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FROM NEW CALEDONIA  
(Crustacea Decapoda Natantia).*

par A. J. BRUCE



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*A REPORT ON SOME PONTONIID SHRIMPS  
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The pontoniid fauna of New Caledonia has been little studied and only three species have been so far reported in the literature. Of these, *Thaumastocaris streptopus* Kemp, collected in 1890 at Noumea, has since been found to occur in Indonesian waters and *Periclimenes noverca* Kemp, has not been reported since its original discovery, while the third, *Coralliocaris graminea* (Dana), is now known to be widespread in the Indo-West-Pacific region. The small collection upon which this report is based is therefore of interest as two of the species included are undescribed and one previously known only from the original specimen.

It is a pleasure to thank M. Y. MAGNIER, Dr. Th. MONOD and Dr. J. C. YALDWYN for the opportunity to examine and report these specimens.

SPECIES REPRESENTED IN THE COLLECTION.

Family PALAEMONIDAE Samouelle, 1819.

Subfamily PONTONINAE Kingsley, 1878.

Genus *Parapontonia* gen. nov.

*Parapontonia nudirostris* sp. nov.

Genus *Periclimenes* Costa, 1844.

*Periclimenes novaecaledoniae* sp. nov.

*Periclimenes affinis* (Zehntner, 1894).

*Periclimenes amymone* De Man, 1902.

*Periclimenes imperator* Bruce, 1967.

*Periclimenes soror* Nobili, 1904.

**Parapontonia** gen. nov.

DIAGNOSIS OF GENUS. — Commensal pontoniid shrimps associated with crinoids. Body elongated, smooth, with well developed compressed toothless rostrum. Antennal, hepatic and supra-ocular spines present.

Pleura rounded. Telson elongated, with two pairs of dorsal and three pairs of terminal spines. Epistome with a pair of large submedian horn-like processes. Sternites of thoracic somites unarmed. Antennule and antennal peduncles normal. Stylocerite well developed. Scaphocerite with a well developed lamina and distinct disto-lateral tooth. Mandible without palp, molar processes with rows of bristles and robust processes. Maxillula with simple palp, broad upper lacinia and narrow lower lacinia. Maxilla with bifid endite, setose palp and narrow scaphognathite. First maxilliped with endites of basis and coxa distinct, palp setose, well developed exopod with large caridean lobe and a bilobed epipod. Second maxilliped with well developed exopod, simple epipod without a podobranch; endopod normal. Third maxilliped normal, with exopod, rounded epipod and a rudimentary arthrobranch. First pereopods normal, slender. Second pereopods normal, robust, similar and subequal. Ambulatory pereopods robust with biunguiculate dactyls. Pleopods typical. Endopod of male first pleopod narrow basally with plumose setae at proximal end of medial border and an adjacent row of small spines, lateral margin with plumose setae distally. Appendix masculina subcylindrical with stout serrated setae distally and subterminally along the medial border. Uropods normal, with a small tooth and a mobile spinule at distal end of lateral border of exopod.

TYPE SPECIES. — *Parapontonia nudirostris* sp. nov.

***Parapontonia nudirostris* sp. nov.** (figs. 1-5).

MATERIAL EXAMINED. — 1 ♂, 1 post-ovigerous ♀. Tiaré Bay, Noumea, New Caledonia, 22° 10' S., 166° 15' E. Coll. Y. Magnier, 1966.

*Description of female.* — A medium sized pontoniid shrimp with a slender, elongated body form. The carapace is smooth with a well developed shallow, slightly depressed rostrum that extends anteriorly to the end

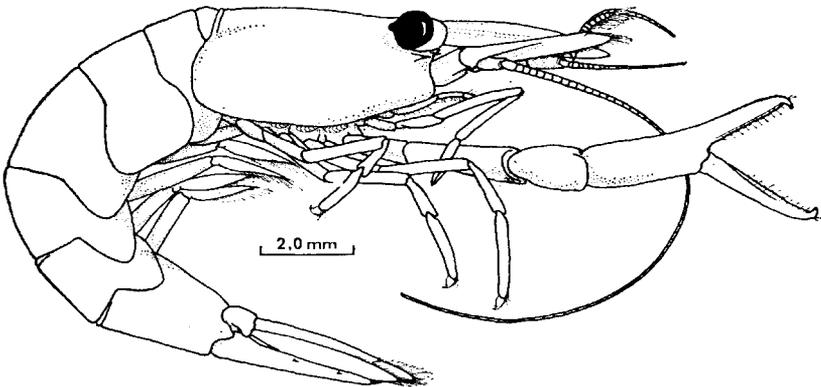


FIG. 1. — *Parapontonia nudirostris* gen. nov., sp. nov. Holotype, adult male.

of the antennular peduncle. The dorsal and ventral margins of the rostrum are feebly convex. Both margins are devoid of teeth. The tip of the rostrum bears a small acute point. The midrib is very well developed and lies at the middle of the rostral lamina. Proximally the midrib is broadly expanded, with convex lateral borders over the ophthalmic somite, and merges posteriorly with the orbital margin. Large supra-ocular spines are present, separated from the posterior end of the rostral midrib by a U-shaped notch. The spines are broad and obtuse and their lateral borders extend postero-laterally to form the margins of a deep orbital fossa. The inferior orbital angle is small broad and blunt. A small acute antennal spine arises from the anterior margin of the carapace and a larger, more robust and distinctly projecting hepatic spine arises from the carapace at a lower and more posterior level. The antero-lateral angle of the carapace projects anteriorly and is broadly rounded. The posterior margin of the branchiostegite is also broadly rounded. The epistome bears a pair of large divergent spines directed antero-ventrally beneath the bases of the proximal segments of the antennular peduncle. The second thoracic sternite bears a narrow transverse lamina, the third is broad and unarmed, and fourth is narrow and lacks a median spine.

The abdomen is elongated and smooth. The third segment is not produced in the dorsal midline. The sixth segment is robust, less than twice the length of the fifth segment and its length is about 1.4 of its depth. The postero-lateral angle is acute and the postero-ventral angle is blunt. The pleuron of the first segment is bluntly angled anteriorly. The second and third pleura are rounded, the fourth and fifth subrectangular with rounded ventral margins and blunt postero-ventral angles. The telson is 1.4 times the length of the sixth abdominal segment and is about 3.5 times longer than its basal width. The lateral margins are feebly convex and converge posteriorly to a bluntly rounded posterior border. Two pairs of minute dorsal spines are present, situated close to the lateral margins, at 58 % and 82 % of the telson's length respectively. The terminal spines are small and three pairs are present. The lateral spines are short and stout, about twice the size of the dorsal spines. The intermediate spines are well developed, strong and slender, about five times the length of the lateral spines. The submedian spines are small, slender, non-setose, and about half the length of the intermediate spines.

The eye is well developed with a globular hemispherical cornea. The distal aspect of the cornea is produced into a small but distinct, blunt conoidal projection and an accessory pigment spot is present on its postero-lateral margin. The eyestalk is subcylindrical, slightly swollen proximally and about twice the diameter of the cornea in length. The cornea lies obliquely in relation to the eyestalk and is slightly greater in diameter.

The antennule is well developed and the peduncle extends anteriorly to the level of the tip of the rostrum and the disto-lateral spine of the scaphocerite. The basal segment exceeds the level of the anteroverged eye by about one third of its length. The lateral margin is almost straight, and the stylocerite is short and broad, and reaches to the middle of the

medial border. The anterior margin is strongly produced and extends almost to the level of the posterior margin of the distal peduncular segment. The margin consists of a broad bluntly pointed medial lobe and a more posteriorly placed, strong lateral tooth. There is no ventro-medial spine. The statocyst is well developed and contains several small granules. The intermediate and distal segments are subequal in length and are obliquely articulated. Their combined lengths are about equal to half the length of the basal segment. The lateral margin of the intermediate segment is feebly lobed and bears a row of plumose setae. The medial margin is carinate and bears numerous strong plumose setae. The distal segment is simple and non-setose. The lower flagellum is subequal to the peduncle in length and consists of 22 segments. The upper flagellum consists of two rami which are fused proximally for seven segments. The shorter ramus consists of three free segments and the longer of nineteen. There are eleven groups of aesthaetascas present on the fourth to tenth segments of the short ramus. The longer ramus exceeds the length of the lower flagellum and consists of fifteen segments.

