

Two new pandalid shrimps and the discovery of the second specimen of the rare hippolytid shrimp *Leontocaris bulga* Taylor & Poore, 1998 (Crustacea, Decapoda) from the Mozambique MAINBAZA cruise

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ABSTRACT

Two new species of the caridean shrimp family Pandalidae were discovered from the recent deep-sea MAINBAZA cruise in the Mozambique Channel. *Pandalina spinicauda* n. sp. is unique in the genus by having much more numerous dorsolateral spines on the telson. *Plesionika neon* n. sp. belongs to the “*Plesionika rostricrescentis* (Bate, 1888)” group that bears distinct basal rostral crest and with elaborate colour patterns, but has the shortest stylocerite and a very different coloration. The rare hippolytid shrimp *Leontocaris bulga* Taylor & Poore, 1998 was also collected by the MAINBAZA cruise. *Leontocaris bulga* has only been known before from a damaged specimen lacking abdomen and collected off Tasmania, and therefore, the Mozambique specimen is described and illustrated in detail.

KEYWORDS

Crustacea,
Decapoda,
Caridea,
Hippolytidae,
Pandalidae,
MAINBAZA,
Mozambique Channel,
new record,
new species.

RÉSUMÉ

Deux nouvelles crevettes Pandalidae et découverte d'un second spécimen de la rare crevette Hippolytidae Leontocaris bulga Taylor & Poore, 1998 lors de la campagne MAINBAZA au Mozambique.

Deux nouvelles espèces de crevettes carides de la famille Pandalidae ont été découvertes lors de la campagne MAINBAZA, faite récemment en mer profonde dans le canal de Mozambique. *Pandalina spinicauda* n. sp. se distingue par un nombre d'épines dorsolatérales sur le telson beaucoup plus élevé que chez les autres espèces du genre. *Plesionika neon* n. sp. appartient au groupe «*Plesionika rostricrescentis* (Bate, 1888)», qui se distingue par une crête rostrale basale marquée et des colorations variées suivant les espèces et très caractéristiques; elle se caractérise par un stylocerite très court et une coloration très particulière. *Leontocaris bulga* n'était connue que par un spécimen sans abdomen, récolté au large de la Tasmanie; le spécimen du Mozambique est décrit et illustré en détail.

MOTS CLÉS

Crustacea,
Decapoda,
Caridea,
Hippolytidae,
Pandalidae,
MAINBAZA,
Canal de Mozambique,
nouvelle signalisation,
espèces nouvelles.

INTRODUCTION

The recent deep-sea survey of the MAINBAZA cruise in the Mozambique Channel, participated by the second author (TYC), obtained a wealthy collection of decapod crustacean material. Two pandalid shrimps were immediately recognized on board as new to science. Another specimen thought to be also a new “pandalid” was later found to be actually a hippolytid after careful examination. Nevertheless, this hippolytid shrimp belongs to a very rarely known species *Leontocaris bulga* Taylor & Poore, 1998, which has only been known before from an incomplete specimen without abdomen and collected from off Tasmania, southern Australia. The two new pandalids are described herein and a detailed description is provided for the MAINBAZA *Leontocaris bulga* specimen as supplementary information of this rare species.

MATERIALS AND METHODS

Specimens used in the present study are deposited in the Muséum national d’Histoire naturelle, Paris (MNHN), National Taiwan Ocean University, Keelung (NTOU) and the National Museum of Natural History, Smithsonian Institution (USNM). The abbreviations before the station numbers refer to the gear types of beam trawl (CP), the Otter Trawl Le Drezen type Solo Hard Bottom 12.4 m (CC) and the Warén Dredge (DW). The postorbital carapace length (cl) is used as a standard measurement indicating the size of specimens.

SYSTEMATICS

Family PANDALIDAE Haworth, 1825
Genus *Pandalina* Calman, 1899

Pandalina spinicauda n. sp.
(Figs 1; 2; 7A)

TYPE MATERIAL. — **Mozambique Channel.** MAINBAZA, stn CP3130, 25°53’S, 33°07’E, 112-127 m, 9.IV.2009, ovigerous ♀ holotype, cl 3.7 mm (MNHN-Na17550).

OTHER MATERIAL EXAMINED. — **Mozambique Channel.** MAINBAZA, stn CC3159, 23°53.80’S, 35°37.8’E, 148-152 m, 15.IV.2009, 1 specimen (sex undetermined, cl 1.9 mm) (MNHN-Na17540). — MAINBAZA, stn CC3175, 25°32.70’S, 33°12.09’E, 155-165 m, 16.IV.2009, 1 specimen (sex undetermined, cl 2.5 mm) (MNHN-Na17541).

ETYMOLOGY. — The name “*spinicauda*” refers to the exceptionally numerous dorsolateral spines on the telson in this new species.

DISTRIBUTION. — Known only from the Mozambique Channel, at depths of 112-165 m.

DESCRIPTION OF HOLOTYPE

Rostrum (Fig. 1A, B) straight, directed forward, reaching level of anterior margin of first segment of antennular peduncle, 0.46 times as long as carapace, tip acuminate; dorsal margin with 8 teeth, including 5 on carapace posterior to level of orbital margin, posterior 6 teeth movable, spine-like, anterior 2 teeth fixed, slightly larger than movable teeth, distal 0.30 unarmed, dorsal teeth almost equidistant except for 2 posteriormost teeth closely set; ventral margin with 3 small fixed teeth in distal 0.40, these teeth decreasing in size anteriorly, ventral blade little developed. Carapace (Fig. 1A-C) with low, but strongly compressed, sharp postrostral median carina extending to midlength; orbital margin evenly concave, lower lobe broadly rounded; antennal tooth moderately small; pterygostomial tooth subequal in size to antennal tooth.

Abdomen (Fig. 1D) dorsally rounded in all somites; posterodorsal margin of third somite substantially produced posteriorly. Pleura of anterior three somites rounded, those of fourth and fifth somites each with acute posteroventral tooth, ventral margin of fifth pleuron gently convex. Sixth somite 1.7 times as long as fifth somite and 2.7 times as long as maximum height; posterolateral process terminating in acute tooth; posteroventral angle with small sharp tooth. Telson (Fig. 1E) subequal in length to sixth somite, tapering posteriorly to blunt apex in posterior 0.60, armed with 17 (left) and 14 (right) dorsolateral spines; posterolateral angle with 2 spines, mesial pair much longer than lateral pair.

Eye (Fig. 1A, C) subpyriform, maximum diameter of cornea 0.26 of carapace length; ocellus distinct, relatively large.

