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THE PONTONIINE SHRIMP FAUNA OF HONG KONG

香港的隐虾亚科 (*Pontoniine Shrimp*)

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ABSTRACT

This report describes ten species of pontoniine shrimp collected during the First International Marine Biological Workshop; the Marine Flora and Fauna of Hong Kong and southern China, 1980; and also provides further information on four species previously recorded from Hong Kong. Five species are new to the fauna list, increasing the number known at present to twenty. All species except four are commensally associated with other marine invertebrates and where possible their hosts have been identified. The fauna is compared with that of Japan and is considered to be impoverished but still very inadequately known. Most of the species are of wide-spread occurrence in the Indo-West Pacific region but one is not yet known from other than Hong Kong waters. Sixteen species occur in Australian waters and twelve in the western Indian Ocean, with seven extending to the Red Sea. Only nine are found in common with the Japanese fauna, while eleven occur elsewhere in the Western Pacific Ocean and one extends to the Hawaiian Islands.

Four species are free living, three associates of Porifera; eight with Coelenterata (Actinaria 2; Scleractinia 2; Antipatharia 1; Gorgonacea 1; Alcyonacea 1 and Hydroida 1), two with Mollusca and two with Echinodermata, the host of one species, *Periclimenes hongkongensis*, remaining uncertain.

摘要

本文报道在1980年在香港所探得的10种隐虾亚科及对先前从香港录得的4个种增添一些补充资料。目前香港的隐虾共有20个种，其中5个种是首次录得。除4个种外全与无脊椎宿主共栖，而在可能情况下，其宿主也被鑑定。与日本的动物区系相比，香港的隐虾种类不但较少而且是知得不详。大部份是印度—西太平洋的广泛分布种，其中一个种却只在香港水域录得。16个种分布于澳洲水域，12个种西印度洋，其中7个种延至红海。跟日本比较下只得9个相同种，其余11个种分布于西太平洋，有一个种延至夏威夷。

4个种自由生活，3个种与海绵共栖，8个种与腔肠动物共栖（海葵目2；石珊瑚目2；角珊瑚目1；柳珊瑚1；海鸡冠目1；水螅目1），2个种与软体动物共栖，2个种与棘皮动物共栖。*Periclimenes hongkongensis*的宿主不详。

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INTRODUCTION

The pontoniine shrimp fauna of Hong Kong, like the rest of the non-commercial caridean families, has been little studied. The first record of the occurrence of any species of this subfamily was provided by Stimpson (1860) when reporting on the material that was collected by the United States Expedition to the Northern Pacific Ocean. One species, *Coralliocaris graminea* (Dana), was recorded "Ad insulam "Hong Kong", in madreporis". This record is of particular interest as it appears to be the earliest report of an association between a pontoniine shrimp and a coral host. No further examples of this species have been subsequently recorded from Hong Kong. H. M. S. "Challenger" visited Hong Kong in 1875, but did not collect any pontoniine shrimps. No further reports appeared in the zoological literature for almost a century until Bruce (1969) provided preliminary descriptions of five new species of the genus *Periclimenes* Costa, from specimens collected in Hong Kong waters, together with others from the northern South China Sea. Full descriptions and illustrations of these shrimps are included in the present report. Subsequently *Palaemonella rotumana* was recorded by Bruce (1970a) and also a new genus, *Hamopontonia corallicola* (Bruce, 1970b) from Kat O Chan. The latter is unique among pontoniine shrimps in that it lacks the typical three pairs of spines on the posterior margin of the telson and is provided with a pair of strong hooked processes, presumably an adaptation to maintaining its position on its massive coral host. More recently, a review of the South China Sea fauna raised to 16 the number of species known from Hong Kong waters (Bruce, 1979).

Material collected during the First International Workshop on the Marine Flora and Fauna of Hong Kong and southern China has provided material of five species not previously recorded from the region. One species, *Periclimenaeus spongicola*, has been deleted from the list. The material collected is deposited in the collection of the British Museum (Natural History). Type material is held in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden.

Full synonymies for most species included in this report are to be found in the works of Kemp (1922) and Holthuis (1952).

C.L. refers in all cases to the post-orbital carapace length measurement in millimeters.

CHECK LIST OF THE PONTONIINE SHRIMP FAUNA OF HONG KONG

[Pontoniinae Kingsley 1878: Palaemonidae Samonelle, 1819]
+ Species new to the Hong Kong Fauna.

Palaemonella Dana, 1852

- ✓ 1. *Palaemonella rotumana* (Borradaile, 1898)

Periclimenes Costa, 1844

- 2. *Periclimenes elegans* (Paulson, 1875)
- ✓ 3. *Periclimenes commensalis* Borradaile, 1915
- ✓ 4. *Periclimenes demani* Kemp, 1915⁺
- ✓ 5. *Periclimenes digitalis* Kemp, 1922
- ✓ 6. *Periclimenes cristimanus* Bruce, 1965
- ✓ 7. *Periclimenes holthuisi* Bruce, 1969
- ✓ 8. *Periclimenes hongkongensis* Bruce, 1969
- ✓ 9. *Periclimenes ornatus* Bruce, 1969
- ✓ 10. *Periclimenes sinensis* Bruce, 1969

- †11. *Periclimenes toloensis* Bruce, 1969
Anchistus Borradaile, 1898
 12. *Anchistus custos* (Forskål, 1775)
Conchodytes Peters, 1852
 13. *Conchodytes monodactylus*, Holthuis, 1952
Periclimenaeus Borradaile, 1915
 †14. *Periclimenaeus arabicus* (Calman, 1939)⁺
 †15. *Periclimenaeus rastrifer* Bruce, 1980⁺
Oncocaris Nobili, 1904
 †16. *Oncocaris oligodentata* Fujino and Miyake, 1969
Hamopontonia Bruce, 1970
 17. *Hamopontonia corallicola* Bruce, 1970
Coralliocaris Stimpson, 1860
 18. *Coralliocaris graminea* (Dana, 1852)
Hamodactylus Holthuis, 1952
 †19. *Hamodactylus boschmai* Holthuis, 1952⁺
Pontonides Borradaile, 1917
 †20. *Pontonides* sp.⁺

SYSTEMATIC ACCOUNT

Palaemonella rotumana (Borradaile, 1898)

Figure 1

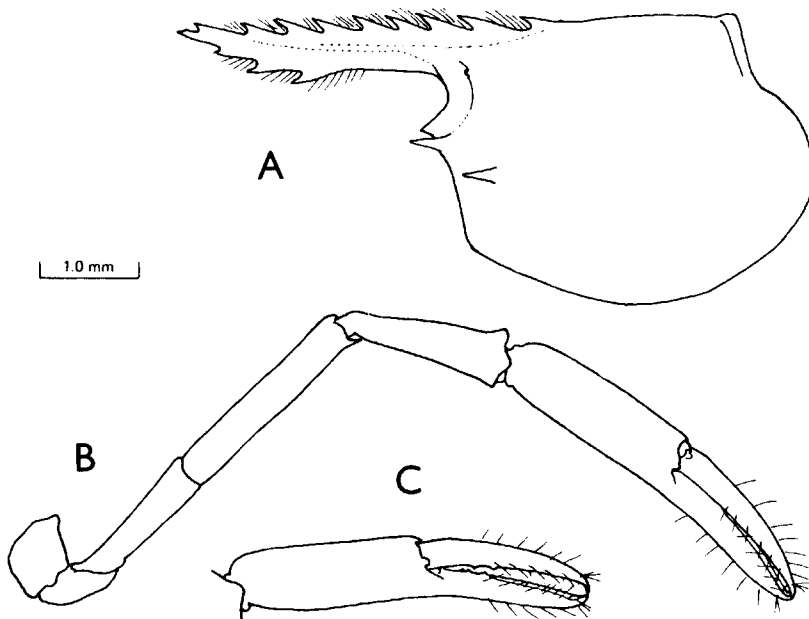


Figure 1. *Palaemonella rotumana* (Borradaile) A, carapace and rostrum. B, second pereiopod. C, chela of second pereiopod.

Restricted synonymy:

Periclimenes (Falciger) rotumanus Borradaile, 1898:383.

Palaemonella vestigialis Kemp, 1922:123-126 figs. 1-2, pl. 3 fig. 2. Holthuis, 1952:8, 24, fig. 3.

Palaemonella rotumana – Bruce, 1970:276-279, fig. 2, pl. 1 e-f; 1979:216-217.

Material examined 1 ovigerous ♀, C.L. 3.4 mm, Hoi Ha Wan, 24 April 1980.

Remarks The single example has a rostral dentition of 9/3, with the rostrum slightly exceeding the tip of the antennular peduncle. The postorbital ridges are distinct, each with a small tubercle present. The chelae of the second pereopods are subequal and equal to about 1.3 of the carapace length, with feeble dentition. The ova are about 0.5 mm in length.

Distribution Previously recorded from Hong Kong, at Kat O Chau, O Chau and Sharp Island (Bruce, 1970a, 1979) and from the Macclesfield Bank. Also known from Singapore and Malaya in the South China Sea. Common and widespread throughout most of the Indo-West Pacific region, from the Red Sea to Hawaii. Its occurrence in Hong Kong represents the most northerly record for this species.

Periclimenes commensalis Borradaile, 1915

Figure 2

Restricted synonymy:

Periclimenes (Cristiger) commensalis Borradaile, 1915:211.

Periclimenes (Periclimenes) commensalis – Holthuis, 1952:8, 52-56, figs. 10-19.
– Monod, 1976:145-147, figs. 44-51.

Periclimenes commensalis – Bruce, 1971:7-11, fig. 2; 1979:220; in press a.

Material examined (i) 1 ovigerous ♀, C.L. 3.7 mm, North Point Reef, Ninepins, at 15m, 22 April 1980. (ii) 1 ovigerous ♀, C.L. 3.9 mm, *idem* (iii) 1 ovigerous ♀, 1 ♀, 1 juvenile, C.Ls. 4.0, 3.2, 2.7 mm, Long Ke Wan, 8m, 27 April 1980, (iv) 1 ♀, C.L. 2.5 mm, Fung Head, 20 m, 29 April 1980. (v) 1 ovigerous ♀, 1 ♀, C.Ls. 4.0, 3.5 mm, 6.5 m, Breaker Reef, 30 April 1980.

Description The specimens agree well with the previous descriptions. The rostral dentition is $\frac{7-9}{1-3}$, with six specimens either 7/1 or 8/2. The smallest female has a dentition of 8/3 and one large ovigerous female 9/2. In all examples the orbit is obsolete and the supra-orbital spine is minute. The lateral rostral carina blends with the orbital notch and not with the supra-orbital ridge, which is very poorly developed. The inferior orbital angle is acutely produced. The disto-lateral angle of the proximal segment of the antennular peduncle bears two acute teeth in all specimens except one ovigerous female in which it is tridentate on one side only. The first pereopod has the chela with the palm slightly compressed, about 1.9 times longer than deep, with the fingers subequal to the palm length, moderately subspatulate with laterally situated entire cutting edges. The palm is about 2.4 times longer than deep, smooth and subcylindrical. The fingers are stout, with hooked tips, about 0.85 times the palm length, with three large low acute teeth on the proximal half of the cutting edge and the distal cutting edge minutely serrated. The dactyls of the third ambulatory pereopods are provided with an acute distal ventral accessory spine on the corpus and a slender spinule is also present dorsally. The

disto-ventral and ventral spines of the propod bear a few minute denticulations on the dorsal surface.

Colouration All specimens were a deep blue black colour, with narrow longitudinal creamy white lines in median, dorso-lateral and lateral positions, extending from the post-orbital region and across the central branchiostegite and pleura.

Host All specimens were collected from the crinoid *Tropiometra afra* (Hartlaub)

Parasites Three specimens were infected by the bopyrid parasite *Dicropleon morator* Markham, 1981.

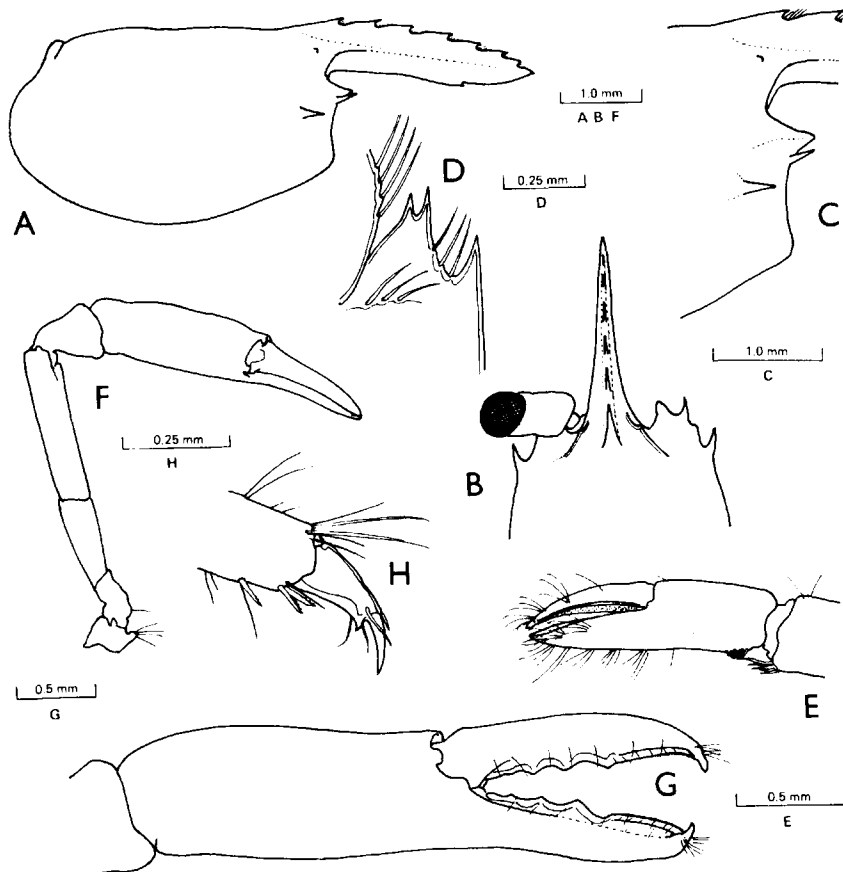


Figure 2. *Periclimenes commensalis* Borradaile. A, carapace and rostrum. B, anterior carapace rostrum, dorsal aspect. C, orbital region of carapace. D, disto-lateral angle of proximal segment of antennular peduncle. E, chela of first pereiopod. F, second pereiopod. G, chela of second pereiopod. H, distal propod and dactyl of third pereiopod.

Remarks This species has been previously recorded from Hong Kong waters, at North Rock and Fuk Kun Tan, also in association with *Tropiometra afra*. The earlier specimens were also noted to have very small supra-orbital spines, remote from the lateral rostral carinae. These contrast with specimens from Indonesia in which the supra-orbital spines are distinct, acute, arising from a well marked supra-orbital ridge that is continuous with

the lateral rostral carina. The specimens also had only a single disto-lateral spine on the proximal segment of the antennular peduncle. Specimens from Noumea (Monod, 1976) and the Solomom Islands (Bruce, in press a) are similar to the Hong Kong examples.

Distribution Type locality, Murray Island, Torres Straits. Also known from Zanzibar, Kenya, Mocambique, Indonesia, Hong Kong, Palau Islands, New Caledonia, Solomon Islands, Fiji Islands and Queensland, Australia.

Periclimenes demani Kemp, 1915

Figure 3

Restricted synonymy:

Periclimenes demani Kemp, 1915:279-283, fig. 27, pl. 13 fig. 10.

Periclimenes (Ancylocaris) demani – Kemp, 1922:71 (key), 219-220, fig. 64.

Periclimenes (Harpilius) demani – Holthuis, 1952:11, 83-84. – Barnard, 1955:48 (key); 1958, 11, 13 (key).

Material examined 3 ♂, 3 ovigerous ♀, C.Ls. 2.8-2.9: 3.2-3.4 mm, Lai Chi Wo, 0.15 m depth, in freshwater outflow over *Zostera* bed, 3 May 1980.

Description Rather slenderly built shrimps. The rostrum is slender, slightly elevated in the males, horizontal in the females, and distinctly exceeds the antennular peduncle, extending to near the tip of the scaphocerite. The dentition is $\frac{7-8}{3-4}$ in the males and $\frac{7-9}{3}$ in the females. The supra-orbital spine is distinct in all specimens, without any trace of a post-orbital ridge. The antero-lateral border of the proximal segment of the antennular peduncle is sinuous with a small lateral tooth. The ventral medial border bears a small slender tooth at about half its length. The scaphocerite has a well developed lateral tooth that exceeds the anterior margin of the lamella, which is about 4.5 times longer than wide. The mouthparts are very similar to those of *P. grandis* (Bruce, 1976). The mandible has a more slender molar process and a broader incisor process and the arthrobranch of the third maxilliped is much better developed. The epipod of the second maxilliped is without a podobranch. The sternite of the first thoracic segment bears a slender median process. The second pereopods are slender, subequal and similar, equal to about 1.15 of the carapace length in the male and 1.0 in the female. The fingers of the chelae are slightly shorter than the palm length, with three very small teeth proximally on the fixed finger and two rudimentary teeth only on the dactyl. The carpus is long and slender, armed distally, with a small acute tooth on the medial side, about 8.0 times longer than the greatest width and slightly longer than the chela. The merus is similarly slender, with a well developed disto-ventral spine and slightly shorter than the carpus. The ischium is slightly longer than the palm. The ambulatory pereopods are moderately robust, with the dactyl of the third pereopod reaching to the tip of the scaphocerite. The dactyl is slender, 0.33 of the length of the propod, about 6.0 times longer than wide, with a feebly marked unguis and a few simple setae near the middle of the dorsal border of the corpus. The dorsal telson spines are situated at 0.3 and 0.6 of the telson length. The ova are about 0.5 mm in diameter.

Colouration Generally semi-transparent with a yellowish tinge, with body feebly speckled with inconspicuous brownish dots and a few larger white spots, with similar spots on the antennal peduncles. The ventral aspect of the abdomen is mottled with red brown and white patches in the ovigerous females. The second pereopods are transparent except for patches of white at the joints and with a diffuse band of bright orange in the region of

the hinge of the fingers. The ambulatory pereiopods also have white at ischiomeral and ischiobasal joints. The caudal fan has white across the base of the telson, on the protopod of the uropod and the distal end of the endopod.

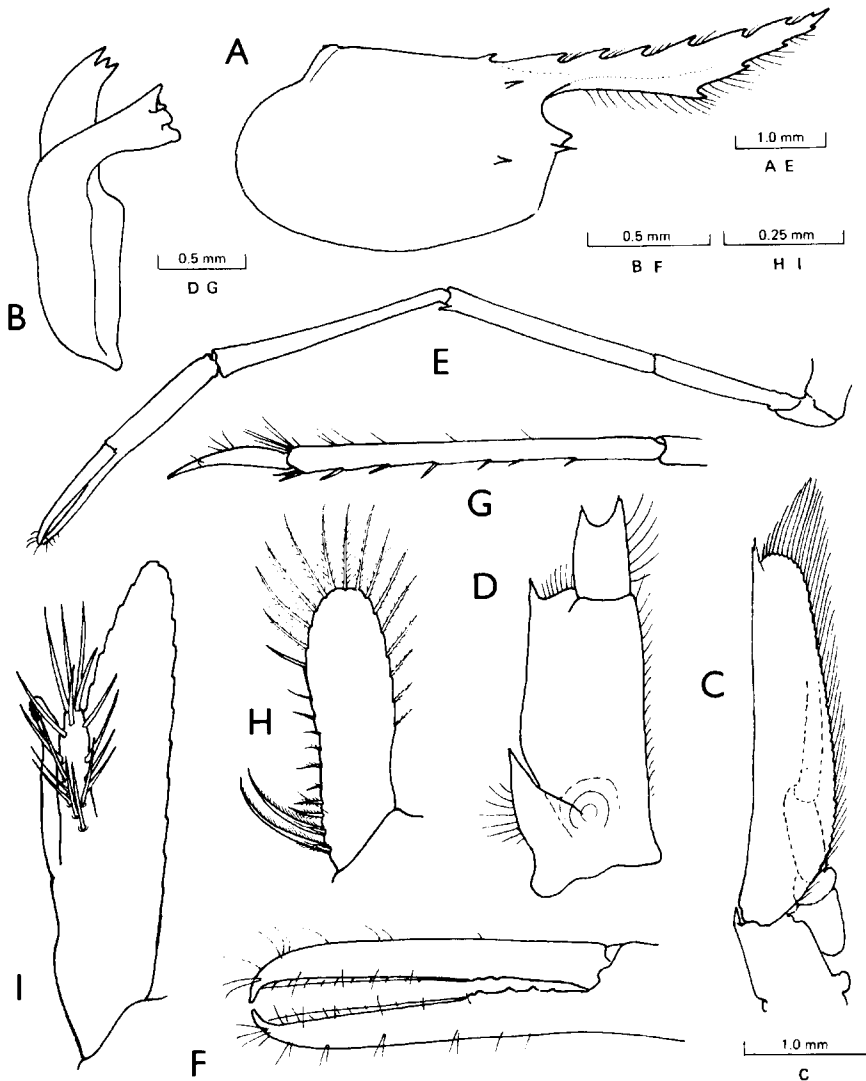


Figure 3. *Periclimenes demani* Kemp, male. A, anterior carapace and rostrum. B, mandible. C, scaphocerite. D, proximal segment of antennular peduncle. E, second pereiopod. F, second pereiopod, fingers of chela. G, propod and dactyl of third pereiopod. H, endopod of first pleopod. I, endopod of second pleopod.

