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A new genus and some new species of the genus *Lauriea* Baba, 1971 (Crustacea, Decapoda, Galatheidae) from the Pacific and Indian Oceans, using molecular and morphological characters

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Abstract

The genus *Lauriea* belongs to the family Galatheidae and is easily differentiated from other genera of the family by the endopod of the uropod being much wider than long and the dactyli of the walking legs being curved and strongly biunguiculate. Examination of many specimens collected during recent expeditions from Madagascar to French Polynesia and using morphological and molecular data revealed the existence of six species, five of them new, that are genetically distinct yet morphologically very similar. Furthermore, another new species, having a triunguiculate P2–4 dactyli, represents a new genus, *Triodonthea*.

Key words: New species, squat lobster, molecular data, morphology, *Lauriea*, *Triodonthea*

Introduction

The genus *Lauriea* was established by Baba (1971) to include *Galathea gardineri* Laurie, 1926, a small species collected in the Providence and Seychelles Islands during the H.M.S. “Sealark” expedition carried out in the western Indian Ocean in 1905. Unfortunately the types of the species (two males and one ovigerous female) are lost. The genus belongs to the family Galatheidae Samouelle, 1819 (Ahyong et al. 2010) and is easily differentiated from other genera of the family by the endopod of the uropod being much wider than long and the dactyli of the walking legs being curved and strongly biunguiculate (Baba 1971; Macpherson & Baba 2011). The body and appendages of *Lauriea* have numerous long setae. *Galathea biunguiculata* Miyake, 1953, from the Palau Islands, was considered a junior synonym of *G. gardineri* by Tirmizi (1966) and Baba (1971). The type material of *G. biunguiculata* is unfortunately also lost. In 1994, a second species of the genus, *Lauriea siagiani* Baba, 1994, was described from Bali, Indonesia.

Lauriea gardineri has been reported sporadically in the Pacific and Indian Oceans (see Baba et al. 2008): Red Sea (Tirmizi 1966; Lewinsohn 1982), Madagascar (Baba 1991, 1994), Japan (Baba 1971, 1989; Kamezaki et al. 1988; Minemizu 2000; Kato & Okuno 2001; Osawa & Okuno 2004), Talaud Islands, Indonesia (Baba 1977a), Sulu Archipelago (Baba 1988), western Indian Ocean off the Somali Republic, the Andaman Islands (Tirmizi & Javed 1993), New Caledonia (Baba, 1994), and Western Australia (Macpherson 2008; Poore et al. 2008). The species has been collected, usually in shallow waters, from the shore to ca. 100 m, although the records from south-western Australia are at 100–382 m (Poore et al. 2008). *Lauriea siagiani* has been reported from Indonesia, the Philippines and Japan (Gosliner et al. 1996; Kato & Okuno 2001; Osawa & Okuno 2004).

A large number of specimens of *Lauriea*, along with colour images of some specimens, have been collected by numerous expeditions over the past decades in the Indian and Pacific Oceans (e.g. Bouchet et al. 2009). Here, we examine all of this material, using a combined morphological and molecular approach based on two mitochondrial (cytochrome oxidase I, COI, and 16S rRNA) markers. This approach follows previous studies on squat lobsters

(Machordom & Macpherson 2004; Schnabel *et al.* 2009; Cabezas *et al.* 2010, 2011; Puillandre *et al.* 2011). Unfortunately, we have not collected material from the type locality of *L. gardineri* (Providence Island), although some specimens were collected ca. 370 km south, in Madagascar.

Our study revealed the existence of six species, five of them new, that are genetically distinct yet morphologically very similar. Furthermore, another new species, having triunguiculate P2–4 dactyli, and which is molecularly clearly differentiated from the species of *Lauriea*, represents a new genus. Specimens of *L. siagiani* were not collected and the species was not considered in the present study. *Lauriea siagiani*, however, is easily differentiable from *L. gardineri* and other species of *Lauriea* described herein (see below, and Baba 1994; Osawa & Okuno 2004). The new species are only differentiable by their molecular data, colour patterns and a few subtle morphological differences. The molecular and the colour information provide the most consistent differences, whereas the morphological characters can be variable and difficult to use. Therefore, previous records of *Lauriea* species are difficult to revise, even if a description and illustrations are available. In this study we have considered the most common species collected in northern Madagascar, 370 km south the type locality, as *L. gardineri*. The species is restricted to the western Indian Ocean, so the other material previously reported from the western Pacific probably belongs to other species. The difficulty in distinguishing preserved material recommends the use of molecular analyses and colour information in future studies.

The species, *L. biunguiculata* (Miyake, 1953), should be resurrected. However, we have no topotypic material (Palau Islands) to designate a neotype. Therefore, the analysis of samples from this area, including colour patterns and molecular data, would confirm the taxonomic status of the species that could belong (or not) to one of the species described in the present study.

The existence of additional species of *Lauriea* is likely. For instance, an unpublished colour photo of a *Lauriea* from Taiwan provided by C.W. Lin has a different colour pattern than from the colour patterns observed in the present work. Therefore, a more detailed study including more specimens from other regions in combination with molecular data would be desirable.

Material and methods

Sampling, terminology and measurements. The specimens were collected in expeditions carried out in Madagascar in 2009 (MIRIKY) and 2010 (ATIMOVATAE), the Philippines in 1980 and 1985 (MUSORSTOM 2 and 3, respectively) and 2004 (PANGLAO), the Mariana Islands in 1994 and 1995, the Solomon Islands in 2001 (SALOMON 1), Vanuatu in 2006 (SANTO), New Caledonia area in 2000 (LIFOU), 2003 (NORFOLK 2), and some cruises carried out in 1978 to 1995, Australia in 2009, Wallis and Futuna in 1992 (MUSORSTOM 7), and French Polynesia in 2006 to 2009.

The terminology used follows Baba *et al.* (2011). The size of the carapace is indicated as the postorbital carapace length measured along the dorsal midline from the orbit margin to the posterior margin of the carapace. The abbreviations used include: Mxp3 = third maxilliped, P1 = first pereopod (cheliped), P2–4 = second to fourth pereopods (first to third walking legs). Material examined: M = males; F = females; ov. = ovigerous. The specimens, including the types of the new species, are deposited in the Museum national d'Histoire naturelle, Paris (MNHN), National Taiwan Ocean University (NTOU), Manila Museum (MM), and Florida Museum of Natural History, Gainesville (UF).

Molecular analysis. Total genomic DNA was isolated from muscle tissue using the QiAamp genomic DNA and RNA kits (QIAGEN) following suppliers recommendations. 1078bp (aligned positions) of the mitochondrial DNA (mtDNA) genome, including partial sequences of 16S rRNA and COI were amplified through Polymerase Chain Reaction (PCR) using primers 16Sar-L and 16Sbr-L (Palumbi 1996) and LCO1490 and HCO2198 (Folmer *et al.* 1994). Amplification reactions were performed in a final volume of 15 µl, the PCR mix contained 2 l of DNA template, 0.2 M of each primer, 0.2 mM of dNTP, 1.5mM MgCl₂, 0.5 l of BSA (10 mg/ml) and 1.0 U of Taq DNA polymerase (Amersham). Thermal cycling conditions for both genes consisted of an initial denaturation step of 94°C for 4 min followed by 35 cycles at 94°C for 30 s, an annealing temperature of 50°C for 1 min, 72°C for 1 min, and a final extension at 72°C for 10 min. Samples were sequenced using Macrogen Inc. Europe services. New sequences are available in GenBank under accession numbers: COI (KC133395–KC133460), 16S (KC133461–KC133514).

Sequences were edited using Bioedit Sequence Alignment Editor v5.0.9 (Hall 1999), and manually aligned. Most alignments were reliable and did not require further edition. Multiple alignments were performed using Clustal W (Thompson *et al.* 1994) included in MEGA version 4 (Tamura *et al.* 2007).

The proportion of different nucleotide sites (p) between each pair of sequences and between species was estimated dividing the number of nucleotide differences by the total number of nucleotides compared, as implemented in MEGA version 4 (Tamura *et al.* 2007).

Results

Molecular Analysis. Molecular sequences from COI and 16S ribosomal RNA markers indicated clear differences among group of individuals, morphologically identified as new species and the existence of a new genus closer to the genus *Macrothea* than to *Lauriea*. The divergences between sequences of the six species of *Lauriea* ranged from 5.2 to 10.6% for the COI marker, and from 0.7 to 3.7% for the 16S rRNA marker. The divergences between the new genus *Triodonthea* and *Macrothea bouchardi* were 12.4% for COI, and 5.7% for 16S rRNA. The divergences between *Triodonthea* and the species of *Lauriea* ranged from 13.1 to 15.2% for the COI marker, and from 3.7 to 5.9% for the 16S rRNA marker (Table 1). *L. adusta* shows a high intraspecific divergence among samples (see below).

TABLE 1. Mitochondrial uncorrected pairwise “p-distances” values among *Lauriea* species, *Macrothea bouchardi* and *Triodonthea setosa*. Distance above the diagonal refer to the 16S rRNA gene and below the diagonal to the COI gene (3.1–5.2, see below).

	<i>L. a</i>	<i>L. c</i>	<i>L. g</i>	<i>L. p</i>	<i>L. s</i>	<i>L. t</i>	<i>T. s</i>	M. b	Intraspecific Range COI	Intraspecific Range 16S
<i>L. adusta</i>		3.4	3.6	3.8	3.2	3.8	5.9	5.7	3.1–5.2	0.0–2.5
<i>L. crucis</i>	9.8		2.3	3.4	1.7	1.0	3.7	5.0	0.2–1.9	0.0–0.0
<i>L. gardineri</i>	10.3	8.8		1.3	0.7	1.7	4.7	5.8	0.0–3.1	0.0–1.4
<i>L. punctata</i>	9.5	9.2	8.7		0.9	1.1	4.1	5.4	0.0–0.3	0.0–0.4
<i>L. simulata</i>	10.6	8.2	5.2	9.7		1.3	4.2	5.4	0.3	0.0–0.2
<i>L. teresae</i>	9.3	7.0	10.5	9.7	10.0		3.7	5.1	0.0–1.3	0.0–0.2
<i>T. setosa</i>	14.6	15.2	15.1	14.1	14.9	13.1		5.7	1.0–1.8	0.0–0.4
<i>M. bouchardi</i>	13.8	14.0	15.1	12.9	15.2	12.4	13.2		1.2–1.6	0.0–0.1

Systematic account

Key to species of *Lauriea* and *Triodonthea* n. gen.

1. P2–4 dactyli triunguiculate *Triodonthea setosa*
- P2–4 dactyli biunguiculate 2
2. Eystalks elongate, fully twice as long as wide. Antennular article 1 without distomesial spine *L. siagiani*
- Eystalks about 1.5 times longer than wide. Antennular article 1 with distomesial spine 3
3. P2–4 meri with the extensor margin sharply ridged and lateral side with few setose striae 4
- P2–4 meri with the extensor margin more or less rounded (in cross-section) and lateral side with numerous setose striae 5
4. Eye 1.8 times longer than wide *L. crucis*
- Eye at most 1.5 times longer than wide *L. teresae*
5. Distomesial spine of antennal article 2 reaching end of article 3. Rostrum dorsally flattish on distal portion; rostral spine and distal-most lateral teeth with convex lateral margins 6
- Distomesial spine of antennal article 2 clearly exceeding article 3. Rostrum slightly concave on distal portion; rostral spine and distal-most lateral teeth with straight lateral margins 7
6. Antennal article 1 with ventromesial process overreaching end of article 2. Ground colour of carapace, abdomen and P1–4

- brownish or whitish, without coloured spots; P1 fingers without red and white bands *L. adusta*
- Antennal article 1 with ventromesial process not reaching or at most reaching end of article 2. Ground colour of carapace and abdomen brownish or whitish, with some small red spots on carapace, abdomen and P1–4; P1 fingers with red and white bands *L. punctata*
- 7. Eye not reaching or at most reaching end of antennal peduncle. Ground colour of carapace and abdomen whitish, with numerous minute brown spots. *L. gardineri*
- Eye exceeding antennal peduncle. Ground colour of carapace and abdomen whitish, with some yellow spots circled by brown on carapace and abdomen *L. simulata*

Genus *Lauriea* Baba, 1971

Lauriea Baba 1971: 51 (gender: feminine).—Baba 2005: 67 (key).—Macpherson & Baba 2011: 54.

Type species. *Galathea gardineri* Laurie, 1926, by monotypy.

