

Thalassinidea (Crustacea, Decapoda) from French Polynesia

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ABSTRACT

New material from the Marquesas Islands and other localities of French Polynesia provided 12 thalassinidean species treated in this work, five of which are new to science. There are four species of Axiidae: *Acanthaxius spinosissimus* (Rathbun, 1906), *Axiopsis pica* Kensley, 2003, *Axiopsis consobrina* de Man, 1905, *Calaxius sibogae* (de Man, 1925); one of Strahlaxiidae: *Neaxius trondlei* n. sp.; two of Thomassiniidae: *Crosniera dayrati* n. sp., *Mictaxius salvati* n. sp.; four of Callianassidae: *Callianassa amboinensis* de Man, 1888, *Corallianassa coutierei* (Nobili, 1904), *Neocallichirus frouini* n. sp., *Cheramus sibogae* (de Man, 1905); and one of Upogebiidae: *Gebiacantha albengai* n. sp. *Neaxius trondlei* n. sp. is differentiated by article 2 of antennal peduncle with one or two upper spines, unarmed laterally; merus of pereopod 2 and 3 unarmed on lower border; telson with three well marked transverse carinae equally distant from one another. *Crosniera dayrati* n. sp. is differentiated by a non spike-like, triangular rostrum, non flattened eyestalks with terminal corneas, elongate telson and uropods. *Mictaxius salvati* n. sp. is hermaphrodite and has abdominal pleuron 1 rounded posteroventrally, approximately quadrate telson with posterior border nearly straight, uropod exopod not bilobed. *Neocallichirus frouini* n. sp. is characterised by major pereopod 1 merus with prominent lower expansion bearing large spines, maxilliped 3 with non quadrate propodus. *Gebiacantha albengai* n. sp. differs in having a rostrum nearly twice as long as wide with three infrarostral spines, single spine on anterolateral border of carapace, pereopod 1 propodus unarmed on mesial surface.

KEY WORDS

Crustacea,
Decapoda,
Thalassinidea,
French Polynesia,
new species.

RÉSUMÉ

Thalassinidea (Crustacea, Decapoda) de Polynésie française.

Du nouveau matériel des Îles Marquises et d'autres localités de Polynésie française a permis d'identifier 12 espèces de Thalassinidea, cinq d'entre elles étant nouvelles. Il y a quatre espèces d'Axiidae : *Acanthaxius spinosissimus* (Rathbun, 1906), *Axiopsis pica* Kensley, 2003, *Axiopsis consobrina* de Man, 1905, *Calaxius sibogae* (de Man, 1925) ; une de Strahlaxiidae : *Neaxius trondlei* n. sp. ; deux de Thomassiniidae : *Crosniera dayrati* n. sp., *Mictaxius salvati* n. sp. ; quatre de Callianassidae : *Callianassa amboinensis* de Man, 1888, *Corallianassa coutierei* (Nobili, 1904), *Neocallichirus frouini* n. sp., *Cheramus sibogae* (de Man, 1905) ; et une d'Upogebiidae : *Gebiacantha albengai* n. sp. *Neaxius trondlei* n. sp. se distingue par l'article 2 du pédoncule antennaire avec une ou deux épines dorsales et aucune épine latérale, le mérus des péréiopodes 2 et 3 au bord ventral inerme, le telson aux trois carènes transversales bien marquées et équidistantes. *Crosniera dayrati* n. sp. diffère par un rostre triangulaire, non terminé en pointe, les pédoncules oculaires non aplatis, aux cornées terminales, le telson et les uropodes allongés. *Mictaxius salvati* n. sp. est hermaphrodite et se caractérise aussi par le pleuron abdominal 1 au bord postéro-ventral arrondi, le telson à peu près quadrangulaire au bord postérieur presque rectiligne, l'exopodite des uropodes non bilobé. *Neocallichirus frouini* n. sp. se distingue par le grand péréiopode 1 à forte expansion ventrale au mérus, le maxillipède 3 au propode non quadrangulaire. *Gebiacantha albengai* n. sp. se caractérise par un rostre presque deux fois plus long que large avec trois épines infrarostrales, une épine au bord antérolatéral de la carapace, le propode du péréiopode 1 inerme à la face mésiale.

MOTS CLÉS
Crustacea,
Decapoda,
Thalassinidea,
Polynésie française,
nouvelles espèces.

INTRODUCTION

The Thalassinidea of French Polynesia are poorly known. Poupin (1998) provided a checklist of decapod Crustacea from the area in which nine thalassinidean species were reported.

Most material for this study came from the MUSORSTOM 9 Expedition to the Marquesas Islands. Additional specimens from other localities in French Polynesia were provided by the collections of the FV *Marara* (J. Poupin) and BENTHAUS (malacologists workshop to the Rapa Island) as well as private individuals, Patrick Frouin, Gustav Paulay and Bernard Salvat. Twelve species are identified, four of the Axiidae, one of the Strahlaxiidae, two of the Thomassiniidae, four of the Callianassidae and

one of the Upogebiidae. Five of them are new and all the others are new records.

This work provides further information on the thalassinidean fauna of French Polynesia and permits certain problems concerning their taxonomy to be addressed. Poore's (1994) key to families and genera is mainly used and discussed, also Poore's (1997) paper on the little known family Thomassiniidae.

Most of the material studied belong to the collection of the Muséum national d'Histoire naturelle, Paris (MNHN); a few are from the collection of the University of Florida (UF). Other depositories mentioned are: University of Guam, Invertebrate Collection (UGI), Smithsonian Institution, Washington (USNM), Zoölogisch Museum Amsterdam (ZMA).

The measurements given in the descriptions are: carapace length (cl.) measured from the tip of the rostrum to the posterior border of the carapace; total length (tl.) measured from the tip of the rostrum to the posterior border of the telson.

Figured specimens and appendages were stained with a light solution of chlorazol black, sometimes with a drop of lactic acid added. The anterior part of the carapace, the telson and uropods are figured in dorsal view and appendages in lateral view.

Abbreviations used in the descriptions are: A1, antennule; A2, antenna; Md, mandible; Mx1 and Mx2, maxillule and maxilla; Mxp1-3, maxillipeds 1-3; P1-5, pereopods 1-5; Plp1-5, pleopods 1-5. The following terminology may require explanation (from Ngoc-Ho 2003):

For axiids, A2 acicle = antennal scale.

For callianassids and thomassiniids, Mxp3: "pediform" means ischium-merus length more than three times merus width; "subpediform" means ischium-merus length about two to three times merus width; "operculiform" means ischium-merus length less than two times merus width.

For upogebiids, lateral ridges are the upper longitudinal toothed crests of the gastric region, on either side of the rostrum.

Family AXIIDAE Huxley, 1879

Genus *Acanthaxius*

Sakai & de Saint Laurent, 1989

Acanthaxius spinosissimus (Rathbun, 1906)

(Fig. 1)

Axius spinosissimus Rathbun, 1906: 894, fig. 50a, b.

Axiopsis (Axiopsis) spinosissima – de Man 1925: 70, 98, pl. 8, fig. 18-18g.

Acanthaxius spinosissimus – Sakai & de Saint Laurent 1989: 67. — Kensler 1996: 70.

TYPE MATERIAL. — Holotype: Molokai Island (Hawaii), *Albatros*, stn 3847, 8.IV.1902, 41-43 m, sex not indicated, cl. 7.5 mm, tl. 18.5 mm (USNM 30534).

MATERIAL EXAMINED. — French Polynesia. Marquesas Islands, Nuku Hiva, MUSORSTOM 9, *Alis*,

stn 1305, 90-155 m, 10.IX.1997, P. Bouchet, B. Dayrat, B. Richer de Forges coll., 1 broken ovigerous ♀, cl. 11 mm, tl. 28 mm (MNHN-Th 1420).

DISTRIBUTION. — Hawaii (Rathbun 1906); North of Buton strait, Indonesia (de Man 1925); Nuku Hiva, Marquesas Islands, French Polynesia.

DESCRIPTION

Carapace (Fig. 1A, B) with pointed rostrum reaching slightly beyond eyes to distal margin of second article of A1 peduncle; lateral border with five spines, continuous with lateral carina of gastric region, latter with seven spines; median rostral carina with three spines, median carina of gastric region with nine spines; submedian carina with eight to nine spines. Anterolateral border of carapace with two spines; two or three hepatic spines present. Cervical groove extending to whole carapace bearing on each side four dorsal and seven lateral spines. Postcervical carapace with small scattered tubercles; weak median carina on posterior half.

Pleuron of abdominal somite 1 (Fig. 1D) narrowing ventrally, anterior border with denticles; pleuron of abdominal somite 2 broadly rounded ventrally, pleura 3-5 with broad ventral angle, pleura 2 and 3 with lower distal denticles. Telson (Fig. 1C) approximately 1.3 times as long as wide, lateral border with two spinules; posterior border with median spine and three posterolateral spines, inner largest; two pairs of large dorsal spines.

Eyestalk cylindrical, as long as rostrum, cornea terminal, well pigmented. A1 peduncle (Fig. 1B) unarmed, second article about as long as third. A2 article 1 and 3 with one and three lower spines respectively (Fig. 1B), acicle with pointed tip nearly reaching to distal margin of article 4 and carrying small mesial spine (Fig. 1A), article 4 nearly twice as long as article 5. Mx2 scaphognathite with posterior seta. Mxp3 (Fig. 1G, H) coxa and basis with two and one lower spines respectively; ischium having three lower spines and prominent mesial toothed crest; five lower spines on merus, increasing in size distally; lower subdistal spine on carpus; exopod not reaching to distal margin of merus.

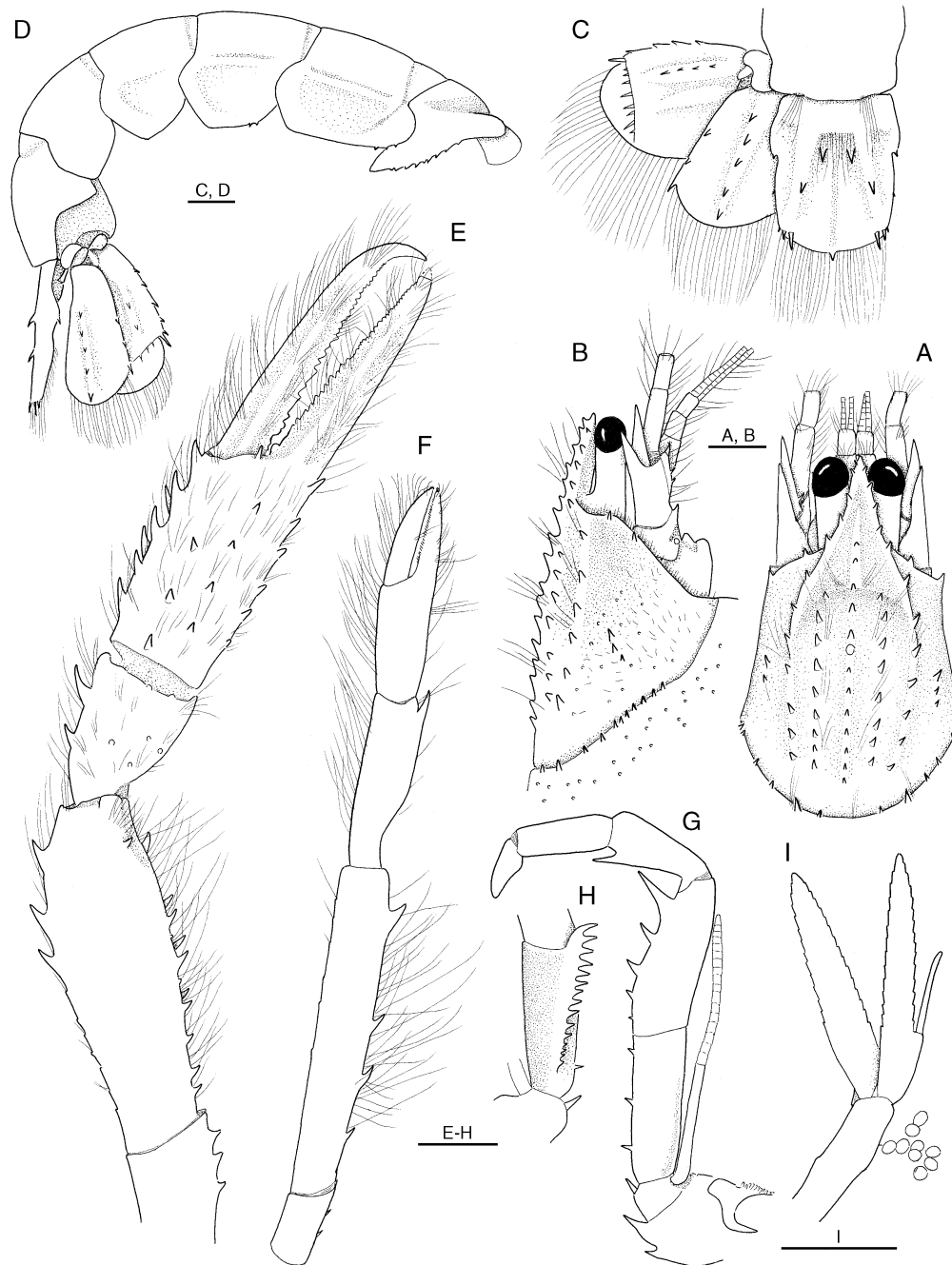


FIG. 1. — *Acanthaxius spinosissimus* (Rathbun, 1906), Marquesas, ♀ (MNHN Th 1420); **A**, anterior part of carapace; **B**, lateral view; **C**, telson and uropods; **D**, abdomen, telson and uropods in lateral view; **E**, **F**, pereopods 1 and 2; **G**, **H**, maxilliped 3 and ischium in mesial view; **I**, pleopod 2. Scale bars: 1 mm.

Right P1 (left missing) (Fig. 1E) slender with three lower spines on ischium; three upper and 10 lower spines on merus; carpus bearing two upper spines; upper margin of propodus with seven strong spines, six smaller spines on lower margin, two longitudinal rows of three and four spines on lateral surface with distal spine near cutting edge of dactylus; fingers slender, longer than palm, cutting edge of both carrying alternatively round or pointed small teeth, dactylus tip curved downwards. P2 (Fig. 1F) with two lower spines on ischium, four lower spines on merus and lower subdistal spine on carpus; propodus with palm about as long as fingers, fixed finger cutting edge pectinate. Gill formula is presented in Table 1.

Female Plp1 present as a short fine filament. Plp2-5 (Fig. 1I) with narrow rami, long and slender *appendix interna*. Uropodal (Fig. 1C) exopod with four spines on lateral margin, eight or nine spines along suture line, largest at junction, four spines along outer carina; endopod bearing three spines along lateral margin, distal largest, five spines on median carina.

REMARKS

This specimen agrees with the type from Hawaii (Rathbun 1906) and the *Siboga* specimen (de Man 1925), especially in the presence of well developed spines along the posterior border of the cervical groove. Other similarities are: 1) anterolateral border of carapace with one or two spines; 2) hepatic spines (or spines on the anterolateral region of carapace) present; 3) carina present on posterior half of post-cervical region of carapace; 4) pereopod 1 and pereopods 3-5 slender and spinose; and 5) four dorsal spines on the telson.

With the material from the Marquesas included, *Acanthaxius spinosissima* is now known from three specimens, all of them damaged. The ovigerous female from the Marquesas is the largest (tl. 28 mm) as compared with the type from Hawaii (sex not indicated, tl. 18.5 mm) and the *Siboga* specimen (♀ tl. 16.82 mm). It bears more spines on the rostrum and pereopods which is probably related to its adult stage and larger size.

TABLE 1. — *Acanthaxius spinosissimus* (Rathbun, 1906), gill formula.

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Epipods	1	1	1	1	1	1	1	
Podobranchs		1	1	1	1	1		
Arthrobranchs		1	1 or 2?	2	2	2	2	
Pleurobranchs								

Acanthaxius was established by Sakai & de Saint Laurent (1989) who included *Axius spinosissimus* in the genus. However, the latter species does not agree with the generic diagnosis in the following features: 1) the rostral margins are continuous with the gastric region; 2) the anterolateral border of carapace and the cervical groove bear spines; 3) the pointed tip of antennal article 2 is not curved inward; and 4) the chelae of P1 is not obliquely positioned (this character is variable).

Kensley (1996: 70) states that *Acanthaxius spinosissimus* does not fit the generic definition, but has characteristics of *Oxyrhyrachaxius* Parisi, 1917. Comparison of *Acanthaxius spinosissimus* with species of *Oxyrhyrachaxius* (see Lin *et al.* 2000: 199) nevertheless reveals important differences in the latter, including the styliform rostrum, unarmed cervical groove and unarmed anterolateral border of carapace.

The species *spinosissimus* Rathbun, 1906 should logically be placed in a new genus related to *Acanthaxius*. However it seems undesirable to establish a monotypic taxon on the basis of three damaged specimens. The species is here provisionally retained in the genus *Acanthaxius* as proposed by Sakai & de Saint Laurent (1989), pending a future study of additional material.

Genus *Axiopsis* Borradaile, 1903

Axiopsis pica Kensley, 2003
(Fig. 2)

Axiopsis pica Kensley, 2003: 363, figs 1, 2, pl. 1.

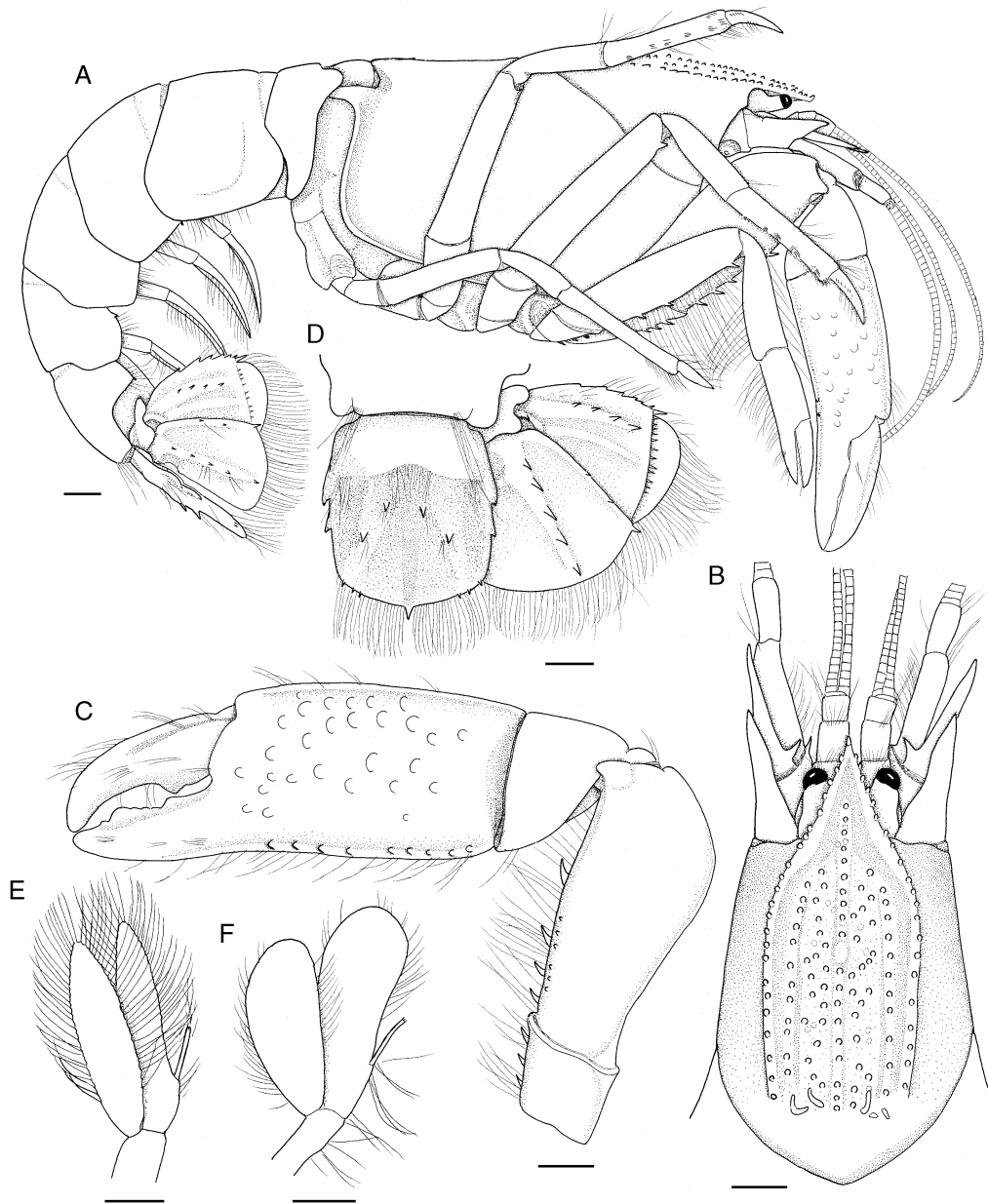


FIG. 2. — *Axiopsis pica* Kensley, 2003; **A-E**, Rangiroa, ♂ (UF 1337); **A**, lateral view; **B**, anterior part of carapace; **C**, pereopod 1; **D**, telson and uropods; **E**, male pleopod 3; **F**, Mariana Islands, ♀ (UF 552), pleopod 3. Scale bars: 2 mm.