Remarks The present specimens differ from Kemp's original description in that the disto-lateral spine of the scaphocerite does distinctly exceed the anterior margin of the lamella, a feature that he uses to distinguish this species from all others of the *grandis* group. The specimens agree well in all other respects and may be distinguished from the only other similar species, *P. grandis* Stimpson, by the proportions of the segments of

the second pereopods, which in that species have the carpus distinctly shorter than the palm of the chela, which also far exceeds the length of the fingers.

The habitat of the present specimens is also consistent with the previous records of this species, which is one of the few pontonine shrimps that have been reported from fresh water.

Distribution Not previously recorded from Hong Kong.

Type locality: Chilka Lake, Orissa and localities near Madras, India. Otherwise reported only from the Mergui Islands and Delagoa Bay, Mocambique.

Periclimenes digitalis Kemp, 1922

Figures 4 and 5

Restricted Synonymy:

Periclimenes (Ancyllocaris) digitalis Kemp, 1922:224-226, fig. 65, pl. 8 fig. 12.

Periclimenes (Harpilius) digitalis Holthius, 1952:87-88, fig. 34.

Periclimenes digitalis Bruce, 1979:231

Material examined 1 ♂, C.L. 3.2 mm, Harbour Island, Tolo Channel, 8 m, dredge, 20 November 1965.

Description A slenderly built shrimp. The rostrum slightly exceeds the antennular peduncle and has a dentition of 8/1, with the third tooth situated over the orbital notch and the first two teeth on the anterior carapace. The first tooth is separated from the second by a slightly larger notch than separates the remaining teeth. The ventral tooth is below the 6-7th dorsal teeth. The antennal spine is well developed, acute and marginal. The hepatic spine is slender and acute, at a distinctly lower level than the antennal spine. The orbit is demarkated posteriorly by a feeble ridge, without any noticeable supra-orbital tubercle. The scaphocerite extends well beyond the antennular peduncle and the tip of the rostrum.

The mandible is robust, with a stout corpus bearing a small two-segmented palp. The molar process bears four stout, blunt distal teeth and the incisor process has three large acute distal teeth. The palp of the maxilla is distinctly bilobed. The upper lacinia is narrow with 8-9 slender simple spines distally. The lower lacinia is short and blunt, with finely setulose setae distally. The maxilla has a short stout non-setiferous palp. The distal endite is deeply bilobed, with the proximal lobe only slightly shorter than the distal, these lobes bearing 13 and 8 slender setulose setae respectively. The scaphognathite is short and broad, about 2.5 times longer than wide, with the antero-medial border convex, and a short rounded posterior lobe. The first maxilliped has a stout tapering palp, bearing a long and a short plumose seta on the distal medial margin. The basal endite is broadly rounded, sparsely fringed with slender setae. The coxal endite is bilobed and separated by a distinct notch from the basal endite, both lobes sparsely setose. The exopod bears a small caridean lobe; the well developed flagellum has seven plumose setae distally. The epipod is well developed, bilobed, with a very large anterior lobe that extends beyond the distal border of the caridean lobe. The second maxilliped is normal, with a subrectangular epipod without a podobranch. The third maxilliped bears four short stout spines on the distal lateral edge of the antepenultimate segment. The basis and ischio-meral segments are clearly separated. The exopod is well developed and a small rounded epipod is present. A small rounded knob represents a rudimentary arthrobranch.

The fourth thoracic sternite bears a slender acute median spine. The first pereopods extend beyond the scaphocerite by the chela and almost the whole length of the carpus.

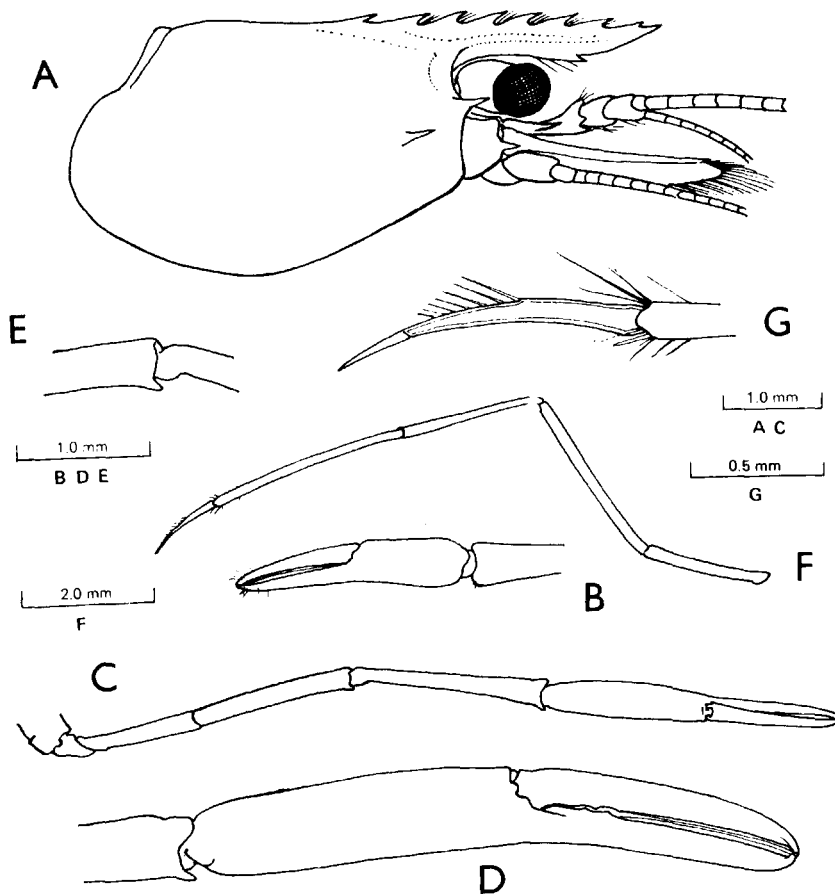


Figure 4. *Periclimenes digitalis* Kemp. A, carapace, rostrum and antennae. B, chela of first pereiopod. C, second pereiopod. D, second pereiopod, chela. E, second pereiopod, carpo-meral joint. F, third pereiopod. G, third pereiopod, dactyl and distal propod.

The fingers of the chela are slender and subequal to the palm length. The second pereiopods are subequal and similar. The chela has fingers equal to 0.6 of the palm length, which is 4.0 times longer than deep. The dactyl is slender, tapering, with a small hooked tip, 8.0 times longer than wide, with a single very small feebly acute tooth at 0.25 of its length, and with the distal cutting edge entire. The fixed finger is similar with two small acute teeth on the proximal third. The carpus is slender, slightly longer than the palm of the chela and is unarmed. The merus is subequal to the palm length, 7.5 times longer than wide, with a small acute tooth at the disto-ventral angle. The carpus is about 0.7 of the merus length; basis and coxa are normal.

The ambulatory pereiopods are very slender. The dactyl of the third pereiopod is about 10.0 times longer than wide, simple with a distinct unguis at 0.75 of its length, and with a longitudinal row of about 7 setae along the distal dorsal border of the corpus. The propod is about 2.5 times the length of the dactyl, about 20 times longer than wide, with a single small disto-ventral spine only. The carpus is 0.76, the merus 0.88 and the ischium 0.63 of the propod length.

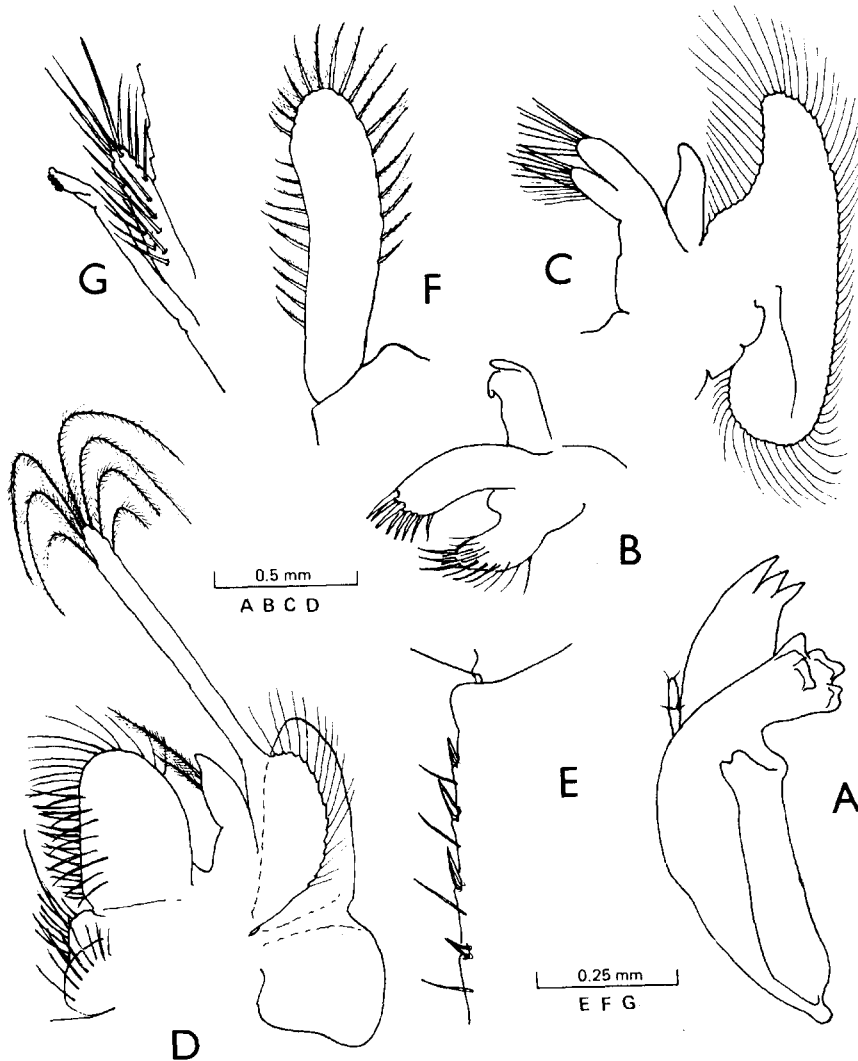


Figure 5. *Periclimenes digitalis* Kemp. A, mandible. B, maxillula. C, maxilla. D, first maxilliped. E, disto-lateral border of antepenultimate segment of third maxilliped. F, endopod of male first pleopod. G, appendix masculina and appendix interna of endopod of second pleopod.

The endopod of the male first pleopod is about 4.3 times longer than the width of the proximal half and the distal half is slightly expanded. The proximal three fifths of the medial border bears a row of 10 feebly serrulate spines. The distal margin and two thirds of the lateral border bears a row of about 17 short plumose setae. On the second pleopod, the appendix interna slightly exceeds the appendix masculina, which is about 6.5 times longer than wide. The extremity bears three large simple setae. The medial margin bears 5 shorter setae distally, and the lateral 4, with about 7 similar setae in a row along the ventral aspect.

The abdominal segments and caudal fan are as previously described.

Remarks The single specimen has been previously referred to by Bruce (1979) and no further examples have since been collected. The specimen agrees in the closest detail with the information provided by Kemp (1922) and Holthuis (1952), except for the presence of a two-segmented palp on the mandible. The mandible is absent in *Periclimenes* Costa, but present in *Palaemonella* Dana, *Vir* Holthuis and *Eupontonia* Bruce. The present specimen does not correspond to any of the described species of *Palaemonella* and is considered to be an abnormal specimen of *Periclimenes*. Chace (1972) has indicated that the presence or absence of the palp is a variable feature in another palaemonid shrimp, *Palaemon debilis* Dana. Gurney (1939; 1940) has indicated that the palp may be asymmetrically present or absent in individual specimens. The present specimen is therefore provisionally left in the genus *Periclimenes* and not transferred to *Palaemonella*, pending further information on the normal condition of the mandible.

In this connection it may be mentioned that a single ovigerous female example of *Periclimenes* was collected from Chukwani, Zanzibar, from 0.2 m on 30 January 1960, which was considered identical with *P. digitalis*, with a rostral dentition of 8/1, with three teeth situated on the carapace. The propods of the ambulatory pereopods were 2.5 times the length of the dactyls and about 20 times longer than wide, devoid of ventral spines. This specimen was also provided with a mandibular palp, and appears to have been conspecific with the present example. It is unfortunately no longer extant.

Kemp (1922) considered that *P. digitalis* was without close relatives in the genus *Periclimenes*. However, it has a close resemblance in many of its morphological features to *P. leptopus* Kemp and *P. calmani* Tattersall, from which it is most easily distinguished by the presence of the small tooth at the disto-ventral angle of the merus of the second pereopod.

Distribution Type locality, Port Blair, Andaman Islands. Otherwise previously recorded only from Saraso Island, Flores Sea and Hong Kong.

Periclimenes cristimanus Bruce, 1965

Figure 6

Restricted synonymy:

Periclimenes cristimanus Bruce, 1965:487-493, figs. 1-2; 1979:220.

Material examined (i) 1 ♀, C.L. 3.0 mm, Peng Chau, 6 m, 1 May 1980. (ii) 2 ♀, C.Ls. 2.9, 2.1 mm, Crescent Island, 4.5 m, 3 May 1980. (iii) 2 ♂, 1 ovigerous ♀, 1 ♀, C.Ls. 1.9, 2.0; 2.6; 2.4 mm, Crescent Island, 5 m, 3 May 1980.

Description The specimens agree generally with the earlier description. The rostral dentition in the males is 5/0 and in the females $\frac{4-5}{0}$. The supra-orbital spines are well developed. The antero-lateral angle of the proximal segment of the antennular peduncle is armed with two acute teeth in all specimens. The first pereopod has the fingers equal to almost twice the length of the palm. The dactyl is inflated, with an entire laterally situated cutting edge, and with the broad dorsal surface covered with numerous small tubercles. The fixed finger is shallow, slender, also with an entire lateral cutting edge, and with numerous long setae in groups ventro-medially. The distal dorsal surface of the short rather compressed palm also bears a few small tubercles, similar to those on the dactyl. The second pereopods have robust fingers with hooked tips and with the cutting edges armed with two acute teeth. The ova are 0.5 mm in length.

Colouration Dark purple, almost black, with a fine longitudinal white line along the whole body length.

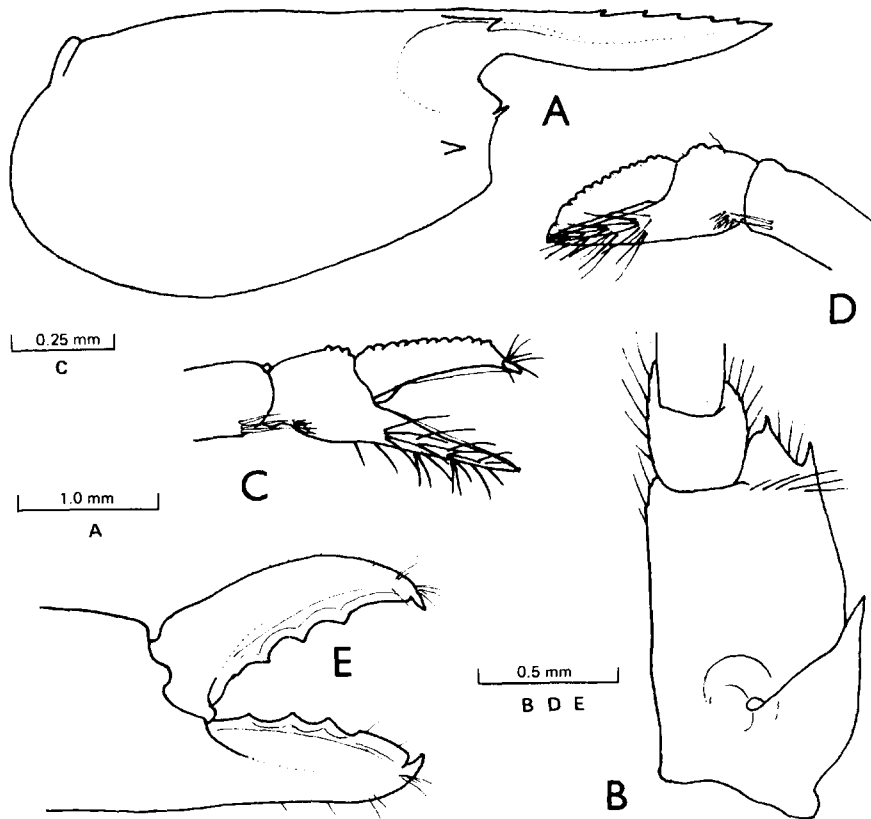


Figure 6. *Periclimes cristimanus* Bruce. A, carapace and rostrum. B, proximal segment of antennular peduncle. C, chela of first pereiopod, male. D, *idem*, female. E, fingers of chela of second pereiopod.

Hosts (i) *Echinothrix calamaris* L. (ii) (iii) *Diadema setosum* Leske, [Echinoidea].

Remarks The holotype specimen from Singapore differs from the Hong Kong specimen in that the dorsal margin of the dactyl and palm of the chela of the first pereiopods was longitudinally carinate and not generally tuberculate. A further difference was that the median lobe of the anterolateral border of the proximal segment of the antennular peduncle was more strongly produced and distally bidentate. The fingers of the second pereiopod chela were also more strongly dentate. These variations are not considered sufficient to require specific recognition, especially as the Singapore example was also found in association with *Diadema setosum*. An example from Heron Island, Queensland, Australia, has the dorsal surface of the dactyl broadened, flattened with a carina and without obvious tubercles.

Distribution Previously reported from Kat O Chau, Hong Kong. Type locality: Pulau Sudong, Singapore. Otherwise known only from Heron Island, north Eastern Australia, but probably also occurs in Japan.

Periclimes holthuisi Bruce, 1969

Figure 7

Restricted synonymy:

Periclimenes (Periclimenes) aesopius – Holthuis, 1952:8, 34-37, figs. 5-6.

1977:225-226, fig. 31. Suzuki & Hayashi, 1977:197-198, figs. 1d, 2d. Bruce, 1979:223; 1979a:205-206, fig. 6 pl. 1d.

Periclimenes holthuisi Bruce, 1969:258-259. Monod, 1969:216-220, figs. 69-73,

Material examined (i) 1 ovigerous ♀, C.L. 6.0 mm, north side of entrance to Tolo Channel, 14-18 m, trawl, rough bottom, 23 April 1980. (ii) 1 ovigerous ♀, C.L. 5.2 mm, Kat O Chau, 3-4 m, 26 April 1980. (iii) 1 ovigerous ♀, C.L. 5.0 mm, Long Ka Wan, 8 m, 27 April 1980. (iv) 1 ♂, 1 ovigerous ♀, C.Ls. 5.0, 4.0 mm, Long Ka Wan, 8 m, 27 April 1980.

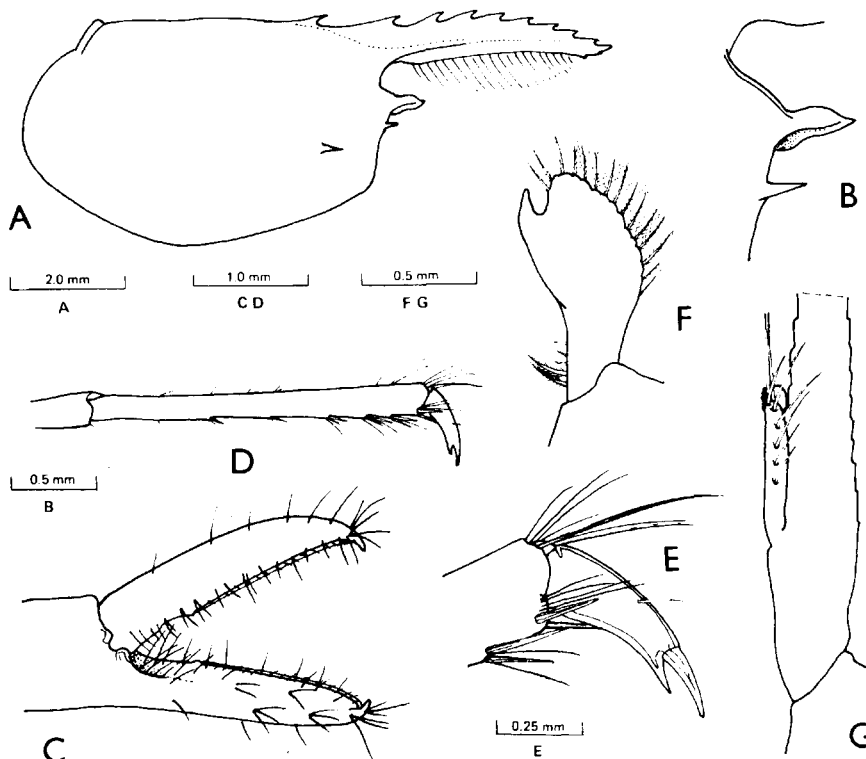


Figure 7. *Periclimenes holthuisi*, Bruce. A, carapace and rostrum, female. B, inferior orbital angle. C, fingers of chela of second pereiopod. D, dactyl and propod of third pereiopod. E, third pereiopod, dactyl and distal propod. F, endopod of male first pleopod. G, appendix masculina and appendix interna of endopod of male second pleopod.

