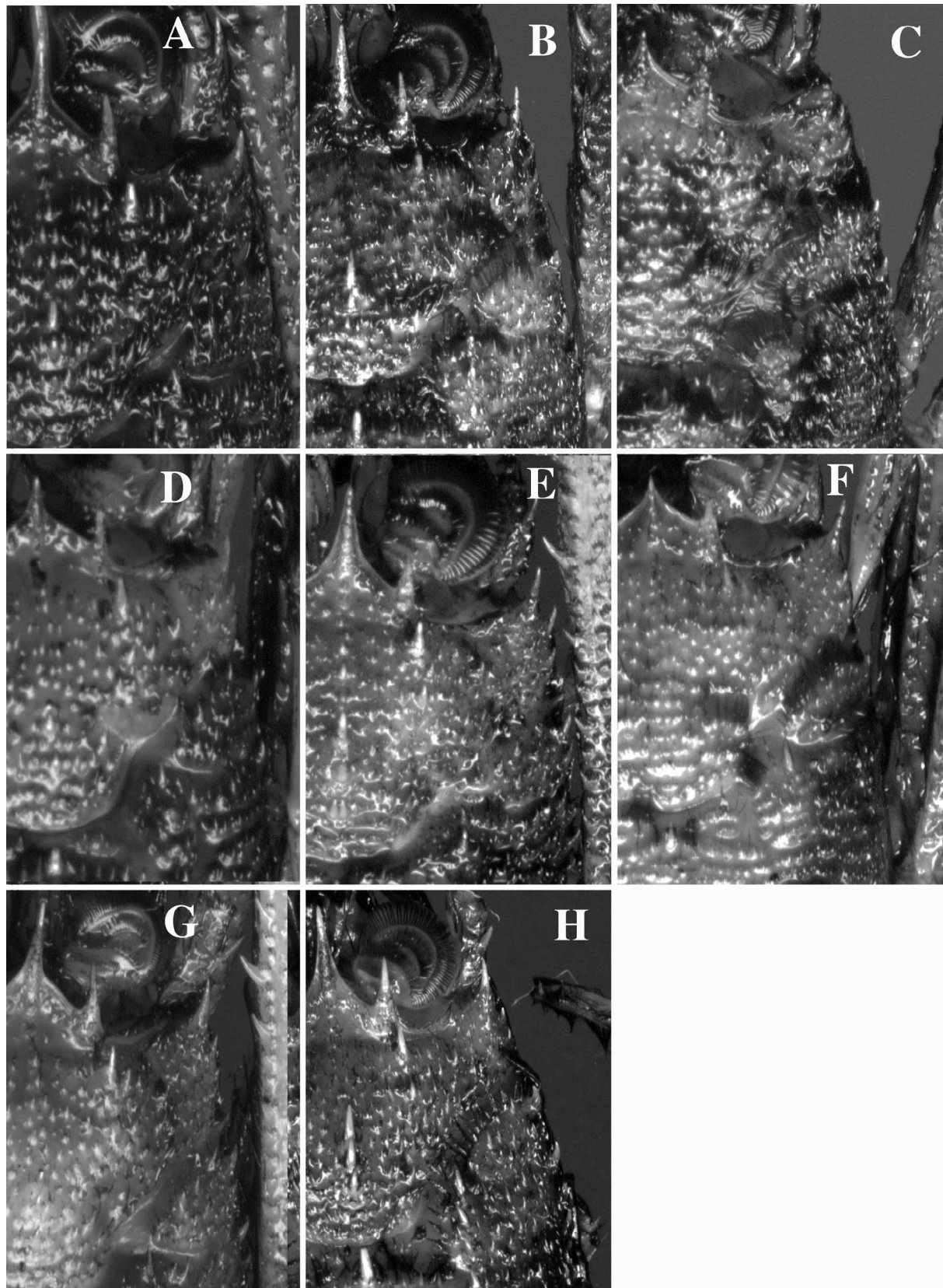


FIGURE 15. Right anterolateral surface of the carapace, dorsal view. A, *Paramunida salai*, SALOMON 1, Stn CP1831, male 10.2 mm. B, *P. scabra*, KARUBAR, Stn CP86, male 11.6 mm. C, *P. setigera*, MUSORSTOM 3, Stn 139, ovigerous female 10.6 mm. D, *P. spica*, holotype, ovigerous female 7.1 mm. E, *P. stichas*, HALIPRO 1, Stn Stn CP877, female 8.9 mm. F, *P. tenera*, holotype, male 8.0 mm. G, *P. thalie*, EBISCO, Stn CP2632, male 8.8 mm. H, *P. tricarinata*, MUSORSTOM 2, Stn CP35, ovigerous female 9.8 mm.