TYPE MATERIAL. — Holotype: Guam, Ana'e Island, ♂ (USNM 296400). Paratypes: Guam, Luminao, 2 ♀ (USNM 243376); Pugua Patch Reef, 1 ♀ (USNM 243377); Piti Bay, 1 ♂, 1 ♀ (USNM 243369); Apra Harbor, 1 ♀ (USNM 296401); Amo Atoll, 1 ♀ (USNM 291365); Tepungan Channel, 1 ♀ (UGI); Agat Bay, 1 ♀ (UF), 3 ♀ ♀ (UF); 2 ♂ ♂, 6 ♀ ♀ (UF).

MATERIAL EXAMINED. — French Polynesia. Tuamotu Archipelago, Rangiroa Atoll, reef flat, under rocks, 16.X.2001, C. Meyer coll., 1 ♂, cl. 26.5 mm, tl. 67 mm (figured) (UF 1337).

OTHER MATERIAL EXAMINED FOR COMPARISON. — *Axiopsis pica*: Mariana Islands. Guam Island, Apra Harbor, Middle Shoal, among coral rubble and rocks, 2-4 feet, 3.VI.2002, H. Conley coll., 1 ovig. ♀, cl. 16 mm (UF 2782); Apra Harbor, Drydock Shoal, under rocks and dead coral, 3-15 feet, 12.VI.2002, Conley H. coll., 1 ovig. ♀, cl. 12 mm (UF 2861); Glass Breakwater, among rocks, 10-20 feet, 17.X.2002, H. Conley coll., 1 ♀, cl. 10.5 mm (UF 1232); near Harbor entrance, among rocks, 25-35 feet, 18.V.2002, H. Conley coll., 1 ♀, cl. 13.5 mm (UF 3021); Asan Bay, E of Camel Rock, among rocks, 18.III.2002, H. Conley coll., 1 ovig. ♀, cl. 17 mm (UF 1954); Alutom Islet, N and NE side, under rocks and coral rubble, 2-4 feet, 10.VI.2002, H. Conley coll., 1 ♀, cl. 17.5 mm (UF 2948); Alutom Island, Agat Bay, H. Conley coll., 1 ovig. ♀, cl. 13.5 mm, 1 ♀, cl. 15.5 mm, tl. 37.5 mm (Fig. 2F) (UF 552).

Axiopsis serratifrons A. Milne-Edwards, 1873: Hawaii. Sandwich Island, 1 ♂, cl. 10 mm, tl. 25 mm, holotype (Fig. 3) (MNHN Th 147).

Japan. Sakai leg. 1977, 1 ♂, cl. 12.5 mm, tl. 30.5 mm (MNHN Th 864).

Djibouti. H. Coutière coll., no date, 1 ♂, cl. 8 mm, tl. 21 mm (MNHN Th 807).

Aldabra. *Cabypso*, 20 m, 16.V.1954, 1 ♂, cl. 8.5 mm, tl. 22 mm (MNHN Th 690).

New Caledonia. Île des Pins, Mission Singer-Polignac 1961, 19.XII.1961, Salvat coll., 1 ♂, cl. 21.5 mm, tl. 61 mm (MNHN Th 691).

Mariana Islands. Guam Island, Apra Harbor, Drydock Shoal, among coral rubble and rocks, 2-15 feet, 15.VI.2002, Conley H. coll., 1 ♂, cl. 14 mm (UF 2747); among dead coral and under rocks, 2-10 feet, 24.VI.2002, Conley H. coll., 1 ♂, cl. 12 mm (UF 2816); Apra Harbor, Glass Breakwater, near harbor entrance, among rocks, 10-20 feet, 28.V.2002, Conley H. coll., 1 ♂, cl. 12 mm (UF 2972); Asan Point, among rocks, 1-4 feet, 1.VII.2002, Conley H. coll., 1 ♂, cl. 15.5 mm (UF 2772); Agat Bay, N of Alutom Island, fore reef, deep in coral rubble, 15.XI.2000, Conley H. coll., 1 ♂, cl. 11 mm, 1 ♀, cl. 15.5 mm (UF 59).

DISTRIBUTION. — Guam (Kensley 2003); Rangiroa Atoll, Tuamotu, French Polynesia.

REMARKS

This species was described in detail and illustrated by its author (Kensley 2003). The present male from Rangiroa is larger than all the type specimens studied but fully agrees in the colour pattern especially and also in having several flattened tubercles on the mesial and lateral surfaces of the P1 propodus (Fig. 2C). Other similarities are: 1) shape of rostrum (Fig. 2B); 2) length of A2 acicle reaching the distal border of the fourth article of A2 peduncle (Fig. 2B); 3) morphology of abdominal pleura (Fig. 2A); 4) morphology of pereopods (Fig. 2A); and 5) morphology and spinulation of the telson and uropods (Fig. 2D). Variation concerns a higher number of spines on the rostrum and appendages as compared with the types.

Male Plp1 absent; male Plp2 with *appendix interna* and *appendix masculina*; Plp3-5 with *appendix interna*, rami slender in male, with long setae (Fig. 2E), comparatively larger and broader in female (Fig. 2F), with finer and shorter setae.

Axiopsis pica, as stated by its author, is closely related to *Axiopsis serratifrons*. The Rangiroa specimen was compared with the holotype of the latter species, a male from Hawaii (MNHN Th 147) which is figured (Fig. 3).

The holotype of *Axiopsis serratifrons* is at present nearly transparent and in fair condition. All mouth appendages as well as the P2 and P4 remain on the body (Fig. 3A) while the right P1 and P5 are broken off (Fig. 3C, D). Main morphological differences of this specimen as compared with *Axiopsis pica* are: 1) P1 slender, no longitudinal upper and lower carinae on propodus (Fig. 3D) (P1 more robust, longitudinal upper and lower carinae present on propodus in *A. pica*); 2) no trace of flattened tubercles on the mesial and lateral surfaces of P1 propodus (Fig. 3D) (flattened tubercles present in *A. pica*); and 3) telson approximately 1.2 times as long as wide (Fig. 3F) (telson approximately quadrate in *A. pica*).

Kensley (1981) studied material of *A. serratifrons* from several areas of the Pacific, Indian and Atlantic oceans and gave a detailed description and figures (Kensley 1981: 1253, figs 1-5).

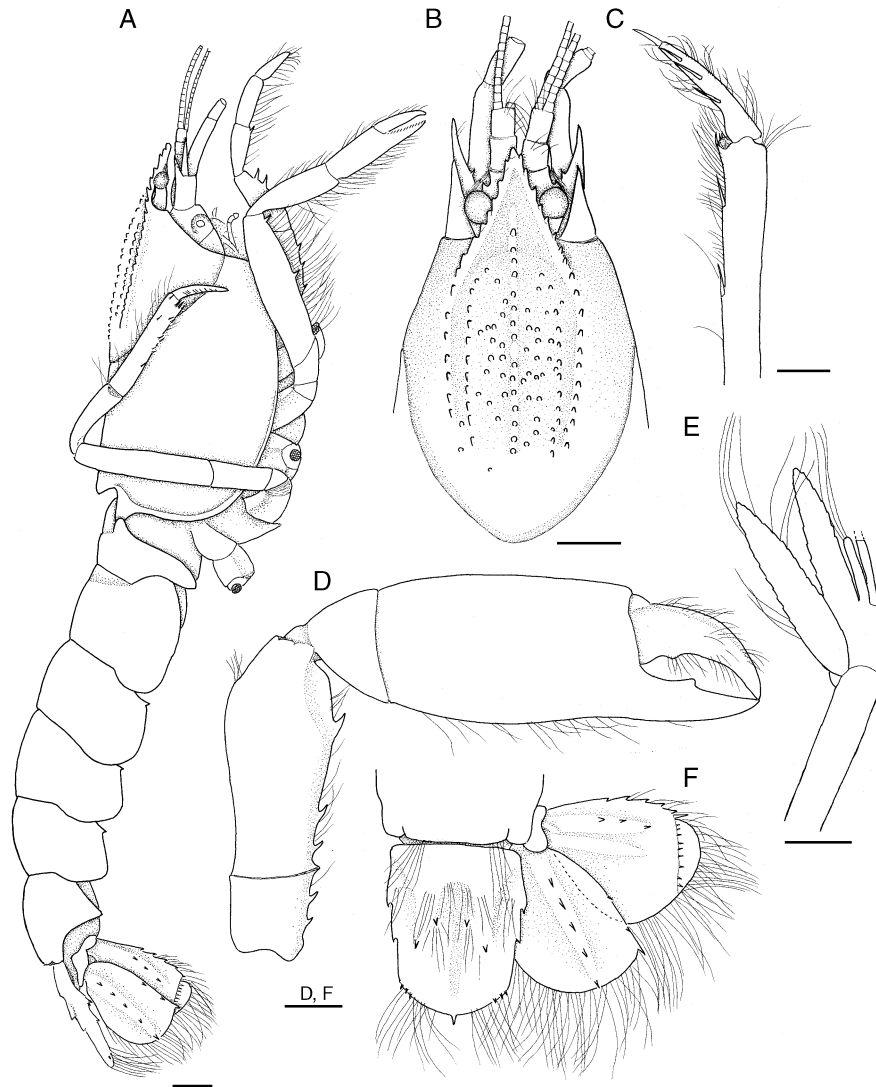


FIG. 3. — *Axiopsis serratifrons* A. Milne-Edwards, 1873, Hawaii, holotype, ♂ (MNHN Th 147); **A**, lateral view; **B**, anterior part of carapace; **C**, distal part of pereopod 5; **D**, pereopod 1; **E**, pleopod 2; **F**, telson and uropods. Scale bars: A, B, D, F, 1 mm; C, E, 0.5 mm.

Although there are differences between the holotype of *A. serratifrons* (Fig. 3) and the figures presented by Kensley (1981: figs 1-3), examination of additional material in the MNHN collection and from Guam indicates that these are variations, in addition to those listed by Kensley (1981: table 1). They concern the following: 1) the antennal acicle varies in length between reaching the middle of

the fourth antennal article (in holotype, Fig. 3B) to reaching the middle of the last article and beyond (Kensley 1981: fig. 2A); 2) P1 merus is usually unarmed on the upper margin (as in holotype, Fig. 3D) or provided with a rudimentary to strong upper subdistal spine (Kensley 1981: fig. 1); 3) the abdominal pleura are approximately straight ventrally, with a spinule (as in holotype, Fig. 3A), or

more convex and unarmed (Kensley 1981: fig. 1), intermediate shapes exist; and 4) the telson is longer than wide (in holotype, Fig. 3F) or sub-square (Kensley 1981: fig 2b).

Variation in the length of the antennal acicle is also found in *A. pica*.

Axiopsis consobrina de Man, 1905

(Fig. 4)

Axiopsis consobrina de Man, 1905: 595. — Balss 1925: 209. — Sakai 1994: 198, fig. 14. — Komai *et al.* 2002: 29.

Axiopsis (Axiopsis) consobrina – de Man 1925: 80, pl. 6, fig. 13-13c. — Poore & Griffin 1979: 230, fig. 4.

Non *Axiopsis consobrina* – Tirmizi 1983: 91, fig. 4.

TYPE MATERIAL. — Lectotype: *Siboga*, stn 305, from Solor Strait, Indonesia, ♂ (ZMA), selected by Sakai (1994).

MATERIAL EXAMINED. — French Polynesia. Society, Tahiti, 2.5 m, coarse sand, 17.I.1995, P. Frouin coll., 1 juvenile, cl. 6 mm, tl. 16 mm, P2-4 missing (MNHN Th 1426).

DISTRIBUTION. — Indonesia (de Man 1905); Gulf of Carpentaria, Queensland, Australia (Poore & Griffin 1979); Tahiti, Society, French Polynesia.

DESCRIPTION

Carapace (Fig. 4B) with triangular pointed rostrum overreaching eyes to distal border of second article of A1 peduncle; lateral border carrying five or six spinules continuous with lateral carina of gastric region, latter with 10 spinules and tubercles. Median carina extending anteriorly to about midlength of rostrum, with 17 tubercles; submedian carina with nine tubercles; no spinules or tubercles between median and submedian carinae. Anterolateral border of carapace (Fig. 4A) unarmed; cervical groove well defined. Abdominal somite 1 (Fig. 4A) with pleura ventrally obtuse, pleuron 3-5 with minute tooth on anterior margin, ventral spinule on pleuron 6. Telson (Fig. 4G) about 1.2 times as long as broad, lateral border with four spinules, four large spines on dorsal surface; posterior border convex carrying three posterolateral spinules, all minute, median posterior spine larger.

A1 peduncle (Fig. 4B) with article 2 and 3 of about same length. A2 peduncle (Fig. 4A, B) bearing lower distal spine on article 3; acicle slender, with a proximal spine on mesial margin, tip nearly reaching distal border of article 4. Mxp3 (Fig. 4C, D) with large coxal spine; ischium having five lower spines and mesial crest of blunt teeth; merus with five lower spines, larger distally, carpus with lower distal spine.

P1 (Fig. 4A, E) unequal (left larger), similar. Ischium and merus each with three or four lower spines, upper subdistal spine on merus; carpus and propodus unarmed, fingers shorter than palm; dactylus curved with bifid tip, half of it corneous. Abdominal sternite 4 with strong lateral spine.

Plp 1 absent; plp 2-5 (Fig. 4F) with long digitiform *appendix interna*.

Uropod (Fig. 4G) exopod with suture; three spinules and movable distal spine along lateral margin, external dorsal carina with five spinules; endopod with two spinules and distal spine on lateral margin, dorsal carina with five spines, distal one near distal border.

REMARKS

Sakai (1994) examined the three type specimens of *Axiopsis consobrina* and stated that only two of these were actually of this species while the third (from North Sulu Island) belonged to *A. tsushimaensis* Sakai, 1992. The male of *Axiopsis consobrina*, from Solor Strait, described in detail by de Man (1925), was selected as the lectotype and a diagnosis of the species was presented. Komai *et al.* (2002) gave additional characteristics to differentiate this species from *A. tsushimaensis*.

The present juvenile (possibly ♀, given the comparatively slender P1 and the *appendix masculina* absent from the Plp2) agrees with the lectotype of *Axiopsis consobrina* in several features: 1) the triangular rostrum, pointed at tip with five spinules on each lateral border; 2) the median carina extending onto the rostrum; 3) the intermediate region between carinae unarmed; 4) the A2 acicle with a subproximal spine on the mesial border; 5) the general morphology of P1, except for the dactylus; and 6) the general morphology

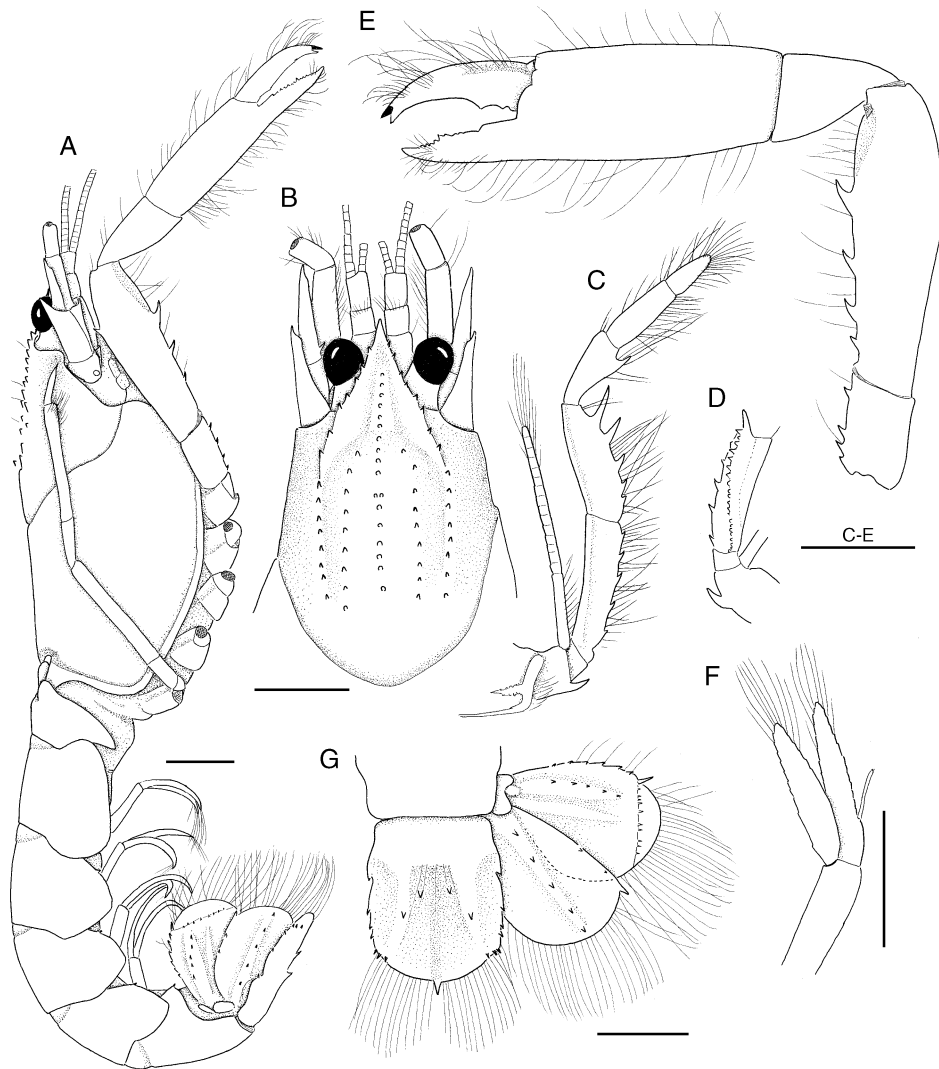


FIG. 4. — *Axiopsis consobrina* de Man, 1905, Tahiti, ♀ (MNH Th 1426); **A**, lateral view; **B**, anterior part of carapace; **C**, **D**, maxilliped 3 and ischium in mesial view; **E**, pereopod 1; **F**, pleopod 2; **G**, telson and uropods. Scale bars: 1 mm.

of the telson and uropods. There are differences in: 1) a higher number of spinules or tubercles on the carinae (still within the range of variations of the species) (see Sakai 1994: table 1); 2) the Mxp3 ischium bearing five lower spines (two to three spines in the lectotype); and 3) the P1 dactylus with a bifid tip half of it corneous (tip entire in the lectotype). This character is probably variable since in the relative species, *A. tsushi-*

maensis, a bifid tip is reported on both the dactylus and the fixed finger in specimens from southern Japan (Komai *et al.* 2002) whereas it is absent from the type (Sakai 1992: 173, fig. 14).

