

A new genus and species of pontoniine shrimp (Crustacea, Decapoda, Palaemonidae, Pontoniinae) associated with plumularid hydroids (Hydroidea, Plumularidae) in Vietnam

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ABSTRACT

A new pontoniine shrimp, *Rapipontonia paragalene* n. gen., n. sp., is described from Nhatrang Bay, Vietnam. *Rapipontonia* n. gen. is morphologically most similar to *Manipontonia* Bruce, Okuno & Li, 2005. The two genera share the presence of long plumose setae on the coxa of the third maxilliped. *Rapipontonia* n. gen. can be distinguished from *Manipontonia* by the more elevated proximal half of the rostrum; the epigastric tooth being separated from the carapace by a suture; the presence of a single basal endite on the maxilla; the expanded caridean lobe on the first maxilliped; and the third maxilliped bearing a distinct suture between the ishiomerus and basis. The presence of long distoventral spines on the propodus and long curved simple dactylus forming together a grasping mechanism on the third to fifth pereopods is an autapomorphy of the new genus. *Periclimenes galene* Holthuis, 1952 and *P. platalea* Holthuis, 1951 share most features with *R. paragalene* n. gen., n. sp. Therefore, these two species are transferred from *Periclimenes* Costa, 1844 to *Rapipontonia* n. gen.

KEY WORDS

Crustacea,
Decapoda,
Pontoniinae,
symbiosis,
hydroids,
cnidarians,
Vietnam,
new species,
new genus.

RÉSUMÉ

Un genre nouveau et une espèce nouvelle de crevette Pontoniinae (Crustacea, Decapoda, Palaemonidae) associée à des hydroïdes (Hydroidea, Plumularidae) au Vietnam.

Une nouvelle crevette Pontoniinae, *Rapipontonia paragalene* n. gen., n. sp., est décrite de Nhatrang, Vietnam. *Rapipontonia* n. gen. est morphologiquement proche de *Manipontonia* Bruce, Okuno & Li, 2005. La principale synapomorphie de ces deux genres est la présence de longues soies plumeuses sur la coxa du troisième maxillipède. Cependant, *Rapipontonia* n. gen. peut être séparé de *Manipontonia* par la moitié proximale du rostre nettement plus élevée; la dent épigastrique bien individualisée, séparée de la carapace par une suture; la présence d'un seul endite basal sur la maxille; le lobe caridien du premier maxillipède bien développé; et le troisième maxillipède possédant une suture bien marquée entre l'ischioméris et le basis. La présence d'épines distoventrales sur le propode et du dactyle allongé, recourbé et simple, formant ensemble un mécanisme de préhension sur les troisième, quatrième et cinquième périopodes, est une autapomorphie du nouveau genre. *Periclimenes galene* Holthuis, 1952 et *P. platalea* Holthuis, 1951 partagent la plupart de caractères avec *R. paragalene* n. gen., n. sp. et sont donc transférées du genre *Periclimenes* Costa, 1844 au genre *Rapipontonia* n. gen.

MOTS CLÉS

Crustacea,
Decapoda,
Pontoniinae,
symbiose,
hydroïdes,
cnidaires,
Vietnam,
genre nouveau,
espèce nouvelle.

INTRODUCTION

Among cnidarian-associated pontoniine shrimps of the tropical shallow waters, three species, viz., the Indo-West Pacific *Manipontonia psamathe* (De Man, 1902) and *Periclimenes galene* Holthuis, 1952, and the eastern Atlantic *Periclimenes platalea* Holthuis, 1951, are known as symbionts of hydroids (Cnidaria, Hydrozoa). *Manipontonia psamathe* and *P. platalea* associate with a wide range of cnidarian hosts, including anthipatharians, gorgonarians and alcyonarians (Holthuis 1951; Wirtz & d'Udekem d'Acoz 2001; Bruce *et al.* 2005), with only few occasional records from hydroids (Bruce 1976). In contrast, *Periclimenes galene* lives exclusively on hydroids throughout the Indo-West Pacific; this association is well described and photographically documented (e.g., Holthuis 1952; Bruce 1976; Fransen 1994; Bruce & Coombes 1995; Debelius 2001).

In August 2006 during technical work under the auspices of the Marine Military Academy in Nhatrang City, Vietnam, the author collected several shrimps from plumulariid hydroids (Hydroidea, Plumulariidae) growing on harbour piles. Examina-

tion of these specimens revealed that they belong to an undescribed species closely related to *P. galene*. This species is described below as new. Furthermore, several features shared by *P. galene*, *P. platalea*, and the new species from Vietnam, set these species apart from all other species of the heterogeneous genus *Periclimenes* Costa, 1844. Therefore, a new genus is established to accommodate these three species.

Postorbital carapace length (pcl, in mm) is used as a standard length. The material is deposited in the Muséum national d'Histoire naturelle, Paris (MNHN) and Zoological Museum of the Moscow State University, Moscow (ZMMU).