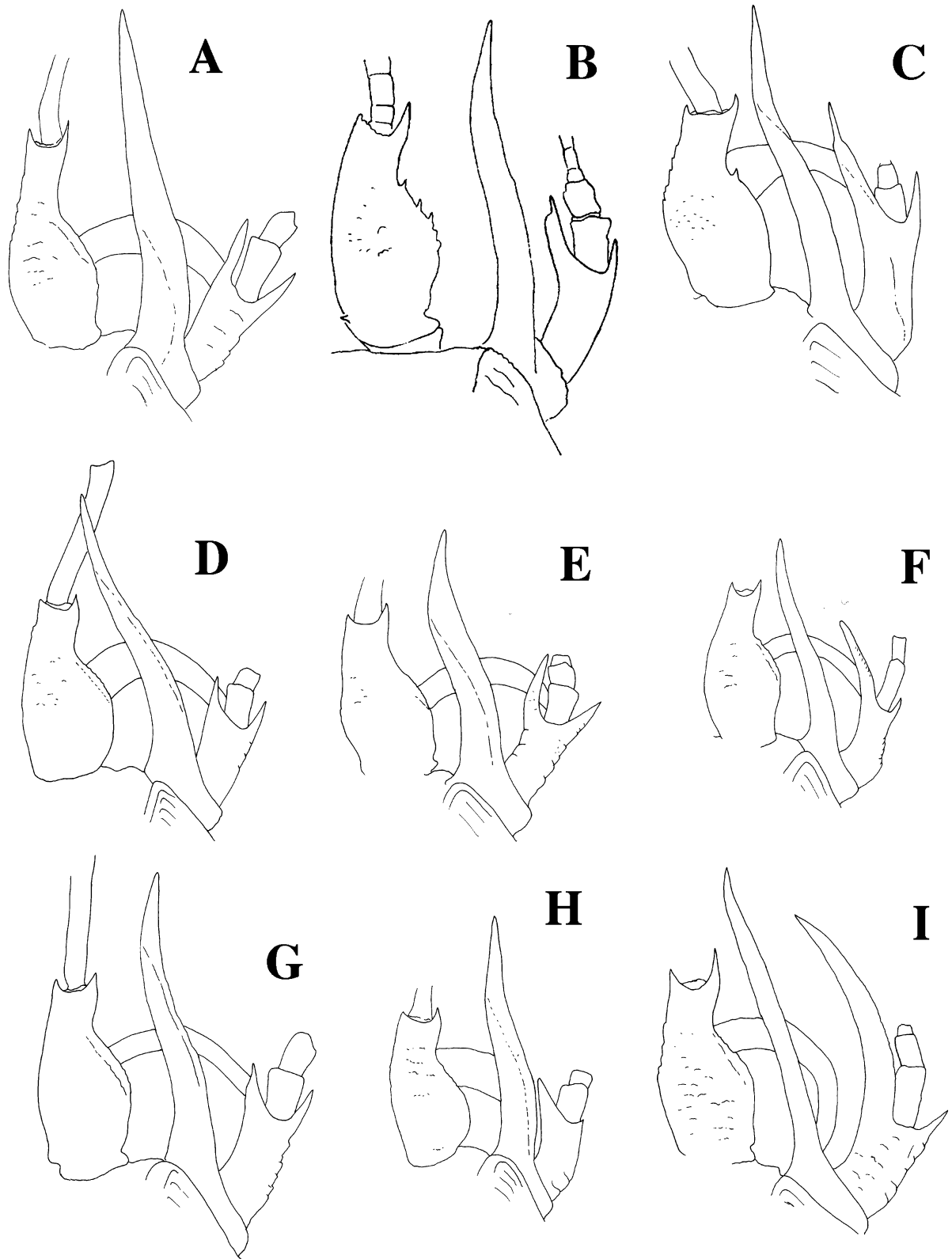


FIGURE 16. Left antennule and antenna, ventral view. A, *Paramunida amphitrita*, LIFOU, Stn DW1650, ovigerous female 10.5 mm. B, *P. antipodes* (from Ah Yong & Poore 2004). C, *P. belone*, MUSORSTOM 8, Stn 963, male 12.0 mm. D, *P. cretata*, BORDAU 1, Stn CP1412, ovigerous female 10.9 mm. E, *P. cristata*, Taiwan, female 10.1 mm. F, *P. curvata*, MUSORSTOM 10, Stn 1390, ovigerous female 10.0 mm. G, *P. echinata*, MUSORSTOM 9, Stn CP1176, male 13.4 mm. H, *P. evexa*, KARUBAR, Stn CP86, male 10.6 mm. I, *P. granulata*, MUSORSTOM 8, Stn CP1027, male 12.4 mm.

