New deep-sea squat lobsters of the genus *Galathea* Fabricius, 1793 (Decapoda, Galatheidae) from Vanuatu and New Caledonia

Enrique MACPHERSON
Centre d'Estudis Avançats de Blanes (CEAB-CSIC),
c. acc. Cala San Francesc 14, E-17300 Blanes (Spain)
macpherson@ceab.csic.es

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ABSTRACT
During two cruises to Vanuatu, MUSORSTOM 8 (September-October 1994) and SANTO 2006 (September-October 2006), numerous specimens of deep-sea galatheids belonging to the genus *Galathea* Fabricius, 1793 were collected. The specimens were caught at stations at depths between 180 and 702 m. These collections contain five new species (*G. barbellata* n. sp., *G. echinata* n. sp., *G. profunda* n. sp., *G. raventosae* n. sp. and *G. sanctae* n. sp.), all of which are also found in other collections obtained by French cruises to New Caledonia. *Galathea barbellata* n. sp., *G. echinata* n. sp. and *G. profunda* n. sp. are closely related to *G. robusta* Baba, 1990, from Madagascar, *G. raventosae* n. sp. resembles *G. consobrina* De Man, 1902, from Indonesia, the Philippines, South China Sea and SW Australia, and *G. sanctae* n. sp. is very close to *G. multilineata* Balss, 1913, from Japan, East China Sea, Taiwan and the Philippines.

KEY WORDS
Crustacea,
Pacific Ocean,
Anomura,
new species.

RÉSUMÉ
Nouveaux galathéidés d'eaux profondes du genre Galathea *Fabricius, 1793 (Decapoda, Galatheidae) originaires du Vanuatu et de Nouvelle-Calédonie.*
Durant deux expéditions au Vanuatu, MUSORSTOM 8 (septembre-octobre 1994) et SANTO 2006 (septembre-octobre 2006), de nombreux spécimens de galathéidés d'eaux profondes appartenant au genre *Galathea* Fabricius, 1793 ont été collectés. Les spécimens ont été capturés à des profondeurs comprises entre 180 et 702 m. Ces collections contiennent cinq nouvelles espèces (*G. barbellata* n. sp., *G. echinata* n. sp., *G. profunda* n. sp., *G. raventosae* n. sp. et *G. sanctae* n. sp.), qui sont toutes également présentes dans d'autres collections issues d'expéditions françaises en Nouvelle-Calédonie. *Galathea barbellata* n. sp., *G. echinata* n. sp. et *G. profunda* n. sp. sont proches de *G. robusta* Baba, 1990, de Madagascar, *G. raventosae* n. sp. ressemble à *G. consobrina* De Man, 1902, d'Indonésie, des Philippines, de la mer de Chine méridionale et du sud-ouest de l'Australie, et *G. sanctae* n. sp. est très proche de *G. multilineata* Balss, 1913, du Japon, de la mer de Chine orientale, de Taiwan et des Philippines.

MOTS CLÉS
Crustacea,
océan Pacifique,
Anomura,
espèces nouvelles.

INTRODUCTION

The genus *Galathea* Fabricius, 1793 is considered one of the most diverse in the family Galatheidae (Ahyong *et al.* 2010). At present about 76 species have been described, mostly form the western Pacific Ocean (Baba & Fujita 2008; Baba *et al.* 2008; Dong & Li 2010). The majority of the species of *Galathea* live in shallow-waters while about 20 species are commonly found in waters deeper than 200 m (Baba 2005). In the western Pacific, several areas have been considered "hot spots" in squat lobster diversity (Macpherson *et al.* 2010), one of which includes Vanuatu and New Caledonia and its adjacent waters. This area has received great taxonomic attention in the last decades and numerous new species have been described as a result of sampling effort (e.g., Macpherson 1999, 2007, 2009; Macpherson & Baba 2006; Cabezas *et al.* 2009, 2010). The genus *Galathea*, however, has received limited attention in this area and only a few new species were described and some new occurrences were noted by Baba (1979, 2005).

Numerous deep-sea (> 200 m) specimens of the genus *Galathea* were collected in Vanuatu by two cruises, MUSORSTOM 8 (September-October 1994) and SANTO 2006 (September-October 2006) as part of a biodiversity survey of the area (for a narrative and background of the expedition, see Bouchet *et al.* [2011a], and for a review of the geography and natural history of Santo, see Bouchet *et al.* [2011b]; Bouchet & Le Guyader 2012). Furthermore, in order to compare this material with other deep-sea specimens, the samples from adjacent waters (New Caledonia, different cruises from 1985 to 2003) were also studied. In this paper the new species found in these cruises are illustrated and described.

MATERIAL AND METHODS

The material examined is deposited in the collections of the Muséum national d'Histoire naturelle, Paris (MNHN).

In addition to the specimens belonging to the new species described here, comparative material of *G. multilineata* Balss, 1913, *G. consobrina* De Man, 1902 and *G. robusta* Baba, 1990 were examined:

– *G. consobrina*: Philippines, MUSORSTOM 3, stn DR117, 12°31'N, 120°39'E, 92-97 m, 3.VI.1985, 5 ♂♂ 2.3-3.6 mm, 2 ovig. ♀♀, 2.7-3.8 mm;
– *G. multilineata*: Philippines, MUSORSTOM 2, stn CP68, 14°02'N, 120°19'E, 195-199 m, 29.XI.1980, 1 ♂, 5.8 mm; MUSORSTOM 2, stn CP67, 14°00'N, 120°18'E, 193-199 m, 29.XI.1980, 2 ovig. ♀♀, 4.9-5.7 mm;
– *G. robusta*: Madagascar, Vauban, CH71 25°13.1'S, 47°17.8'E, 105-115 m, 3.III.1973, 1 ♂, 8.3 mm (with rostrum), holotype (MNHN Ga712); Madagascar, stn CP3561, 25°38'S, 46°13'E, 128-133 m, 6.V.2010, 1 ♂, 3.0 mm; Reunion Island, cruise MD32, stn CP57, 21°04.5'S, 55°11'E, 210-227 m, 22.VIII.1982, 2 ovig. ♀♀, 3.0-4.4 mm.

Measurements of the specimens represent the post-orbital carapace length. The rostrum breadth is measured between the posterior-most lateral incisions, and the rostrum length between the rostral tip to the frontal margin; the length of the pereiopod articles are measured along the mesial or lateral borders (P1) or the dorsal border (P2-4), the breadth of articles are measured at midlength. Terminology used mainly follows Baba *et al.* (2009). The terms flexor and extensor borders of articles are only used for the maxilipeds and dactylus of the walking legs.

Abbreviations

Mxp	maxiliped;
P1	pereiopod 1, cheliped;
P2-P4	pereiopods 2-4, first to third walking legs;
ovig.	ovigerous.

The station numbers include gear types used:

CP, AT	beam trawl;
WD	Warén dredge.

SYSTEMATICS

Family Galatheidae Samouelle, 1819
Genus *Galathea* Fabricius, 1793

Galathea barbellata n. sp.
(Fig 1)

Holotype. — **New Caledonia**. SMIB 4, stn DW55, 23°21.40'S, 168°04.50'E, 260 m, 9.III.1993, 1 ovig. ♀, 4.9 mm (MNHN-IU-2009-587).

PARATYPES. — **Vanuatu**. MUSORSTOM 8, stn CP1086, 15°36'S, 167°16'E, 182-215 m, 5.X.1994, 1 ♂, 3.5 mm (MNHN-IU-2009-588).
New Caledonia. BERYX 11, stn CP44, 23°41'S, 168°01'E, 230-250 m, 20.X.1992, 1 ♀, 3.5 mm (MNHN-IU-2009-589).
SMIB 8, stn DW155, 24°45'S, 168°08'E, 257-262 m, 28.I.1993, 1 ovig. ♀, 3.6 mm (MNHN-IU-2009-590).

DISTRIBUTION. — Vanuatu and New Caledonia, in 182-262 m.

ETYMOLOGY. — From the Latin "barba", beard, in reference to the numerous setae on the body and appendages, "ellus" (diminutive suffix), and "tus" (adjective suffix denoting possession or fullness).