SYSTEMATICS

Family PALAEMONIDAE Rafinesque, 1815
Subfamily PONTONIINAE Kingsley, 1878

Genus *Rapipontonia* n. gen.

TYPE SPECIES. — *Rapipontonia paragalene* n. sp., by present designation.

SPECIES INCLUDED. — *Rapipontonia paragalene* n. sp.; *Periclimenes galene* Holthuis, 1952; *Periclimenes platalea* Holthuis, 1951.

ETYMOLOGY. — The name of the new genus is derived from the grasping mechanism of the dactylus-propodus articulation of ambulatory pereopods: *rapina*, Latin for seizure, capture, claw; *Pontonia* – the type genus of the Pontoniinae. Gender feminine.

DIAGNOSIS. — Medium-sized pontoniine shrimps. Carapace smooth, with antennal, hepatic and epigastric spines; hepatic spine smaller than antennal, situated posterior and slightly above level of antennal spine; epigastric spine well marked, smaller than proximal dorsal rostral tooth, clearly separated from rostral teeth, either separated from carapace by well marked suture or fused to carapace. Rostrum long and slender, with well developed dorsal carina bearing six teeth, ventrally unarmed; four proximal dorsal rostral teeth large, acute, two distal dorsal teeth small. Inferior orbital angle produced. Abdomen smooth, third tergite non-carinate or posteriorly produced; pleura posteroventrally rounded; telson slender, tapering distally, with two pairs of small dorsal spines and three pairs of posterior marginal spines. Ophthalmic somite without ocellar beak. Antennule and antenna normal, without special features, scaphocerite well developed. Eyes with globular cornea. Epistome unarmed. Mandible without palp. Maxillula with bilobed palp, well developed upper and lower laciniae. Maxilla with slender palp, well developed scaphognathite, basal endite well developed; coxal endite lacking. First maxilliped with simple palp, basal endite broad, coxal endite smaller, exopod well developed, caridean lobe well developed, epipod bilobed. Second maxilliped with non-modified endopod, exopod as in first maxilliped, with caridean lobe, epipod small, simple, without podobranch. Third maxilliped with slender segments, ischiomerus and basis fused, with distinct suture, exopod well developed, coxa with rounded lateral plate, single small arthrobranch and several long, plumose setae. Fourth thoracic sternite without finger-like median process, fifth to eighth unarmed. First pereopods slender, fingers simple, with spoon-like tips. Second pereopods slender, unequal in length and shape; fingers simple, with well developed cutting edges, without molar process and fossa. Ambulatory pereopods slender, propodus with three to five pairs of long straight distolateral spines and distinctive plumose setae; dactyls simple, long, slender, curved. Pleopods normal; endopod of male second pleopod with appendix interna bearing terminal cincinnuli; appendix masculina with two terminal serrated setae. Uropods slender, without specific features.

SYSTEMATIC POSITION

Rapipontonia n. gen. is morphologically similar to *Manipontonia* Bruce, Okuno & Li, 2005. The two genera share a long, slender rostrum with well developed

dorsal carina and unarmed ventral margin; presence of antennal, hepatic and epigastric teeth; absence of podobranch on the second maxilliped; and presence of single arthrobranch on the third maxilliped. The presence of long plumose setae on the coxa of third maxilliped, an unusual feature for pontoniine shrimps (Bruce *et al.* 2005), is an additional synapomorphy of these two genera. However, *Rapipontonia* n. gen. can be clearly distinguished from *Manipontonia* by the presence of a single basal endite on the maxilla (vs. both basal and coxal endites present in *Manipontonia*); the presence of a well developed caridean lobe on the first maxilliped (reduced in *Manipontonia*); a well marked suture between the ischiomerus and basis of the third maxilliped (ischiomerus and basis being completely fused in *Manipontonia*); the third pereopod with three to five pairs of long distoventral spines; the epigastric tooth separated from the carapace by a distinct suture, as in *R. galene* and *R. paragalene*, or at most partly fused, as in *R. platalea* (vs. completely fused in *Manipontonia*); and the unarmed dorsal rostral teeth (distoventrally serrated in *Manipontonia*).

Rapipontonia differs from *Periclimenes* sensu stricto with the type species *P. amethysteus* (Risso, 1827) (see Marin 2006 for short diagnosis), by the presence of plumose setae on the coxa of the third maxilliped (absent in *Periclimenes*); the presence of a suture between basal segments of the third maxilliped (completely fused in *Periclimenes*); spatulated fingers of the second pereopod (simple in *Periclimenes*); the simple dactylus of the third pereopod (biunguiculate in *Periclimenes*); and the third pereopod with three to five pairs of long distoventral spines (one pair of small distoventral spines in *Periclimenes*). Thus the long distoventral spines with additional plumose setae and long curved simple dactylus forming grasping mechanism of the dactylus-propodus articulation on the third to fifth pereopods is an autapomorphy of *Rapipontonia* n. gen., clearly separating it from all other pontoniine genera.

