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ADDITIONS TO THE MARINE SHRIMP FAUNA OF HONG KONG

A.J. Bruce

Division of Natural Sciences, Northern Territory Museum,
P.O. Box 4646, Darwin, Australia 0801

ABSTRACT

Details are provided of some shrimp taxa new to the fauna of Hong Kong, mainly from Tolo Channel and Mirs Bay. A new species of *Athanas*, *A. hongkongensis* (Alpheidae) is described and illustrated, and a new genus, *Periclimenoides*, is designated for *Periclimenaeus odontodactylus* Fujino & Miyake (Palaemonidae). Specimens of *Alpheus bannerorum* and *Athanas ornithorhynchus*, both previously known only from Australian waters, are reported from Hong Kong. *Philocheras lowisi* is also recorded for the second time only. The genus *Prionalpheus* is also recorded from Chinese waters for the first time.

INTRODUCTION

The study of the shrimp fauna of Hong Kong commenced with the visit of the North Pacific Exploring Expedition, 1853–1856, which stayed in Hong Kong waters for six months from March 1854. Although important collections were made, these were subsequently all lost in the 1871 fire in which the Chicago Academy of Sciences was destroyed (Deiss and Manning, 1981). The draft of a detailed illustrated report was also destroyed and only a short, unillustrated report provided brief Latin diagnoses of the material collected (Stimpson, 1860). H.M.S. *Challenger* also visited Hong Kong but added only one alpheid shrimp record (Bate, 1888). Subsequent attention focused mainly on the commercially important penaeid prawns and few reports concerning caridean shrimps have subsequently appeared. Bruce (1979) reported on some pontoniine shrimps from Hong Kong and a more detailed report on the pontoniine fauna was later provided by Bruce (1982). Banner and Banner (1978), in a survey of the Alpheidae and Ogyrididae of the South China Sea, added numerous species to the Hong Kong fauna.

The present study provides details of shrimp species not previously recorded from Hong Kong waters. The specimens were collected by the participants in the Second International Marine Workshop held at Wu Kai Sha, on Tolo Channel, in April 1986. Most of the material collected was from Tolo Channel and from Mirs Bay, with small collections from other parts of Hong Kong. The specimens are now deposited in the collections of the Northern Territory Museum, Darwin.

SYSTEMATIC ACCOUNT

Pasiphaeidae Dana, 1852

Leptochela pugnax De Man

Restricted synonymy. *Leptochela pugnax* De Man, 1916: 148; 1920, 26, pl. 4 fig. 8. *Leptochela (Leptochela) pugnax* — Chace, 1976: 31–34, figs. 25–27.

Material examined. (i) 1 spec., Starfish Bay, 22°26'N, 114°14.6'E, sandy mud, 4 m, 4 April 1986, coll. divers, NTM Cr.003785. (ii) 1 spec., Stn. T/1, Mirs Bay, 22°28.9'N, 114°22.8'E, trawl, 20 m, NTM Cr.005238. (iii) 1 spec., Stn. T/2, Mirs Bay, 22°28.8'N, 114°23.1'E, trawl, 22 m, NTM Cr.004018. (iv) 9 specs., Stn. T/3, Mirs Bay, 22°28.1'N, 114°22.5'E, trawl, 16.5 m, NTM Cr.003916. (v) 1 spec., Stn. T/14, Mirs Bay, 22°32.0'N, 114°19.65'E, trawl, 18 m, NTM Cr.005241. (vi) 1 spec., Stn. T/32, Mirs Bay, 22°31.7'N, 114°22.9'E, trawl, 18 m, NTM Cr.003924.

Remarks. Most specimens were collected from sediment samples. Only one ovigerous female was obtained (Stn. T/3). All specimens agreed well with the description provided by Chace (1976). The species has not been previously recorded from Hong Kong.

Distribution. Type localities, Indonesia, Java to Moluccas. Also known from Maldivic Islands to Japan and the Philippines.

Leptochela sydniensis Dakin and Colefax

Restricted synonymy. *Leptochela sydniensis* Dakin and Colefax, 1940: 153, figs. 245–246. *Leptochela (Leptochela) sydniensis* — Chace, 1976: 40–44, figs. 32–34.

Material examined. (i) 1 spec., Stn. T/9, Mirs Bay, 22°26.5'N, 114°23.7'E, 16.5 m, trawl, NTM Cr.003799.

Remarks. The single specimen presents no special features and agrees with the description provided by Chace (1976). It has not been previously recorded from Hong Kong.