Description All specimens have the characteristically arched rostrum, with a well developed epigastric spine present. The dentition of the lamina proper is 8/2 in the females, and 7/2 in the male. The ventral rostral teeth are situated close to the tip and are very small. The inferior orbital angle is strongly and acutely produced, with the marginal antennal spine situated at a distinctly lower level. The "becocellaire" on the ophthalmic somite is minute. The third abdominal somite is conspicuously produced postero-dorsally, similarly in both sexes. The second pereiopods have the fingers equal to 0.43 of the chela length in the females and 0.48 in the males. In both sexes the fingers

are very poorly armed, with only a single minute tooth situated proximally on both cutting edges. The third pereopods have the propod moderately robust, about 10 times longer than the distal width, and armed with about six sets of spines ventrally, of which the two proximal sets consist of single spines only and the rest of paired spines. The dactyl is robust, about 3.5 times longer than wide, equal to about 0.25 of the propod length, strongly biunguiculate with a clearly demarkated unguis. The endopod of the male first pleopod is broadly expanded distally, about 2.2 times longer than wide, with a small subacute disto-medial lobe. The proximal medial border bears two stout setulose spines and three short simple spines. The disto-lateral margin is provided with about 13 short plumose setae. On the second pleopod, the appendix masculina is slightly exceeded by the appendix interna, about 6.0 times longer than wide, with a pair of long slender simple spines distally, and a single ventral row of six similar spines. The ova are about 0.5 mm in length.

Colouration Mainly highly transparent. The most conspicuous feature is a posteriorly directed chevron of white, situated on the dorsal process of the third abdominal segment, outlined by narrow bands of red. The rest of the abdomen is colourless except for large patches of red and white on the processes of the first three pleura, with smaller dots of red and white on the main part, and a bar of orange-red across the distal part of the sixth somite at the base of the caudal fan. The rostrum is colourless and the carapace bears a few small paired red and white chromatophores of similar isolated spots. The antennae are colourless except for a white spot on the intermediate antennular peduncular segment. The eye has a longitudinal white dorsal stripe, outlined by red. The second pereopod are mainly creamy yellow with the fingers purple, also the distal carpus, proximal ischium and merus and the mero-carpal joint. The third maxilliped and first pereopod are similar but less distinctly coloured. The ambulatory pereopods are transparent. The telson has the second quarter white and the distal quarter red. The exopod of the uropod has a conspicuous blue oval distally, outlined in white and the distal endopod is yellow.

Types The male holotype specimen, C.L. 2.6 mm, is deposited in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, catalogue number (RMNH Crust. D. 33226).

Hosts The host of specimen (i) is unknown; (ii) (iii) were collected from highly retractile anemones on a soft substrate, probably *Cerianthus* sp., and (iv) from a green anemone on rock.

Remarks Long Ha Wan in the New Territories is the type locality for this species, and the type material was collected from unidentified anemones. Divers report that these shrimps are abundant in association with the highly retractile anemones, which remain to be collected and identified. *P. holthuisi* has also been reported in association with caryophyllid corals, i.e. *Catalaphyllia* and with fungiid corals, as well as with actinarians and scyphozoans. Several colour forms of this species appear to exist which may be related different host types but insufficient data is available for this to be confirmed. Samples found in association with *Catalaphyllia* and *Cassiopeia* may have the same white chevron on the third abdominal segment as in the present material. Samples from the Red Sea found with anemones of the genus *Cyrostoma* also have the white chevron, but show a more strongly dentate rostrum, with a dentition of $\frac{10-13}{3-5}$ (Bruce and Svoboda, in press).

Distribution Type locality, Lung Ha Wan, Hong Kong. Also known from the Red Sea, Zanzibar, Seychelle Islands, Maldive Islands, Ceylon, Indonesia, New Guinea, Japan, New Caledonia, Palau Islands and north east Australia.

Periclimenes hongkongensis Bruce, 1969
Figures 8 to 10

Restricted synonymy:

Periclimenes hongkongensis Bruce, 1969:259-260, 277 (key); 1980: 223-224.

Material examined (i) 1 ♀ (damaged), C.L. 2.9 mm, Po Toi Chau, 27 m, trawl, 2 January 1963. (ii) 2 ♀, C.Ls. 2.8, 2.6 mm, Rocky Harbour, R/V "Cape St. Mary", trawl, 28 m, coll. D. Eggleston, 16 January 1965.

Description Moderately slender build. The rostrum extends well beyond the end of the antennular peduncle, but does not reach the tip of the scaphocerite. The lamina is rather deep, with a strongly convex ventral border and the greatest depth at about 0.6 of the pre-orbital length. The dorsal margin is also convex, with 13-16 small acute teeth, fairly evenly spaced but slightly reduced in size and spacing distally. The proximal 6-8 teeth appear to be articulated with the carapace. The ventral margin bears 2-3 small acute teeth on the distal third. A small epigastric spine is present, well separated from the first dorsal rostral tooth, which is situated on the carapace. The lateral rostral carinae are feebly developed. The orbit is obsolescent and supra-orbital spines are lacking. The inferior orbital angle is acutely produced, with a ventral reflected flange. The antennal spine is slender and marginal. The hepatic spine is more robust, situated at a much lower level than the antennal spine, well anterior to the level of the epigastric spine. The antero-lateral angle of the carapace is bluntly angled or feebly produced.

The abdomen has the third abdominal segment without a postero-dorsal process. The fifth segment is 0.55 of the length of the sixth, which is 1.8 times longer than deep, with the postero-lateral angle acute and the postero-ventral angle bluntly pointed. The pleura of the first three segments are broadly rounded. The fourth and fifth pleura are posteriorly produced, distally rounded. The telson is slightly longer than the sixth abdominal segment, tapering, about 3.2 times longer than the anterior width, which is 3.4 times the distal width. Two pairs of small dorsal spines are present about 0.5 and 0.75 of the telson length respectively. The posterior border of the telson is triangularly produced, with a small acute median point. The lateral spines are larger than the dorsal spines, moderately stout, equal to 0.2 of the length of the intermediate spines, which are long and slender, equal to about 0.25 of the telson length. The submedian spines are slender and simple, a little less than half the length of the intermediate spines.

The eye is well developed with a large globular cornea, without a distinct accessory pigment spot, set obliquely on the stalk which is slightly flattened, broader than the corneal diameter, with its breadth equal to its maximum length.

The antennular peduncle has the proximal segment reaching the level of the middle of the scaphocerite and the distal segment to about the base of the disto-lateral spine. The proximal segment is about 1.7 times longer than wide, with the medial border straight, bearing a small acute tooth at 0.3 of its length. The disto-lateral angle is strongly produced, with a rounded lobe medially and a slender tooth laterally, both reaching to about the middle of the intermediate peduncular segment. The stylocerite is slender, with the tip reaching to about 0.65 of the segment length. The statocyst is normally developed, with a granular statolith. The intermediate segment is short, about 0.2 of the length of the proximal segment, with a well developed lateral lobe, with numerous plumose setae medially and laterally. The distal segment is narrower than the intermediate, about 1.4 times longer than wide, about 0.4 of the length of the proximal segment. The upper flagellum is biramous with the short ramus with about 8 segments and about 16 groups of aesthetascs. The longer ramus is filiform and the proximal segments of the two rami are fused.

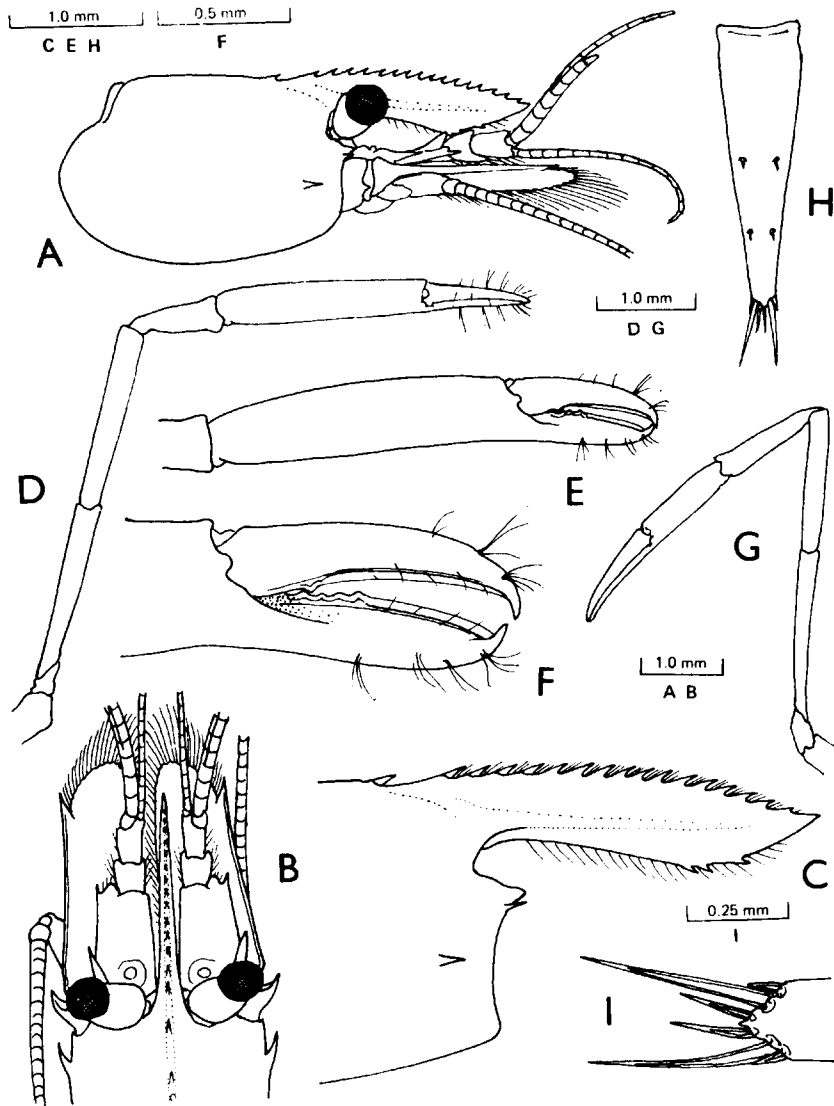


Figure 8. *Periclimenes hongkongensis* Bruce, holotype. A, carapace, rostrum and antennae. B, anterior carapace, rostrum and antennae, dorsal aspect. C, anterior carapace and rostrum. D, major second pereiopod. E, second pereiopod, chela. F, second pereiopod, fingers of chela. G, minor second pereiopod. H, telson. I, posterior telson spines.

The antenna has a stout basicerite with a strong antero-lateral tooth. The merocerite and ischierite are normal. The carpuerite is short and stout, about 2.0 times longer than wide, not reaching to the middle of the scaphocerite length. The scaphocerite is well developed, extending well beyond the antennular peduncle and the tip of the rostrum, with the lamina about 3.0 times longer than broad, extending well beyond the tip of the strong disto-lateral tooth, or the straight lateral border. The flagellum is also well developed, filiform.

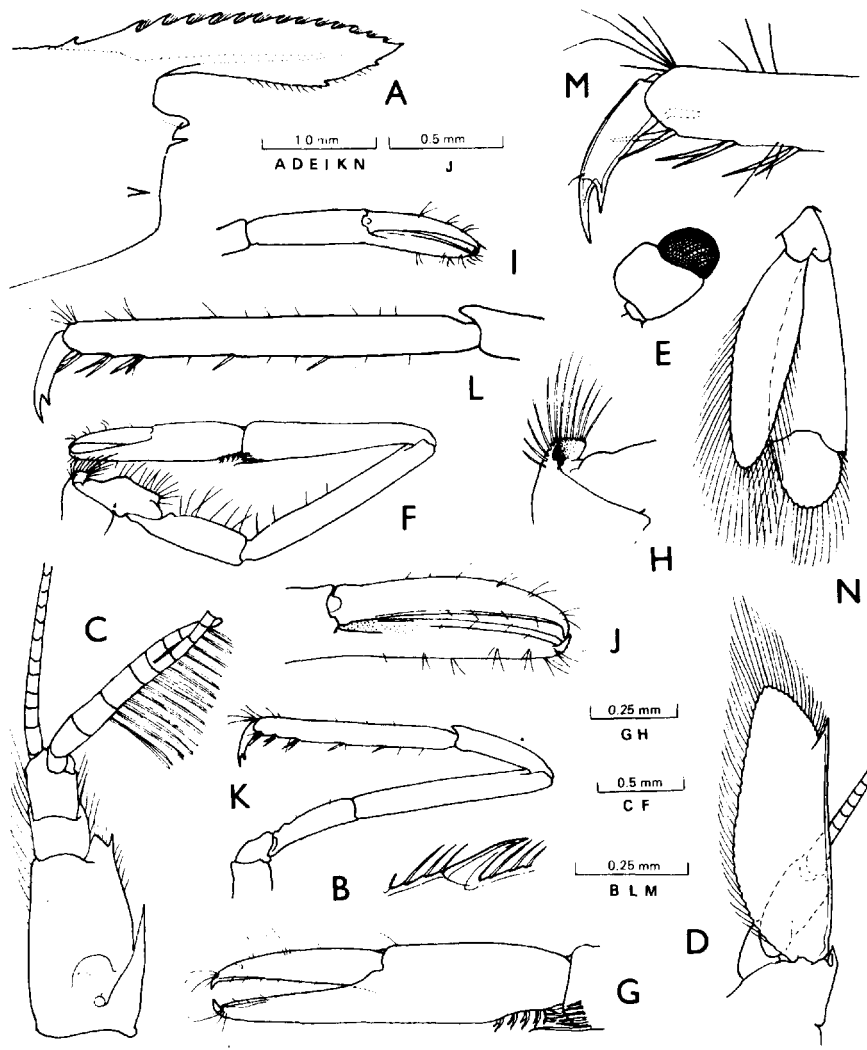


Figure 9. *Periclimenes hongkongensis* Bruce, paratype. A, anterior carapace and rostrum. B, detail of posterior rostral tooth. C, antennule. D, antenna. E, eye. F, first pereiopod. G, first pereiopod, chela. H, first pereiopod, ventral coxal process. I, chela of minor second pereiopod. J, second pereiopod, fingers. K, third pereiopod. L, third pereiopod, propod and dactyl. M, third pereiopod, distal propod and dactyl. N, uropod.

The mandible is normally developed, without a palp. The molar process is robust with five stout teeth and a setiferous lobe distally. The incisor process is slender, tapering, with three small acute teeth distally. The maxillula has a distinctly bilobed palp, the large lower lobe bearing a small ventral process but no seta. The upper lacinia is stout, tapering distally, armed with about 9-10 stout simple spines and a few short setae. The lower lacinia is also stout, strongly tapering distally with numerous slender setulose setae distally. The maxilla bears a well developed slender non-setiferous palp. The basal endite is bilobed with the distal lobe slightly larger than the proximal, bearing 13 and 11 long slender setae respectively. The coxal endite is lacking. The scaphognathite is about 2.75

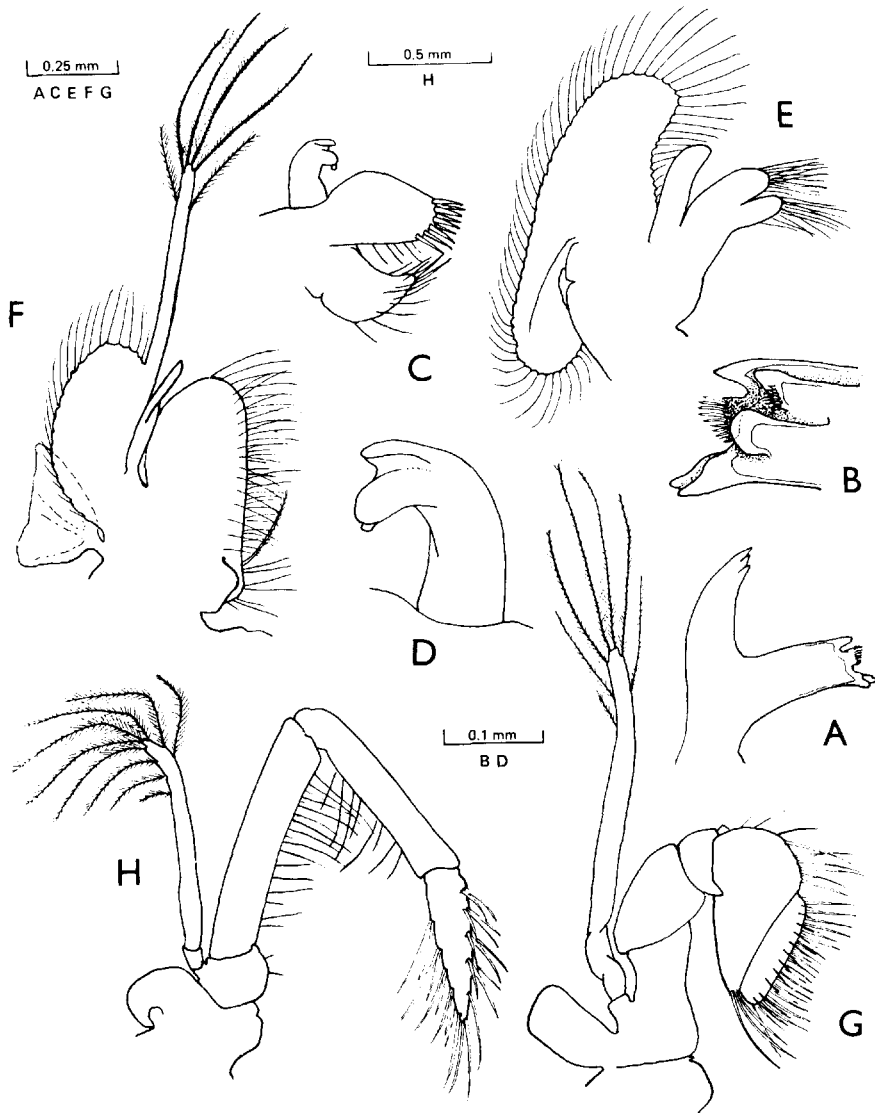


Figure 10. *Periclimenes hongkongensis* Bruce, paratype. A, mandible. B, mandible, molar process. C, maxillula. D, maxillula, palp. E, maxilla. F, first maxilliped. G, second maxilliped. H, third maxilliped.

times longer than broad, with a broad anterior lobe and a narrow posterior lobe. The first maxilliped has a long slender non-setiferous palp. The basal endite is produced, distally rounded, with a straight medial border sparsely provided with long slender setae. The coxal endite is dorso-ventrally bilobed, with dorsal lobe fused with the basal endite and provided with a few slender setae only. The exopod is well developed, with a large caridean lobe and a slender flagellum bearing four long plumose terminal setae and two shorter setae distally. A triangular epipod is present. The second maxilliped is of normal form. The dactylar segment is narrow, with slender serrulate spines. The exopod is

provided with four plumose terminal setae and three shorter distal setae. A subrectangular epipod, without a podobranch, is present. The third maxilliped has a slender endopod, which reaches anteriorly to slightly exceed the carpocerite. The antepenultimate segment is distinct from the basis, about 5.5 times longer than wide, uniform, sparsely setose along its medial margin. The penultimate segment is about 0.9 of the length of the antepenultimate, about 5.5 times longer than broad, with a few sparse medial setae. The terminal segment is about 0.8 of the length of the penultimate, tapering, 4.0 times longer than wide, with numerous groups of strong serrulate spines. The basis is medially rounded and bears a normal exopod laterally, with four plumose terminal setae and five distal setae. The coxa is medially rounded and bears a large rounded epipod laterally with a knob-like vestigial arthrobranch.

The fourth thoracic sternite bears a low transverse ridge with a subcircular median notch. The first pereopod is moderately slender and reaches anteriorly to exceed the scaphocerite by the length of the dactyl. The palm of the chela is subcylindrical, about 2.2 times longer than deep, with several rows of short cleaning setae proximally. The fingers are simple, slender, tapering with small acute hooked tips and entire distal cutting edges. The dactylus is about 4.6 times longer than wide proximally and slightly shorter than the palm length. The carpus is about 1.1 times the length of the chela, expanded distally and about 4.75 times longer than the distal width, with numerous cleaning setae disto-ventrally. The merus is about 1.2 of the carpus length, more slender, uniform and about 8.5 times longer than wide. The ischium is compressed, 3.5 times longer than wide and 0.6 of the carpus length, ventrally subcarinate with a few setae. The basis is subequal to the palm length, strongly carinate ventrally with numerous setae. The coxa is stout with a disto-ventral setose laminar process.