Rapipontonia paragalene n. sp. (Figs 1-5)

TYPE MATERIAL. — Holotype: Vietnam, South China Sea, Nhatrang Bay, on pile under pier of Marine Military

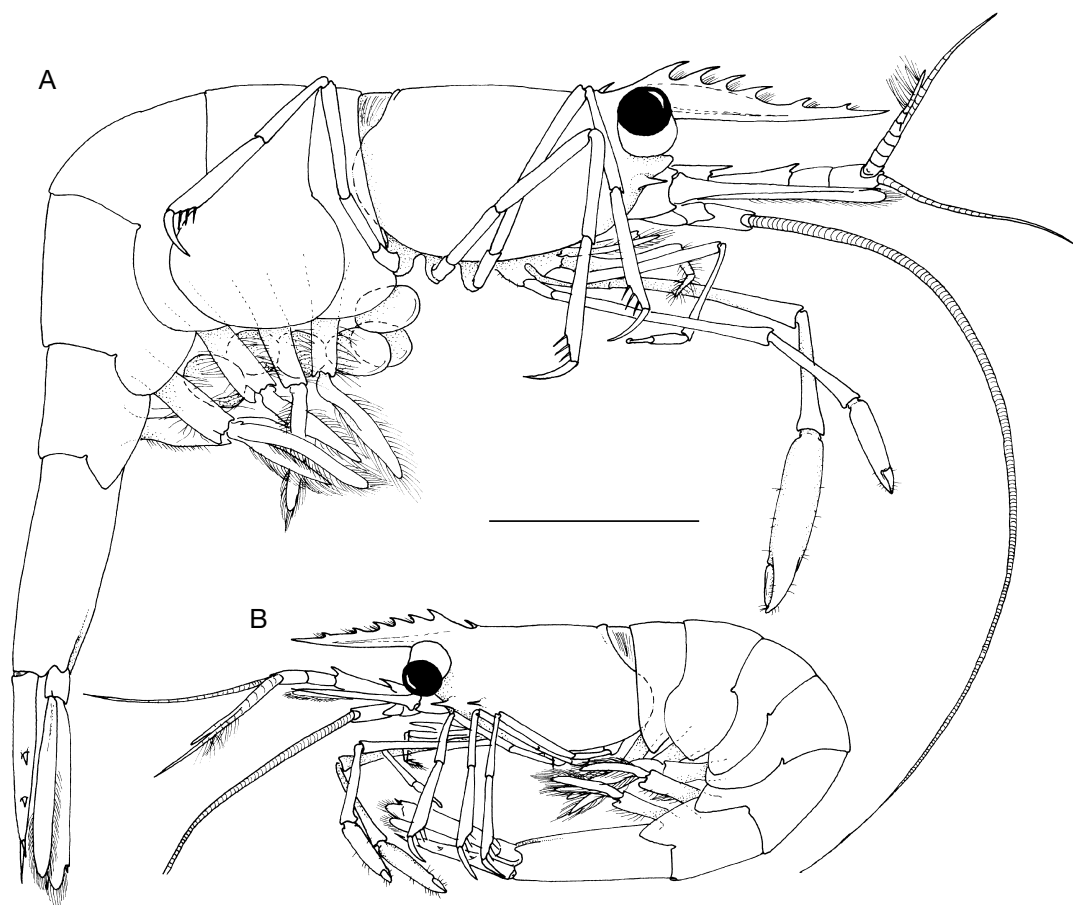


FIG. 1. — *Rapipontonia paragalene* n. gen., n. sp.: **A**, female holotype from Vietnam, pcl 2.5 mm (MNHN); **B**, male allotype from Vietnam, pcl 1.8 mm (MNHN). Scale bar: 2 mm.

Academy (MMA), depth 2 m, on hydroid *Lytocarpia* sp., 17.VII.2006, 1 ovigerous ♀ pcl 2.5 mm (MNHN-Na 16395).

Allotype: same locality as for holotype, 1 ♂ pcl 1.8 mm (MNHN-Na 16396).

Paratypes: Vietnam, South China Sea, Nhatrang Bay, on pile under pier of MMA, depth 2 m, on hydroid *Lytocarpia* sp., 23.VII.2006, 4 ovigerous ♀♀ pcl 2.3, 2.6 (dissected), 3.2, 3.4 mm (photo), 1 ♂ pcl 1.7 mm (ZMMU).

ETYMOLOGY. — The new species is closely related to *Rapipontonia galene* n. comb. (*para*, Latin for similar, resembling).

TYPE LOCALITY. — Nhatrang Bay, Vietnam.

DISTRIBUTION. — Known from the type locality, Nhatrang Bay, Vietnam.