Distribution. Type locality, Sydney, New South Wales, Australia, and recorded from numerous localities in southern and western Australia and Tasmania. Also recorded from the South China Sea, north-east of Taiwan.

Rhynchocinetidae Ortmann, 1890

Rhynchocinetes rugulosus Stimpson

Restricted synonymy. *Rhynchocinetes rugulosus* Stimpson, 1860: 36, — Holthuis, 1947: 79–80.

Material examined. (i) 1 male, Stn. T/13, Mirs Bay, 22°31.5'N, 114°19.9'E, 18 m,

5 April 1986, coll. P. Shin, NTM. Cr.003806. (ii) 1 male, Stn. PH.HK-4, Kai Kun Tan, 4–6 m, 5 April 1986, coll. P. Hutchings, NTM Cr.003812. (iii) 1 ovig. female, Peng Chau, Mirs Bay, depth ?, 15 April 1986, coll.?, NTM Cr.003951. (iv) 1 male, Gau Tau, Mirs Bay, 16–20 m, 18 April 1986, coll. divers, NTM Cr.004002.

Remarks. The specimens all agree well with previously published descriptions and all consistently possess small arthrobranchs on the third pereopod. Not previously recorded from Hong Kong. These shrimps are frequently reported by divers to occur in association with echinoids.

Colouration. Generally a complex pattern of white bars and spots outlined by bright red, with a particularly conspicuous large red median spot posteriorly on the third abdominal segment. The largest male specimen was a much darker colour, closely resembling the illustration in Debelius (1984).

Distribution. Type locality, Port Jackson, New South Wales, Australia. Also known from Australia, Indonesia and Japan to Hawaii.

Palaemonidae Rafinesque, 1815

Periclimenes soror Nobili

Restricted synonymy. *Periclimenes soror* Nobili, 1904: 232, — Bruce, 1976: 299–306, figs. 1–6. *Periclimenes (Periclimenes) soror* — Holthuis, 1952: 51–53, fig. 7, (full synonymy).

Material examined. 1 ♀, Wang Chau Kok, Mirs Bay, Hong Kong, 15 m, 29 September 1986, coll. B. Darvell, NTM Cr.004249.

Host. *Pentaceratus magnificus* Goto (Echinodermata: Oreasteridae)

Colouration. Body generally dull yellow, with scattered red chromatophores.

Remarks. Not previously recorded from Hong Kong. The association with *P. magnificus* also represents a new host record. Otherwise associated with a wide range of asteroid hosts. The single specimen has a rostral dentition of 15 dorsal and no ventral teeth. Gordon (1939) reports a dorsal rostral dentition of 10–13 and Bruce (1976), of 10–14 teeth.

Distribution. Type locality, Jibuti. Widespread throughout the Indo-West Pacific region from the Red Sea to the Tuamotu Islands, including southern Japan, and also known from Taboga Island, Panama and Mexico.

Periclimenes brevicarpalis (Schenkel)

Restricted Synonymy. *Ancyllocaris brevicarpalis* Schenkel, 1902: 563, pl. 13, fig. 21. *Periclimenes (Ancyllocaris) brevicarpalis* — Kemp, 1922: 185, figs. 40–42, pl. 6, fig. 8. *Periclimenes (Harpilius) brevicarpalis* — Holthuis, 1952: 69–73, fig. 27.

Material examined. 1 ovig. female, NW of Waglan Island, 15 m, 14 June 1987, coll., B. Darvell, NTM Cr.005505.

Host. Actinaria indet.

Coloration. A colour photograph of the live shrimp indicates that the specimen shows the characteristic colour pattern of purple bands and white patches of this well known species.

Remarks. This generally common and well known shrimp has not been previously recorded from Hong Kong, although known from Singapore, Ryukyu Islands and Japanese waters, and is also known from North Danger Reef, central South China Sea (Bruce, 1979). It is an obligatory associate of giant anemones, although juveniles may occur elsewhere, and its distribution is determined by that of its hosts. Usually associated with well developed coral reefs and intertidal flats.

Distribution. Widely distributed through most of Indo-West Pacific region. Type locality, Makassar, Celebes, Indonesia. Also known from Gulf of Aden, Zanzibar, Moçambique, to the Great Barrier Reef, Vanuatu, Marshall Islands, as far east as Fanning Island.

Perichlimenes perturbans Bruce
(Figure 1)

Perichlimenes perturbans Bruce, 1978: 253–255, figs. 25–26.