The second pereopods are slender and markedly unequal. The major pereopod exceeds the antenualar peduncle by the length of the carpus and chela. The chela is about 1.22 of the carapace length, with a smooth subcylindrical palm about 4.5 times longer than deep. The dactyl is about 0.45 of the palm length, about 4.5 times longer than the proximal depth, tapering distally to an acute hooked tip. The cutting edge, feebly laterally situated, bears a single small acute tooth at 0.25 of its length and the distal edge is laminar and entire. The fixed finger is similar but bears a series of up to four small teeth on the proximal fourth of the cutting edge. The carpus is short and robust, expanded distally, 2.5 times longer than its distal width, unarmed and equal to 0.45 of the palm length. The merus is slender, about 7.0 times longer than wide, uniform and without a disto-ventral spine, equal to 0.85 of the palm length. The carpus is slightly shorter than the merus, unarmed and tapered proximally. The basis and coxa are short and of normal form. The minor second pereopod exceeds the carpocerite by the distal third of the merus, carpus and chela, and is slightly shorter than the palm of the major chela. The palm is subcylindrical, about 3.5 times longer than wide. The dactyl is subequal to the palm length, about 5.5 times longer than wide, with a hooked tip and an unarmed entire cutting edge. The fixed finger is similar. The carpus is slightly longer than the palm length, about 1.25 times the length of the carpus of the minor chela. The merus is about 1.5 times the palm length and 1.2 times the length of the carpus. The ischium, basis and coxa are similar to those of the major pereopod.

The ambulatory pereopods are slender, the third exceeding the scaphocerite by the distal fourth of the propod and dactyl. The dactyl is slender, curved, about 3.75 times longer than wide, with a slender distinct unguis, equal to about 0.6 of the length of the length of the corpus, which is 2.5 times longer than wide, with a slender acute distal accessory spine. The propod is about 9.5 times longer than wide and 4.8 times the length of the dactyl. The distal fifth is armed with three pairs of long slender ventral spines and two further spines are present more proximally on the ventral border. The

carpus is slightly less than half the length of the propod and the merus is subequal to the length of the propod. The ischium is about half the length of the merus and the basis and coxa are normal. The fourth and fifth pereopods are similar but with reduced spinulation on the propods.

The protopodite of the uropod is postero-laterally rounded and the rami extend well beyond the posterior telson spines. The exopod is 3.3 times longer than broad, with the lateral border feebly convex, almost straight, with a very small acute tooth distally with a much larger mobile spine medially. The rounded distal portion is demarkated by a well marked diëresis. The endopod is much shorter than the exopod and 3.6 times longer than wide.

Types The larger female, from Rocky Harbour, Hong Kong, is selected as the holotype and is deposited in the collections of the Rijksmuseum van Natuurlijke Historie, Leiden, catalogue number RMNH Crust. D. 33227.

Colouration The freshly formolized specimens were noted to have much orange red on the ventral aspect of the eyestalk, around the inferior orbital angle, antennal spine and basicerite, around statocyst and at distal end of antennular peduncle. A carmine chevron is present on the mid-dorsal carapace. Also reddish were the bases of first to third and fifth pereopods, the distal ends of rami of pleopods, along the ventral aspect of abdomen and at the postero-ventro angle of the sixth segment. Otherwise colourless or transparent.

Host The specimens were found in apparent association with a holothurian, *Aphelodactyla andamanensis* (Bell), but the catches were made by trawl, so that the association cannot be considered fully reliable.

Remarks Preliminary details of this species were provided by Bruce (1969). No further occurrences have since been reported.

P. hongkongensis is one of a group of closely related species including *P. incertus* Borradaile, *P. obscurus* Kemp, *P. sinensis* Bruce and *P. toloensis* Bruce. *P. hongkongensis* can be readily distinguished from all others by the large number of dorsal rostral teeth, of which the posterior teeth appear articulated with the carapace. Other features that separate these species are the symmetry and proportions of the second pereopods.

Distribution Type locality, Rocky Harbour, Hong Kong. Otherwise recorded only from off Po Toi Island, Hong Kong.

Periclimenes ornatus Bruce, 1969
Figures 11 and 12

Restricted synonymy:

Periclimenes ornatus Bruce, 1969:266-267; 1974:479. – Suzuki & Hayashi, 1977:198, figs. 1e, 2e, pl. 2 fig. 2. – Bruce, 1979:226-227; 1979a:218-219, fig. 3b, pl. 1b.
– Bruce & Svoboda, in press.

Material examined (i) 1 ♂, 1 post-ovigerous ♀, C.Ls. 3.1, 4.8 mm, north of Bate Head, 7 m, 30 April 1980. (ii) 1 ♂, 1 ovigerous ♀, C.Ls. 3.1, 4.0 mm, Peng Chau, 5 m, 1 May 1980.

Description The adult females are moderately stout. The rostral lamina is horizontal, deep, with a strongly convex lower border, and the tip reaches the level of the end of the antennular peduncle. The dentition is $\frac{6-7}{0-1}$, with the first tooth situated over or

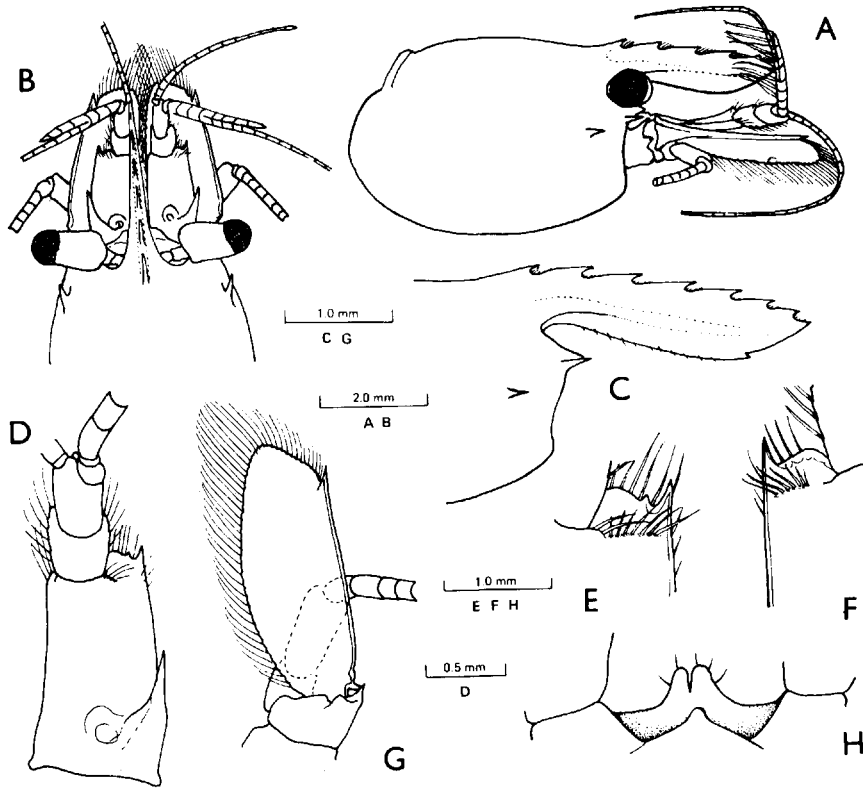


Figure 11. *Periclimenes ornatus* Bruce. A, carapace, rostrum and antennae, female. B, anterior carapace, rostrum and antennae, female, dorsal aspect. C, anterior carapace and rostrum, male. D, antennular peduncle, male. E, antennular peduncle, male, disto-lateral angle of proximal segment. F, antennular peduncle, female. G, antenna. H, fourth thoracic sternite, male.

slightly behind the posterior orbital margin. The dorsal teeth are well developed, but the ventral tooth is small. Only the smaller female is without a ventral rostral tooth. The orbit is obsolete. The inferior orbital angle is well developed, acutely produced. The antennal spine is slender and marginal, and the hepatic spine of similar size at a lower level. The antennular peduncle has the stylocertite slender, exceeding half the length of the proximal segment. The antero-lateral margin has a rounded median lobe with an acute lateral tooth. In one male a small accessory tooth is present medially to the disto-lateral tooth. The scaphocerite has the lamina about 2.6 times longer than wide, with the anterior border extending well beyond the tip of the disto-lateral tooth, and with the greatest width at about half its length. The first pereiopod is moderately robust. The palm is about 1.5 times longer than wide, and slightly compressed. The fingers are subequal to the palm length, subspatulate, with the lateral edges expanded and with thin entire, unarmed cutting edges. The coxa bears a slender setose medial process. The sternite of the fourth thoracic segment forms a broad transverse ridge with a pair of submedian processes separated by a narrow fissure. The second pereiopods are well developed, with the chelae similar but slightly unequal. In the major chela, the palm is about 3.8 times longer than deep, subcylindrical and smooth. The dactyl is about 0.56 of the palm length with an acutely hooked tip and three acute teeth on the proximal half of the cutting

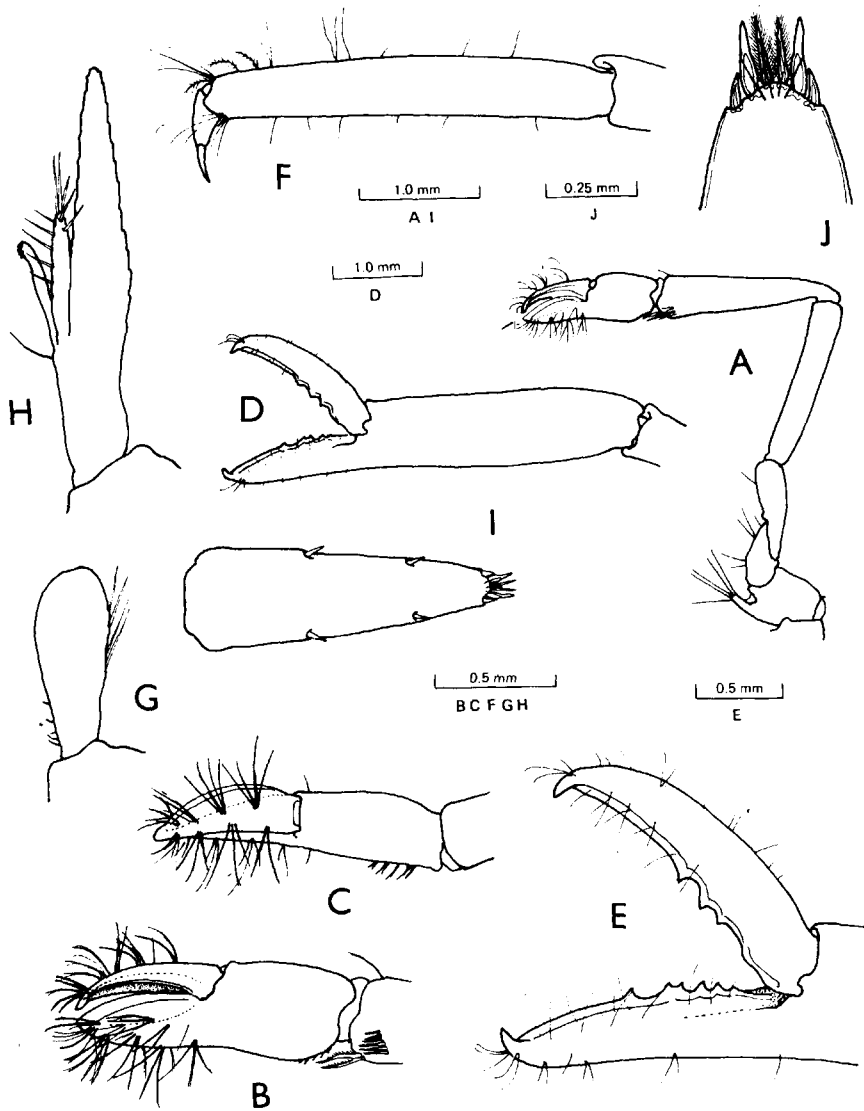


Figure 12. *Periclimenes ornatus* Bruce, male. A, first pereiopod. B, first pereiopod, chela, lateral. C, first pereiopod, dorsal. D, chela of major second pereiopod. E, second pereiopod, fingers. F, propod and dactyl of third pereiopod. G, endopod of first pleopod. H, endopod of second pleopod. I, telson. J, posterior telson spines.

edge. The fixed finger is similar, with 4-5 acute teeth on the proximal cutting edge. The carpus and merus are unarmed. The ambulatory pereiopods have the propod robust about 7.0 times longer than wide, unarmed except for a very small disto-ventral spine. The dactyl is simple, equal to about 0.22 of the propod length, with a slender distinct unguis, equal to 0.75 of the corpus length. The endopod of the first pleopod of the male is slightly expanded distally, about 2.5 times longer than wide, with five short simple spines proximally on the medial side and four simple setae on the middle of the lateral border. The appendix masculina on the second pleopod slightly exceeds the appendix

interna and is about 6.0 times longer than wide, with three slender distal spines, and a row of five ventro-medial spines and two ventro-lateral distal spines. The telson is about 2.9 times longer than the anterior width, with straight sides tapering posteriorly. Well developed dorsal spines are present, close to the lateral borders at 0.40 and 0.75 of the telson length. The posterior margin is rounded, 0.33 of the anterior width and without a median point. The lateral spines are small, 0.6 of the length of the dorsal spines. The intermediate spines are short and stout, with the proximal half swollen, about 0.09 of the telson length. The submedian spines are of similar length, slender and densely setulose.

Types The holotype specimen, an ovigerous female, C.L. 4.2 mm, is deposited in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, catalogue number RMNH Crust. D. 33229.

Colouration Mainly transparent with a well developed white eye stripe and a Y-shaped narrow white intrathoracic band, with the double part thoracic, originating near the bases of the third maxilliped, and the single ramus along the intestine. The ventral abdominal surface has a median longitudinal white stripe and is also finely striated with thin whitish streaks. The antennae, pereopods and caudal fan are all transparent with numerous small discrete blue and white chromatophores. These tend to be arranged in longitudinal lines on the ambulatory pereopods.

Host The specimens were obtained from a greenish sessile anemone.

Remarks Lung Ha Wan is the type locality for this species, which is morphologically very similar to *P. inornatus* Kemp, from which it is most easily distinguished by its colour pattern and the shape of the fourth thoracic sternite. *P. inornatus*, as its name implies, is almost completely transparent and is generally found in association with giant anemones, particularly *Radianthus* spp. The host anemones of *P. ornatus* have rarely been identified but in Japanese waters it has been found on *Parasicyonis maxima* (Wassilieff) and *P. actinostroides* (Wassilieff) (Suzuki & Hayashi, 1977). The Hong Kong host may well be one of these anemones.

Distribution Type locality, Lung Ha Wan, Hong Kong. Also known from the Red Sea, Kenya, Japan; the Great Barrier Reef and the Marshall Islands.

Periclimenes sinensis Bruce, 1969
Figures 13 and 14

Restricted synonymy:

Periclimenes sinensis Bruce, 1969:270-272, 277 (key); 1979:288. Hayashi, 1975:180.

Periclimenes setoensis Fujino & Miyaki 1969: 149-154, figs. 4-5.

Material examined 2 ♀, C.L., 2.0 mm, Hong Kong, prior to 1962, no further data available.

Description The present species closely resembles *P. hongkongensis* in its general morphology. The rostrum exceeds the end of the antennular peduncle but not the lamella of the scaphocerite. The rostrum is straight and horizontal, with feebly developed lateral carinae. The dorsal margin bears 9-10 acute teeth, of which the posterior 3-5 appear articulated with the carapace. The ventral border bears 2 small teeth on the distal fourth. The most distal teeth, dorsally and ventrally, are considerably smaller than the others. The epigastric spine is absent. Other features of the carapace and abdomen are as in *P. hongkongensis*. The telson is about 3.2 times longer than wide, with large dorsal spines at 0.5 and 0.7 of the telson length. The posterior margin is about 0.3 of the anterior

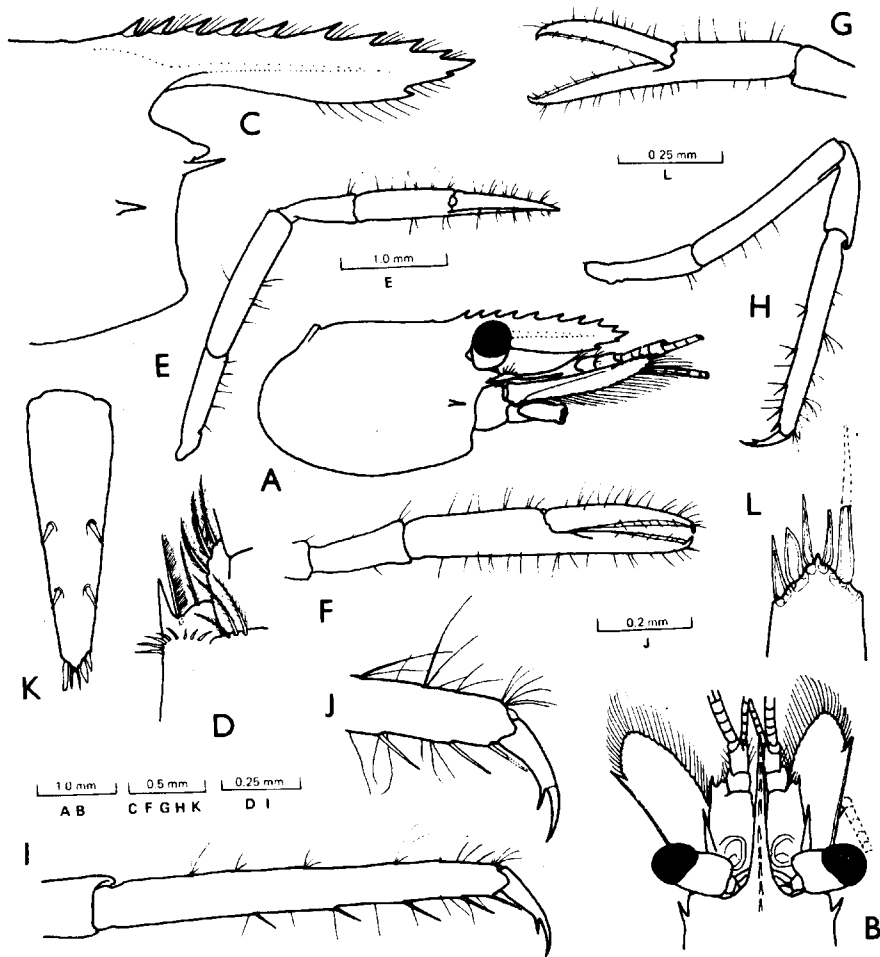


Figure 13. *Periclimenes sinensis* Bruce, holotype. A, carapace, rostrum and antennae. B, anterior carapace, rostrum and antennae, dorsal aspect. C, anterior carapace and rostrum. D, disto-lateral angle of proximal segment of antennular peduncle. E, antennular peduncle, chela and carpus. G, minor second pereiopod, H, third pereiopod, I, third pereiopod, propod and dactyl. J, third pereiopod, distal propod and dactyl. K, telson. L, posterior telson spines.

width, medially pointed, with three pairs of dorsal spines. The antennae and eye are as in *P. hongkongensis*. The mouthparts dissected were in poor condition but no differences from *P. hongkongensis* were noted. The first pereiopod has the chela subequal to the carpal length, which is about 0.9 of the meral length. The second pereiopods in the holotype are subequal and similar. In the paratype only a single regenerating second pereiopod is present. The palm of the chela is subcylindrical, about 3.0 times longer than wide. The dactyl is slender, about 5.8 times longer than wide, subequal to the length of the palm, with a small acute hooked tip and an entire unarmed cutting edge. The fixed finger is similar. The chela is generally provided with numerous simple setae. The carpus is about 0.6 of the palm length, slightly broadened distally, about 2.5 times longer than wide and unarmed. The merus is about 1.7 times the length of the palm, about 5.0 times

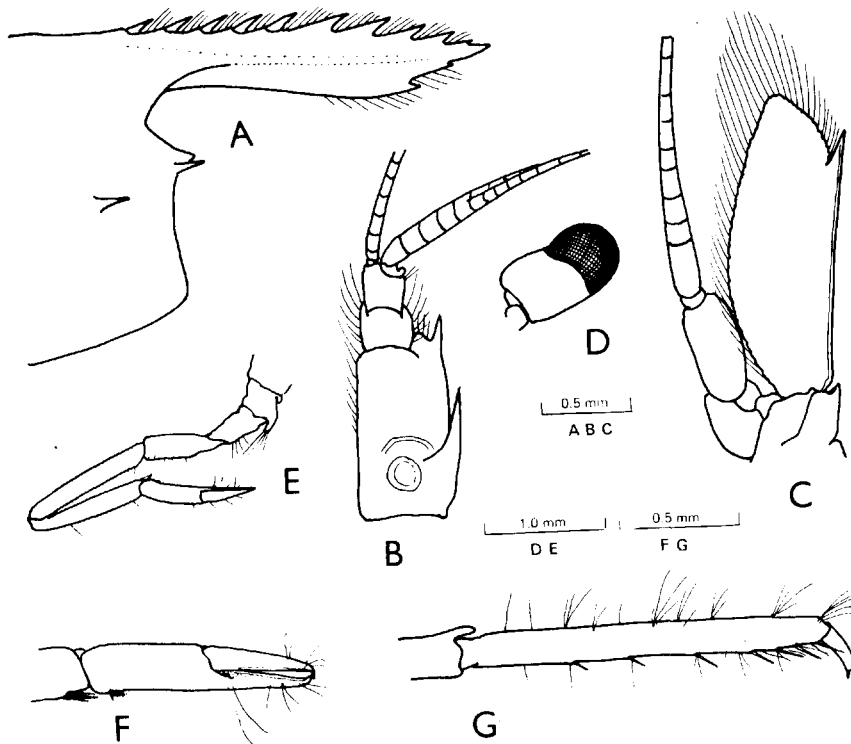


Figure 14. *Periclimenes sinensis* Bruce, paratype. A, anterior carapace and rostrum. B, antennule. C, antenna. D, eye. E, first pereiopod. F, first pereiopod, chela. G, propod and dactyl of third pereiopod.

longer than wide, uniform and without a disto-ventral tooth. The ischium is slightly longer than the palm length, also unarmed. The basis and coxa are normal. The minor second pereiopod is essentially similar, but with the chela very slightly smaller. The third pereiopod is moderately slender and similar to *P. hongkongensis*. The unguis of the dactyl is more slender, about 0.7 of the corpus length and the corpus is 2.3 times longer than wide. The propod is 9.2 times longer than wide, tapering slightly distally, 4.2 times the length of the dactyl, with 5-6 slender spines ventrally. Other features of the ambulatory pereiopods, pleopods and uropods are as in *P. hongkongensis*.