Comparisons of *A. consobrina* with *A. tsushimaensis* were given by Sakai (1994) and Komai *et al.* (2002). As de Man (1925: 72) stated, *A. consobrina* is closely related to *A. serratifrons*, from which it differs in two features: 1) there are no spinules

or tubercles between the carinae of the gastric region (scattered tubercles present between carinae in *A. serratifrons*); and 2) the P1 merus bears a strong upper subdistal spine (in typical *A. serratifrons*, this spine is either rudimentary or absent). As mentioned above, the length of the A2 acicle is variable in *A. serratifrons* and cannot be used as a reliable differentiating character between the two species.

Tirmizi (1983) assigned a female from Bali, Indonesia, to *A. consobrina*, an identification that Sakai (1994: 199) rejected on the basis of scattered denticles between the median and submedian carinae. By contrast, the two specimens (1 ♂, 1 ♀, tl. 19 and 24 mm) from the Gulf of Carpentaria, Queensland, Australia (Poore & Griffin 1979: 230) agree well with the type except for the median carina of the gastric region that exists as a double row in its posterior third. This can probably be regarded as a variation.

Genus *Calaxius* Sakai & de Saint Laurent, 1989

Calaxius sibogae (de Man, 1925)
(Fig. 5)

Calocaris (Calastacus) sibogae de Man, 1925: 118, pl. 9, fig. 21-21e.

Calaxius sibogae – Sakai & de Saint Laurent 1989: 86.

TYPE MATERIAL. — Holotype: *Siboga*, stn 139, N of Batjan Island, Indonesia, ♀ (ZMA De 102461).

MATERIAL EXAMINED. — **French Polynesia.** Marquesas Islands, Nuku Hiva, MUSORSTOM 9, *Alis*, stn 1298, 305 m, 9.IX.1997, P. Bouchet, B. Dayrat, B. Richer de Forges coll., 1 ♀, cl. 7 mm, tl. 18 mm (MNHN Th 1421).

DISTRIBUTION. — Indonesia (de Man 1925); Nuku Hiva, Marquesas Islands, French Polynesia.

DESCRIPTION

Carapace (Fig. 5B) with pointed rostrum overreaching eyes to distal border of second article of A1 peduncle, lateral border carrying two large spines and continuous with lateral carina of gastric region, latter also with two spines. Median

carina having two spines anterior to blunt tubercle; submedian carina with three spines; distal spinous tubercle anteriorly between median and submedian carinae. Anterolateral border of carapace (Fig. 5A) unarmed; cervical groove defined in median part, faint laterally; unobvious short postcervical carina on posterior fourth of carapace. Abdominal somite 1 (Fig. 5A) with triangular pleuron ventrally subacute, pleuron 2 broadly rounded ventrally, pleura 3-6 slightly angular. Telson (Fig. 5J) about 1.3 times as long as broad, lateral border with two small spines; posterior border regularly rounded carrying three posterolateral spines, inner largest, outer very small.

A1 peduncle (Fig. 5B) with article 2 and 3 of about same length. A2 peduncle (Fig. 5A, B) bearing lower distal spine on article 1 and 3; acicle slender, tip reaching approximately distal third of article 4. Mxp3 (Fig. 5H, I) with lower distal spine on coxa and basis; ischium having two lower spines and mesial crest of blunt teeth; merus with three lower spines, larger distally, carpus with small lower distal spine; long exopod flagellum overreaching merus.

P1 (Fig. 5A, D) similar in length and spinulation with left slightly stouter than right; ischium with lower distal spine; merus having one or two upper subdistal spines and three or four lower spines; carpus with oblique setose crest near lower border and two upper spines; propodus well setose dorsally, palm about 1.2 times as long as wide on left appendage, more slender on right with longitudinal lower crest and four upper spines, scattered tubercles on lateral surface and median distal spine near base of fixed finger; both fixed finger and dactylus with large triangular tooth near proximal third of cutting edge; dactylus with curved tip. P2 (Fig. 5E) merus with two lower spines. P3 missing, P4 (Fig. 5F) with two lower spinules on merus, propodus with lower spiniform corneous setae, distal largest. P5 (Fig. 5G) simple. Female Plp1 (Fig. 5A) as fine short filament on abdominal somite 1. Plp2-5 (Fig. 5C) with slender rami and long, slender *appendix interna*. Uropod (Fig. 5J) exopod with suture; three spinules and movable distal spine along

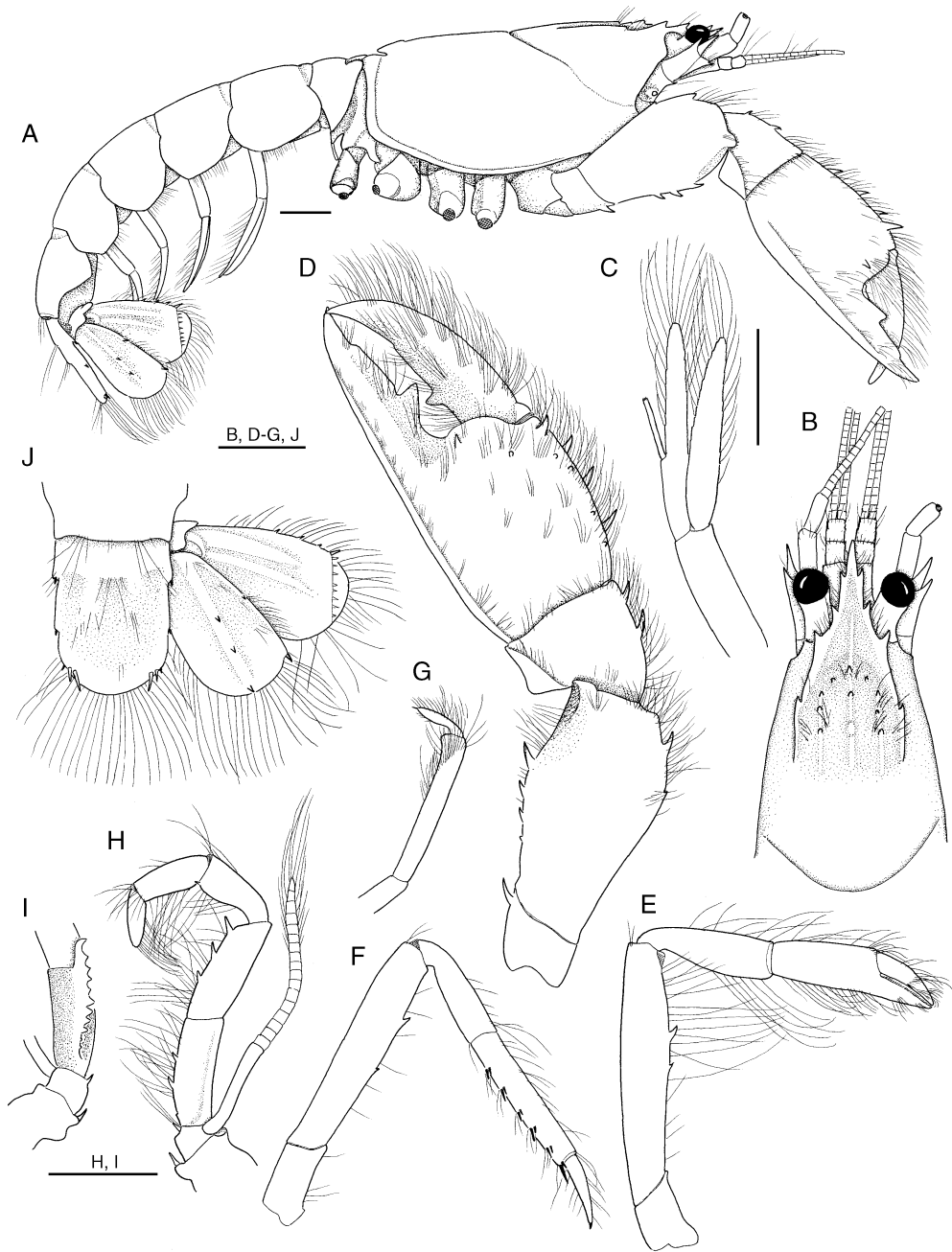


FIG. 5. — *Calaxius sibogae* (de Man, 1925), Marquesas, ♀ (MNHN Th 1421); **A**, lateral view; **B**, anterior part of carapace; **C**, pleopod 2; **D-G**, pereopod 1-3 and distal part of pereopod 5; **H, I**, maxilliped 3 and ischium in mesial view. Scale bars: 1 mm.

lateral margin, dorsal carinae unarmed; endopod with minute spinule around midlength and distal spine on lateral margin, dorsal carina with three spines, distal near distal border.

REMARKS

The specimen studied agrees with the holotype of *Calaxius sibogae* in the shape and spinulation of the rostrum, the abdominal pleura slightly pointed ventrally, the spinulation of P1, and the spinulation of the telson and uropods.

It differs in the following characters: 1) rostrum slightly shorter reaching the distal margin of the second article of A1 peduncle (vs rostrum reaching the middle of the last article of A1 peduncle in holotype); 2) Mxp3 stouter with three and one lower spines on merus and carpus respectively (vs Mxp3 with one lower spine on merus, carpus unarmed in holotype); 3) P1 with fingers not longer than the palm (vs P1 fingers one and a half as long as palm in holotype); 4) telson nearly 1.5 times as long as broad (vs “quadrangular, somewhat longer than broad” in holotype); and 5) median carina of the uropod endopod with three spines including distal one (vs one distal spine in holotype).

This specimen is smaller than the holotype (cl. 12.5 mm, tl. 29.5 mm) and the above differences are probably due to the difference in size and age.

Family STRAHLAXIIDAE Poore, 1994
Genus *Neaxius* Borradaile, 1903.

Neaxius trondlei n. sp. (Figs 6; 7)

TYPE MATERIAL. — Holotype: Marquesas Islands, Ua Huka, MUSORSTOM 9, stn 19, Hane bay, W coast, with algae, corals, pebbles, 5.X.1997, R. von Cosel, J. Trondlé, J. Tardy coll., ♂ cl. 29 mm, tl. 78 mm (MNHN Th 1419). Paratypes: same locality, 1 ♂, cl. 30 mm, tl. 78 mm; 1 ♀, cl. 21 mm, tl. 56 mm (MNHN Th 1427); stn 23, W of Haamamao Bay, rocky coast with sand and pebbles, in sand, 1 ♀, cl. 13.5 mm, tl. 35 mm (MNHN Th 1428).

ETYMOLOGY. — The new species is named for Jean Trondlé, one of the collectors.

OTHER MATERIAL EXAMINED. — *Neaxius acanthus* (A. Milne-Edwards, 1879): New Caledonia. Lectotype ♀ (dried) (selected by Sakai & de Saint Laurent 1989), cl. 26 mm, tl. 74.5 mm (MNHN Th 812); paralectotype, ♂, cl. 27 mm, broken, poor condition, all pereopods lost except P2 (A2 Fig. 7L, M) (MNHN Th 190).

DISTRIBUTION. — Only known from the type locality.

DIAGNOSIS. — Carapace with bifid rostrum, lateral rostral margin with three or four spines, lateral carina of gastric region unarmed; anterolateral border of carapace with three or four spines. Telson with three prominent transverse carina on dorsal surface, equally distant from one another.

Article 2 of A2 peduncle with one or two upper spines, unarmed laterally; antennal acicle large, distally acute with five or six lower spines. No posterior seta on exopod of Mx2. Mxp3 with four or five lower spines on merus, lower distal spine on carpus.

P1 unequal, ischium with two or three lower spines; merus with two or three upper spines, three or four spines on proximal half of lower border; carpus with lower proximal spine. P2 with lower spine on ischium. Plp1 present in female, simple, faintly biarticulated. Plp1 absent in male, male Plp2 without *appendix masculina*. Plp2-5 in male and female with broad rami and digitiform *appendix interna*. Uropodal exopod with proximal dorsal spine, 10-11 spines on posterior margin, no suture; endopod with large spine on posterolateral angle, two to four spines on median longitudinal carina and two or three spines on posterolateral border.

DESCRIPTION

Carapace (Fig. 6A, B) with bifid and slightly depressed rostrum reaching beyond eye; lateral rostral margin with three or four teeth, continuous with lateral carina of gastric region, latter unarmed; median rostral carina with four tubercles. Anterolateral border of carapace with four spines. Eyestalk nearly reaching distal border of second article of A1 peduncle; cylindrical, cornea hemispherical, distal, weakly pigmented. Gastric region weakly convex, cervical groove well defined, with two or three lateral spines. Pleuron of abdominal somite 1 (Fig. 6B) tapering and bifid or trifid ventrally; pleuron of abdominal somite 2 overlapping that of somite 1, ventrally rounded bearing five to ten spinules; pleura of somites 3 and 4 with posterior and posterolateral setae. Thoracic sternite of P4 with lateral spine. Telson (Fig. 7I) about two-thirds

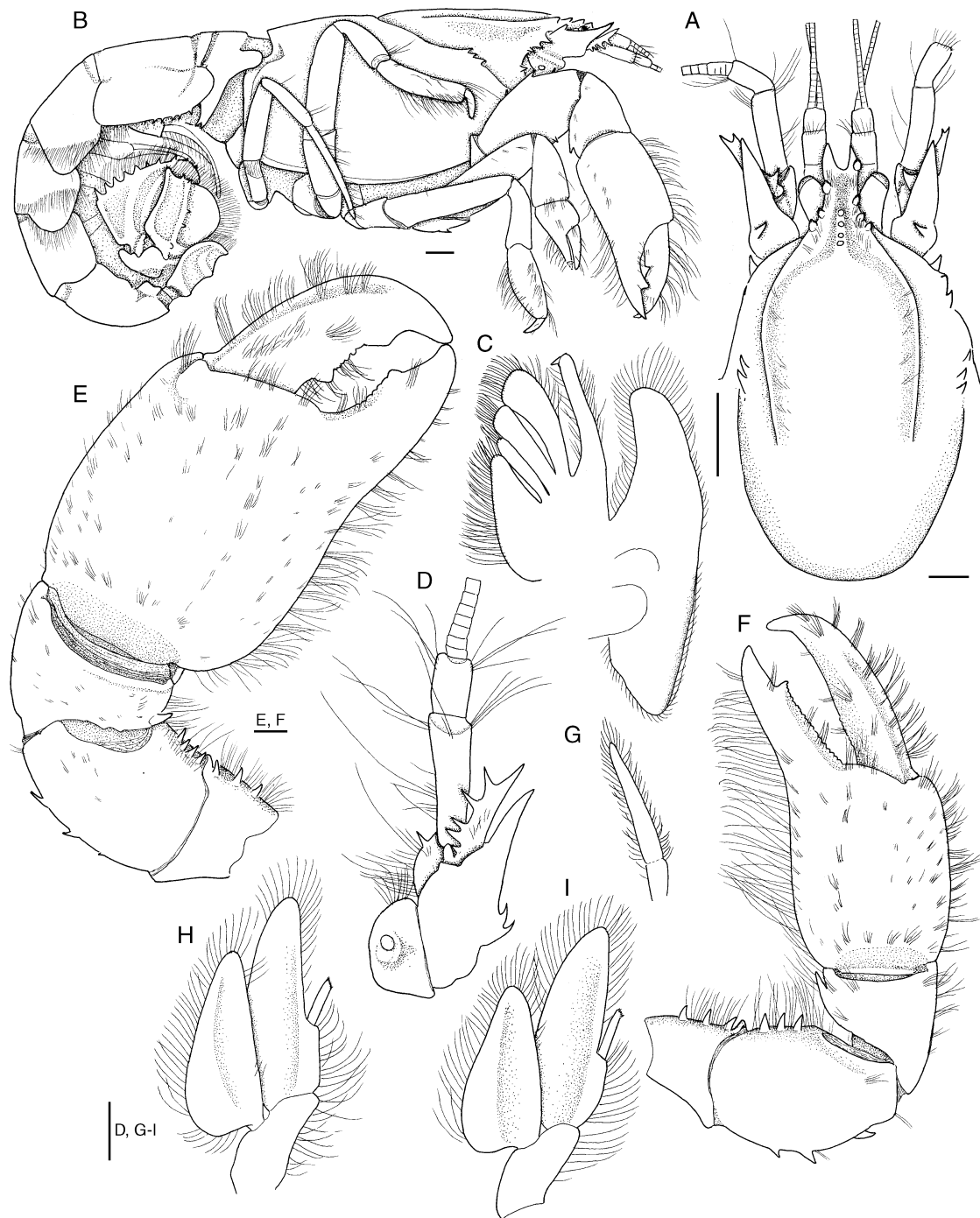


FIG. 6. — *Neaxius trondlei* n. sp., Marquesas; A, I, holotype, ♂ (MNHN Th 1419); B, G, H, ♀ paratype (MNHN Th 1427); C-F, ♂ paratype (MNHN Th 1427); A, anterior part of carapace; B, lateral view; C, maxilla; D, antenna; E, F, major and minor pereiopod 1; G, pleopod 1; H, I, pleopod 2. Scale bars: 2 mm.

as long as its largest breadth, three prominent transverse carinae on dorsal surface, equally distant from one another; lateral border convex near proximal third and tapering posteriorly; posterior border concave medially with median spine.

A1 peduncle (Fig. 6A) hardly reaching distal half of article 4 of A2 peduncle. A2 peduncle (Fig. 6D) with article 2 pointed distally, carrying one or two upper spines, unarmed laterally; article 3 with lower spine; acicle large, distally acute with mesial spine (Fig. 6A) and five or six lower spines; article 4 nearly twice as long as article 5. Md cutting edge (Fig. 7I) smooth. Mx1 exopod sickle-shaped. Mx2 (Fig. 6C) scaphognathite carrying no posterior seta. Mxp1 (Fig. 7E) epipod with truncate posterior lobe. Mxp2 (Fig. 7F) with curved digitiform epipod; exopod flagellum hardly articulated. Mxp3 (Fig. 7G, H) ischium with mesial crest bearing obtuse round teeth; four or five lower spines on merus, larger distally, lower distal spine on carpus; exopod not reaching distal border of merus, flagellum obscurely articulated.

Major P1 (Fig. 6E) either on right or left, much stouter than minor in male (Fig. 6F) with lower spine on basis, four or five spines on ischium; merus with three upper spines, four or five spines on proximal half of lower border, distal half slightly excavated, unarmed, except for two median spines near distal margin (in holotype only); carpus with lower proximal spine; propodus unarmed, fixed finger bearing small round teeth on cutting edge with larger one near distal third; dactylus of major P1 with two large teeth on cutting edge, near proximal and distal third and small round teeth between; dactylus of minor P1 unarmed. P2 (Fig. 7A) unarmed except for lower spine on ischium. P3-5 (Fig. 7B-D) as figured, unarmed. P1-3 with coxal spine.

Gill formula is presented in Table 2.

Male Plp1 absent, female Plp1 (Fig. 6G) uniramous, with basipod indistinctly separated from last article; Plp2-5 (Figs 6H, I; 7K) in male and female, with broad rami and digitiform *appendix interna*.

TABLE 2. — *Neaxius trondlei* n. sp., gill formula.

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Epipods	1	1	1	1	1	1	1	
Podobranchs			1	1	1	1		
Arthrobranchs			2	2	2	2	2	
Pleurobranchs				1	1	1	1	

Uropod (Fig. 7J) exopod nearly triangular in shape with proximal spine, two curved unarmed carinae and 10 or 11 spines on posterior margin, no suture; endopod with large spine on posterolateral angle, two to four spines on median longitudinal carina and two or three spines on posterolateral border.

REMARKS

This species has no posterior seta on the Mx2 scaphognathite and this feature is probably of generic importance, as a posterior seta is also absent from the Mx2 of *N. acanthus*, type species of *Neaxius*. By contrast, it is present on the Mx2 of *Strahlaxius plectrorhynchus* (Strahl, 1862), type species of *Strahlaxius* (Strahlaxiidae), as well as in many other groups of thalassinideans. Poore (1994: 85) discussed its significance in the thalassinidean taxonomy.

