

**A re-examination of *Periclimenes (Hamiger) novae-zealandiae* Borradaile, 1916, and recognition of the pontoniine shrimp genus *Hamiger*, Borradaile**

A. J. BRUCE

*Division of Natural Sciences, Northern Territory Museum,  
P.O. Box 4646, Darwin, Australia 5794*

*(Accepted 11 November 1985)*

The syntypes of *Periclimenes (Hamiger) novae-zealandiae* Borradaile, 1916, the only known specimens, from off North Cape, New Zealand, are redescribed and illustrated. Placed by Kemp (1922) in the genus *Periclimenaeus* Borradaile, 1915, the species is now removed from that genus and Borradaile's subgenus *Hamiger* is raised to generic status for its reception. The male specimen is designated as lectotype. The specimens are held in the collection of the British Museum (Natural History).

The genus *Hamiger* is most closely related to the genera *Thaumastocaris* Kemp, 1922, and *Orthopontonia* Bruce, 1982, both monospecific genera, known to associate with sponges. It is considered that *H. novae-zealandiae* is probably also a sponge associate and that *Palaemonetes natalensis* Stebbing, 1915 may be closely related.

---

**Introduction**

In 1916 L. A. Borradaile described the only known specimens of a shrimp collected from 128 m by the British Antarctic Exploring Expedition from a position 11.3 km off North Cape, New Zealand. The specimens were placed in the genus *Periclimenes* Costa and in a new subgenus *Hamiger*. This subgenus was considered by subsequent authors (Kemp, 1922; Holthuis, 1952, 1955) as a synonym of the genus *Periclimenaeus* Borradaile, 1915, and little subsequent reference has been made to this species in the zoological literature.

The genus *Periclimenaeus* is the second most speciose genus of the Pontoniinae, with almost 40 Indo-West Pacific species, but none have been reported from New Zealand waters. They live mainly associated with sponges, but also with colonial ascidians. With few exceptions, the species of *Periclimenaeus* are very consistent in their general morphology and are particularly characterized by the presence of very unequal chelae on their second pereopods, one usually being massive, with a very characteristic 'pit-and-hammer' mechanism present on the fingers. In Borradaile's time, only two species of pontoniine shrimp were referred to the then subgenus *Periclimenaeus*, *P. fimbriatus* Borradaile and *P. robustus* Borradaile, both more typical members of the genus, with 'pit-and-hammer' mechanisms on the fingers of the major chela, features that are conspicuously absent in the male specimen of *P. novae-zealandiae*. In his 1917 review of the Pontoniinae, Borradaile (1917) only mentions these specimens in a footnote but does suggest that they are 'Representative ... possibly of a new genus'. The lack of this character indicates that *P. novae-zealandiae* cannot be placed in the genus *Periclimenaeus* as generally conceived and described by Borradaile, and his genus *Hamiger* is no recognized as an independent genus.

***Hamiger* Borradaile, 1916**

*Diagnosis.* Body subcylindrical, moderately slender; carapace smooth with well-developed compressed dentate rostrum, supra-orbital and hepatic spines absent, antennal spine present; abdomen smooth, with anterior pleura rounded, posterior feebly angulate; telson with two pairs of dorsal spines, three pairs of posterior spines; eyes well developed; antennule with acute stylocerite and normal statocyst, upper flagellum biramous; antenna with scaphocerite well developed, basicerite feebly armed laterally; mandible robust, without palp, molar and incisor processes normal; maxillula with bilobed palp and slender laciniae; maxilla with normal palp, bilobed basal endite and well-developed scaphognathite with broad anterior lobe; first maxilliped with slender palp, broad basal endite, reduced coxal endite, well-developed exopod with broad caridean lobe, epipod bilobed; second maxilliped normal, with well-developed exopod and subrectangular epipod, without podobranch; third maxilliped normal with well-developed exopod, coxa with rounded lateral plate, without epipod, small arthrobranch present; fourth thoracic sternite without median process; first pereopods slender with robust chela with elongate fingers densely setose laterally; second pereopods well developed, unequal, dissimilar, major chela large and robust, with carinate dactyl, fingers short, lacking 'pit-and-hammer' mechanism; minor chela slender, fingers long, simple; ambulatory pereopods slender, propod ventrally spinulate, dactyl biunguiculate with minor accessory denticles on corpus; uropods broad, protopod unarmed posterolaterally, exopod with lateral margin entire with strong posterior tooth with smaller mobile spine medially.