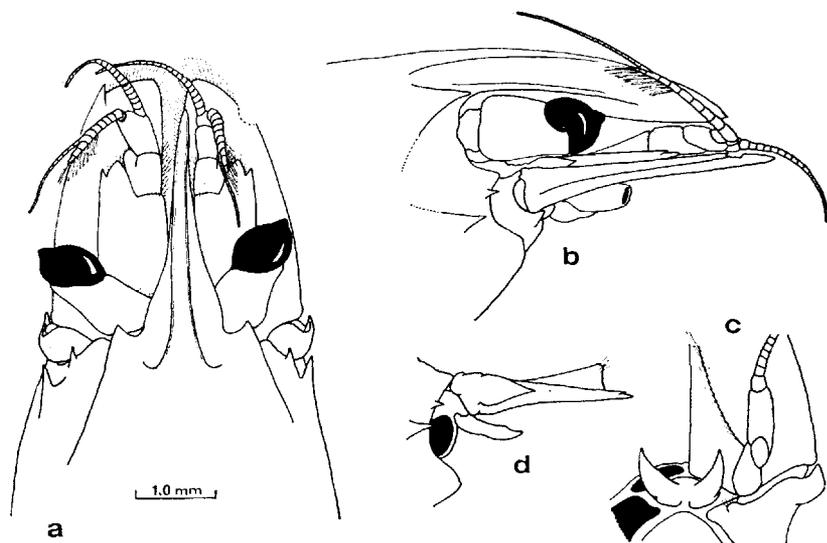


FIG. 2. — *Parapontonia nudirostris* gen. nov., sp. nov. Allotype, female. Anterior region of carapace with appendages : a) dorsal view ; b) lateral view. Epistomal region with right antennae removed ; c) ventral view ; d) lateral view.

The antenna is well developed and the scaphocerite distinctly exceeds the tip of the rostrum and the antennular peduncle. The lateral margin of the scaphocerite is feebly convex and terminates in a strong tooth at the level of the anterior margin of the antennular peduncle. The lamina is broad, about three times longer than wide, with its greatest width situated in the proximal half, and the anterior portion bluntly angulated. The basicerite bears a triangular tooth laterally and the carpocerite is about one fifth of the length of the lamina of the scaphocerite. The

antennal flagellum is well developed and extends posteriorly to the posterior margin of the third abdominal segment.

The mouthparts of the right side of the specimen only have been removed. The mandible lacks a palp. The molar process is slender and bears distally a transverse row of eight small teeth, of which the first and last are slightly longer than the rest. The molar process is robust and bears three posterior chitinous process and a pair of anterior setiferous lobes. The maxillula has a well developed palp, which is simple and bears a single hooked seta distally. The upper lacinia is broad and truncate with a row of eight stout spines distally, together with a number of slender setae. The lower lacinia is narrow and curved with numerous long setae distally. The maxilla has a well developed but narrow scaphognathite. The endite is deeply cleft, for about one third of its length, each lobe bearing numerous long slender simple setae. The palp is broad and bears a single seta at two thirds of the length of the medial border. All maxillipeds have well developed setose exopods. The first maxilliped has a large broad basal endite separated by a small notch from a small coxal endite. A long slender palp is present bearing two long slender plumose setae on the medial aspect of its proximal half. The exopod bears a large caridean lobe and a bilobed epipod, is present. The second maxilliped is of normal shape and bears a subrectangular epipod without a podobranch. The third maxilliped is slender and extends anteriorly to the middle of the carapocerite. The terminal and penultimate segments are subequal in length and together are subequal in length to the antepenultimate segment. The two distal segments bear dense rows of serrate setae along the medial borders. The antepenultimate segment is feebly setose. The exopod exceeds the length of the antepenultimate segment and a robust rigid epipod and a rudimentary arthrobranch are present.

The first pereopod is long and slender and exceeds the tip of the scaphocerite by the length of the chela and half the palm. The chela is slender with narrow fingers which are slightly shorter than the length of the palm. The cutting edges are entire and are situated along the lateral aspects of the fingers. The propod is slightly more than twice the length of the chela and increases slightly in width distally. The merus is slightly shorter than the carpus. Both carpus and merus are subcylindrical. The ischium and merus are slightly flattened and the ischium is slightly longer than the merus. A small setose prominence is present in the medial aspect of the coxa.

The second pereopods are detached. The chelae are similar and unequal. The major chela is robust with the fingers, which are strongly curved and hooked, equal to about half the length of the palm. The cutting edges are situated laterally on the fingers and bear five low teeth on the fixed finger and four on the dactyl. The minor chela is more slender and the fingers, which are also curved and hooked, are about four fifths of the length of the palm. The cutting edge of the fixed finger bears six low teeth and that of the dactyl five. The carpus is short, stout and unarmed, a little less than a third of the palm of the major chela in length. The merus is one and a third times the length of the

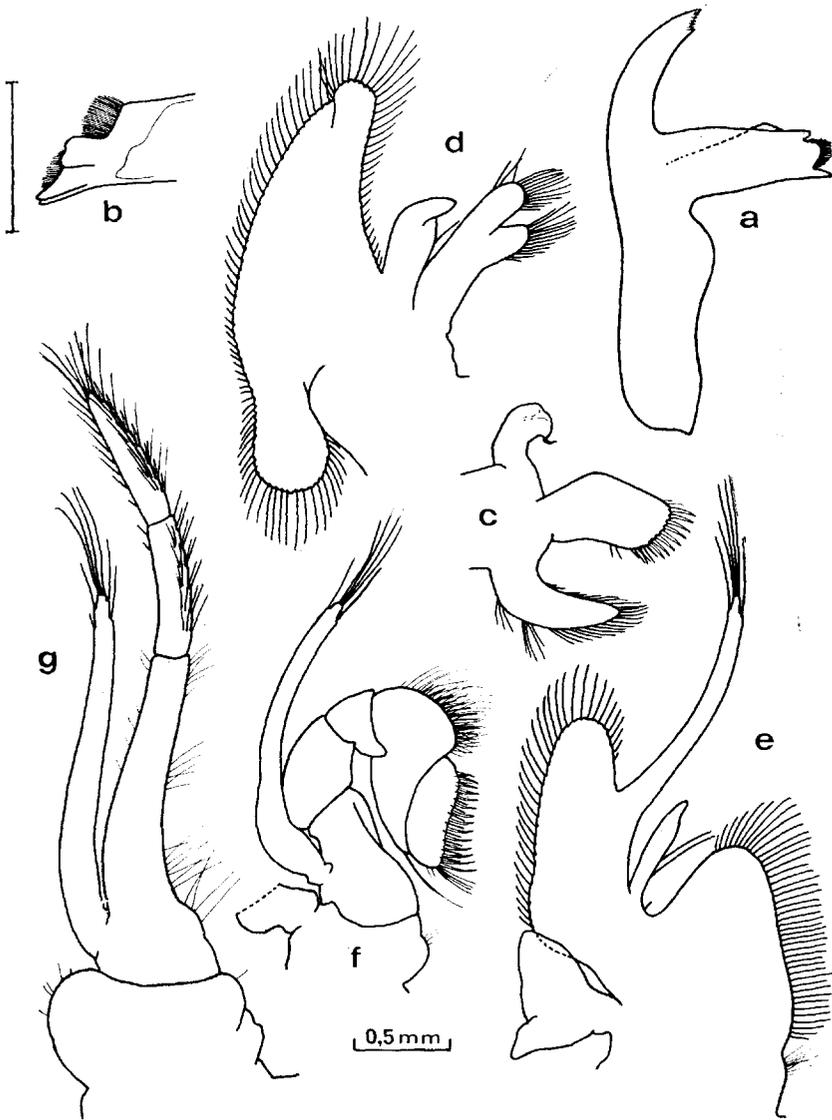


FIG. 3. — *Parapontonia nudirostris* gen. nov., sp. nov. Allotype, female, mouthparts. a) mandible; b) molar process of mandible; c) maxillula; d) maxilla; e) first maxilliped; f) second maxilliped; g) third maxilliped.

carpus. Upper and lower distal inner angles of the merus are lobular, the ventral distinctly larger than the dorsal. The ischium is subequal in length to the carpus.