***Lauriea adusta* n. sp.**

(Figs 1, 8D, 9G–H)

Dubious records:

Galathea gardineri Tirmizi, 1966: 177, fig. 2 (Red Sea, 29–55 m).—Lewinsohn, 1969: 112 (no record).
Lauriea gardineri Lewinsohn, 1982: 299, fig. 1 (Gulf of Aqaba (northern Red Sea), 3–81 m).—Kamezaki *et al.*, 1988: 99, with color fig. (Okinawa).—Tirmizi & Javed, 1993: 23, figs 10–11 (western Indian Ocean off Somali Republic, Andaman Islands, 66–177 m).—Baba, 1994: 43, fig. 2 (Madagascar, New Caledonia).—Kato & Okuno, 2001: 88, fig. (Hachijo Island, Japan, 25 m).

Material examined. *Holotype:* Philippines. Bohol Island, W of Baclayon. PANGLAO, Stn T6, 9°35.1'N, 123°51.2'E, 34–82 m, 2 June 2004: 1 M 2.5 mm, coarse muddy sand with large sponges (NTOU).—Pamilacan Island. PANGLAO. Stn B19, 9°29.4'N, 123°56.0'E, 17 m, 21 June 2004: 1 ov. F 3.3 mm (MM).—Panglao Island, North of Doljo, PANGLAO. Stn B36, 9°35.9'N, 123°44.5'E, 24 m, 1 July 2004: 1 ov. F 2.5 mm (NTOU).

Paratypes: Madagascar. MIRIKY. Stn DW3230, 13°25'S, 47°57'E, 71–158 m, 3 July 2009: 1 F 2.8 mm (MNHN-IU-2010-1116).

Philippines. Bohol Island, Baclayon Takot, PANGLAO. Stn B13, 9°37.1'N, 123°52.6'E, 3–5 m, 15 June 2004: 1 ov. F 3.1 mm, 1 F 2.6 mm (NTOU).—Pamilacan Island. PANGLAO. Stn B19, 9°29.4'N, 123°56.0'E, 17 m, 21 June 2004: 1 ov. F 2.7 mm (NTOU).—Panglao Island, Pontod Lagoon 1. PANGLAO. Stn B39, 9°32.8'N, 123°42.1'E, 17–25 m, 2 July 2004: 1 M 2.0 mm, 1 ov. F 2.4 mm (NTOU).—Balicasag, PANGLAO. Stn T38, 9°32.3'N, 123°42.3'E, 80–140 m, 4 July 2004: 1 M 2.3 mm, 1 F 2.7 mm, in sponges (NTOU).

Vanuatu. SANTO. Stn DB8, 15°34.6'S, 167°13.8'E, 12 m, 12 September 2006: 1 F 2.8 mm (MNHN-IU-2010-5261).—Stn FB43, 15°28.4'S, 167°14.9'E, 19 m, 30 September 2006: 1 M 2.1 mm (MNHN-IU-2010-5260).

Etymology. From the Latin, *adustus*, brownish, in reference to the colouration of the new species.

Description. *Carapace:* as long as or slightly longer than wide, dorsal surface covered with long and short setae arising from numerous short and slightly elevated ridges; small spines scattered on dorsal surface, 2 largest spines on epigastric region, transverse ridge directly anterior to posterior margin with several small spines. Cervical groove indistinct. Lateral margins convex, with 6 or 7 small but distinct spines on each side, last spine sometimes absent or mesial to lateral margin; first (anterolateral) small, lateral to lateral limit of orbit, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised teeth, dorsal surface nearly flat, with a few long setae; length (measured from the tip to level of orbital margin) 0.4 times carapace length, and slightly greater than carapace width (measured at level of orbital margin); rostral spine and pair of distalmost lateral teeth with convex margins.

Abdomen: somites with thick long coarse uniramous setae. Somites 2–4 each 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin produced, medially notched, ca. 3.5 times wider than long; breadth of sternite 4 twice that of sternite 3, and ca. 4.0 times wider than long.

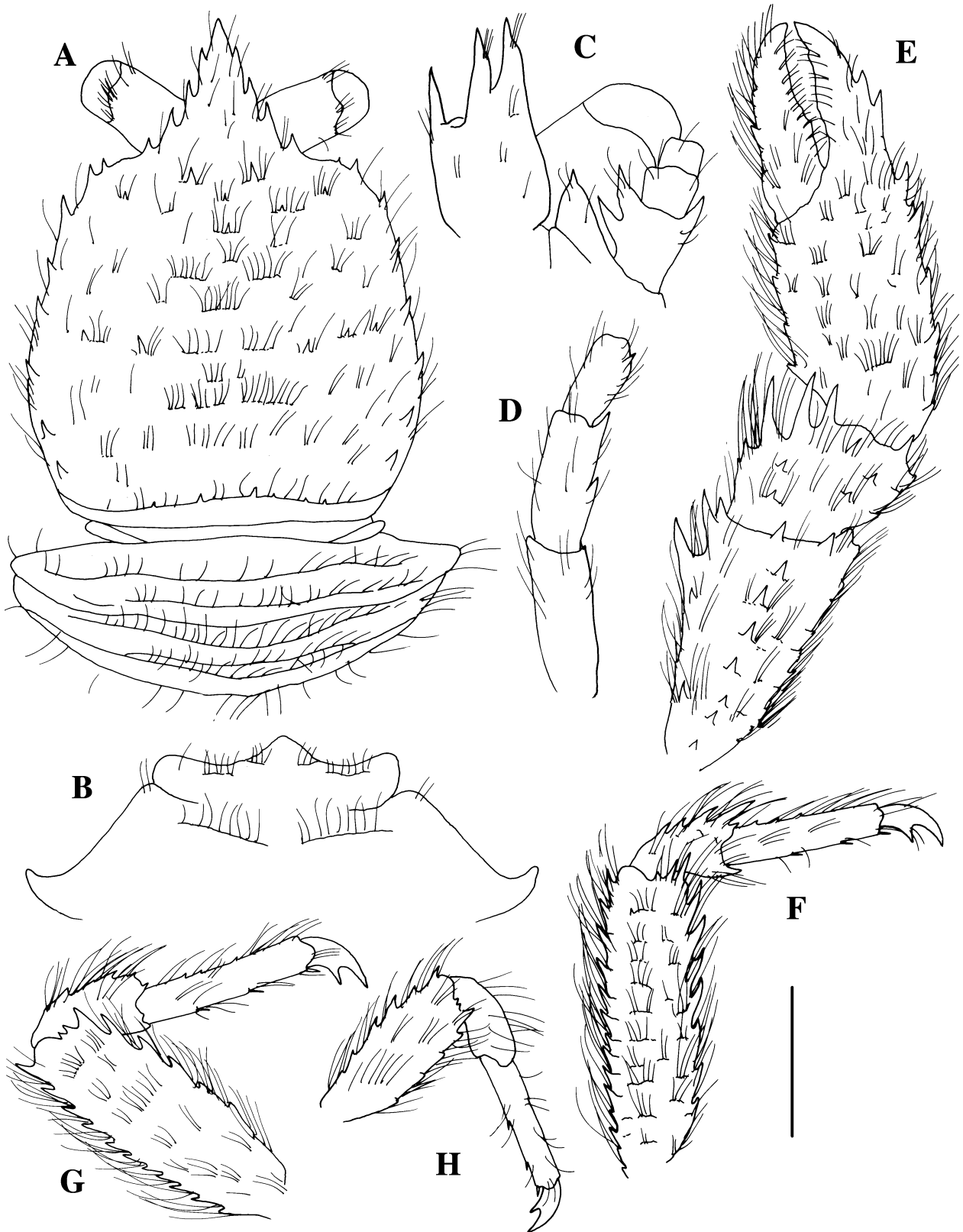


FIGURE 1. *Lauriea adusta* n. sp., holotype, ovigerous female, 3.3 mm, Philippines, PANGLAO, Stn B19 (NTUO). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, right P2, lateral view; G, right P3, lateral view; H, right P4, lateral view. Scale: A, E–H = 1 mm; B–D = 0.5 mm.

Eyes: orbit not laterally produced, unarmed. Eystalks short, 1.6–1.8 times longer than wide, reaching end of antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea length slightly less than that half of remaining eystalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with strong ventromesial process ending in acute spine overreaching end of article 2; article 2 with distomesial and distolateral spines reaching end of article 3, additional spine on mesial margin; article 3 unarmed or with minute distomesial spine.

Mxp3: ischium slightly longer than merus when measured in lateral midline, flexor margin with small distal spine, mesial ridge with 23–25 denticles. Merus with 2 subequal spines on flexor margin. Carpus with small distal spine on flexor margin.

P1: ca. 2.5 times carapace length; setose dorsally, scarcely setose or nearly glabrous ventrally; plumose and non-plumose long setae, partly coarse, arising from numerous short striae. Merus 0.8–0.9 times shorter than carapace, dorsal and mesial sides with row of spines, mesial spines larger, distal ones prominent, lateral margin with several distal spines. Carpus as long as wide, equally wide as propodus, and 0.4–0.5 length of merus; scattered small spines on dorsal side, row of strong spines along mesial margin, small spines on ventral side. Palm 1.3–1.5 times as long as wide; dorsal surface unarmed, with some long plumose and non plumose setae arising from numerous short striae, mesial margin with row of several spines, lateral margin with row of spines continued on to fixed finger. Fingers as long as or slightly longer than palm, not gaping and tips crossing when closed; terminating in sharp curved spine; dorsal surface unarmed; movable finger unarmed on mesial margin.

P2–4: P2 about 1.8 times carapace length, very setose on margins, with long plumose and non-plumose setae. P2–4 meri posteriorly diminishing in size, extensor margin rounded, with row of proximally diminishing spines, well-developed spines on flexor margin, 0–3 small spines on lateral side, and 1 extra spine on terminal margin close to distal flexor marginal spine, lateral side with some long setae arising from numerous short striae; P2 merus 0.9 times carapace length, 3.7–3.9 times longer than wide, and twice longer than propodus. Carpi with small spines (5 or 6 on P2, 0–3 on P3–4) on extensor margin. Propodi with row of small proximal spines (3 or 4 on P2, 0–2 on P3–4) along extensor margin and 4 or 5 movable slender spines on flexor margin, terminal paired; P2 propodus ca. 4.0 times longer than wide, and more than 1.8 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Colour. Ground colour of carapace and abdomen brownish or whitish, without coloured spots. P1–4 brownish or whitish, without coloured bands. Setae whitish and brownish. The colour figures of Kamezaki et al. (1988) and Kato & Okuno (2001) are quite similar to the present material, although additional study of these specimens are necessary to confirm their identity.

Remarks. *Lauriea adusta* n. sp. is closely related to *L. punctata* n. sp. from the Philippines, Papua, Australia (Queensland), Vanuatu and New Caledonia. Their relationships are discussed under the Remarks of *L. punctata* (see below).

The intraspecific molecular divergences are wider than in all other species of *Lauriea* (3.1–5.2% in COI). The specimen from Madagascar diverges clearly between specimens from Philippines-Vanuatu (5.2% in COI) suggesting that they might belong to a different species. However, no clear morphological differences have been found and the colour pattern is only available for the Panglao specimens. Additional specimens from Madagascar should confirm their taxonomic position.

Distribution. Madagascar, Philippines and Vanuatu, at 3–158 m.

***Lauriea crucis* n. sp.**
(Fig. 2)

Material examined. *Holotype*: Vanuatu. SANTO, Stn DB16, 15°35.5'S, 167°15.8'E, 32–40 m, 14 September 2006: 1 M 2.1 mm (MNHN-IU-2010-5291).

Paratypes: Vanuatu. SANTO, Stn DB16, 15°35.5'S, 167°15.8'E, 32–40 m, 14 September 2006: 1 ov. F 2.2 mm (MNHN-IU-2010-5259).