DESCRIPTION

Carapace, exclusive of rostrum, 1.2-1.3 times as long as broad; dorsal surface nearly horizontal from anterior to posterior; anterior and posterior cervical grooves distinct; epigastric and secondary ridges scale-like, interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove; mid-transverse ridge interrupted, preceded by distinct cervical groove, followed by three interrupted and three uninterrupted transverse ridges placed alternately; ridges setose and with some scattered long and thick plumose setae. Epigastric region with 9-11 small spines; two submedian protogastric spines, and one or two parahepatic spines on each side; two postcervical spines on each side and two pairs of cardiac spines placed side by side; sometimes one anterior branchial spine on each side. Lateral margins subparallel, with seven spines: two spines in front of and five strong spines behind anterior cervical groove; first anterolateral, well developed, distinctly posterior to level of lateral limit of orbit; second small, situated at midlength between anterolateral spine and anterior cervical groove, accompanying another small spine ventral to between first and second; two spines on anterior branchial region, and three spines on posterior branchial margin. Small outer orbital spine; infra-orbital margin with one or two denticles. Rostrum 2.0-2.5 times as long as broad, length 0.5-0.6 that of, breadth 0.2-0.3 that of carapace, dorsal surface nearly horizontal in lateral view, with small setiferous ridges; lateral margin with four sharp teeth.

Pterygostomian flap rugose with sparse setae, anteriorly rounded; some granules on upper margin near linea anomurica.

Sternal plastron 1.2 times as long as broad. Sternite 3 1.9 times as broad as long, anterior margin bilobated. Sternite 4 slightly wider than following sternite, with one or two small spines on each side of anterior margin, 4 times longer and 3.5 times broader than preceding sternite, 0.6 as long as broad; surface with few short transverse ridges bearing long setae. Following sternites smooth on surface; sternites 6 and 7 with setose anterolateral margin.

Abdominal somites 2-4 each with three uninterrupted transverse ridges on tergite; somites 5 and 6 each with two ridges, both uninterrupted on somite 5 and both medially interrupted on somite 6. Telson 0.8 as long as broad, incompletely subdivided. Two pairs of male gonopods.

Ocular peduncles 1.6-1.9 times longer than broad; eyestalk (other than cornea) with some short fine setae on dorsal striae; cornea as broad as peduncle.

Basal article of antennular peduncle with three well-developed distal spines, distodorsal larger; additional small spine on each of ventromesial and lateral margins. Ultimate article with a few short setae not in tuft on distodorsal margin.

Article 1 of antennal peduncle with depressed ventral distomesial process not reaching distal margin of article 2. Article 2 with distolateral spine smaller than distomesial, not reaching midlength of article 3. Articles 3 and 4 unarmed.

Mxp3 basis with four or five denticles on mesial ridge, distal-most distinct, remainder very small. Ischium with well-developed spine on extensor distal margin; crista dentata with 18 or 19 denticles. Merus subequal in length to ischium, with three spines on flexor margin, proximalmost larger than others; extensor margin with distal spine. Carpus spineless.

P1 3.1-3.7 (females), 3.8-3.9 (males) times postorbital carapace length, relatively slender, subcylindrical, with long stiff setae on striae of all articles, and some scattered long and thick plumose setae. Merus 1.1-1.5 times length of carapace, 1.6-2.1 times as long as carpus, with several rows of spines, dorsomesial row with strong spines. Carpus 0.8-0.9 length of palm, 2.5-2.9 (females), 2.2-2.7 (males) times

longer than broad, dorsal surface with row of small spines; mesial surface with well-developed spines; and some small spines along lateral margin. Palm 3.0-3.6 (females), 3.2-3.5 (males) times longer than broad; small dorsal spines roughly in three rows: mesial, dorsal and lateral; lateral row not continued on to lateral margin of fixed finger. Fingers 0.8-0.9 as long as palm, distally spooned, prehensile edges close fitting with intermeshing teeth when closed; mesial margin of movable finger unarmed.

P2-4 relatively short, somewhat compressed, setose, sparsely with thick long plumose setae on all articles. Meri successively shorter posteriorly (P3 merus 0.8 length of P2 merus, P4 merus 0.8 length of P3 merus), equally broad on P2-4; P2 merus 0.7 carapace length, 3.9 times as long as broad, 1.3 times longer than P2 propodus; P3 merus 3.4 times as long as broad, 1.0 times length of P3 propodus; P4 merus 3.5 times as long as broad, 0.9 length of P4 propodus. Dorsal margins with row of 6 or 7 proximally diminishing spines on P2-4; dorsolateral surface unarmed on P2-3, with 3 small spines on P4; ventrolateral margins ending in strong terminal spine proximally followed by smaller spine; ventromesial margin with small terminal spine on P2 only. Carpi each with 4-5 spines on extensor margin on P2-4, distal-most larger; dorsolateral surface with row of 2-4 small spines or acute granules paralleling extensor row; flexor distal margins with very small distal spine. Propodi subequal in length on P2-4, each 4.6-5.3 times as long as broad; extensor margin with 3-4 proximal spines on P2-4; flexor margin with seven or eight spines, terminal one paired with another smaller spine mesial to it. Dactyli subequal in length, 0.6 length of propodi, ending in incurved, strong, sharp spine; flexor margin with four or five successively diminishing teeth, terminal tooth prominent; each tooth with seta-like movable spine.

Epipods present on P1, absent on P2-3.

Remarks

Galathea barbellata n. sp. belongs to the group of species having an interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove, the rostrum with four lateral spines, the carapace lateral margin with a small spine between the anterolateral spine and the anteriormost branchial marginal spine, and the gastric striae not scale-like. The new species is closely related to *G. robusta* from Madagascar. Both species have submedian protogastric spines, parahepatic, and postcervical spines on each side, and two pairs of cardiac spines placed side by side.

The new species is easily distinguished from *G. robusta* by the following differences (Table 1):
– the antennular basal article has three large spines and one additional small ventromesial spine in the new species, whereas this article has two spines in *G. robusta;*
– the epigastric region bears more numerous spines in the new species than in *G. robusta.* Furthermore, the lateral protogastric and median mesogastric spines are absent in the new species, whereas these spines are present in *G. robusta*;
– the anterior margin of sternite 4 bears one or two small spines on each side in the new species, whereas this margin is unarmed in *G. robusta*.

Galathea echinata n. sp.
(Fig. 2)

Holotype. — **New Caledonia**. NORFOLK 2, stn DW2024, 23°27.92'S, 167°50.90'E, 370-371 m, 21.X.2003, 1 ♂, 5.1 mm (MNHN-IU-2009-591).

Paratypes. — **New Caledonia**. SMIB 5, stn DW88, 22°18.60'S, 168°40.20'E, 350 m, 13.IX.1989, 1 ♂, 4.6 mm, 1 ovig. ♀, 5.0 mm (MNHN-IU-2009-592).

Distribution. — New Caledonia, in 350-371 m.

Etymology. — From the Latin "echinatus", spiny, in reference to the numerous spines on the dorsal surface of the carapace.

Description

Carapace, exclusive of rostrum, 1.2 times as long as broad; dorsal surface of gastric region slightly convex, anterior cardiac region concave; anterior and posterior cervical grooves distinct; ridges on gastric and anterior branchial regions scale-like, not well defined; mid-transverse ridge interrupted, preceded by cervical groove, followed by scale-like ridges and interrupted transverse ridge; all ridges finely setose, with some scattered long and thick