The ambulatory pereiopods are stout and devoid of spines, but a few simple setae are present distally on the propods. The third pereiopods

extend anteriorly to the level of the spine of the scaphocerite. The fifth pereiopod extends anteriorly to the level of the middle of the carapocerite.

The dactyls of the ambulatory pereiopods are short, robust and strongly hooked. The dactyl of the fifth pereiopod bears a distinct accessory spine, that of the third pereiopod has a reduced accessory spine and that

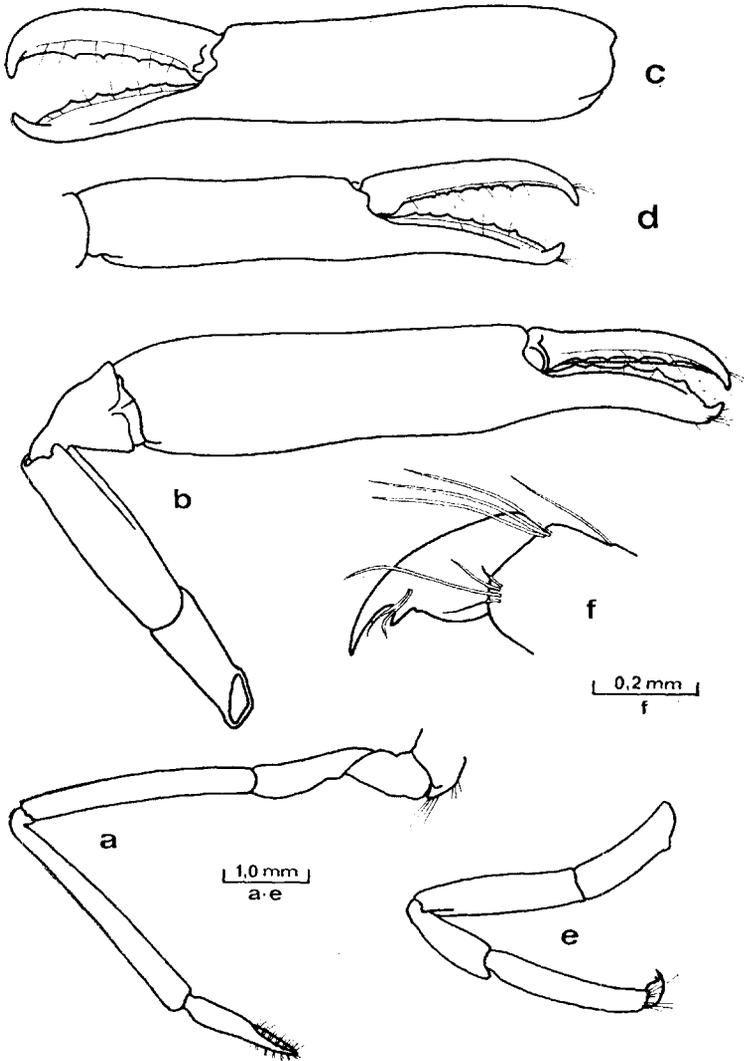


FIG. 4. — *Parapontonia nudirostris* gen. nov., sp. nov. Allotype, female. a) first pereiopod ; b) major second pereiopod, dorsal view ; c) chela of major second pereiopod, medial view ; d) chela of minor second pereiopod ; e) fifth pereiopod ; f) dactyl of fifth pereiopod.

of the fourth pereopod lacks an accessory spine. The merus and carpus of the fifth pereopod are subequal and the carpus is about two thirds of the length of the propod. The lengths of the propod and the merus of the third to fifth pereopod are both in the ratio of 9:8:8. The dactyls are about one quarter of the lengths of the propods.

The pleopods are long and slender with elongated basal and coxal segments. The endopod of the first pleopod is slender, tapering distally, about one third of the length of the exopod, five times longer than wide, and its lateral and anterior distal border densely fringed with long plumose setae. The endopods of the second to fifth pleopods have well developed appendices internae. The uropods are subequal and exceed the posterior end of the telson, reaching to the level of the tip of the terminal spines. The basipodite bears two blunt lobes dorsally. The lateral margin of the exopod is feebly convex and bears distally a minute tooth and a small mobile spinule.

**DESCRIPTION OF MALE.** — The male closely resembles the female apart from being generally smaller and slimmer. The following small differences may be noted. The rostrum is longer, one quarter of its length exceeding the antennular peduncle and tip of the scaphocerite, and is not depressed. The lateral expansion of the midrib are less well developed than in the female and the tip of the rostrum is blunter.

The divergent epistomal spines noted in the female are similarly present in the male and the cornea has a similar distal conoidal projection. The antennular peduncle is more slender and the antero-lateral lobe of the basal peduncle segment is more produced with an acute median lobe at the same level as the disto-lateral tooth. The lateral aspect of the basiscerite is armed with an acute spine.

The chelae of the second pereopods are less robust with the fingers relatively longer in relation to the palm and with smaller, more numerous teeth. The ambulatory pereopods are similar to those of the female except that in all cases the dactyls are provided with distinct accessory spines. The third pereopod extends anteriorly to the level of the distal end of the antennular peduncle.

The first pleopod has a reduced endopod which bears a row of four plumose setae along the distal third of its lateral border. On the second pleopod the appendix interna slightly exceeds the appendix masculina, which bears five stout spinulate setae along the distal half of its medial border, and five plumose setae along the proximal half.

The uropods extend beyond the tip of the telson and the exopod is slightly longer than the endopod.

MEASUREMENTS (mms)	<i>Female</i>	<i>Male</i>
Post-orbital carapace length.....	6.4	4.0
Length of carapace and rostrum.....	7.6	7.6
Fifth abdominal segment.....	2.1	1.8
Sixth abdominal segment.....	2.8	2.2
Telson .....	4.3	3.2

Length of major chela of second pereiopod.....	7.2	4.3
Length of minor chela of second pereiopod.....	5.7	4.2
Maximum diameter of ovum.....	0.7	—

COLOUR. — Colour noted in the field as “red and black”.

HOST. — The two specimens were obtained together on a specimen of the crinoid *Tropiometra afra* (Hartlaub).

TYPE. — The male specimen is selected as the holotype and has been deposited in the collections of the Museum National d'Histoire Naturelle, registration number : 6844.

REMARKS. — The new genus *Parapontonia* may be separated from all other genera of pontoniid shrimps by the presence of a well developed, edentate, †-shaped rostrum and a pair of large horn-like processes on the epistome.

*Parapontonia* is most closely related to a group of species of the genus *Periclimenes* Costa, that are also known to be associated with echinoderms. This group consists of *P. amboinensis* De Man, *P. ceratophthalmus* Borradaile, *P. commensalis* Borradaile, *P. cornutus* Borradaile, *P. cristimanus* Bruce and *P. zanzibaricus* Bruce. The group is characterized by the presence of a broadly expanded rostral midrib bearing acute supra-ocular spines. In this group some of the species are at present placed in the subgenus *Periclimenes* s. str. and others in the subgenus *Harpilius* Dana. The species *P. amboinensis*, *P. ceratophthalmus* and *P. cornutus* also resemble *Parapontonia nudirostris* in the presence of a conoidally produced cornea.