*Type-species.* *Periclimenes (Hamiger) novae-zealandiae* Borradaile, 1916, by monotypy. Gender masculine.

*Etymology.* Borradaile (1916) indicated that the name *Hamiger* referred to the strongly hooked nature of the fingers of the major second pereopod. It may be noted that the label with the type-specimens, presumably in Borradaile's handwriting, refers to *Periclimenes (Plumiger) novae-zealandiae*, probably a reference to the fingers of the first pereopods.

***Hamiger novaezealandiae* (Borradaile, 1916) nov. comb.**

*Periclimenes (Hamiger) novae-zealandiae* Borradaile, 1916: 87–88, fig. 4.—1917: 323.

*Periclimenes (Periclimenaeus) novae-zealandiae*—Kemp, 1922: 167.

*Periclimenaeus novae-zealandiae*—Holthuis, 1952: 14, 130.—Richardson and Yaldwyn, 1958: 34, fig. 24.

*Periclimenaeus novaezealandiae*—Bruce, 1981: 213.

*Material examined.* 1♂, 1 ovig. ♀, British Antarctic Exploring Expedition, 'Terra Nova', Stn 96, 11.3 km off North Cape, New Zealand, 128 m, 1910.

Male in good condition, largely complete, with both second pereopods attached. Female with carapace, eyes and antennae detached and mouthparts removed, one first and one third pereopod attached. Mouthparts, some pereopods, including minor second pereopod, preserved.

***Description***

*Male.* Body generally slender, subcylindrical and smooth. Carapace smooth, rostrum well developed, short, straight, reaching to about end of intermediate segment of antennular peduncle, compressed, with feeble lateral carinae, dorsal margin with six well-developed acute teeth, first two situated posterior to orbital margin, ventral