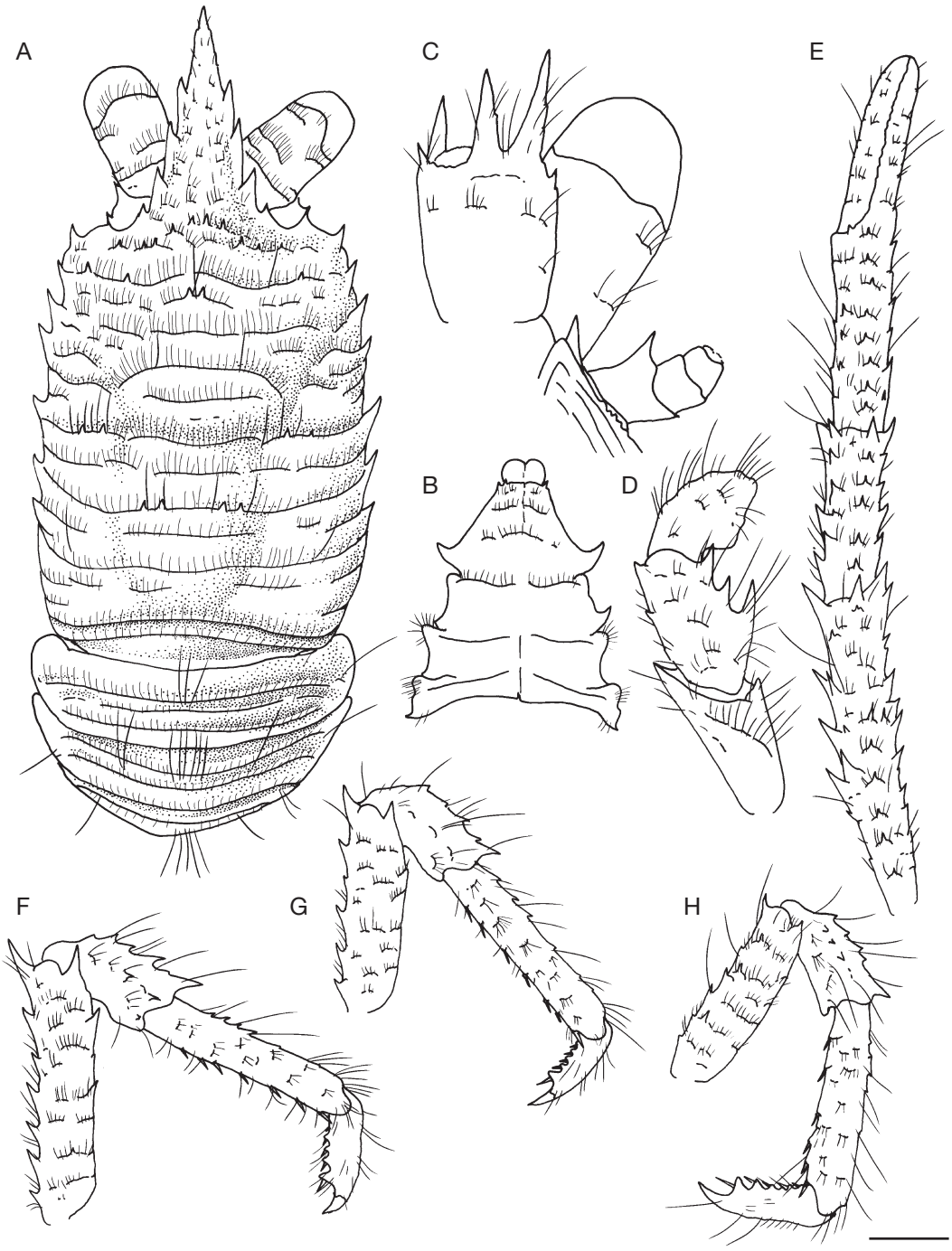

FIG. 1. — *Galathea barbellata* n. sp., holotype ovig. ♀, 4.9 mm (MNHN-IU-2009-587): **A**, carapace and abdomen, dorsal view; **B**, sternal plastron; **C**, cephalic region, showing antennular and antennal peduncles, ventral view; **D**, right Mxp3, lateral view; **E**, right P1, dorsal view; **F**, right P2, lateral view; **G**, right P3, lateral view; **H**, right P4, lateral view. Scale bars: A, B, F, G, H, 1 mm; C, D, 0.5 mm; E, 2 mm.

TABLE 1. — Main differences among *Galathea barbellata* n. sp., *G. echinata* n. sp., *G. profunda* n. sp. and *G. robusta* Baba, 1990.

	***G. barbellata* n. sp.**	***G. echinata* n. sp.**	***G. profunda* n. sp.**	***G. robusta***
Carapace: spines on gastric region	9-11 epigastric, 2 submedian protogastric and 1-2 parahepatic on each side	4 epigastric, 1 median protogastric, 1 parahepatic on each side and 2 submedian metagastric	1 parahepatic on each side, 1 strong median protogastric	7-8 epigastric, 2 lateral protogastric on each side and 2 median mesogastric
Carapace: ridges on gastric region	some uninterrupted and well defined	scale-like and not well defined	some uninterrupted and well defined	some uninterrupted and well defined
Carapace: spines on branchial margin	5	3	4	5
Sternum: anterior margin of sternite 4	1-2 spines on each side	unarmed	unarmed	unarmed
Distal spines on antennular article 1	3 well developed, and 1 small	2 well developed, and 1 small	3 well developed	2 well developed, and 1 small
Spines on flexor margin of 3 Mxp merus	3 of moderated size	1 strong at midlength	1 strong at midlength, and 1-3 small	3 of moderated size
P2 merus	4 times longer than broad	3 times longer than broad	3 times longer than broad	> 4 times longer than broad

plumose setae. Two pairs of small epigastric spines; one median protogastric, and one parahepatic spine on each side; two submedian metagastric spines; one postcervical spine on each side and two cardiac spines. Lateral margins medially convex, with five spines: two spines in front of and three strong spines behind indistinct end of anterior cervical groove; first anterolateral, strong, distinctly posterior to level of lateral limit of orbit; second small, just anterior to lateral end of anterior cervical groove, accompanying another small spine ventral to between first and second; one spine on anterior branchial region, and two spines on posterior branchial margin, last slightly smaller than others, situated at level of cardiac spines. Small spine on lateral limit of orbit; infra-orbital margin with one spine. Rostrum 2.2-2.3 times as long as broad, length 0.6 that of, breadth 0.3 that of carapace, dorsal surface nearly horizontal in lateral view, with small setiferous ridges; lateral margin with four relatively small teeth.

Pterygostomian flap rugose with sparse setae, anteriorly rounded.

Sternal plastron 1.3 times as long as broad, lateral limits divergent posteriorly. Sternite 3 1.3 times as broad as long, anterior margin bilobated. Sternite 4 6.2 times longer and 4.7 times broader than preceding sternite, 0.5 as long as broad; surface with a few short transverse ridges bearing long setae. Following sternites smooth.

Abdominal somites 2-4 each with two uninterrupted transverse ridges on tergite; somite 5 and 6 each with two ridges, posterior one uninterruped on somite 5 and both medially interrupted on somite 6. Telson 0.8 as long as broad, incompletely subdivided. Two pairs of male gonopods.

Ocular peduncles 1.8 times longer than broad; cornea not dilated, as broad as peduncle.

Basal article of antennular peduncle with two well-developed distal spines, distodorsal larger than distolateral, distomesial obsolete. Ultimate article with a few short setae not in tuft on distodorsal margin.

Article 1 of antennal peduncle with depressed ventral distomesial process not reaching distal margin of article 2. Article 2 with distolateral spine clearly larger than distomesial, barely reaching midlength of article 3. Articles 3 and 4 unarmed.

Mxp3 ischium with well-developed distal spine on extensor margin; crista dentata with 21 or 22 denticles. Merus subequal in length to ischium, with one strong spine at midlength of flexor margin; extensor margin with very small spine. Carpus spineless.