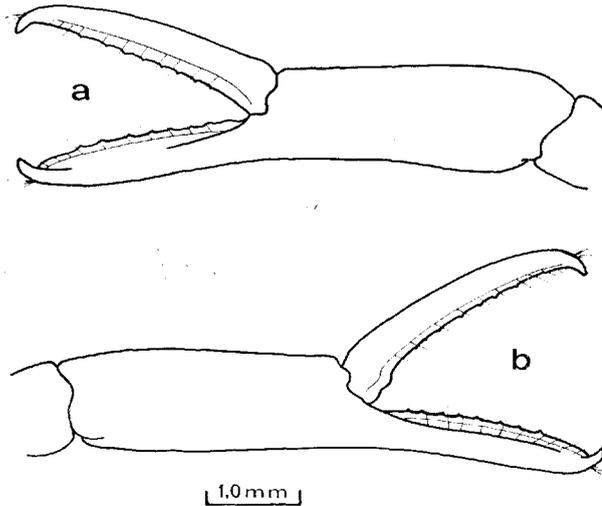


FIG. 5. — *Parapontonia nudirostris* gen. nov., sp. nov. Holotype, male. a) left second pereiopod b) right second pereiopod.

*Parapontonia* is also closely related to the genus *Pontoniopsis* Borradaile, which contains only a single species, *P. comanthi* Borradaile, and is also commensally associated with crinoids. *Pontoniopsis* resembles *Parapontonia* in having an edentate rostrum but the lamina above the expanded midrib is reduced to a low carina. In addition, both supra-ocular and hepatic spines are absent and the chelae of the second pereopods are dissimilar, in contra-distinction to *Parapontonia*.

A resemblance is also shown by *Parapontonia* to two other pontoniid genera that are known to be associated with echinoderms. These two genera, *Stegopontonia* Nobili and *Tuleariocaris* Hipeau-Jacquotte also contain slender species with well developed rostra bearing posteriorly expanded midribs. In *Tuleariocaris* the rostrum is †-shaped, like *Parapontonia*, but bears a series of distinct dorsal teeth. In *Stegopontonia* the rostrum is edentate but the lamina above the midrib is absent and the rostrum is therefore T-shaped. Both *Stegopontonia* and *Tuleariocaris* have grossly unequal, dissimilar chelae on the second pereopods.

***Periclimenes novaecaledoniae* sp. nov. (figs. 6-9)**

MATERIAL EXAMINED. — 3 ♂, 1 ovig. ♀, Hot Maitre, Noumea, New Caledonia, 22° 20' S., 116° 25' E. Coll. Y. MAGNIER, 1966.

DESCRIPTION OF FEMALE. — General body form slender and slightly compressed. Carapace smooth, with well developed, slightly depressed rostrum extending anteriorly to just beyond the antennular peduncle. The rostral lamina is deep with a distinct central midrib which expands posteriorly and merges with the superior orbital margin. The upper margin is feebly concave and bears eight regularly spaced teeth, all anterior to the level of the orbital margin. The anterior teeth decrease gradually in size and the most anterior is small and subterminal. The ventral rostral margin is also convex and bears two teeth, which are smaller than the dorsal series and are situated close together just in front of the middle of the lower border at the level of the proximal end of the intermediate segment of the antennular peduncle. A small post-rostral tubercle is present on the anterior carapace in the midline. Supra-ocular and supra-orbital spines are absent. The well developed, dorsally inclined antennal spine is slender, and rises from the anterior margin of the carapace immediately below the inferior orbital angle, which is well developed and bluntly triangular. The hepatic spine is robust, ventrally inclined and distinctly larger than the antennal spine. It originates at a much posterior and slightly more ventral level than the antennal spine. The anterior margin of the carapace is slightly produced and broadly rounded. The posterior margin of the carapace is distinctly thickened. The posterior margin of the branchiostegite is evenly rounded and also thickened dorsally. The third thoracic sternite is unarmed. The fourth and fifth sternites bear transverse laminae, both notched in the midline, behind the level of the coxae of the first and second pereopods respectively. The sixth to eight sternites are unarmed.

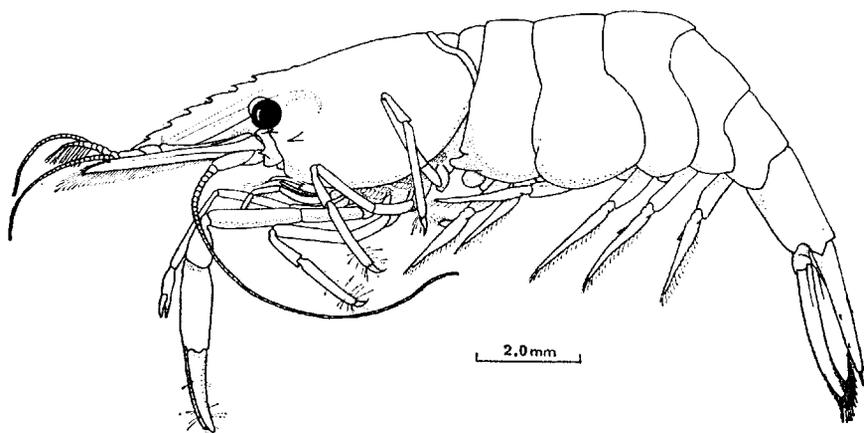


FIG. 6. — *Periclimenes novaecaledoniae* sp. nov. Holotype, ovigerous female.

The abdomen is smooth. The third segment is slightly produced in the dorsal midline. The fifth segment is about two thirds of the length of the sixth segment, which is 1.5 times longer than deep. The postero-lateral angle of the sixth segment is broadly produced and acute. The postero-ventral angle is bluntly triangular. The margins of the pleura are blunt. The anterior margin of the first pleuron is lobulated. The second and third are broadly rounded. The fourth is produced posteriorly and is bluntly triangular and the fifth, which is feebly produced, is bluntly subrectangular. Telson is elongated and narrow, uniformly tapering, with straight lateral margins, about four times longer than wide and 1.3 times the length of the sixth abdominal segment. The distal extremity is rounded. There are two pairs of small dorsal spines, the posterior pair slightly larger than the anterior pair, arising from close to the lateral margins of the telson at half and three quarters of its length. Three pairs of terminal spines are present. The lateral spines are small, subequal to the posterior dorsal spines. The intermediate spines are robust, long and slender and equal to about one fifth of the length of the telson. The plumose submedian spines are less robust than the intermediate and about half its length.

The cornea is globular and set obliquely on the eyestalk. A well marked accessory pigment spot is present dorso-posteriorly. The diameter of the cornea is half the length of the eye. The eyestalk is slightly flattened proximally and sub-circular in section distally.

The antennule is well developed and the peduncle reaches to a level slightly posterior to the tip of the rostrum. The medial border of the basal segment is slightly longer than twice its width. The stylocerite is broad, acutely pointed and half the length of the medial border. The lateral border is slightly sinuous with a strong, laterally inclined distal

tooth. The anterior margin is strongly produced anteriorly and extends to the level of the middle of the intermediate peduncular segment. It is bluntly angled medially and bears a distinct tooth laterally, which is slightly smaller than the disto-lateral tooth. Ventrally a small spine is present close to the middle of the medial border. The statocyst is well developed and contains a regular circular statolith. The intermediate segment is short, about one fifth of the length of the basal segment. The lateral border is enlarged to form a setose lobe and a similar but smaller lobe is present on the medial side. The distal segment is subcylindrical but increasing slightly in size distally, and subequal to the length of the