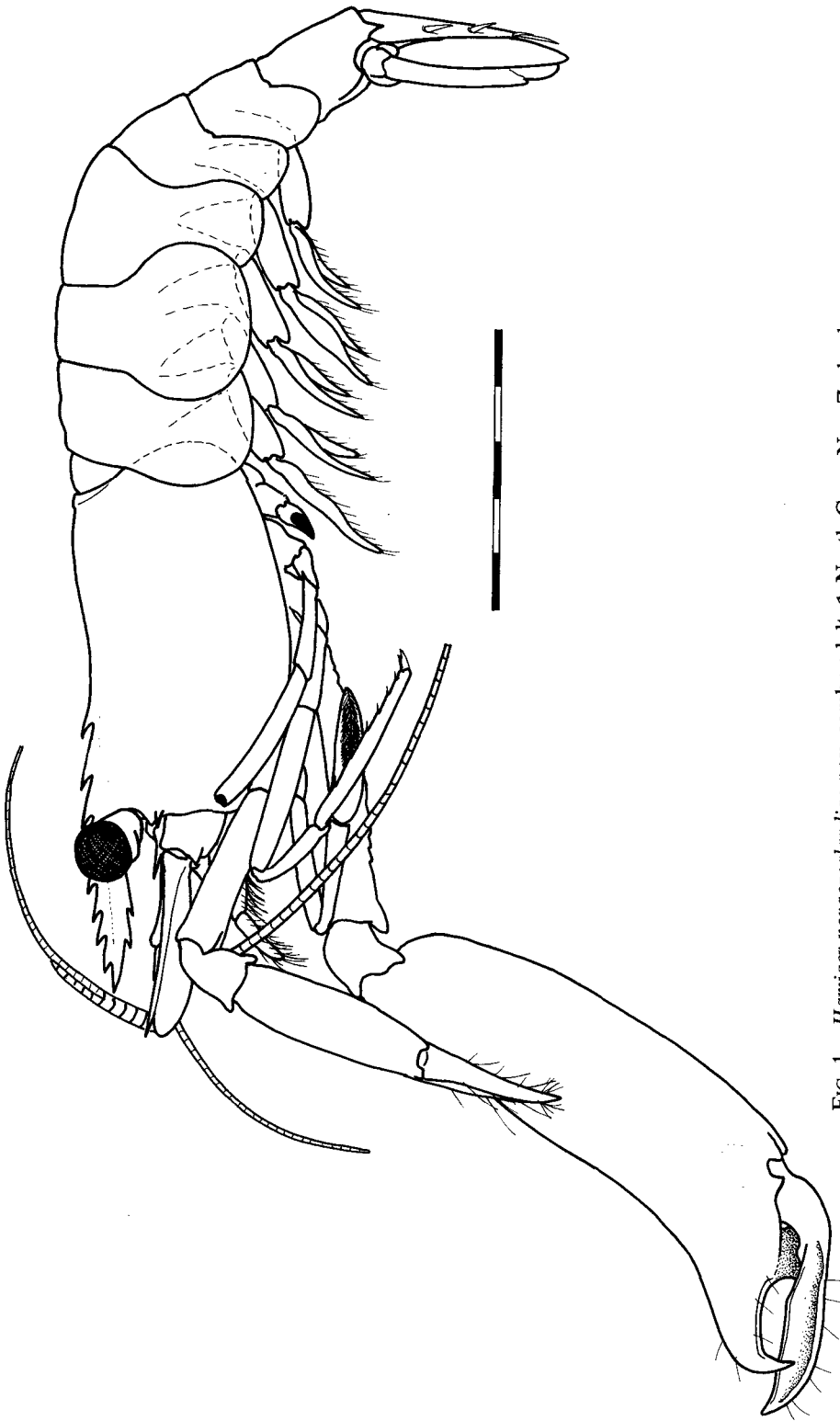


FIG. 1. *Hamiger novaezealandiae* nov. comb.: adult ♂, North Cape, New Zealand.

