

A new species of *Glyphocrangon* (Crustacea, Decapoda, Caridea, Glyphocrangonidae) from the Austral Islands, French Polynesia

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ABSTRACT

A new species of the deep-water shrimp genus *Glyphocrangon* A. Milne-Edwards, 1881, *G. arduus* n. sp., is described from the Austral Islands, French Polynesia. It is the first representative of Glyphocrangonidae known from French Polynesia. The closest morphological affinities of *G. arduus* n. sp. are with *G. speciosa* Komai, 2004 from New Caledonia and *G. ferox* Komai, 2004 from Madagascar. The new species is readily distinguished from *G. speciosa* by the weak armament of the posterior third carina on the carapace, different shape of the intercarinal tubercles on the carapace and pleon, and the living coloration. From *G. ferox*, *G. arduus* n. sp. is separable by the presence of an acute anterior tooth of the posterior fourth carina on the carapace, sharp intercarinal tubercles on the branchial region and the smaller corneas.

KEY WORDS

Crustacea,
Decapoda,
Caridea,
Glyphocrangonidae,
Glyphocrangon,
French Polynesia,
Austral Islands,
new species.

RÉSUMÉ

Une nouvelle espèce de Glyphocrangon (Crustacea, Decapoda, Caridea, Glyphocrangonidae) des îles Australes, Polynésie française.

Une nouvelle espèce de crevette d'eau profonde appartenant au genre *Glyphocrangon* A. Milne-Edwards, 1881, *G. arduus* n. sp., est décrite des îles Australes, en Polynésie française. Elle est la première représentante des Glyphocrangonidae trouvée en Polynésie française. Les espèces dont elle est morphologiquement les plus proches sont *G. speciosa* Komai, 2004 de Nouvelle-Calédonie et *G. ferox* Komai, 2004 de Madagascar. La nouvelle espèce se distingue de *G. speciosa* par une troisième carène postérieure de la carapace faiblement armée, la forme différente des tubercules situés entre les carènes de la carapace et du pléon, et la coloration des spécimens vivants. *Glyphocrangon arduus* n. sp. se distingue aisément de *G. ferox* par la présence d'une dent antérieure aiguë sur la quatrième carène postérieure de la carapace, des tubercules situés entre les carènes pointues dans la région branchiale et des cornées plus petites.

MOTS CLÉS

Crustacea,
Decapoda,
Caridea,
Glyphocrangonidae,
Glyphocrangon,
Polynésie française,
îles Australes,
espèce nouvelle.

INTRODUCTION

The caridean genus *Glyphocrangon* A. Milne-Edwards, 1881 constitutes a monotypic family Glyphocrangonidae. Species of the genus are exclusively deep-water inhabitants, recorded at depths of 153–6373 m (Holthuis 1971; Gore 1985; Kensley *et al.* 1987; Komai 2004). Komai (2004, 2006) reviewed species of the genus from the Indian Ocean and the western to central Pacific Ocean. At present, 62 species are known from the region (Komai 2004, 2005, 2006). Nevertheless, there is no doubt that the depths of world oceans still await discovery of more unknown forms. In this paper, a new species of *Glyphocrangon* is described from the Austral Islands, the southernmost islands of French Polynesia. It is the first representative of the genus known from French Polynesia. The closest relatives of the new species are *G. speciosa* Komai, 2004 from New Caledonia and *G. ferox* Komai, 2004 from Madagascar.

The BENTHAUS Expedition to the Austral Islands was carried out between 28 October and 28 November 2002, and was named using a combination of the words “BENTHos” and “AUStral”. It was organized by the Institut de Recherche pour Développement (IRD) and the Muséum national d’Histoire naturelle, Paris (MNHN). The measurements given in millimeters are of postorbital carapace length, measured from the posterior orbital margin to posterodorsal margin of the carapace. Other abbreviation used in the text is CP from the French “chalut à perche”, meaning beam trawl. The terminology follows in general that of Komai (2004). The type specimens are deposited in the MNHN and the Natural History Museum and Institute, Chiba (CBM).