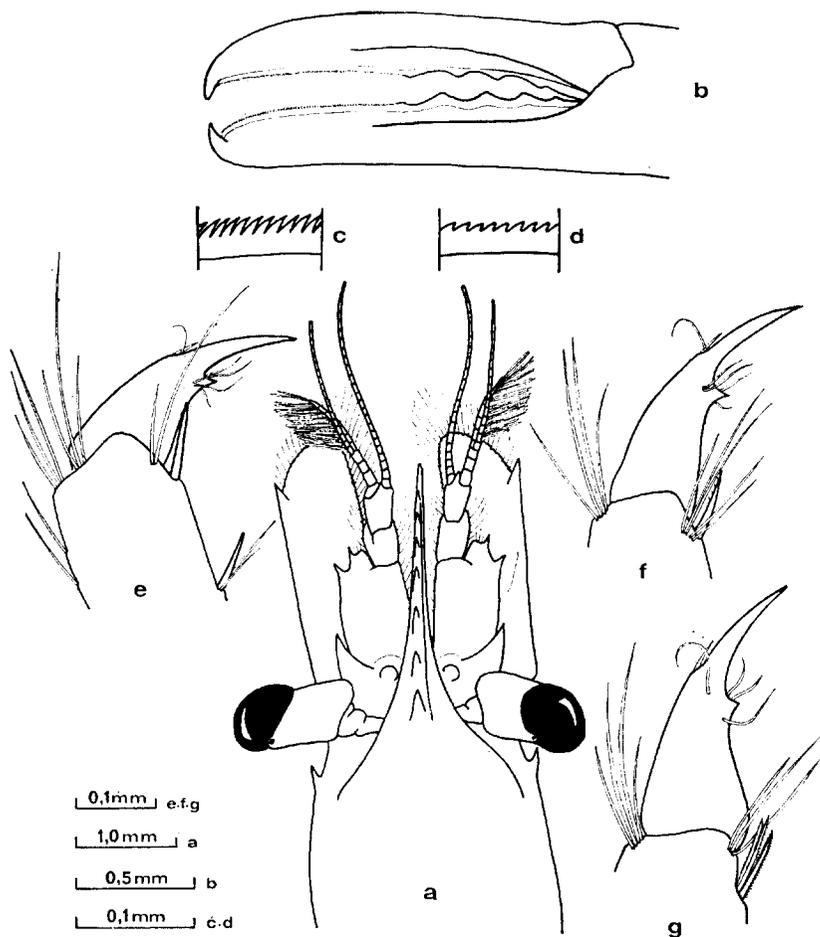


FIG. 7. — *Periclimenes novaecaledoniae* sp. nov. Holotype, ovigerous female. a) anterior region of carapace with appendages, dorsal view; b) fingers of chela of second pereiopod; c) anterior region of cutting edge of fixed finger; d) central region of cutting edge of fixed finger; e) dactyl of third pereiopod; f) dactyl of fourth pereiopod; g) dactyl of fifth pereiopod.

intermediate segment. The lower flagellum is filiform and consists of twenty segments. The upper flagellum consists of two rami which are fused for the three proximal segments. The shorter free ramus consists of four segments bearing nine groups of aesthaetases. The longer free ramus consists of twenty four segments.

The antenna is well developed, the lamina of the scaphocerite distinctly exceeding the antennular peduncle and the tip of the rostrum. The lateral border of the scaphocerite, which is three and a quarter times longer than wide, bears a robust tooth. The tooth is exceeded by the lamina which is bluntly angled medially. The carpocerite is subcylindrical and does not reach the level of the anterior border of the basal segment of the antennular peduncle. The basicerite is robust with an acute tooth ventro-laterally on its anterior margin. The antennal flagellum extends to the posterior border of the fifth abdominal segment.

The mouthparts have not been dissected but well developed exopods can be seen on all maxillipeds. No arthrobranch can be discerned on the third maxilliped.

The first pereiopod is slender and exceeds the lamina of the scaphocerite by the length of the fingers. The fingers of the chela are slender and slightly longer than the palm, which is subcylindrical. The cutting edges of the fingers are entire and lie along the dorsal edges giving the fingers a feebly spatulate appearance. The carpus is slender and increasing in width distally, about 1.75 times the length of the chela, and subequal to the length of the merus. The second pereiopods are well developed, robust, similar and subequal and exceed the tip of the scaphocerite by the fingers and one third of the palm. The fingers are slightly shorter than the palm, which is subcylindrical. The dactyl is situated laterally when the chela is extended and the fingers are curved ventrally, with strongly hooked tips. The cutting edges are situated along the dorsal margins. The proximal half of the cutting edge of the dactyl bears four teeth and the opposing edge of the fixed finger bears five. All teeth are low and blunt and the anterior tooth on each edge is feeble. The anterior halves of the cutting edges of both fingers are finely serrated. Distally the denticles are long, slender, acute and curved posteriorly. Proximally the denticles are shorter and blunter. Distally the cutting edge of the fixed finger is separated from the hooked tip by a distinct notch into which the tip of the dactyl fits. The carpus is a little more than half the length of the palm, twice as broad distally as proximally and unarmed. The merus is subequal to the palm, five times longer than wide, slightly compressed and unarmed. The ischium is also unarmed and about two thirds of the length of the merus. The ambulatory pereiopods are robust. The third pereiopod extends to the spine of the scaphocerite. The fourth and fifth pereiopods exceed the carpocerite by one third of the propod and the dactyl. The dactyls are robust proximally, with a slender distal portion, and bear a small acute accessory spine in the middle of the posterior border. The anterior margin bears a short stout spine and a slender seta. The propods of the third to fifth pereiopods have lengths in the ratio 10:11:14. The posterior margins of the propods are feebly spinose

distally, with three simple spines on the third pereopod, four feebly spinulose spines on the fourth and three on the fifth. The distal spines on the fifth propod are serrated and associated with some serrated setae, the other spines on the posterior margin are feebly spinulose and the setae are simple. The carpus, merus and ischium of all ambulatory pereopods are unarmed and non-setose. The meri are subequal and about two thirds of the length of the propod of the fifth pereopod.

The pleopods are well developed, with elongated bases and coxae. The endopod of the first pleopod is reduced, short, and curved dorso-medially, without an appendix interna. The endopods of the second to fifth pleopods have well developed appendices internae. The basipod of the uropod is blunt disto-laterally. The endopod and exopod are elongated and slender. The exopod reaches the tips of the intermediate terminal telson spines and the endopod reaches the tip of the submedian spines. The lateral margin of exopod is straight terminating in a small acute fixed tooth with a longer slender mobile spinule medially, at the level of the posterior margin of the telson.

The ova, which are undeveloped, number 124 and have a maximum length of about 0.6 mm.

DESCRIPTION OF MALES. — Generally similar to the female but much smaller and more slender. The following differences may be noted. Two specimens have seven dorsal and one ventral rostral teeth. The rostrum of the third specimen is damaged. In the two undamaged specimens the rostrum just reaches the end of the antennular peduncle. The antennae are also similar to those of the female but the flagella are relatively longer and more slender. The proximal segment of the antennular peduncle is narrow and the anterior lobe bears a tooth laterally and an acute lobe medially. The antero-lateral spine on the basicerite is feebly developed.

The mouthparts have been removed from the damaged specimen. The mandible is without a palp. The incisor processes have five subequal teeth distally. The molar processes are asymmetrical and are provided with processes and dense rows of coarse and fine setae as illustrated in fig. 8. The maxillula has a well developed, feebly bi-lobed palp provided with a small conical appendage. The upper lacinia is broad centrally, tapering and is armed with five short teeth and numerous setae distally. The lower lacinia is slender with a dense brush of setae distally. The maxilla has a short broad scaphognathite. The palp is well developed, curved medially with three setae arising from its inner border. A single well developed bifid basal endite is present, with its distal lobe broader than the proximal lobe and both provided with numerous slender setae distally. The proximal coxal endite is represented by a shallow lobe arising proximally to the basal endite. The first maxilliped has an exopod with a well developed setose flagellum and a small caridean lobe. The palp is long and slender, does not exceed the margin of the caridean lobe, and is provided medially with a single subterminal seta and a row of four plumose setae proximally. The basal endite is broad and rounded and provided with sparsely distributed serrate setae along its medial