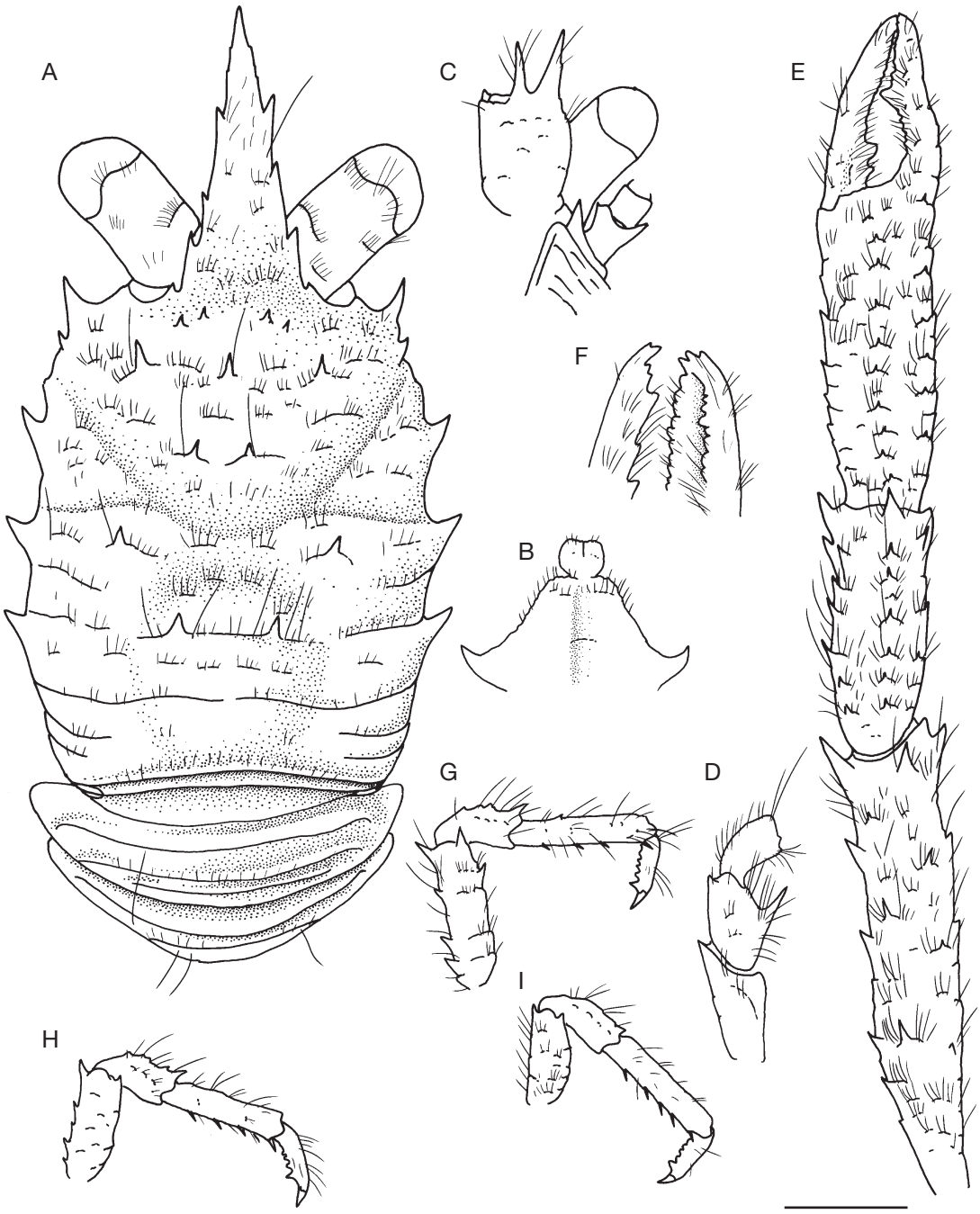

FIG. 2. — *Galathea echinata* n. sp., holotype ♂, 5.1 mm (MNHN-IU-2009-591): **A**, carapace and abdomen, dorsal view; **B**, anterior part of sternal plastron; **C**, cephalic region, showing antennular and antennal peduncles, ventral view; **D**, right Mxp3, lateral view; **E**, right P1, dorsal view; **F**, distal part of P1 fingers, ventral view; **G**, right P2, lateral view; **H**, right P3, lateral view; **I**, right P4, lateral view. Scale bars: A, B, D, F, 2 mm; C, 1.5 mm; E, G, H, I, 1 mm.

P1 4.9 (males), 4.0 (females) times postorbital carapace length, relatively slender, subcylindrical, with long stiff setae on striae of all articles, and some scattered long and thick plumose setae. Merus 1.6-1.9 times length of carapace, 1.8-2.3 times as long as carpus, with several rows of spines, dorsomesial row with strong spines. Carpus 0.7-0.9 length of palm, 2.4 (males), 1.5 (females) times longer than broad, dorsal surface with row of small spines; mesial surface with well-developed spines; some small spines along lateral margin. Palm 2.9-3.8 (males), 4.5 (females) times longer than broad; small dorsal spines roughly in three rows: mesial, dorsal and lateral; lateral row not continued on to fixed finger. Fingers 0.7 (males), 0.6 (females) as long as palm, distally spooned, touching each other with intermeshing teeth when closed; opposable margins gaping (holotype); when gaping, fixed finger with eminence at distal third and movable finger with process at proximal third; mesial margin of movable finger unarmed.

P2-4 relatively short, somewhat compressed, setose, sparsely with thick long plumose setae on all articles. Meri successively shorter posteriorly (P3 merus 0.8 length of P2 merus, P4 merus 0.9 length of P3 merus), equally broad on P2-4; P2 merus 0.6 carapace length, 3.2 times as long as broad, 1.2 times longer than P2 propodus; P3 merus 2.9 times as long as broad, 1.0 times length of P3 propodus; P4 merus 2.5 times as long as broad, 0.8 length of P4 propodus; dorsal margins with row of 5-6 proximally diminishing spines on P2-3, with terminal spine only on P4; dorsolateral surface unarmed on P2-4; ventrolateral margins with strong terminal spine; ventromesial margin with small terminal spine on P2 only. Carpi with four or five (on P2-3) and 1-3 (on P4) spines on extensor margin, distal-most larger; dorsolateral surface with row of 3-4 small granules paralleling extensor margin on P2-4; flexor distal margins with very small distal spine. Propodi subequal in length on P2-4, each 4.5-5.0 times as long as broad; extensor margin with one or two proximal spines on P2-3, unarmed on P4; flexor margin with 6-8 spines, terminal one paired with another smaller spine mesial to it. Dactyli subequal in length, 0.6 length of propodi, ending in incurved, strong, sharp spine; flexor margin with five or six proximally diminishing teeth, terminal one prominent; each tooth with seta-like movable spine.

Epipods absent on pereopods.

REMARKS

Galathea echinata n. sp. belongs to the group of species having an interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove, the rostrum with four lateral spines, the carapace lateral margin with a small spine between the anterolateral and anteriormost branchial marginal spines, gastric striae not scale-like, and the antennular basal article with two spines. The closest relative is *G. robusta* Baba, 1990 from Madagascar (see above for the comparative material used), from which it is easily distinguished by the following (Table 1):

– the branchial margin of the carapace has three strong spines instead of five spines of moderate size;

– the ridges on gastric and anterior branchial regions are scale-like and not well defined in the new species, whereas some of these ridges are uninterrupted and well defined in *G. robusta*;

– the flexor margin of the Mxp3 merus bears a strong spine at midlength, instead of three spines of moderated size (proximal and median subequal).

Galathea profunda n. sp.
(Fig. 3)

HOLOTYPE. — **Vanuatu**. MUSORSTOM 8, stn DW1029, 17°53'S, 168°34'E, 324-360 m, 28.IX.1994, 1 ♂, 7.7 mm (MNHN-IU-2009-593).

PARATYPES. — **Vanuatu**. MUSORSTOM 8, stn CP1090, 15°08'S, 167°17'E, 470-502 m, 6.X.1994, 1 ♂, 6.1 mm (MNHN-IU-2009-594).

New Caledonia. MUSORSTOM 4, stn CP239, 22°14.80'S, 167°15.70'E, 470-475 m, 2.X.1985, 1 ♂, 5.7 mm (MNHN-IU-2009-595).

SMIB 3, stn DW1, 24°55.70'S, 168°21.80'E, 520 m, 20.V.1987, 1 ♀, 6.3 mm (MNHN-IU-2009-598).

SMIB 5, stn DW101, 23°21.20'S, 168°04.90'E, 270 m, 14.IX.1989, 1 ovig. ♀, 4.9 mm (MNHN-IU-2009-597).

BERYX 11, stn CH49, 23°45.22'S, 168°17.06'E, 400-460 m, 21.X.1992, 1 ♂, 6.1 mm (MNHN-IU-2009-596).

BATHUS 3, stn CP812, 23°43'S, 168°15'E, 391-440 m, 28.XI.1993, 1 ovig. ♀, 7.0 mm (MNHN-IU-2009-599).

— Stn CP833, 23°02' S, 166°58'E, 441-444 m, 30.XI.1993, 1 ♀, 8.1 mm (MNHN-IU-2009-600). — Stn CP846, 23°02'S, 166°57'E, 500-514 m, 1.XII.1993, 1 ovig. ♀, 5.1 mm (MNHN-IU-2009-601).
BATHUS 4, stn CP912, 18°55'S, 163°07'E, 690-702 m, 5.VIII.1994, 1 ♂, 5.9 mm (MNHN-IU-2009-602).
NORFOLK 2, stn DW2041, 23°40.93'S, 168°01.29'E, 400 m, 23.X.2003, 1 ♂, 7.7 mm (MNHN-IU-2009-603). — Stn DW2156, 22°54.19'S, 167°15.13'E, 468-500 m, 5.XI.2003, 1 ovig. ♀, 7.1 mm (MNHN-IU-2009-604).

DISTRIBUTION. — Vanuatu and New Caledonia, between 270 and 702 m.

ETYMOLOGY. — From the Latin "profundus", deep, in reference to the depth distribution of the species.

DESCRIPTION

Carapace 1.1 times as long as broad; no epigastric spines, only several acute granules present in epigastric region in a few specimens; small parahepatic spine on each side, sometimes absent; one strong median protogastric spine; gastric region with interrupted ridges; mid-transverse ridge uninterrupted, preceded by cervical groove, successively followed by three interrupted, one uninterrupted (interrupted in several specimens), and one interrupted transverse ridges; cardiac region with two spines placed side by side on elevated ridge preceded by depression or concavity; ridges with numerous simple setae, and some scattered thick and long plumose setae mostly on median gastric and cardiac regions. Lateral margin with two spines in front of and four spines behind distinct anterior cervical groove; first at anterolateral angle, slightly posterior to level of lateral limit of orbit, second very small, accompanying another small spine ventral to between first and second and, in several specimens, a minute spine at base of first spine; fourth spine strongest. Small outer orbital spine; infra-orbital margin with one spine. Rostrum 2.0-2.4 times as long as broad, length 0.6-0.8 that of, breadth 0.3-0.4 that of carapace; dorsal surface with small setiferous ridges; lateral margin with four deeply incised teeth.

Pterygostomian flap unarmed on surface, anteriorly rounded.