Type The holotype female specimen is deposited in the collection of the Rijksmuseum van Natuurlijke Historie, Leiden, catalogue number RMNH Crust. D. 33230.

Colouration No data.

Host *Morchellana planoregularis* (Burchardt) [Coelenterata: Alcyonacea]

Remarks A preliminary description of this species was provided by Bruce (1969). No further specimens have since been recorded from Hong Kong waters and none were obtained during the present study. This species most closely resembles *P. hongkongensis* from which it may be separated by the absence of an epigastric spine; the smaller number of rostral teeth; the subequal similar chelae of the second pereiopods; the more slender ambulatory pereiopods with simpler ventral spinulation on the propods, and the conspicuously larger dorsal spines on the telson.

Periclimenes setoensis Fujino & Miyake, 1969, is very closely related, also an associate of alcyonarians, and may prove to be synonymous. Its description corresponds exactly with that of *P. sinensis* except that the presence of articulated posterior dorsal rostral spines is not mentioned and the antero-lateral angle of the proximal segment of the antennular peduncle, with its disto-lateral tooth, appears to be much more strongly produced (Fujino & Miyake, 1969, fig. 5a). *P. setoensis* is known only from Shisô-jima, Tanabe Bay, Japan, in association with *Dendronephthya disciformis* Kukenthal.

Distribution Type locality, Hong Kong, (precise locality, depth, unrecorded). Also reported only from Japan.

Periclimenes toloensis Bruce, 1969

Figures 15 to 18

Restricted synonymy:

Periclimenes toloensis Bruce, 1969:272-275, 277 (key); 1979:229-230.

Material examined 1 ♂, C.L. 2.4 mm, off Ap Chau, 10-30 m, F/V. "Yuen Ling", trawl, 16 February 1965, coll. D. Eggleston.

Description A slenderly built pontonine shrimp. The carapace is smooth and the rostrum slender, horizontal and well developed, reaching to just beyond the antennular peduncle. The dorsal lamina is feebly convex with eight small acute fixed teeth, the first situated over the orbit, approximately evenly spaced, with the distal teeth rather smaller than rest. The ventral lamina is shallow, with the margin mainly straight, bearing a single small acute tooth beneath the seventh dorsal tooth. The lateral carinae are feebly developed. A small epigastric spine is present at one fourth of the carapace length from the orbital notch. The orbit is obsolete. Supra-orbital spines are lacking. The inferior orbital angle is strongly produced, exceeding the tip of the antennal spine. The antennal spine is well developed, slender, acute and marginal, at a lower level than the inferior orbital angle. The hepatic spine is similar to the antennal, situated at a much lower level and anterior to the level of the epigastric spine.

The abdominal segments are smooth. The third segment is not produced postero-dorsally. The fifth segment is about 0.5 of the length of the sixth segment, which is 2.0 times longer than deep. The postero-ventral angle and the postero-lateral angles are acutely produced. The pleura of the first three segments are broadly rounded and the pleura of the fourth and fifth bluntly produced. The telson is slightly longer than the sixth abdominal segment, 4.3 times longer than the anterior width, with the sides almost straight, converging to the posterior margin which is about 0.3 of the anterior width. Two pairs of minute dorsal spines are present at 0.6 and 0.8 of the length, remote from the lateral margins. The posterior border is triangular, without a median point. The lateral spines are much longer than the dorsal, robust, equal to 0.3 of the length of the intermediate spines, which are long and slender, equal to about 0.16 of the telson length. The submedian spines are small and slender, with the tips broken off.

The antennule is normally developed. The proximal segment of the peduncle is about 1.8 times longer than wide, with a small acute spine ventrally on the medial margin. The disto-lateral angle is strongly produced with a broad angular median lobe and a strong acute lateral spine. The stylocerite is slender and extends a little beyond the middle of the segment length. The statocyst is normally developed without a statolith. The intermediate and distal segments are short, together equal to 0.6 of the length of the proximal segment. The intermediate segment has a lateral lamina and is less than half the length of the narrow distal segment. The upper flagellum is biramous. The stout shorter ramus consists of eight segments with about 14 groups of aesthetascs. The four proximal segments

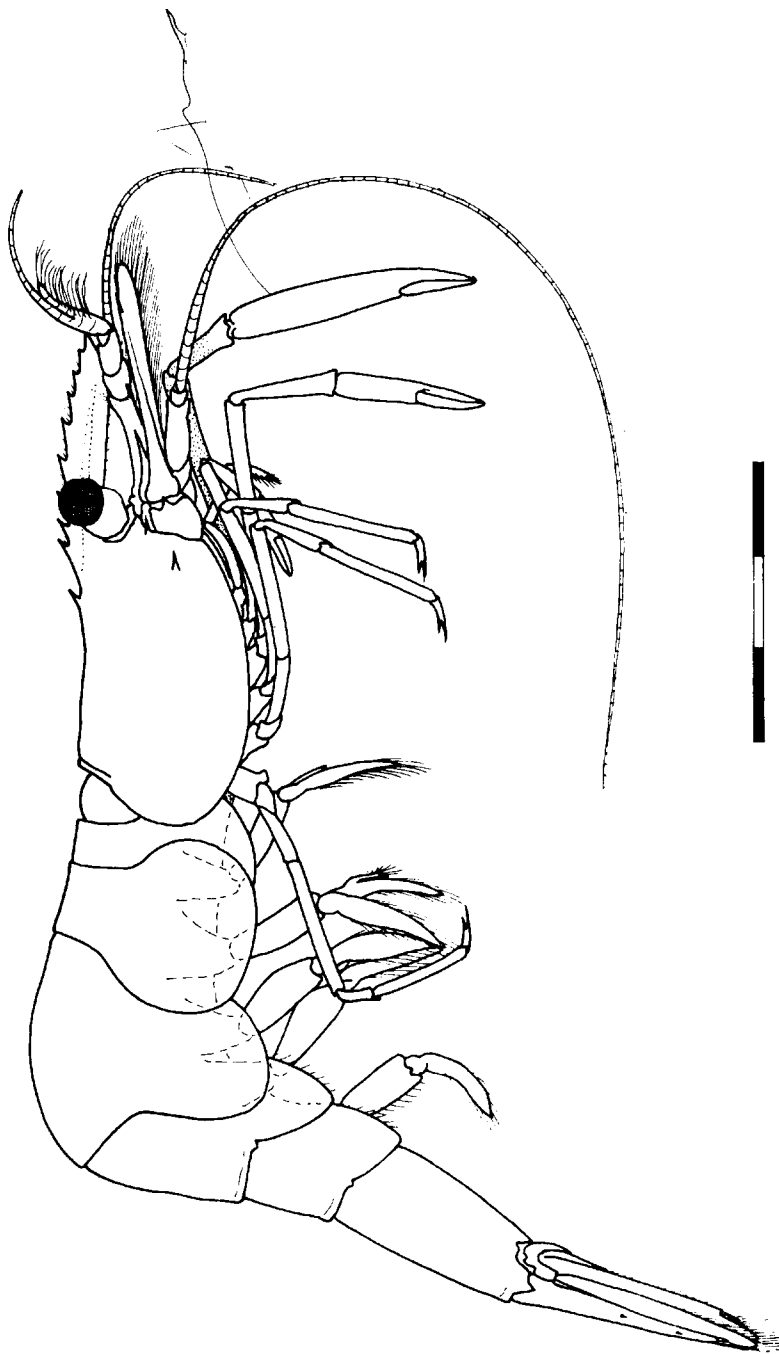


Figure 15. *Perichimenes toloensis* Bruce, holotype, Tolo Channel, Hong Kong. Scale in millimeters.

are fused with the slender filiform longer ramus. The lower ramus is also filiform.

The antenna has a stout basicerite bearing an acute lateral tooth. The ischiocerite and merocerite are normal. The carpocerite is short, about 2.2 times longer than wide, not reaching to the middle of the scaphocerite. The flagellum is well developed, equal to about 5.0 times the carapace length. The scaphocerite extends well beyond the antennular peduncle and the tip of the rostrum. The lateral border is straight and bears a strong acute distal tooth, much outreached by the anterior margins of the lamina, which is about 3.0 times longer than the greatest width, situated at 0.33 of its length.

The eye has a globular cornea with a conspicuous dorsal accessory pigment spot. The stalk is slightly compressed, about as wide as long and of greater width than the corneal diameter.

The mouthparts are essentially similar to those of *P. hongkongensis* (*vide supra*), but the exopods of the maxillipeds are less well provided with plumose setae.

The fourth thoracic somite is unarmed. The first pereopod is normal, rather short, reaching only to exceed the carpocerite by the chela and half the carpus. The chela has a subcylindrical palm, slightly compressed, about 2.4 times longer than deep. The fingers are robust, about 0.85 of the palm length, tapering strongly, with acute hooked tips and short, laterally situated entire cutting edges. The carpus is equal to 0.85 of the length of the chela, about 5.0 times longer than wide distally, tapering proximally. The merus is uniform, about 6.0 times longer than wide and 1.1 times the carpal length. The ischium is 0.6 of the merus length and the basis is normal. The coxa bears only a small setose disto-ventral process.

The second pereopods are well developed, unequal and dissimilar. The major second pereopod is well developed, moderately robust and exceeds the carpocerite by the carpus and chela. The chela has the palm smooth, subcylindrical, slightly swollen centrally, about 4.3 times longer than wide. The dactyl is equal to about 0.5 of the palm length and is about 3.6 times longer than wide, tapering to an acute hooked tip. The cutting edge bears a small blunt tooth at about 0.3 of its length, with the distal cutting edge thin and entire. The fixed finger is similar but has a slightly larger tooth. The carpus is about 0.46 of the palm length, 2.5 times longer than wide, broadened distally and unarmed. The merus is also unarmed, uniform, about 7.5 times longer than wide and 0.6 of the palm length. The ischium is long and slender, about 9.0 times longer than wide, uniform, about 0.9 of the palm length. The basis and coxa present no special features. The minor second pereopod is distinctly shorter and more slender than the major, with the chela equal to 0.93 of the major palm length. The palm is smooth, about 3.2 times longer than deep, slightly expanded distally. The fingers are slender, 0.85 of the palm length, with small acute hooked tips and unarmed cutting edges. The carpus is 1.2 times the palm length, 5.5 times longer than wide and unarmed. The merus is subequal to the carpal length and the ischium is 1.5 times the palm length, only slightly shorter than that of the major second pereopod.

The ambulatory pereopods are moderately robust. The third reaches to the tip of the scaphocerite. The dactyl is slender, with a feebly demarkated unguis, about 4.3 times longer than wide, 0.75 of the corpus length. The corpus is about 2.8 times longer than deep, with a large distal accessory spine equal to about half the length of the unguis. The propod is about 3.7 times the length of the dactyl, uniform, about 9.6 times longer than wide. The ventral border is armed with five sets of slender spines, paired at the disto-ventral angle and preterminally, otherwise of single spines only. The carpus is about 0.45 of the propod length and unarmed. The merus is subequal to the propod length, about 6.8 times longer than wide, uniform and unarmed. Ischium, basis and coxa present no special features. The fourth and fifth pereopods are similar but with the propods with fewer spines ventrally.

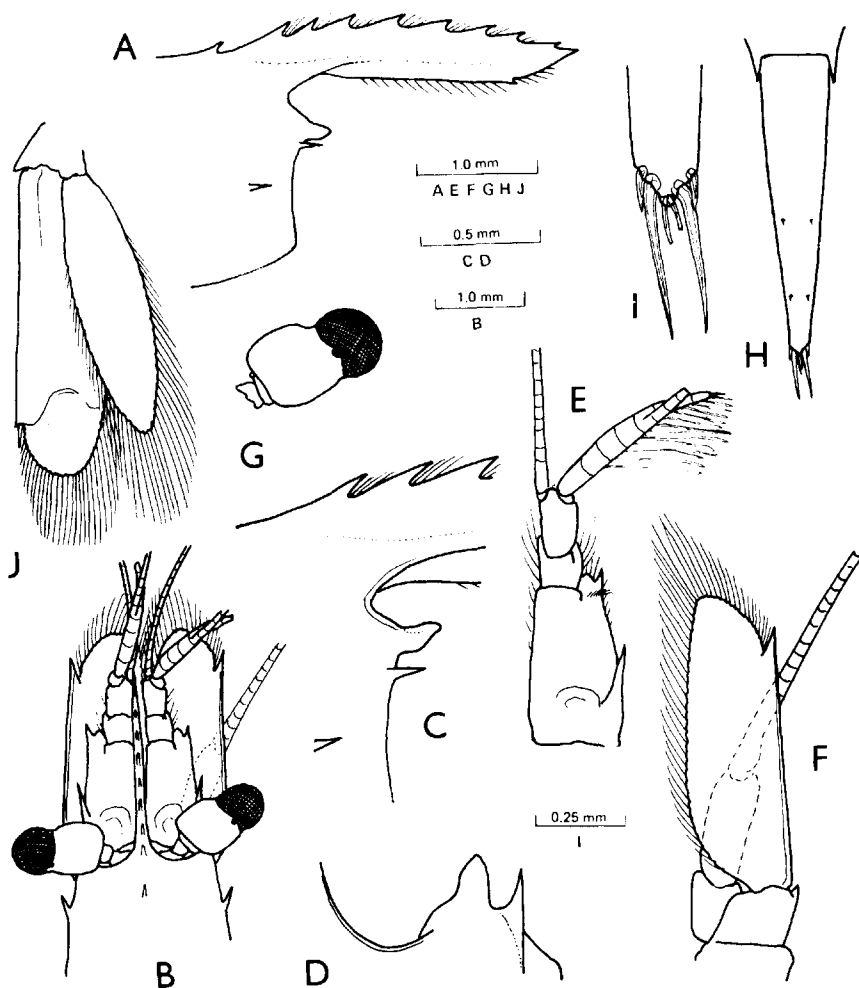


Figure 16. *Periclimenes toloensis* Bruce, holotype. A, anterior carapace and rostrum. B, anterior carapace, rostrum and antennae, dorsal aspect. C, orbital region, lateral. D, orbital region, dorsal. E, antennule. F, antenna. G, eye. H, telson. I, posterior telson spines. J, uropod.

The endopod of the first pleopod is 3.0 times longer than wide. The distal half is feebly expanded, acutely pointed distally, with a small acute accessory lobe medially. The proximal third of the medial margin bears two long setulose setae and five short hooked spines. The distal half of the lateral border bears 8 short plumose setae. On the endopod of the second pleopod, the appendix interna clearly exceeds the corpus of the appendix masculina, which is about 7.0 times longer than wide, with a pair of slender finely serrulate distal setae and a longitudinal row of five shorter simple dorsal spines.

The uropod has the protopodite postero-laterally unarmed. The exopod is about 3.3 times longer than wide, with a straight lateral border with a small acute distal tooth and a much larger medial spine. The endopod is 3.7 times longer than wide and about 0.85 of the exopod length.

Types The only male example is designated as the holotype and is deposited in the

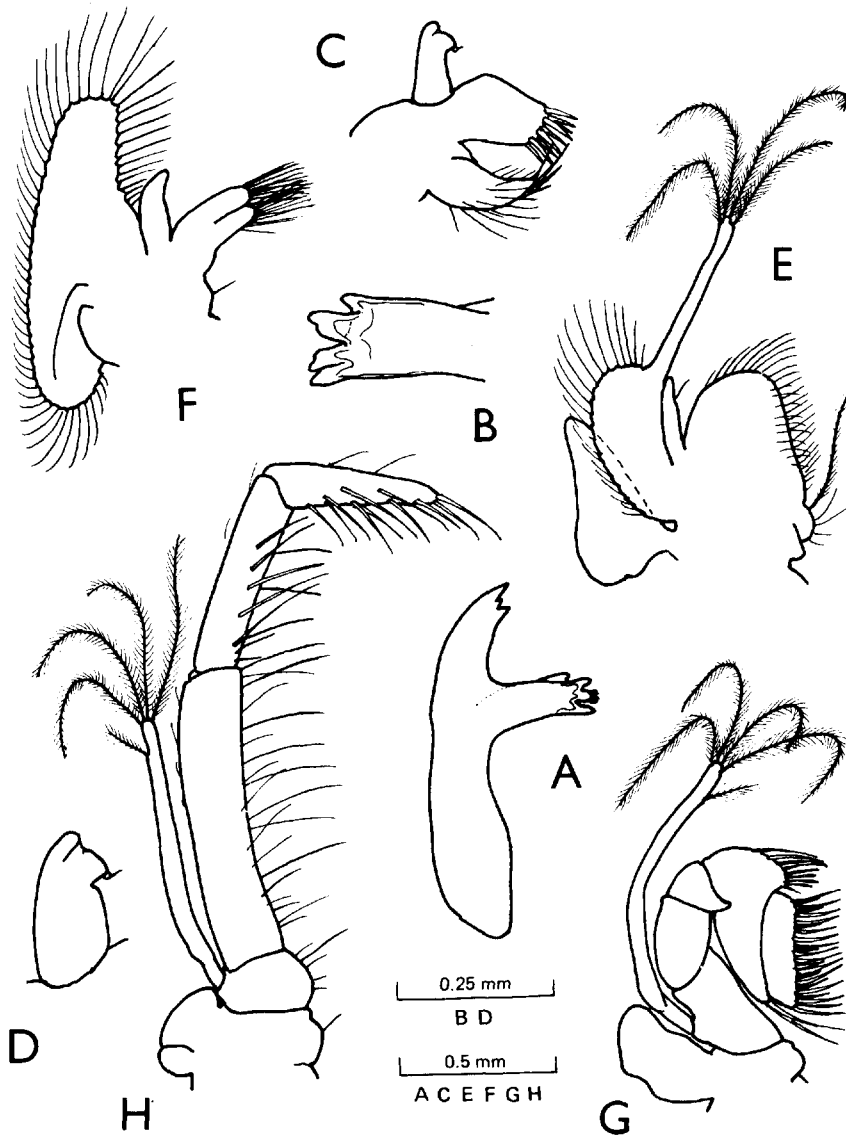


Figure 17. *Periclimenes toloensis* Bruce, holotype. A, mandible. B, mandible, molar process. C, maxillula. D, maxillula, palp. E, maxilla. F, first maxilliped. G, second maxilliped. H, third maxilliped.

collection of the Rijksmuseum van Natuurlijke Historie, Leiden, catalogue number RMNH Crust. D. 33231.

Colouration Mainly transparent.

Host Not identified. Caught in association with many gorgonians.