The new taxon is similar to *Neaxius acanthus* as well as to *Neaxius glyptocercus* (von Martens, 1868) by the morphology and spinulation of the rostrum and gastric region, and the morphology of the telson and uropods.

It differs from *Neaxius acanthus* in: 1) the second article of A2 peduncle is armed near its base with one or two upper spines and unarmed laterally (same article armed with one upper spine, four or five lateral spines in *N. acanthus*, Fig. 7L, M); 2) the third article of A2 peduncle bears a lower spine (unarmed in *N. acanthus* Fig. 7L); 3) one spine on the lower border of Mxp3 carpus (three to five spines in *N. acanthus*); 4) the distal half of the lower border of P1 merus and all lower border of P2 merus are unarmed (spines present in *N. acanthus*); and

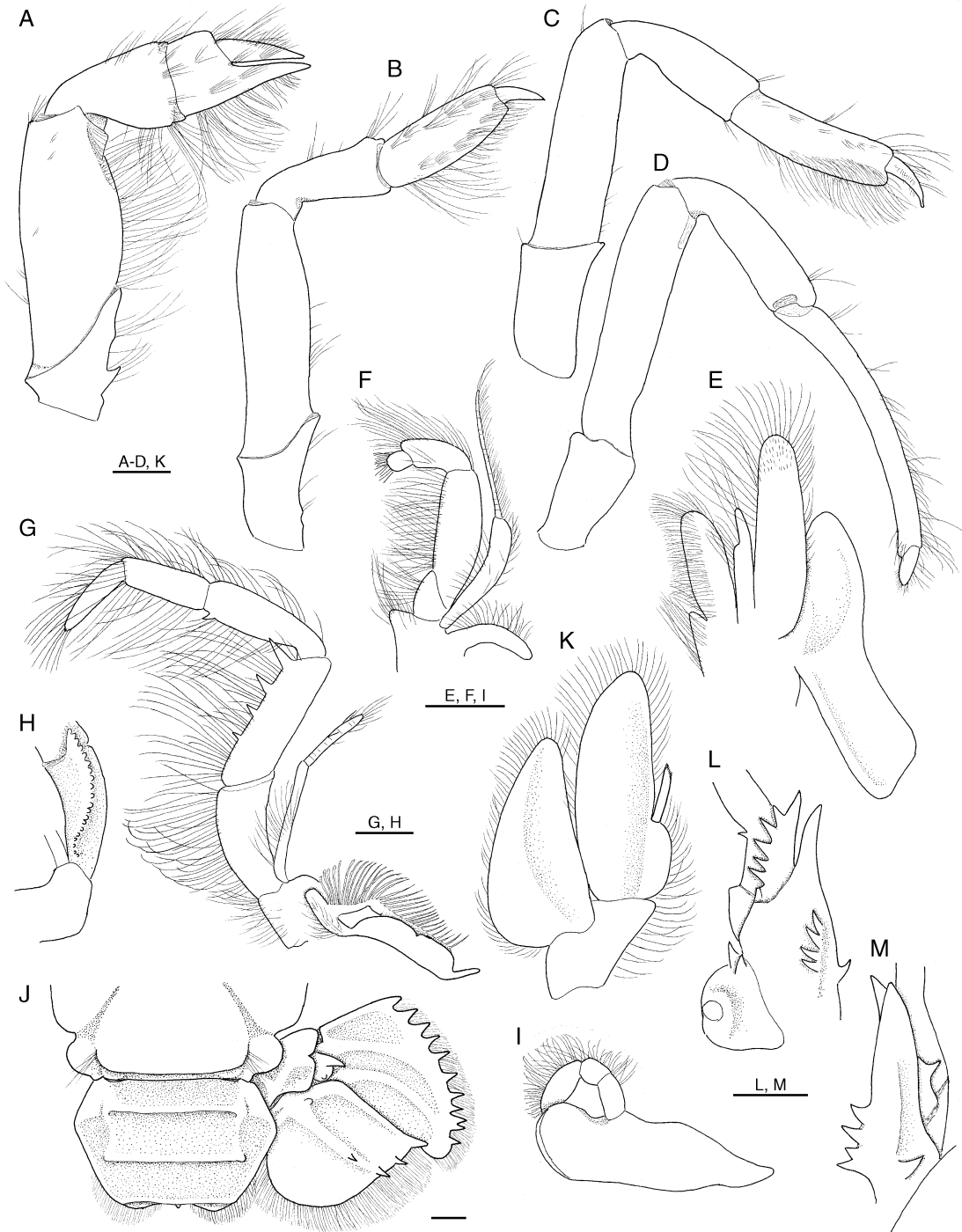


FIG. 7. — **A-K**, *Neaxius trondlei* n. sp., Marquesas; **A-I**, ♂ paratype (MNHN Th 1427); **J, K**, holotype, ♂ (MNHN Th 1419); **A-D**, pereopod 2-5; **E, F** maxilliped 1 and 2; **G, H**, maxilliped 3 and ischium in mesial view; **I**, mandible; **J**, telson and uropods; **K**, pleopod 3; **L, M**, *Neaxius acanthus* (A. Milne-Edwards, 1879), ♂ paralectotype (MNHN Th 190), antenna in lateral and dorsal view. Scale bars: 2 mm.

5) the telson with three well marked transverse carina equally distant from one another (distal carina often faint and apart from the others in *N. acanthus*).

It differs from *N. glyptocercus* in: 1) the cervical groove has two or three lateral spines (unarmed in *N. glyptocercus*); 2) the second article of A2 peduncle is armed near its base with one or two upper spines (unarmed in *N. glyptocercus*); 3) the Mxp3 bears four or five lower spines on merus, a lower spine on carpus (Mxp3 with two to four lower spines on merus, lower border of carpus unarmed in *N. glyptocercus*); 4) the lower border of P3 merus is unarmed (with spines in *N. glyptocercus*); and 5) the telson with three well marked transverse carina (distal carina often nearly absent in *N. glyptocercus*).

Family THOMASNIIDAE de Saint Laurent, 1979
Genus *Crosniera* Kensley & Heard, 1991

Crosniera dayrati n. sp.
(Figs 8; 9)

TYPE MATERIAL. — Holotype: Marquesas Islands, Nuku Hiva, MUSORSTOM 9, *Alis*, stn 1306, 283-448 m, 10.IX.1997, P. Bouchet, B. Dayrat, B. Richer de Forges coll., ♀, cl. 5 mm, tl. 15.5 mm (MNHN Th 1418).

ETYMOLOGY. — The species is named for Benoît Dayrat, one of the collectors.

DISTRIBUTION. — Only known from the type locality.

DIAGNOSIS. — Carapace with short acute triangular rostrum, slightly overreaching eyes, *linea thalassinica* extending posteriorly to level of cervical groove, latter present in median part. Telson longer than broad, tapering posteriorly.

Eyestalk short, not flattened, cornea terminal; A1 peduncle shorter than that of A2, A2 acicle very small; Mx2 scaphognathite with posterior seta; Mxp3 pediform, ischium with stiff setae on lower border and weak spinous mesial crest, merus with two lower spines.

P1 subequal, similar, unarmed except for fingers; merus with convex lower border; fixed finger of major P1 bearing large anteriorly directed tooth near midlength, fixed finger of minor P1 with small round teeth on proximal third.

Female Plp1 of two articles. Plp2-5 slender, with digitiform *appendix interna*. Uropodal endopod and exopod

elongate, with rounded posterior border; endopod presumably longer than telson with small spine on median carina.

DESCRIPTION

Carapace (Fig. 8B) with short acute triangular rostrum, slightly overreaching eyes; *linea thalassinica* extending posteriorly to level of cervical groove, latter present in median part; no anterolateral setal rows; posterodorsal margin excavate, continuous with posterolateral margin, latter with slight thickening.

Abdominal somite 1 (Fig. 8A) shorter than second, without anterolateral lobes, pleuron rounded ventrally; abdominal somite 2 weakly overlapping somite 1, pleuron with lower border nearly straight; abdominal somites 3-6 with convex lower border, somites 3-5 with fine lateral setae not arranged in rows. Telson (Fig. 9H), broken in holotype, presumably longer than broad, tapering posteriorly.

Eyestalk (Fig. 8B) short, not flattened, cornea terminal. A1 with article 1 overreaching eyestalk, article 2 shorter than article 3. A2 acicle very small, article 4 nearly three times as long as article 5. Mx2 (Fig. 9A) scaphognathite tapering posteriorly, with posterior seta (broken in figured appendage). Mxp1, 2 (Fig. 9B, C) as figured. Mxp3 (Fig. 9D, E) pediform with exopod slightly longer than ischium, latter with convex lower border carrying stiff setae and weak spinous mesial crest; merus with small lower spine near midlength and larger one distally; carpus, propodus, dactylus unarmed.

P1 (Fig. 8C, D.) subequal, similar, unarmed except for teeth on fingers, right slightly stouter than left; a few lower tubercles on ischium; merus with lower border convex; propodus with fixed finger shorter than palm in both appendages, fixed finger with small round teeth proximally on cutting edge in both appendages and large anteriorly directed tooth near midlength on right appendage; dactylus with curved tip, cutting edge with small rectangular tooth near midlength followed anteriorly by small round teeth in right appendage, unarmed in left. P2-5 (Fig. 8E-H) as figured; P2 with pectinate cutting edge on fixed

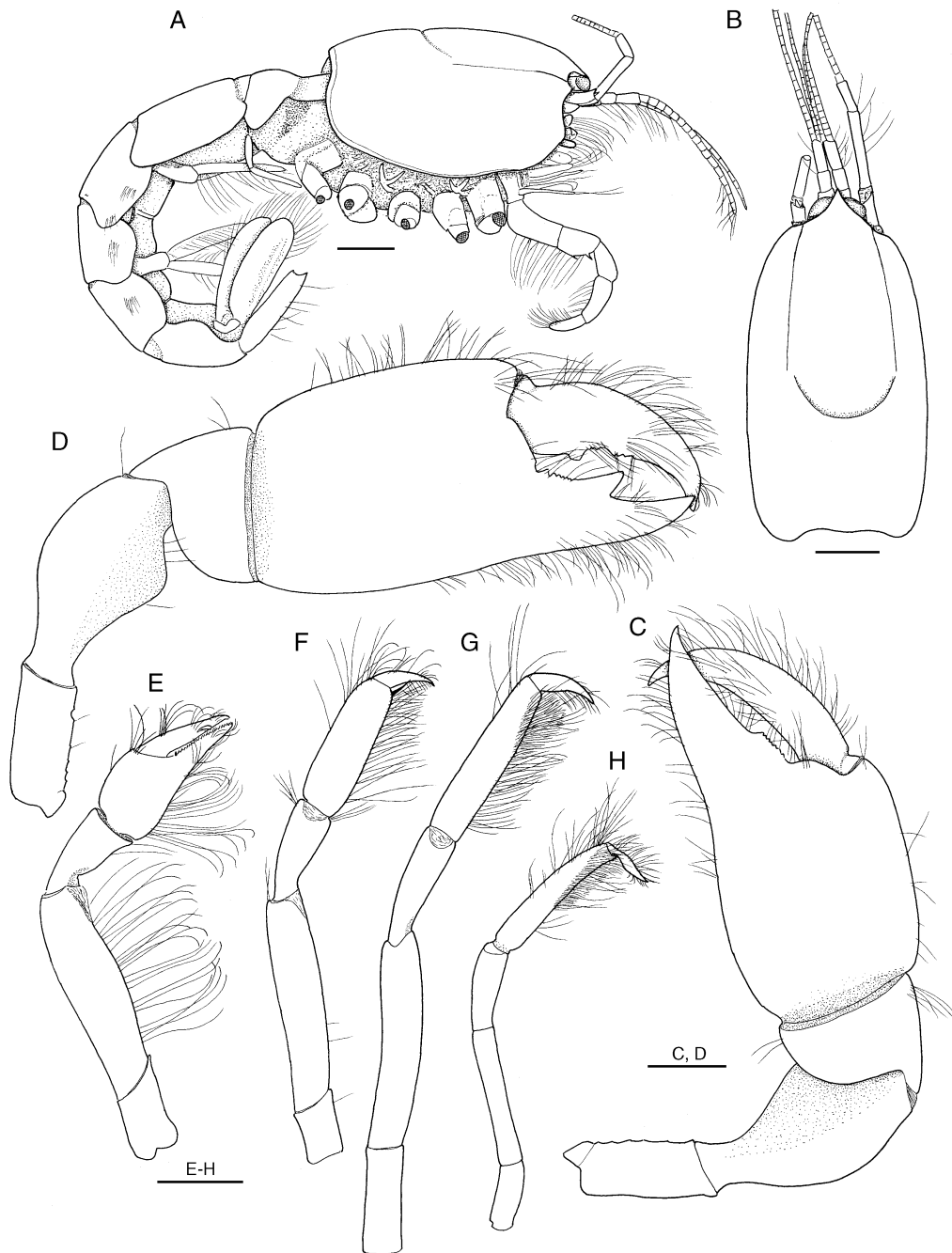


FIG. 8. — *Crosniera dayrati* n. sp., Marquesas, holotype, ♀ (MNHN Th 1418); **A**, lateral view; **B**, anterior part of carapace; **C**, **D**, minor and major pereopod 1; **E**–**H**, pereopod 2–5. Scale bars: 1 mm.

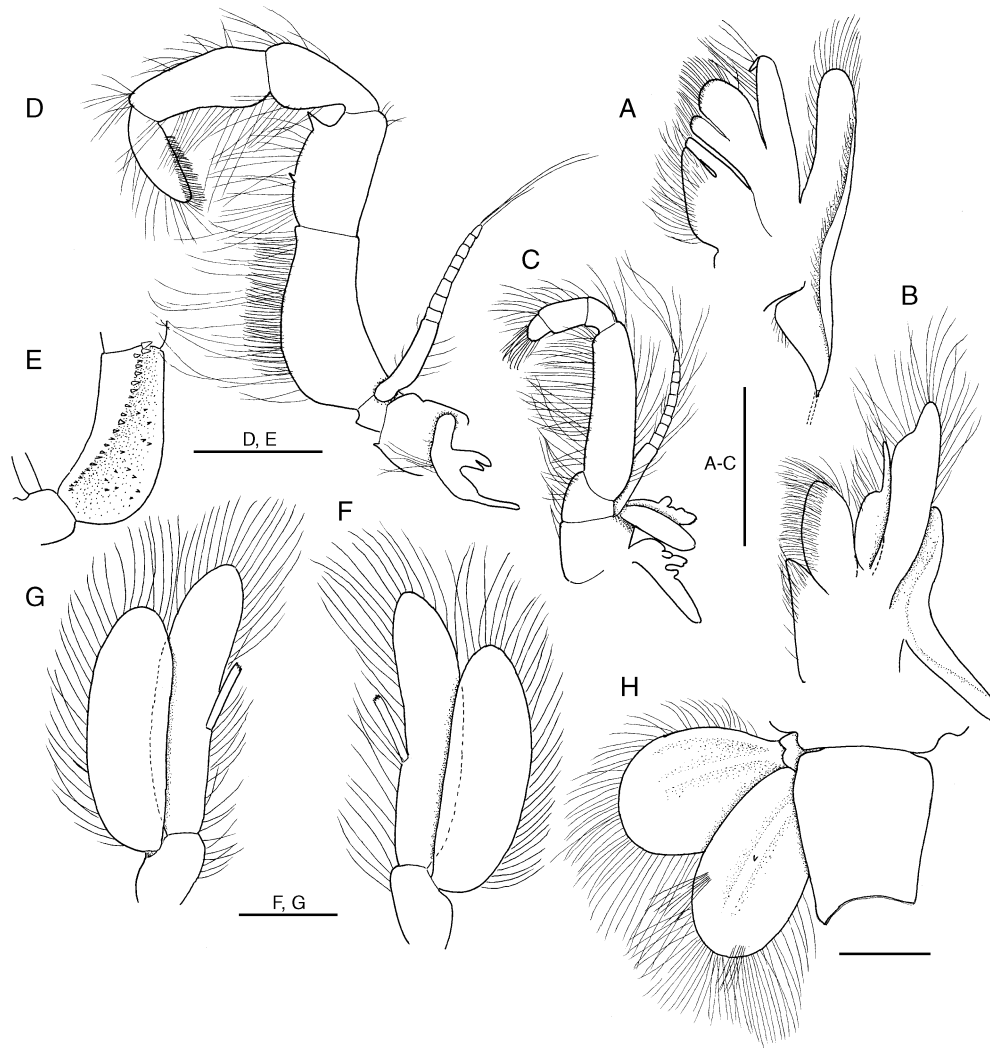


FIG. 9. — *Crosniera dayrati* n. sp., Marquesas, holotype, ♀ (MNHN Th 1418); **A**, maxilla (posterior seta broken); **B**, **C**, maxilliped 1 and 2; **D**, **E**, maxilliped 3 and ischium in mesial view; **F**, pleopod 2; **G**, pleopod 3; **H**, telson (distal part missing) and uropods. Scale bars: 1 mm.

finger; P3 propodus about three times as long as broad, with lower distal thick seta; P4 propodus more slender, about 4.5 times as long as broad; P5 subchelate.

Gill formula is presented in Table 3.

Plp1 (Fig. 8A) relatively large, of two articles. Plp2-5 (Fig. 9F, G) similar, exopod and endopod slender, with digitiform *appendix interna*. Uropod (Fig. 9H) endopod and exopod elongate, with rounded posterior border; endopod presum-

ably longer than telson with small spine on median carina.

REMARKS

The new taxon is similar to the type species of *Crosniera*, *C. minima* (Rathbun, 1901) in: 1) presence of a rostral spine overreaching the eyes; 2) *linea thalassinica* present and incomplete; 3) A2 acicle present and small; 4) Mxp3 exopod as long as ischium, latter with stiff setae on lower

TABLE 3. — *Crosniera dayrati* n. sp., gill formula. Abbreviation: r, rudiment.

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Epipods	1	1	1	1	1	1		
Podobranchs		1	r	r	r	r		
Arthrobranchs		1	2	2	2	2	2	
Pleurobranchs								

border and dentate crest on mesial surface; 5) general morphology of pereopods; 6) telson wider proximally than distally; and 7) pleopodal rami relatively narrow.

It differs from *C. minima* and other known species of *Crosniera* in: 1) non spike-like, triangular rostrum similar to that of *Crosniera* sp. 1 from Indonesia identified by Poore (1997: 402, fig. 31); 2) non flattened eyestalks with terminal corneas; and 3) elongate telson and uropods. It can be noted that setal pits are absent.

Genus *Mictaxius* Kensley & Heard, 1991

Mictaxius salvati n. sp. (Figs 10; 11)

TYPE MATERIAL. — Holotype: French Polynesia, Mururoa, Mission II Tuamotu, 40 m, 1965, B. Salvat coll., hermaphrodite ovigerous specimen, broken, poor condition, cl. 4 mm, tl. 14 mm (MNHN Th 1417).

ETYMOLOGY. — The species is named for Bernard Salvat who collected the material.

OTHER MATERIAL EXAMINED. — *Mictaxius* sp. 1, Tahiti, Moorea Island, Tiahura, B. A. Thomassin coll., stn Tia 23, no date, 1 ♂, 1 ♀ without pereopods, tl. 8 mm and 7.2 mm (MNHN Th 1302).

DISTRIBUTION. — Mururoa, Tuamotu; Tahiti, Society, French Polynesia.

DIAGNOSIS. — Hermaphrodite. Carapace with obsolete rostrum, *linea thalassinica* running full length of carapace, anterolateral setal row of about 12 setae, cervical groove present in median part. Abdominal somite 1 narrow, without anterolateral lobes. Telson 1.2 times

as long as broad, lateral border convex in proximal half and tapering to posterior border.