DESCRIPTION (based on female holotype)

Medium-sized shrimps with slender body (Fig. 1). Carapace swollen, smooth, with well developed antennal, hepatic and epigastric teeth; hepatic tooth smaller than antennal, situated posterior and slightly above level of antennal tooth; epigastric tooth well marked, slightly smaller than proximal dorsal tooth, clearly separated from rostral teeth, separated from carapace by a well marked suture. Rostrum (Fig. 2A, B) long and slender, with well developed dorsal carina bearing six teeth, ventrally unarmed; proximal half of rostrum with crest-like carina bearing four large acute teeth; distal half of rostrum slender, with two small teeth. Inferior orbital angle strongly produced, rounded.

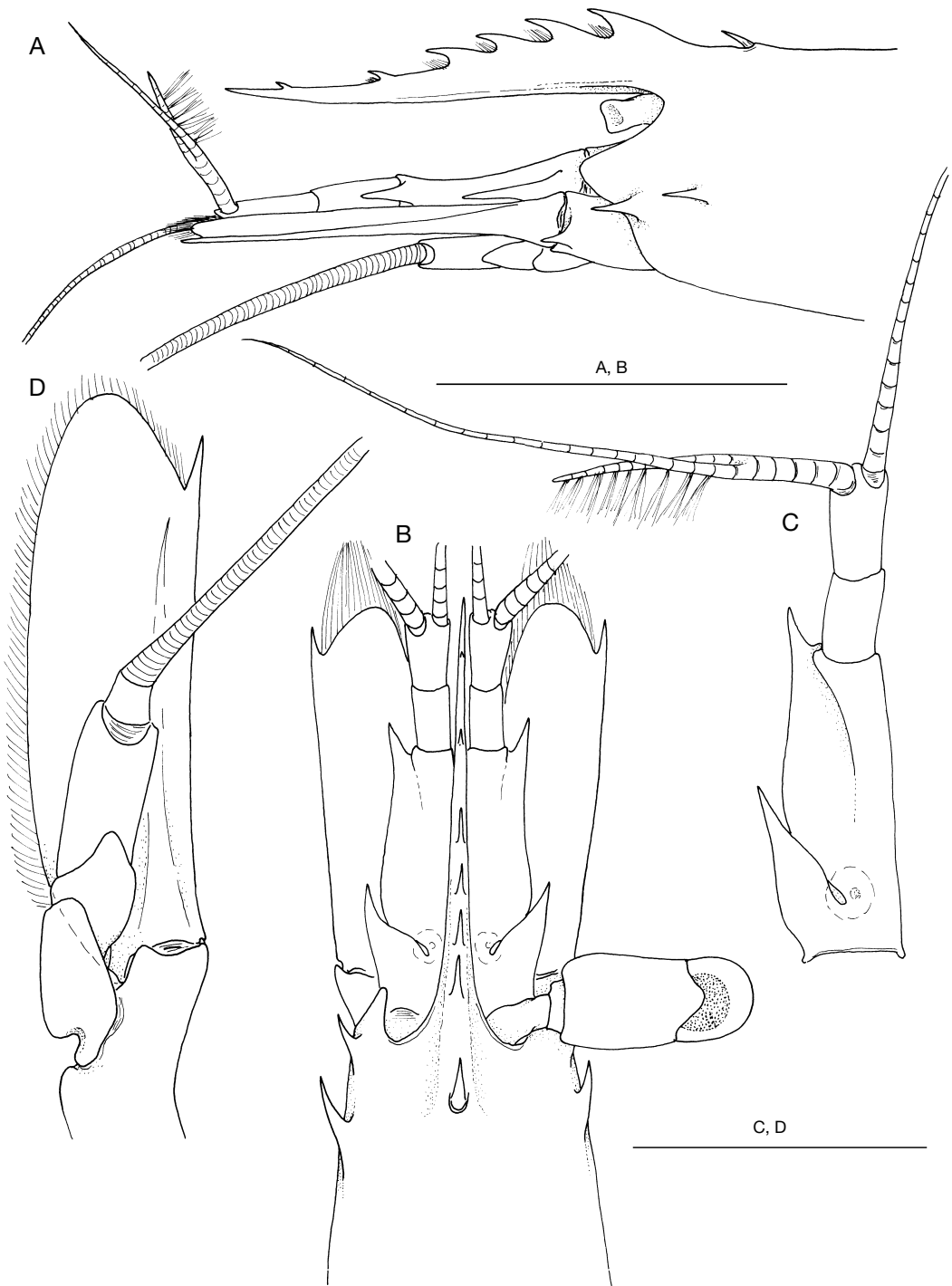


FIG. 2. — *Rapipontonia paragalene* n. gen., n. sp., female paratype from Vietnam, pcl 2.6 mm (ZMMU): **A**, anterior part of carapace, lateral view; **B**, same, dorsal view; **C**, antennule; **D**, antenna. Scale bars: A, B, 2 mm; C, D, 1 mm.