Material examined. 1 male, 1 female, Kat O Chau, ?m, 8 April 1986, coll. divers, NTM Cr.003857.

Remarks. The two specimens both closely resemble the single previously known holotype specimen, a shrimp characterized largely by the lack of useful taxonomic characters. The specimens have a rostral denition of 1+7–8/1. The hepatic spines, although strongly projecting do not appear to be mobile. A distinct epigastric spine is present and its absence in the holotype, which had only a small epigastric tubercle, may have been due to damage during the capture of that specimen.

The first pereopods are essentially as in the holotype, but the carpus is somewhat longer, subequal to the chela length, and the fingers of the chela slightly shorter than the palm length, instead of subequal. The second pereopods are also generally similar to those of the holotype but slightly different in proportions. The male has only the right second pereopod, which has the palm about 3.5 times longer than deep and slightly longer than the fingers, which are slender with small acute hooked tips, unarmed, with sharp entire distal cutting edges, with numerous groups of simple setae; carpus about 1.25 times palm length, unarmed; merus about 1.1 of carpus length, unarmed, ischium about 1.2 merus length, unarmed. The female has both second pereopods, chelae subequal and similar, right slightly larger and more robust; palm about 3.0 times longer than deep, fingers about 0.6 of palm length, unarmed; left, palm about 3.0 times longer than wide, fingers about 0.8 of palm length, unarmed; merus, ischium and basis similar on left and right, essentially as in male. Ambulatory pereopods slender, dactyl about 0.3 of propod length, unguis slender, about 0.75 of corpus length, about 2.5 times longer than proximal width, compressed, unarmed and without distolateral setae; propods about 8.8 times longer than wide, uniform, with three small separate spines distoventrally, largely