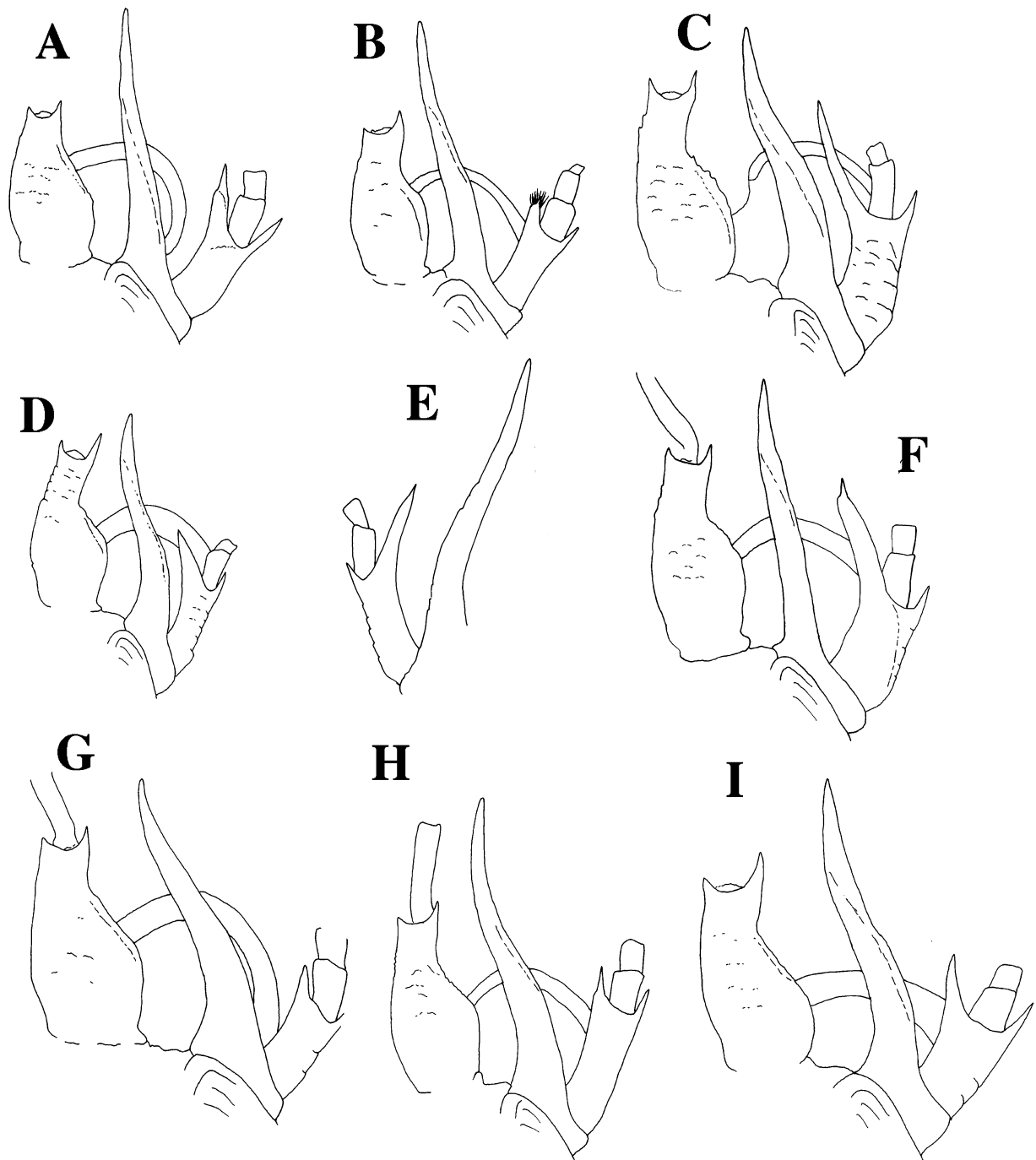


FIGURE 17. Left antennule and antenna, ventral view. A, *Paramunida hawaiiensis*, Hawaii, male 9.3 mm. B, *P. labis*, MUSORSTOM 8, Stn CP971, female 8.3 mm. C, *P. leptotes*, Taiwan, ovigerous female 12.8 mm. D, *P. longior*, BATHUS 2, Stn CP742, male 9.6 mm. Right antenna, ventral view. E, *P. longior*, holotype, 8.5 mm. Left antennule and antenna, ventral view. F, *P. lophia*, SALOMON 2, Stn 2199, male 11.8 mm. G, *P. luminata*, MUSORSTOM 7, Stn 629, male 11.4 mm. H, *P. pictura*, MUSORSTOM 8, Stn 1025, male 9.8 mm. I, *P. polita*, KARUBAR, Stn CP86, male 11.6 mm.

***Paramunida thalie* Macpherson, 1993**
(Figs. 15G, 18H)

Paramunida thalie Macpherson, 1993: 467, figs 10, 16 (Loyalty Islands, 245–283 m); 2004: 290 (Fiji, 310–420 m). — Ahyong & Poore 2004: 68 (Queensland, 210 m). — Baba 2005: 304 (key, synonymies). — Baba *et al.* 2008: 175 (list of occurrences).

Material examined. Vanuatu. MUSORSTOM 8. Stn CP971, 20°19'S, 169°53'E, 21 September 1994, 250–315 m: 1 M 11.5 mm, 1 ov. F 10.9 mm.

New Caledonia. BIOCAL. Stn CP110, 22°12.38'S, 167°06.43'E, 09 September 1985, 275 m: 5 M 7.3–10.7 mm, 3 F 7.0–9.3 mm.

Loyalty Islands. MUSORSTOM 6. Stn 417, 20°41.8'S, 167°03.6'E, 16 February 1989, 283 m: 1 F 10.4 mm (holotype, MNHN-Ga3478).

Chesterfield Islands. EBISCO. Stn CP2632, 21°03.655'S, 160°44.673'E, 21 May 2005, 297–378 m: 1 M 8.8 mm.