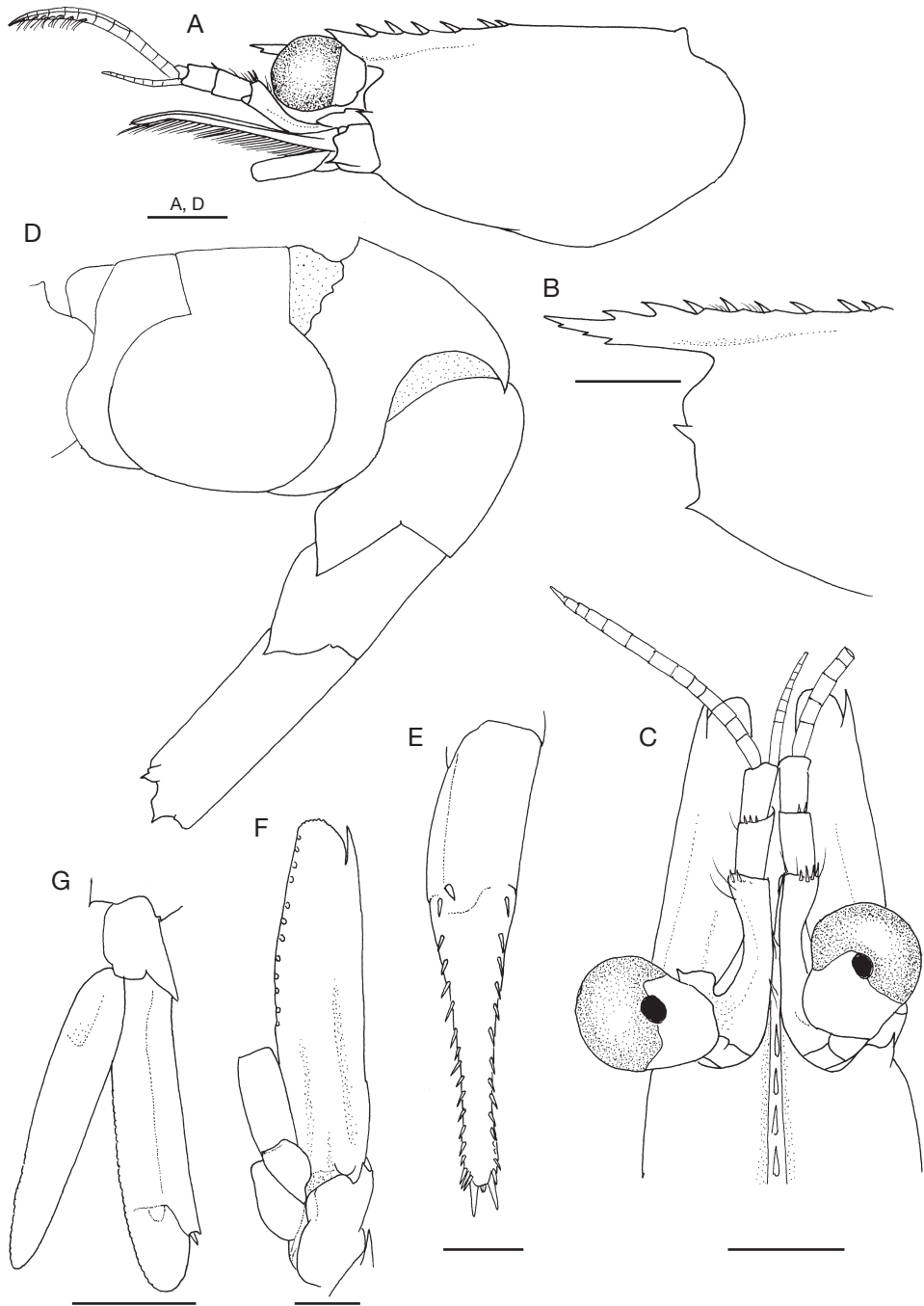


FIG. 1. — *Pandalina spinicauda* n. sp., holotype ovigerous ♀ (cl 3.7 mm), MNHN-Na17550: **A**, carapace and cephalic appendages, lateral view (left); **B**, rostrum and anterior part of carapace, lateral view (left; setae omitted); **C**, anterior part of carapace and cephalic appendages, dorsal view (setae partially omitted); **D**, abdomen, lateral view (setae omitted; third somite damaged); **E**, telson, dorsal view (partially damaged); **F**, left antenna, ventral view (setae omitted); **G**, right uropod, dorsal view (setae omitted). Scale bars: A-D, G, 1 mm; E, F, 0.5 mm.

Antennular peduncle (Fig. 1A, C) reaching distal 0.20 of antennal scale. First segment with small tooth on ventromesial margin, dorsodistal margin with 3 or 4 movable spinules; stylocerite very short, sinuously truncate distally (Fig. 1C), distolateral angle sharply pointed. Distal two segments combined shorter than basal segment; second segment with 2 or 3 spinules on dorsodistal margin; third segment subequal in length to second segment. Outer flagellum short, about 0.7 times as long as carapace, consisting of about 13 articles, distal half with aesthetascs; inner flagellum less than half length of outer flagellum.

Antennal peduncle (Fig. 1A, C) with stout basicerite bearing small ventrodistal tooth; carapocerite reaching 0.4 of antennal scale. Antennal scale (Fig. 1C, F) 0.70 times as long as carapace and about 4.0 times longer than wide; lateral margin nearly straight, distolateral tooth falling slightly short of rounded distal margin of lamella.

Mouthparts not dissected; maxilla with posterior lobe of scaphognathite short, rounded, with several elongate setae (subequal to total length of scaphognathite) on posterior margin. Third maxilliped (Fig. 2A) slender, moderately long; ultimate segment 1.6 times as long as penultimate segment, with terminal cluster of slender spines (Fig. 2B); antepenultimate segment slightly sinuous, longer than distal two segments combined; no exopod.

First pereopod (Fig. 2C) relatively long and slender, microscopically chelate (Fig. 2D); propodus 0.60 times as long as carpus; merus slightly longer than carpus; ischium slender, bearing 4 minute spinules in distal half (Fig. 2E). Second pereopods appreciably unequal, left longer than right, relatively long and slender. Left second pereopod (Fig. 2F) with chela 0.26 times as long as carpus; dactylus slightly shorter than palm; carpus divided into 8 articles, proximalmost article occupying about 0.40 of carpal length; merus about 0.60 times as long as ischium, no annulations apparent; ischium with faint convexity on ventral margin proximally, with short row of stiff setae. Right second pereopod (Fig. 2G) with chela 0.46 times as long as carpus; dactylus shorter than palm; fingers leaving narrow hiatus when closed (Fig. 2H); carpus about

TABLE 1. — Gill formula of *Pandalina spinicauda* n. sp.

Gills/thoracic somites	1 2 3			4 5 6 7 8				
	maxillipeds			pereopods				
Appendages	1	2	3	1	2	3	4	5
Pleurobranchs	0	0	0	1	1	1	1	1
Arthrobranchs	0	0	1	0	0	0	0	0
Podobranchs	0	0	1	0	0	0	0	0
Epipods	1	1	1	1	1	1	1	1
Exopods	1	1	0	0	0	0	0	0

12 times as long as greatest width, divided into 4 articles, proximalmost article occupying about 0.70 length of carpus; merus about 0.60 times as long as ischium, no annulations apparent; ischium similar to that of left in structure. Third pereopod with only proximal 4 segments of right preserved (Fig. 2I); merus about 0.80 times as long as carapace and about 13 times as long as wide, armed with 6 lateral and 7 ventrolateral or ventral spines; ischium with 1 lateral and 2 ventral spines in distal 0.30. Fifth pereopod (Fig. 2J) relatively slender; dactylus noticeably curved, 0.20 times as long as propodus, armed with 2 accessory spinules at midlength; propodus with row of slender spinules on flexor margin, increasing in length distally, distalmost spinule greatly elongate, curved, reaching nearly midlength of dactylus; carpus about 0.6 times as long as propodus, unarmed; merus about 0.60 times as long as carapace, with 7 lateral spines decreasing in length proximally; ischium unarmed.

Uropodal protopod (Fig. 1G) with sharp posterolateral tooth; endopod narrow, gradually tapering distally; exopod slightly broader than endopod, lateral and mesial margins parallel except for distal part, posterolateral angle with minute fixed tooth and movable spinule.

Gill formula given in Table 1. Pleurobranchs present on fourth to eighth thoracic somites. Arthrobranch present only on third thoracic somite (above base of third maxilliped). Podobranch present only on second maxilliped. Epipods present on first maxilliped to fourth pereopods, those on third maxilliped to fourth pereopods strap-like each with terminal hook.

Eggs small and numerous, measuring about 1.0 × 0.8 mm.