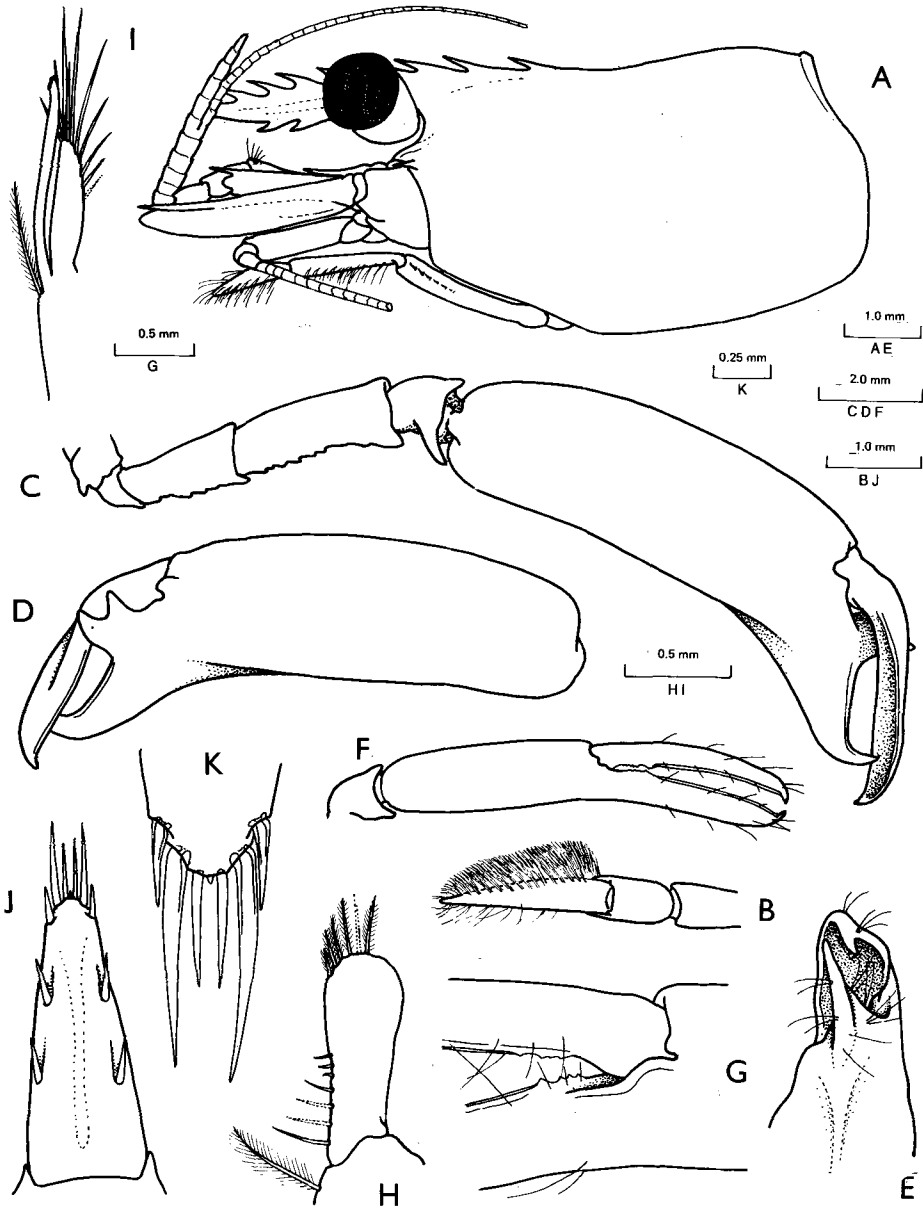


FIG. 2. *Hamiger novaezealandiae* nov. comb., adult ♂: A, carapace and antennae; B, chela of first pereiopod, dorsal aspect; C, major second pereiopod; D, same, chela, lateral aspect; E, same, fingers, ventral aspect; F, minor second pereiopod, chela; G, same, finger, proximal region; H, first pleopod, endopod; I, second pleopod, appendix interna and appendix masculina; J, telson; K, same, posterior spines.

border with two smaller acute teeth on preterminal fourth; orbit obsolete, inferior orbital angle produced, broadly angular in dorsal view, antennal spine well developed, submarginal, immediately below level of inferior orbital angle in lateral view; supra-orbital and hepatic spines absent; anterolateral angle of branchiostegite bluntly obtuse.

Abdomen smooth, slender, third segment not posterodorsally produced, pleura broadly rounded, fourth and fifth slightly posteriorly produced; fifth segment about 0.6 of length of sixth, sixth about 1.5 times longer than deep, moderately compressed, posteroventral angle produced, blunt, posterolateral angle strongly acute. Telson about 1.4 times as long as sixth segment, about 2.3 times longer than wide, with median furrow, sides straight, convergent, posterior margin about 0.4 of anterior width, rounded, with small median point; two pairs of large dorsal spines, about 0.16 of telson length, submarginal, set in deep grooves; posterior spines well developed, lateral spines situated slightly dorsally, well in advance of intermediate spines; intermediate spines 2.5 times as long as laterals, about 0.3 of telson length, slender and straight; submedian spines, slender, longer than laterals, non-setulose, about 0.5 of length of intermediate spines.

Eyes well developed, with large globular cornea; stalk about 1.2 times broader than long, length equal to about 0.8 of corneal diameter; cornea not transversely banded and without accessory pigment spot.

Antennule with proximal segment about 2.0 times longer than wide, statocyst normally developed, stylocerite slender acute, reaching to middle of segment length, distolateral lobe strongly produced, rounded, with strong acute lateral tooth reaching to 0.7 of intermediate segment length, medial border with small ventral tooth at about half length; intermediate with small lateral lobe; upper flagellum biramous, proximal 4–5 segments fused, shorter free ramus with five segments, aesthetascs missing, longer ramus with about 35 segments; lower flagellum filiform, about 35 segments.

Antenna with basicerite robust, with small acute lateral tooth, carpopocerite about 3.5 times longer than wide, exceeding half scaphocerite length, flagellum elongated, slender; scaphocerite exceeding tip of rostrum and antennular peduncle, broad, widest centrally about 2.8 times longer than central width, with very robust distolateral tooth reaching to angular distal border of lamella.

Epistome with distinct lateral protuberances. Fourth thoracic sternite with low transverse ridge with U-shaped median notch; fifth sternite similar, larger; posterior sternites moderately broad, unarmed.

First pereiopods well developed, moderately slender with relatively large chela; palm moderately compressed, about 1.4 times longer than deep; with six–seven transverse rows of cleaning setae ventrally, fingers about 2.1 times as long as palm, similar, with small hooked tips, subcylindrical with entire cutting edges distinct along distal halves of opposing edges medially, with about 18 dense transverse rows of short setae on lateral aspects of each finger; carpus slightly shorter than chela, about 5.4 times longer than distal width, tapered proximally; merus about 1.2 times as long as carpal, about 8.0 times longer than wide, uniform; ischium about 0.45 of merus length, ventrally carinate and sparsely setose; basis about 0.9 of ischium length, with low setose median lobe; coxa without median process.