SYSTEMATICS

Family GLYPHOCRANGONIDAE

A. Milne-Edwards, 1881

Genus *Glyphocrangon* A. Milne-Edwards, 1881*Glyphocrangon arduus* n. sp.
(Figs 1–3)

TYPE MATERIAL. — Holotype: French Polynesia, Austral Islands, off Tubuai Island, BENTHAUS Expedition,

stn CP 1967, 23°21.4’S, 149°34.2’W, 600–1200 m, 19.XI.2002, ovig. ♀ 28.0 mm (MNHN-Na 16340).

Paratypes: French Polynesia, Austral Islands, off Tubuai Island, BENTHAUS Expedition, stn CP 1965, 23°21.3’S, 149°33.9’W, 500–1200 m, 19.XI.2002, 5 ♀♀ 15.9–25.6 mm, 3 ovig. ♀♀ 28.4–30.1 mm, 2 juveniles 11.2, 11.3 mm (MNHN-Na 16341). — Stn CP 1966, 23°21.3’S, 149°34’W, 636–1200 m, 19.XI.2002, 2 ♀♀ 23.0, 22.4 mm; 3 ovig. ♀♀ 28.3–31.8 mm (MNHN-Na 16342). — Same data as holotype, 1 ♀ 19.4 mm (MNHN-Na 16343); 1 ovig. ♀ 25.7 mm (CBM-ZC 8818).

ETYMOLOGY. — From the Latin *arduus*, meaning steep, referring to the steep slope habitat of the new species.

DISTRIBUTION. — So far known only from off Tubuai Island, Austral Islands, French Polynesia, at depths of 500–1200 m. The precise bathymetric range of the new species remains unclear, because the specimens all came from steep slopes.

DESCRIPTION

Body (Fig. 1) moderately robust. Integument of carapace and abdomen firm, surface naked.

Rostrum (Fig. 1) moderately narrow, 0.55–0.67 of carapace length, noticeably upturned in distal 0.25, deepest at base; armed with 2 pairs of acute teeth on moderately raised dorsolateral ridges; middorsal carina conspicuous throughout length of rostrum, higher than dorsolateral ridges in distal part, extending nearly to anterior groove of carapace, bearing 2–4 tiny tubercles posteriorly; dorsal surface without sculpture; dorsolateral ridge between lateral teeth bluntly edged; ventral surface (Fig. 2A) with shallow median groove becoming narrower and deeper posteriorly, flanked by ventrolateral carinae; midventral carina faint or absent.

Carapace (Figs 1; 2B–D) with lateral and cervical grooves moderately deep. Tubercles on intercarinal spaces acutely or subacutely pointed, subconical or compressed dentiform in shape. First (submedian) carina composed of moderately small, forwardly directed, acute teeth, 6 or 7 on anterior section, 4 on posterior section, posterior end of carina overhanging posterodorsal margin of carapace. Anterior second (intermediate) carina composed of 3 or 4 acute teeth, increasing in size anteriorly, anterior-most tooth prominent; posterior second carina slightly convex in lateral view, composed of 5 or 6 moderately large acute teeth, becoming smaller