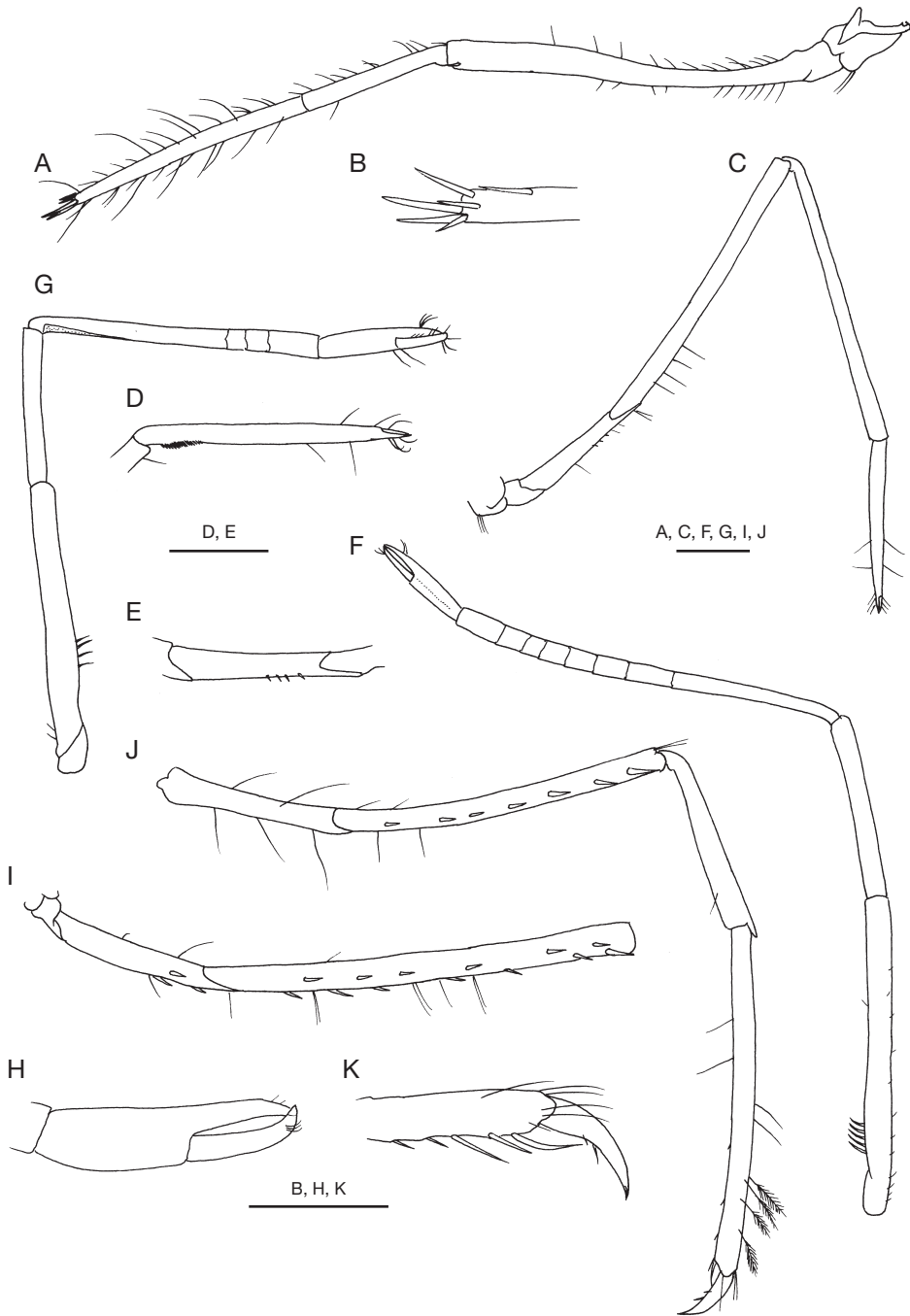


FIG. 2. — *Pandalina spinicauda* n. sp., holotype ovigerous ♀ (cl 3.7 mm), MNHN-Na17550: **A**, left third maxilliped, lateral view; **B**, same, distal part of ultimate segment, dorsal view; **C**, right first pereopod, lateral view; **D**, same, propodus and dactylus, ventrolateral view; **E**, same, ischium, showing spination; **F**, left second pereopod, lateral view; **G**, right second pereopod, lateral view; **H**, same, chela, extensor view; **I**, merus and ischium of right third pereopod, lateral view; **J**, right fifth pereopod, lateral view; **K**, same, distal part of propodus and dactylus, lateral view. Scale bars: 0.5 mm.

Notes on non-type specimens

The two non-type specimens, of which sexes were not determinable, are small (probably juvenile) and badly damaged. The smaller specimen (cl 1.9 mm) has an intact rostrum bearing 8 dorsal teeth (4 on the carapace posterior to the orbital margin), of which the posterior 6 are movable with distinct basal sutures; there are 3 minute ventral teeth; the telson bears 9 pairs of dorsolateral spines. The larger specimen (cl 2.5 mm) is in poor condition; the telson is broken with the distal 0.3 missing, but the preserved part still has 9 (left) or 10 (right) dorsolateral spines.

Coloration

Body whitish translucent, carapace with many tiny red dots and scattered pinkish red patches. Abdominal pleura and pleopods covered with many red dots. Tail fan with some red dots; distal half of telson and uropods banded with red and white. Antennular and antennal peduncles reddish, antennular flagella light pink. Cornea dark brown. Pereopods with indistinct red bands. Eggs pale green. See Figure 7A.

REMARKS

The genus *Pandalina* is characterized by the following features (Christoffersen 1989; Holthuis 1993; Komai 1994): the rostrum is short, with fixed and movable teeth on the dorsal margin; the carapace is devoid of sharp longitudinal carinae on the lateral surface; the posterior lobe of the scaphognathite is short and rounded, but with greatly elongate setae on its posterior margin; there are no arthrobranchs above the bases of first to fourth pereopods; the third maxilliped lacks an exopod; strap-like epipods are present on the first to fourth pereopods; the first pereopod is devoid of laminar expansion on the ischium; and the second pereopods are appreciably unequal, of which carpi are divided into more than three articles. It includes four known species, *P. brevirostris* (Rathke, 1847) from the Northeastern Atlantic, *P. modesta* (Bate, 1888) from southwestern to southern Africa, *P. nana* Burukovsky, 1990 from Sala-y-Gomez Ridge in the southeastern Pacific, and *P. profunda* Holthuis, 1946 from the eastern Atlantic from Europe to West

Africa and the Mediterranean. However, the generic status of *P. nana* is questionable. *Pandalina nana* appears rather close to species of *Bitias* Fransen, 1990 in the subequal second pereopods and the rostrum bearing a dorsal series of movable spines (cf. Fransen 1990; Chuang *et al.* 2003), though *Bitias* differs from *Pandalina* by the possession of arthrobranchs above the bases of anterior four pereopods. Burukovsky (1990) did not mention the gill formula of *P. nana*. Examination of specimens of *P. nana* is necessary to ascertain the exact affinity of this species. In any case, the present new species from Mozambique differs from *P. nana* and the other three known species of *Pandalina* in having more numerous dorsolateral spines on the telson (more than 10 versus nine or less in adults; see Holthuis 1946; Burukovsky 1990; Macpherson 1993; 2 males [cl 3.5, 3.5 mm, USNM 121773] of *P. brevirostris* are examined in this study). The three known species no doubt belong to *Pandalina*, they are all distributed in the eastern Atlantic, although *P. modesta* extends to East London off the southeastern coast of South Africa (Macpherson 1993). This new species is the first representative of *Pandalina* occurring in the warm waters of the Indian Ocean. In spite of the recent extensive survey in the West Pacific, no *Pandalina* species has yet been found there. Further differences between *P. spinicauda* n. sp. and these three species are that the stylocerite is truncate distally with a sharply pointed distolateral angle in the present new species, whereas in *P. brevirostris* and *P. profunda* it is rounded (Holthuis 1946). The shape of the stylocerite is not particularly mentioned for *P. modesta* in the redescription by Macpherson (1993), and this may suggest that there is no significant difference in this character between *P. modesta* and the other two species. The second pereopods are much more slender in the new species. For example, the carpus of the right second pereopod is about 12 times as long as wide in *P. spinicauda* n. sp., rather than about 6 times in the other three species. The carpus of the left second pereopod is divided into fewer articles in *P. spinicauda* n. sp. than in the other three species (eight in *P. spinicauda* n. sp. versus 14 to 21 in the other three species).