Second pereiopods markedly unequal and dissimilar. Major pereiopod with robust chela, palm smooth, oval in section, about 3.0 times longer than deep; axis of fingers at about 115° to axis of palm; dactyl broad and shallow, with strong longitudinal medial dorsal flange, with concave medial aspect, cutting edge unarmed, almost straight, ending in small hooked tip, far over-reaching tip of fixed finger; fixed finger strongly compressed, with very stout, strongly curved hooked tip, distal cutting edge straight, unarmed distally, with large bidentate tooth proximally, passing laterally to the proximal dactyl; carpus short and stout, about as long as broad, expanded distally but without distinct teeth, equal to about 0.14 of palm length; merus robust, about 0.4 of

palm length, about 3.0 times longer than pre-terminal width, slightly compressed, with strong distomedial and distolateral ventral lobes, ventral surface irregularly tuberculate; ischium about 0.75 of merus length, and 2.2 times longer than distal width, distoventral angle produced and ventral surface irregularly tuberculate; basis short and unarmed; coxa with small ventral lobe.

Minor second pereiopod with chela subequal to palm length of major chela; palm subcylindrical, smooth, about 3.3 times longer than central width; dactyl subequal to palm length, slender, about 8.5 times longer than deep, tapering distally to robust hooked tip; proximal fourth of cutting edge armed with three teeth separated by small gap from fourth tooth, distal cutting edge entire; fixed finger similar, about 6.6 times longer than deep and with teeth on cutting edge slightly larger and more acute; carpus about 0.25 of palm length; merus and ischium similar to major chela in length but less robust.

Ambulatory pereiopods slender, third, exceeding carapocerite by propod and dactyl. Dactyl short, about 0.1 of propod length, compressed with slender simple unguis equal to about 0.5 of dorsal length of corpus, about 6.0 times longer than proximal width and obliquely articulated; corpus about 1.8 times longer than proximal depth, ventrally sharp with large acute distal accessory tooth and about six small ventral accessory denticles, a pair of short sensory setae present distally on each side of corpus; propod about 9.0 times as long as dactyl, uniform, about 12.0 times longer than proximal depth, with one distoventral spine and about six robust ventral spines; carpus about 0.5 of propod length, slightly tapered proximally, unarmed; merus about 1.1 times as long as propod, slightly expanded centrally, unarmed, about 8.0 times as long as central width; ischium about 0.55 of propod length, unarmed; basis and coxa without special features. Fourth and fifth pereiopods similar.

First pleopod with endopod about 4.0 times as long as proximal width, distal half slightly expanded, without median lobule, proximal half of medial border with four setae of decreasing length and three distal spines, distal margin with six (or more) short plumose setae. Second pleopod with long slender appendix interna far outreaching appendix masculina, corpus of appendix masculina stout about 4.2 times as long as proximal width with 10 simple spines distally and medioventrally, longest spines situated distally.

Uropod with protopodite unarmed. Distolateral region of exopods damaged.

*Female.* Generally similar to male. Rostrum less than half post-orbital carapace length, with eight dorsal and two ventral teeth. Abdomen with first three pleura enlarged.

Mandible moderately stout; without palp; with robust molar process with several stout teeth distally, incisor process robust with four acute teeth distally, outer teeth enlarged. Maxillula with deeply bilobed palp, upper lobe slender, lower lobe stout, with small uncinata seta distally. Maxilla with long slender non-setigerous palp; basal endite large, broad, rounded, fringed with slender non-setulose setae, coxal lobe small, rounded and non-setose; exopod with flagellum well developed with numerous plumose setae distally, caridean lobe large, broadly rounded; with bilobed epipods (lost in female, visible in male). Second maxilliped of normal form, dactylar segment broad, with three dense rows of spines and setae medially, propodal segment slightly produced distomedially with longer slender spines, coxa slightly produced, medially setose; exopod well developed; triquetral epipod present, without podobranch. Third maxilliped with endopod slender, ischiomerus bowed, about 4.5 times longer than broad, sub-uniform, with about six small spines along distolateral margin and dense