Sternal plastron slightly longer than broad, lateral extremities divergent posteriorly. Sternite 3 1.2 times longer than broad, anterior margin bilobated. Sternite 4 anteriorly narrow, medially concave, half as long as broad, length 3.5 times that of, breadth 5.4 times that of sternite 3; surface with some short transverse ridges on sternites 5-7.

Tergites of abdominal somites 2-3 with three transverse ridges; somites 4-6 each with two ridges, posterior one medially interrupted. Telson 0.9 as long as broad, incompletely subdivided. Two pairs of male gonopods.

Ocular peduncles 1.6 times longer than broad; anterior border of eyestalk not well extended anteriorly; cornea not dilated, as broad as peduncle.

Basal article of antennular peduncle with three spines, all well developed, distodorsal largest; ultimate article with a few short setae distally.

Article 1 of antennal peduncle with well-developed ventral distomesial spine exceeding article 2. Article 2 with distolateral spine slightly larger than distomesial spine, somewhat overreaching midlength of article 3. Article 3 unarmed.

Mxp3 ischium with very small spine on flexor distal margin, extensor margin also with distal spine; crista dentata with 21 or 22 denticles. Merus equally long as ischium, flexor margin with one strong spine at midlength and 1-3 small additional spines distal to it, extensor distal margin acutely angular or with distinct spine. Carpus unarmed.

P1 2.8-3.0 (females), 3.3-3.9 (males) times longer than carapace, relatively massive, with long stiff setae on ventral surface and along lateral and mesial margins, some scattered long and thick plumose setae. Ischium with two or three strong distal spines. Merus 1.2 as long as carapace, 1.6 times length of carpus; with some rows of spines, mesial spines strong. Carpus 1.7 times longer than broad; with some rows of spines, distomesial spine prominent. Palm 1.8-2.1 (males), 1.8-2.2 (females) times longer than broad, mesial and lateral spines small, lateral spines continued on to proximal half of fixed finger; carpus-palm length ratio 0.7. Fingers 0.6-0.8 (males), 0.6-0.7 (females) length of palm, distally spooned, prehensile edges close fitting with intermeshing teeth.

P2-4 somewhat compressed, setose, sparsely with long plumose setae. Meri successively shorter posteriorly (P3 merus 0.9 length of P2 merus, P4 merus 0.8 length of P3 merus); breadth subequal on P2-4; length-breadth ratio, 2.8 on P2, 2.7 on P3, 2.3 on

P4; merus-propodus length ratio, 1.1 on P2, 0.9 on P3, 0.8 on P4; P2 merus 0.6 as long as carapace; dorsal margin with 6-7 proximally diminishing spines on P2, 6-7 spines on P3, one or two distal spines (proximal one much smaller) on P4; ventromesial margin with strong terminal spine on P2-4. Carpi subequal, 0.6 length of propodi on P2-4; row of 4-5 spines on extensor margin. Propodi subequal on P2-4; length-breadth ratio, 4.5 on P2, 3.5 on P3, 4.0 on P4; flexor margin with six or seven spines on P2, eight or nine on P3, six or seven on P4, all movable. Dactylus 0.5-0.6 length of propodus on P2-4; flexor margin with six or seven proximally diminishing teeth, each with corneous spine.

Epipods present on P1, absent on P2-4.

Remarks

The species is closely related to *G. robusta* Baba, 1990 from Madagascar in having an interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove, the rostrum with four deeply incised lateral teeth, the carapace lateral margin with a small spine between the anterolateral and anteriormost branchial marginal spines, and not scale-like gastric striae. However, *G. robusta* and the new species can be separated by the following (Table 1):

– the new species has a strong median protogastric spine, whereas there are only two small metagastric spines in *G. robusta*. The epigastric region is unarmed in the new species, whereas there are some small spines and acute granules in *G. robusta*;

– the branchial lateral margin of the carapace has four spines in the new species, instead of five spines in *G. robusta*;

– the antennular basal article bears three well-developed spines in the new species, instead of only two in *G. robusta*;

– the flexor margin of the Mxp3 merus bears three small spines distal to a prominent spine at the midlength in the new species, instead of three spines of moderate size (proximal and median subequal) in *G. robusta*;

– the walking legs are broader in the new species than in *G. robusta*: P2 merus is less than 3 times longer than broad in *G. profunda* n. sp., whereas it is more than 4 times longer in *G. robusta*.

Galathea raventosae n. sp.
(Figs 4; 6A)

Holotype. — **Vanuatu**. SANTO 2006, stn AT34, 15°35.9'S, 167°17.1'E, 234-270 m, 23.IX.2006, 1 ♂, 4.5 mm (MNHN-IU-2009-605).

Paratypes. — **Vanuatu**. SANTO 2006, stn AT22, 15°32.3'S, 167°16.0'E, 180-227 m, 22.IX.2006, 1 ♂, 3.5 mm, 1 ovig. ♀, 5.0 mm (MNHN-IU-2009-606). — Stn AT69, 15°40.4'S, 167°17.3'E, 207-229 m, 5.X.2006, 1 ovig. ♀, 5.4 mm (MNHN-IU-2009-607).
New Caledonia. HALIPRO 1, stn CP853, 21°45'S, 166°37'E, 241-250 m, 19.X.1993, 1 ovig. ♀, 4.6 mm (MNHN-IU-2009-608).

Distribution. — Vanuatu and New Caledonia, in 180-270 m.

Etymology. — Named for Nuria Raventos, CEAB, for her support and advocacy for marine research.

Description

Carapace, exclusive of rostrum, as long as broad; dorsal surface nearly horizontal from anterior to posterior; transverse ridges with sparse long plumose setae among short fine setae; cervical groove distinct, laterally bifurcated; most ridges on gastric region interrupted, with some scattered scale-like ridges; small parahepatic spine lateral to second transverse ridge; epigastric region with pair of submedian spines; anterior branchial region with distinct ridges; mid-transverse ridge uninterrupted, preceded by shallow cervical groove, followed by three interrupted and three uninterrupted transverse ridges placed alternately. Lateral margins well convex medially, with six spines: two spines in front of and four spines behind anterior cervical groove; first anterolateral, well developed, second very small but distinct, located at midlength between first spine and anterior cervical groove, without small spine ventral to between first and second; two spines on anterior branchial margin, and two spines on posterior branchial margin. Small outer orbital spine; infraorbital margin with strong spine. Rostrum 1.6-1.7 as long as broad, length 0.6-0.7 postorbital carapace length and breadth 0.3 that of carapace; dorsal surface nearly horizontal in lateral view, with small setiferous ridges; lateral margin with four deeply incised sharp teeth.