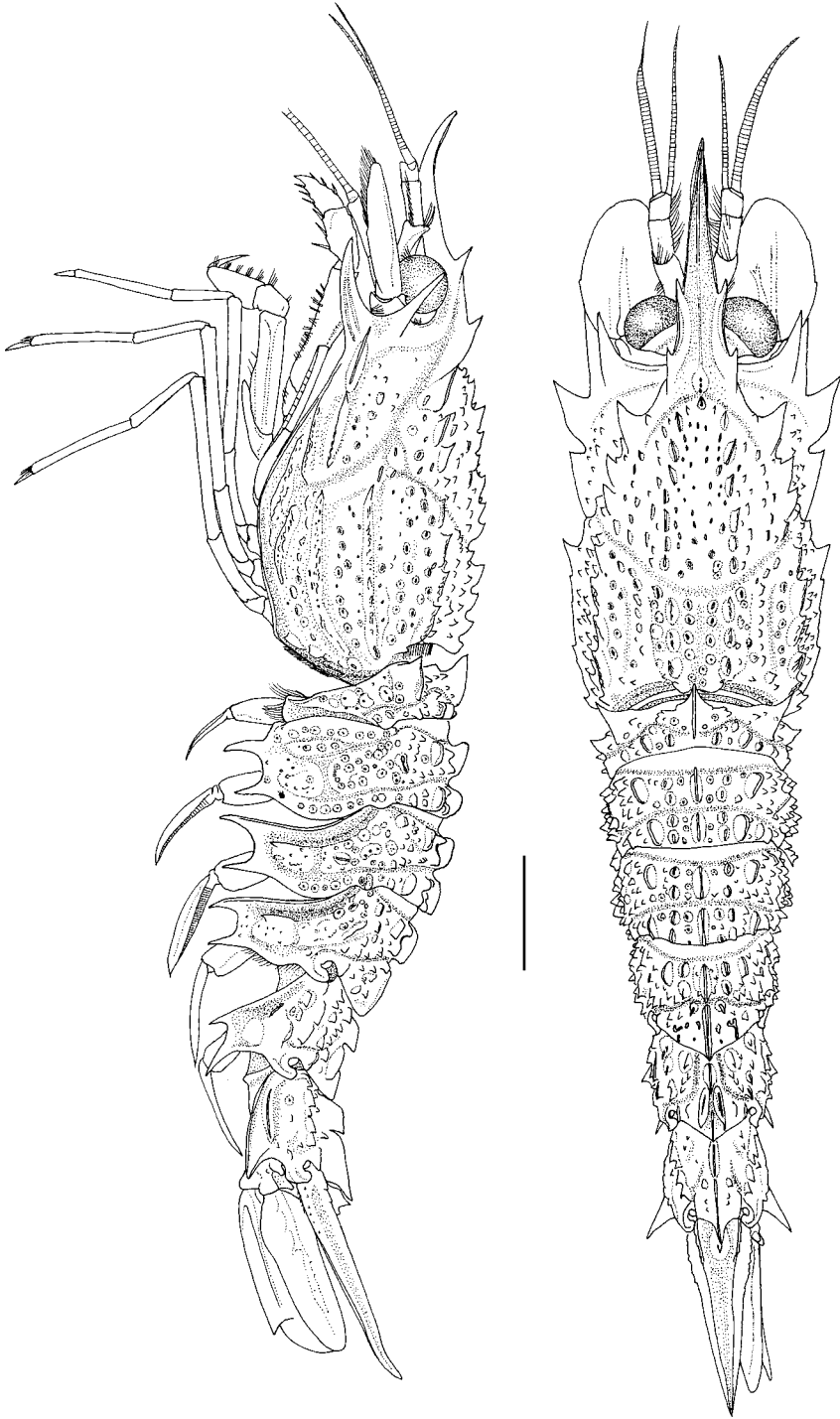


FIG. 1. — *Glyphocrangon arduus* n. sp., holotype, ovigerous female cl 28.0 mm (MNHN-Na 16340), entire animal in dorsal and lateral views. Scale bar: 10 mm.