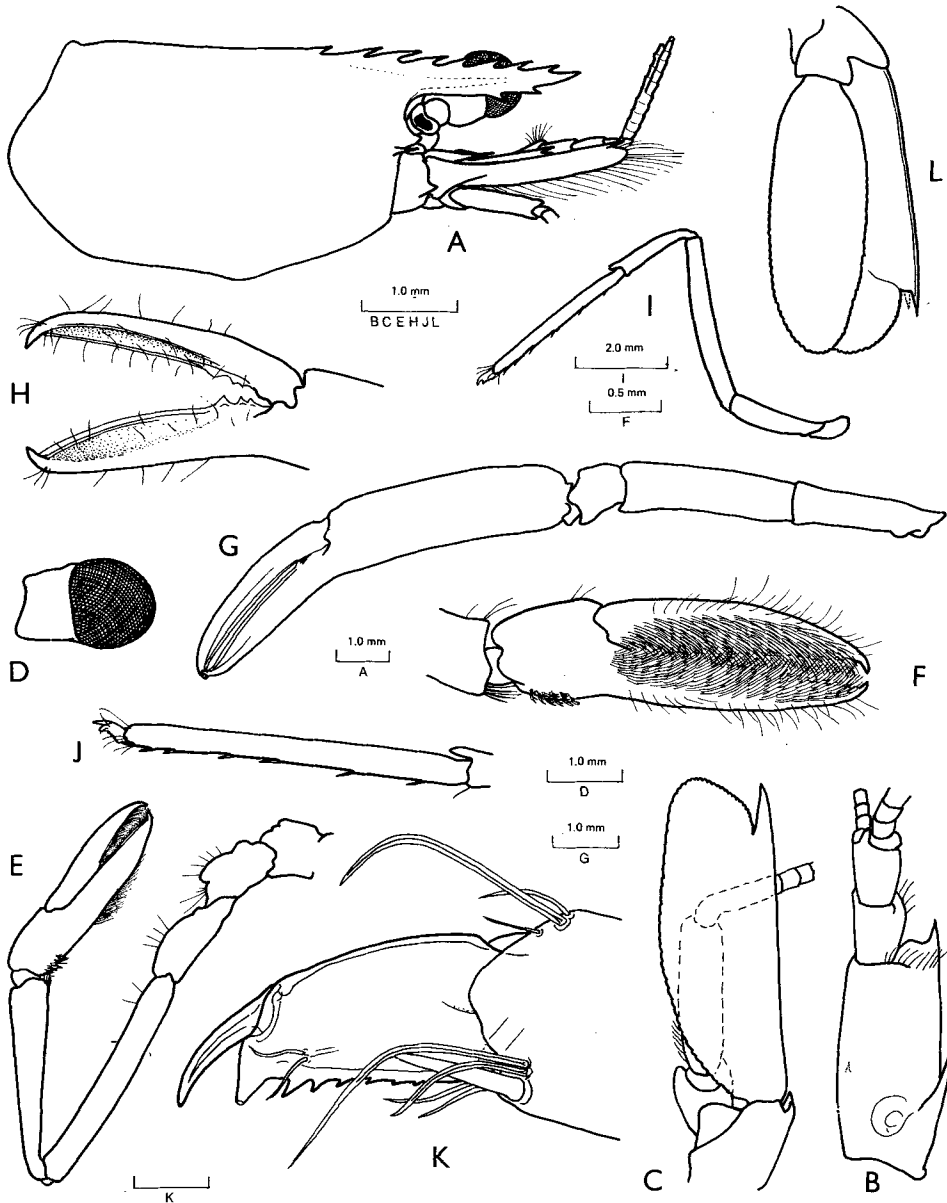


FIG. 3. *Hamiger novaezealandiae* nov. comb., adult female: A, carapace and antennae; B, antennule; C, antenna; D, eye; E, first pereiopod; F, same, chela, lateral aspect; G, minor second pereiopod; H, same, fingers, medial aspect; I, third pereiopod; J, same, dactyl and propod; K, same, dactyl; L, uropod.