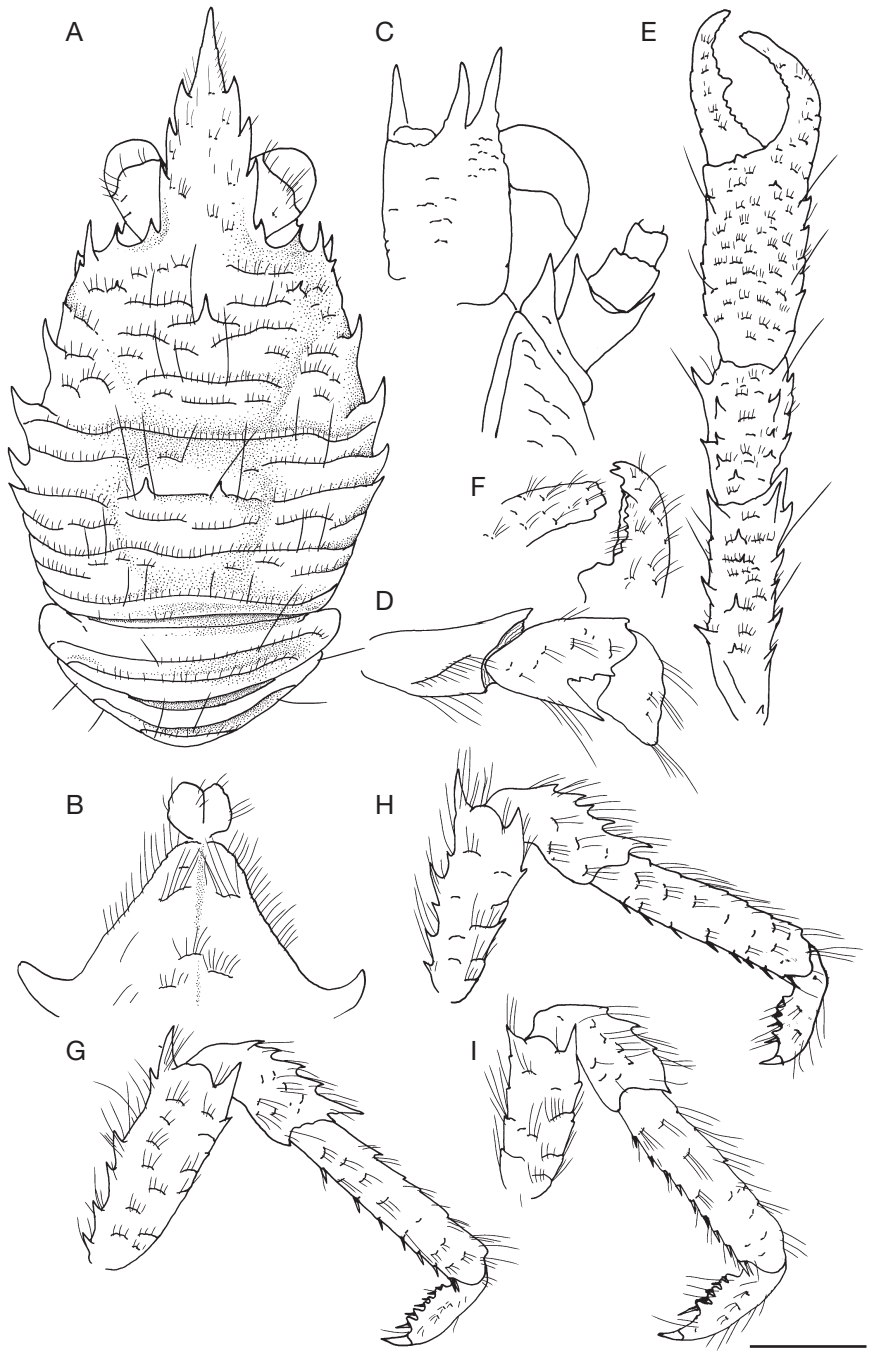

FIG. 3. — *Galathea profunda* n. sp., holotype ♂, 7.7 mm (MNHN-IU-2009-593): **A**, carapace and abdomen, dorsal view; **B**, anterior part of sternal plastron; **C**, cephalic region, showing antennular and antennal peduncles, ventral view; **D**, right Mxp3, lateral view; **E**, right P1, dorsal view; **F**, distal part of P1 fingers, ventral view; **G**, right P2, lateral view; **H**, right P3, lateral view; **I**, right P4, lateral view. Scale bars: A, F, G, H, I, 2 mm; B, C, D, 1 mm; E, 0.5 mm.

Pterygostomian flap rugose, with sparse short setae, anterior margin bluntly angular.

Sternal plastron about as long as broad, lateral extremities gently divergent posteriorly. Sternite 3 twice as broad as long, with median depression bordering left and right lobes, anterior margin of each lobe convex, with minute dentitions. Sternite 4 3.4 times longer and 3.3 times broader than sternite 3, 0.5 as long as broad; surface with setiferous interrupted transverse ridges, not reaching lateral margin. Following sternites smooth.

Abdominal somites 2-3 each with two uninterrupted transverse ridges on tergite, anterior ridge more distinctly elevated than posterior ridge; somite 4 with two ridges, posterior ridge medially interrupted; somites 5 and 6 each with uninterrupted anterior ridge and two medially interrupted ridges. Telson 0.8 as long as broad, incompletely subdivided. Male gonopods on abdominal somites 1-2.

Ocular peduncles 1.3 times longer than broad; eyestalk (other than cornea) with lateral margin straight, dorsally with some long setae; cornea not dilated, as broad as the peduncle.

Basal article of antennular peduncle with three spines; well-developed distodorsal and distolateral spines, distodorsal larger; distomesial spine somewhat shorter than distolateral. Ultimate article with a few short fine setae not in tuft on distodorsal margin.

Antennal peduncle with article 1 hardly visible in dorsal view, with ventral distomesial spine not reaching distal margin of article 2. Article 2 with two well-developed distal spines, distolateral spine terminating in or slightly overreaching midlength of article 3, distomesial spine slightly shorter than distolateral. Article 3 with distinct distomesial spine. Article 4 unarmed.

Mxp3 basis with several denticles on mesial ridge, distalmost larger. Ischium with well-developed spine on flexor distal margin; extensor margin with small but distinct distal spine; crista dentata with 20-21 denticles. Merus shorter than ischium; flexor margin with one strong spine at midlength, and one small distal spine; extensor margin with two obsolescent distal spines. Carpus unarmed.

P1 2.5-2.6 (females), 3.0-3.7 (male) times postorbital carapace length, subcylindrical, somewhat depressed on palm, more so on fingers, covered with finely setiferous scales, with scattered long thick plumose setae. Merus 1.3 times length of carapace, 1.7 times as long as carpus, with spines arranged roughly in rows, dorsomesial and ventromesial spines stronger; distal spines prominent. Carpus 0.9-1.2 length of palm, 1.7-1.9 times as long as broad; dorsal surface with small spines arranged roughly in two longitudinal rows; mesial margin with 3-4 strong spines (distal second largest). Palm 1.7-2.1 times longer than broad, lateral and mesial margins slightly convex; spines arranged roughly in dorsolateral and dorsomesial rows, some small spines scattered on dorsal side. Fingers 0.7-0.8 length of palm, distally spooned, prehensile distal edges close fitting with intermeshing teeth when closed; opposable margins slightly gapping, with blunt serration; mesial margin of movable finger unarmed.

P2-4 moderately slender, with setose striae and sparse long plumose setae. Meri successively shorter posteriorly (P3 merus 0.9 length of P2 merus, P4 merus 0.8 length of P3 merus); P2 merus 0.8 carapace length, 4.2 times as long as broad, 1.3 times longer than P2 propodus; P3 merus 3.7 times longer than broad, equally broad as P4 merus, 1.2 times longer than P3 propodus; P4 merus 3.1 times as long as broad, 0.9-1.0 length of P4 propodus. Dorsal margins of propodi with row of 7-10 proximally diminishing spines on P2-3, three or four distal spines on P4; ventral margins distally ending in strong spine followed proximally by small spine and several tubercles or eminences. Carpi with five spines on extensor margin on P2-3, one or two spines on P4, distal-most smaller than distal second; dorsolateral surface with acute granules sub-paralleling extensor margin on P2-4; flexor distal margin with small distal spine. Propodi subequal in length on P2-4, each about 5.0 times as long as broad; extensor margin unarmed; flexor margin with 5-7 slender movable spines on P2-4, terminal one paired with another smaller spine mesial to it. Dactyli subequal in length, distally ending in well-curved strong spine, length 0.7 that of propodi; flexor margin 6 proximally diminishing teeth, terminal one prominent; each tooth with seta-like movable spine.

Epipods absent on pereopods 1-3.