Eyestalks slightly flattened, adpressed, acute distomesially, cornea distolateral. A1 peduncle slightly shorter than that of A2, latter with minute acicle. Mx2 with long posterior seta on scaphognathite. Mxp3 pediform with small exopod, ischium with stiff setae on proximal half of lower border and weak mesial crest.

P1 subequal, similar; nine or ten lower spinules on ischium, merus with convex lower border, fixed finger with small triangular tooth near midlength of cutting edge, dactylus unarmed. Plp1 of two articles. Plp2 with *appendix masculina* and *appendix interna*. Plp3-5 with digitiform *appendix interna*. Uropod endopod and exopod rounded, unarmed except for small spine on median carina of endopod.

DESCRIPTION

Carapace (Fig. 10A) with obsolete rostrum; *linea thalassinica* lateral to eyes running full length of carapace; anterolateral setal row of about 12 setae; cervical groove present in median part; dorso-posterior margin excavate, continuous to posterior margin, without setal rows. Abdominal somite 1 (Fig. 10B) narrower than somite 2, without anterolateral lobes, pleuron rounded ventrally, lateral setal row present with six or seven hardly visible setae; abdominal somite 2 weakly overlapping somite 1; abdominal somites 2-6 of approximately same length, flattened, without setal rows. Telson (Fig. 10J) 1.2 times as long as broad, lateral border convex in proximal half and tapering to slightly rounded posterior border.

Eyestalks (Fig. 10A) slightly flattened, adpressed, acute distomesially, cornea distolateral. A1 (Fig. 10A) with article 1 shorter than eyestalk, article 2 shorter than article 1, article 3 subequal to article 1. A2 (Fig. 10H) with minute acicle; article 5 half as long as article 4, reaching just beyond last antennular article. Md (Fig. 10I) with small teeth on cutting edge. Mx2 (Fig. 10E) scaphognathite carrying posterior seta about 1.4 times its length. Mxp1 and 2 (Fig. 11D, F) as figured, Mxp1 epipod tapering distally. Mxp3 (Fig. 10F, G) pediform, with small exopod; small lower spine on coxa; ischium two times as long as merus, with stiff setae on proximal half of lower border and weak mesial crest of 12-13 spines; carpus-dactylus unarmed.

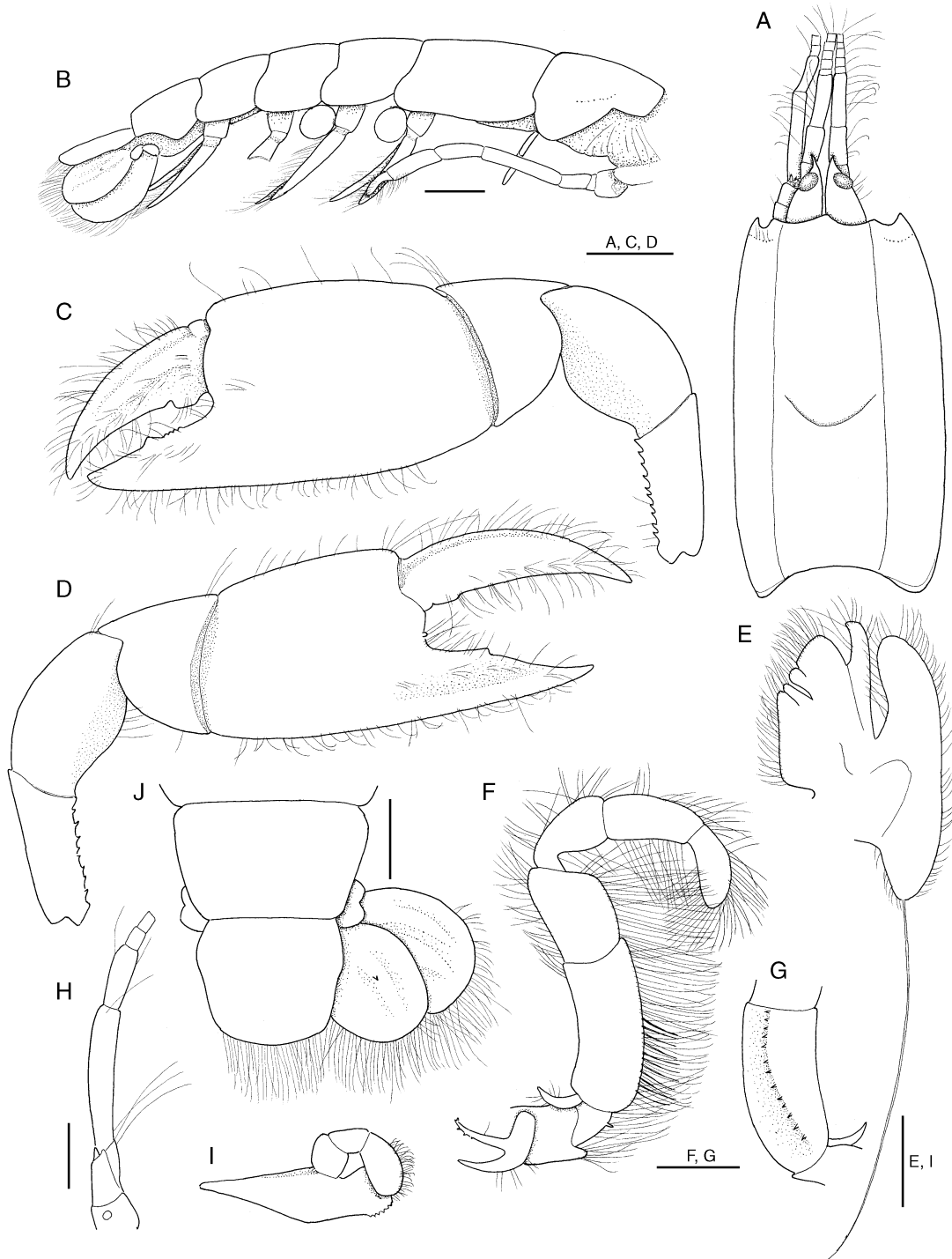


FIG. 10. — *Mictaxius salvati* n. sp., Mururoa, Tuamotu, holotype, hermaphrodite (MNHN Th 1417); **A**, anterior part of carapace; **B**, abdomen, telson and uropods in lateral view; **C**, **D**, major and minor pereopod 1; **E**, maxilla; **F**, **G**, maxilliped 3 and ischium in mesial view; **H**, antenna; **I**, mandible; **J**, telson and uropods. Scale bars: A-D, J, 1 mm; E-I, 0.5 mm.

TABLE 4. — *Mictaxius salvati* n. sp., gill formula. Abbreviation: r, rudiment.

	Maxillipeds			Pereopods				
	1	2	3	1	2	3	4	5
Epipods	1	1	1	1	1	1	1	1
Podobranchs		r	r	r	r	r	r	
Arthrobranchs		1	2	2	2	2	2	
Pleurobranchs								

P1 (Fig. 10C, D) subequal, similar; nine or 10 lower spinules on ischium; merus ovate with convex lower border; propodus with fixed finger about as long or slightly shorter than palm, small triangular tooth near midlength of cutting edge; dactylus weakly overreaching fixed finger, unarmed. P2-4 (Fig. 11A-C) as figured; P3 propodus about 1.7 times as long as broad, lower border convex; P4 propod three times as long as broad, lower border straight, P5 simple.

♀ gonopore well open on P3, small ♂ gonopore on P5.

Gill formula is presented in Table 4.

Plp1 (Fig. 11F) relatively large, of two articles. Plp2 (Fig. 11G) exopod and endopod slender, *appendix masculina* present, partly fused with *appendix interna*. Plp3-5 (Fig. 11H) with digitiform *appendix interna*. Uropod (Fig. 10J) endopod and exopod about as long as telson, rounded, unarmed except for small median spine on endopod.

REMARKS

This species agrees with the diagnosis of the genus given by Poore (1997) except for being hermaphrodite and in having the uropod exopod not apically twisted or bilobed.

It is most similar to the type species of the genus, *Mictaxius thalassicola* Kensley & Heard, 1991 from the Atlantic Panama, in: 1) the morphology of the rostrum and eyestalks (slightly more acute anteriorly in the new taxon); 2) the complete *linea thalassinica*; 3) the Mxp3 with vestigial exopod and weak ischial *crista dentata*; and 4) the general morphology of pereopods.

It differs by: 1) abdominal pleuron 1 rounded posteroventrally (tapering in *M. thalassicola*); 2) telson approximately quadrate with posterior border nearly straight (posterior border rounded in *M. thalassicola*); 3) uropod exopod not bilobed; and 4) much fewer setal pits than in *M. thalassicola*. The hermaphrodite status separates this new species from *Mictaxius thalassicola* and all known *Mictaxius* members.

The juvenile specimens (♂ of tl. 8 mm and ♀ of tl. 7.2 mm) from Tahiti (MNHN Th 1302), cited as *Mictaxius* sp. 1 by Poore (1997: 408) are likely to belong to this new taxon. They differ mainly in being gonochoristic and having a shorter *linea thalassinica* (not reaching the posterior border of the carapace). The latter difference may be due to their young age and, as they are also very small, it is hard to be certain about their sexual status.

Family CALLIANASSIDAE Dana, 1852
Subfamily CALLIANASSINAE Dana, 1852
Genus *Callianassa* Leach, 1814

Callianassa amboinensis de Man, 1888 (Fig. 12)

Callianassa amboinensis de Man, 1888: pl. 20, fig. 4. — Zehntner 1894: 194. — Holthuis 1958: 35. — Poore & Griffin 1979: 248, fig. 14. — Sakai 1984: 96, figs 1, 2; 1988: 53, 57, fig. 1; 1999: 38. — Ngoc-Ho 1991: 283, fig. 1. — Tudge *et al.* 2000: 143.

Callianassa (Trypaea) amboinensis – de Man 1928b: 27, 93, 107, 165, pl. 18, fig. 28-28c.

Callianassa (Calliactites) amboinensis – Borradaile 1903: 545.

Callianass ngochoae Sakai, 1999: 49.

TYPE MATERIAL. — Whereabouts unknown, probably lost (see Sakai 1999).

TYPE LOCALITY. — Ambon, Indonesia.

MATERIAL EXAMINED. — **Marquesas Islands.** Hiva Oa, *Alis*, MUSORSTOM 9, stn 1204, 9°52.6'S, 139°03.2'W, 60-62 m, 20.VIII.1997, P. Bouchet, B. Dayrat, B. Richer de Forges coll., 1 ovigerous ♀, cl. 3 mm, tl. 12 mm (MNHN Th 1431).

Philippines. *Coriolis*, MUSORSTOM 3, stn 117, 12°31'N, 120°39'E, 92-97 m, 3.VI.1985, 1 broken ♀, cl. 4 mm (MNHN Th 1227).

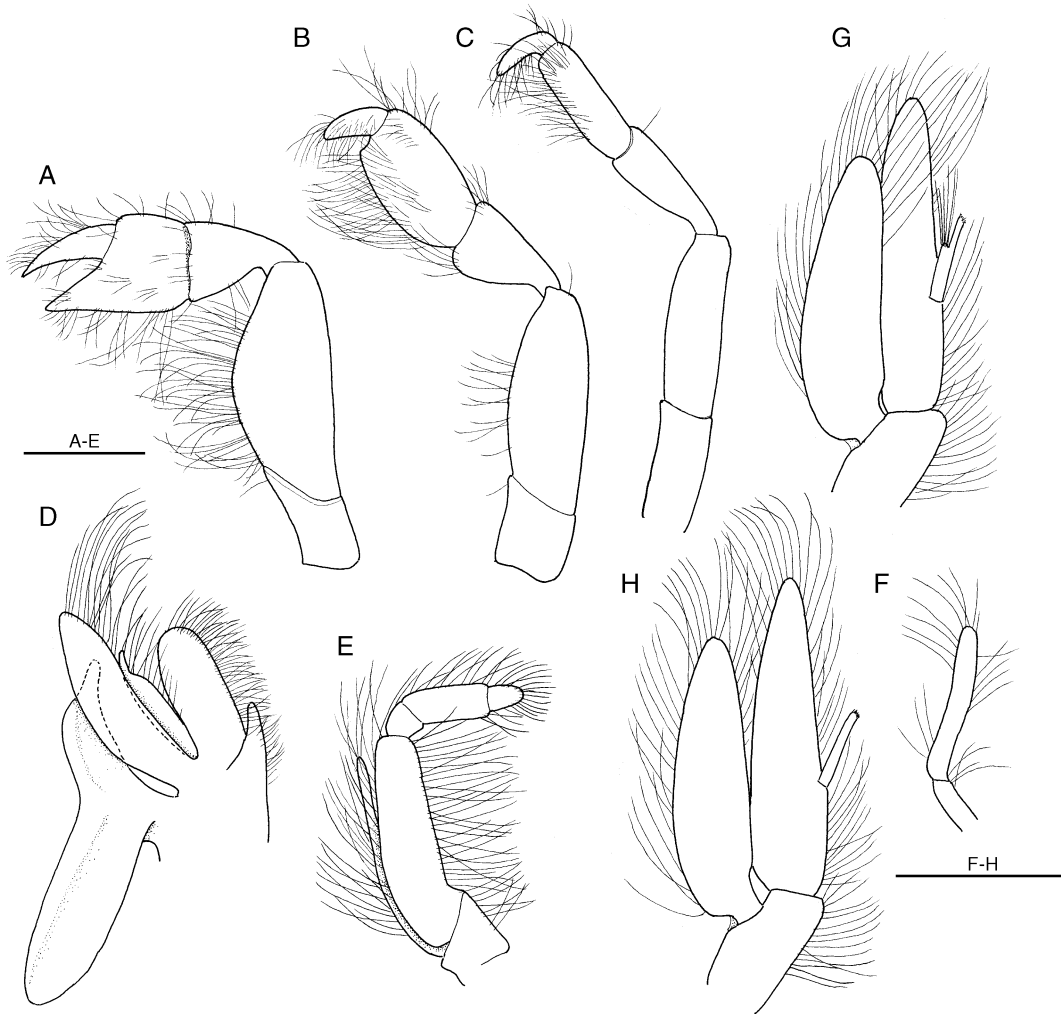


FIG. 11. — *Mictaxius salvati* n. sp., Mururoa, Tuamotu, holotype, hermaphrodite (MNHN Th 1417); **A-C**, pereopod 2-4; **D, E**, maxilliped 1 and 2; **F**, pleopod 1; **G**, pleopod 2; **H**, pleopod 3. Scale bars: A-C, F-H, 1 mm; D, E, 0.5 mm.

DISTRIBUTION. — Ambon, Indonesia (de Man 1888; Zehntner 1894); Eylath, Israel (Holthuis 1958); Dampier Archipelago, western Australia (Poore & Griffin 1979); Heron Island, Queensland, Australia (Sakai 1984); Port Essington, Northern Territory, Australia (Sakai 1988); New Caledonia (Ngoc-Ho 1991); Marquesas Islands, French Polynesia.

REMARKS

This Marquesas specimen agrees with the description and figures of the type (de Man 1888) and other material previously studied

(Sakai 1984, 1988) in the shape of the rostrum, the eyestalks, the A1, A2 (Fig. 12A), the morphology of the Mxp3 (Fig. 12E), the pereopods (Fig. 12B, C), and the telson and uropods (Fig. 12F).

Ngoc-Ho (1991) assigned a ♂ specimen from New Caledonia (MNHN Th 1071) to this species and compared it with an ovigerous ♀ of the *Siboga* Expedition (ZMA De 102-435) that she mistook for the holotype (see Sakai 1999: 39). Sakai contended that the holotype described

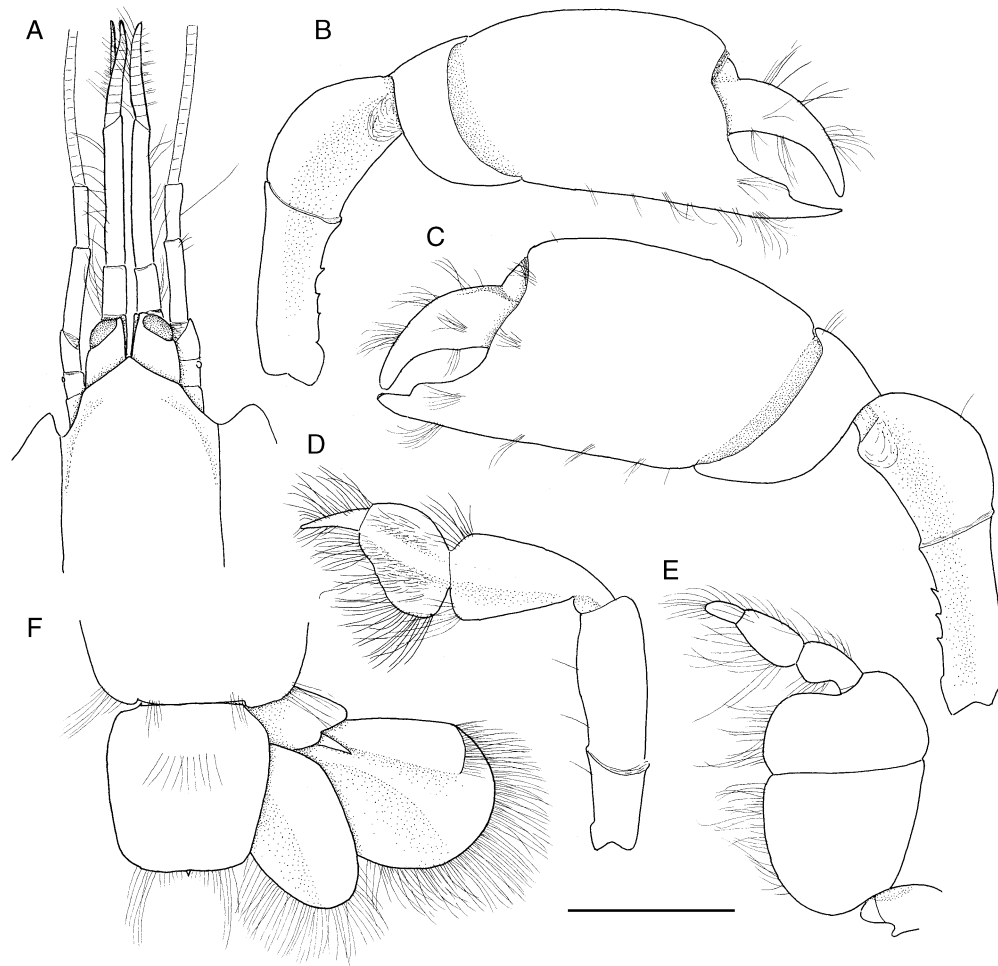


FIG. 12. — *Callianassa amboinensis* de Man, 1888, Marquesas, ♀ (MNHN Th 1431); **A**, anterior part of carapace; **B, C**, pereopods 1; **D**, pereopod 3; **E**, maxilliped 3; **F**, telson and uropods. Scale bar: 1 mm.

by de Man was missing and that the New Caledonian specimen belonged to a different species, *Callianassa ngochoae*. According to Sakai (1999), it differs from *C. amboinensis* in:

1) “the terminal segment (or segment 3) of A1 peduncle is 1.5 times as long as the penultimate segment (segment 2) while it is three times as long in *C. amboinensis*”.

When laid flat, the ratio of A1 segments 3/2 in the New Caledonian specimen is actually about 2.5 (see Ngoc-Ho 1991: fig. 1a). The same ratio

is found in other material, including the *Siboga* specimen (de Man 1928b: 167) and the ovigerous female from Wistari Reef, Australia studied by Sakai (1984: 96, fig. 1C).

2) “the merus of the larger cheliped is serrated and largely convex ventrally while it is neither regularly serrated nor convex ventrally in *C. amboinensis*”.

The merus of the larger cheliped is actually convex in a specimen from Malaysia examined by Zehntner (1894: 194: “le méropodite de la

grande patte antérieure est plus dilaté au milieu”), it is both curved and minutely dentate in some specimens from Australia (Sakai 1984: 96, fig. 1; 1988: fig. 1D; Poore & Griffin 1979: 248, fig. 14D). In the New Caledonian specimen the merus of the larger P1 is more convex and serrated (Ngoc-Ho 1991: fig. 1i) but probably lies within the range of variation of the species.