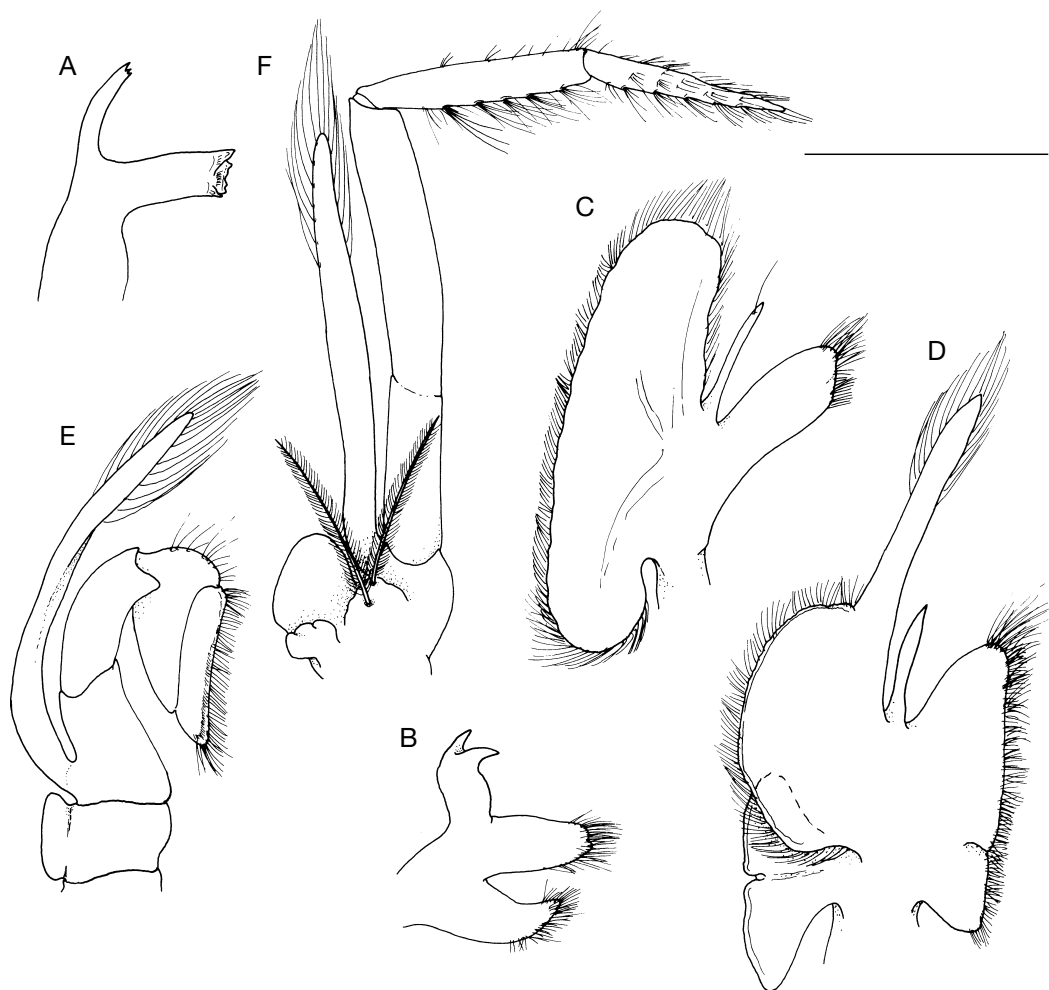


FIG. 3. — *Rapipontonia paragalene* n. gen., n. sp., female paratype from Vietnam, pcl 2.6 mm (ZMMU): **A**, mandible; **B**, maxillula; **C**, maxilla; **D**, first maxilliped; **E**, second maxilliped; **F**, third maxilliped. Scale bar: 1 mm.

Abdominal somites smooth; tergites non-carinate, not posteriorly produced; pleura of first to fifth abdominal somites posteroventrally rounded. Telson (Fig. 4I) slender, four times as long as wide, tapering distally, with two pairs of small dorsal spines at 0.5 and 0.7 of telson length, respectively; posterior margin with three pairs of spines, most-lateral spines shortest, intermediate spines longest, mesial spines more slender than others, about half length of intermediate spine.

Eyes large, cornea rounded.

Antennules (Fig. 2C) with basal segment about three times as long as wide, with distinct ventromesial tooth; lateral portion depressed, well defined (individualized from rest of basal segment), bearing large acute distolateral tooth; stylocerite acute, reaching to about mid-length of basal segment; intermediate segment robust, about 1.5 times as long as wide; distal segment about twice as long as wide; upper (lateral) flagellum long, slender, shorter ramus with more than seven segments, with eight groups of aesthetascs; main ramus with more than