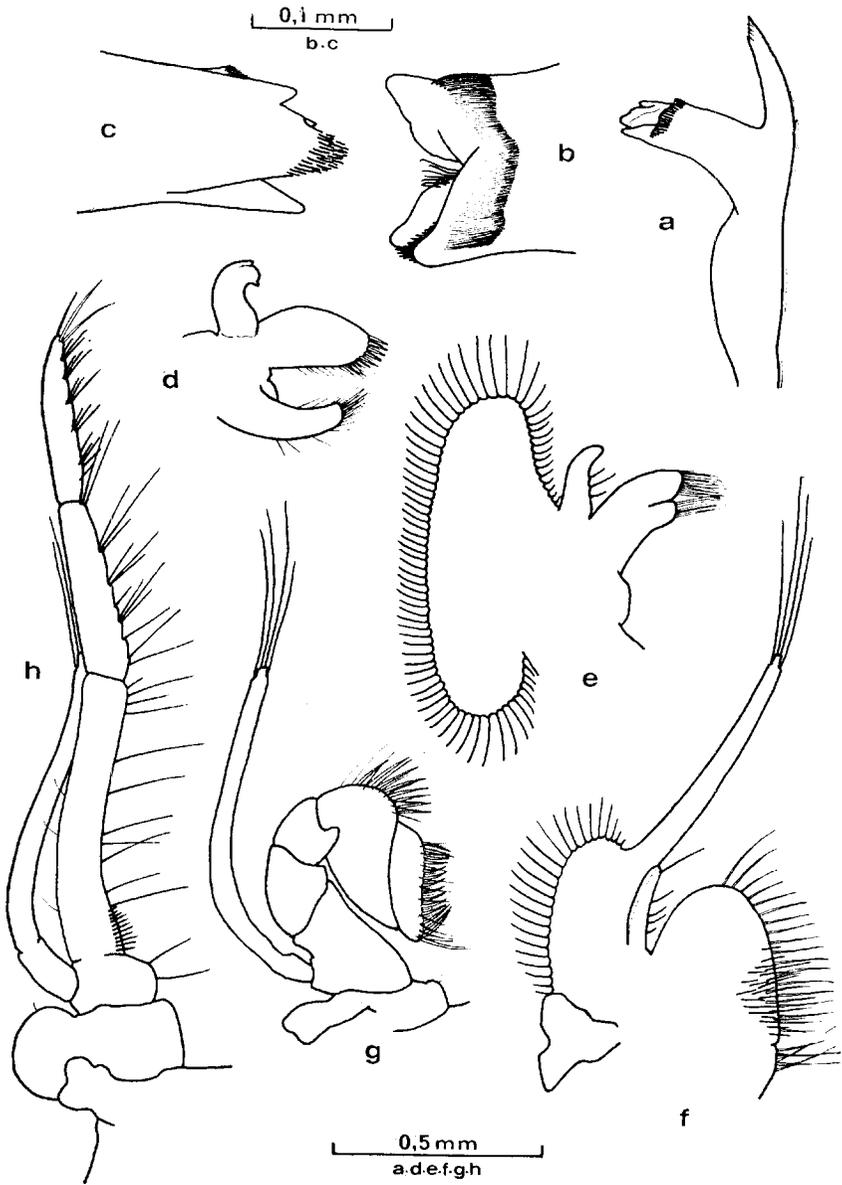


FIG. 8. — *Periclimenes novaecaledoniae* sp. nov. Paratype, male. a) mandible ; b) right molar process ; c) left molar process ; d) maxillula ; e) maxilla ; f) first maxilliped ; g) second maxilliped ; h) third maxilliped.

and distal margin. A small coxal endite is separated from the basal endite by a small notch, and is provided with a few long slender setae. A bi-lobed epipod is also present. The second maxilliped is typical and provided with a well developed exopod and a small subrectangular epipod, without a podobranch. The segments of the endopod are rather broad and robust. The third maxilliped is long and slender, extending anteriorly to the middle of the carpoperite. The terminal and penultimate segments of the endopod are subequal in length and provided with numerous slender serrate setae. The tip of the terminal segment bears three long, slender non-serrated setae. The antepenultimate segment is equal in length to the combined lengths of the terminal and penultimate segments. It is strongly bowed ventrally and bears numerous long slender simple setae along the medial border. A row of contiguous, short, plumose setae arises submarginally from the medial border near the proximal end of the segment. The exopod extends to the base of the penultimate segment of the endopod. A broad rounded epipod is present and also a very small arthrobranch.

The first pereopod extends anteriorly to the level of the disto-lateral spine of the scaphocerite and is similar to that of the female. The second pereopods are also similar to those of the female. The fingers are equal to about two thirds of the length of the palm and the cutting edges have three teeth on the dactyl and four on the fixed finger posteriorly. The merus is subequal to the length of the palm. The carpus is subequal to the length of the fingers and the ischium. Carpus, merus and ischium are all unarmed. The ambulatory pereopods are similar to the female but more slender.

The endopod of the first pleopod is reduced. It is narrow proximally and bears three long plumose setae at the base of the medial margin with a row of seven short spines immediately distally to the setae. The distal portion is more expanded and bears seven plumose setae along its lateral margin. The appendix masculina is cylindrical and extends anteriorly to the level of the tip of the appendix interna. It is armed with seven stout serrated setae, five of which are situated terminally and two sub-terminally on the medial margin. Two simple setae are also present on the disto-medial border. The third to fifth pleopods and the uropods are as in the female.

MEASUREMENTS (mm)	<i>Female</i>	<i>Male</i>	<i>Male</i>	<i>Male</i>
Post-orbital carapace length.....	3.25	2.20	2.25	2.00
Length of carapace and rostrum.....	6.20	4.20	4.60	—
Fifth abdominal segment.....	1.20	0.95	0.95	0.80
Sixth abdominal segment.....	1.90	1.60	1.70	1.40
Telson .....	2.80	2.00	2.10	1.90
Length of major chela.....	3.40	2.55	2.50	2.20
Length of minor chela.....	3.30	2.30	2.25	2.10
Maximum diameter of ovum.....	0.60	=	—	—

COLOUR. — Colour noted in the field as black.