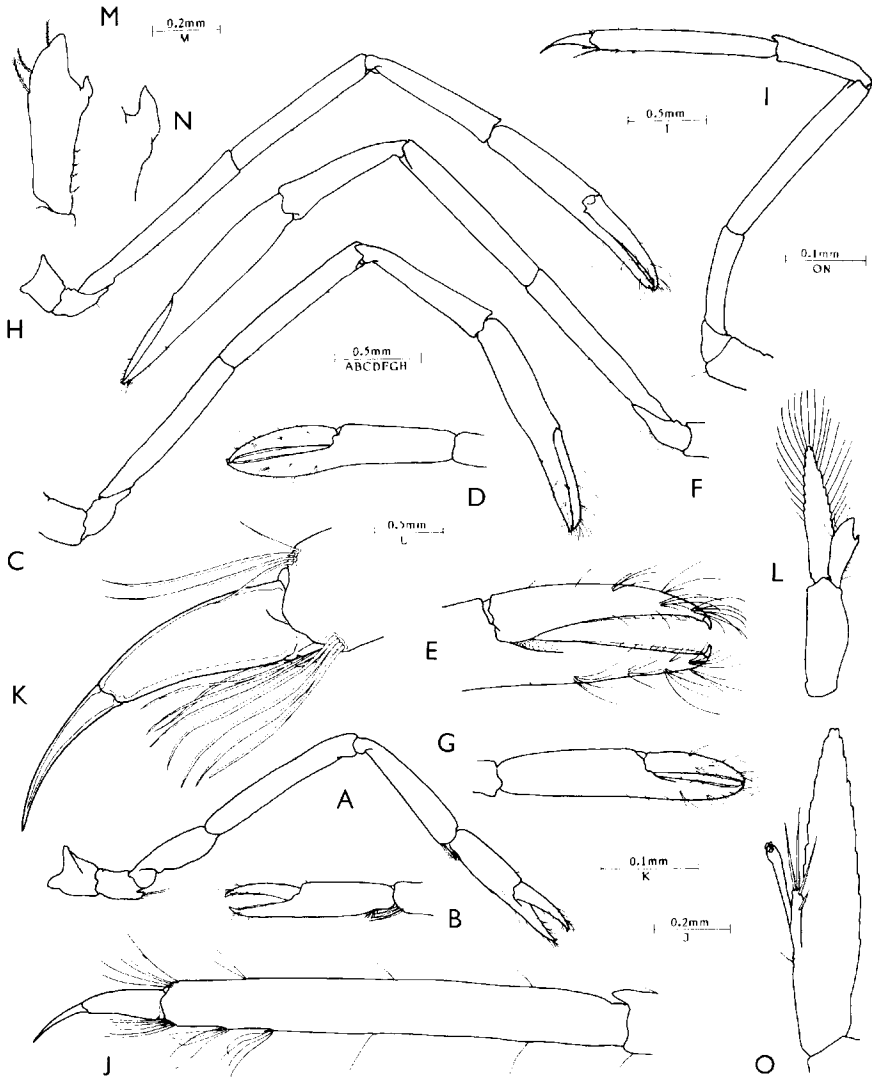


Figure 1. *Perlimenes perturbans* Bruce, CL 1.9mm. A, first pereiopod; B, same chela; C, female second pereiopod; D, same, chela; E, male second pleopod, fingers; F, male second pereiopod, left; G, same, chela; H, male second pereiopod, right; I, male third pereiopod; J, same, propod and dactyl; K, same, dactyl; L, first pleopod; M, same, endopod; N, same, medial process; O, second pleopod, endopod.

obscured by groups of slender setae; proximal segments without special features, as in holotype.

The male first pleopod has the endopod equal to about half the exopod length, about 3.3 times longer than broad with the distal third pointed. The medial margin is expanded and bears a small distally acute accessory lobe; the proximal medial margin bears four

short curved spinules. The distolateral margin bears three small feebly plumose setae. The endopod of the male second pleopod bears a short appendix masculina, corpus about 5.5 times longer than wide, equal to about 0.18 of endopod length, with two long spines distally and two shorter distoventral spines, mainly unarmed but with a few proximal setules; appendix interna elongated and slender, with about six distal concinnuli only, twice length of appendix masculina.

P. perturbans has not been previously recorded from Hong Kong and is known only from the male holotype specimen, found in association with an alcyonarian host, *Morchelana gilva*, at a depth of 40 m. The present association represents a new host record.

Host. Antipatharian indet.

Distribution. Type locality, near Nosy Bé, Madagascar. No further records.

Periclimenoides gen. nov.

Diagnosis. Slenderly built shrimps, associated with sponges. Body slightly compressed, smooth, glabrous; rostrum slender, dorsally dentate; orbit and inferior orbital angle obsolete, antennal spine well developed, hepatic and supraorbital spines absent. Abdomen smooth, pleura rounded; telson normal, with two pairs of dorsal spines and three pairs posterior spines. Antennae normal, basicerite laterally unarmed, scaphocerite well developed. Mandible without palp, molar process slender, incisor process well developed, strongly bidentate; maxillula with bilobed palp, laminae moderately broad; maxillula with slender palp, bilobed basal endite and narrow scaphognathite; first maxilliped with slender palp, broad simple basal endite, exopod with well developed exopod with broad caridean lobe, epipod bilobed; second maxilliped with normal endopod and exopod, epipod elongate, without podobranch; third maxilliped with basis incompletely fused to ischiomerus, exopod well developed, coxa with oval lateral plate, without arthrobranch. Thoracic sternites unarmed. First pereopod slender, chela with broad subspatulate fingers, with expanded laminar lateral margin. Second pereopods well developed, chelae unequal, similar, fingers serrate and dentate, without "pit and hammer" mechanism and without microtuberculations, palms moderately compressed, smooth. Ambulatory pereopods slender, dactyls short and simple. Uropod with protopodite unarmed, exopod laterally unarmed, with small distoventral tooth with medial mobile spine.

Type species. *Periclimenaeus odontodactylus* Fujino and Miyake, 1968.

Etymology. Derived from the generic name *Periclimenes* Costa, 1844, plus *eidōs*, (Greeks), form, shape or likeness. Gender masculine.

Systematic Position. Closely related to *Periclimenaeus* Borradaile, 1915, and *Orthopontonia* Bruce, 1982. Readily distinguished from the former by the distally serrate and proximally dentate fingers of the second pereopods and the absence of a sound-producing "pit and hammer" mechanism on the fingers of the major second pereopod. From *Orthopontonia*, the new genus may be distinguished by the lack of rows of multicarinate tubercles on the cutting edges of the fingers of the minor second pereopod. The acutely bidentate incisor processes of the mandibles also appear to be characteristic of this new genus. Some species of *Periclimenaeus* show a similar incisor process but

less conspicuously developed, with stout blunt teeth. Some species of *Oncocarisidella*, for example *O. stenolepis* Holthuis, also show a similar process. With the removal of *Orthopontonia* and *Periclimenoides* from *Periclimenaeus* Borradaile, this genus is restricted to those shrimps without hoofshaped basal processes on the dactyls of the ambulatory pereopods and with a unilateral presence of a "pit and hammer" sound producing mechanism on the major second pereopod chela.