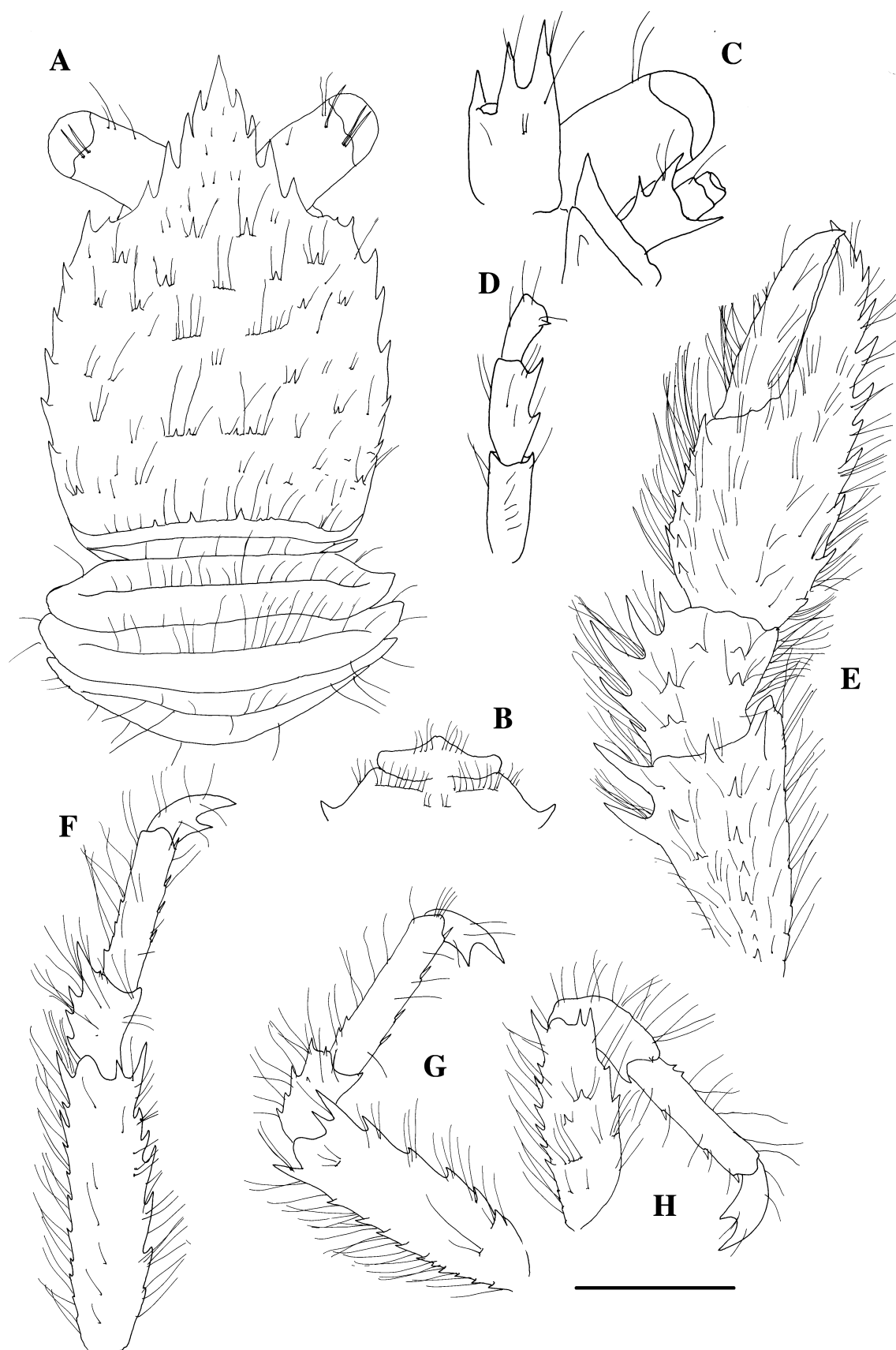


FIGURE 2. *Lauriea crucis* n. sp., holotype, male, 2.4 mm, Vanuatu, SANTO, Stn DB16 (MNHN-IU-2010-5291). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, right P2, lateral view; G, right P3, lateral view; H, right P4, lateral view. Scale: A, B, E–H = 1 mm; C–D = 0.7 mm.

Wallis and Futuna. MUSORSTOM 7, Stn CP498, 14°18.9'S, 178°03.1'W, 105–160 m, 10 May 1992: 1 ov. F 2.0 mm (MNHN-IU-2010-5258).

Etymology. The name *crucis* refers to one of the constellations of the southern hemisphere (*Crux*, cross).

Description. *Carapace:* as long as wide, dorsal surface covered with long and short fine setae arising from numerous short transverse ridges; small spines scattered on dorsal surface, 2 largest spines on epigastric region, and 3 or 4 spines along transverse ridge anterior to posterior margin. Cervical groove indistinct. Lateral margins convex, with 7 small but distinct spines on each side, last spine sometimes absent or mesial to lateral margin; first (anterolateral) directly lateral to lateral limit of orbit, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised teeth, dorsal surface slightly concave, flatish on distal portion, with a few short setae; length (measured from the tip to level of orbital margin) 0.4–0.5 times carapace length, and 0.9 times carapace width (measured at level of orbital margin); rostral spine and distalmost lateral tooth with slightly convex lateral margins.

Abdomen: somites with thick long coarse setae. Somites 2–4 each with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin medially produced, 3 times wider than long; sternite 4 nearly twice as long as sternite 3, and 4.5 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eyestalks moderately elongate, 1.8 times longer than wide, slightly exceeding antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea not swollen, length less than that of remaining eyestalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with ventromesial process ending in acute spine, not exceeding article 2, article 2 with distomesial spine exceeding article 3, distolateral spine reaching end of article 3, additional spine on mesial margin; article 3 unarmed.

Mxp3: ischium as long as merus when measured in lateral midline, flexor margin with short distal spine, mesial ridge with 26–29 denticles. Merus with 2 subequal spines on flexor margin, extensor border unarmed. Carpus with small distal spine on flexor margin.

P1: 2.6–2.7 times carapace length; very setose dorsally, scarcely setose or nearly glabrous ventrally; long setae mostly plumose. Merus 0.8–0.9 times carapace length, with row of spines along lateral, dorsal and mesial sides, mesial spines larger, distal ones strongest. Carpus 1.3–1.4 times longer than wide, more than half length of merus; some scattered spines on dorsal side, row of strong spines along mesial margin, some small spines on ventral side. Palm 1.3–1.5 times as long as wide; dorsal surface unarmed, with some long setae arising from a few short striae, mesial margin with row of spines, lateral margin with row of well-developed spines continued on to fixed finger. Fingers as long as palm, not gaping and tips crossing when closed; terminating in sharp curved spine, dorsal surface unarmed; movable finger unarmed on mesial margin.

P2-4: P2 1.5–1.8 times carapace length, very setose on margins, setae long and coarse, often plumose on extensor margin. P2–4 meri posteriorly diminishing in size, extensor margin sharply ridged, with row of proximally diminishing spines, well-developed spines on flexor margin, and 2 extra spines on terminal margin close to distal flexor marginal spine, lateral side with long setae arising from a few short striae, and 1 or 2 minute spines on P4; P2 merus 0.9 times carapace length, 3.8 times longer than wide, and 2.0–3.0 times longer than propodus. Carpi with small spines (4 on P2–3, 0–1 on P4) on extensor margin (distal one larger). Propodi with very small spines along extensor proximal margin and 4 or 5 movable slender spines on flexor margin, including pair of terminal spines; P2 propodus ca. 4.0 times longer than wide, and 1.9–2.0 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Remarks. *Lauriea crucis* n. sp. is closely related to *L. teresae* n. sp. from French Polynesia (see the differences under the Remarks of *L. teresae*)

Distribution. Vanuatu, Wallis and Futuna, between 32 and 160 m.

***Lauriea gardineri* (Laurie, 1926)**

(Figs 3, 8A, 9A)

Galathea gardineri Laurie, 1926: 131, pl. 9, figs 1–5 (Providence, 106 m).—Baba, 1990: 961 (Madagascar, 50 m).

Dubious records:

Galathea gardineri Tirmizi, 1966: 177, fig. 2 (Red Sea, 29–55 m).—Lewinsohn, 1969: 112 (no record).

Lauriea gardineri Lewinsohn, 1982: 299, fig. 1 (Gulf of Aqaba (northern Red Sea), 3–81 m).—Tirmizi & Javed, 1993: 23, figs 10–11 (western Indian Ocean off Somali Republic, Andaman Islands, 66–177 m).—Baba, 1994b: 43, fig. 2 (Madagascar, New Caledonia).

Material examined. *Neotype*: Madagascar. ATIMOVATAE. Stn CP3624, 25°38.1'S, 45°57.0'E, 63 m, 15 May 2010: 1 M 2.8 mm (MNHN-IU-2010-5254).

Madagascar. ATIMOVATAE. Stn TB02, 25°01.3'S, 47° 00.5'E, 18 m, rock, 1 May 2010: 1 M 1.8 mm (MNHN-IU-2010-5252).—Stn DW3563, 25°37'S, 46°18'E, 347–355 m, 6 May 2010: 1 M 2.6 mm (MNHN-IU-2010-5256).—Stn CP3579, 25°54.5'S, 45°33.2'E, 65–66 m, 9 May 2010: 1 ov. F 2.6 mm (MNHN-IU-2010-5255).—Stn DW3605, 24°54.5'S, 44°51.0'E, 56–57 m, 13 May 2010: 1 M 2.4 m (MNHN-IU-2010-5257).—Stn CP3624, 25°38.1'S, 45°57.0'E, 63 m, 15 May 2010: 1 M 2.8 mm, 1 F 2.7 mm (MNHN-IU-2010-5253).

Madagascar. MIRIKY. Stn DW3246, 14°52'S, 46°58'E, 235–241 m, 7 July 2010: 1 M 2.4 mm (MNHN-IU-2010-1018).

Description. *Carapace*: as long as wide, dorsal surface covered with long and short setae both arising from numerous short transverse and more or less elevated ridges; small spines scattered on dorsal surface, 2 largest spines on epigastric region; transverse ridge anterior to posterior margin usually unarmed. Cervical groove indistinct. Lateral margins convex, with 7 small but distinct spines on each side, last spine sometimes mesial to lateral margin; first (anterolateral) small, lateral to lateral limit of orbit, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised teeth, dorsal surface slightly concave, with a few long setae; length (measured from the tip to level of orbital margin) 0.5 times carapace length, and subequal to width (measured at level of orbital margin); rostral spine and distalmost lateral tooth with straight lateral margins.

Abdomen: somites with thick long coarse uniramous setae. Somites 2–4 each with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin produced, 2.8 times wider than long; sternite 4 nearly twice as wide as sternite 3, and 3.9 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eyestalks moderately elongate, 1.6 times longer than wide, reaching end of antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea not swollen, length slightly less than that half of remaining eyestalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with ventromesial process ending in short acute spine not reaching end of article 2, article 2 with distomesial spine exceeding article 4, distolateral spine reaching end of article 3, additional spine on mesial margin; article 3 unarmed or with small distomesial spine.

Mxp3: ischium slightly longer than merus when measured in lateral midline, flexor margin with short distal spine, mesial ridge with 23 or 24 denticles. Merus with 2 subequal spines on flexor margin. Carpus with small distal spine on flexor margin.

PI: 3.2 times carapace length; very setose dorsally, scarcely setose or nearly glabrous ventrally; plumose and non-plumose long setae, partly coarse, arising from numerous short striae. Merus as long as carapace, with spines along lateral, dorsal and mesial sides, mesial spines larger, distal ones prominent. Carpus 1.5 times longer than wide, equally wide as propodus, and 0.6 length of merus; some scattered small spines on dorsal side, row of strong spines along mesial margin, some small spines on ventral side. Palm 2.1 times as long as wide; dorsal surface unarmed, with some long setae arising from a few short striae, mesial margin with row of several spines, lateral margin with row of spines continued on to fixed finger. Fingers shorter or as long as palm, not gaping, tips crossing when closed; terminating in sharp curved spine; dorsal surface unarmed. Movable finger unarmed on mesial margin.