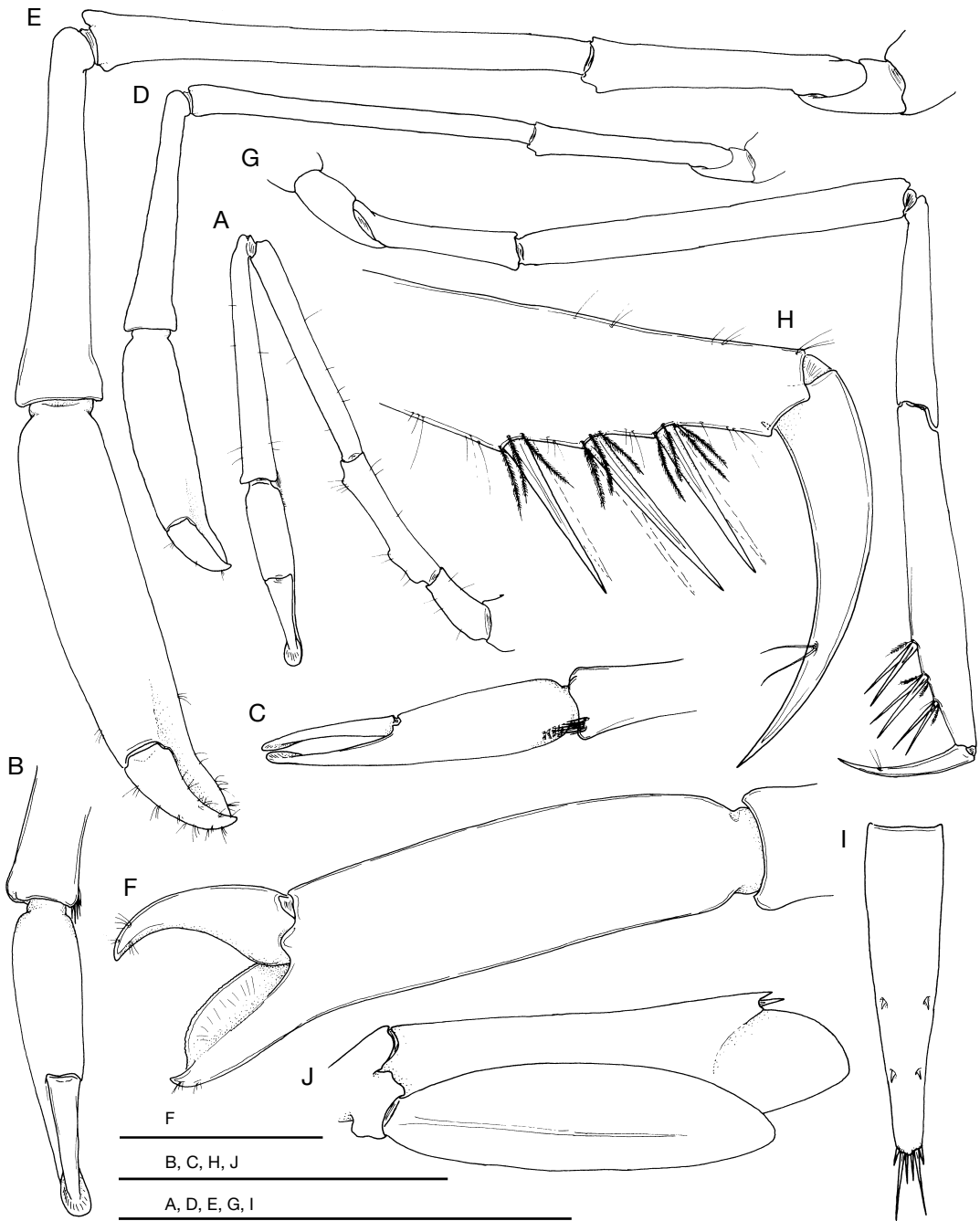


FIG. 4. — *Rapipontonia paragalene* n. gen., n. sp., female paratype from Vietnam, pcl 2.6 mm (ZMMU): **A**, first pereiopod; **B**, **C**, chela of first pereiopod; **D**, minor second pereiopod; **E**, major second pereiopod; **F**, same, chela; **G**, third pereiopod; **H**, dactylus of third pereiopod; **I**, telson; **J**, uropod. Scale bars: **A**, **D**, **E**, **G**, **I**, 2 mm; **B**, **C**, **H**, **J**, 1 mm; **F**, 0.5 mm.