Periclimenoides odontodactylus comb. nov.
(Figures 2–3)

Periclimenaeus odontodactylus — Fujino and Miyake, 1968: 85–90, figs. 1–2, — Bruce, 1981: 11, 26; 1983: 205.

Material examined. 1 female, off Chek Chau, Mirs Bay, 15 m, 6 April 1986, in rubble, coll. divers, NTM Cr.003830.

Remarks. Not previously recorded from Hong Kong. The single non-ovigerous female agrees precisely with the original description provided by Fujino and Miyake (1968), which was found in a sponge, *Ircinia fasciculata* (Pallas). The host of the present specimen could not be ascertained. The rostrum has seven dorsal teeth, one more than in the holotype.

The mandibles have been removed from both sides and the incisor processes are similarly and symmetrically bidentate. This feature appears to be unique and is without parallel in any of the related genera. The dactyl of the first pereopod is subspatulate, with a broadly expanded finely denticulate lateral lamella that extends along the whole length of the dactyl. Its fine denticulation was not reported in the original species description. The dactylus of the major second pereopod has 34 small robust blunt teeth along the distal cutting edge and the fixed finger has 33. On the small chela these fingers have 35 and 33 respectively. The dactyl of the third pereopod, equal to about 0.15 of

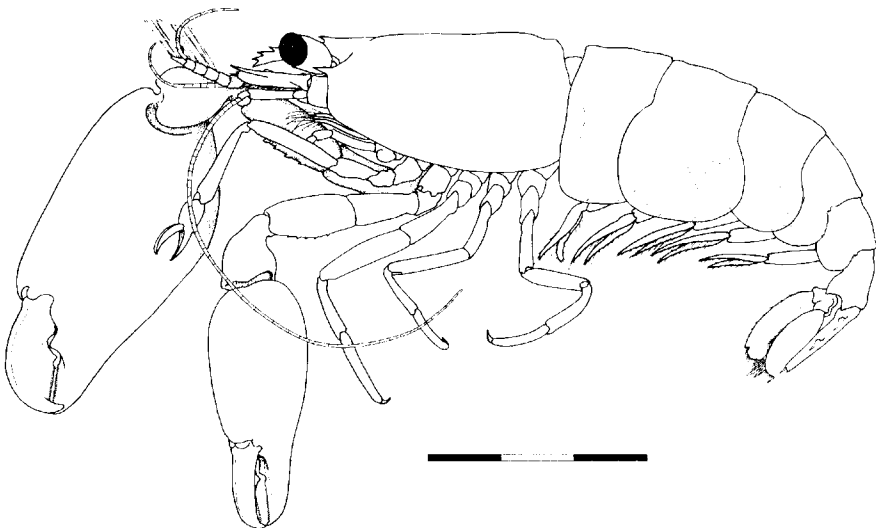


Figure 2. *Periclimenoides odontodactylus* (Fujino & Miyake), female.