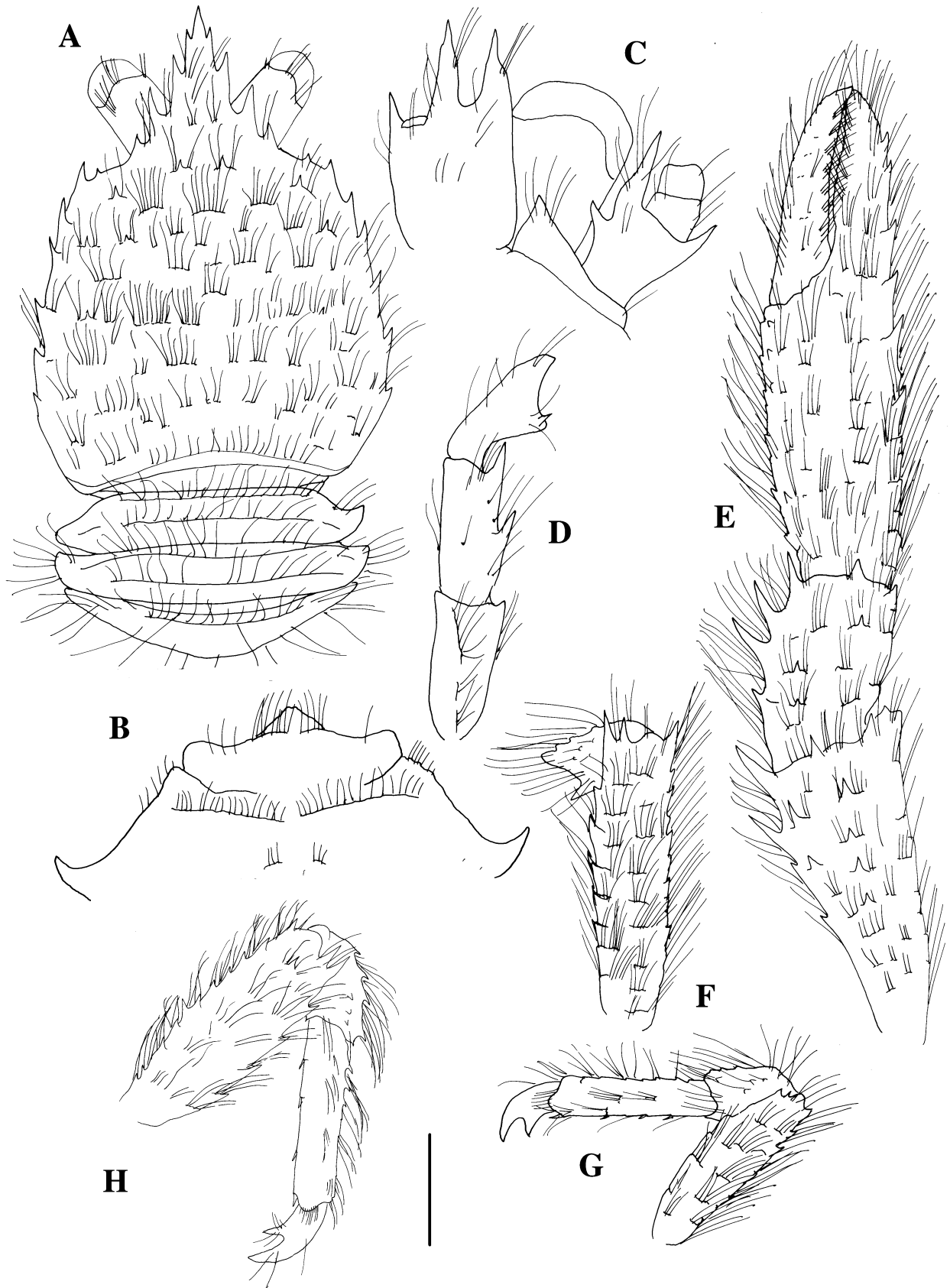


FIGURE 3. *Lauriea gardineri* Laurie, 1926, neotype, male, 2.8 mm, Madagascar, ATIMOVATAE, Stn CP3624 (MNHN-IU-2010-5254). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, left P2, lateral view, broken; G, left P4, lateral view. H, Madagascar, male, 2.4 mm, ATIMOVATAE, Stn CP3605 (MNHN-IU-2010-5257), right P3, lateral view. Scale: A, E–H = 1 mm; B–D = 0.5 mm.

P2–4: P2 1.6–1.8 times carapace length, very setose on margins, with long plumose and non-plumose setae. P2–4 meri posteriorly diminishing in size, extensor margin more or less rounded, with row of proximally diminishing spines; row of well-developed spines on flexor margin, 0–2 small spines on lateral side, and 2 extra spines on terminal margin close to distal flexor marginal spine, lateral side with long setae arising from numerous short striae; P2 merus 0.9 times carapace length, 3.7 times longer than wide, and 1.7 times longer than propodus. Carpi with small spines (3 or 4 on P2, 0–2 on P3–4) on extensor margin (distal one usually larger). Propodi with small spines along extensor proximal margin and 5 or 6 movable slender spines on flexor margin, terminal paired; P2 propodus ca. 3.6 times longer than wide, and more than 1.8 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Colour. Ground colour of carapace and abdomen whitish, with numerous minute brown spots, setae brownish. P1 with large brown and whitish bands, a red spot on dorsal side of merus. P2–4 whitish, with numerous minute brown spots, setae whitish.

Remarks. *Lauriea gardineri* was described from two males and one ovigerous female collected in the western Indian Ocean (Providence and Seychelles Islands) (Laurie 1926). Unfortunately the types of the species are lost. We consider *L. gardineri* to be the most common species in northern and southern Madagascar, although additional topotypic samples from the type localities would be desirable in order to select a neotype. Therefore, a specimen from Madagascar is selected here to fix the identity of the species. The existence of numerous species of *Lauriea*, only distinguished by subtle morphological differences, molecular and colour data does not allow accurate confident identification at this stage. It seems that *L. gardineri* is restricted to the western Indian Ocean. However, the existence of a second species in the area (*Lauriea adusta*), that is also found in the western Pacific, suggests caution in this geographical restriction. In any case, additional studies of the material collected in the western Indian Ocean, from the Red Sea (Tirmizi 1966; Lewinsohn 1969, 1982) and Somali Republic (Tirmizi & Javed 1993) to Madagascar (Baba 1990, 1994) are recommended.

Lauriea gardineri is closely related to *L. simulata* from the western Pacific Ocean, in having the rostrum slightly concave on the distal portion, both the rostral spine and the distalmost lateral teeth with straight lateral margins, and the distomesial spine of the antennal article 2 clearly exceeding the article 3.

However, these species are distinguished by the following differences:

- The eye reaches the end of the antennal peduncle in *L. gardineri*, instead of exceeding the antennal peduncle as in *Lauriea simulata*.
- In *L. gardineri*, the ground colour of the carapace and abdomen is whitish, with numerous minute brown spots, P1 has large brown and whitish bands, and a red spot on the dorsal side of merus. In *L. simulata*, the ground colour is whitish, with some yellow spots circled by brown on the carapace and abdomen, P1 is whitish and brownish marbled, with some yellow spots circled by brown on merus and carpus.

The genetic divergences between *L. gardineri* and *Lauriea simulata* were 5.2% (COI) and 0.7% (16S rRNA). *Lauriea adusta*, the second species from Madagascar, can be distinguished from *L. gardineri* by the following differences:

- The rostrum is dorsally flattish instead of slightly concave on the distal portion, and the rostral spine and the distalmost lateral teeth have convex instead of straight lateral margins.
- The distomesial spine of the antennal article 2 reaches the end of the article 3 rather than exceeding the antennal peduncle.
- The ground colour of the carapace and abdomen is brownish or whitish, without coloured spots, and the P1 is brownish or whitish, without coloured bands, in *Lauriea adusta*, whereas the ground colour of the carapace and abdomen is whitish, with numerous minute brown spots, the P1 has large brown and whitish bands, and a red spot on the dorsal side of merus in *L. gardineri*.

The genetic divergences between *L. gardineri* and *Lauriea adusta* were 10.6% (COI) and 3.2% (16S rRNA).

Distribution. Western Indian Ocean (Madagascar, Providence and Seychelles Islands), between 18 and 241 m.

***Lauriea punctata* n. sp.**

(Figs 4, 8C, 9C, D)

Material examined. *Holotype:* Vanuatu. SANTO. Stn AT13, 15°27.8'S, 167°15.7'E, 146–153 m, 19 September 2006: 1 M 3.4 mm (MNHN-IU-2010-5292).

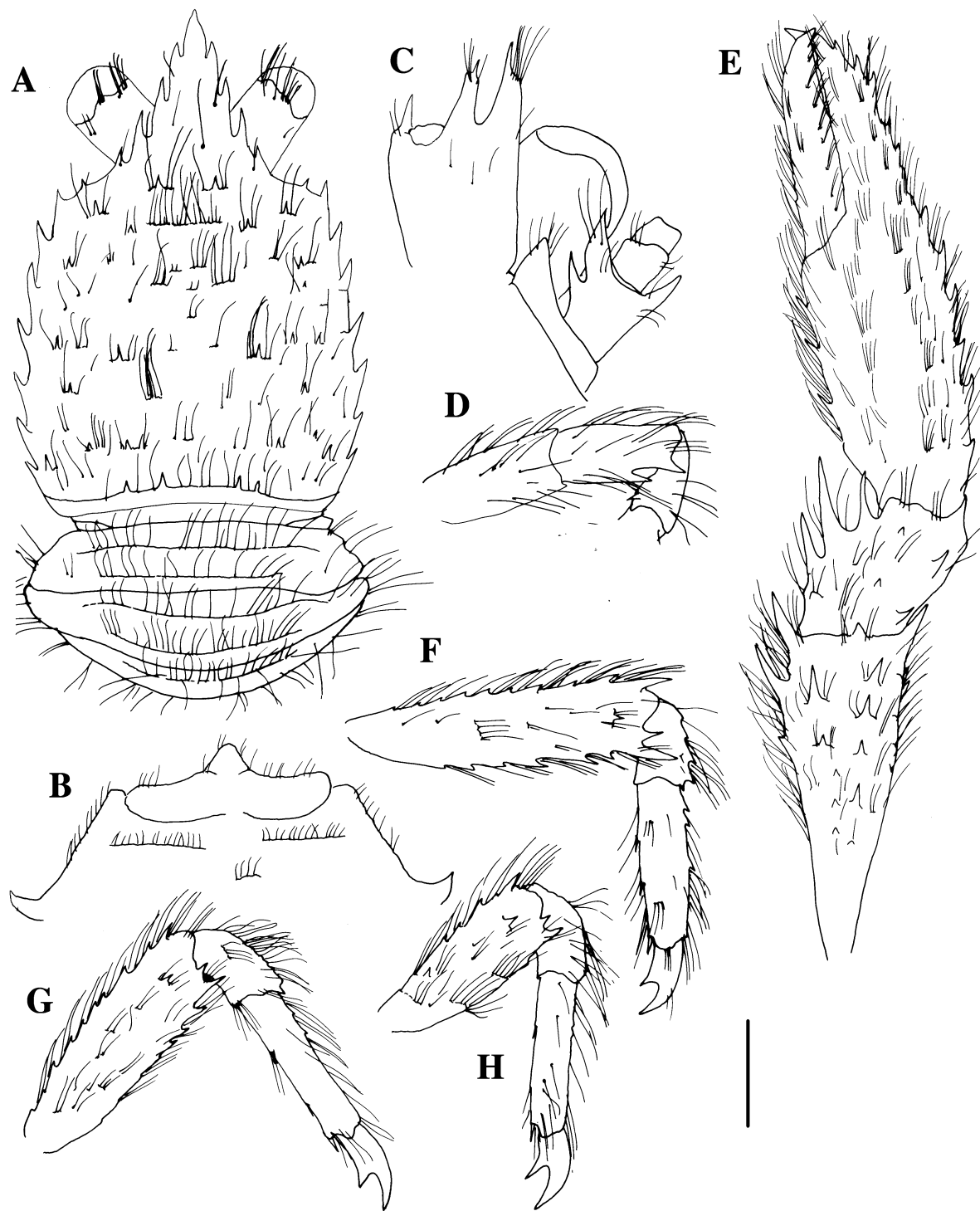


FIGURE 4. *Lauriea punctata* n. sp., holotype, male, 3.4 mm, Vanuatu, SANTO, Stn AT13 (MNHN-IU-2010-5292). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, right P2, lateral view; G, right P3, lateral view; H, right P4, lateral view. Scale: A, E–H = 1 mm; B–D = 0.5 mm.

Paratypes: Philippines. MUSORSTOM 2. Stn CP47, 13°33'N, 122°10'E, 81–84 m, 26 November 1980: 1 M 2.8 mm (MNHN-IU-2010-5336), 1 F 3.3 mm (MNHN-IU-2010-5337). MUSORSTOM 3. Stn CP121, 12°08'N, 121°17'E, 73–84 m, 3 June 1985: 3 F 2.4–3.2 mm (MNHN-IU-2010-5334, MNHN-IU-2010-5335).—Bohol Island, Maribohoc Bay. PANGLAO. Stn P1, 9°36.1'N, 123°45.0'E, 90–200 m, 30 May 2004, 1 M, 2.4 mm (NTOU).—Bohol Island, Ubajan. PANGLAO. Stn B2, 9°33.0'N, 123°46.5'E, 5 m, 31 May 2004: 1 M 2.9 mm (NTOU).—Bohol Island, W of Baclayon. PANGLAO, Stn T6, 9°35.1'N, 123°51.2'E, 34–82 m, 2 June 2004: 1 M

2.8 mm, coarse muddy sand with large sponges (NTOU).—Panglao Island, Biking, PANGLAO. Stn B5, 9°35.2'N, 123°50.4'E, 4 m, 2 June 2004: 1 M 2.4 mm (NTOU).—Bohol Island, W of Baclayon. PANGLAO. Stn T7, 9°36.1'N, 123°53.3'E, 61–62 m, 3 June 2004: 2 M 2.1–2.7 mm, 1 ov. F 2.8 mm, 2 F 2.6–3.4 mm, in mud-sand (NTOU).—Catarman. PANGLAO. Stn B7, 9°35.9'N, 123°51.8'E, 4–30 m, 5 June 2004: 1 M 2.0 mm (NTOU).—Bohol Island, Maribohoc Bay. PANGLAO. Stn T13, 9°40.5'N, 123°49.5'E, 90–100 m, 17 June 2004: 1 ov. F 2.9 mm, in sponges (NTOU).—Panglao Island, Tangnan. PANGLAO. Stn L40, 9°37.3'N, 123°46.5'E, 100–120 m, 24 June 2004: 1 F 1.8 mm (NTOU).—Pamilacan Island. PANGLAO. Stn B24, 9°29.4'N, 123°56'E, 16 m, 25 June 2004: 1 M 2.9 mm (NTOU).—Balicasag, Black Forest. PANGLAO. Stn B23, 9°31.1'N, 123°41.3'E, 20–25 m, 25 June 2004: 2 M 2.5–2.8 mm, 2 ov. F 2.5–3.1 mm, rubble on sand (NTOU).—PANGLAO. Stn T4, 9°33.0'N, 123°48.5'E, 82 m, 1 July 2004: 1 M 2.8 mm, in sponges (NTOU).—Panglao Island between Momo and Napaling. PANGLAO. Stn B42, 9°37.0'N, 123°46.0'E, 30–33 m, 6 July 2004: 1 M 2.0 mm, 1 F 1.9 mm (NTOU).