Remarks A preliminary description of this species was provided by Bruce (1969) and the species has since been reported from the western Indian Ocean and the Great Barrier

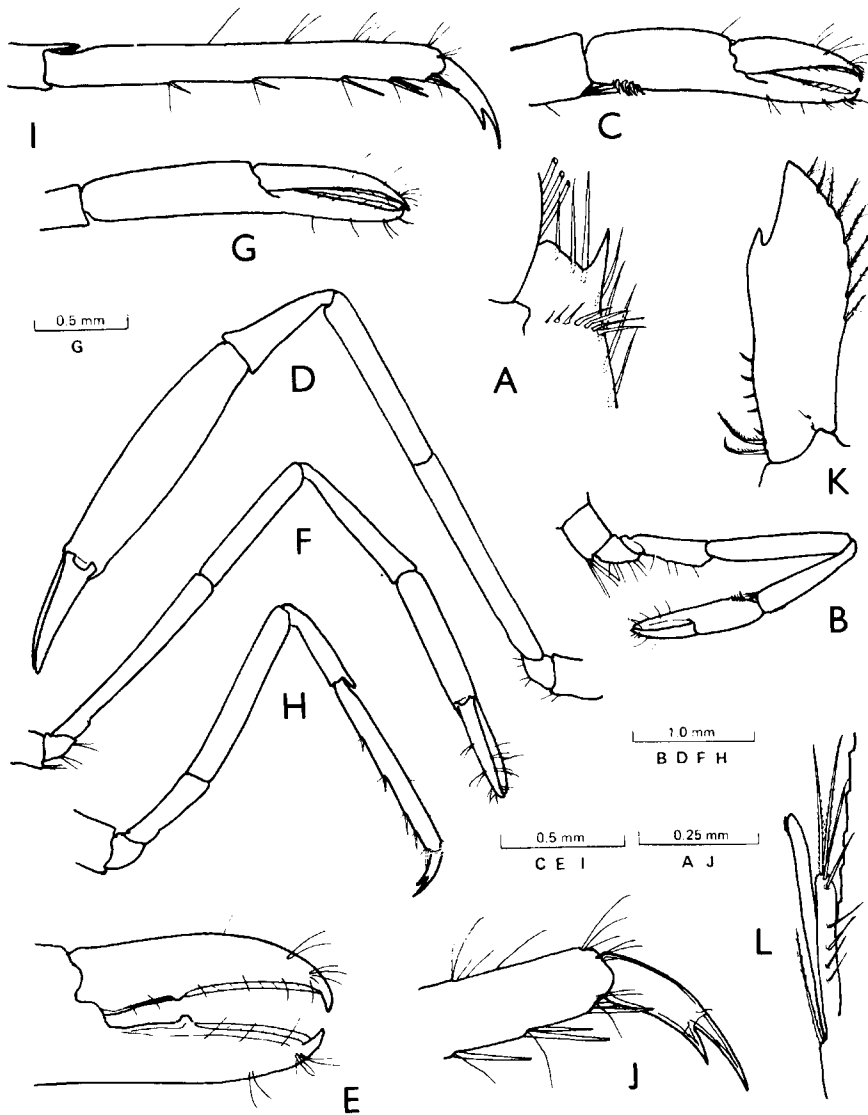


Figure 18. *Periclimenes toloensis* Bruce, holotype. A, disto-lateral angle of proximal segment of antennule. B, first pereiopod. C, first pereiopod, chela. D, major second pereiopod. E, major second pereiopod, fingers of chela. F, minor second pereiopod. G, minor second pereiopod, distal propod and dactyl. H, minor second pereiopod. I, minor second pereiopod. J, distal propod and dactyl of minor second pereiopod. K, endopod of first pleopod. L, appendix masculina and appendix interna of second pleopod.

Reef. The latter specimens were collected from the hydroid *Lytocarpus philippinus* (Kirchenpauer) where specimens were found in association with *Periclimenes psamathe*, *P. nilandensis* and *P. granulimanus*.

P. toloensis is closely related to *P. obscurus* Kemp, *P. incertus* Borradaile and *P. hongkongensis* Bruce, all of which have a well marked epigastric spine on the carapace. *P. incertus* can be distinguished from *P. toloensis*, as well as the other species, by the dactyls of the ambulatory pereiopods, which are comparatively short and stout, with a

very well developed broad accessory spine. The basis and coxa also bear characteristic ventral processes not found in the other species. *P. obscurus* has a slender dactyl on the third pereiopod as in *P. toloensis*, but has a more arched rostrum, a feebly produced inferior orbital angle and a post-marginal antennal spine. *P. hongkongensis* is most readily distinguished from *P. toloensis* by the more strongly dentate rostrum, $\frac{13-17}{2-3}$ rather than 8/1. The proportions of the segments of the second pereiopods are also rather different, with the carpus of the major second pereiopod half the length of the palm in *P. toloensis* and distinctly less than half the palm length in *P. hongkongensis*.

Distribution Type locality, off Ap Chau, Tolo Channel, Hong Kong. Also reported from the southern Zanzibar Channel and from Heron Island, Queensland.

♣ *Anchistus custos* (Forskål, 1775)

Figure 19

Restricted synonymy:

Cancer custos Forskål, 1775:94.

Anchistus custos — Holthuis, 1952:13, 105-109, figs. 33-34. — Johnson & Liang, 1966:433-455, figs. 1-10. — Bruce, 1979:231-232.

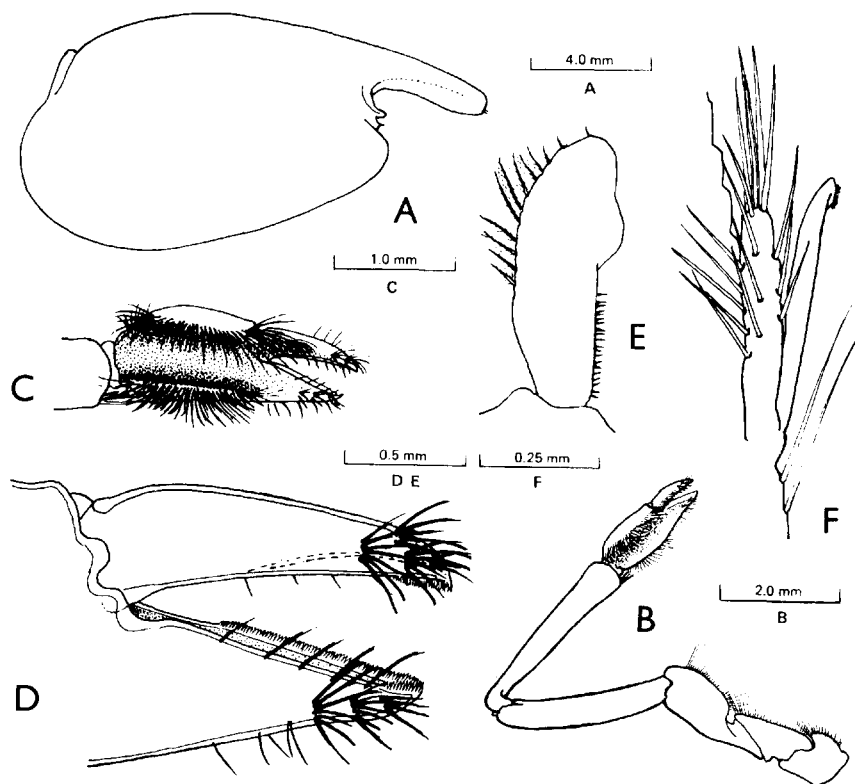


Figure 19. *Anchistus custos* (Forskål), female. A, carapace and rostrum. B, first pereiopod. C, first pereiopod, chela. D, first pereiopod, fingers of chela. Male. E, endopod of first pleopod. F, appendix masculina and appendix interna of second pleopod.

Material examined 1 ♂, 1 ovigerous ♀. C.Ls. 5.8; 8.0 mm, Mirs Bay near Peak Rock, 14 m, trawl, 23 April 1980.

Host *Pinna* sp., [Mollusca, Bivalvia].

Remarks This widely distributed species has been previously recorded from Hong Kong waters, at Sharp Island, Harbour Island and from Mirs Bay.

These specimens agree well with previously published descriptions. The species can be readily separated from all other pontoniine shrimps by means of the unique cannulate palm on the chela of the first pair of pereopods. The dorsal and ventral borders of the palm are extended medially as thin expansions and provided with dense bands of slender setae along outer aspects. A ridge bearing similar setae is also present proximally on the medial aspect of the dactylus. The fingers are equal to about 0.6 of the palm length and are narrowly subspatulate, with laterally situated cutting edges, minutely denticulate, that also extend round the tip and the distal part of the medial aspect. The fingers bear a number of dense groups of setae also. The carpus and merus are normal. The ischium and basis are ventrally carinate, with a fringe of fine setae. The coxa bears a large ventral lobe that is similarly setose.

The endopod of the male first pleopod is about 3.2 times longer than the central width, with the distal half expanded medially. The proximal half of the straight medial border bears about 24 short simple spinules. The distal half of the convex lateral border bears 12 short plumose setae. The appendix masculina of the second pleopod is slightly shorter than the appendix interna. The corpus is about 6.0 times longer than wide, with four long slender setae distally. The medial, ventral and lateral borders bear 3, 4 and 5 setae on the distal half respectively. Length of ova, on point of hatching, 0.6 mm.

Distribution Type locality, Loheia, Red Sea. Known from Red Sea to Mocambique, to South Australia and Japan; east to Fijian and Santa Cruz Islands.

Periclimenaeus arabicus (Calman, 1939)

Figure 20

Restricted synonymy:

Periclimenes (*Periclimenaeus*) *arabicus* Calman, 1939:210-211, fig. 4.

Periclimenaeus arabicus — Holthuis, 1952:13, 130. — Bruce, 1974: 1563-1568, figs. 3c-f, 4-6, 7c-h; 1980:25-27, fig. 11.

Periclimenaeus ohshimai Miyake & Fujino, 1967:275-279, fig. 1. — Fujino, 1978:21.

Material examined 1 juvenile ♀, C.L. 2.1 mm, Tolo Channel, 2 m, 24 April 1980.

Description The single example agrees generally with the previously published descriptions. The rostrum has a dentition of 5/0 and a small supra-orbital spine is present. The disto-lateral angle of the proximal segment of the antennular peduncle is acutely produced and the scaphocerite has a robust disto-lateral spine that exceeds the anterior margin of the truncated lamina. The first pereopod has a slender curved chela, with the palm 3.0 times longer than deep, tapering distally to slender fingers, equal to about 0.45 of the palm length, with indistinct cutting edges and small hooked tips. The second pereopods have the major chela stout, with the palm finely tuberculate, the dactyl with a stout molar process, opposing a socket on the fixed finger, and with the ventral borders of the merus and ischium finely spinulate. The second pereopod has the chela much smaller, the palm finely tuberculate and equal to half the length of the palm of the major chela. The dactyl is slender, equal to about 0.7 of the palm length, with a hooked tip and an entire

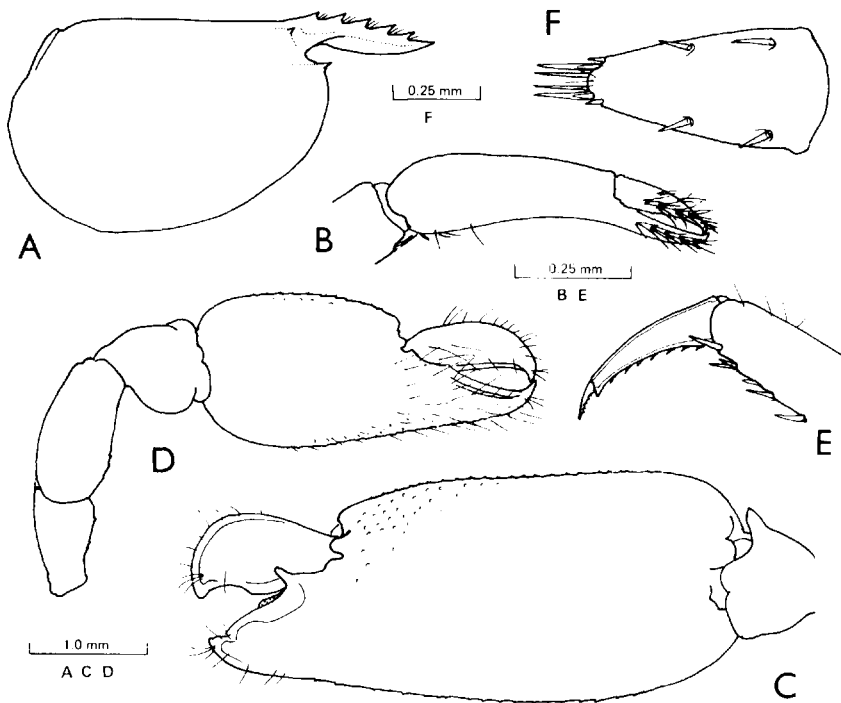


Figure 20. *Periclimenaeus arabicus* (Calman), female. A, carapace and rostrum. B, chela of first pereiopod. C, chela of major second pereiopod. D, minor second pereiopod. E, dactyl of third pereiopod. F, telson.

concave cutting edge. The fixed finger is grooved along its concave cutting edge and also has a hooked tip, and bears numerous long setae on its dorsal aspect. The ventral merus and ischium are feebly spinulate. The third pereiopod has the dactyl long and slender, with the unguis bearing five small ventral denticles and the corpus seven acute teeth along its whole length. The ventral border of the propod bears numerous large spines and the ischium is acutely tuberculate. The ventral border of the carpus is unarmed. The dorsal telson spines are large, at 0.23 and 0.55 of the length.

Colouration Completely transparent.

Host *Gellius taxius* Topsent [Porifera, Haplosclerida], a new host record. Previously reported in association with sponges of the genera *Toxochalina*, *Callyspongia* and *Acarnus*.

Remarks The present specimen differs from other examples referred to *P. arabicus* in the absence of ventral tubercles on the carpus of the ambulatory pereiopods. The rostral dentition of 5/0 is also lower than found in other examples which have been reported from 6/0 to 9/1. These differences, combined with the association with a different genus of host sponge, may indicate that a separate species is involved.

Distribution Type locality, 19°22.6' N., 57°53.0' E., off Oman. Also known from Djibouti, Zanzibar, Kenya, Japan, New Caledonia and the Great Barrier Reef.

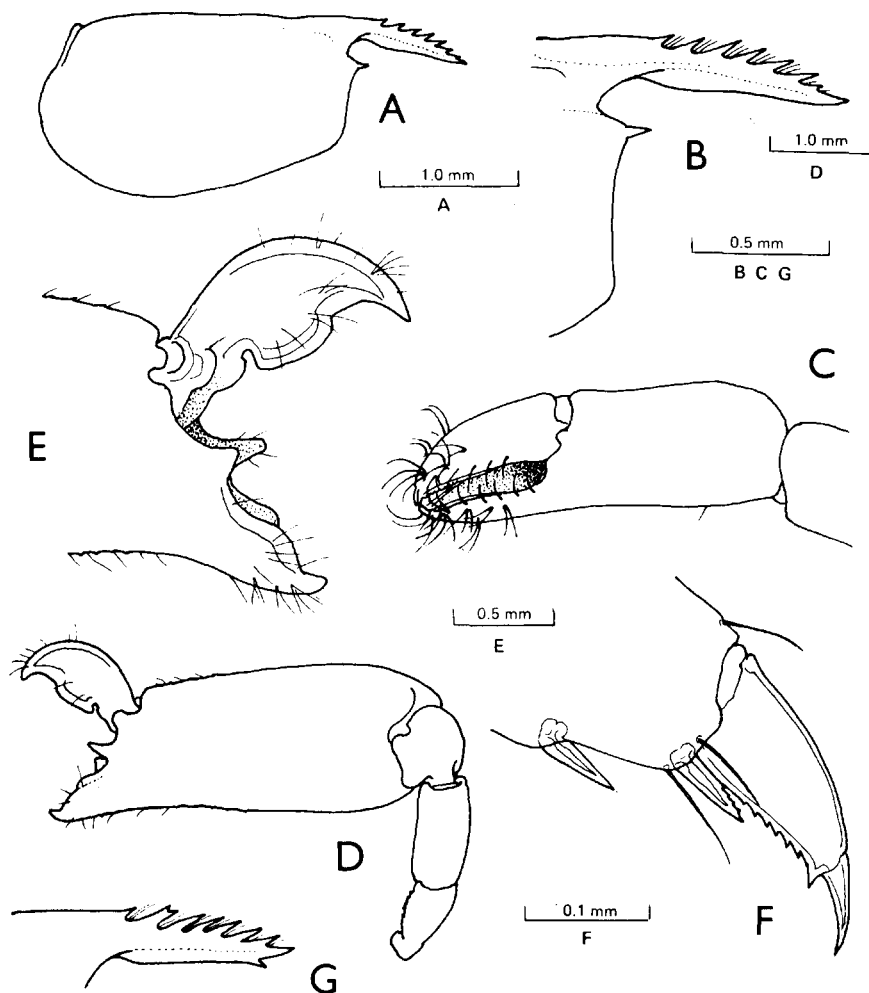


Figure 21. *Periclimenaeus rastrifer* Bruce, male. A, carapace and rostrum. B, anterior carapace and rostrum. C, chela of first pereiopod. D, major second pereiopod. E, major second pereiopod, fingers of chela. F, dactyl of third pereiopod. Female. G, rostrum.

Periclimenaeus rastrifer Bruce, 1980

Figure 21

Restricted synonymy:

Periclimenaeus rastrifer Bruce, 1980:27-33, figs. 12, 13 ab.

Periclimenaeus spongicola – Bruce, 1980:235.

Material examined (i) 1 ♂, C.L. 2.1 mm, Hoi Ha Wan, 8-10 m, 23 April 1980. (ii) 1 ovigerous ♀ (damaged), C.L. 2.4 mm, Kat O Chau, 3-7 m, 26 April 1980. (iii) 1 ♂, C.L. 1.8 mm, Long Ke Wan, 8 m, 27 April 1980.

Description The rostrum is slightly depressed, slender, tapering, acute, with 7 slender acute dorsal teeth, and 0-1 ventral teeth. All dorsal teeth are situated on the distal four-fifths of the rostrum and a short post-rostral carina extends onto the anterior carapace. The only ovigerous female has a single small preterminal ventral rostral tooth. The inferior

border of the rostrum is feebly sinuous. The antennal spine is marginal and acute, distinct from the inferior orbital angle. The first pereopods have the fingers short and broad, equal to about 0.65 of the palm length, spatulate. The dactyl has a pair of short hooked teeth distally and the adjacent cutting edges are finely dentate. The fixed finger has a single hooked distal tooth and entire cutting edge. The major second pereopod is conspicuously larger than the minor, with the palm very feebly tuberculate distally about 2.3 times longer than deep and slightly compressed. The dactyl is stout, about 2.3 times longer than deep, with an acute hooked tip and a well developed molar process. The fixed finger has a moderately hooked tip, a deep fossa on the proximal part of the cutting edge, and with acute processes projecting from the upper and lower edges proximally, the lower one longer and more acute than the upper. The carpus is short and stout, and devoid of tubercles. The merus is robust, equal to about 0.33 of the palm length, 2.0 times longer than wide, with the ventral aspect flattened and with numerous small acute tubercles. The ischium is shorter than the merus, tapering proximally, about 2.0 times longer than wide, carinate ventrally with a few small acute tubercles. The minor second pereopod is about 0.55 of the length of the major chela, with the palm compressed, about 1.6 times longer than deep, finely tuberculate, with long setae ventrally. The dactyl is semi-circular, laminar, with a strongly hooked tip and an entire convex cutting edge that fits into a groove on the fixed finger. The merus and ischium are ventrally spinulate. The third ambulatory pereopod is robust. The dactyl is stout and short with a well defined simple unguis. The corpus bears a well developed distal accessory tooth and a series of acute 5-6 ventral denticles. The disto-ventral spine of the propod bears some small serrations on its distal dorsal aspect.

Colouration Completely transparent in life.

Hosts (i) *Siphonochalina* sp. [Porifera: Haplosclerida]. (ii) *Mycale philipensis* Dendy [Porifera: Poecilosclerida]. (iii) *Tedania anhelans* (Lieberkühn) [Porifera: Poecilosclerida], (i) and (iii) are new host records. The type specimen was associated with *Dysidea* sp., and the species has also been reported in association with *Ulosa* sp.

Remarks The holotype specimen was incomplete, with a damaged rostrum and lacking the major second pereopod. The present examples agree closely with the original description and enable it to be completed. The characteristic fingers of the first pereopods are clearly developed in all specimens. The ovigerous female, with a rostral dentition of 7/1, also shows a less heavily spinose ventral border on the propod of the third pereopods, but in all other features appears similar to the males with a rostral dentition of 7/0.

The specimens referred to *P. spongicola* by Bruce (1979) have been reexamined and found to belong to *P. rastrifer*. They were found in association with the sponge *Mycale philippensis* (Dendy), at Kat O Chau in March 1961.

Distribution Type locality, Noumea, New Caledonia. Otherwise known only from Heron Island, Queensland, Australia.

Onycocaris oligodentata Fujino & Miyake, 1969
Figures 22 to 24

Restricted synonymy:

Onycocaris oligodentata Fujino & Miyake, 1969:405 (key), 415, 422, figs. 7, 8 d-f, 9 d-f. — Bruce, 1979:236.

Material examined (i) 2 ♂, 1 ♀, 1 ovigerous ♀, C.Ls. 2.7, 2.8; 3.2, 3.6 mm, Hoi Ha Wan, 8-10 m, 23 April 1980. (ii) 1 ♂, 1 ovigerous ♀, C.Ls. 2.4; 3.0 mm, Tolo Channel, 2 m, 24 April 1980. (iii) 1 ♂, 1 ovigerous ♀, C.Ls. 2.8; 3.6 mm, Kat O Chau, 3-7 m, 26 April 1980. (iv) 1 ♂, 1 ♀; 1 ovigerous ♀, C.Ls. 2.4; 2.8; 3.9 mm, Tolo Channel, 8 m, 28 April 1980.