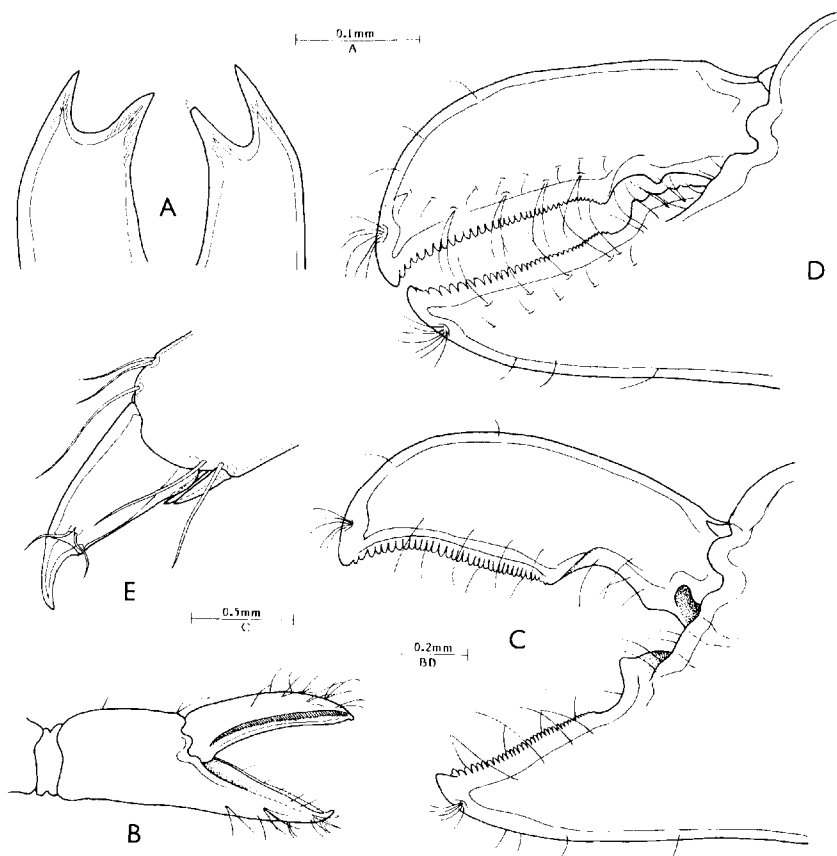


Figure 3. *Periclimenoides odontodactylus* (Fujino & Miyake), female. A, incisor processes of mandibles; B, first pereiopod, chela; C, major second pereiopod, fingers; D, minor second pereiopod, fingers; E, third pereiopod, dactyl.

the propod length, has the corpus compressed, tapering distally, unarmed, about 1.5 times longer than proximal width, with a pair of sensory setae distolaterally. The unguis is distinctly demarcated from the corpus, simple, curved, broad-based, about 2.0 times longer than proximal width.

Distribution. Previously known only from the type locality, Amakusa Island, southern Japan, and Lizard and Heron Islands on the Australian Great Barrier Reef. Also occurs on the Australian North West Shelf (pers. obs.).

Gnathophyllum americanum Guérin-Ménéville
(Figure 4)

Restricted synonymy. *Gnathophyllum americanum* Guérin-Ménéville, 1855 viii, pl. 2 fig. 14. — Manning, 1963: 58, figs. 5–6.

Material examined. Nil. Nine Pins Rocks, Mirs Bay, 1975.

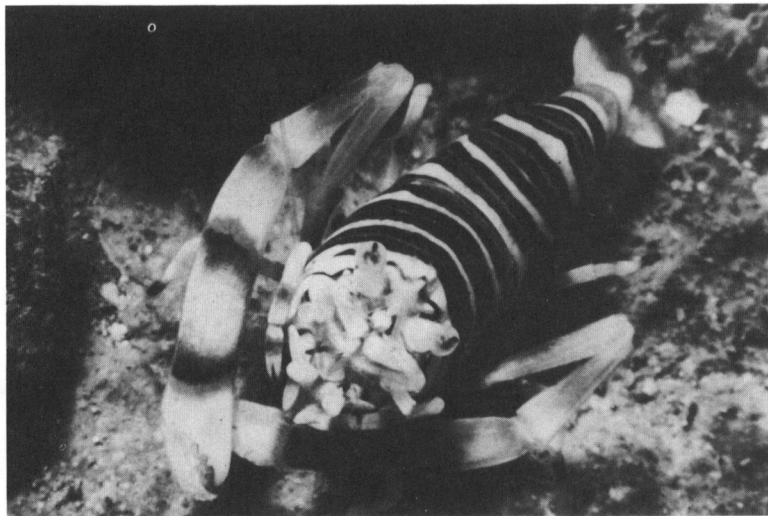


Figure 4. *Gnathophyllum americanum* Guérin-Ménéville, Nine Pins Rocks, Mirs Bay, photo. D.J.H. Phillips.

Remarks. The record is based upon a close-up underwater photograph taken by D.J.H. Phillips, in which the characteristic morphology and colour pattern of this species is readily discernable. This species has not been previously recorded from Hong Kong waters and the collection of some further examples is desirable.

Distribution. Known throughout the Indo-West Pacific, from the Rea Sea to the Tuamotu Islands, and also the Caribbean, Gulf of Mexico, Florida, Bermudan and Canary Islands.

Alpheidae Rafinesque, 1815

Alpheus bannerorum Bruce
(Figure 5)

Alpheus bannerorum Bruce, 1987: Beagle, 61–71, figs. 1–6, pl. 1 a, c.