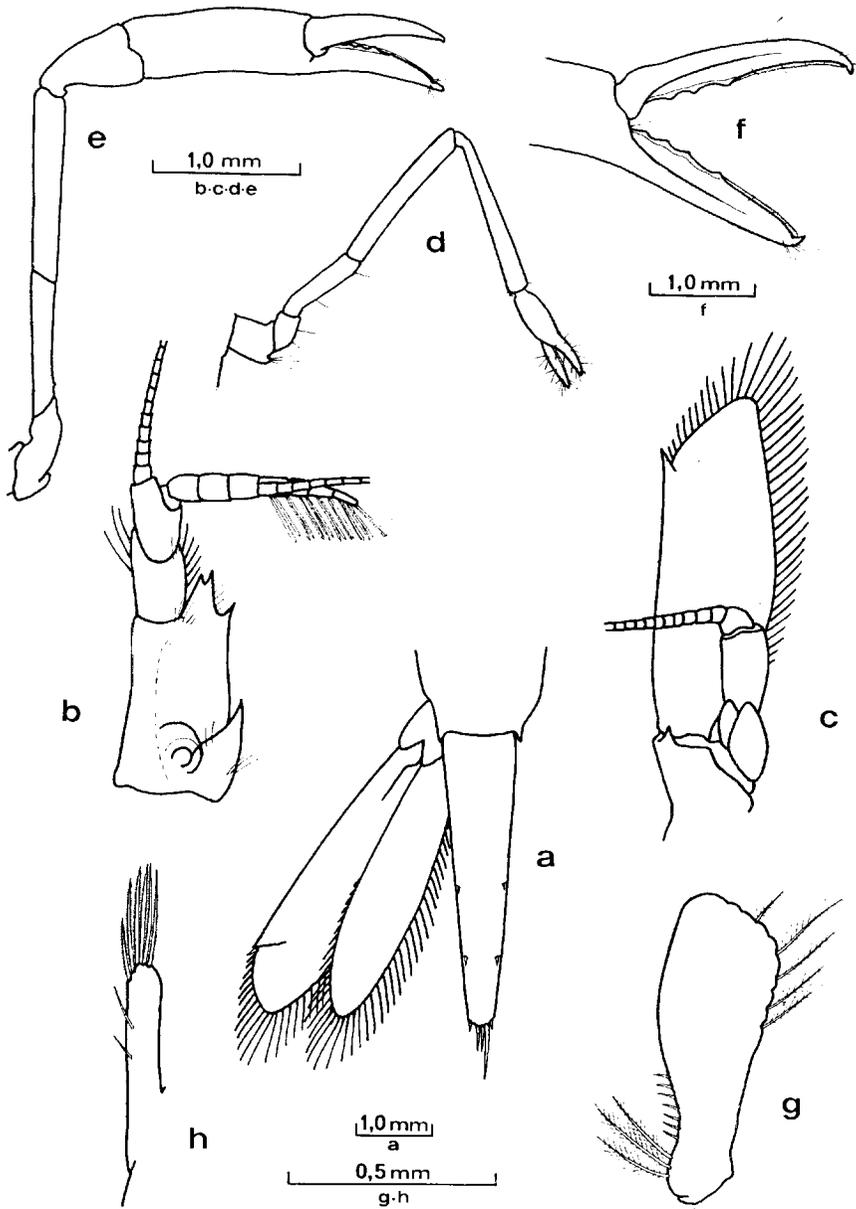


FIG. 9. — *Periclimenes novaecaledonia* sp. nov. Paratype, male. a) telson and left uropod; b) antennule; c) antenna; d) first pereiopod; e) right second pereiopod; f) fingers of chela of right second pereiopod; g) endopod of first pleopod; h) appendix masculina.

HOST. — All specimens were obtained from a single specimen of *Tropiometra afra* (Hartlaub).

TYPE. — The female is selected as the holotype and is deposited in the collections of the Museum National d'Histoire Naturelle, registration number : 6812.

REMARKS. — On account of the presence of well developed accessory spines on the dactyls of the ambulatory pereopods, *Periclimenes novae-caledoniae* should be referred to the subgenus *Periclimenes* s. str. However, it is most closely related morphologically to two species at present placed in the subgenus *Harpilius* Dana, *P. affinis* (Zehntner, 1844), and *P. brockettii* Borradaile, 1915. These two species are also closely related to each other and may be distinguished from *P. novae-caledoniae* by the following common features :

- a) a posterior dorsal rostral tooth behind the orbital margin.
- b) anterior half of the cutting edges of the fingers of the second pereopods entire.
- c) no accessory spines on dactyls of ambulatory pereopods.
- d) no spinules on posterior margins of propods of ambulatory pereopods.

They may be separated from each other by the relative lengths of the fingers and palm of the chelae of the second pereopods. In *P. affinis* the fingers are half the length of the chela whereas in *P. brockettii* the fingers are subequal to the palm. Also in *P. brockettii* the fingers of this chela are entire whereas in *P. affinis* they are armed with distinct teeth.

*Periclimenes affinis* (Zehntner)

*Palaemonella affinis* Zehntner, 1894, p. 208 ; BEDOT, 1909, p. 166 ; BORRADAILE, 1917, p. 357 (key), 358 ; HOLTHUIS, 1952, p. 20.

*Periclimenes affinis*, HOLTHUIS, 1958, p. 6, fig. 2.

MATERIAL EXAMINED. — 1 ♂, 1 ovig. ♀ and 1 juv. Hot Maitre, near Noumea, New Caledonia ; 22° 20' E. 166° 25' E. Coll. Y. MAGNIER, 1966.

HOST. — *Cenolia* sp.

REMARKS. — The specimens agree closely with the redescription of the type specimen (HOLTHUIS, 1958). The only significant difference noted is that, in the largest specimen, the ovigerous female, post-orbital carapace length 3.1 mms, the basal segment of the antennular peduncle is armed disto-laterally with two similar, well developed, acute teeth. The median tooth arises from the disto-lateral lobe of the segment and is therefore slightly in advance of the lateral tooth. In the two smaller examples the disto-lateral lobe is produced and rounded as described in the type. The adults have seven dorsal and one ventral rostral teeth. The juvenile has only six dorsal and one ventral tooth. It may also be noted that the thoracic sternites are all unarmed and that the ambulatory pereopods

are devoid of spinules but bear numerous tufts of long slender setae distally. The original specimen was also obtained in association with a crinoid, *Actinometra* sp.

DISTRIBUTION. — This species has not been re-discovered since the description of the type specimen which was obtained at Amboina, in Indonesia, in 1890.

*Periclimenes anymone* De Man

*Periclimenes anymone* De Man, 1902, p. 829, pl. 25, fig. 53.

*Periclimenes (Falciger) anymone*, BORRADAILE, 1917, p. 371.

*Periclimenes (Ancylotaris) anymone*, KEMP, 1922, p. 219; 1925, p. 326; ARMSTRONG, 1941, p. 12.

*Periclimenes (Harpilius) anymone*, HOLTHUIS, 1952, p. 82, fig. 32; JOHNSON, 1961, p. 58; PATTON, 1966, p. 273.

MATERIAL EXAMINED. — 1 ♂, 2 ovig. ♀. Noumea, New Caledonia. Coll. Y. MAGNIER, 1966.

HOST. — *Pocillopora* sp.

REMARKS. — The specimens agree well with DE MAN's description. In the females the proximal half of the rostrum is slightly depressed and there are seven dorsal and two ventral teeth. In the male the rostrum is badly damaged. There is a long slender median spine present on the fourth thoracic sternite and a broad transverse lamina, notched in the midline, on the fifth thoracic sternite behind the coxae of the second pereiopod. An acute median process is present on the eighth thoracic sternite in the male but only a feeble knob is present in this situation in the female. The meral and carpal spines on the second pereiopods are strongly developed. The propods of the ambulatory pereiopods are devoid of spinules but are provided with numerous long slender setae.

*Periclimenes imperator* Bruce.

*Periclimenes imperator* Bruce, 1967, p. 53, figs. 23-25.

MATERIAL EXAMINED. — 3 ♂, 3 ovig. ♀, from Aquarium Noumea, New Caledonia, don. R. CATALA. Museum National d'Histoire Naturelle, 1 ♂, 1 ovig. ♀, ref. no. 4110; 1 ♂, 1 ovig. ♀, unnumbered; Australian Museum, 1 ♂, 1 ovig. ♀, registration no. P. 13705.

HOST. — *Hexabranhus imperialis* and *Hexabranhus* sp.

REMARKS. — All specimens agree well with the published description. The males in the collection of the Muséum National d'Histoire Naturelle have 26 and 28 dorsal rostral teeth and the two females each have 28 teeth. The only difference noted in these specimens is that the pectinations on the cutting edges of the fingers of the first pereiopods are reduced and limited to the distal portions. Previously recorded specimens were also found in association with *Hexabranhus*.

DISTRIBUTION. — The species has been reported from Mocambique, Madagascar, Zanzibar and the Red Sea, and also from Hawaii.

*Periclimes soror* Nobili.

*Periclimes soror* Nobili, 1904, p. 232; 1906, p. 50, pl. 2, fig. 6; GORDON, 1939, p. 395, figs. 1-3; BRUCE, 1965, p. 493.

*Periclimes (Cristiger) frater* Borradaile, 1915, p. 210; 1917, p. 324, 364, pl. 53, fig. 6.

*Periclimes (Cristiger) soror*, BORRADAILE, 1917, p. 363.

*Periclemenes (Periclimes) soror*, KEMP, 1922, p. 141, 165; HOLTHUIS, 1952, p. 9, 17, fig. 7; 1959, p. 194.

*Periclimes (Ancylocaris) frater*, KEMP, 1922, p. 170.

*Periclimes bicolor* Edmondson, 1935, p. 10, fig. 3.

*Periclimes (Harpilius) frater*, HOLTHUIS, 1952, p. 11.

MATERIAL EXAMINED. — 1 ♀, Noumea, New Caledonia. 3-4 m. Coll. Y. MAGNIER, 1966.

HOST. — *Culcita* sp.

REMARKS. — This specimen agrees well with the published description. Eleven dorsal rostral teeth are present in this specimen and the basal segment of the antennular peduncle is bispinose distally on both sides. The fourth thoracic sternite projects antero-ventrally as a broad transverse lamina, bearing a pair of bluntly acute teeth separated by a small median notch. The fifth to eighth thoracic sternites are unarmed. *P. soror* has been previously reported in association with *Culcita*, and also with *Acanthaster*, *Protoreaster* and *Linckia*.