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions usually not forming groups, lacking scaly striae and with few short uniramous setae. Mesogastric region with row of 3 well-developed spines. Cardiac region with 3 well-developed spines. Few and short setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of segment 1 spiniform; segment 2 slightly longer than broad with distomesial spine spiniform, exceeding segment 3, distolateral spine not reaching end of segment 3; segment 3 twice as long as broad. Base of P1 carpus without bundle of setae. P2 propodus about 9 times as long as wide, and 1.2–1.4 times dactylus length.

Remarks. *Paramunida thalie* is closely related to *P. amphitrita* from Futuna, Fiji, Tonga and New Caledonia islands. They can be easily distinguished by the presence of numerous arcuate striae on the thoracic sternites 5–7 of *P. thalie*, whereas these sternites are smooth in *P. amphitrita*. The two species can also be differentiated by the length of the P2–4 propodi and the length of the distomesial spine of the antennal segment 2 (see Macpherson 1996). The genetic divergences between *P. amphitrita* and *P. thalie* were 4.70% (16S rRNA) and 11.16% (ND1).

Distribution. Vanuatu, New Caledonia, Loyalty Islands, Chesterfield Islands, Fiji and Queensland, between 245 and 420 m.

Paramunida tricarinata (Alcock, 1894)

(Figs. 15H, 18I)

Munida tricarinata Alcock, 1894: 324 (Andaman Sea, 205 m); 1901: 246 (Andaman Sea and Arabian Sea off N. Maldives Atoll, 205–384 m). — Alcock & Anderson 1895: pl. 12, fig. 1 (no record).

Paramunida tricarinata Baba 2005: 304 (key, synonymies). — Baba *et al.* 2008: 175 (list of occurrences). — Baba *et al.* 2009: 283, figs. 260–261 (Taiwan).

Paramunida scabra Wu *et al.* 1998: 145, figs 41, 42G (Taiwan). — Macpherson 1993: 462 (in part) (not *P. scabra* (Henderson, 1885)).

Dubious identity:

Munida tricarinata Laurie 1926: 138 (Providence and Saya De Malha Bank, 281–275 m). — Tirmizi 1966: 202, fig. 21 (Zanzibar and Maldives, 183–457 m).

Paramunida tricarinata. — Baba 1990: 968, fig. 15b (Madagascar, 308–444 m). — Macpherson 1993: 469, fig. 11 (Maldives Islands and Madagascar, 238–428 m).

Material examined. Taiwan. Dashi fishing port (no depth recorded), Yilan County, 05 August 1982: 1 M 8.0 mm. — 09 September 1989: 1 ov. F 7.0 mm, 2 F 8.3–8.5 mm. — 03 March 1991: 1 M 8.4 mm, 2 ov. F 7.9–8.1 mm, 1 F 5.2 mm. — 19 April 1995: 1 M 9.1 mm, 1 ov. F 9.1 mm. — 13 June 1995: 1 M 8.9 mm. — 09 November 1995: 4 M 10.2–12.7 mm, 2 F 10.4–12.7 mm. — 28 January 1997: 1 M 9.6 mm. — 01 September 1997: 1 ov. F 9.8 mm. — 23 September 1997: 1 M 9.8 mm, 1 ov. F 9.5 mm. — 30 October 1997: 1 ov. F 10.1 mm. — 18 November 1997: 1 M 8.6 mm. — 05 December 1997: 1 M 10.1 mm, 1 ov. F 8.9 mm. — 26 January 1999: 1 M 9.0 mm. — 23 March 1999: 1 M 9.8 mm. — 09 December 2003: 1 F 11.5 mm. — 16 December 2004: 6 M 10.8–11.6 mm, 1 ov. F 11.4 mm.