Material examined. (i) 1 male, 1 female, Stn. PH. HK-4, Kai Kun Tan, 4–6 m, 5 April 1985, coll. P. Hutchings, NTM Cr.003809. (ii) 1 ovig. female, Chek Chau, Mirs Bay, ? depth, 9 April 1986, coll. divers, NTM Cr.003874. (iii) 1 female, Stn. PH HK-23, Tap Mun, Mirs Bay, 5–10 m, grab, 16 April 1986, coll. P. Hutchings, NTM Cr.003974.

Remarks. The four specimens agree precisely with the original description, especially with reference to the characteristic colour pattern with a barred abdomen with paired eyespots on second and third abdominal segments, which readily distinguishes this species from the closely related *A. parvirostris* Dana, also recorded from Hong Kong by Horikoshi and Takeda (1982). Not previously reported outside Australian waters.

Distribution. Type locality, Darwin, Australia. Also known from Heron Island, Queensland, Australia.

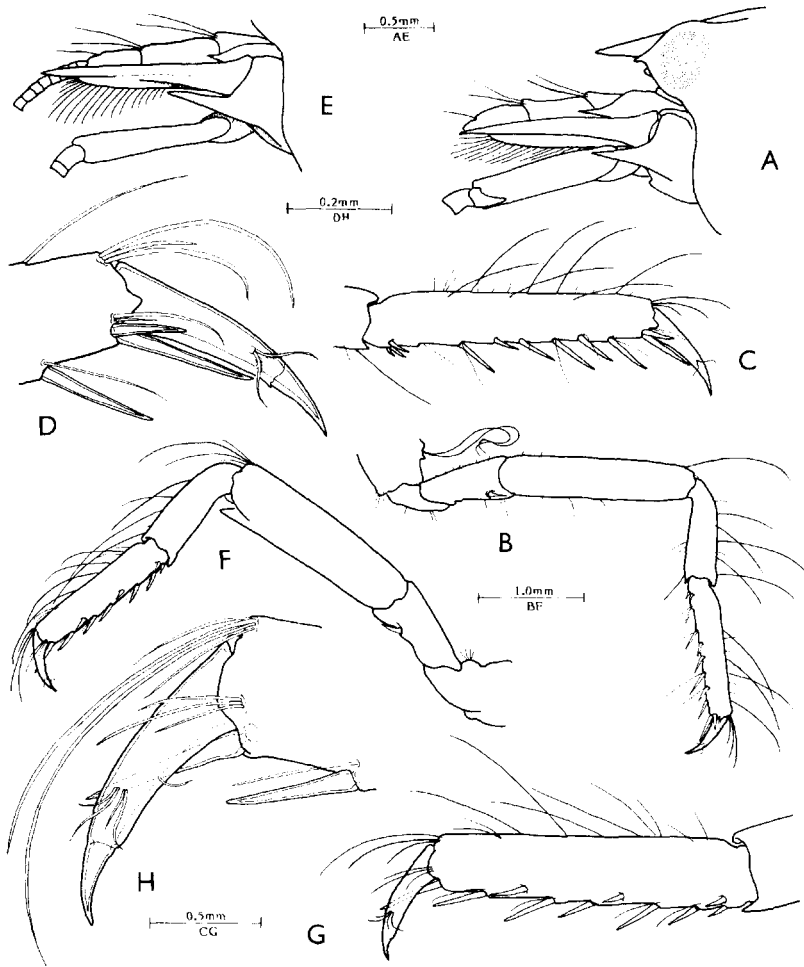


Figure 5. *Alpheus bannerorum* Bruce. A, anterior carapace and antennal peduncles; B, third pereiopod; C, same, propod and dactyl. *Alpheus parvirostris* Dana. D, antennal peduncles, lateral; E, third pereiopod; G, same, propod and dactyl; H, same, dactyl.

Alpheus brevicristatus De Haan

Restricted synonymy. *Alpheus brevicristatus* De Haan, 149: 177, pl. 45 fig. 1. — Jeng and Chang, 1985: 247, fig. 17.

Material examined. (i) 6 specs., Wu Kai Sha, Tolo Channel, 22°25.75'N, 114°13.9'E, LWS, fine mud, 8 April 1986, coll. A.J. Bruce, NTM. Cr.003854. (ii) 13 specs., Wu Kai Sha, Tolo Channel, LW5, fine mud, rotenone, 10 April 1986, coll. A.J. Bruce, NTM. Cr.003884.