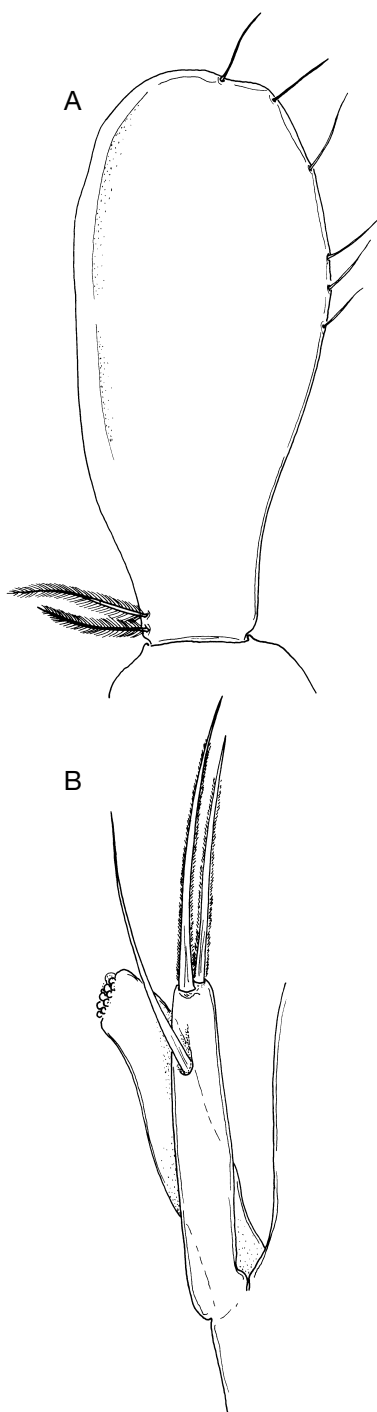


FIG. 5. — *Rapipontonia paragalene* n. gen., n. sp., male allotype from Vietnam, pcl 1.8 mm (MNHN): **A**, endopod of first pleopod; **B**, appendix interna and appendix masculina.

10 segments; lower (mesial) flagellum filiform, with more than 30 segments.

Antenna (Fig. 2D) with distolateral margin of basicerite, with distolateral tooth; carpocerite about 1.5 times as long as wide; scaphocerite slender, exceeding antennular peduncle and rostrum, about three times as long as maximum width, with well developed distolateral tooth, latter not exceeding blade.

Mouthparts without specific features. Mandible (Fig. 3A) without palp; incisor process slender, tapering distally, with three to four distal teeth; molar process well developed. Maxillula (Fig. 3B) with well developed, bilobed palp; upper lacinia larger than lower lacinia, slightly tapering distally, with strong distal spines; lower lacinia slender, distally rounded, with distal setae. Maxilla (Fig. 3C) with well developed, simple palp; basal endite simple, furnished with stiff, elongated setae; coxal endite absent; scaphognathite relatively broad. First maxilliped (Fig. 3D) with distinct endites; palp well developed, without distal setae; exopod with expanded caridean lobe bearing plumose setae marginally; epipod subtriangular. Second maxilliped (Fig. 3E) with normal exopod; distolateral margin of propodus broadly rounded, with slender setae; dactylus about three times as long as broad, with numerous spines along distal margin; epipod poorly developed; podobranch absent.

Third maxilliped (Fig. 3F) relatively slender; coxa with rounded lateral plate and several long plumose setae; basis and ischiomerus fused to single antepenultimate segment, about six times as long as wide, suture between basis and ischiomerus well marked; penultimate segment slender, about four times as long as wide; ultimate segment about four times as long as wide; exopod well developed; single arthrobranch small.

First pereiopod (Fig. 4A) slender, segments unarmed; basis about 1.5 times as long as wide; ischium about three times as long as wide; carpus slender, six times as long as wide; propodus about 4.5 times as long as maximum width, widening distally; palm (Fig. 4B, C) twice as long as wide, subcylindrical; fingers slender, about six times as long as wide, with spoon-like tips and straight cutting edges.

Second pereiopods unequal in size, symmetrical in shape (Fig. 4D, E); basis rectangular; ischium about five times as long as maximal width; merus about ten

times as long as maximal width; carpus about three times as long as maximum width, broadening distally; palm subcylindrical (Fig. 4E), about three times as long as maximal width; fingers robust, about two times as long as wide, about one third of the palm length, curved, with acute tips; dactylus simple, round in cross section, without sharp cutting edge; pollex with well developed lateral carina, without sharp cutting edge (Fig. 4F); ratio dactylus : propodus : carpus approximately equal to 1 : 3 : 3.

Third pereiopod (Fig. 4G) slender; basis about twice as long as wide; ischium about four times as long as wide; merus about 10.5 times as long as wide; carpus about five times as long as maximum width, with slightly projecting distodorsal margin; propodus six times as long as wide, with broadened distal third, bearing three pairs of long spines; dactylus (Fig. 4H) simple, about five times longer than wide, slender, curved, forming together with long propodal spines a grasping mechanism. Fourth and fifth pereiopods similar to third.

Pleopods without specific features. Uropods (Fig. 4J) slender, exceeding telson; lateral margin of uropodal exopod with small subdistal tooth and adjacent spine.

Allotype male smaller in size but otherwise similar to holotype female; body somewhat more slender; endopod of first pleopod oval-shaped (Fig. 5A); endopod of second pleopod with well developed appendix masculina bearing two long plumose terminal setae and one simple submarginal seta (Fig. 5B).