Papua. Papua New Guinea, Alotau, 12 m: 2 ov. F 2.6 mm, 1 F 2.7 mm, in sponge (UF2388).

Vanuatu. SANTO. Stn EP10, 15°38.0'S, 167°13.6'E, 45–101 m, 15 September 2006: 3 M 2.0–3.2 mm (MNHN-IU-2010-5310, MNHN-IU-2010-5309, MNHN-IU-2010-5304), 1 ov. F 2.6 mm (MNHN-IU-2010-5306), 4 F 2.0–2.4 mm (MNHN-IU-2010-5308, MNHN-IU-2010-5307, MNHN-IU-2010-5310, MNHN-IU-2010-5305).—Stn AT13, 15°27.8'S, 167°15.7'E, 146–153 m, 19 September 2006: 2 M 2.3–3.1 mm (MNHN-IU-2010-5299), 1 F 2.1 mm (MNHN-IU-2010-5350).—Stn AT14, 15°24'S, 167°13.5'E, 102–120 m, 19 September 2006: 1 M 2.2 mm (MNHN-IU-2010-5331).—Vanuatu, SANTO, Stn DB63, 15°26.9'S, 167°15.8'E, 21 m, 25 September 2006: 1 F 1.5 mm (MNHN-IU-2010-5330).—Stn AT45, 15°37.5'S, 167°02.7'E, 188–148 m, 29 September 2006: 1 M 2.1 mm (MNHN-IU-2010-5327).—Stn ZB9, 15°40.6'S, 167°05.1'E, 5–7 m, 02 October 2006: 1 ov. F 2.5 mm (MNHN-IU-2010-5340).—Stn FP47, 15°32.4'S, 167°12.7'E, 45–50 m, 2–3 October 2006: 1 F 2.1 mm (MNHN-IU-2010-5329).—Stn AT75, 15°37.0/37.3'S, 167°09.2'E, 52–66 m, 10 October 2006: 2 F 1.6–2.0 mm (MNHN-IU-2010-5322, MNHN-IU-2010-5323).—Stn AT76, 15°38.7'S, 167°03.6'E, 105–135 m, 10 October 2006: 1 ov. F, 4.1 mm (MNHN-IU-2010-5320), 1 F 3.2 mm (MNHN-IU-2010-5321).—Stn AT85, 15°32.6'S, 167°15.7'E, 114–196 m, 12 October 2006: 1 M 2.6 mm (MNHN-IU-2010-5324), 2 ov. F 2.9–3.6 mm (MNHN-IU-2010-5326, MNHN-IU-2010-5325).—Stn FB90, 15°35'S, 167°07.7'E, 36–39 m, 16 October 2006: 1 F 2.0 mm (MNHN-IU-2010-5328).

Australia. Queensland. Lizard Island, Washing Machine. 14°39.07'S, 145°16.47'E, 10–12 m, 9 February 2009: 1 M 2.2 mm (UF16687), 1 ov. F 3.1 mm (UF16683).—14°39.62'S, 145°27.73'E, 18 February 2009: 1 M 1.1 mm (UF18236), 1 ov. F 2.3 mm, in dead *Pocillopora* (UF18237).

New Caledonia. Lagoon, 15–20 m, 20 September 1978: 1 M 2.8 mm (MNHN-IU-2010-5342).—Stn CP1, 22°17'S, 166°30.7'E, 22 m, 22 May 1984: 1 M 3.3 mm, 1 ov. F 3.0 mm (MNHN-IU-2010-5343).—St. Vincent Bay, Stn DW163, 22°12'S, 166°07.5'E, 15 m, September 1984: 1 ov. F 4.3 mm, in sand (MNHN-IU-2010-5341).—Noumea, Stn DW272, 22°12'S, 166°23'E, 20 m, October 1984: 1 M 3.3 mm (MNHN-IU-2010-5346).—East Lagoon, Stn DW641, 21°53'S, 166°43'E, 50–52 m, August 1986: 1 ov. F 4.5 mm (MNHN-IU-2010-5347).—Stn DW707, 21°25.3'S, 166°04.1'E, 34–38 m, August 1986: 1 ov. F 2.5 mm (MNHN-IU-2010-5345).—Maitre Island, 25 m, 5 September 1978: 3 M 2.0–3.2 mm (MNHN-IU-2010-5316, MNHN-IU-2010-5319, MNHN-IU-2010-5317), 1 ov. F 3.9 mm (MNHN-IU-2010-5315), 1 F 2.8 mm (MNHN-IU-2010-5318).—Maitre Island, 22 m, 22 September 1992: 2 ov. F 3.0–3.4 mm, sponge (MNHN-IU-2010-5301, MNHN-IU-2010-5302).—Plotmatre, 22°19.35'S, 166°25.85'E, 20 m, 10 November 1995: 2, ov. F 2.9–3.1 mm (MNHN-IU-2010-5348, MNHN-IU-2010-5349).—Lagoon, 22°19.35'S, 166°25.85'E, 21 m, 10 November 1995: 1 M 3.2 mm (MNHN-IU-2010-5300).—Stn 99, 10.5 m, 14 November 1995: 2 M 2.5–3.2 mm (MNHN-IU-2010-5311, MNHN-IU-2010-5314), 3 ov. F 2.3–3.3 mm (MNHN-IU-2010-5314, MNHN-IU-2010-5313, MNHN-IU-2010-5312).

New Caledonia, Chesterfield Islands. CORAIL 2, Stn DW26, 20°22'S, 161°05'E, 62 m, 22 July 1988: 1 M 3.2 mm (MNHN-IU-2010-5333).

New Caledonia, Lifou Island. LIFOU. Stn 1436, 20°55.5' S, 167°04.2' E, 10–20 m, 10 November 2000: 1 ov. F 2.2 mm (MNHN-IU-2010-5339).—Stn 1459, 20°47.0' S, 167°03.0' E, 55–80 m, 5 November 2000: 1 F 3.2 mm (MNHN-IU-2010-5338).

Etymology. From the Latin, *puncta*, puncture, dot, in reference to the presence of numerous red spots on the carapace, abdomen and pereopods.

Description. *Carapace:* 1.0–1.2 times longer than wide, dorsal surface covered with long and short setae arising from numerous short and slightly prominent transverse ridges; small spines scattered on dorsal surface, 2

largest spines on epigastric region; transverse ridge anterior to posterior margin with minute spines. Cervical groove indistinct. Lateral margins convex, with 7 small but distinct spines on each side, last spine sometimes absent or mesial to lateral margin; first (anterolateral) small, lateral to lateral limit of orbit, remainder more or less distantly separated from another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised teeth, distal portion dorsally flatish, with a few long setae; length (measured from the tip to level of orbital margin) 0.4–0.5 times carapace length, and 0.8–0.9 times width (measured at level of orbital margin); rostral spine and distal tooth pair with slightly convex lateral margins.

Abdomen: somites with thick long coarse uniramous setae. Somites 2–4 each with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin medially produced, 2.6–2.8 times wider than long; sternite 4 twice as wide as sternite 3, and 3.0–3.2 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eyestalks short, 1.5 times longer than wide, reaching end of antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea length slightly less than half that of remaining eyestalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with strong ventromesial process ending in acute or blunt angle, nearly reaching end of article 2; article 2 with distomesial and distolateral spines reaching end of article 3, additional spine on mesial margin; article 3 unarmed.

Mxp3: ischium slightly longer than merus when measured in lateral midline, flexor margin with small distal spine, mesial ridge with 23–27 denticles. Merus with 2 subequal spines on flexor margin. Carpus with small distal spine on flexor margin.

P1: ca. 3.0 times carapace length; setose dorsally, scarcely setose or nearly glabrous ventrally; plumose and non-plumose long setae, partly coarse, arising from numerous short striae. Merus slightly shorter than carapace, dorsal and mesial sides with row of spines, mesial spines larger, distal ones prominent. Carpus 1.4–1.5 times longer than wide, equally wide as propodus, and 0.4–0.5 length of merus; some scattered small spines on dorsal side, row of strong spines along mesial margin, small spines on ventral side. Palm 1.5–1.9 times as long as wide; dorsal surface unarmed, with long plumose and non-plumose setae arising from numerous short striae, mesial margin with row of several spines, lateral margin with row of spines continued on to fixed finger. Fingers 0.8–0.9 propodus length, not gaping and tips crossing when closed; terminating in sharp curved spine; dorsal surface unarmed; movable finger unarmed on mesial margin.

P2–4: P2 about 1.3 times carapace length, very setose on margins, with long plumose and non-plumose setae. P2–4 meri posteriorly diminishing in size, extensor margin more or less rounded, with row of proximally diminishing spines, some well-developed spines on flexor margin, 0–2 small spines on lateral side, and 1 extra spine on terminal margin close to distal flexor marginal spine, lateral side with some long setae arising from numerous short striae; P2 merus 0.8 times carapace length, 3.6–3.9 times longer than wide, and twice longer than propodus. Carpi with small spines (4 or 5 on P2, 0–3 on P3–4) on extensor margin. Propodi with row of small spines (3 or 4 on P2, 0–2 on P3–4) along extensor proximal margin and 4- or 5 movable slender spines on flexor margin, including pair of terminal spines; P2 propodus ca. 3.2–3.4 times longer than wide, and more than 1.8 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Colour. Ground colour of carapace and abdomen brownish or whitish; carapace with one red spot on each side of anterolateral and branchiocardiac area; abdominal somite 1 with pair of red spots, sometimes additional pair on other somites. P1–4 brownish or whitish; P1 with some red spots on dorsal side of merus and carpus; distal half of fingers with transverse red and white bands. P2–4 with 1 or 2 red and white spots on lateral side of each article. Setae whitish and brownish.

Remarks. *Lauriea punctata* is closely related to *L. adusta* from Madagascar, Philippines and Vanuatu in having the rostrum flattish on the distal portion, both the rostral spine and the distalmost lateral teeth with convex lateral margins, and the distomesial spine of the antennal article 2 reaching the end of the article 3.

However, these two species are distinguished by the following differences:

- The distomesial process of the antennal article 1 exceeds the end of the article 2 in *L. adusta*, whereas at most it reaches the end of the article 2 in *L. punctata*.

- In *L. adusta*, the ground colour of the carapace and the abdomen is brownish or whitish, without coloured spots, and the P1–4 have no coloured bands and red spots, whereas in *L. punctata*, several red spots are distinct on the carapace and the abdomen and colored bands and red spots are visible on P1–4.

The genetic divergences between *L. punctata* and *L. adusta* were 9.5% (COI) and 3.8% (16S rRNA).

Distribution. Philippines, Papua, Australia (Queensland), Vanuatu and New Caledonia, at 4–200 m.

***Lauriea simulata* n. sp.**

(Figs 5, 8B, 9B)

Material examined. *Holotype:* Vanuatu. SANTO. Stn FR4-F22, 15°34.5'S, 167°13.6'E, 3–24 m, 12 September 2006: 1 ov. F 2.7 mm (MNHN-IU-2010-5290).

Paratypes: Philippines. Panglao Island, Napaling. PANGLAO, R30, 9°37.1'N, 123°46.1'E, 15–37 m, 8 June 2004: 1 F 2.0 mm, in gorgonians (NTOU).—Panglao Island, Front of PTA Compound. PANGLAO. Stn L41, 9°31.3'N, 123°41.2'E, 90–100 m, 1 July 2004: 1 M 2.5 mm (NTOU).