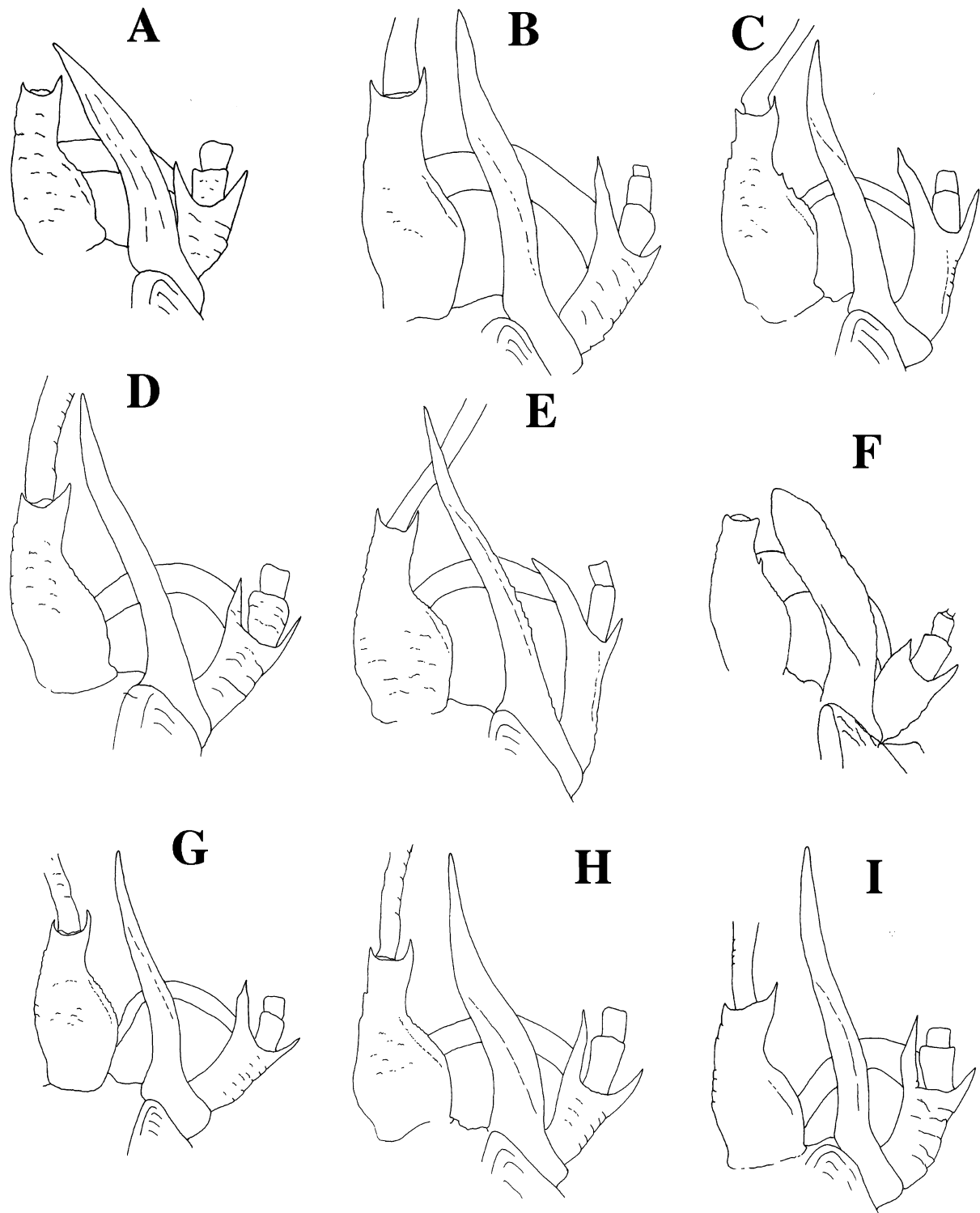


FIGURE 18. Left antennule and antenna, ventral view. A, *Paramunida pronoe*, NORFOLK 1, Stn CP1670, ovigerous female 8.3 mm. B, *P. proxima*, SALOMON 1, CP1831, male 11.6 mm. C, *P. salai*, SALOMON 1, Stn CP1831, male 11.0 mm. D, *P. scabra*, KARUBAR, Stn 86, male 10.4 mm. E, *P. setigera*, MUSORSTOM 3, Stn 139, male 10.3 mm. F, *P. spatula*, BENTHAUS, Stn DW1897, holotype, male 9.4 mm (from Macpherson, 2006). G, *P. stichas*, HALIPRO 1, Stn CP877, ovigerous female 11.0 mm. H, *P. thalie*, EBISCO, Stn CP2632, male 8.8 mm. I, *P. tricarinata*, MUSORSTOM 2, Stn 35, male 9.0 mm.