posteriorly. Anterior third (antennal) carina confined to antennal spine; posterior third carina moderately high, parallel to plane of dorsal margin of carapace, terminating anteriorly in small acute tooth, and with row of 3-5 small, blunt or subacute tubercles or denticles, some of them occasionally obsolete. Anterior fourth (lateral) carina strongly compressed vertically, divided in 2 acute teeth by deep U-shaped notch; anterior tooth large, but not reaching level of orbital margin, distance between tips slightly greater than distance between tips of anterior teeth of posterior third carinae; posterior tooth much smaller than anterior tooth; posterior fourth carina moderately high, faintly tuberculate, subparallel to posterior third carina, terminating anteriorly in small acute tooth. Anterior fifth (sublateral) carina not particularly compressed vertically, surface bluntly edged, eroded; posterior fifth carina low, followed posteriorly by 3 or 4 dentiform tubercles, surface erose. Sixth (submarginal) carina broad, eroded, not extending to posterolateral angle. Submarginal posteroventral ridge independent from sixth carina, showing as acuminate tooth. Posterolateral carina consisting of 3 dentiform tubercles becoming much smaller dorsally. Orbital margin slightly elevated, without submarginal groove. Postorbital region with few, minute spiniform tubercles. Median part of gastric region slightly concave, bearing about 30-40 subconical tubercles arranged in 4 irregular rows; posterior median region with row of 5 or 6 small subconical tubercles on either side of midline. Lateral part of gastric region with about 20 scattered dentiform tubercles on space between first and second carinae; space between second carina and lateral groove with 5-7 dentiform tubercles. Posterior dorsolateral region with 20-30 dentiform tubercles arranged in 4 irregular rows. Hepatic region with upper part weakly inflated, without trace of anterior third carina, but with 15-20 small subconical tubercles; lower part concave, unarmed. Branchial region with upper part bearing about 30-40 scattered subconical tubercles; middle part with about 20 subconical tubercles arranged in 2 or 3 irregular rows; lower part with 2 irregular rows of tubercles. Subbranchial region with space between anterior fifth and sixth carinae concave, unarmed; space between sixth and seventh (marginal) carinae moderately

broad, unarmed. Antennal spines long, not markedly diverging anteriorly, strongly ascending in lateral view (angle about 45° against horizontal plane of carapace), almost straight; somewhat compressed dorsoventrally, without accessory tubercle basally. Branchiostegal spines partially visible in dorsal view, directed forward, slightly curved, exceeding antennal spines, not reaching midlength of antennal scale; lateral face with 2 weak carinae, both not in contact with anterior fourth carina. Posterolateral corner produced in blunt triangular lobe.

Pleon (Fig. 1) covered with numerous small tubercles, those tubercles conical or dentiform, subacutely or acutely pointed; major carinae high, strongly compressed laterally in general, their edges sharp. First pleonal somite with median elevation defined by deep surrounding groove, bearing some small tubercles on either side of median carina; median carina not extending to posterodorsal margin of somite, terminating anterodorsally in large, acute tooth; posterior end of median carina abruptly truncate. Dorsolateral carina terminating anterodorsally in acute tooth; dorsal margin with minute tubercle at posterior end. Lateral carina composed of 2 tubercles, of which anterior tubercle compressed, terminating in acute spine. Pleuron with posterior depression abruptly delimited; anteroventral corner slightly produced, blunt or subacute.

Second to fourth pleonal somites with median carinae each deeply divided in 2 sections by U-shaped notch, none of them acuminate; posterior transverse grooves on terga deep; dorsolateral carinae high, but none acuminate. Ventral lobe of pleural elevation on second somite with small, but distinct acute spine; anterior ridges of ventral lobes of pleural elevations on third and fourth somites each terminating ventrally in acute spine (Fig. 2E); pleural marginal teeth slightly unequal or subequal, long and slender, acuminate. Anteroventral margin of second somite weakly produced in blunt triangular lobe. Posterior dorsolateral carina reaching posterodorsal margin of somite.