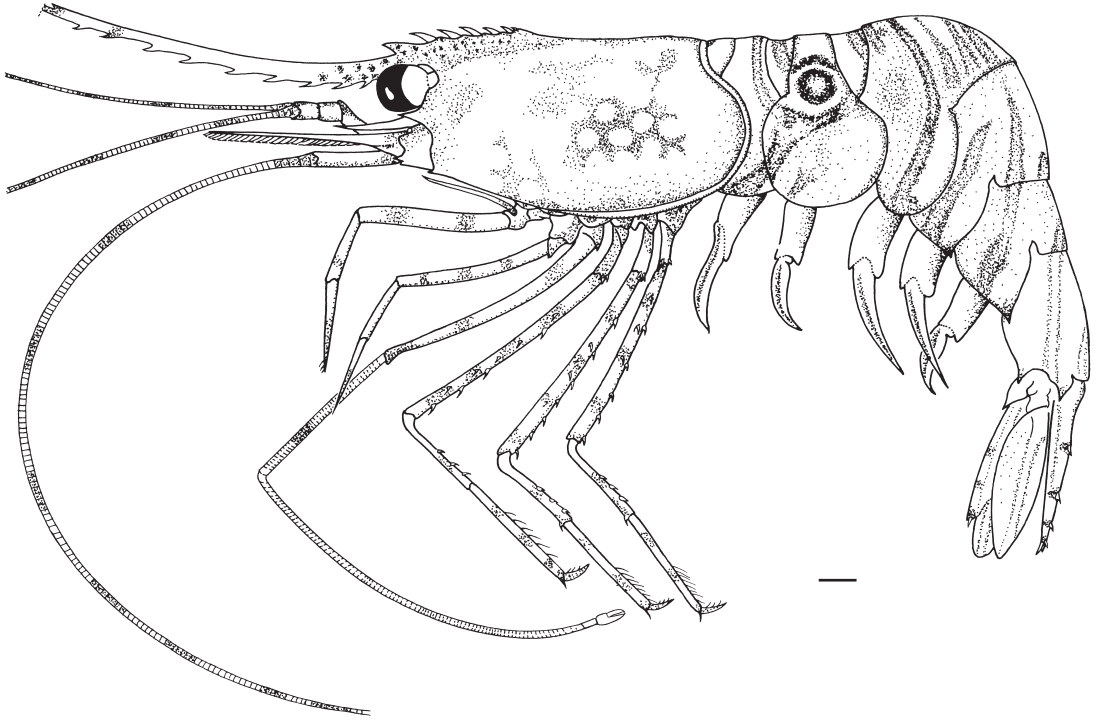


FIG. 3. — *Plesionika neon* n. sp., holotype ♂ (cl 7.1 mm), MNHN-Na17551, lateral view, showing the colour pattern. The specimen actually has only the basal part of the antennal flagellum that remains, the fourth abdominal pleuron with the posteroventral tooth is damaged, the left fourth pereopod is lost, the distolateral movable spine on the exopod of the uropod is missing, and the distal half of the telson is lost. These parts were modified from the right side of the holotype or similar parts of the paratypes. Scale bar: 1 mm.

The holotype is not intact: abdomen and telson are partially damaged, and several appendages, including right third maxilliped, left first pereopod, left third pereopod, both fourth pereopods, left fifth pereopod and left uropod are missing. Nevertheless, the photograph shows that some of these appendages were preserved at the time of capture.

Genus *Plesionika* Bate, 1888

Plesionika neon n. sp.
(Figs 3; 4; 7B)

TYPE MATERIAL. — **Mozambique Channel**. MAINBAZA, stn CP 3130, 25°53'S, 33°07'E, 112-127 m, 9.IV.2009 holotype ♂, cl 7.1 mm, (MNHN-Na17551). Paratypes: MAINBAZA, stn CP 3130, 25°53'S, 33°07'E, 112-127 m, 9.IV.2009, 1 ♂ (cl 6.9 mm), 1 ovig. ♀ (cl

7.0 mm) (NTOU M00914), 1 ♂ (cl 7.1 mm), 1 ♀ (cl 4.8 mm), 1 specimen (cl 5.6 mm, cephalothorax only) (MNHN-Na17542). — Stn CC 3159, 23°55'S, 35°37'E, 148-152 m, 15.IV.2009, 1 ovig. ♀ (cl 7.0 mm), 2 juveniles (cl 3.4, 3.5 mm) (MNHN-Na17552). — Stn DW 3167, 26°12'S, 35°02'E, 228-230 m, 16.IV.2009, 1 ovig. ♀ (cl 13.0 mm) (MNHN-Na17553).

ETYMOLOGY. — The name refers to the impression that the bright colour markings and spots on the body of this new shrimp like a neon lamp. The name “*neon*” is used as a latinisation of the English word now used for neon lamp and neon bulb, and it is used as a noun in apposition.

DISTRIBUTION. — Known only from the Mozambique Channel at depths of 112-230 m.

DESCRIPTION

Body size small for the “*Plesionika rostricrescentis* (Bate, 1888)” group; largest males cl 7.1 mm but from 2 specimens, one (holotype) with appendix

masculina of second pleopod as long as appendix interna while another with appendix masculina slightly shorter than appendix interna; largest female cl 13.0 mm and smallest ovigerous female cl. 7.0 mm.

Rostrum slightly descending at base but up-turned anterior to eyes, more strongly curved in females than in male (Figs 3; 4A-C); 1.3-1.6 times (longer in males) as long as carapace; basal rostral crest moderately high in females but low in male, bearing 7 or 8 teeth, including 1-3 fixed and 5 or 6 movable teeth, posterior 5 or 6 teeth situated posterior to orbital margin; none of dorsal teeth barbed; dorsal rostrum proper unarmed except for 2 subapical teeth; 9 or 10 teeth on ventral margin. Carapace with orbital margin regularly concave, with lower lobe roundly triangular to nearly truncate; antennal tooth large, but pterygostomial tooth small.

Third abdominal somite slightly arched and rounded dorsally, unarmed on posterodorsal margin. Fourth and fifth abdominal pleura each bearing distinct posteroventral tooth. Sixth somite 1.74-2.04 times as long as maximum height. Telson 1.15-1.29 times as long as sixth somite, bearing 3 pairs of dorsolateral and 3 pairs of terminal spines flanking apex of telson (Fig. 4D).

Eye subspherical, maximum width of cornea 0.20-0.26 as long as carapace, bearing distinct ocellus. Antennular peduncle more or less extending to midlength of antennular scale, stylocerite tapered anteriorly to sharply pointed tip, from just overreaching basal segment to reaching about midlength of second segment. Antennal scale 0.7-0.8 times as long as carapace and 3.7-4.2 times as long as broad, with distolateral tooth more or less reaching distal margin of lamella (Fig. 4E); basicerite with ventrolateral tooth moderately long and almost extending to proximal end of lateral margin of antennal scale.

Third maxilliped just reaching beyond antennal scale; ultimate segment 1.4-1.6 times as long as penultimate segment; exopod long; epipod well-developed, strap-like.

Anterior four pereopods all bearing well-developed, strap-like epipods. First pereopod microscopically chelate, extending to tip of antennal scale or just

reaching beyond antennal scale. Second pereopods greatly unequal; left second pereopod overreaching antennal scale by about distal 0.8 of carpus and chela, bearing about 90 carpal articles, merus and distal part of ischium annulated; right second pereopod exceeding antennal scale by half to almost entire length of chela, bearing 17-20 carpal articles, distal half of merus annulated. Third pereopod overreaching antennal scale by 0.3-0.5 length of propodus and dactylus; dactylus elongate conical, 0.20-0.26 times as long as propodus (Fig. 4F), flexor margin bearing 3 or 4 accessory spinules and subterminal spinule abutting and half to almost as long as unguis (Fig. 4G); propodus 0.50-0.56 times as long as carapace, bearing 6 long and 0-2 short spinules on flexor margin; carpus 0.66-0.75 as long as propodus, with 3 ventral spines; merus bearing 4 or 5 ventral spinules and 5 or 7 lateral spinules, ischium with 1 lateral and 1 ventral spinules. Fourth and fifth pereopods similar to third pereopod; dactyli each with 3 or 4 accessory spinules on flexor margin; fourth pereopod overreaching antennal scale more or less by dactylus; fifth pereopod just reaching to or exceeding antennal scale by full length of dactylus.

Eggs suboval, about 0.3 mm in diameter and becoming about 0.4 mm in diameter when near hatching.