Vanuatu. SANTO. Stn EP1, 15°32.5'S, 167°09.0'E, 46–47 m, 10 September 2006: 1 M 1.4 mm (MNHN-IU-2010-5279).—Stn DB8, 15°34.6'S, 167°13.8'E, 12 m, 12 September 2006: 2 M 1.9–2.3 mm (MNHN-IU-2010-5267, MNHN-IU-2010-5294).—Stn FR4-F22, 15°34.5'S, 167°13.6'E, 3–24 m, 12 September 2006: 1 M 2.8 mm (MNHN-IU-2010-5271).—Stn DB12, 15°36.6'S, 167°10.1'E, 10–18 m, 13 September 2006: 2 F 2.8 mm (MNHN-IU-2010-5272, MNHN-IU-2010-5344).—Stn DB20, 15°30.5'S; 167°01.4'E, 20–25 m, 15 September 2006: 1 ov. F 1.8 mm (MNHN-IU-2010-5289).—Stn DB29, 15°38.9'S, 167°05.1'E, 15 m, 17 September 2006: 2 M 1.8–1.9 mm (MNHN-IU-2010-5297, MNHN-IU-2010-5298), 3 ov. F 2.0–2.3 mm.—Stn ED16, 15°35.3'S, 167°07.4'E, 5–7 m, 17 September 2006: 1 M 1.1 mm (MNHN-IU-2010-5274).—Stn DB33, 15°34.7'S, 167°13.8'E, 14–25 m, 18 September 2006: 2 M 1.2–1.7 mm (MNHN-IU-2010-5277).—Stn DB46, 15°28.8'S, 167°15.2'E, 2–3 m, 20 September 2006: 1 M 2.5 mm (MNHN-IU-2010-5270), 1 ov. F 2.4 mm (MNHN-IU-2010-5269).—Stn DB48, 15°38.7'S, 167°5.2'E, 10–17 m, 21 September 2006: 1 ov. F 2.0 mm (MNHN-IU-2010-5284).—Stn DB53, 15°28.8'S, 167°15.2'E, 5 m, 22 September 2006: 4 M 1.1–1.3 mm (MNHN-IU-2010-5265, MNHN-IU-2010-5278, MNHN-IU-2010-5293), 1 ov. F 3.1 mm (MNHN-IU-2010-5266).—Stn DB65, 15°25.8'S, 167°13.0'E, 13 m, 26 September 2006: 1 M 1.4 mm, 1 ov. F 2.3 mm (MNHN-IU-2010-5281).—Stn DB67, 15°22.9'S, 167°13.1'E, 7 m, 26 September 2006: 1 F 2.2 mm (MNHN-IU-2010-5280).—Stn DB75, 15°22.9'S, 167°11.9'E, 20 m, 28 September 2006: 1 M 1.5 mm (MNHN-IU-2010-5275), 1 F 2.1 mm (MNHN-IU-2010-5296).—Stn ZB6, 15°36.8'S, 167°01.3'E, 30 m, 28 September 2006: 1 M 1.5 mm, 1 ov. F 2.0 mm, 2 F 1.3–1.6 mm (MNHN-IU-2010-5295).—Stn DB80, 15°37.1'S, 167°07.5'E, 18 m, 02 October 2006: 1 ov. F 2.5 mm (MNHN-IU-2010-5288).—Stn AT56, 15°36.1'S, 167°01.3'E, 98–105 m, 2 October 2006: 1 M 2.7 mm (MNHN-IU-2010-5282).—Stn FB56, 15°35.2'S, 167°02.1'E, 3–18 m, 07 October 2006: 1 M 1.5 mm (MNHN-IU-2010-5286).—Stn FB64, 15°35.4'S, 166°59.2'E, intertidal, 10 October 2006: 1 ov. F 2.2 mm (MNHN-IU-2010-5276).—Stn FB68, 15°35.4'S, 166°59.7'E, 11 m, 11 October 2006: 1 ov. F 2.2 mm (MNHN-IU-2010-5285).—Stn EP30, 15°37.6'S, 167°05.4'E, 103–120 m, 12 October 2006: 1 M 2.0 mm (MNHN-IU-2010-5287).—Stn FB83, 15°32.6'S, 167°17.4'E, 8–20 m, 15 October 2006: 1 F 2.0 mm (MNHN-IU-2010-5268).

New Caledonia. Vauban. Stn DW16, 22°20.7'S, 166°37.9'E, 30 m, 22 May 1984: 1 M 3.6 mm, 1 ov. F 3.1 mm (MNHN-IU-2010-5283).

New Caledonia. Lifou Island. LIFOU. Stn1448, 20°45.8' S, 167°01.65' E, 20 m, 17 November 2000: 1 M 1.8 mm (MNHN-IU-2010-5273).

Etymology. From the Latin, *simulatus*, imitate, in reference to the similarity between the new species and *L. gardineri*.

Description. *Carapace:* 1.0–1.3 times longer than wide, dorsal surface covered with long and short setae arising from numerous short and slightly prominent transverse ridges; small spines scattered on dorsal surface, 2 largest spines on epigastric region; no spine on transverse ridge anterior to posterior margin. Cervical groove indistinct. Lateral margins convex, with 7 small but distinct spines on each side, last spine very small, sometimes absent or located mesial to lateral margin; first (anterolateral) small, lateral to lateral limit of orbit, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised lateral teeth, dorsal surface slightly concave, with a few long setae; length (measured from the tip to level of orbital margin) 0.4–0.5 times carapace length, and 0.8 times width (measured at level of orbital margin); tip of rostral spine and distalmost lateral teeth with straight lateral margins.

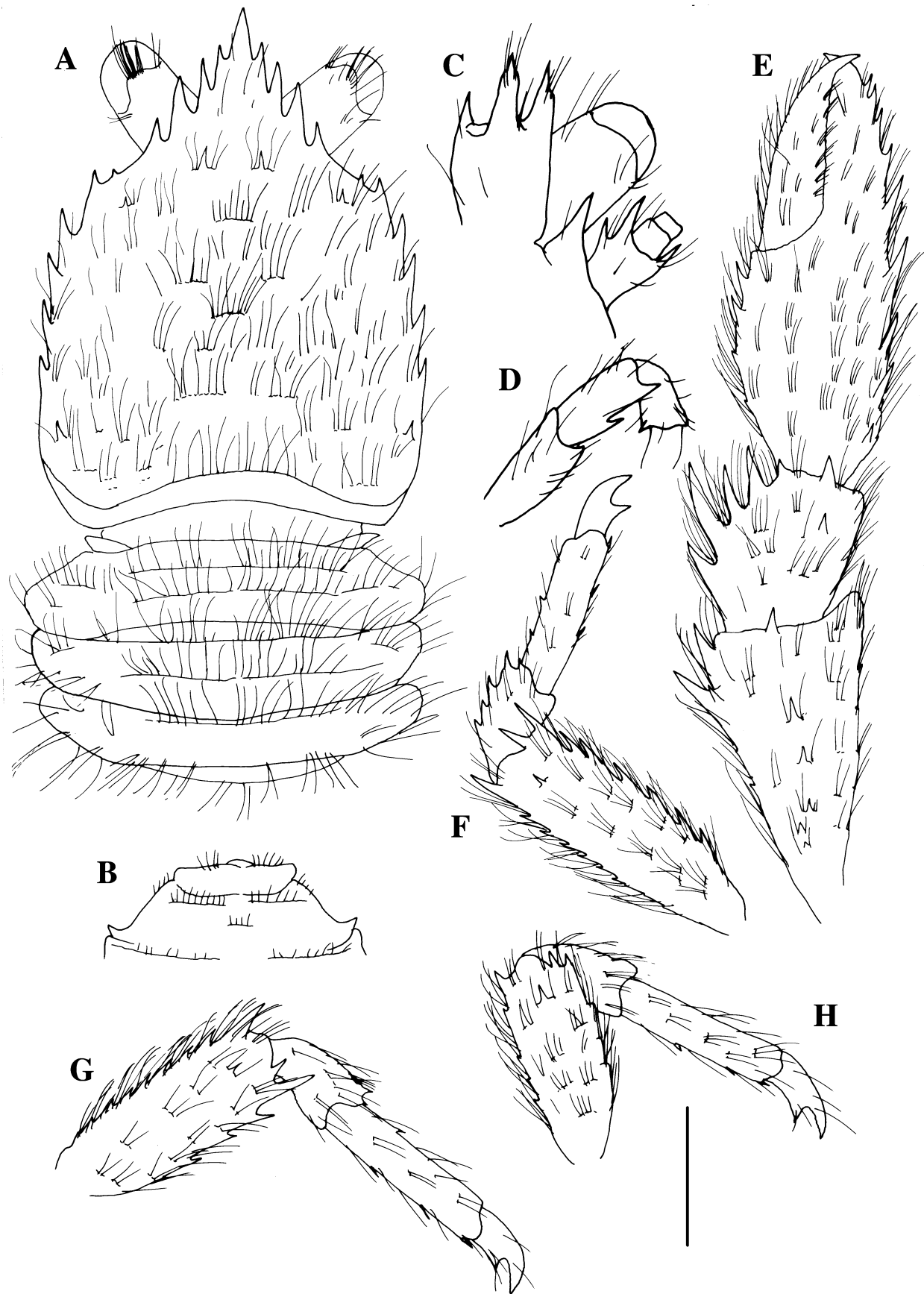


FIGURE 5. *Lauriea simulata* n. sp., holotype, ovigerous female, 2.7 mm, Vanuatu, SANTO, Stn FR4-F22 (MNHN-IU-2010-5290). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, right P2, lateral view; G, right P3, lateral view; H, right P4, lateral view. Scale: A, B, E–H = 1 mm; C–D = 0.7 mm.

Abdomen: somites with thick long coarse uniramous setae. Somites 2–4 each with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin somewhat produced medially, 2.8 times wider than long; sternite 4 twice as wide as sternite 3, and 3.2 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eyestalks short, 1.4 times longer than wide, clearly exceeding antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea not swollen, length slightly less than half that of remaining eyestalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with strong ventromesial spine exceeding article 2; article 2 with distomesial spine nearly reaching end of peduncle, and distolateral spine reaching end of article 3, additional spine on mesial margin; article 3 unarmed or with minute distomesial spine.

Mxp3: ischium slightly longer than merus when measured in lateral midline, flexor margin with small distal spine, mesial ridge with 23 or 24 denticles. Merus with 2 subequal spines on flexor margin. Carpus with small distal spine on flexor margin.

P1: 3.0–3.2 times carapace length; setose dorsally, scarcely setose or nearly glabrous ventrally; plumose and non-plumose long setae, partly coarse, arising from numerous short striae. Merus as long as carapace; spines on dorsal and mesial sides, mesial spines larger, distal ones prominent. Carpus 1.3–1.5 times longer than wide, equally wide as propodus, and 0.5–0.6 length of merus; some scattered small spines on dorsal side, row of strong spines along mesial margin, some small spines on ventral side. Palm 1.4–1.6 times as long as wide; dorsal surface unarmed, with some long setae arising from numerous short striae, mesial margin with row of several spines, lateral margin with row of spines continued on to fixed finger. Fingers 0.7–0.9 palm length, not gaping and tips crossing when closed; terminating in sharp curved spine; dorsal surface unarmed; movable finger unarmed on mesial margin.

P2–4: P2 1.5–1.8 times carapace length, very setose on margins, with long plumose and non-plumose setae. P2–4 meri posteriorly diminishing in size, extensor margin rounded, with row of proximally diminishing spines, some well-developed spines on flexor margin, 0–2 small spines on lateral side, and 1 extra spine on terminal margin close to distal flexor marginal spine, lateral side with some long setae arising from numerous short striae; P2 merus 0.8 times carapace length, 3.5–3.7 times longer than wide, and 2.0–2.1 times longer than propodus. Carpi with small spines (2 or 3 on P2, 0–2 on P3–4) on extensor margin. Propodi with row of small proximal spines (2 or 3 on P2, 0 or 1 on P3–4) along extensor margin and 4- or 5 movable slender spines on flexor margin, including 2 terminal spines; P2 propodus 3.2–3.5 times longer than wide, and more than 1.8 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Colour. Ground colour of carapace and abdomen whitish, with yellow spots circled by brown at base of rostrum, and at each side of anterolateral, mesogastric and anterior branchial areas; 2 additional spots on abdominal somite 1; setae brownish and whitish. P1–4 whitish and brownish marbled, some yellow spots circled by brown on P1 merus and carpus; setae whitish.

Remarks. *Lauriea simulata* is closely related to *L. gardineri* from the western Indian Ocean (see the differences under the Remarks of *L. gardineri*).

Distribution. Philippines, Vanuatu and New Caledonia, from intertidal to 120 m.

***Lauriea teresae* n. sp.**

(Figs 6, 8E, 9E–F)

Material examined. *Holotype:* French Polynesia, Society Islands, Moorea Island. Outer reef slope, 17°28.48'S, 149°50.35'W, 18 m, 28 July 2006: 1 ov. F 2.7 mm (UF10148).

Paratype: French Polynesia, Society Islands, Moorea Island. Outer reef slope, 17°28.48'S, 149°50.35'W, 18 m, 28 July 2006: 1 M 1.9 mm (UF10171), 2 ov. F 2.2–2.7 mm (UF10146).—S of Vaiare Pass, outer reef slope: 17°31.82'S, 149°45.73'W, 22 m, 27 October 2008: 1 M 1.8 mm (UF16172).—no depth recorded, November 2009: 1 M 1.8 mm (UF24131).