Fifth pleonal somite with anterior section of median carina terminating posteriorly in acute tooth, posterior section subacute or blunt. Tergum with deep transverse groove; anterior submedian carinae terminating posteriorly in acute tooth; posterior

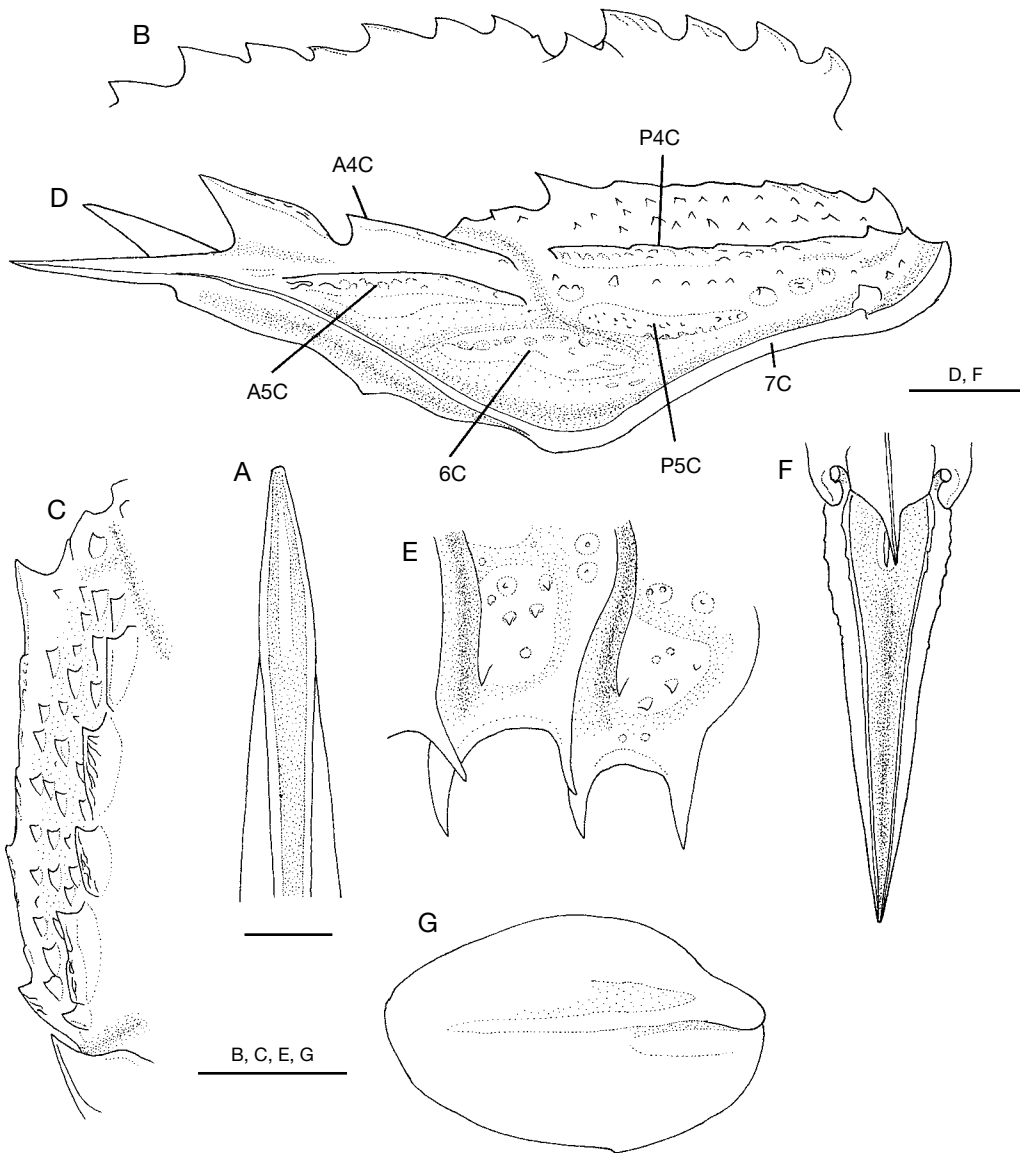


FIG. 2. — *Glyphocrangon arduus* n. sp., holotype, ovigerous female cl 28.0 mm (MNHN-Na 16340): **A**, distal part of rostrum, ventral view; **B**, outline of left first carina of carapace, lateral view; **C**, upper part of left branchial region, dorsal view; **D**, ventrolateral part of carapace, left part, ventral view; **E**, ventral part of pleura of third and fourth pleonal somites, lateral view; **F**, telson, dorsal view; **G**, left antennal scale, lateral view. Abbreviations: **A4C**, anterior fourth carina; **A5C**, anterior fifth carina; **P4C**, posterior fourth carina; **P5C**, posterior fifth carina; **6C**, sixth carina; **7C**, seventh carina. Scale bars: A, 2 mm; B-G, 5 mm.

submedian carinae high, moderately divergent in dorsal view, not reaching posterodorsal margin of somite, each dorsal margin convex. Lateral carina divided in 2 acute or subacute teeth. Pleuron with

2 long, acute ventral teeth; posterior margin always unarmed.

Sixth pleonal somite with crested median carina becoming higher posteriorly, divided in 2 sections

by deep, narrow notch; anterior section of median carina terminating posteriorly in acute tooth, with faintly sinuous dorsal margin; posterior section of median carina terminating posteriorly in rather slender, acute tooth, with faintly sinuous dorsal margin. Tergum with few small spiniform tubercles on either side of midline; lateral carina composed of 5 acute teeth. Pleuron generally concave, with few small spiniform tubercles; lateroventral carina faintly tuberculate; posteroventral tooth strong, supported by conspicuous carina continuous with lateroventral carina.

Telson (Figs 1; 2F) about 0.7 of carapace length; anterior projection strongly compressed laterally, terminating posterodorsally in acute tooth; dorso-lateral carina high, with few tiny tubercles in anterior 0.20; ventrolateral carina with row of tiny tubercles in anterior 0.3.