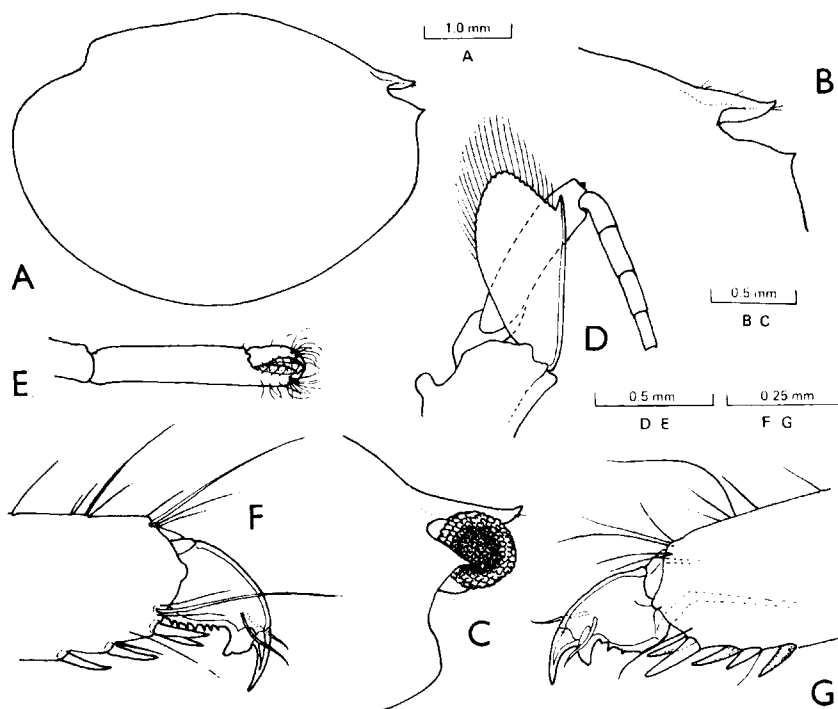


Figure 22. *Onycocaris oligodentata* Fujino & Miyake. A, carapace and rostrum. B, anterior carapace and rostrum. C, anterior carapace and rostrum. D, antenna. E, chela of first pereiopod. F, distal propod and dactyl of third pereiopod. G, third pereiopod. A, B, D, F, female; C, E, G, male.

Description The specimens agree closely with the original description, except for a few small features mentioned below.

The rostrum is short and slightly up-turned, with a few distal ventral setae. The inferior orbital angle is acutely produced. The anterolateral angle of the branchiostegite is broadly rounded in the female and slightly produced in the male. The antenna has the carpoperite distinctly exceeding the anterior margin of the lamina, which is angularly produced and extends well beyond the tip of the robust antero-lateral tooth.

The mandible is without a palp. The molar process is obliquely truncate distally with small stout teeth posteriorly and bands of short setae anteriorly. The incisor process is reduced, short and broad, with a single acute tooth only and a denticle on the medial margin distally. The maxillula has a very feebly bilobed palp. The upper lacinia bears three slender spines distally and numerous setae. The lower lacinia bears numerous long finely setulose setae. The maxilla has a long tapering non-setiferous palp. The distal endite is large, simple, with 3-4 finely setulose distal setae only. The scaphognathite is very narrow, about 3-4 times longer than wide, with a long posterior lobe. The first maxilliped has a slender, non-setiferous palp. The basal endite is broad, with a convex sparsely setose medial border, completely fused with the basal endite. The exopod is well developed, with a narrow caridean lobe and a flagellum bearing four plumose distal setae. A subrectangular epipod is present also. The second maxilliped is of normal form. The distal segment of the endopod is broad with the medial margin straight, densely fringed with numerous long finely setulose spines. The exopod bears four plumose distal setae, and a narrow epipod is also present. The third maxilliped presents no special

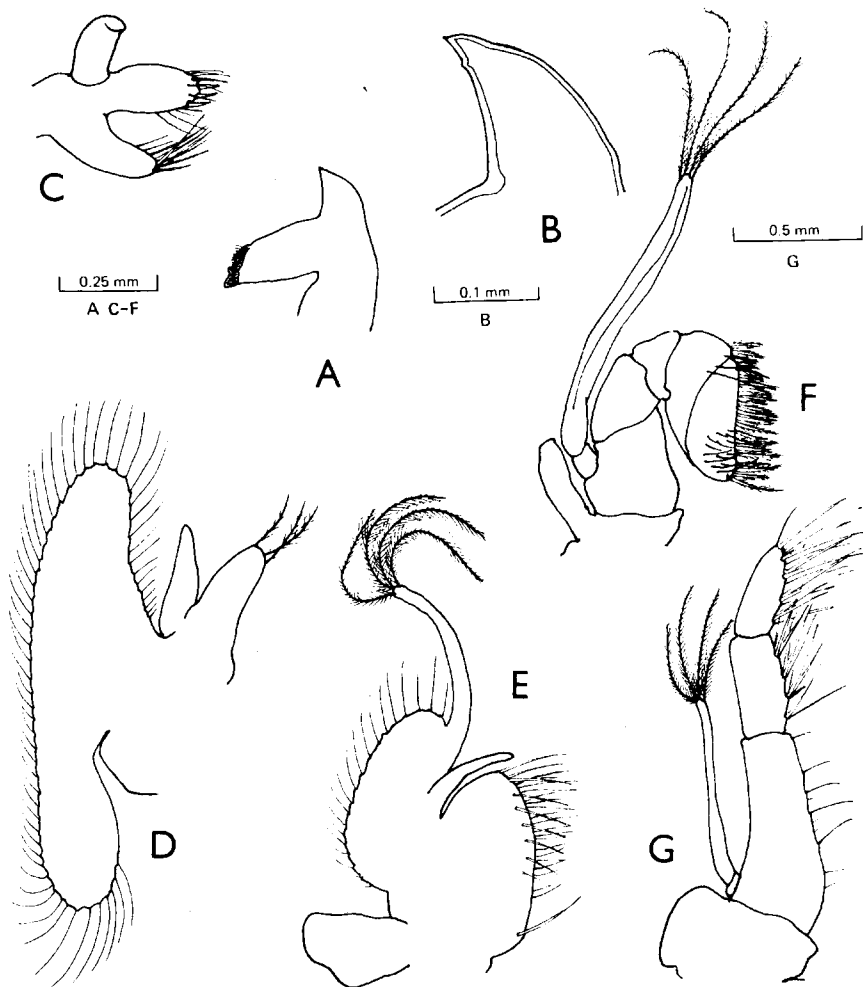


Figure 23. *Onycocaris oligodentata* Fujino & Miyake, female. A, mandible. B, incisor process. C, maxillula. D, maxilla. E, first maxilliped. F, second maxilliped. G, third maxilliped.

features. The exopod is normal, a round epipod is present but no arthrobranch.

The first pereiopod has the palm subcylindrical, about 4.0 times longer than deep and about 2.7 times the length of the finers, which are feebly subpatulate, with lateral entire cutting edge and small acute hooked tips with numerous short stout densely biserrate setae.

The second pereiopods are usually small, subequal and similar in the females, larger, unequal and dissimilar in the males, in which the smaller chela is similar to those of the females. The palms are strongly compressed and without tuberculations. In the females, the palm is about 1.25 times longer than deep, oval in outline, and wide centrally. The dactyl equals about 0.65 of the palm length, and is about 2.6 times longer than wide, broad, tapering distally to a stout hooked tip, and with the medial aspect strongly concave so that the cutting edge is laterally placed. The distal half of the cutting edge bears about 9 stout acute teeth, of increasing size distally and continuous with the terminal tooth

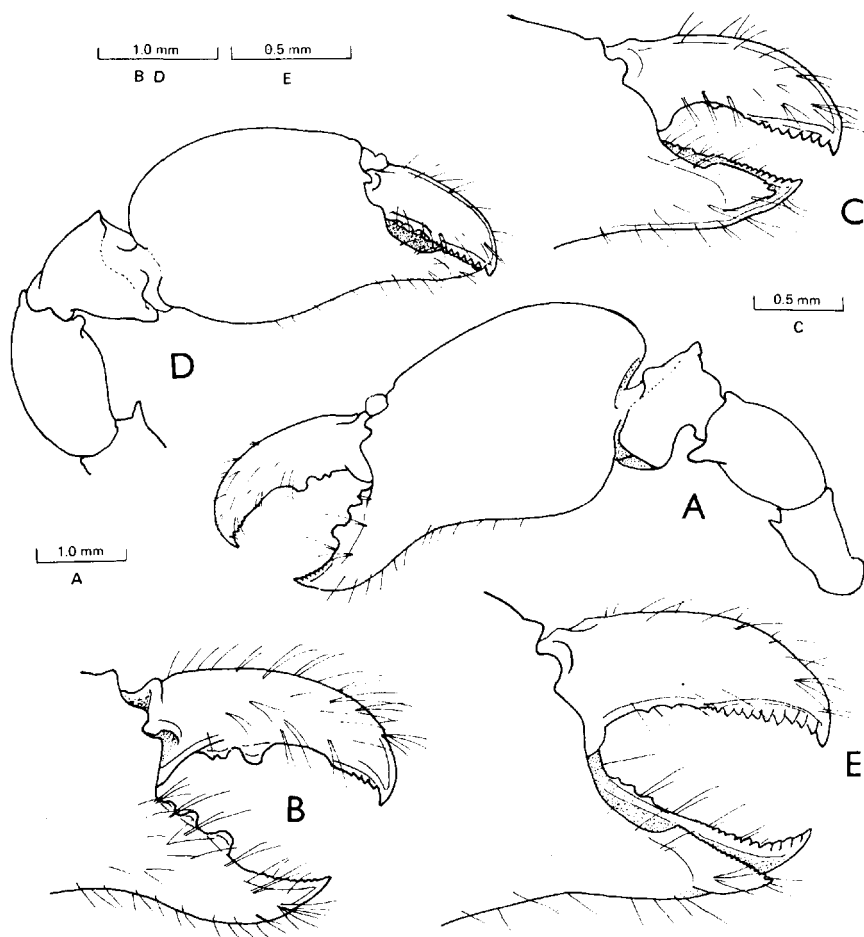


Figure 24. *Onycocaris oligodentata* Fujino & Miyake. A, major second pereiopod, lateral, male. B, major second pereiopod, fingers, medial. C, fingers of minor second pereiopod, lateral, male. D, minor second pereiopod, lateral, female. E, minor second pereiopod, fingers.

of the dactyl. The proximal half of the cutting edge is concave with two small acute teeth. The fixed finger is similarly concave with a lateral cutting edge. The tip is more strongly curved and acute. The distal half of the cutting edge bears about 13 stout acute teeth and the proximal half has three small acute teeth. The cutting edge of the dactyl closes laterally to the edge of the fixed finger and lies in a deep groove extending distally from the base of the hinge. This groove is provided with a thin laminar flange over its distal half, that projects over the closed teeth of the dactyl, and is armed with a row of about 20 small denticles along its upper edge. The carpus is robust and unarmed. The merus bears a blunt lobe on the lateral disto-ventral angle and the ischium bears a conspicuous acute pre-terminal disto-ventral tooth. The male minor second pereiopod is essentially similar but rather less strongly armed and with a smaller lateral flange. The proximal halves of the cutting edges of the dactyl and fixed finger have only one and two small acute teeth respectively. The major second pereiopod has the palm about 1.4 times longer than deep, with the greatest width proximally, with the lower border strongly

concave. The fingers are robust, with the cutting edges central. The dactyl is about 0.6 of the palm length, 3.1 times longer than deep, with a strongly hooked acute tip. The distal third of the cutting edge bears 3-4 small acute teeth. A large diastema extends over the central third and the proximal third bears two large blunt tipped teeth, the proximal tooth with an irregular top. The fixed finger has about 8 small teeth on the distal third of the cutting edge and the proximal half bears three large blunt-topped teeth, with the distal tooth much larger than the proximal. In all chelae, the fingers are provided with numerous long setae. The carpus bears a blunt process disto-dorsally and the merus has a large blunt disto-ventral process. The disto-ventral ischial tooth is similar to that of the female.

The ambulatory pereopods bear short, strongly compressed and curved dactyls, with the unguis clearly demarkated, simple and without ventral denticulations. The corpus bears a strong recurved disto-ventral accessory tooth, triangularly acute on the male, trapezoidal in the female. The ventral border of the corpus is concave, with about 4 irregular denticles in the male and a more regular series of about 7 acute denticles in the female. The propod bears a pair of robust disto-ventral spines in both sexes. The distal ventral border bears a further 3-4 single spines in the female and 5-6 in the male, with alternating spines offset medially and laterally. Length of ova, about 0.75 mm.

Colouration Body uniformly covered with evenly distributed small white dots, hepatopaneas orange, ovary and ova orange-brown (Hoi Ha Wan specimens).

Hosts *Siphonochalina* sp., (i). *Pachychalina* sp., (ii) (v) (vi). *Callyspongia* sp. nov., (iii). [Porifera: Haplosclerida: Haliclona]. All represent new host records as this species has been previously only reported in association with sponges of the genera *Spongionella* and *Haliclona*.

Remarks The Hong Kong specimens differ from the Japanese type specimens in several details: (1) the antennal spine is acute, (2) the carpocerite extends well beyond the lamina of the scaphocerite. (3) the disto-lateral tooth of the scaphocerite is more robust and is clearly exceeded by the lamina. (4) the incisor process of the mandible is reduced, with a single tooth only instead of about 12. (5) the second maxilliped has a normal epipod present. (6) the unguis of the dactyls of the ambulatory pereopods are devoid of ventral denticulations. These differences are not considered justification for separating the two forms.

O. oligodentata is also retained as distinct species from *O. aualitica* Nobili, which it closely resembles (Bruce, 1973), particularly in view of the differences in the disto-ventral ischial spine of the second pereopods which is situated in a terminal position, and the well developed ventral denticulation of the unguis of the ambulatory pereopods in the latter species.

It may also be noted, that one female was provided with a second pereopod of the male major chela type.

Distribution Type locality, — Tomioka, Amakusa Islands, Japan. Otherwise only recorded from the Capricorn Islands, Queensland, Australia.

Hamodactylus boschmai Holthuis, 1952
Figures 25 and 26

Restricted synonymy:

Hamodactylus boschmai Holthuis, 1952:18, 209-212, figs. 101-103. — Bruce, 1970: 538-539, fig. 1. — Monod, 1973:8-9, figs. 5-13. — Bruce, 1978:283-284.

Material examined (i) 1 ovigerous ♀, C.L. 1.9 mm, Long Ke Wan, 8 m, 27 April 1980.

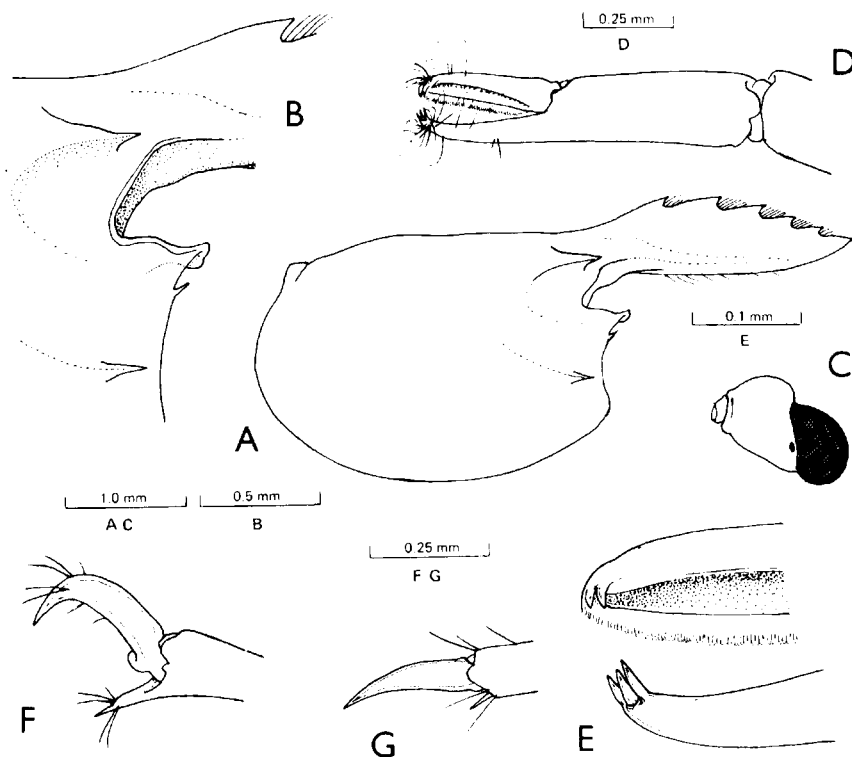


Figure 25. *Hamodactylus boschmai*, Holthuis, ovigerous female. A, carapace and rostrum. B, orbital region. C, eye. D, chela of first pereiopod. E, first pereiopod, tips of fingers. F, fingers of chela of second pereiopod. G, distal propod and dactyl of third pereiopod.

(ii) 2 ♀, 1 ovigerous ♀, C.Ls. 2.2, 2.5 2.6 mm, Fung Head, Sai Kung, 20 m, 20 April 1980. (iii) 1 juvenile ♀, C.L. 1.9 mm, *idem*, (iv) 1 ♂, C.L. 1.9 mm, North Bate Head, 8.5 m, 30 April 1980. (v) 1 ♀, C.L. 1.6 mm, Breakers Reef, 17 m, 30 April 1980. (vi) 1 ♂, C.L. 1.3 mm, Breakers Reef, 17 m, 30 April 1980. (vii) 1 ovigerous ♀, C.L. 2.5 mm, Bate Head, 7 m, 30 April 1980. (viii) 1 ovigerous ♀, C.L. 2.5 mm, Bate Head, 6.5 m, 30 April 1980.

Description The specimens agree well with the original description. The rostral dentition is $\frac{4-6}{0}$ and in all specimens the lower border of the rostrum is distinctly concave. The supraorbital spines are well developed and the orbit moderately well defined. The inferior orbital angle is produced, with the ventral border reflexed medially. The antennal spine is small and slender, marginal and upturned. The hepatic spine is robust, at a much lower level than the antennal spine. The proximal segment of the antennular peduncle bears only a single disto-lateral tooth. The eye has a very large globular cornea, very obliquely situated on a short dorso-ventrally flattened stalk, with a conspicuous dorsal ocellus.

The first pereiopods have the fingers equal to about 0.6 of the palm length, which is about 2.8 times its depth. The fingers are shallowly subspatulate, broad and distally rounded, both with laterally situated finely pectinate cutting edges. The tip of the dactyl bears a pair of short hooked teeth, and three similar but longer teeth are present distally

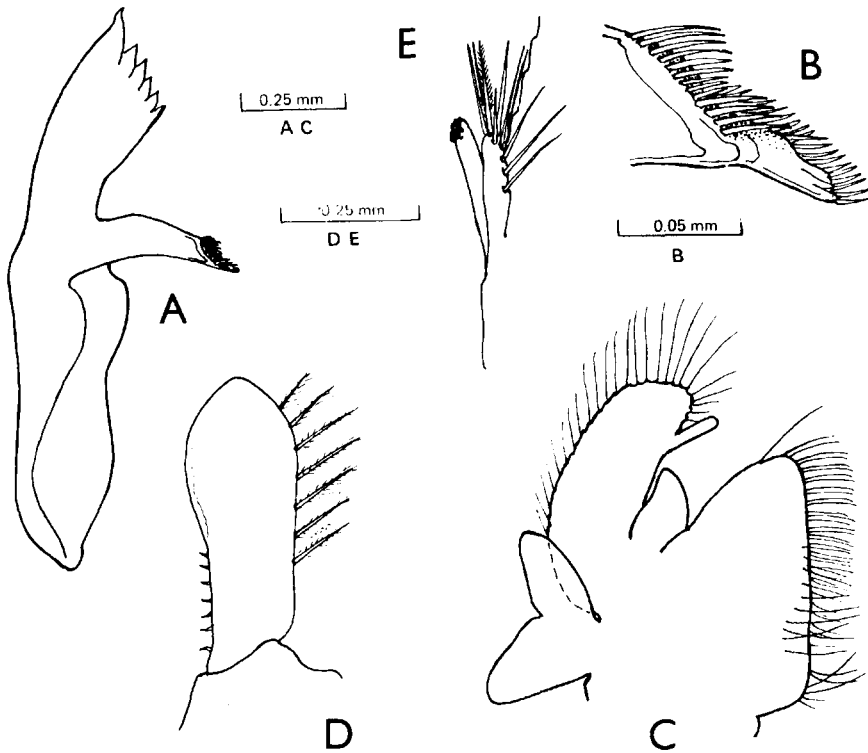


Figure 26. *Hamodactylus boschmai* Holthuis, ovigerous female. A, mandible. B, mandible, distal molar process. C, first maxilliped. Male. D, endopod of first pleopod. E, appendix masculina and appendix interna of second pleopod.

on the fixed finger, the stouter central one of which appears to be an articulated spine. The second pereopods are very small, with the chelae subequal and similar, with a well developed strongly hamate dactylus and a short, distally acute fixed finger. The dactyl of the third ambulatory pereopod is simple, without a well defined unguis and the corpus is devoid of lateral setae. The propod bears a small single disto-ventral spine only.

The endopod of the male first pleopod is about 3.2 times longer than the central width, and the distal half is slightly expanded. The proximal half of the medial border bears 7 short curved similar, evenly spaced spinules. The lateral border bears 7 short plumose setae, absent from the proximal third and the tip. The appendix masculina is short and stout, about 4.0 times longer than wide, distinctly exceeded by the appendix masculina. The tip is armed with four slender spines, one of which is bi-setulose, the others simple. The ventro-lateral aspect bears a longitudinal row of 6 simple spines. The ova are about 0.4 mm in length.