Coloration

Body translucent, covered with many red, white and golden yellow markings. Tip of rostrum reddish. Basal rostral crest with many tiny white dots. Carapace with scattered patches of red dots and golden yellow reticular lines but with anterior two-thirds of lateral surface evenly distributed with small white spots, patch of red dots on posterolateral surface arranged in a pattern of large hollow circles. Abdomen with first to fourth somites evenly distributed with red dots; oblique red margined golden yellowish transverse lines present on all somites, one of these golden yellowish lines on each tergite becoming thick red line on corresponding pleuron in first to fourth somites; second tergite with white margined large reddish purple circular spot on lateral surface just above junction with pleuron, outer rim of this white margined reddish

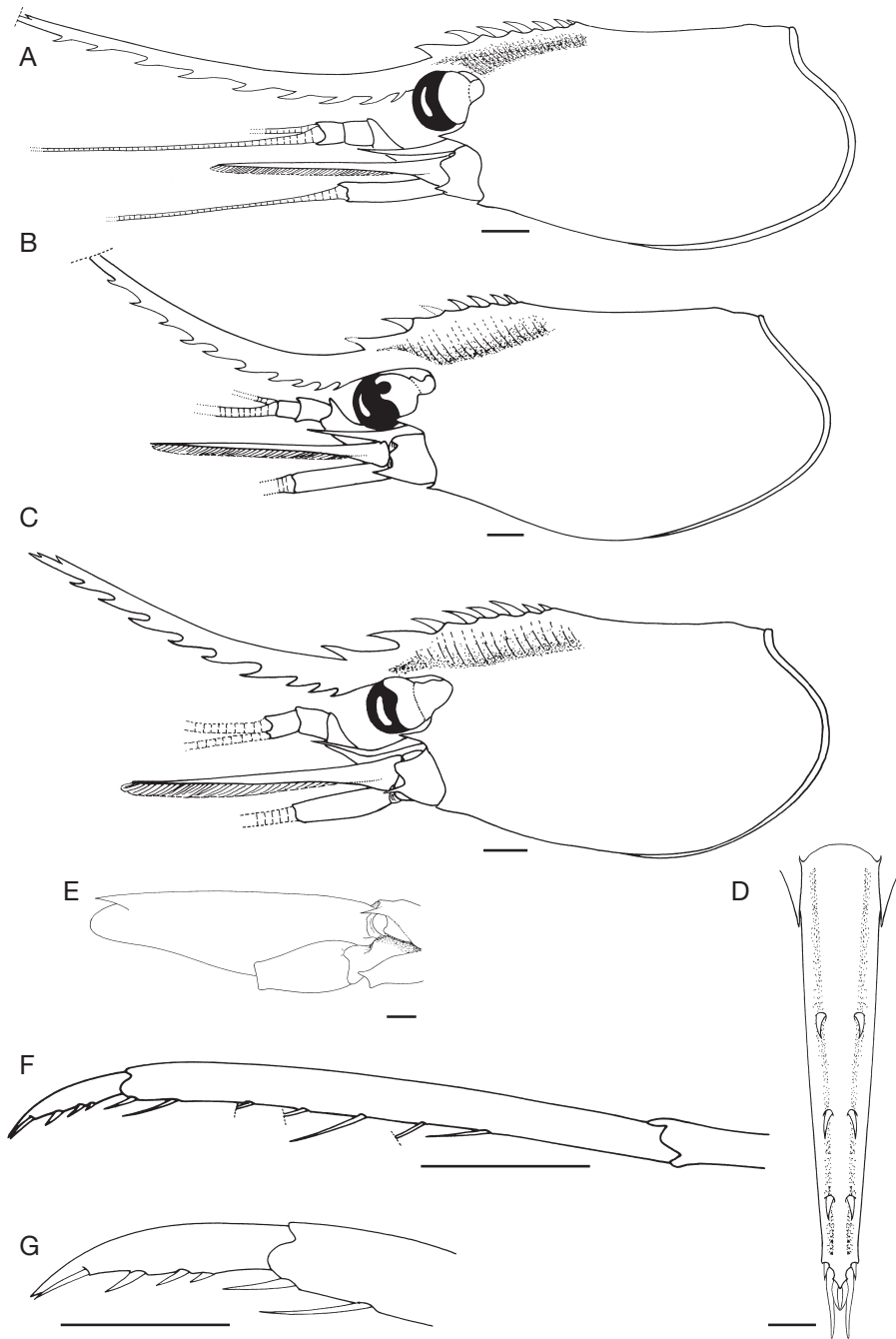


FIG. 4. — *Plesionika neon* n. sp.: **A, F, G**, holotype σ (cl 7.1 mm), MNHN-Na17551; **B, D, E**, paratype ovigerous f (cl 13.0 mm), MNHN-Na17553; **C**, paratype ovigerous f (cl 7.0 mm), NTOU M00914; **A-C**, carapace and cephalic appendages, lateral view (left); **D**, telson, dorsal view; **E**, left antennal scale, ventral view (setae omitted); **F**, left third pereopod, lateral view (setae omitted); **G**, same, distal part of propodus and dactylus, lateral view (setae omitted). Scale bars: A-F, 1 mm; G, 0.5 mm.

purple spot also surrounded by thick red circle. Tail fan translucent and with pairs of reddish spots on telson and lateral margins of exopods of uropods. Eyes black. Antennular and antennal flagella banded with red and white. Third maxilliped whitish translucent. Pereopods whitish translucent and with distinct red bands except on carpus and chela of second pereopod. Pleopods whitish translucent and with lateral surface of protopods covered with tiny white dots as well as some red and golden yellow dots. See Figure 7B.

REMARKS

Of the 92 known species in *Plesionika* (De Grave *et al.* 2009), the present new species belongs to the “*Plesionika rostricrescentis*” group in bearing a distinct basal rostral crest and the dorsal margin of the rostrum being unarmed between the subapical teeth and anteriormost tooth of the basal rostral crest (Chan 2004). Five known species are present in this group, namely *P. rostricrescentis*, *P. erythrocyclus* Chan & Crosnier, 1997, *P. bimaculata* Chan, 2004, *P. hsuehyui* Chan, 2004 and *P. suffusa* Chan, 2004. All of them have an elaborate body colour that includes large circular spots, and are restricted to the West and South Pacific (see Chan 2004). The Mozambique form has a very different coloration and with a large circular spot on the lateral side of the second abdominal tergite, a position never observed in other species of the “*P. rostricrescentis*” group or even in the closely related “*P. lophotes* Chace, 1985” group (see Chan 2004: Figs 10-17 vs Fig. 7B). Morphologically, the new species is most similar to *P. bimaculata* from the South Pacific in having a lower basal rostral crest, longer rostrum (longest 1.6 times carapace length in the present new species and 1.8 times in *P. bimaculata*) and moderate number of ventral rostral teeth (9 or 10 in the present new species and 9-13 usually 10 or 11 in *P. bimaculata*). However, it is readily separated from all the known species of the “*P. rostricrescentis*” group in having a short stylocerite. The stylocerite in all the other species of the “*P. rostricrescentis*” group extends at least to the base of the distal segment of the antennular peduncle. In the new species, the stylocerite at most only reaches the middle of the second segment of

the antennular peduncle (Fig. 4A-C), similar to that of the species of the “*P. lophotes*” group. It was thought that the length of the stylocerite is one of the distinguishing characters between the “*P. rostricrescentis*” and “*P. lophotes*” groups (see Chan 2004). Although the development of the basal rostral crest has strong sexual dimorphism in species of the “*P. rostricrescentis*” group (*i.e.* higher in females and lower in males), the new species is characterized in the group in having the height of the basal rostral crest being intermediate between *P. erythrocyclus* and *P. hsuehyui*. The basal rostral crest in this new species (Figs 3; 4A-C) is lower than that of *P. hsuehyui* (see Chan 2004: fig. 3) but higher than that of *P. erythrocyclus* (see Chan 2004: fig. 2). The basal rostral crest of *P. bimaculata* (see Chan 2004: fig. 1) is even lower than that of *P. erythrocyclus* and being the lowest in the “*P. rostricrescentis*” group. Comparison of the partial COI sequences (658 bps) amongst the present new species (MNHN-Na17552, Genbank no. HM627408) with *P. bimaculata* (paratypes, NTOU M00633 [formerly NTOU P-N-1716], Genbank no. HM627406), *P. hsuehyui* (Taiwan, Dasi fishing port, 21.X.2000, NTOU M00915, Genbank no. HM627407) and *P. erythrocyclus* (New Caledonia, NORFOLK 1, stn CP 1718, NTOU M00639, specimens used in Chan 2004, Genbank no. GW249588) shows that the nucleotide divergences are as high as 19.3% between the present form and *P. bimaculata*, 17.0% with *P. hsuehyui* and 20.6% with *P. erythrocyclus*. The lowest genetic divergence amongst these four species is 11.6%, between *P. bimaculata* and *P. erythrocyclus*. Thus, the new specific status of the Mozambique form is also strongly supported by the genetic data.