Cornea (Fig. 1) moderately large, maximal diameter about 0.20 of carapace length, light gray in preservative; ocular peduncle with small process anteromesially.

Antennular peduncle (Fig. 1) reaching or slightly overreaching distal margin of antennal scale; second segment 2.3-2.4 times longer than wide. Outer flagellum with aesthetasc-bearing portion 0.36-0.38 times as long as carapace.

Antennal scale (Figs 1; 2G) oval, about 0.40 times as long as carapace, 1.6-1.8 times longer than wide; dorsal surface naked, with obsolete longitudinal ridges; lateral margin convex, with trace of lateral tooth arising at 0.45 of length of antennal scale. Carpocerite far falling short of distal margin of antennal scale.

Third maxilliped (Figs 1; 3A) overreaching distal margin of antennal scale by 0.2 length of ultimate segment; ultimate segment terminating in sharp spine; marginal spines on distal 2 segments moderately slender; antepenultimate segment with distinct dorsolateral ridge.

First pereopod (Figs 1; 3B) prehensile, devoid of fixed finger; palm naked on lateral surface, with row of tufts of setae dorsomesially; merus with weak longitudinal ridge on lateral surface; ischium with prominent ventral lobe. Second pereopods (Figs 1; 3C) subequal, both not reaching distal margin of antennal scale; left chela slightly larger than right

chela; left carpus composed of 17-19 articles, right carpus composed of 21 or 22 articles. Posterior 3 pairs of pereopods moderately long and slender for genus. Third pereopod (Figs 1; 3D) overreaching distal margin of antennal scale by length of dactylus; dactylus compressed laterally, 0.25 of propodal length. Fourth pereopod (Figs 1; 3E) overreaching distal margin of scaphocerite by half length of dactylus; dactylus (Fig. 3G, H) somewhat depressed dorsoventrally, about 0.25 of propodal length, terminating in simple, acuminate unguis; dorsal surface generally flattened, with short submedian groove accompanied by row of very short setae. Fifth pereopod (Figs 1; 3F) not reaching distal margin of antennal scale; dactylus (Fig. 3I, J) 0.20-0.23 of propodal length, generally similar to that of fourth pereopod in structure.