3) “the telson is about as long as broad”.

The shape of the telson in the New Caledonian specimen (Ngoc-Ho 1991: fig. 1g) agrees with that of most material of *C. amboinensis* previously described, including the holotype (de Man 1888: fig. 4a).

The New Caledonian specimen is therefore maintained in *C. amboinensis* as the differences mentioned above are here considered as variations. *Callianassa ngochoae* is regarded as a junior synonym of the latter species.

Variations occur in: 1) the length ratio between segment 3 and segment 2 of A1 varies between 2.5 and 3; 2) the lower border of the major P1 can be straight and unarmed or convex and serrate; and 3) the length of A2 peduncle varies between reaching midlength and the distal fourth of segment 3 of A1 peduncle.

Subfamily CALLICHIRINAE
Manning & Felder, 1991

Genus *Corallianassa* Manning, 1987

Corallianassa Manning, 1987: 392.

Callichirus Stimpson, 1866: 47. — De Saint Laurent 1973: 514.

Callianassa (*Callichirus*) – Borradaile 1903: 546.

Corallichirus Manning, 1992: 571.

Glypturus – Sakai 1999: 78 (part).

REMARKS

There is confusion in the taxonomy of this genus and actions concerning the species *Callianassa* (*Callichirus*) *coutierei* Nobili, 1904 and its junior synonym *Callianassa* (*Callichirus*) *placidus* de Man, 1905 are here considered and discussed.

Following Borradaile (1903), Nobili (1904) and de Man (1928b) placed the two species, *coutierei* and *placidus* under the subgenus *Callianassa* (*Callichirus*).

De Saint Laurent (1973), then de Saint Laurent & Le Loeuff (1979: 97) reinstated the genus *Callichirus* Stimpson, distinct from *Callianassa*.

Manning (1987) erected the new genus *Corallianassa* which included the species *Callichirus coutierei* (Nobili, 1904) and *Callichirus placidus* (de Man, 1905).

Manning (1992) established *Corallichirus* and placed *Callichirus placidus* (de Man) in this new genus.

Sakai (1999: 78) considered *Callianassa* (*Callichirus*) *coutierei* Nobili, 1904 and *Callianassa placida* de Man, 1905 as synonyms, and assigned the species to the genus *Glypturus* Stimpson, 1866.

Corallianassa coutierei (Nobili, 1904)
(Fig. 13)

Callianassa (*Callichirus*) *Coutierei* Nobili, 1904: 237; 1906a: 60; 1906b: 101, 110, pl. 7, fig. 1. — de Man 1928b: 28, 109, 174.

Callianassa placida de Man, 1905: 612.

Callianassa (*Callichirus*) *placidus* – de Man 1928b: 29, 93, 108, 171, 177, pl. 18, fig. 29-29b, pl. 19, fig. 29c-e.

Callianassa coutierei – Tudge *et al.* 2000: 143.

Callichirus coutierei – de Saint Laurent & Le Loeuff 1979: 97.

Callichirus placidus – de Saint Laurent & Le Loeuff 1979: 97.

Corallichirus placidus – Manning 1992: 571. — Tudge *et al.* 2000: 144.

Glypturus coutierei – Sakai 1999: 78, figs 17a-f, 18a-d.

Glypturus placidus – Sakai 1999: 82, fig. 17c-e.

TYPE MATERIAL. — Lectotype (selected by Sakai [1999]): Djibouti, H. Coutière coll., ♀, cl. 10.5 mm, tl. 36.5 mm, broken (MNHN Th 75). Paralectotypes: 5 ♀♀, poor condition (3 specimens of cl. 11-14 mm, 2 large specimens badly damaged, including 1 ovigerous of body length 55 mm) (MNHN Th 73).

MATERIAL EXAMINED. — Marquesas Islands. Ua Huka, MUSORSTOM 9, stn 20 south, Hinipahue Bay, 8°56.20'S, 139°32.90'W, on paving stone of

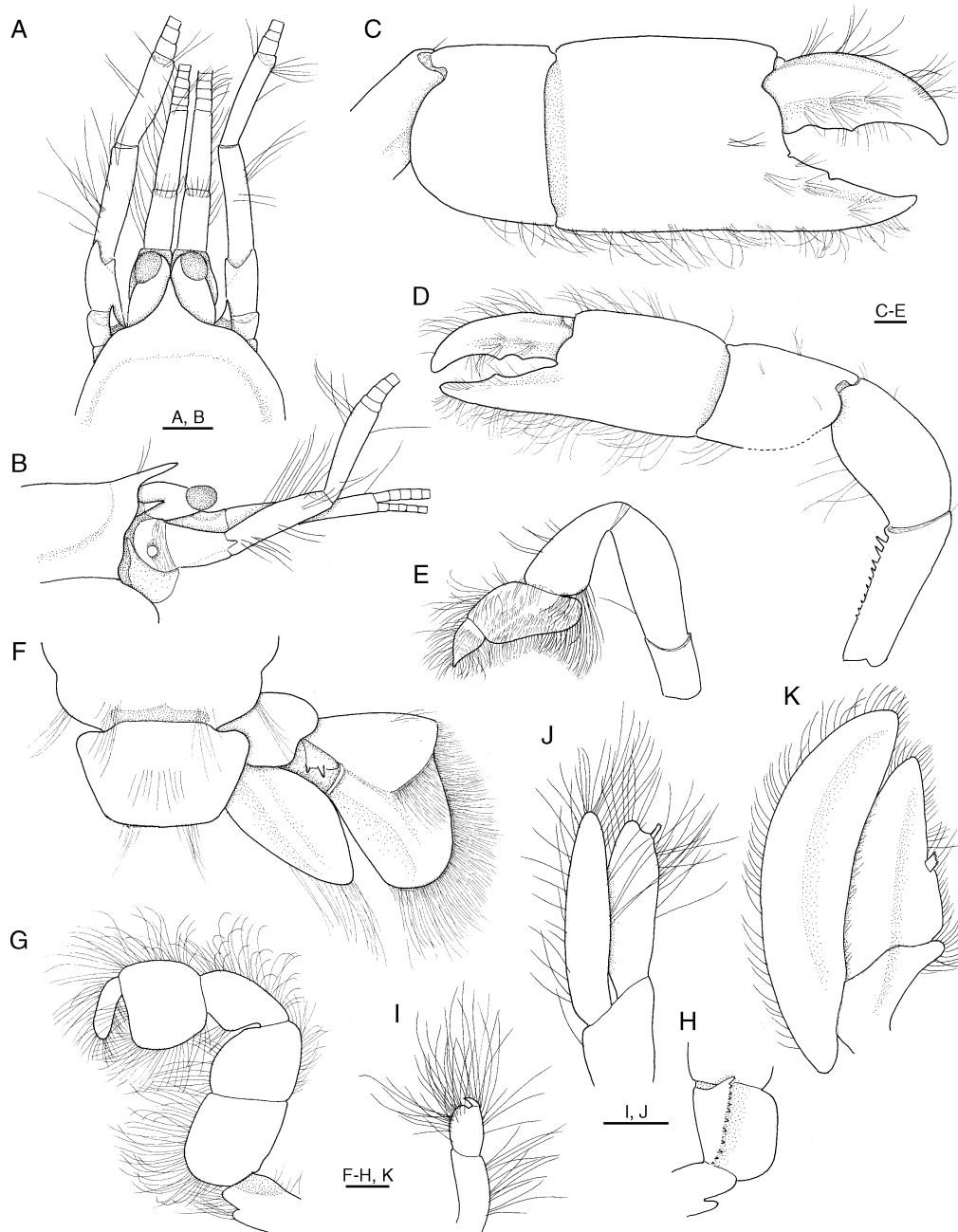


FIG. 13. — *Corallianassa coutierei* (Nobili, 1904), Marquesas, ♂ (MNHN Th 1430); **A**, **B**, anterior part of carapace in dorsal and lateral view; **C**, distal part of major pereopod 1; **D**, minor pereopod 1; **E**, pereopod 3; **F**, telson and uropods; **G**, **H**, maxilliped 3 and ischium in mesial view; **I**, pleopod 1; **J**, pleopod 2; **K**, pleopod 3. Scale bars: 1 mm.

sidewalk with sand, IX.1997, R. von Cosel, J. Trondlé and J. Tardy coll., 1 broken ♂, cl. 11 mm, tl. 41.5 mm, major P1 broken at level of distal part of merus (MNHN Th 1430).

OTHER MATERIAL EXAMINED FOR COMPARISON. — *Corallianassa coutierei*: Arabian Gulf. Mission J. Bonnier & Ch. Perez 1901, 1 ♂, cl. 14 mm, tl. 53 mm (MNHN Th 74).

Madagascar. Îles Glorieuses, intertidal, 29.I.1971, A. Crosnier coll., 1 ovig. ♀, cl. 17.5 mm, tl. 67.5 mm (MNHN Th 476); Nosy Bé, no date, B. Thomassin coll., 1 ♂, cl. 9 mm, tl. 31.5 mm (MNHN Th 475).

Corallianassa xutha Manning, 1988: **Clipperton Island.** 14.VIII.1958, F. A. Chace Jr leg., 1 ♀, cl. 9.5 mm, tl. 35 mm (MNHN Th 99).

Corallianassa longiventris (A. Milne-Edwards, 1870): **Martinique.** Lectotype (selected by de Saint Laurent & Le Loeuff 1979), ♀, cl. 9.5 mm, tl. 38.5 mm (MNHN Th 86); 1 paralectotype ♂, cl. 12 mm, tl. 46.5 mm (MNHN Th 87).

Bahia. 1913, P. Serre coll., 1 ♀, cl. 19 mm, tl. 68 mm (MNHN Th 505).

Florida. Palm Beach County, 12.VIII.1987, D. L. Felder, W. D. Lee, P. Mikkelsen coll., 1 ♀, cl. 26.5 mm, tl. 105.5 mm, 3 ♂♂, cl. 17-23 mm, tl. 67-88 mm (MNHN Th 1273).

Glypturus acanthochirus Stimpson, 1866: **Martinique.** IX.1984, Célimène leg., 1 ♂, cl. 24 mm, tl. 81 mm (MNHN Th 676).

Glypturus lauræ (de Saint Laurent, 1984). **Jordan.** Aqaba, I.1983, J. de Vaugelas coll., holotype, ♀, cl. 34 mm, tl. 125 mm (MNHN Th 648).

DISTRIBUTION. — Djibouti (Nobili 1904); Suba off Seba, Indonesia (de Man 1928b), Tuléar Madagascar, Philippines, Tahiti (Sakai 1999), Marquesas Islands, French Polynesia.

DESCRIPTION

Rostrum (Fig. 13A, B) triangular with pointed tip overreaching midlength of eyestalks and slightly upturned; anterolateral spines of carapace with proximal non-calcified membrane. Abdominal segment 2 a little longer than segment 6 (7/6.5 mm). Telson (Fig. 13F) wider proximally than distally, posterior border straight.

Eyestalks (Fig. 13A, B) with terminal rounded corneas. A1 peduncle shorter than that of A2 (Fig. 13A) reaching approximately midlength of last A2 article. Mxp3 (Fig. 13G, H) subpediform, with moderate spinous crest on ischium, propodus strongly widened ventrally, nearly quadrate.

P1 unequal; minor P1 (Fig. 13D) with ischium bearing lower spines larger distally, merus ovate

and unarmed; ischium and merus of major P1 (Fig. 13C) missing; carpus and propodus of both major and minor P1 unarmed with a small tooth on cutting edge of fixed finger, two teeth on cutting edge of dactylus. P3 (Fig. 13E) propodus with small posterior lobe.

Plp1 (Fig. 13I) two-segmented with small distal hook; Plp2 (Fig. 13J) foliaceous, biramous with elongated *appendix interna*; Plp3-5 (Fig. 13K) with embedded and shorter *appendix interna* than that of Plp2. Uropod (Fig. 13F) much longer than telson, exopod with truncate posterior border and two proximal spines; endopod tapering posteriorly.

REMARKS

The present classification of the specimen from Marquesas is based on the following viewpoint: Sakai's synonymy of *Callianassa coutierei* Nobili, 1904 with *Callianassa placida* de Man, 1905 is accepted.

De Man (1928b: 174) noted three differences between the two species: 1) rostrum slightly upturned in *C. coutierei*, downturned in *C. placida*; 2) corneas subterminal in *C. coutierei*, terminal in *C. placida*; and 3) P1 ischium with spines placed perpendicular to lower border in *C. coutierei* as opposed to being directed obliquely forward in *C. placida*.

Examination of the types and other material of *C. coutierei* reveals that these characters are variable: 1) the rostrum in *C. coutierei* can be slightly upturned or nearly horizontal; 2) the corneas are subterminal in the lectotype of *C. coutierei* (see Sakai 1999: fig. 17a) but terminal in the specimen from Nosy Bé (MNHN Th 475) and the present specimen from the Marquesas; and 3) spines on P1 ischium can be perpendicular or obliquely directed forward on the lower border in *C. coutierei* (see Sakai 1999: fig. 18a-d), as in *C. placida*.

Examination of the present material does not confirm the establishment of the genus *Corallichirus* Manning, 1992 (type species: *Corallianassa xutha*), or its separation from the genus *Corallianassa* (type species: *Corallianassa longiventris*).

Manning (1992) placed in *Corallichirus* all those species (formerly assigned to *Corallianassa*) in which “the second abdominal somite is subequal in length to the sixth abdominal somite” whereas *Corallianassa* was “restricted to species in which the second abdominal somite is distinctly longer than the sixth abdominal somite, almost as long as the sixth somite and telson combined” (see also Poore’s [1994] key distinguishing the two genera).

This diagnostic feature, however, is subject to variation. In all material of *Corallianassa coutierei* (or *Corallichirus coutierei* sensu Manning 1992) examined, abdominal segment 2 is longer than abdominal segment 6. In the lectotype (MNHN Th 75), the relative length of segment 2/6 is 7.5/6.5 mm, and segment 2/6 + telson is 7.5/9 mm. Abdominal segment 2 is nearly as long as segment 6 + telson (11/12 mm) in an ovigerous ♀ from Madagascar (MNHN Th 476); it is as long as segment 6 + telson in a ♂ from Nosy Bé (MNHN Th 475) (6.5 mm for both).

As for *Corallianassa longiventris*, both the lectotype (MNHN Th 86) and paralectotype (MNHN Th 87) have abdominal segment 2 as long as segment 6 + telson (6.5 mm for both in the lectotype, 8 mm in the paralectotype). In the material from Florida (four specimens, MNHN Th 1273), abdominal segment 2 is about as long as segment 6 + telson in two ♂ of tl. 67 mm and 88 mm, slightly shorter in the ♂ of tl. 83.5 mm (15/16 mm), but much longer in the large ♀ of tl. 105.5 mm (18.5/15.5 mm).

Another feature mentioned by Manning (1992) is the maximum size: adults of *Corallianassa* may attain a total length of 100 mm, whereas members of *Corallichirus* are smaller with a maximum total length of 55 mm.

The maximum size is unlikely to be a good differentiating character. Furthermore, species of *Corallichirus* (sensu Manning 1992) may include large specimens and in the type material of *C. coutierei*, two large females (one ovigerous, both broken) were referred to (see Nobili 1904: 238; 1906a: 110) as being of tl. 80 mm.

Sakai (1999: 72) considered both *Corallianassa* and *Corallichirus* as synonyms of *Glypturus* s.l. Stimpson, but his action is not justified according to the present examination of material.

This work adopts Manning’s (1987: 390) definition of *Glypturus* s.s., restricting this genus to species with a trispinous front, lateral eye corneas, spines on both merus and palm of P1. These features allow the genus to be distinguished from other callianassid genera and especially from its close relative, *Corallianassa*.

Genus *Neocallichirus* Sakai, 1988

Neocallichirus frouini n. sp.

(Fig. 14)

TYPE MATERIAL. — Holotype: French Polynesia, Tahiti, stn 13, 17°31’25”S, 149°32’08”W, 18 m, mud, 16.I.1995, P. Frouin coll., ♂, cl. 5.5, tl. 19 mm (MNHN Th 1432) (Fig. 14A, B, I, L, M). Paratypes: stn 15, 17°31’30”S, 149°32’12”W, 6 m, fine sand, 5.VII.1994, P. Frouin coll., 4 ♂♂, cl. 4.5 mm, tl. 16 mm (Fig. 14C-H, J, K, N), cl. 3.5-4 mm, tl. 12.5-14 mm, 2 ♀♀, cl. 3.5 mm, tl. 12.5 mm (Fig. 14O), cl. 3 mm, tl. 11 mm (MNHN Th 1433).

ETYMOLOGY. — The species is named for Patrick Frouin who collected the material.

OTHER MATERIAL EXAMINED. — *Neocallichirus mauritanus* (Miers, 1882): Mauritius. 1880, Robillard coll., 1 ♀, cl. 13 mm, tl. 48 mm (MNHN Th 504).

DISTRIBUTION. — Only known from Tahiti.

DIAGNOSIS. — Rostrum very short, no rostral spine; abdominal segments 3-5 with lateral tufts of setae; telson with lateral borders regularly curved, posterior border weakly concave medially, unarmed.

Eyestalk with cornea dorsal, subterminal, disk-shaped; A1 peduncle shorter than that of A2. Mxp3 subpediform with both ischium and merus tapering distally; propodus with rounded lower border, about three or four times as wide as dactylus at proximal third, narrowing distally; dactylus digitiform, slender.

P1 unequal, dissimilar. Major P1 ischium convex with 12-16 lower spinules; merus with dilated lower border, widest in proximal third carrying two or three large spines, narrower distally with five to six spinules; carpus, propodal palm and fixed finger unarmed.

Plp1 uniramous, Plp2 biramous with *appendix interna* in both sexes; Plp3 with embedded *appendix interna*. Uropod exopod with rounded posterior border, uropod endopod subquadrate.