row of short strongly curved spinules along proximal half of medial margin; penultimate segment equal to 0.9 of ischiomer length, about 5.5 times longer than proximal width, tapering slightly distally, densely setose laterally and ventrally; terminal segment about 0.6 of length of penultimate segment, about 5.5 times longer than proximal width, tapering slightly distally and densely setose; basis feebly demarcated from ischiomerus, slightly produced medially and sparsely setose; exopod well developed, exceeding distal end of ischiomer segment, with numerous plumose

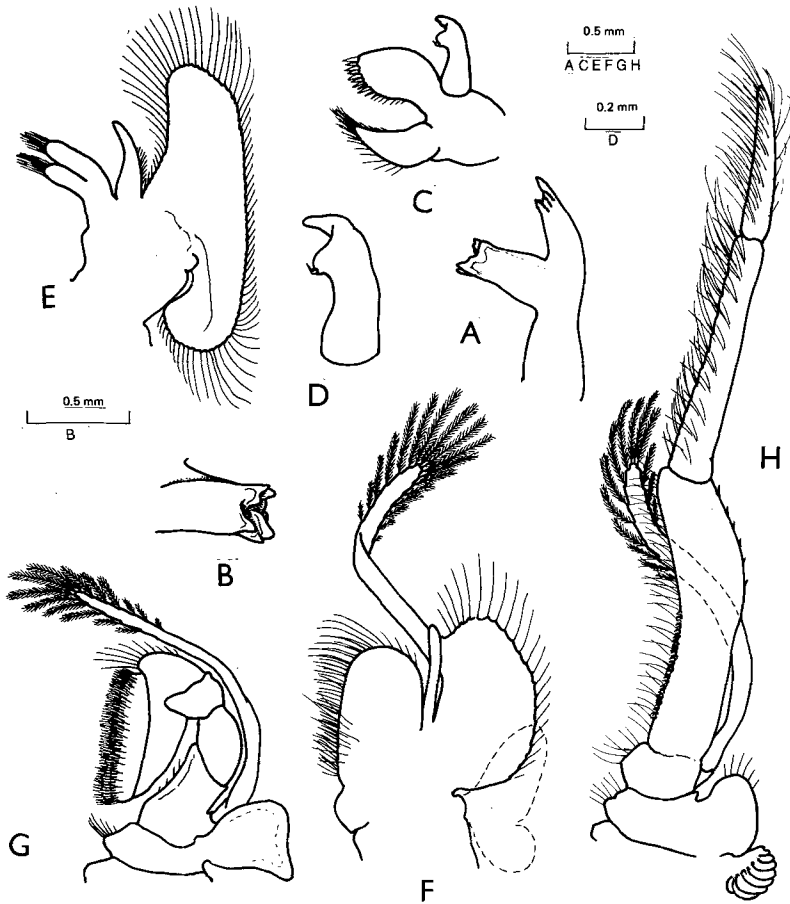


FIG. 4. *Hamiger novaeseelandiae* nov. comb., adult ♂: A, mandible; B, same, molar process; C, maxillula; D, same, palp; E, maxilla; F, first maxilliped; G, second maxilliped; H, third maxilliped.

setae distally; coxa slightly produced medially and sparsely setose, with large oval lateral plate and small multilamellar arthrobranch.

First pereiopod as in male. Minor second pereiopod only preserved, similar to male, fingers equal to 0.8 of palm length, fingers at about  $140^\circ$  with axis of chela (at about  $160^\circ$  in male), cutting edges laterally situated, entire, except for three small acute teeth on proximal fifth, slightly larger on fixed finger than on dactyl. The ova are numerous and small, length about 0.7 mm.

*Measurements.* Post-orbital carapace length: ♂, 5.2; ♀, 7.3 mm.

*Coloration and host.* No data.

*Types.* The male specimen is best preserved and is almost complete, and is now selected as lectotype. The specimens are held in the collections of the British Museum (Natural History) registration number 1917.1.29.89; the female is registered as 1917.1.29.90.