Gill formula typical of *Glyphocrangon spinicauda* group (cf. Komai 2004).

Egg size about 3.9 × 2.9 mm; number not counted.

Coloration in life

Body generally pale orange; rostrum, dorsal part of carapace, antennal and branchiostegal spines darker. Third maxilliped and first pereopod orange. (Based on a colour slide taken during BENTHAUS Expedition).

Size

Females 15.9-31.8 mm, ovigerous specimens 25.7-31.8 mm.

Variation

Juveniles and young specimen are different from adults in the less tuberculate carapace and abdomen and the proportionally longer rostrum, like other congeneric species.

REMARKS

No male specimens have been available for study, and therefore, it is impossible to assess sexual dimorphism in the new species. The following comparison is restricted to females. Morphologically, *Glyphocrangon arduus* n. sp. is most similar to *G. speciosa* from New Caledonia and *G. ferox* from Madagascar. All three species share at least the following obvious characters: rostrum armed

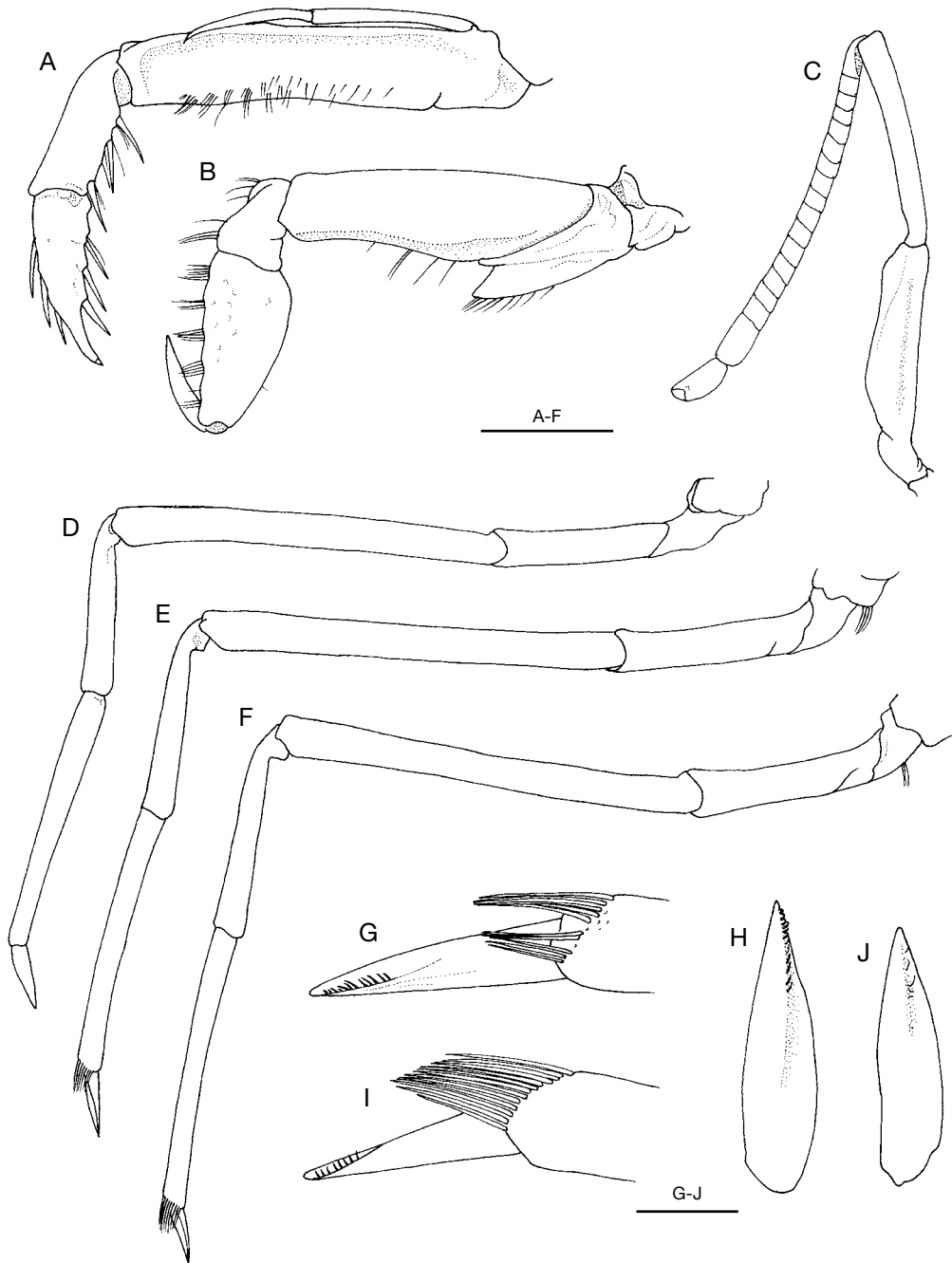


FIG. 3. — *Glyphocrangon arduus* n. sp., holotype, ovigerous female cl 28.0 mm (MNHN-Na 16340), left thoracic appendages: **A**, third maxilliped, lateral view; **B**, first pereopod, lateral view; **C**, second pereopod, lateral view; **D**, third pereopod, lateral view; **E**, fourth pereopod, lateral view; **F**, fifth pereopod, lateral view; **G**, dactylus and distal part of propodus of fourth pereopod, lateral view; **H**, dactylus of fourth pereopod, dorsal view; **I**, dactylus and distal part of propodus of fifth pereopod, lateral view; **J**, dactylus of fifth pereopod, dorsal view. Scale bars: A-F, 5 mm; G-J, 1 mm.

with two pairs of dorsolateral teeth; carapace and abdomen with covering of small tubercles; first carina on carapace composed of row of acute teeth; anterior fourth carina on carapace deeply divided in two acuminate teeth; ventral lobes of lateral elevations of third and fourth pleonal pleura each terminating in acute spine; dactyli of fourth and fifth