Of the ten specimens collected for the present new species, only two females (one ovigerous, NTOU M00914, MNHN-Na17542) have intact rostrum and both have two subapical teeth. The rostrum of these two females is 1.3 times as long as the carapace. For males, only the holotype has a near complete rostrum, which has the apical portion of the rostrum missing but with one subapical tooth still present. The rostrum of the male holotype is considerably longer than that of females, being 1.6 times as long as the carapace.

Family HIPPOLYTIDAE Bate, 1888
Genus *Leontocaris* Stebbing, 1905

Leontocaris bulga Taylor & Poore, 1998
(Figs 5; 6; 7C)

Leontocaris bulga Taylor & Poore, 1998: 59, Figs 2-4. — Poore 2009: 966.

MATERIAL EXAMINED. — **Mozambique Channel.** MAINBAZA, stn CC 3156, 21°46'S, 36°35'E, 1810-1820 m, 14.IV.2009, 1 ♀ (cl 11.5 mm) (MNHN-Na17554).

DISTRIBUTION. — Previously known only from Tasmania seamounts, at depths of 1400-1650 m. The present specimen greatly extends the geographical range of this species to the western Indian Ocean, and also extends the vertical distribution to 1820 m deep.

DESCRIPTION OF NEWLY COLLECTED SPECIMEN

Body integument not firm. Rostrum (Fig. 5A-C) 1.25 times as long as carapace, somewhat curving dorsally, tip minutely bifid; dorsal margin armed with 22 small teeth distributed over entire length and decreasing in size distally (some teeth broken), including 2 teeth on carapace posterior to level of orbital margin, posteriormost tooth arising at 0.09 of carapace length; ventral margin with 15 teeth (some distal teeth minute) decreasing in size distally, none particularly enlarged. Carapace (Fig. 5A-C) slightly compressed laterally, naked on surface; low postrostral median ridge extending to 0.20 length of carapace; lateral surface smooth, no distinct carina or groove; orbital margin evenly rounded, lower lobe strong, exceeding beyond antennal tooth, triangular with subacute apex, upturned, overreaching base of eyestalk; antennal tooth, moderately strong, submarginal, distinctly overreaching anterolateral margin of carapace, shortly buttressed; pterygostomial margin forming blunt angle; ventral part of branchiostegite membranous.

Abdomen (Fig. 5D) rounded dorsally, no mid-dorsal tooth on any somite. Pleura of anterior four somites broadly rounded, that of fifth somite bearing acute posterolateral and posteroventral teeth. Sixth somite twice as long as fifth somite and 2.2 times as long as maximum height, posteroventral angle subacutely pointed, posterolateral process terminating in subacute tooth. Telson (Fig. 5E)

about 1.5 times as long as sixth abdominal somite and about 4.5 times longer than wide, slightly narrowed posterior to subtruncate posterior margin; dorsal surface faintly sulcate medially; lateral margins each with 2 movable spines, anterior spine arising at posterior 0.44 length, posterior spine at 0.20 length; posterior margin slightly damaged, bearing at least 12 spinules or spiniform setae, 2 at posterolateral angle shorter than mesial pairs (Fig. 5F).

Gill formula including 2 arthrobranchs above base of third maxilliped, 1 arthrobranch above bases of first to fourth pereopods, 1 pleurobranch on fourth to sixth thoracic somites (above bases of first to fifth pereopods), and 1 podobranch on epipod of second maxilliped.

Eye (Fig. 5A, C) subpyriform; cornea well developed, maximum diameter 0.13 of carapace length, darkly pigmented; without distinct ocellus.

Antennular peduncle (Fig. 5A, C) slender, about half length of rostrum. First segment longer than distal two segments combined; stylocerite slender, sharp, clearly separated from first segment, slightly overreaching distal margin of first segment. Second segment about half length of first segment. Third segment with base of mesial flagellum extending distally. Outer flagellum shorter than carapace, slightly overreaching rostral tip; mesial flagellum slender than and subequal in length to outer flagellum.

Antenna (Fig. 5A, C) with stout basicerite bearing small, acute ventrolateral tooth. Carpocerite slightly overreaching distal margin of first segment of antennular peduncle. Antennal scale (Fig. 5G) with distal part broken off; lateral margin with serration consisting of row of sharp, slender teeth, proximal part unarmed.

Mouthparts not dissected. Mandible with 2-articulated palp; distal article having about 5 setae. Third maxilliped (Fig. 6A) slender, overreaching distal end of antennular peduncle by half length of ultimate segment; ultimate segment 2.2 times as long as penultimate segment, terminating in acute unguis, bearing 1 minute spinule subterminally mesial to unguis, forming chela-like structure (Fig. 6C), mesial surface bearing short transverse sets of spiniform setae (Fig. 6B); antepenultimate segment nearly straight, broadened proximally in ventral view, unarmed; coxa lacking epipod.