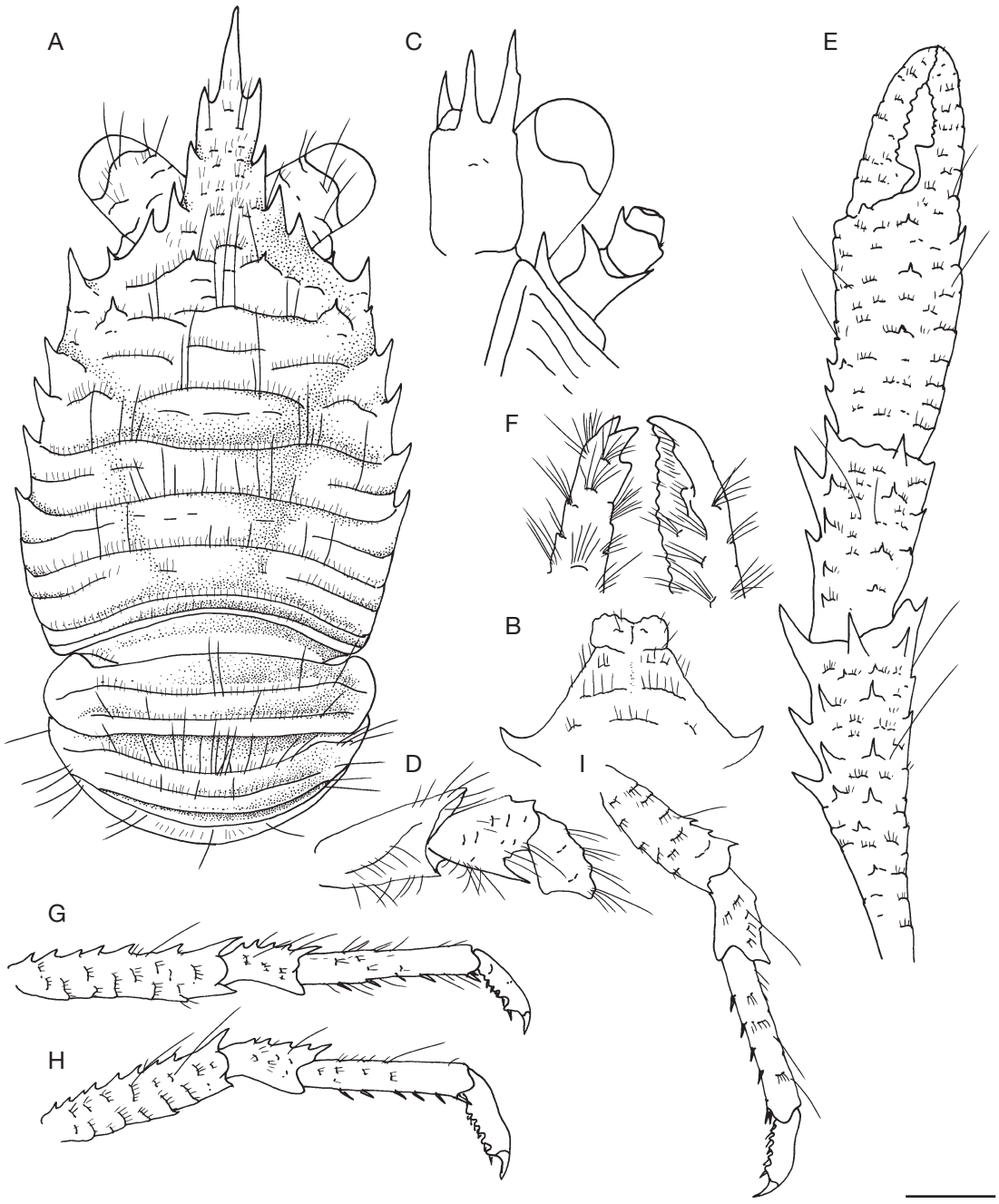

FIG. 4. — *Galathea raventosae* n. sp., holotype ♂, 4.5 mm (MNHN-IU-2009-605): **A**, carapace and abdomen, dorsal view; **B**, anterior part of sternal plastron; **C**, cephalic region, showing antennular and antennal peduncles, ventral view; **D**, right Mxp3, lateral view; **E**, right P1, dorsal view; **F**, distal part of P1 fingers, ventral view; **G**, right P2, lateral view; **H**, right P3, lateral view; **I**, right P4, lateral view. Scale bars: A, B, C, D, F, 1 mm; E, G, H, I, 0.5 mm.

Colouration
Ground colour of carapace, abdominal somites 2-4 and pereopods light brownish or pale; abdominal somites 5-6, telson and uropods whitish or translucent. Long thick plumose setae of carapace, abdomen and P1 mostly brown. P2-4 dactyli whitish.

Remarks
The new species resembles *G. consobrina* from Indonesia, the Philippines, South China Sea and southwestern Australia (De Man 1902; Baba 1988; Poore *et al.* 2008; Dong & Li 2010). Both species have an interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove, the rostrum with four lateral spines, the carapace lateral margin with a small spine between anterolateral and anteriormost branchial marginal spines, gastric striae not scale-like, the antennular basal article with three spines, epigastric spines present, and epipods absent on P1-3. However, the two species can be distinguished by the following:
– one hepatic spine is distinct on each side in *G. consobrina*, whereas it is absent in the new species;
– the small spine ventral to between first and second lateral spines of the carapace is well developed in *G. consobrina*, whereas it is absent in the new species;
– the branchial lateral margin of the carapace has five spines in *G. consobrina*, four spines in the new species;
– the flexor margin of the Mxp3 merus bears two well-developed spines of subequal size in *G. consobrina,* instead of one strong median and one minute distal spines as in the new species.

Galathea sanctae n. sp.
(Figs 5; 6B)

Holotype. — **Vanuatu**. SANTO 2006, stn AT27, 15°22.4'S, 167°15.4'E, 341-347 m, 23.IX.2006, 1 ovig. ♀, 5.5 mm (MNHN-IU-2009-609).

Paratypes. — **Vanuatu**. MUSORSTOM 8, stn CP1092, 15°10'S, 167°12'E, 314-321 m, 6.X.1994, 1 ovig. ♀, 6.8 mm (MNHN-IU-2009-610). — Stn CP1118, 15°08'S, 166°53'E, 191-248 m, 9.X.1994, 1 ♂, 6.7 mm (MNHN-IU-2009-611). — Stn CP1120, 15°07'S, 166°53'E, 282-321 m, 9.X.1994, 1 ♂, 6.8 mm, 2 ovig. ♀♀, 5.1-6.2 mm (MNHN-IU-2009-612).
BOA 0, stn CP2326, 15°39.83'S, 167°01.9'E, 260-313 m, 18.XI.2004, 1 ♂, 5.0 mm (MNHN-IU-2009-613).
SANTO 2006, stn AT9, 15°41.5'S, 167°01.3'E, 481 m, 17.IX.2006, 2 ♂♂, 5.7-5.8 mm, 1 ovig. ♀, 5.5 mm (MNHN-IU-2009-614). — Stn AT27, 15°22.4'S, 167°15.4'E, 341-347 m, 23.IX.2006, 1 ovig. ♀, 5.1 mm, 1 ♀, 4.8 mm (MNHN-IU-2009-615). — Stn AT63, 15°39.6'S, 167°01.3'E, 290-334 m, 4.X.2006, 1 ♂, 6.3 mm, 1 ovig. ♀, 5.4 mm, 1 ♀, 5.2 mm (MNHN-IU-2009-616).
New Caledonia. HALIPRO 1, stn CP852, 21°44'S, 166°36'E, 253-266 m, 19.III.1994, 1 ♂, 5.6 mm (MNHN-IU-2009-617).
BATHUS 4, stn CP952, 20°34'S, 164°58'E, 270-316 m, 10.VIII.1994, 1 ♂, 3.7 mm (MNHN-IU-2009-618). — Stn CP955, 21°45'S, 166°37'E, 242-250 m, 11.VIII.1994, 1 ovig. ♀, 4.5 mm (MNHN-IU-2009-619).

Distribution. — Vanuatu and New Caledonia, at 191-481 m.

Etymology. — From the Latin "sanctus" in reference to the type Locality (Espiritu Santo Island).

Description
Carapace, exclusive of rostrum, as long as broad; dorsal surface nearly horizontal from anterior to posterior. Cervical groove distinct, laterally bifurcated. Gastric region with nine setiferous ridges; first epigastric, with two or three submedian spines; second medially convex anteriorly; fourth scale-like; fifth laterally not continuous to anteriormost branchial marginal spine; sixth to eighth successively shorter posteriorly, uninterrupted; anterior branchial region with distinct ridges; mid-transverse ridge uninterrupted, preceded by cervical groove, usually followed by three interrupted and three uninterrupted transverse ridges placed alternately (five uninterrupted and one interrupted ridges in several specimens); some additional scattered scales among ridges; ridges with numerous simple setae. Lateral margins convex medially, with ten spines: three spines in front of and seven spines behind anterior cervical groove; first anterolateral, well developed, second and third very small, located between first and anterior cervical groove, accompanying another small spine ventral to between first and second; three well-developed spines on anterior branchial margin, and four spines on posterior branchial margin. Lateral orbital angle with small spine; infraorbital margin minutely denticulate. Rostrum