Colour

Body, appendages and eyestalks translucent, with numerous large white chromatophores ordered in longitudinal bands along carapace and abdomen; first to fourth abdominal pleurae with oblique black bands; additional broad black bands present along ventral margin of posterior abdominal segments; four narrow longitudinal black stripes on upper surface of gonads; antennules, distal uropods and telson black; distal part of propodus and fingers of second pereiopod reddish. Gonads and eggs white (Fig. 6).

ECOLOGY

All specimens were found clinging onto plumulariid hydroid, *Lytocarpia* sp. (Hydroidea, Thacaphora,

Plumulariidae) (Fig. 6), growing on harbour piles, at depths of 2-5 m.

VARIATION

In two paratype ovigerous females, largest in the type series (pcl. 3.2; 3.4 mm), the major chela is similar in proportions to the holotype, while the minor chela is comparatively more slender, with the carpus being about twice as long as the palm. Nevertheless, the proportion between the dactylus and the palm remains the same (1 : 3).

REMARKS

The new species is closely related to *Rapipontonia galene* n. comb., but can be clearly separated from the latter species by the shorter fingers and different proportions of distal segments in the second pereiopod, with the ratio dactylus : propodus : carpus of about 1 : 3 : 3 in the holotype *R. paragalene* n. sp. (vs. 1 : 2 : 4 in *R. galene* n. comb.; cf. Holthuis 1952: fig. 24f). In the large specimens of *R. paragalene* n. sp., the second pereiopods are slightly dissimilar in size, with this ratio in the minor chela being about 1 : 3 : 6. *Rapipontonia paragalene* n. sp. also differs from *R. galene* n. comb. by the finger tips of the first pereiopod being less distinctly scoop-shaped (vs. clearly scoop-shaped in *R. galene* n. comb.; cf. Bruce 1976: fig. 3d, e); and the number of distal propodal spines on the third pereiopod: three pairs of equally long spines in *R. paragalene* n. sp. vs. five pairs of unequal spines in *R. galene* n. comb. (cf. Holthuis 1952: fig. 24g), although Bruce (1976: fig. 3g) illustrated three pairs of equally long spines in *R. galene* n. comb. from Kenya. The colour pattern of *R. paragalene* n. sp. also differs from that of *R. galene* n. comb.; the latter species presents numerous broad black and narrow yellow longitudinal on the carapace and abdomen (Debelius 2001: 185).

The remaining species, *Rapipontonia platalea* n. comb., differs from *R. paragalene* n. sp. by the significantly shorter, simple distal portion of the rostrum; and the second pereiopod with larger fingers, about half as long as palm (cf. Holthuis 1951: fig. 32); further, this species is distributed in the Eastern Atlantic (Holthuis 1951; Wirtz & d'Udekem d'Acoz 2001).



FIG. 6. — Colour pattern of *Rapipontonia paragalene* n. gen., n. sp., **A, B**, female paratype from Vietnam (ZMMU), pcl 3.4 mm, in slightly different views, on its host, the plumulariid hydroid, *Lytocarpia* sp. (Hydroidea, Thecaphora, Plumulariidae).

KEY TO THE SPECIES OF *RAPIPONTONIA* N. GEN.

1. Distal portion of rostrum rather short, about 1/4 of total rostral length, simple; epigastric tooth partly fused with carapace. Eastern Atlantic *R. platalea* n. comb. (Cape Verde Islands and Guinea; on black corals, *Antipathes* spp. [Octocorallia, Antipatharia] and gorgonians, *Leptogorgia* spp. [Octocorallia, Gorgonacea])
- Distal portion of rostrum rather long, about 1/3 of total rostral length, with small dorsal tooth; epigastric tooth separated from carapace by suture. Indo-West Pacific 2
2. Second pereopod fingers about 1/3 of palm length; carpus of major second pereopod equal to palm length; in life covered with longitudinal bands of white chromatophores *R. paragalene* n. sp. (Vietnam and, possibly, Japan; on hydroids, *Lytocarpia* sp. [Hydroidea, Thecaphora])
- Second pereopod fingers about 1/2 of palm length; carpus of major second pereopod about twice as long as palm; in life covered with longitudinal bands of black chromatophores *R. galene* n. comb. (Eastern Africa, Seychelles, Philippines, Indonesia, Comoro Islands, Japan, Australia, probably Hawaii; on hydroids, *Lytocarpia* and *Aglaophenia* [Hydroidea, Thecaphora])

The establishment of *Rapipontonia* n. gen. increases the number of pontoniine genera represented in both the Indo-Pacific and the Atlantic Oceans to 11, other genera being *Ascidonia* Fransen, 2002; *Balsia* Kemp, 1922 (Bruce 2004); *Neopontonides* Holthuis, 1951; *Palaemonella* Dana, 1852; *Periclimenaeus* Borradaile, 1915; *Periclimenes* Costa, 1844; *Pontonia* Latreille, 1829; *Pseudocoutierea* Holthuis, 1951; *Tuleariocaris* Hipeau-Jacquotte, 1965 and *Typton* Costa, 1844.

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