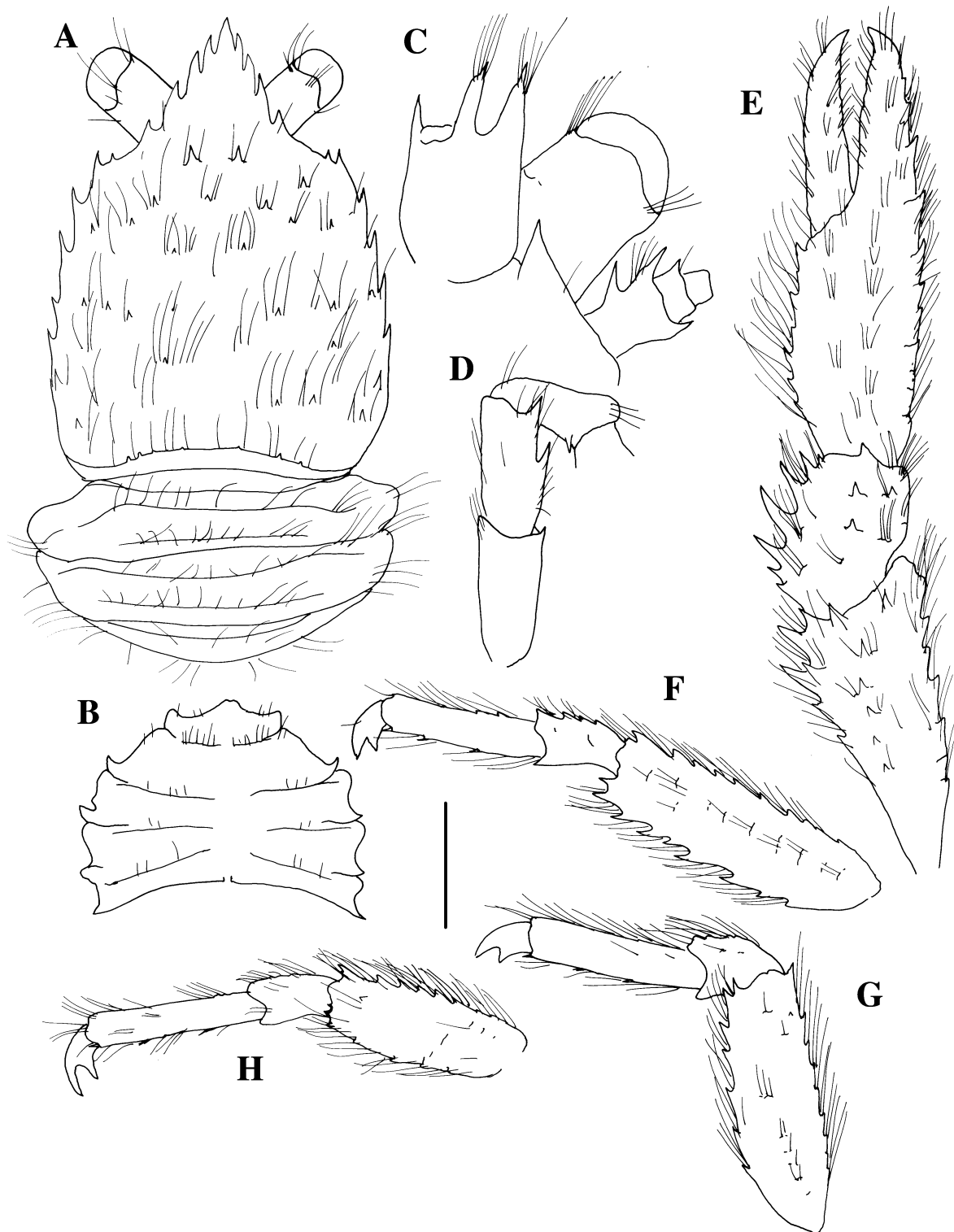


FIGURE 6. *Lauriea teresae* n. sp., holotype, ovigerous female, 2.7 mm, French Polynesia, Moorea Island (UF-10148). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, left P2, lateral view; G, left P3, lateral view; H, left P4, lateral view. Scale: A, B–H = 1 mm; C–D = 0.5 mm.

Etymology. The species is dedicated to Teresa Alcoverro (CEAB-CSIC), for her important contributions to littoral ecology.

Description. *Carapace:* as long as wide, dorsal surface covered with long and short fine setae arising from numerous short transverse ridges; small spines scattered on dorsal surface, 2 largest spines on epigastric region,

and 6–8 spines along transverse ridge anterior to posterior margin. Cervical groove indistinct. Lateral margins convex, with 7 or 8 small but distinct spines on each side, last spine sometimes absent or mesial to lateral margin; first (anterolateral) smaller, directly lateral to lateral limit of orbit, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised lateral teeth, dorsal surface slightly concave, flattish on distal portion, with a few long setae; length (measured from the tip to level of orbital margin) 0.4 times carapace length, and 0.9 times width (measured at level of orbital margin); rostral spine and distalmost lateral teeth with convex lateral margins.

Abdomen: somites with thick long coarse setae. Somites 2–4 with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin medially produced, 2.3 times wider than long; sternite 4 nearly twice as wide as sternite 3, and 3.6 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eystalks moderately elongate, 1.5 times longer than wide, slightly exceeding antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea not swollen, length slightly less than that of remaining eystalk.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with ventromesial process ending in acute spine nearly reaching distal end of article 2, article 2 with distomesial spine exceeding article 3, distolateral spine not reaching end of article 3, additional spine on mesial margin; article 3 with small distomesial spine.

Mxp3: ischium slightly longer than merus when measured in midlateral line, flexor margin with short distal spine, mesial ridge with 26–29 denticles. Merus with 2 subequal spines on flexor margin. Carpus with small distal spine on flexor margin.

P1: 2.5–2.7 times carapace length; very setose dorsally, scarcely setose or nearly glabrous ventrally; long setae mostly plumose, partly coarse. Merus 0.8–0.9 times carapace length, with row of spines along lateral, dorsal and mesial sides, mesial spines larger, distal ones prominent. Carpus 1.4 times longer than wide, equally wide as propodus, and more than half length of merus; scattered spines on dorsal side, row of strong spines along mesial margin, small spines on ventral side. Palm 1.5–1.8 times as long as wide; dorsal surface unarmed, with some long setae arising from a few short striae, mesial margin with row of spines, lateral margin with row of spines continued on to fixed finger. Fingers slightly shorter than propodus, not gaping and tips crossing when closed; terminating in sharp curved spine; movable finger sometimes with proximal spine on mesial margin; fingers unarmed dorsally.

P2–4: P2 about 1.5 times carapace length, very setose on margins, setae long and coarse, often plumose on extensor margin. P2–4 meri posteriorly diminishing in size, extensor margin sharply ridged, with row of proximally diminishing spines, well-developed spines on flexor margin, and 2 extra spines on terminal margin close to distal flexor marginal spine, lateral side with long setae arising from short striae; P2 merus 0.9 times carapace length, 3.6 times longer than wide, and 1.5–2.0 times longer than propodus. Carpi with small spines (4 on P2, 0–2 on P3–4) on extensor margin (distal one larger). Propodi with line of very small proximal spines along extensor margin (absent on P4, and sometimes absent on P3) and 3 or 4 movable slender spines on flexor margin; P2 propodus 4.0 times longer than wide, and more than 2.0 times dactylus length. Dactyli sharply biunguiculate, terminal claw strongest.

Colour. Ground colour of carapace, abdomen and P1–4 dark grey or green. Carapace with several small white spots, 2 large spots, sometimes small, on metagastric and branchiocardiac areas. Abdominal somites 2–3 sometimes with 1 or 2 small median white spots; somites 4–5 each with large median pair of white spots. Corneae white on dorsal side. P1 fingers with large white band on proximal half, distal half red or brownish; distal portion of palm with brown band. P2–4 propodi each with distal white spot preceded by brown band. Setae brownish or grey.

Remarks. *Lauriea teresae* is closely related to *L. crucis* from Vanuatu and Wallis and Futuna. The two species can be easily distinguished from the other species of the genus by the presence of a few setose striae on the P2–4 meri. Furthermore, the P2–4 meri are carinated along the extensor margin.

However, *L. teresae* is distinguished from *L. crucis* by the width of the eyes that is less than 1.5 times instead of 1.8 times longer than wide.

The genetic divergences between *L. teresae* and *L. crucis* were 7.0% (COI) and 1.0% (16S rRNA).

Distribution. French Polynesia (Society Islands), 18–22 m.

Triodonthea n. gen.

Diagnosis. Carapace as long as broad, lateral margins slightly convex; dorsal surface dorsal surface devoid of distinct striae, covered with long and short fine setae, some of them plumose, arising from numerous short transverse ridges; cervical groove indistinct. Rostrum triangular, with 4 strong lateral teeth on each side. Epistome with ridge between marginal ridge (mouth) and ventral margin of orbit, without protuberance near marginal ridge. Telson well developed, completely subdivided. Endopod of uropod clearly elongated. Basal antennular segment with 3 distal spines. Mxp3 lacking spine on the flexor distal margin of carpus. P1–4 stout, spinose and setose. P2–4 dactyli curved inward distally, triunguiculate, with well-developed claw on flexor margin. Chela of P5 with setae moderate in density on flexor face, without brush of plumose setae, fingers more setose, setae simple, not ribbon-like. One pair of male gonopods.

Type-Species. *Triodonthea setosa* n. sp.

Etymology. From the Latin, *tri*, three, *odontos*, tooth, plus the last syllables of *Galathea*. In reference to the three teeth in P2–4 dactyli. Gender: feminine.

Remarks. The carapace dorsal surface that is devoid of distinct striae, the triangular rostrum triangular, with lateral spines on each side, the clearly elongated endopod of the uropod clearly elongated, well-developed eyes well-developed with broad and short eyestalks, shape of P2–4 dactyli and males with one pair of gonopods link this new genus to *Lauriea* Baba, 1971, but their molecular relationships are rather distant. These genera may be easily differentiated from each other by the following characters: (1) the P2–4 dactyli are triunguiculate in the new genus, whereas these dactyli are biunguiculate in *Lauriea*, and (2) the 3 Mxp 3 carpus is unarmed in *Triodonthea*, whereas one small distal spine is present in all species of *Lauriea*, and (3) the P1–4 articles are covered with numerous long and plumose setae in the new genus, these plumose setae are restricted to mesial and lateral margins of P1 and extensor and flexor margins of P2–4 in *Lauriea*.

The divergences between *Triodonthea setosa* and six species of *Lauriea* ranged from 13.1 to 15.2% for the COI marker, and from 3.7 to 5.9% for the 16S rRNA marker (Table 1). These differences were quite similar to those between the new genus and the genus *Macrothea* Macpherson & Cleva, 2010 (Table 1).

Triodonthea setosa n. sp.

(Figs 7, 8F)

Material examined. *Holotype*: Solomon Islands. SALOMON 1. Stn DW1840, 10°17.0'S, 161°43.0'E, 97–223 m, 6 October 2001: 1 M 3.2 mm (MNHN-IU-2010-5262).

Paratypes: New Caledonia. SMIB 5. Stn DW100, 23°22.90'S, 168°05.20'E, 80–120 m, 14 September 1989: 1 ov. F 4.8 mm (MNHN-IU-2010-5263). NORFOLK 2, Stn CP2141, 23°00.52'S, 168°19.80'E, 92–100 m, 3 November 2003: 1 M 3.5 mm, 1 ov. F 4.0 mm (MNHN-IU-2010-5264).

Etymology. From the Latin, *setosus*, bristly, in reference to the numerous long setae on the body.

Description. *Carapace*: as long as wide, dorsal surface covered with long and short fine setae, some of them plumose, arising from numerous short transverse ridges; 2 spines on epigastric region, (paratype with additional pair of epigastric spines and 1 postcervical spine on each side). Cervical groove indistinct. Lateral margins convex, with 6 or 7 small but distinct spines on each side, last spine sometimes absent or located mesial to lateral margin; first (anterolateral) small, remainder more or less distantly separated from one another; 1 small spine mesial to anterolateral spine. Rostrum sharply triangular, with 4 moderately incised lateral teeth; dorsal surface flattish, with numerous long setae; length (measured from the tip to level of orbital margin) 0.5 times carapace length, and 1.0–1.3 times width (measured at level of orbital margin); rostral spine and distalmost tooth pair with convex lateral margins.

Abdomen: somites with thick long coarse setae. Somites 2–4 with 2 transverse setiferous ridges each preceded by groove.

Sternum: sternite 3 with anterior margin produced, medially notched, 2.9 times wider than long; sternite 4 twice sternite 3, and 3.1 times wider than long.