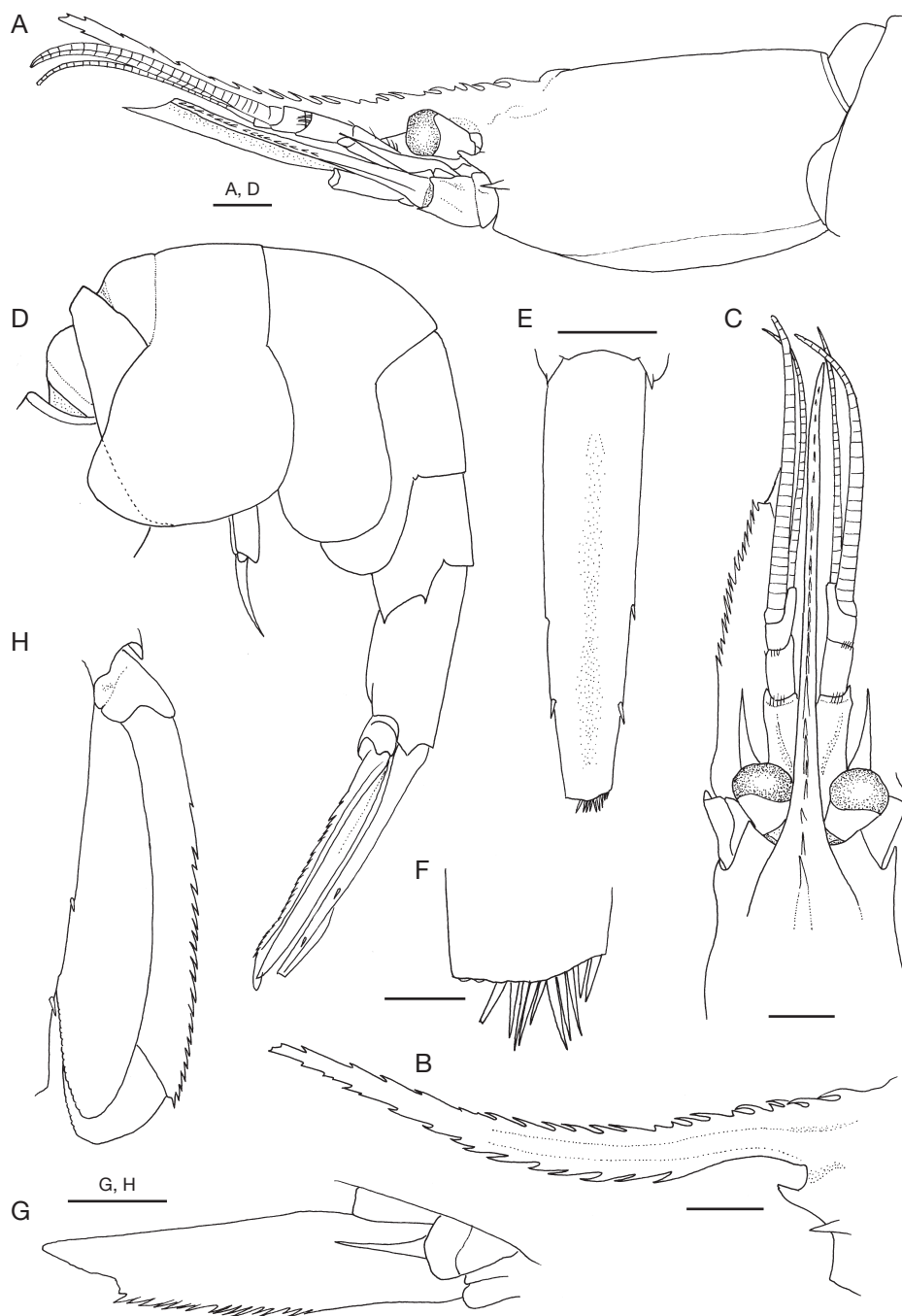


FIG. 5. — *Leontocaris bulga* Taylor & Poore, 1998, ♀ (cl 11.5 mm), MNHN-Na17554: **A**, carapace and cephalic appendages, lateral view (left); **B**, rostrum and anterior part of carapace, lateral view (left); **C**, rostrum, anterior part of carapace and cephalic appendages, dorsal view (left antennal scale damaged, right antennal scale lost); **D**, abdomen, telson and uropod, lateral view (left); **E**, telson, dorsal view; **F**, posterior part of telson, dorsal view (left spines missing); **G**, left antennal scale, dorsal view (setae omitted; distal part broken off); **H**, right uropod, dorsal view (setae omitted). Scale bars: A-E, G, H, 2 mm; F, 0.5 mm.

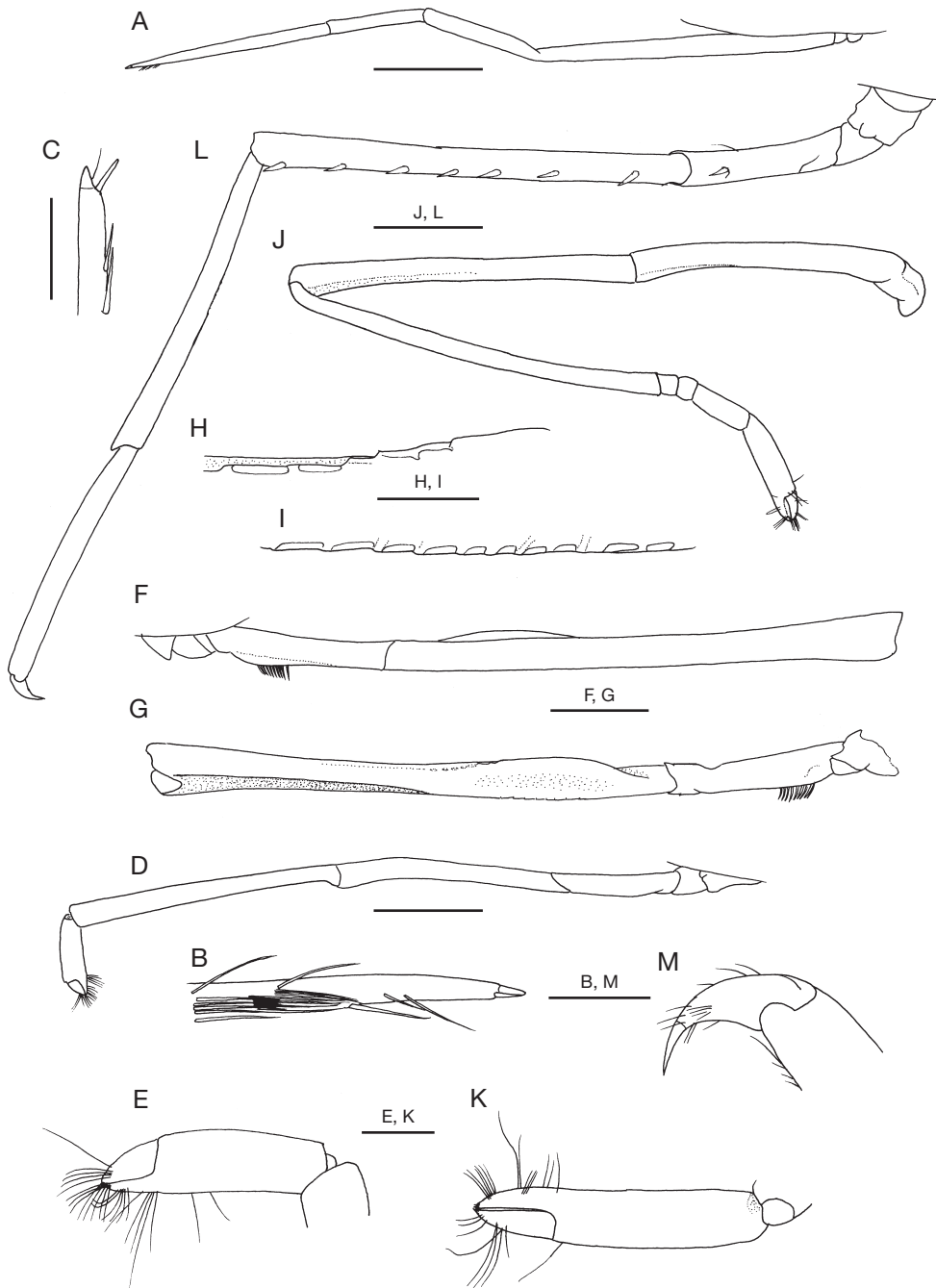


FIG. 6. — *Leontocaris bulga* Taylor & Poore, 1998, ♀ (cl 11.5 mm), MNHN-Na17554: **A**, left third maxilliped, lateral view; **B**, same, distal part of ultimate segment, mesial view; **C**, same, dorsal view; **D**, left first pereopod, lateral view; **E**, same, chela, lateral view; **F**, merus and ischium of right second pereopod, lateral view; **G**, same, mesial view; **H**, detail of distal slope of dorsomesial convexity on merus of right second pereopod; **I**, detail of ventromesial margin of merus of right second pereopod just inferior to dorsomesial convexity; **J**, left second pereopod, lateral view; **K**, same, chela, extensor view; **L**, left third pereopod, lateral view; **M**, same, dactylus, lateral view. Scale bars: A, D, F, G, L, J, 2 mm; B, C, E, H, I, K, M, 0.5 mm.

First pereopod (Fig. 6D) chelate, reaching nearly to level of distal end of antennular peduncle, ratio of merus:carpus:chela 1.0:1.3:0.4; dactylus less than half of palm (Fig. 6E); fingers with tufts of stiff setae; carpus widened distally; articulation between merus and ischium strongly oblique.

Major second pereopod (Fig. 6F, G) broken, chela and carpus missing. Merus greatly elongate, reaching nearly to level of distal end of antennular peduncle, widened in distal part; lateral surface rounded; proximal half of dorsomesial margin crested, forming broad convexity, this convexity bearing row of pore-like structures (Fig. 6H); dorsal surface lateral to convexity shallowly sulcate; proximal half of mesial surface shallowly concave, ventromesial margin sharply carinate, bearing row of pore-like structures (Fig. 6I); ventral surface longitudinally concave, becoming shallower in distal half. Ischium slightly widened distally, bearing weak convexity on ventromesial margin proximally, this convexity having 9 stiff setae; cross section of ischium roundly subquadrate.

Minor second pereopod (Fig. 6J) slender, overreaching distal end of antennular peduncle by 0.3 length of carpus, ratio of ischium:merus:carpus:chela 1.0:1.2:1.7:0.4. Chela (Fig. 6K) with tufts of stiff setae on fingers; dactylus less than half length of palm. Carpus divided into 4 very unequal articles, successively 0.81, 0.03, 0.03, 0.13 times total length. Merus slightly widened distally. Ischium slightly excavate ventrally.

Third and fourth pereopods moderately slender, similar (fifth pereopods missing). Third pereopod (Fig. 6L) overreaching distal end of antennular peduncle by full length of propodus, ratio of ischium:merus:carpus:propodus:dactylus 1.0:2.8:2.0:1.6:0.25; dactylus (Fig. 6M) simple, strongly curved, hooked, no accessory spinules on flexor margin, unguis clearly demarcated; propodus with transverse row of minute setae adjacent to ventrodistal margin and with irregular rows of minute setae at distal portion of ventral surface; carpus widened distally; merus with 6 (right) or 7 (left) lateral spines; ischium with 1 ventrolateral subdistal spine. Fourth pereopod with merus bearing 6 lateral spines; ischium with 1 ventrolateral subdistal spine.