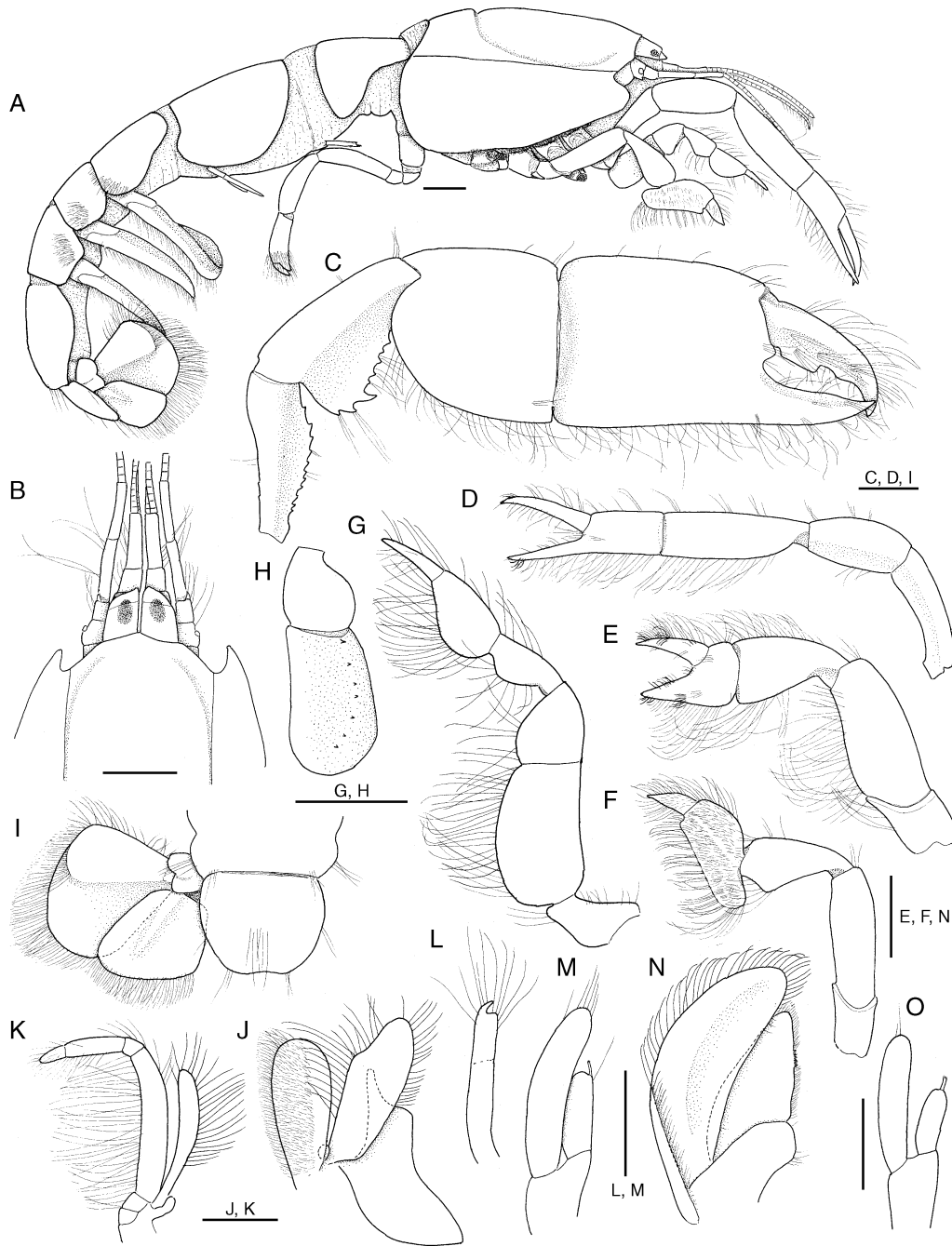


FIG. 14. — *Neocallichirus frouini* n. sp., Tahiti; **A, B, I, L, M**, holotype, ♂ (MNHN Th 1432); **C-H, J, K, N**, ♂ paratype (MNHN Th 1433); **O**, ♀ paratype (MNHN Th 1433); **A**, lateral view; **B**, anterior part of carapace; **C, D**, major and minor pereopod 1; **E, F**, pereopod 2 and 3; **G, H**, maxilliped 3 and ischium in mesial view; **I**, telson and uropods; **J, K**, maxilliped 1 and 2; **L**, pleopod 1; **M, O**, pleopod 2; **N**, pleopod 3. Scale bars: A-I, L-N, 1 mm; J, K, O, 0.5 mm.

DESCRIPTION

Carapace (Fig. 14B) with very short triangular rostrum, no rostral spine. Abdominal segments 3-5 (Fig. 14A) with lateral tufts of setae. Telson (Fig. 14I) approximately 1.2 times as wide as long, lateral borders regularly curved, posterior border slightly concave medially, unarmed.

Eyestalk (Fig. 14B) with blunt distal tip; cornea dorsal, subterminal, disk-shaped. A1 peduncle shorter than that of A2, reaching about midlength of last A2 article, latter about as long as penultimate; antennal acicle very small. Mxp1 (Fig. 14J) epipod tapering distally. Mxp2 (Fig. 14K) exopod shorter than merus, small epipod. Mxp3 subpediform (Fig. 14G, H) without exopod, both ischium and merus with lower border regularly curved and tapering distally; ischium nearly twice as long as merus bearing weak mesial crest of spinules; carpus as long as merus, lower border rounded; propodus about three or four times as wide as dactylus near proximal third, narrowing distally to digitiform slender dactylus.

P1 unequal, dissimilar. Major P1 (Fig. 14C) ischium with convex lower border bearing 12-16 spinules; merus with dilated triangular lower border, wide in proximal third carrying two or three large spines, narrower distally with five to six spinules; carpus about as long as merus, lower border rounded posteriorly, unarmed; propodal palm approximately one and a half times as long as carpus and twice as long as fingers, unarmed and so is fixed finger; dactylus cutting edge with large flat tooth proximally and small triangular tooth on distal third. Minor P1 (Fig. 14D) with all articles unarmed, carpus largest, about twice as long as palm, latter nearly as long as fingers. P2, P3 (Fig. 14E, F) as figured, P3 propodus with moderate rounded posterior lobe; P4 and P5 subchelate.

Male Plp1 (Fig. 14L) uniramous, indistinctly biarticulated with small distal hook-shaped expansion, female Plp1 lost; male Plp2 (Fig. 14M) and female Plp2 (Fig. 14O) biramous with *appendix interna*. Plp3-5 (Fig. 14N) foliaceous, *appendix interna* well embedded with only distal row of thick setae showing on mesial border of endopod. Uropod (Fig. 14I) exopod approxi-

mately triangular with rounded posterior border; endopod broadened posteriorly, subquadrate.

REMARKS

By the slightly concave posterior border of the telson, this new taxon seems close to the genus *Sergio* Manning & Lemaitre, 1993. In *Sergio* species, however, the median cleft on the posterior border of the telson is much more pronounced and sometimes armed with a spine (see Manning & Lemaitre 1993: fig. 1), the telson is broader (about 1.5 times as broad as long in the type species, *S. guassutunga* (Rodrigues, 1971) (see Manning & Felder 1995: fig. 1), and the uropod endopod is slender, longer than broad, tapering distally (Manning & Lemaitre 1993: 40, diagnosis) whereas it is subquadrate in the new taxon. The latter also differs with *Sergio* species by the eye corneas that are neither subterminal nor hemispherical.

The new taxon agrees with the definition of *Neocallichirus* given by Sakai (1988, 1999) and Manning & Felder (1991) in several features except that for the Mxp3, the ischium-merus narrows distally and the propodus is not subquadrate, though ventrally dilated. It is also unusual in having an *appendix interna* on the Plp2 of both male and female. This feature is found in a few other *Neocallichirus* species, e.g., *N. moluccensis* (de Man, 1905) (see Sakai 1999: fig. 25e, f), *N. cacahuate* Felder & Manning, 1995 or *N. raymanningi* Blanco Rambla & Lemaitre, 1999.

Among the Indo-Pacific species of *Neocallichirus*, *N. frouini* n. sp. is most similar to *Neocallichirus mauritianus* (Miers, 1882) (assigned to this genus by Sakai 1999) (see Miers 1884: 15, fig. 2, 2a; de Man 1928a: pl. 2, fig. 4a-c; Kensley 1976: 51, fig. 3). The type material of *N. frouini* n. sp. (tl. 11-19 mm) is compared with a ♀ specimen of *N. mauritianus* from Mauritius (tl. 48mm) (MNHN Th 504). There are similarities in the shape of the eyestalks and corneas, the lower expansion bearing spines of the major P1 merus, the unarmed minor P1 with a long carpus, and the slender Mxp3 with a triangular merus (see Kensley 1976: fig. 3C).

The new taxon can be differentiated from *N. mauritianus* by: 1) lower expansion on major P1 merus with larger spines, at least two large proximal spines in all specimens; 2) major P1 carpus shorter than the palm in male as in female (Fig. 14C) rather than longer than the palm in female of *N. mauritianus* (see de Man 1928a: pl. II, fig. 4b); 3) male major P1 with fixed finger as long as dactylus and no deep excavation between bases of fingers, Fig. 14C; rather than shorter than dactylus with deep excavation between bases in *N. mauritianus* (see Miers 1884: fig. 2a); 4) telson with lateral borders weakly convex, posterior border slightly concave (Fig. 14I) instead of rounded lateral borders and posterior borders straight in *N. mauritianus* (see Kensley 1976: fig. 3B); and 5) the new taxon can also be separated from *N. mauritianus* and all other *Neocallichirus* by the non quadrate Pmx3 propodus (Fig. 14G) (as compared with Kensley 1976: fig. 3C).

The type material of the present species includes only small specimens which however are unlikely to be young representatives of *N. mauritianus* but members of a different taxon.

Subfamily CHERAMINAE
Manning & Felder, 1991
Genus *Cheramus* Bate, 1888

Cheramus sibogae (de Man, 1905)
(Fig. 15)

Callianassa Sibogae de Man, 1905: 613; 1928b: 27, 98.

Callianassa (?*Cheramus*) *Sibogae* – de Man 1928b: 124, pl. 11, fig. 17-17e.

Callianassa sibogae – Ngoc-Ho 1994: 54, fig. 3. — Sakai 1999: 52.

Cheramus sibogae – Tudge *et al.* 2000: 145.

TYPE MATERIAL. — Holotype: Indonesia, Java Anchorage (7°46'S, 114°30'E), *Siboga* Expedition, stn 5, 300 m, ♂ (ZMA De 102 439).

MATERIAL EXAMINED. — French Polynesia. Raiatea Is., Society, FV *Marara*, stn D 91, 16°43.17'S, 151°25.67'E, dredge, 309 m, 9.V.1991, J. Poupin

coll., 1 ♀, cl. 7.5 mm, tl. 23.5 mm, both Mxp3 and one P1 missing (MNHN Th 1434).

DISTRIBUTION. — Java Anchorage, Indonesia (de Man 1905); northwest shelf, Australia (Ngoc-Ho 1994); Raiatea Is., Society, French Polynesia.

REMARKS

This species is assigned to the genus *Cheramus*, following Tudge *et al.* (2000) due to the presence of a rostral spine, subterminal lateral corneas, pereopod 1 without meral hook, pleopods 3-5 slender with digitiform *appendix interna*, elongate uropod exopod (though length is not twice width, as defined by Manning & Felder 1991).

The absence of both Mpx3 as well as one P1 casts a little uncertainty over the identification of the present specimen. It nevertheless agrees well with the holotype of *C. sibogae* (see de Man 1928b: 124, pl. 11, fig. 17-17e) and the material from Australia studied by Ngoc-Ho (1994: 54, fig. 3) in the acute and slightly upturned rostrum (Fig. 15A, B), the form of eyestalks, the A1 and A2 (Fig. 15A), the (presumably) minor P1 (Fig. 15C), and the telson and uropods (Fig. 15K). The P2-P5 (Fig. 15D-G) are all unarmed and the P3 propodus is not expanded ventrally, lacking a posterior lobe.

Female Plp1 (Fig. 15H) is uniramous, Plp2 (Fig. 15I) is biramous, Plp3-5 (Fig. 15J) with slender rami and digitiform *appendix interna*.

Cheramus sp.
(Fig. 16)

MATERIAL EXAMINED. — Tahiti, Society, French Polynesia, stn 15, 17°31'30"S, 149°32'12"W, 6 m, fine sand, 12.IV.1994, P. Frouin coll., 1 ♀, cl. 3.5 mm, tl. 11 mm (Fig. 16A-G, I-K), 2 juvs, cl. 2.3-2.5 mm, tl. 9-9.5 mm (Fig. 16H) (MNHN Th 1435).

REMARKS

With a digitiform Mxp3 dactylus (Fig. 16G), the carapace with dorsal oval and rostral spine (Fig. 16A), finger-like *appendix internae* on the Plp3-5 (Fig. 16L), this material keys, according to Manning & Felder (1991), to the monotypic subfamily Cheraminae. As in some other

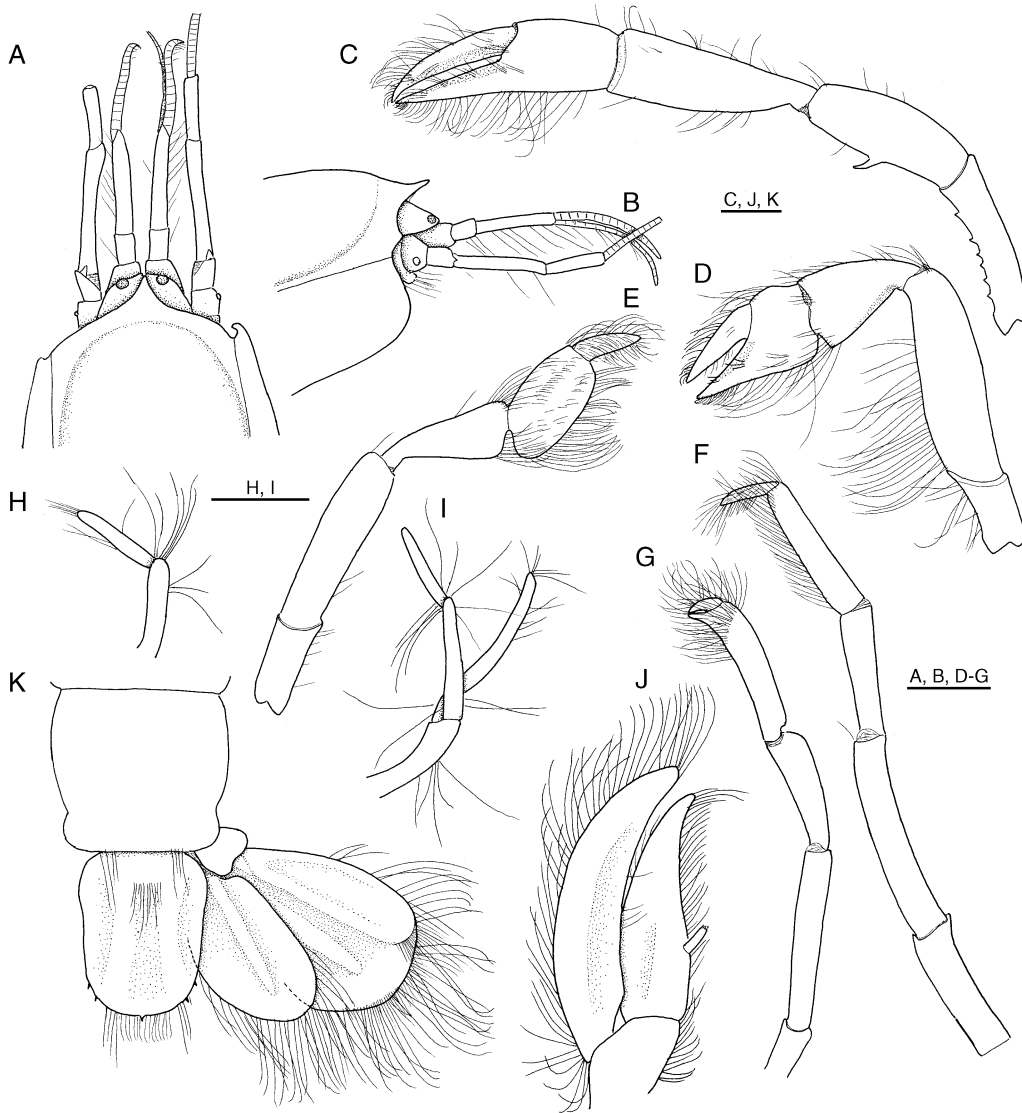


FIG. 15. — *Cheramus sibogae* (de Man, 1905), Raiatea, ♀ (MNHN Th 1434); **A, B**, anterior part of carapace in dorsal and lateral view; **C-G**, pereopod 1-5; **H, I**, pleopod 1 and 2; **J**, pleopod 3; **K**, telson and uropods. Scale bars: 1 mm.

Indopacific species of *Cheramus* (see Tudge *et al.* 2000), e.g., *C. preadatrix* (de Man, 1905) and *C. propinqua* (de Man, 1905), it has a subpediform Mxp3 (Fig. 16F, G) (slightly wider in the juvenile, Fig. 16H), the major P1 (Fig. 16B) lacking a meral hook, the P3 propodus elongated with no posterior lobe (Fig. 16D), the Plp1

(Fig. 16J) slender and uniramous, the Plp2 biramous in female (Fig. 16K). Nevertheless, the uropod exopod is definitely shorter relative to the telson than in the other species.

Other particularities that could be of generic or specific value are: eyes terminal, corneas rounded, A1 and A2 peduncles of about same length (Fig. 16A);

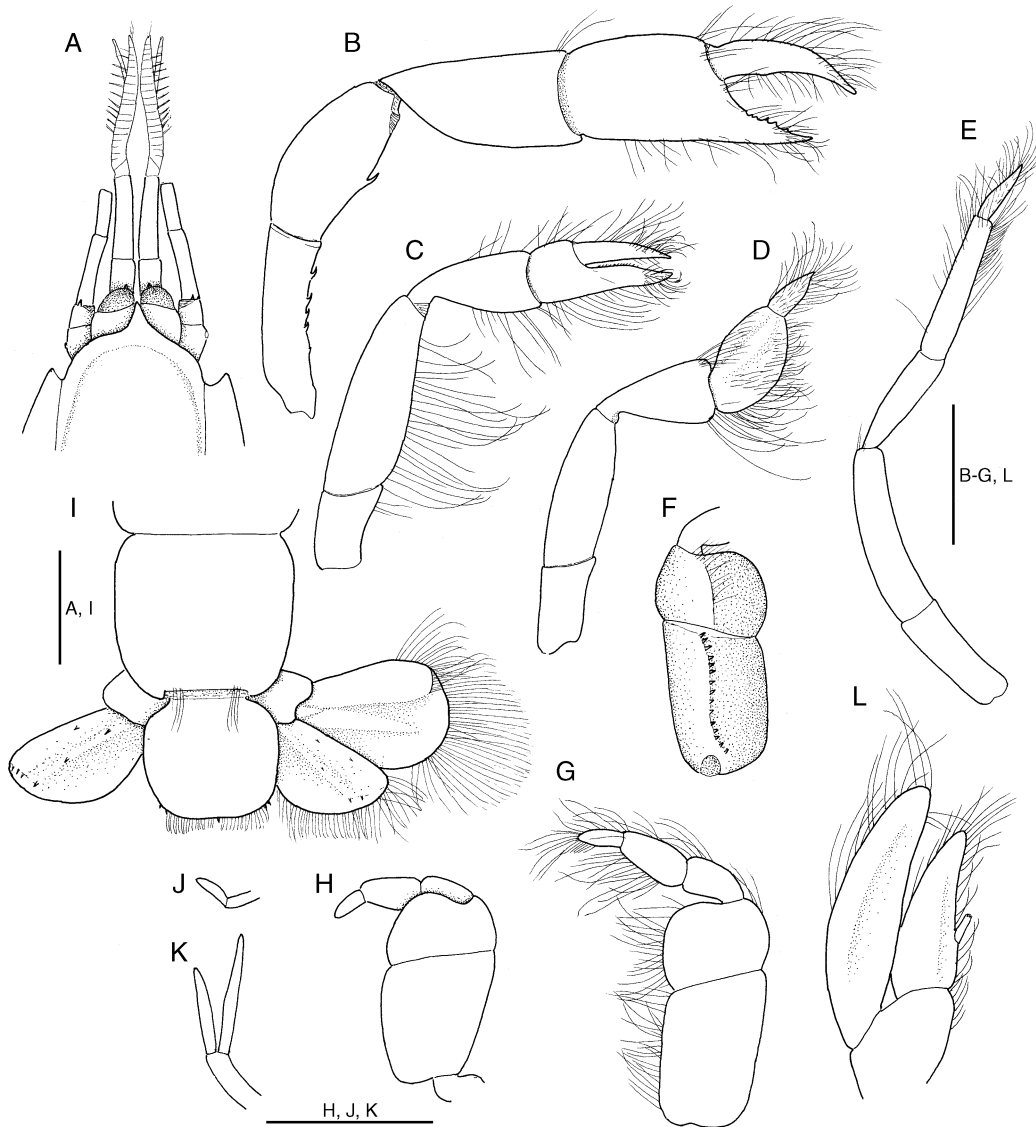


FIG. 16. — *Cheramus* sp., Tahiti; **A-G, I-K**, ♀, tl. 11 mm (MNHN Th 1435); **H**, juvenile, tl. 9.5 mm (MNHN Th 1435); **A**, anterior part of carapace; **B-E**, pereopod 1-4; **F**, ischium and merus of maxilliped 3 in mesial view; **G, H**, maxilliped 3; **I**, telson and uropods; **J, K**, pleopod 1 and 2; **L**, pleopod 3. Scale bars: 1 mm.