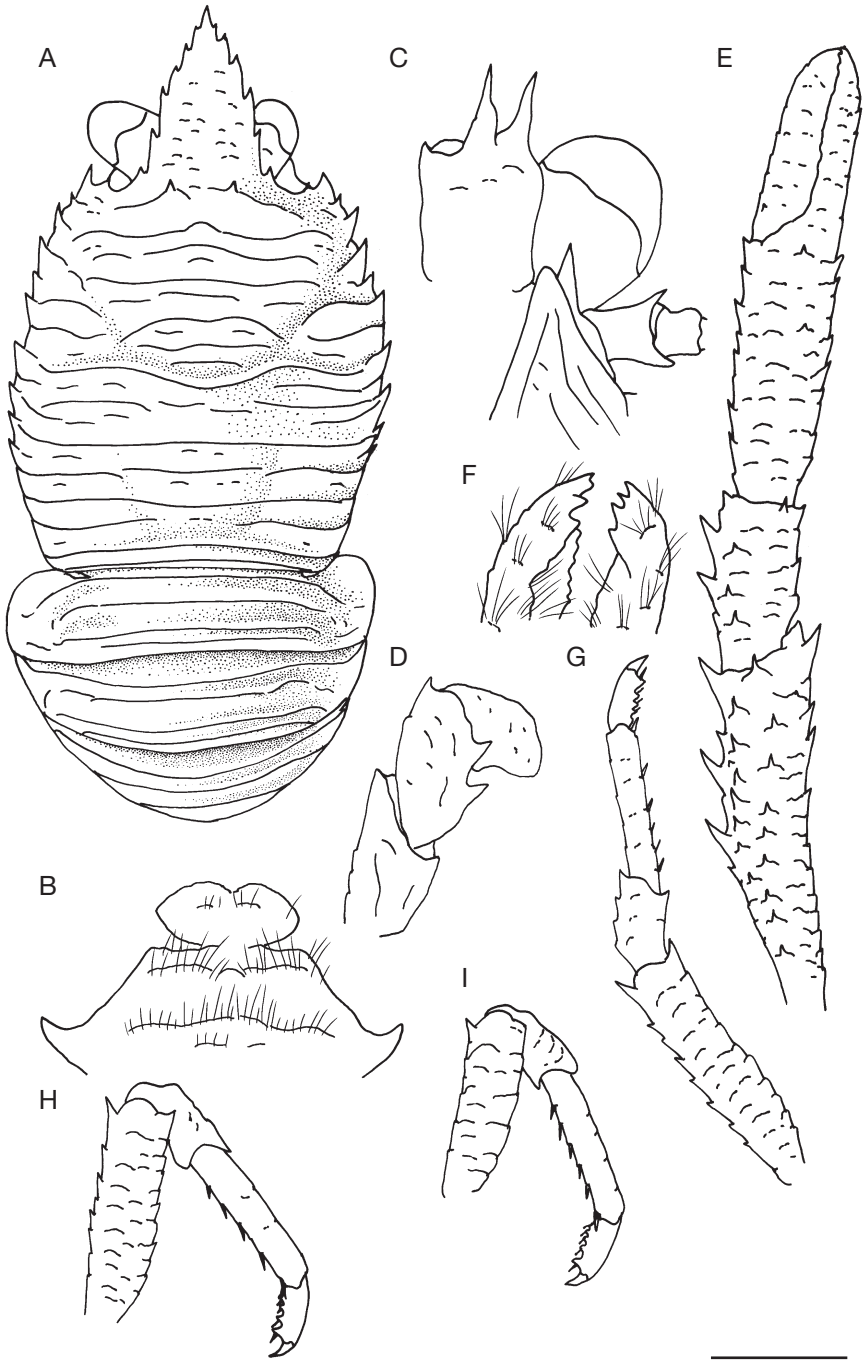

FIG. 5. — *Galathea sanctae* n. sp., holotype ovig. ♀, 5.5 mm (MNHN-IU-2009-609): **A**, carapace and abdomen, dorsal view; **B**, anterior part of sternal plastron; **C**, cephalic region, showing antennular and antennal peduncles, ventral view; **D**, right Mxp3, lateral view; **E**, right P1, dorsal view; **F**, distal part of P1 fingers, ventral view; **G**, right P2, lateral view; **H**, right P3, lateral view; **I**, right P4, lateral view (setae on carapace and appendages not illustrated). Scale bars: A, E, G, H, I, 2 mm; B, C, D, F, 1 mm.

1.6-1.8 times as long as broad, length 0.5 postorbital carapace length and breadth 0.3 that of carapace; dorsal surface nearly horizontal in lateral view, with small setiferous ridges; lateral margin with five or six relatively small, shallowly incised teeth.

Pterygostomian flap spineless on surface, with sparse short setae, anterior margin bluntly angular.

Sternal plastron about as long as broad, lateral extremities gently divergent posteriorly. Sternite 3 twice as broad as long, with median depression bordering left and right lobes, anterior margin of each lobe convex, with minute dentitions. Sternite 4 2.0 times longer and 2.5 times broader than sternite 3, 0.4 as long as broad; surface with setiferous transverse ridges not reaching lateral margin. Following sternites smooth or with short ridge on each side.

Abdominal somites 2-3 each with four uninterrupted transverse ridges on tergite, anterior ridge more distinctly elevated than posterior ridge; somite 4 with uninterrupted anterior ridge and one medially interrupted posterior ridge; somites 5 and 6 with anterior ridge followed by one or two medially interrupted ridges, posteromedian margin nearly transversal with setiferous ridge, all these ridges with posteriorly directed fine setae. Telson 0.8 as long as broad, incompletely subdivided. Male gonopods on abdominal somites 1-2.

Ocular peduncles 1.3 times longer than broad; eyestalk (other than cornea) with lateral margin straight, dorsally with fine setae; cornea not dilated, as broad as peduncle.

Basal article of antennular peduncle with two spines; well-developed distodorsal and distolateral spines, distodorsal larger; distomesial spine obsolescent. Ultimate article with tuft of fine setae on distodorsal margin.

Antennal peduncle having article 1 hardly visible in dorsal view, with ventral distomesial spine not reaching distal margin of article 2. Article 2 with two distal spines, distolateral spine slightly larger than distomesial, not reaching midlength of article 3. Articles 3-4 unarmed.

Mxp3 basis with a few denticles on mesial ridge. Ischium with small spine on flexor distal margin; extensor margin with small but distinct distal spine; crista dentata with 17 or 18 denticles. Merus as long as ischium; flexor margin with two strong subequal spines, sometimes one additional small distal spine; extensor margin with distal spine. Carpus unarmed.

P1 3.1-3.4 (males), 2.7-3.1 (females) times postorbital carapace length, relatively slender, subcylindrical, with setose scales. Ischium with 1-3 ventrodistal spines. Merus 1.0-1.2 times as long as carapace, 2.0-2.1 times as long as carpus, with spines arranged roughly in rows, dorsomesial and ventromesial spines stronger, distal spines prominent. Carpus 0.6-0.7 length of palm, 2.0-2.3 times as long as broad; dorsal surface with some small spines arranged roughly in rows; mesial margin with three or four spines (distal second largest). Palm 2.4-2.8 (females), 2.4-2.6 (males) times longer than broad, lateral and mesial margins subparallel; spines arranged roughly in dorsolateral and dorsomesial rows, some small spines scattered on dorsal side. Fingers 0.7-0.8 length of palm, distally spooned, prehensile edges close fitting with intermeshing teeth; opposable margins with blunt serration; mesial margin of movable finger unarmed.

P2-4 moderately slender, with setose striae. Meri successively shorter posteriorly (P3 merus 0.9 length of P2 merus, P4 merus 0.8 length of P3 merus); P2 merus 0.7 carapace length, 4.5 times as long as broad, 1.8 times longer than P2 propodus; P3 merus 3.9 times longer than broad, equally broad as P4 merus, 1.6 times longer than P3 propodus; P4 merus 3.3 times as long as broad, 1.3 length of P4 propodus. Dorsal margins with row of nine or ten proximally diminishing small spines on P2-3, distal spine only on P4; dorsolateral surface unarmed on P2-4; ventrolateral margin distally ending in strong spine followed proximally by several small spines. Carpi with four small spines on extensor margin on P2, one or two minute spines on P3-4; dorsolateral surface with acute granules sub-paralleling extensor margin on P2-4; flexor distal margin with small distal spine. Propodi subequal in length on P2-4, each about 4 times as long as broad; extensor margin unarmed; flexor margin with six or seven slender movable spines on P2-4, terminal one paired with another smaller spine mesial to

FIG. 6. — **A**, *Galathea raventosae* n. sp., holotype ♂, 4.5 mm, dorsal view; **B**, *Galathea sanctae* n. sp., holotype ovig. ♀, 5.5 mm, dorsal view.

it. Dactyli subequal in length, distally ending in well-curved strong spine, 0.5 length of propodi; flexor margin with five successively diminishing teeth, terminal one prominent; each tooth with seta-like movable spine.

Epipods on P1, absent on P2-4.

Colouration

Carapace and abdominal somites 2-5 orange, anterior branchial regions reddish; one postcervical blue spot (directly behind bifurcation of cervical groove) on each side. Sixth abdominal somite, telson, and uropods whitish or traslucent. Pereopods orange; distal half of P1 fingers light orange; P2-4 propodi and dactyli with light and dark orange stripes.

REMARKS

The species is very closely related to *G. multilineata*, from Japan, East China Sea, Taiwan and the Philippines (e.g., Balss 1913; Baba 1988; Baba *et al.* 2009). Both species share an interrupted ridge between the anteriormost branchial marginal spines directly behind the anterior cervical groove, the rostrum with five lateral spines, and the carapace dorsal surface with numerous ridges. However, the new species is easily distinguished from *G. multilineata* by the following:

– two epigastric spines are distinct instead of absent;

– the secondary ridges on the carapace are less numerous;

– the lateral marginal teeth of the rostrum are more deeply incised;
– the hepatic lateral margin between the anterolateral spine and the end of anterior cervical groove bears two small but distinct spines, instead of being unarmed;
– the carapace dorsal surface bears two blue post-cervical spots, which are absent in *G. multilineata*.

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