DISTRIBUTION. — Red Sea, Seychelles, Lesser Sunda Islands, Sulu Archipelago and Hawaiian Islands.

**Discussion.**

Three of the species reported in this paper have been found in association with crinoid hosts. Four other species of the genus *Periclimes* Costa have also been mentioned as occurring on crinoids and several other species living on other echinoderms have been reported (BRUCE, 1965). Other pontoniid genera containing species known to be living in association with crinoids are *Palaemonella* Dana (*P. pottsi* Borradaile) and *Pontoniopsis* Borradaile (*P. comanthi* Borradaile). *Pontoniopsis comanthi* appears to be the most highly modified of the crinoid commensals, which form a series of transitional forms. *Palaemonella pottsi* is the least specialized member of the series. The species of *Periclimes* represent a wide range of increasing morphological modification and some of the species are closely related to other species of the genus found on other classes of the Echinodermata.

*Periclimes imperator* Bruce is the only pontoniid known to be asso-

ciated with a nudibranch. *P. rex* Kemp, a very closely related species, has been reported in association with a holothurian. *P. soror* Nobili is a member of the same small group of species, which otherwise lives commensally with asteroid echinoderms. This group at present only contains *P. noverca* Kemp, *P. parasiticus* Borradaile and probably *P. pectiniferus* Holthuis, the host of which is as yet unknown, in addition to the species mentioned above.

Two other species of *Periclimenes* are also found commensally with echinoderms. *P. lanipes* Kemp occurs on ophiuroids and *P. hertwigi* Balss on echinoids.

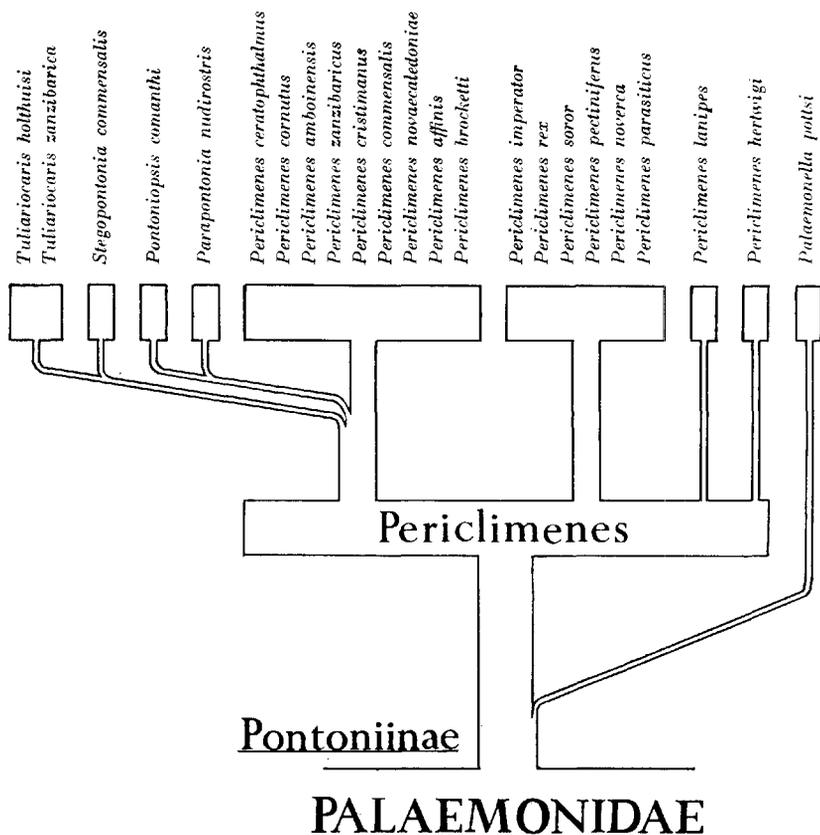


Fig. 10.

The phylogeny of these species can be most conveniently expressed in diagrammatic form (fig. 10). In the genera associated with crinoids the morphology of the mouthparts shows little modification except for the presence of a mandibular palp and a podobranch on the epipod of the second maxilliped in *Palaemonella pottsi*. The antenna and first pereio-

pods show little modification throughout the series. The second pereopods vary from having unspecialized, robust, similar, simple chelae (*Palaemonella*, *Periclimenes*, *Parapontonia*) to feeble, dissimilar chelae (*Pontoniopsis*) and highly modified, grossly asymmetrical chelae, (*Stegopontonia*, *Tuleariocaris*). The ambulatory pereopods vary from the presence of simple dactyls (*Palaemonella pottsi*, *Periclimenes affinis*, *P. brocketti*, *P. cornutus*.) and biunguiculate dactyls (*Periclimenes amboinensis*, *P. ceratophthalmus*, *P. cristimanus*, *P. novaecaledoniae*, *P. zanzibaricus*, *Parapontonia* and *Pontoniopsis*) to highly specialized dactyls (*Stegopontonia*, *Tuleariocaris*). The relationship of the generic characteristics may be summarized as follows :

1. **Palaemonella.** The least modified genus, very closely related to the basic palaemonid stock as shown by the presence of a mandibular palp, a podobranch on the epipod of the second maxilliped, a well developed arthrobranch on the third maxilliped and a long finger-like median process on the fourth thoracic sternite, all features which have been lost by the great majority of pontoniid shrimps. The species of this genus are slender graceful shrimps with slender elongated symmetrical chelae and simple dactyls on the ambulatory pereopods.

2. **Periclimenes.** The species associated with echinoderms tend to be robust. The mandibles lack palps, the epipods of the second maxillipeds lack podobranchs and the arthrobranchs of the third maxillipeds are small or rudimentary. The fourth thoracic sternite is unarmed. The second pereopods are robust and similar. The dactyls of the ambulatory pereopods may be simple or biunguiculate. In some cases (*P. imperator*, *P. affinis*.) the accessory dactyls appear to have been secondarily lost. Two evolutionary trends are discernible. The first trend involves the broadening of the rostral midrib with the development of supra-ocular spines and the suppression of the rostral teeth. The second trend shows a reduction in the rostral midrib with an increase in the number of rostral teeth and the modification of the chelae of the first pereopod into subspatulate form.

3. **Parapontonia.** Closely related to the first subgroup of *Periclimenes* echinoderm commensals but distinguished by the complete disappearance of all rostral teeth and the presence of a pair of large epistomal horns. The arthrobranch of the third maxilliped is very small. The second pereopods are similar to those of *Periclimenes* and the dactyls of the ambulatory pereopods are biunguiculate.

4. **Pontoniopsis.** Generally similar to *Parapontonia* but dorsal lamina of rostrum reduced, hepatic spine and supra-ocular spines absent. Second pereopods dissimilar.

5. **Stegopontonia.** Generally similar to *Pontoniopsis* but hepatic spine still present. Rostral lamina dorsal to midrib absent. Endite of maxilla simple. Second pereopods with grossly dissimilar chelae. Ambulatory pereopods with biunguiculate dactyls, the accessory teeth bordered by a dense fringe of setae.

6. **Tuleariocaris**. Generally resembles *Stegopontonia* but dorsal part of rostral lamina present and dentate. Incisor process of mandible reduced. Terminal segment of endopod of second maxilliped greatly reduced. Second pereopods with extremely dissimilar chelae. Dactyls of ambulatory pereopods biunguiculate and highly modified.

RÉSUMÉ.

Nous signalons la présence de plusieurs crevettes pontoniides commensales en Nouvelle Calédonie. Parmi elles figurent une espèce nouvelle de *Periclimenes*, *P. novaecaledoniae* sp. nov., et une espèce d'un genre nouveau, *Parapontonia nudirostris*, gen. nov., sp. nov., qui vivent en association avec des Crinoïdes. Les nouveaux taxa sont décrits et nous discutons leur position systématique par rapport à d'autres crevettes pontoniides commensales de Crinoïdes et d'autres Échinodermes.

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