### Discussion

The genus *Hamiger* Borradaile is more closely related to the genera *Thaumastocaris* Kemp, 1922, and *Orthopontonia* Bruce, 1982, than to *Periclimenaeus* Borradaile, 1915. The form of the chela of the first pereiopod in *Hamiger* and the major second pereiopod



chela are unique in the Pontoniinae and readily serve to distinguish the genus from *Periclimenaeus*, in which the fingers of the major second pereopod are characterized by a distinctive 'pit-and-hammer' mechanism, otherwise only found in the genus *Coralliocaris* Stimpson in the Pontoniinae and some genera of the Alpheidae. The genus *Thaumastocaris* is characterized by, amongst other features, a segmented carpus on the first pereopod. This feature is not found in *Hamiger* or any other pontoniine shrimp. *Orthopontonia*, formerly also originally placed in the genus *Periclimenaeus*, lacks the segmented first pereopod carpus, but also possess unique tuberculations of the fingers of the minor second pereopod. The removal of *Hamiger* (and *Orthopontonia*) from the genus *Periclimenaeus* renders that genus, with some 39 Indo-West Pacific species, much more highly morphologically consistent.

It is possible that *Palaemonetes natalensis* Stebbing, 1915, presently considered to be a species of *Periclimenaeus* (Holthuis, 1952), may be congeneric with *H. novaezealandiae*. Unfortunately the only known specimen, from 805 m off Natal, and probably no longer extant, lacked any second pereopods (Stebbing, 1915). The fingers of the first pereopods do not have the dense setal brushes found in *H. novaezealandiae* but in most respects the two species are closely similar. *Palaemonetes natalensis* can be readily distinguished from *H. novaezealandiae* by its more strongly armed rostrum, with 11 dorsal and three ventral teeth, and the absence of small accessory denticles along the ventral border of the corpus of the dactyl of the ambulatory pereopods.

The two specimens of *Hamiger novaezealandiae* described by Borradaile (1916) are probably a mated pair and it seems quite likely that they were found together in association with a sponge host, in view of the close relationship of *Hamiger* to *Thaumastocaris*, *Orthopontonia* and *Periclimenaeus*, all primarily sponge associates.

### Acknowledgements

I am most grateful to Dr R. Ingle and Ms A. Gurney for the opportunity to examine the type material of *Periclimenes (Hamiger) novae-zealandiae* Borradaile.

### References

- BORRADAILE, L. A., 1916, Crustacea, Part I. Decapoda. *Natural History Reports, British Antarctic Expedition* 3, (2), 75–110, figs 1–16.
- BORRADAILE, L. A., 1917, On the Pontoniinae. The Percy Sladen Trust Expedition to the Indian Ocean in 1905, under the leadership of Mr J. Stanley Gardiner. *Transactions of the Linnaean Society of London (Zoology)* 17, (2), 323–396, pls 52–57.
- BRUCE, A. J. 1981. Decapod Crustacea: Pontoniinae. In *Resultats des campagnes MUSORSTOM. I—Philippines (18–28 mars 1976). Collection Memoires ORSTOM no. 91* 189–215, figs 1–18.
- BRUCE, A. J., 1982. Notes on some Indo-Pacific Pontoniinae, XLI. *Orthopontonia*, a new genus, proposed for *Periclimenaeus ornatus* Bruce. *Crustaceana* 43, (2), 163–176, figs 1–5, pl 1.
- HOLTHUIS, L. B., 1952. The Palaemonidae collected by the Siboga and Snellius Expeditions with remarks on the species. II. Subfamily Pontoniinae. The Decapoda of the Siboga Expedition, 10. *Siboga Expeditie*, 39 a 10, 1–252, figs 1–110, tab. 1.
- HOLTHUIS, L. B., 1955. The recent genera of the caridean and stenopodidean shrimps (Class Crustacea, Order Decapoda, Supersection Natantia) with keys for their determination. *Zoologisches Verhandelingen, Leiden* 26, 1–157, figs 1–105.
- KEMP, S., 1922. Notes on Crustacea Decapoda in the Indian Museum, XV. Pontoniinae. *Records of the Indian Museum* 24, 113–288, figs 1–105, pls 3–9.
- RICHARDSON, L. R. R. and YALDWYN, J. C., 1958. A Guide to the Natant Decapod Crustacea (*Shrimps and Prawns*) of New Zealand. *Tuatera* 7, (1), 34, fig. 24.
- STEBBING, T. R. R., 1915. South African Crustacea (Part VIII of S. A. Crustacea, for the Marine Investigations of South Africa). *Annals of the South African Museum* 15, 57–104, pls 13–25.