pereopods subspatulate, acuminate. The new species is distinguished from *G. speciosa* by the armament of the carapace and pleon. The posterior third carina of the carapace is armed with three to five small denticles or tubercles in *G. arduus* n. sp., rather than having five to eight sharp teeth in *G. speciosa*. The intercarinal tubercles on the carapace and pleon are generally weaker in *G. arduus* n. sp. than in *G. speciosa*. Furthermore, the colour in life is quite different between the two species. The general colour of the body and appendages of *G. arduus* n. sp. is light orange, but that of *G. speciosa* is crimson. *Glyphocrangon arduus* n. sp. differs from *G. ferox* in having an acute tooth at the anterior end of the posterior fourth carina of the carapace, acute or subacute intercarinal tubercles on the branchial region of the carapace and the smaller cornea (the maximal diameter 0.19-0.20 times of the carapace length versus 0.25-0.27 times). In *G. ferox*, the posterior fourth carina terminates bluntly at the anterior end; intercarinal tubercles on the branchial region are all blunt.

In the last two decades, active surveys on the bathyal fauna in French Polynesia have been carried out (Poupin 1996, 1998; Richer de Forges *et al.* 1999; <http://www.tropicaldeepseabenthos.org>), but this new species is the first and unique representative of *Glyphocrangon* from the region. *Glyphocrangon* species prefer in general soft bottoms on the continental slopes to ocean floor (Komai 2004). The scarce record of *Glyphocrangon* in French Polynesia may reflect that suitable habitats for species of *Glyphocrangon* are rather scarce in the regions. The present new species was discovered from samples from a steep slope with a depth range of 500-1200 m. Komai (2004, 2006) discussed that Indo-West Pacific species of *Glyphocrangon* show high degree of endemism, and the present new species may be an endemic element of the southern part of French Polynesia.

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