Colouration Colouration variable, closely matching that of the host animal, with numerous transparent patches (see Bruce, 1980a).

Hosts All specimens were associated with gorgonian hosts including *Echinomuricea coccinea* (Stimpson), *Echinogorgia* sp., *Acalycigorgia* sp. and three species of *Euplexaura*. The associations with *Echinomuricea* and *Echinogorgia* represent new host records for this species.

TABLE 1

A comparison of the pontoniine fauna of Singapore*, Hong Kong and Amakusa Island, Japan.

Species	Singapore	Hong Kong	Amakusa Is.
1. <i>Anapontonia denticauda</i>	+	—	—
2. <i>Anchistioides compressus</i>	—	—	+
3. <i>Anchistus custos</i>	+	+	—
4. <i>Anchistus demani</i>	+	—	—
5. <i>Anchistus miersi</i>	+	—	—
6. <i>Chernocaris placunae</i>	+	—	—
7. <i>Conchodytes meleagrinae</i>	—	—	+
8. <i>Conchodytes monodactylus</i>	+	+	+
9. <i>Coralliocaris graminea</i>	+	+	—
10. <i>Hamodactylus boschmai</i>	—	+	—
11. <i>Hamopontonia corallicola</i>	—	+	—
12. <i>Harpiliopsis beaupresii</i>	+	—	—
13. <i>Ischnopontonia lophos</i>	+	—	—
14. <i>Onycocaris amakusensis</i>	—	—	+
15. <i>Onycocaris callyspongiae</i>	—	—	+
16. <i>Onycocaris oligodentata</i>	—	+	+
17. <i>Palaemonella pottsi</i>	+	—	—
18. <i>Palaemonella rotumana</i>	+	+	+
19. <i>Periclimenaeus arabicus</i>	—	+	+
20. <i>Periclimenaeus odontodactylus</i>	—	—	+
21. <i>Periclimenaeus rastrifer</i>	—	+	—
22. <i>Periclimenaeus tridentatus</i>	+	—	—
23. <i>Periclimenes aktiensis</i>	—	—	+
24. <i>Periclimenes anonymone</i>	+	—	—
25. <i>Periclimenes brevicarpalis</i>	+	—	—
26. <i>Periclimenes brocki</i>	+	—	—
27. <i>Periclimenes calmani</i>	+	—	—
28. <i>Periclimenes commensalis</i>	—	+	+
29. <i>Periclimenes cristimanus</i>	+	+	+
30. <i>Periclimenes demani</i>	—	+	—
31. <i>Periclimenes digitalis</i>	+	+	—
32. <i>Periclimenes diversipes</i>	+	—	—
33. <i>Periclimenes elegans</i>	+	+	—
34. <i>Periclimenes grandis</i>	+	—	+
35. <i>Periclimenes holthuisi</i>	—	+	+
36. <i>Periclimenes hongkongensis</i>	—	+	—
37. <i>Periclimenes indicus</i>	+	—	—
38. <i>Periclimenes kempi</i>	+	—	—
39. <i>Periclimenes lutescens</i>	+	—	—
40. <i>Periclimenes ornatus</i>	—	+	—
41. <i>Periclimenes parvus</i>	+	—	—
42. <i>Periclimenes seychellensis</i>	+	—	—
43. <i>Periclimenes sinensis</i>	—	+	—
44. <i>Periclimenes suvadivensis</i>	+	—	—
45. <i>Periclimenes toloensis</i>	—	+	—
46. <i>Periclimenes tosaensis</i>	—	—	+
47. <i>Philarius imperialis</i>	+	—	—
48. <i>Pontonia katoi</i>	—	—	+
49. <i>Pontonides unciger</i>	—	—	+
50. <i>Pontonides</i> sp.	—	+	—
51. <i>Tuleariocaris zanzibarica</i>	—	—	+
51 spp.	* see addendum	28	20
			17

Remarks The rostrum is generally rather deeper in the Hong Kong specimens than in the type material, and the fingers of the first pereopod rather less broad. The finely pectinate cutting edges were not reported by Holthuis (1952), Bruce (1979) or Monod (1973), but are indicated by the latter in his illustration. The mouthparts were dissected from one example and are exactly as shown by Holthuis (1952), except for the incisor process of the mandible which has six acute distal teeth. The molar process is reduced, very slender with a very oblique medial end, fringed by short setae, with a strong tooth posteriorly. The flagellum of the exopod of the first maxilliped is greatly reduced and without distal setae, even shorter than illustrated for the type material.

Distribution Type localities, — the original material of this species was collected from Djedan, Aru Islands and Ternate, Moluccan Islands. Otherwise reported only from Zanzibar, Kenya, Madagascar, New Caledonia and the Great Barrier Reef.

Pontonides sp.

Material examined (i) 1 ♂, 1 ovigerous ♀, Fung Head, 12 m, 30 April 1980. (ii) 1 ♀, 1 ovigerous ♀, Fung Head, 12 m, 30 April 1980. (iii) 2 ♂, 4 ♀, Breakers Reef, 17 m, 30 April 1980.

Remarks The specimens are distinct from the two Indo-West Pacific species previously described. *P. maldivensis* (Borradaile, 1915) and *P. unciger* Calman, 1939, and also from the recently described Eastern Pacific species *P. sympathes* Ridder and Holthuis, 1979, and will be described in detail in a forthcoming publication. All specimens were found in association with antipatharian hosts.

DISCUSSION

Twenty species of pontoniine shrimp have now been recorded from Hong Kong on the northern shore of the South China Sea. The region is of particular interest from the zoogeographic point of view as it is near the northern border of the Indo-West Pacific region. However, the area studied is of very restricted area, depth range and variety of habits, so that comparisons with other regions will be of only limited value. The waters of Hong Kong are strongly influenced by the outflow of the Pearl River, which is most marked on the western side of the territory and most fully marine conditions are found in the east, and in this region a restricted development of the coral reef biotope can be found. It is in this habitat that the greatest variety of pontoniine shrimps normally occurs, and its poor development in Hong Kong waters can account for the apparent absence of many common Indo-West Pacific shrimp species, such as *Periclimenes spiniferus*. There is no doubt that further collections, particularly by scuba divers, can be expected to add many more species to the species list in due course. Particularly poorly represented are the associates of sponges and tunicates, either simple or colonial. Gorgonians and antipatharians can be expected to provide more species, as can the actinians.

The Hong Kong fauna can conveniently be compared with the fauna of Singapore, described by Johnson (1961) and with additions by Bruce (1979), which presents a similarly restricted spectrum of habitats and area, and with the fauna of Amakusa Island in western Japan, which has been studied in detail and recorded by Kikuchi and Miyake (1978). Singapore has the richest fauna with 28 species and Amakusa Island the poorest, with only 17 species. In the Hong Kong fauna the species normally associated with scleractinian corals are particularly reduced. The Hong Kong scleractinian fauna is dominated by faviid corals and is particularly poorly provided with the species that are normally hosts for a wide variety of pontoniine shrimp associates, i.e., certain *Acropora*,

Pocillopora, *Stylophora*, *Seriatopora* and *Galaxea* species. Eight of the Singapore species are associates of these corals, and if these are eliminated from consideration the number of species at the two localities is very similar. However the Singapore reefs do provide a richer source of potential hosts than the Hong Kong reefs, and further studies there would certainly also increase the number of species known.

The Hong Kong fauna includes 9 species that are not known from Singapore or Amakusa Island, but only one species that is so far not known other than from Hong Kong, *Periclimenes hongkongensis*. Only two species, *Palaemonella rotumana* and *P. cristimanus* were found in all three localities. *P. rotumana* is one of the commonest, most ubiquitous and widespread pontoniine shrimp found throughout the Indo-West Pacific region and in the eastern Mediterranean Sea. *P. cristimanus* has a much more restricted distribution, occurring only in the western Pacific Ocean. Five other species occur in common between Singapore and Hong Kong and four between Hong Kong and Amakusa Island. Nine species found in Hong Kong (45%) are absent from both Singapore and Amakusa Island. On the evidence available so far, there is little similarity between the faunae of the three regions, but this would probably increase on further collecting. The occurrences of these species are indicated in Table 1.

In addition to the 17 species known from Amakusa Island, the fauna of Japan includes a further 26 species, many of which could be reasonably expected to occur in Hong Kong waters, although some, particularly the deeper water species, clearly would not. Three species found in Hong Kong have been reported from localities in Japan other than Amakusa Island, *Periclimenes ornatus*, *P. sinensis* and *Hamopontonia corallicola*. Many of the shallow water Japanese species are of widespread Indo-West Pacific distribution but their occurrence in Hong Kong waters would be largely determined by the presence or absence of suitable host animals.

At generic level the faunae of the three areas, Singapore, Hong Kong and Amakusa Island are represented by 11, 10 and 8 taxa respectively, with a total of 17 genera represented. Four genera are represented in all three regions: *Palaemonella*, *Periclimenes*, *Periclimenaeus* and *Conchodytes*. Two genera are present in Singapore and Hong Kong only, *Anchistus* and *Coralliocaris*, and two at Hong Kong and Amakusa Island only, *Onycocaris* and *Pontonides*. Five genera are present at Singapore only, *Apopontonia*, *Ischnopontonia*, *Philarius*, *Harpiliopsis* and *Chernocaris*. At Amakusa Island three genera are recorded, not found from the other localities, *Anchistioides*, *Tuleariocaris* and *Pontonia*. At Hong Kong, only the genus *Hamodactylus* has not so far been recorded from Singapore or Amakusa Island. In all three regions, *Periclimenes* is the dominant genus, with 14, 10 and 6 species in Singapore, Hong Kong and Amakusa Island respectively, from a total of 24 species from the whole series.

Of the 20 species found so far in Hong Kong waters, 4 are considered to be free-living: *Palaemonella rotumana*, *Periclimenes demani*, *P. digitalis* and *P. elegans*. All others are known to be specifically associated with other marine invertebrates except for *P. hongkongensis*, which is thought to be a commensal species although its host has not yet been identified with certainty. The associations of the other commensal species may be summarized as follows:—

PORIFERA

1. DEMOSPONGIA *Periclimenaeus arabicus*, *P. rastrifer*, *Onycocaris oligodonta*

COELENTERATA

2. HYDROIDA *Periclimenes toloensis*
3. ANTIPATHARIA *Pontonides* sp.
4. ALCYONACEA *Periclimenes sinensis*
5. GORGONACEA *Hamodactylus boschmai*
6. ACTINIARIA *Periclimenes holthuisi*, *P. ornatus*

7. SCLERACTINIA *Hamopontonia corallicola*, *Coralliocaris graminea*
MOLLUSCA
8. LAMELLIBRANCHIA *Anchistus custos*, *Conchodytes monodactylus*
ECHINODERMA
9. CRINOIDEA *Periclimenes commensalis*
10. ECHINOIDEA *Periclimenes cristimanus*

Many of the pontoniine shrimps so far reported from Hong Kong waters are of wide ranging Indo-West Pacific distribution. The exception is *Periclimenes hongkongensis*, as yet known only from its type locality. It is mentioned above that 6 species occur at Amakusa Island and altogether nine species are in common with the Japanese fauna. The

TABLE 2

The Zoogeographical Distribution of the Hong Kong Pontoniine Shrimp Fauna.

Species	Red Sea	Western Indian Ocean	Eastern Indian Ocean	Malaysia-Indonesia	HONG KONG	Japan	Australia	Western Pacific Ocean	Central Pacific Ocean
1. <i>Palaemonella rotumana</i>	+	+	+	+	+	+	+	+	+
2. <i>Periclimenes elegans</i>	+	+	+	+	+	-	+	+	-
3. <i>Periclimenes commensalis</i>	-	+	-	+	+	-	+	+	-
4. <i>Periclimenes demani</i>	-	+	+	+	+	-	-	-	-
5. <i>Periclimenes digitalis</i>	-	+	+	+	+	-	-	-	-
6. <i>Periclimenes cristimanus</i>	-	-	-	+	+	+	+	-	-
7. <i>Periclimenes holthuisi</i>	+	+	+	+	+	+	+	+	-
8. <i>Periclimenes hongkongensis</i>	-	-	-	-	+	-	-	-	-
9. <i>Periclimenes ornatus</i>	+	+	-	-	+	+	+	+	-
10. <i>Periclimenes sinensis</i>	-	-	-	-	+	+	-	-	-
11. <i>Periclimenes toloensis</i>	+	-	-	-	+	-	+	-	-
12. <i>Anchistus custos</i>	+	+	+	+	+	+	+	+	-
13. <i>Conchodytes monodactylus</i>	-	-	-	+	+	-	+	-	-
14. <i>Periclimenaeus arabicus</i>	-	+	-	-	+	-	+	+	-
15. <i>Periclimenaeus rastrifer</i>	-	-	-	-	+	-	+	+	-
16. <i>Onycocharis oligodentata</i>	-	-	-	-	+	+	+	-	-
17. <i>Hamopontonia corallicola</i>	-	-	-	-	+	+	+	-	-
18. <i>Coralliocaris graminea</i>	+	+	+	+	+	+	+	+	-
19. <i>Hamodactylus boschmai</i>	-	+	-	+	+	-	+	+	-
20. <i>Pontonides sp.</i>	-	+	-	-	+	-	+	+	-
	7	12	7	11	20	9	16	11	1

Hong Kong fauna shares the greatest number of species with the rich fauna of north east Australia, which has been studied in detail on the southern Great Barrier Reef (Bruce, in press b, c). Here 16 species occur in common between the two regions. Many species have ranges extending far to the west. Thus 12 species occur in the western Indian Ocean and 7 extend into the Red Sea. To the east, the species ranges appear more limited, with only 11 occurring in the western Pacific Ocean, and only 1 occurring in the central region of the Pacific Ocean, the ubiquitous *Palaemonella rotumana*. The distribution of the Hong Kong pontonine shrimps are summarized in Table 2.

To facilitate the identification of Hong Kong pontonine shrimps a key is provided below. In general terms, pontonine shrimps may be generally recognized by the presence of well developed chelae on the first and second pairs of pereopods. The first pair are usually of small size and slender build, in marked contrast to the second pair, which are usually much larger and more robust, often unequally developed and sometimes dissimilar in shape. All species also lack an arthrobranch on the third maxilliped and most have three pairs of spines on the posterior margin of the telson. As far as possible, adult specimens should be used for identifications. Some variation in the rostral dentition is common. Juvenile specimens usually have a reduced dentition. Many of the species included in the key are closely related to other species not so far recorded from Hong Kong but which may well be found in the future. It is therefore important that all identifications should be carefully checked against detailed illustrated descriptions. The present key will not exclude species not yet recorded from Hong Kong.

A KEY TO THE PROVISIONAL IDENTIFICATION OF HONG KONG PONTONINE SHRIMPS

1. Mandible with palp, 2
Mandible without palp, 3
2. Supraorbital ridges distinct, generally with a small tubercle; ambulatory
pereopods with numerous well developed ventral spines,
R $\frac{6-8}{1-3}^+$, *Palaemonella rotumana*
Supraorbital ridges without tubercle; ambulatory pereopods with single
small disto-ventral spine only; R $\frac{8-11}{1-2}$. (Mandibular palp may be
absent) *Periclimenes digitalis*
3. Third maxilliped normally developed, 4
Third maxilliped with exopod absent, 20
4. Hepatic spine present, 5
Hepatic spine absent, 14
5. Dactyls of ambulatory pereopods simple, 6
Dactyls of ambulatory pereopods biungiculate, 10
6. Supraorbital spines absent; ambulatory pereopods slender, with
disto-ventral spine only, 7
Supraorbital spines present; ambulatory pereopods robust, ventral
propod spinose, 8
7. Sternite of fourth thoracic somite with single long slender
finger-like median process; fingers of first pereopod chela
simple, R $\frac{8-11}{1-2}$. (Mandibular palp may be present) *Periclimenes digitalis*
Sternite of fourth thoracic somite with a pair of flattened submedian

- processes; fingers of first pereiopod chela strongly subspatulate,
 $R \frac{6-7}{0-1}$ *Periclimenes ornatus*
8. Rostrum without ventral teeth, $R \frac{4-5}{0}$, *Periclimenes cristimanus*
 Rostrum with ventral teeth present 9
9. Carpus of second pereiopod distally unarmed, distinctly longer than
 palm or merus, $R \frac{7-9}{3-4}$, *Periclimenes demani*
 Carpus of second pereiopod with strong dorsal and medial carpal spines;
 carpus shorter than merus or palm, $R \frac{6-8}{3-5}$, *Periclimenes elegans*
10. Supraorbital spines present; distal cutting edges of fingers of second
 pereiopod chelae finely denticulate, $R \frac{7-9}{1-3}$, *Periclimenes commensalis*
 Supraorbital spines absent; fingers of chelae of second pereiopods
 distally entire 11
11. Rostrum slender and arched, $R \frac{7-8}{2}$; third abdominal segment produced
 as postero-dorsal hump *Periclimenes holthuisi*
 Rostrum not slender and arched; third abdominal segment not produced
 postero-dorsally, 12
12. Carapace with an isolated epigastric spine, 13
 Carapace without a distinct epigastric spine, $R \frac{9-10}{2}$, *Periclimenes sinensis*
13. Rostrum deep, $R \frac{13-17}{2-3}$, with posterior teeth articulated; carpus of
 second pereiopod equal to 0.4 of palm *Periclimenes hongkongensis*
 Rostrum shallower, $R \frac{8}{1}$, without articulated teeth; carpus of second
 pereiopod equal to 0.5 of palm length, *Periclimenes toloensis*
14. Posterior margin of telson terminating in a pair of hook-like processes,
 without posterior spines, $R \frac{5-7}{0}$ *Hamopontonia corallicola*
 Posterior margin of telson with three pairs of spines 15
15. Dactyls of ambulatory pereiopods with a large hoof-shaped ventral
 process; chelae of second pereiopods similar, normally
 subequal, with pit and hammer sound producing mechanism,
 $R \frac{5}{2}$ *Coralliocaris graminea*
 Dactyls of ambulatory pereiopods without a hoof-shaped ventral process 16
16. Chelae of second pereiopods simple, subequal or unequal, similar,
 without specialized ornamentation 17
 Chelae of second pereiopods generally unequal, with special ornamentation
 on at least one side 18
17. Dactyl of ambulatory pereiopods simple; chela of first pereiopod with
 cannulate palm, $R \frac{0}{0}$ *Anchistus custos*
 Dactyl of ambulatory pereiopod with proximal protuberance on corpus; chela
 of first pereiopod with normal palm, $R \frac{0}{0}$ *Conchodytes monodactylus*
18. Rostrum greatly reduced, unarmed; chela of second pereiopods strongly
 bilaterally compressed, without molar process on fingers,
 $R \frac{0}{0}$ *Onycocaris oligodentata*
 Rostrum normally armed; chelae of second pereiopods not compressed,
 with molar process on dactyl 19

19. Dactyl of ambulatory pereiopod long and slender; propod and merus
 both ventrally spinulate, $R \frac{6-9}{0-1}$, *Periclimenes arabicus*
 Dactyl of ambulatory pereiopod short and stout; merus without ventral
 spines, $R \frac{7}{0-1}$ *Periclimenaeus rastrifer*
20. Second pereiopods well developed, larger than first pereiopods.
 Rostrum with broad lateral carinae, $R 0/0$ *Pontonides* sp.
 Second pereiopods feebly developed, smaller than first pereiopods.
 Rostrum with lateral carinae feebly developed, dorsal carina
 well developed, $R \frac{4-6}{0}$, *Hamodactylus boschmai*

SUMMARY

The pontoniine shrimp fauna of Hong Kong is increased from 16 to 20 species by the addition of 5 newly recorded species and the deletion of one previously recorded species. Such a small variety suggests that the fauna is markedly impoverished, although undoubtedly many more species remain to be detected. The more northerly fauna of Japan is considerably richer, so that latitude alone does not appear to be a major factor, nor does minimum water temperature. This impoverishment is probably due mainly to the freshwater influence of the Pearl River and its silt laden waters preventing the growth of many of the coral reef species that act as hosts for the many commensal species of this subfamily. Clearly, with their high degree of specialization and host specificity, the shrimps cannot survive in the absence of their host animals. The Hong Kong fauna is particularly poor in the species associated with Porifera, Scleractinia and Echinoderma. These taxa normally support a rich fauna of associates which are so far conspicuously absent from Hong Kong.

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ADDENDUM

A paper by the late D.S. Johnson published in 1980 has provided further information on the caridean fauna of Singapore and raised the number of species known from that locality from 28 to 34. One species, *Periclimenes suvadiensis* Borradaile, is deleted from the list of species known from Singapore. The species added are: *Periclimenes holthuisi*, *P. incertus* Borradaile, *P. psamathe* (De Man), *Platycaris latirostris* Bruce, *Hamodactylus boschmai* and *Anchistioides willeyi* (Borradaile). Of these, *P. holthuisi* and *H. boschmai* are in common with the Hong Kong fauna. *P. psamathe* has been reported also from Japan but not *P. incertus*, *P. latirostris* or *A. willeyi*. All species are associated with Porifera or Coelenterata.

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