P2-5 (Fig. 16C-E) unarmed, telson subquadrate with lateral borders regularly curved (Fig. 16I). Assigning these three specimens to a known or a new taxon is difficult however as they are all young and very small. They are here provisionally placed in the genus *Cheramus* and additional material is needed to determine their status.

Family UPOGEBIIDAE Borradaile, 1903
Genus *Gebiacantha* Ngoc-Ho, 1989

Gebiacantha albengai n. sp.
(Fig. 17)

TYPE MATERIAL. — Holotype: Rapa Island, Austral, French Polynesia, BENTHAUS, in dead corals, 30 m,

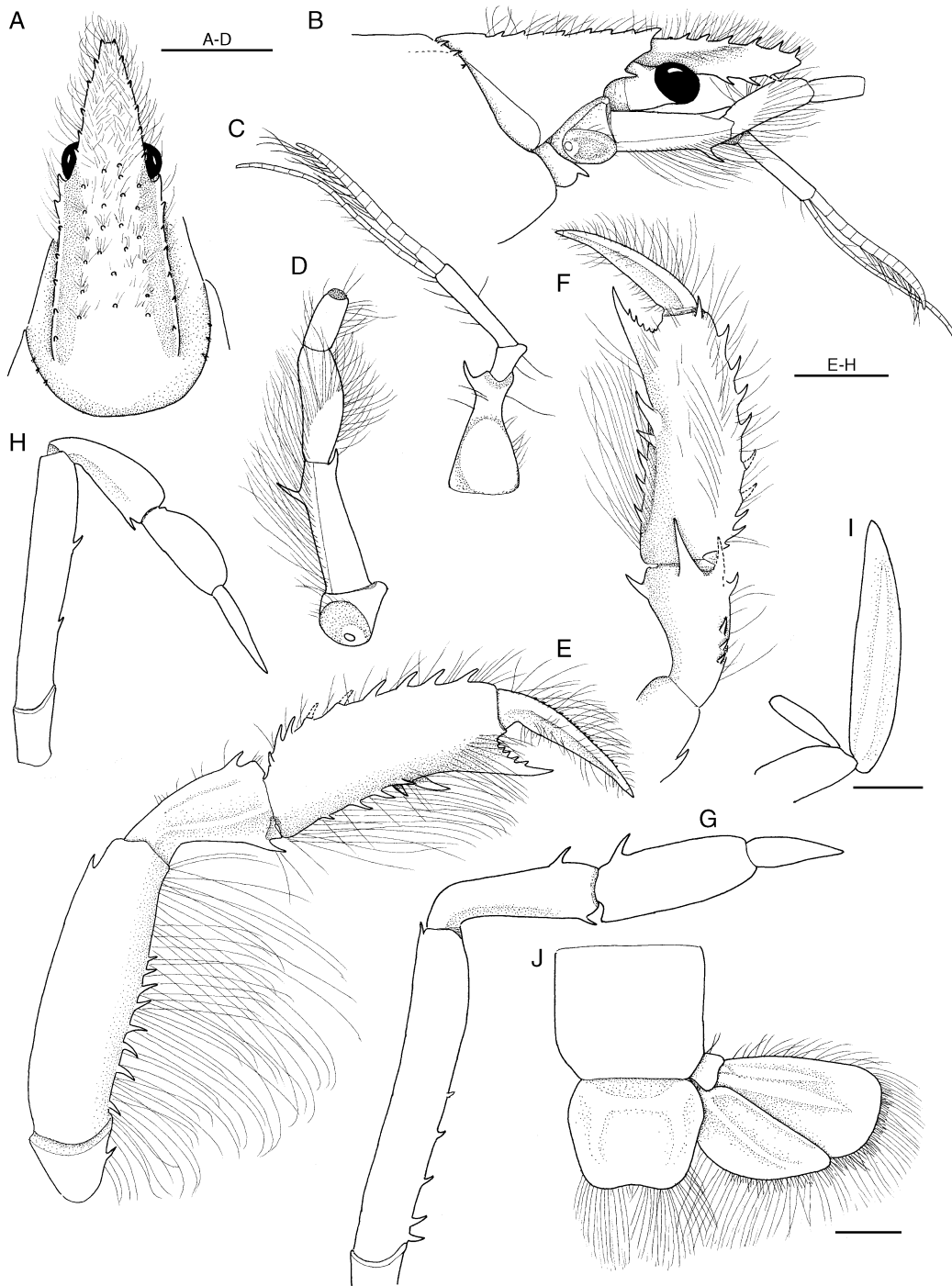


FIG. 17. — *Gebiacantha albengai* n. sp., Rapa, holotype, ♀ (MNHN Th 1436); **A, B**, anterior part of carapace, dorsal and lateral view; **C, D**, antennule and antenna; **E, F**, pereopod 1 and distal part in mesial view; **G, H**, pereopod 2 and 3; **I**, pleopod 3; **J**, telson and uropods. Scale bars: 1 mm.

19.XI.2002, ♀, cl. 6 mm, tl. 14.5 mm (MNHN Th 1436).

ETYMOLOGY. — The species is named for Laurent Albenga who sorted the material.

DISTRIBUTION. — Only known from the type locality.

DIAGNOSIS. — Rostrum nearly twice as long as wide, three infrarostral spines and six small spiniform teeth on lateral border; anterolateral border of carapace with single spine; seven spinules on lateral ridges of gastric region. Telson with lateral borders convex, posterior border concave medially.

A1 peduncle with lower spine on article 1; A2 peduncle with lower spine on article 3. P1 subchelate, lower spine on ischium; upper subdistal spine and seven lower spines on merus; carpus with three upper spines and four subdistal spines: one upper, one lower and two large mesial; propodus bearing nine upper spines and upper mesial distal spine near base of dactylus, four lower spines on proximal half and two mesial lower spines, near base of fixed finger, latter carrying five small pointed teeth on cutting edge. Dactylus dentate on upper border, cutting edge unarmed. P2 merus with upper distal spine and four lower proximal spines; carpus with upper and lower subdistal spine; propodus with upper proximal spine. P3 merus with two lower spines, lower distal spine on carpus.

Uropod exopod and endopod longer than telson, posterior border nearly straight, lateral inner border convex.

DESCRIPTION

Rostrum (Fig. 17A) nearly twice as long as wide at base, far overreaching eyestalks, with three spines on ventral surface (distal broken in holotype) and six small spiniform teeth on each lateral border. Anterolateral border of carapace (Fig. 17B) with spine; epistome with pointed mesial tip. Gastric region with small tubercles alongside shallow and narrow lateral grooves, fine lateral ridges bearing seven spinules. Cervical groove well defined with three dorsolateral spinules on each side; *linea thalassinica* faint, invisible posterior to cervical groove. Telson (Fig. 17J) approximately 1.2 times as wide as long, lateral border convex near proximal third, posterolateral angle rounded, posterior border concave in median part, very faint U-shaped carina on dorsal surface. A1 (Fig. 17C) peduncle with large lower spine on article 1. A2 (Fig. 17D) peduncle with large lower spine on article 3, antennal scale with pointed tip.

P1 (Fig. 17E, F) slender, subchelate. Ischium with lower spine. Merus over three times as long as wide, with upper subdistal spine and seven lower spines. Carpus with fine longitudinal groove on upper part of external surface, three upper spines, four subdistal spines: one upper, one lower and two large mesial. Propodus about 2.5 times as long as wide, bearing nine upper spines and upper mesial distal spine near base of dactylus; lower border with four lower spines on proximal half and two mesial lower spines more distally, near base of fixed finger, latter about half as long as dactylus carrying five small pointed teeth on cutting edge. Dactylus dentate on upper border, cutting edge unarmed. P2 (Fig. 17G) merus with upper distal spine and five spines on proximal half of lower border, carpus with upper and lower subdistal spine; propodus with upper proximal spine. P3 (Fig. 17H) merus with two lower spines; lower distal spine on carpus.

Pleopod 1 uniramous. Plp2-5 (Fig. 17I) foliaceous, lanceolate; exopod nearly three times as long as endopod with a weak longitudinal carina; endopod narrow. Uropod (Fig. 17J) exopod and endopod slender, both longer than telson, posterior border nearly straight, lateral inner border convex.

REMARKS

The new taxon can be placed within the group of *Gebiacantha* species that inhabit warm waters, with the uropods longer than the telson, as mentioned by Ngoc-Ho (1989: 144). Among these, the most closely related to *G. albengai* n. sp. is *G. ceratophora* (de Man, 1905) (see de Man 1928b: 69, fig. 9-9g; de Saint Laurent & Ngoc-Ho 1979: 57, figs 6-8, 22-24; Ngoc-Ho 1994: 64, fig. 5). The two are similar in the long rostrum, the small number of spines on the anterolateral border of the carapace, the A2 peduncle and the shape of the telson. They can be differentiated as follows (characters of *G. ceratophora* in brackets): 1) rostrum nearly twice as long as wide in *G. albengai* n. sp. (vs about 1.3 times as long as wide); 2) three infrarostral spines in *G. albengai* n. sp. (vs one infrarostral spine); 3) P1 propodus

unarmed on mesial surface, with two large lower spines posterior to fixed finger in *G. albengai* n. sp. (vs several spines on mesial surface, one lower spine posterior to fixed finger); and 4) uropodal exopod with nearly straight posterior border in *G. albengai* n. sp. (vs posterior border of uropod exopod rounded).

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REFERENCES

- BALSS H. 1925. — Macrura der Deutschen Tiefsee-Expedition. 1. Palinura, Astacura und Thalassinidea. *Deutsche Tiefsee-Expedition 1808-1809* 20 (4): 189-216, figs 1-16, pls 18, 19.
- BORRADAILE L. A. 1903. — On the classification of the Thalassinidea. *Annals and Magazine of Natural History* ser. 7, 12: 534-551.
- HOLTHUIS L. B. 1958. — Crustacea Decapoda from the Northern Red Sea (Gulf of Aqaba and Sinai Peninsula). I. Macrura. Contributions to the knowledge of the Red Sea, No. 8. *Bulletin of the Sea Fisheries Research Station, Israel* 17: 1-40, figs 1-15.
- KENSLEY B. 1976. — Records of mud-prawns (genus *Callianassa*) from South Africa and Mauritius (Crustacea, Decapoda, Thalassinidea). *Annals of the South African Museum* 69 (3): 47-58, figs 1-5.
- KENSLEY B. 1981. — Notes on *Axiopsis* (*Axiopsis*) *seratifrons* (A. Milne-Edwards) (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* 93 (4): 1253-1263, figs 1-5, tabl. 1.
- KENSLEY B. 1996. — A new species of the axiid shrimp genus *Acanthaxius* from the Caribbean (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* 109 (1): 70-74, figs 1, 2.
- KENSLEY B. 2003. — Axioid shrimps from Guam (Crustacea, Decapoda, Thalassinidea). *Micronesica* 35-36: 361-386, figs 1-10, pls 1-7.
- KOMAI T., OHTSUKA S., NAKAGUCHI K. & GO A. 2002. — Decapod Crustaceans collected from the southern part of the Sea of Japan in 2000-2001 using TRV *Toyoshio-maru*. *Natural History Research* 7 (1): 19-73, figs 1-20.
- LIN F.-J., KENSLEY B. & CHAN T.-Y. 2000. — The rare axiid genus *Oxyrhynchaxius* Parisi, 1917 (Decapoda: Thalassinidea), with a description of a new species from Australia. *Journal of Crustacean Biology* 20, special number 2: 199-206, figs 1-4.
- MAN J. G. DE 1888. — Bericht über die in Indischen Archipel von Dr. J. Brock gesammelten Decapoden und Stomatopoden. *Archiv für Naturgeschichte* 53: 215-600, pls 7-22a.
- MAN J. G. DE 1905. — Diagnoses of new species of Macrurous Decapod Crustacea from the "Siboga Expedition". *Tijdschrift der Nederlandsche Dierkundige Vereeniging Leiden* 9 (2): 587-614.
- MAN J. G. DE 1925. — The Decapoda of the *Siboga* Expedition. Part VI. The Axiidae collected by the *Siboga* Expedition. *Siboga-Expeditie* 39a5: 1-128, pls 1-10.
- MAN J. G. DE 1928a. — A contribution to the knowledge of twenty-two species and three varieties of the genus *Callianassa* (Leach). *Capita Zoologica* 2 (6): 1-56, pls 1-12.
- MAN J. G. DE 1928b. — The Decapoda of the *Siboga* Expedition. Part VII. The Thalassinidae and Callianassidae collected by the *Siboga*-Expedition with some remarks on the Laomediidae. *Siboga-Expeditie* 39 a6: 1-187, pls 1-20.
- MANNING R. B. 1987. — Notes on Western Atlantic Callianassidae (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* 100 (2): 386-401, figs 1-9.
- MANNING R. B. 1992. — A new genus for *Callianassa xutha* Manning (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* 105 (3): 571-574, figs 1, 2.
- MANNING R. B. & FELDER D. L. 1991. — Revision of the American Callianassidae (Crustacea: Decapoda: Thalassinidea). *Proceedings of the Biological Society of Washington* 104 (4): 764-792, figs. 1-18.
- MANNING R. B. & FELDER D. L. 1995. — Description of the ghost shrimp, *Sergio mericeae*, a new species from South Florida, with reexamination of *S. guassutina* (Crustacea: Decapoda: Callianassidae). *Proceedings of the Biological Society of Washington* 108 (2): 266-280, figs 1-5.
- MANNING R. B. & LEMAITRE R. 1993. — *Sergio*, a new genus of ghost shrimp from the Americas (Crustacea: Decapoda: Callianassidae). *Nauplius*, Rio Grande 1: 39-43, fig. 1.
- MIERS E. J. 1884. — On some Crustaceans from Mauritius. *Proceedings of the Zoological Society London*, January 15, 1884: 10-17, pl. 1.
- NGOC-HO N. 1989. — Sur le genre *Gebiacantha* gen. nov. avec la description de cinq espèces nouvelles (Crustacea, Thalassinidea, Upogebiidae). *Bulletin du Muséum national d'Histoire naturelle*, 4^e sér., 11, section A (1): 117-145, figs 1-9, tabl. 1.
- NGOC-HO N. 1991. — Sur quelques Callianassidae et Upogebiidae de Nouvelle-Calédonie (Crustacea, Thalassinidea), in RICHER DE FORGES B. (éd.), *Le*

- benthos des fonds meubles des lagons de Nouvelle-Calédonie*. Vol. I. ORSTOM, Paris: 281-311, figs 1-11.
- NGOC-HO N. 1994. — Some Callianassidae and Upogebiidae from Australia with description of four new species (Crustacea: Decapoda: Thalassinidea). *Memoirs of the Museum of Victoria* 54: 51-78, figs 1-12.
- NGOC-HO N. 2003. — European and Mediterranean Thalassinidea (Crustacea, Decapoda). *Zoosystema* 25 (3): 439-555, figs 1-37.
- NOBILI G. 1904. — Diagnoses préliminaires de vingt-huit espèces nouvelles de stomatopodes et de décapodes macrourus de la mer Rouge. *Bulletin du Muséum d'Histoire naturelle* 10 (5): 228-237.
- NOBILI G. 1906a. — Mission J. Bonnier et Ch. Perez (Golfe Persique 1901) : crustacés décapodes et stomatopodes. *Bulletin scientifique de la France et de la Belgique* 40: 13-159, figs 1-3, pls 2-7.
- NOBILI G. 1906b. — Faune carcinologique de la mer Rouge. Décapodes et stomatopodes. *Annales des Sciences naturelles, Zoologie* 9 (4): 1-347, figs 1-12, pls 1-11.
- POORE G. C. B. 1994. — A phylogeny of the families of Thalassinidea (Crustacea: Decapoda) with keys to families and genera. *Memoirs of the Museum of Victoria* 54: 79-120, figs 1-8.
- POORE G. C. B. 1997. — A review of the thalassinidean families Callianeidae Kossmann, Micheleidae Sakai, and Thomassinidae de Saint Laurent (Crustacea, Decapoda) with description of fifteen new species. *Zoosystema* 19 (2-3): 345-420, figs 1-38.
- POORE G. C. B. & GRIFFIN D. I. G. 1979. — The Thalassinidea (Crustacea: Decapoda) of Australia. *Records of the Australian Museum* 12 (6): 217-321, figs 1-56.
- POUPIN J. 1998. — Crustacea Decapoda and Stomatopoda of French Polynesia. *Atoll Research Bulletin* 451: 1-54, figs 1-9.
- RATHBUN M. J. 1906. — The Brachyura and Macrura of the Hawaiian Islands. *U.S. Fish Commission Bulletin for 1903*, Part 3: 827-930, figs 1-79, pls 1-24.
- SAINT LAURENT M. DE 1973. — Sur la systématique et la phylogénie des Thalassinidea : définition des familles des Callianassidae et Upogebiidae et diagnose de cinq genres nouveaux (Crustacea, Decapoda). *Comptes rendus des séances de l'Académie des Sciences* 277: 513-514.
- SAINT LAURENT M. DE & LE LOEUFF P. 1979. — Campagnes de la *Calypso* au large des côtes atlantiques africaines (1956 et 1959). 22. Crustacés Décapodes Thalassinidea. I. Upogebiidae et Callianassidae. *Annales de l'Institut océanographique* 55 (fasc. suppl.) 29-101, figs 1-28.
- SAINT LAURENT M. DE & NGOC-HO N. 1979. — Description de deux espèces nouvelles du genre *Upogebia* Leach, 1814 (Decapoda, Upogebiidae). *Crustaceana* 37 (1): 57-70, figs 1-40.
- SAKAI K. 1984. — Some Thalassinideans (Decapoda: Crustacea) from Heron Is., Queensland, Eastern Australia, and a new species of *Gouretia* from East Africa. *The Beagle* 1 (11): 95-108, figs 1-7.
- SAKAI K. 1988. — A new genus and five new species of Callianassidae (Crustacea: Decapoda: Thalassinidea) from Northern Australia. *The Beagle* 5 (1): 51-69, figs 1-1.
- SAKAI K. 1992. — Axiid collection of the Zoological Museum, Copenhagen, with the description of one new genus and six new species (Axiidae, Thalassinidea, Crustacea). *Zoologia Scripta* 21 (2): 157-180, figs 1-18.
- SAKAI K. 1994. — Eleven species of Australian Axiidae (Crustacea: Decapoda: Thalassinidea) with description of one new genus and five new species. *The Beagle* 11: 175-202, figs 1-14.
- SAKAI K. 1999. — Synopsis of the family Callianassidae, with keys to subfamilies, genera and species, and the description of new taxa (Crustacea: Decapoda: Thalassinidea). *Zoologische Verhandlungen*, Leiden 326: 1-152, figs 1-33.
- SAKAI K. & SAINT LAURENT M. DE 1989. — A check list of Axiidae (Decapoda, Crustacea, Thalassinidea, Anomura), with remarks and in addition descriptions of a new subfamily, eleven new genera and two new species. *Naturalists* 3: 1-104, figs 1-25.
- STIMPSON W. 1866. — Description of new genera and species of macrurous Crustacea from the coasts of North America. *Proceedings of the Chicago Academy of Sciences* 1: 46-68.
- TIRMIZI N. M. 1983. — Four axiids (Decapoda, Thalassinidea) from Indonesia. *Researches on Crustacea* 12: 85-95.
- TUDGE C. C., POORE G. C. B. & LEMAITRE R. 2000. — Preliminary phylogenetic analysis of generic relationships within the Callianassidae and Ctenochelidae (Decapoda: Thalassinidea: Callianassoidea). *Journal of Crustacean Biology* 20, special number 2: 129-149, figs 1-4.
- ZEHNERTNER I. 1894. — Crustacés de l'Archipel Malais. Voyage de MM. M. Bedot et C. Pictet dans l'Archipel Malais. *Revue suisse de Zoologie* 2: 135-214, pls 7-9.

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