Eyes: orbit not laterally produced, unarmed. Eyestalks moderately elongate, twice longer than wide, reaching end of antennal peduncle, proximally somewhat wider, distally with long setae directly proximal to cornea; cornea not swollen, length less than half that of remaining eyestalk.

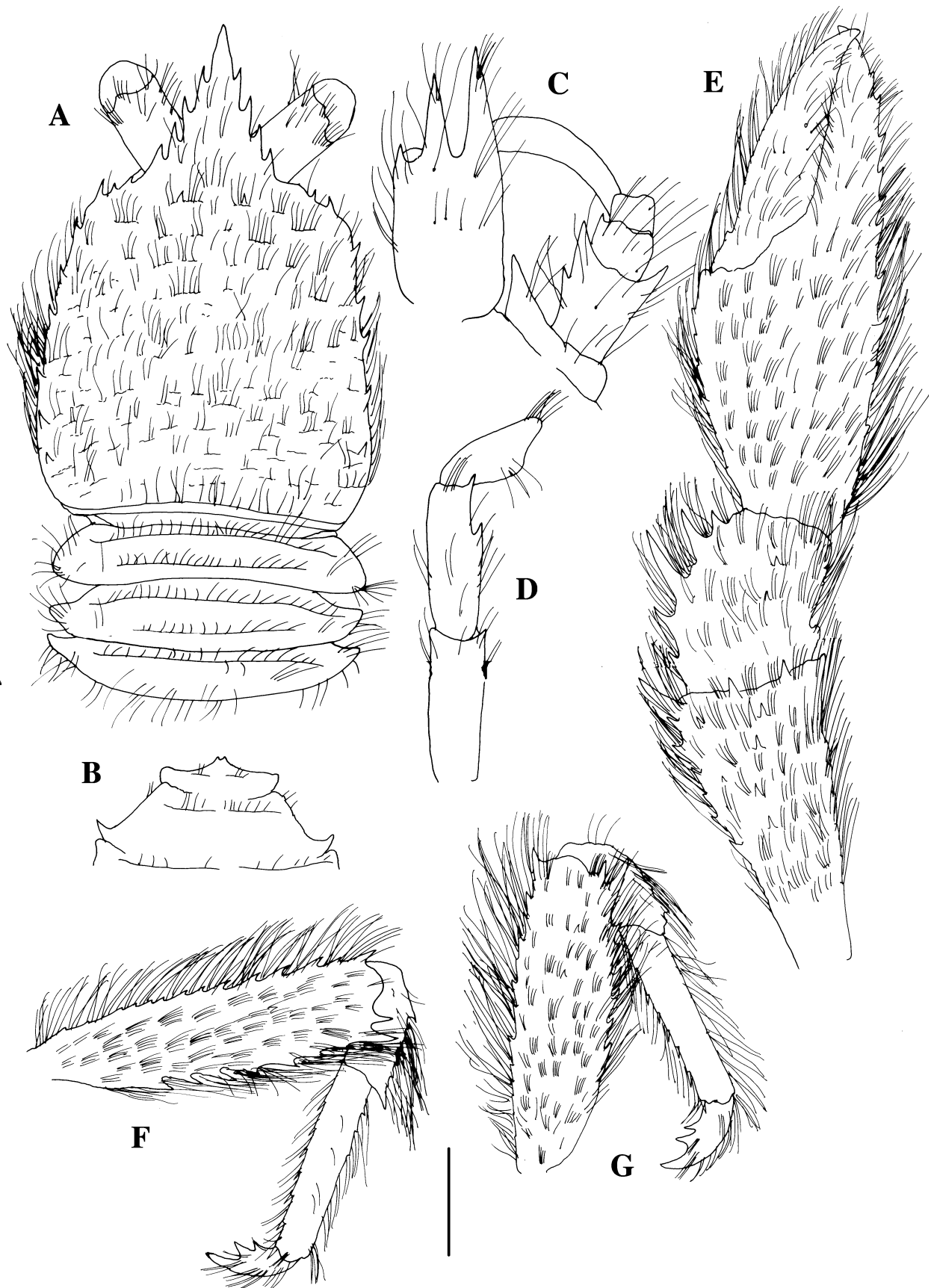


FIGURE 7. *Triodonthea setosa* n. sp., holotype, male, 3.2 mm, Solomon Islands, SALOMON 1, Stn DW1840 (MNHN-IU-2010-5262). A, carapace and abdomen, dorsal view; B, sternal plastron, sternites 3 and 4; C, left cephalic region, showing antennular and antennal peduncles, ventral view; D, right Mxp3, lateral view; E, right P1, dorsal view; F, right P2, lateral view; G, right P3, lateral view. Scale: A, B, E–H = 1 mm; C–D = 0.5 mm.

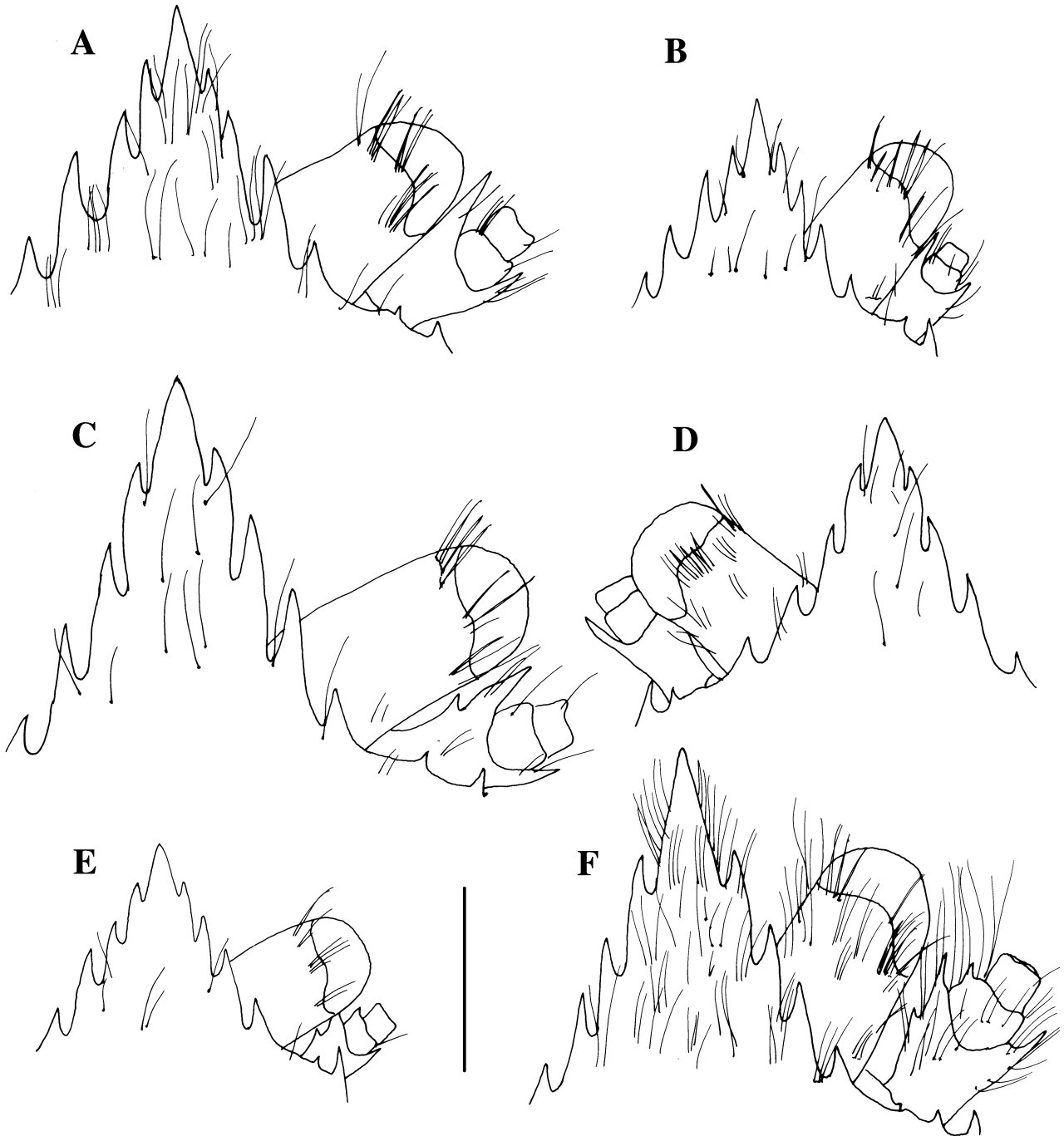


FIGURE 8. Rostrum and anterior portion of carapace, dorsal view. A, *Lauriea gardineri* Laurie, 1926, ovigerous female, 2.4 mm, Madagascar, ATIMOVATAE, Stn DW3605, male, 2.4 mm. B, *Lauriea simulata*, New Caledonia, LIFOU, Stn 1448, male, 1.8 mm. C, *Lauriea punctata*, Vanuatu, SANTO, Stn AT85, male, 2.6 mm. D, *Lauriea adusta*, Philippines, PANGLAO, Stn B39, male, 2.0 mm. E, *Lauriea teresae*, French Polynesia, Moorea Island, male, 1.8 mm. F, *Triodonthea setosa*, New Caledonia, SMIB 5, Stn DW100, ovigerous female, 4.8 mm. Scale, 0.5 mm.

Antennule: article 1 with 3 distal spines: distomesial slender, distolateral well developed, dorsolateral larger than distolateral; 2 slender terminal segments, ultimate segment with tuft of pronounced setae on extensor distal margin.

Antenna: article 1 with ventromesial process ending in acute spine reaching distal end of article 2; article 2 with subequal distomesial and distolateral spines (distomesial spine reaching end of article 3), and additional spine on mesial margin; article 3 with minute distomesial spine.



FIGURE 9. Colour photographs. A, *Lauriea gardineri* Laurie, 1926, Madagascar, ATIMOVATAE, Stn TB02, male, 1.8 mm. B, *Lauriea simulata*, Vanuatu, SANTO, Stn FR4-F22, holotype, ovigerous female, 2.7 mm. C, *Lauriea punctata*, Vanuatu, SANTO, Stn AT13, holotype, male, 3.4 mm. D, *Lauriea punctata*, Philippines, PANGLAO, Stn T6, male, 2.8 mm. E, *Lauriea teresae*, French Polynesia, Moorea Island, male, 1.8 mm. F, *Lauriea teresae*, French Polynesia, Moorea Island, ovigerous female, 2.2 mm. G, *Lauriea adusta* new species, ovigerous female, 2.7 mm, Philippines, PANGLAO, Stn B19. H, *Lauriea adusta* new species, ovigerous female, 3.1 mm, Philippines, PANGLAO, Stn B13. Photos, G. Paulay and T.Y. Chan.

Mxp3: ischium slightly longer than merus when measured in lateral midline, flexor margin with 2 spines, distal smaller; mesial ridge with 25–27 denticles. Merus with 2 subequal spines on flexor distal margin. Carpus unarmed on flexor margin.

P1: 2.9 times carapace length; very setose dorsally, scarcely setose or nearly glabrous ventrally; long setae mostly plumose, partly coarse. Merus 0.9 times carapace length, with row of spines along lateral, dorsal and mesial sides, mesial spines larger, distal ones prominent. Carpus 1.4 times longer than wide, equally wide as propodus, and 0.8 length of merus; scattered small spines on dorsal side, row of strong spines along mesial margin, small spines on ventral side. Palm 1.4–1.5 times as long as wide; dorsal surface unarmed, with long setae arising from numerous short striae, mesial margin with row of small spines, lateral margin with row of well-developed spines continued on to fixed finger. Fingers 0.8–1.2 times longer than propodus, not gaping and tips crossing when closed; terminating in sharp curved spine; movable finger with proximal spine on mesial margin; fingers unarmed dorsally.

P2–4: *P2* about twice carapace length, very setose, setae very long and coarse, often plumose on extensor margin. *P2–4* meri posteriorly diminishing in size, extensor margin moderately rounded, lateral side with long setae arising from numerous short striae, and 2 or 3 minute scattered spines; row of proximally diminishing spines on extensor margin, flexor margin with well-developed spines, and 1 extra spine on terminal margin close to distal flexor marginal spine; *P2* merus 0.9 times carapace length, 4.0 times longer than wide, and 1.8 times longer than propodus. Carpi with small spines (3 or 4 on *P2*, 0–2 on *P3–4*) on extensor margin (distal one larger). Propodi with 4–8 (*P2*) or 0–5 (*P3–4*) proximal spines on extensor margin and 7–9 movable slender spines on flexor margin, pair of terminal spines included; *P2* propodus 4.5 times longer than wide, and more than 2.5 times dactylus length. Dactyli curved, terminal claw strong, with 2 spines, proximal small.

Distribution. Solomon Islands and New Caledonia, between 80 and 223 m.

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