Pleopods well developed. First pleopod with endopod about half length of exopod. Second to fifth pleopods each with stout, digitiform appendix interna. Uropod (Fig. 5H) slightly overreaching tip of telson; endopod moderately narrow, unarmed, slightly shorter than exopod; exopod wider than endopod, lateral margin slightly convex, serrated with sharp fixed teeth in distal 0.80; diaeresis distinct, strongly oblique in lateral portion.

Coloration

Body generally light pink and with rostrum, eyestalks, anterolateral carapace, antennules, thoracic appendages, dorsal surface of second and third abdominal somites, and tail fan reddish. Eyes black. See Figure 7C.

REMARKS

The present specimen is somewhat damaged, and in particular, the chela and carpus of the major second pereopod, representing the most peculiar structure of *Leontocaris* (Taylor & Poore 1998; Poore 2009), are unfortunately missing. Nevertheless, in every diagnostic aspect, the present specimen agrees well with the holotype of *L. bulga* (cf. Taylor & Poore 1998), originally described from Tasman seamounts based on a specimen without abdomen. Initial comparison with the original description suggested that the structure of the merus of the major second pereopod might be different between the two specimens. At our request, Dr G. C. B. Poore of the Museum Victoria kindly reexamined the holotype of *L. bulga*. It is confirmed that the structure of the merus of the second pereopod is actually similar between the present specimen and the holotype of *L. bulga*. In spite of the very remote locations of the holotype and the present specimen, it is concluded that they belong to the same species. The Mozambique specimen is now able to supply the characteristics of the abdomen in this rare species.

Leontocaris contains eight species (Taylor & Poore 1998; Fransen 2001; Poore 2009): *L. alexander* Poore, 2009 from southeastern Australia at depths of 1050-1230 m and Chatham Rise, New Zealand at depths of 950-971 m (Poore 2009; Ahyong 2010); *L. amplexipes* Bruce, 1990 from off southeastern

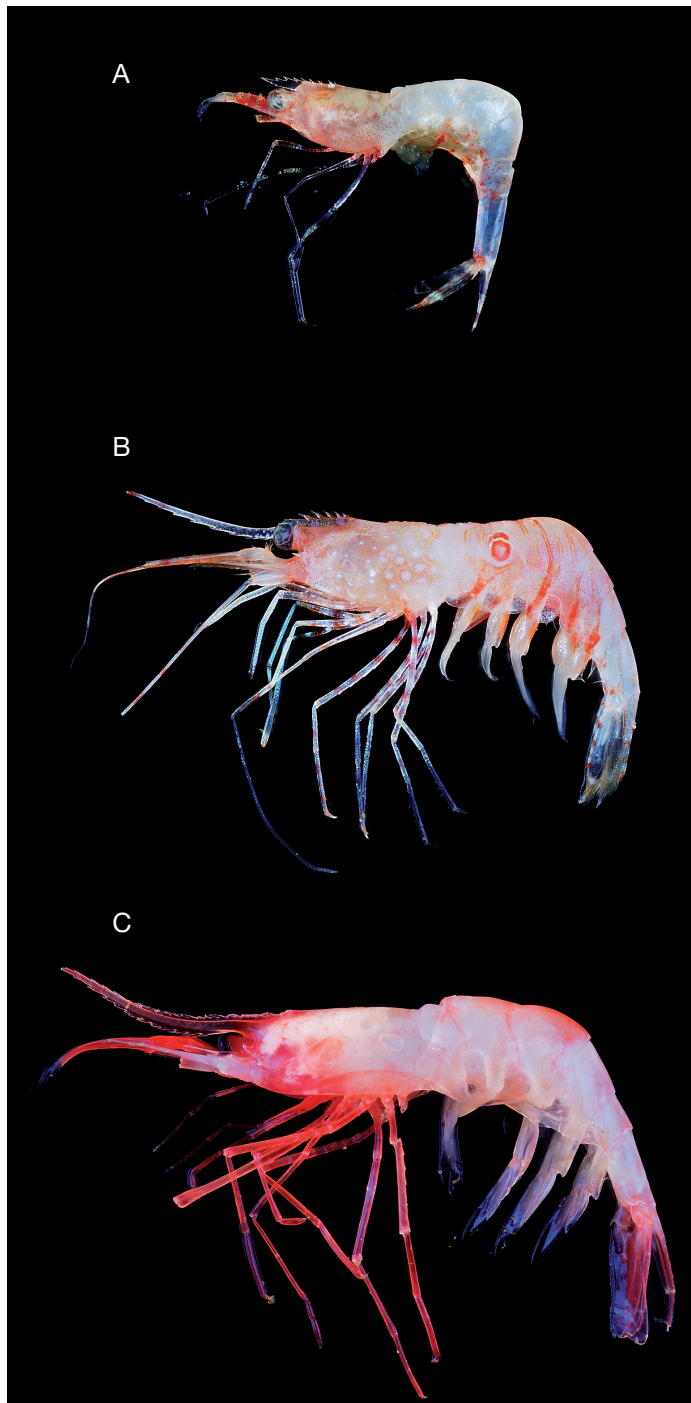


FIG. 7. — **A**, *Pandalina spinicauda* n. sp., holotype ovigerous ♀ (cl 3.7 mm), MNHN-Na17550; **B**, *Plesionika neon* n. sp., holotype ♂ (cl 7.1 mm), MNHN-Na17551; **C**, *Leontocaris bulga* Taylor & Poore, 1998, ♀ (cl 11.5 mm), MNHN-Na17554.

Australia and eastern New Zealand at depths of 750–2182 m (Ahyong 2010); *L. bulga* from south-eastern Australia and Mozambique at depths of 1400–1820 m (Taylor & Poore 1998; present study); *L. lar* Kemp, 1906 from off Ireland at depths of 1000–1300 m (Kemp 1906, 1910; Taylor & Poore 1998); *L. pacificus* Zarenkov, 1976 from off Chile, southeastern Pacific, at depths of 680–700 m (Zarenkov 1976; Taylor & Poore 1998); *L. paulsoni* Stebbing, 1905 from off South Africa at depths of 240–265 m (Stebbing 1905); *L. vanderlandi* Fransen, 2001 from Seychelles at depth of 600 m (Fransen 2001); and *L. yarramundi* Taylor and Poore, 1998 from seamounts off southeastern Australia and Chatham Rise, New Zealand, at depths of 900–1448 m (Taylor & Poore 1998; Ahyong 2010). The genus is very characteristic in having a serrated lateral margin of the antennal scale and the uropodal exopod, and the strongly asymmetrical second pereopods, of which the chela of the major side is elongate and robust with a chopper-shaped dactylus. Taylor & Poore (1998) reviewed the genus and provided a key to the six species known at that time. Fransen (2001) performed a morphological phylogenetic analysis on *Leontocaris*, but omitted the three species described by Taylor & Poore (1998). Poore (2009) recently studied the phylogenetic relationships among all the species in the genus based on morphological characters.

Poore (2009) suggested that the sister taxon of *L. bulga* is *L. vanderlandi*. However, the discovery of a more complete specimen of *L. bulga* by the present study does not support this relationship. Poore (2009) considered that the presence of a seta-bearing ridge on the ischium of the major second pereopod was apomorphic, but this character is widespread in Pandalidae and Hippolytidae (Komai, unpublished data) and thus it is questionable if the character is really apomorphic within *Leontocaris*. The number of the mandibular palp is two in *L. bulga* and *L. vanderlandi*, whereas it is one in the other species (Poore 2009). The reduction in the number of articles of the mandibular palp is considered to be apomorphic, and thus the state seen in *L. bulga* and *L. vanderlandi* could not be apomorphic within *Leontocaris*. The presence of the abdomen and telson in the Mozambique specimen

shows that the shape and armature of the telson are similar between *L. bulga* and *L. vanderlandi*, but these characters are considered to be plesiomorphic in Poore (2009). Nevertheless, the possession of numerous spines on the posterior margin of the telson is synapomorphic between *L. bulga* and *L. vanderlandi*. On the other hand, the possession of a posterolateral tooth on the fifth pleuron may link *L. bulga* to *L. yarramundi*.

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