Philippines. MUSORSTOM 2. Stn 31, 13°40'N, 120°54'E, 24 November 1980, 204–230 m: 5 M 8.7–11.6 mm, 2 ov. F 8.5–9.0 mm (MNHN-Ga3430). — Stn 35, 13°28'N, 121°12'E, 160–198 m: 2 M 7.7–9.0 mm, 3 ov. F 9.0–9.6 mm, 1 F 7.3 mm (MNHN-Ga3431).

Diagnosis. Rostrum spiniform, larger than supraocular spines, with thin dorsal carina; margin between rostral and supraocular spines straight or slightly concave. Spinules on gastric and hepatic regions forming groups arising from scale-like striae and with few short uniramous setae. Mesogastric region with row of 3 well-developed spines. Cardiac region with 3 or 4 well-developed spines. Tufts of long and dense setae along anterior branch of cervical groove. Sternal plastron with numerous striae on sternites 4–7. Lateral margin of antennular segment 1 with distal slender portion about half as long as proximal inflated portion. Antennal peduncle with anterior prolongation of antennal segment 1 spiniform; segment 2 slightly longer than broad, with distomesial spine spiniform, slightly overreaching end of antennal peduncle, distolateral spine not reaching end of segment 3; segment 3 1.4 times longer than broad. Base of P1 carpus without bundle of setae. P2 propodus about 9 times as long as wide, and 1.2–1.4 times dactylus length.

Remarks. *Paramunida tricarinata* is very similar to *P. crinita* n. sp., from the Philippines, and *P. ascella* n. sp., from Vanuatu.

P. tricarinata can be differentiated from *P. crinita* by the following characters:

- A row of 3 or 4 distinct spines instead of 1 (rarely 2) well-developed spines.
- The distomesial spine of the antennal segment 2 overreaches instead of never reaching the end of the antennal peduncle.

P. tricarinata is easily distinguished from *P. ascella* by the following aspects:

- Rostrum is spiniform rather than triangular.
- The distomesial spine of the antennal segment 2 is spiniform instead of mucronated. Furthermore, this spine distinctly overreaches the antennal peduncle in *P. tricarinata*, whereas the spine never exceeds this peduncle in *P. ascella*.

The genetic divergences between *P. tricarinata* and the other two species were: *P. crinita* 1.13% (16S rRNA) and 2.06% (ND1), and *P. ascella* 1.41% (16S rRNA) and 2.19% (ND1).

Paramunida tricarinata is also closely related to *P. marionis* n. sp. from Madagascar, and they can be differentiated by the following characters:

- *P. marionis* has a very spiny gastric region with well developed spines, whereas in *P. tricarinata* the spines are fewer and smaller in size.
- The distolateral spine of the antennal segment 2 never reaches the end of the antennal segment 3 in *P. tricarinata*, whereas this spine slightly overreaches the end of the third segment in *P. marionis*.

The occurrences of *P. tricarinata* along the western Indian Ocean (coast of Africa, Madagascar, Arabian Sea) (e.g. Laurie 1926; Tirmizi 1966; Baba 1990) should be considered with caution. Most of *Paramunida* species show restricted geographic ranges so it is not unlikely that such records may correspond to the new species described herein (*P. marionis* and *P. mozambica*), which are morphologically very close related to *P. tricarinata*. Therefore, a careful comparison would be desirable in order to confirm their identity.

Distribution. Arabian Sea, Maldives Islands, Andaman Sea, Taiwan and Philippines, between 205 and 384 m. The occurrences in other localities require confirmation (see above).

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