Remarks. Not previously reported from Hong Kong. The specimens were collected from a small area of very soft mud, just exposed at a low spring tide level. The colour pattern

was identical with that shown in the colour photograph of Jeng and Chang (1985) and quite distinct from the closely related *A. distinguendus* De Man, that occurs commonly in deeper water. Taiwanese specimens are reported from seagrass meadows.

Distribution. Type locality, Japan. Otherwise known only from Taiwan.

Alpheus paralcione Coutière

Restricted synonymy. *Alpheus paralcione* Coutière, 1905: 895, fig. 34. — Miya, 1974: 139, pl. 24. — Banner and Banner, 1981: 113–116, fig. 30.

Material examined. 3 specs., Stn. PH. HK-11, Chek Koh Tau, Mirs Bay, 5–10 m. in rubble, 8 April 1986, coll. P. Hutchings, NTM Cr.003860.

Remarks. Although found in rubble, the specimens were probably associated with a sponge, but this species has also been reported in association with alcyonaceans (Miya, 1974).

Colouration. Generally pale orange, most intense on major chela, particularly on fingers.

Distribution. Type locality, Maldive Islands. Also known from the Seychelle Islands to Hawaii and Japan to northern Australia.

Alpheus pareuchirus Coutière
(Figure 6)

Alpheus pareuchirus Coutière, 1905: 906, pl. 84 fig. 43. ? *Alpheus pareuchirus* var. *leucothoe* De Man, 1911: 420, pl. 23 fig. 102. *Alpheus pareuchirus pareuchirus* — Banner & Banner, 1981: 276, fig. 85a–k.

Material examined. 1 ♀, Starfish Bay, 22°26.0'N, 144°14.6'E, sandy mud, 4 m, 4 April 1980, coll. divers, NTM Cr.003786.

Remarks. The single specimen differs slightly from the figure provide by the Banners (1981), which shows the propod of the third pereopod armed ventrally with a double row of rather short stout spines. In the Hong Kong specimen this segment has a single row of long, slender spines and more closely resembles the specimen from Indonesia described by De Man (1911) as *A. pareuchirus* var. *leucothoe*. The dactyl of the major second pereopod is provided with a very low molar process, the proximal edge of which is fringed with distally curved setae, presenting a rather characteristic appearance to this usually glabrous feature. The species has not been previously recorded from Hong Kong.

Colouration. Very heavily spotted with dark red dots, all over body, caudal fan and chelae.

Distribution. Type locality, North Male Atoll, Maldive Islands. Also recorded from Madagascar, Indonesia, the Philippines and Australia.

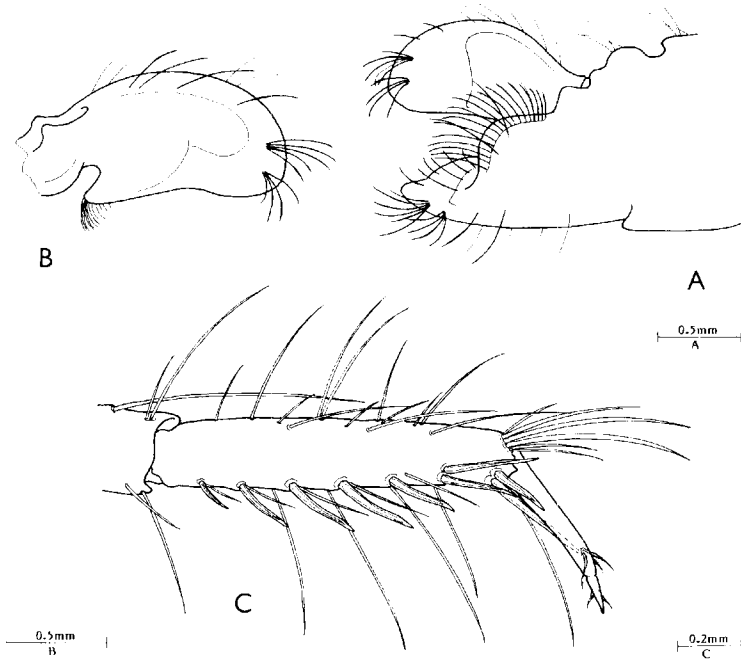


Figure 6. *Alpheus parouchirus* Coutière. A, major chela, fingers; B, same, dactyl; C, third pereiopod, propod and dactyl.

Alpheus polyxo De Man

Alpheus polyxo De Man, 1909: 108; 1911: 423, fig. 104. — Banner & Banner, 1981: 274–276, fig. 84.

Material examined. 1 ♀, Stn. 3, Mirs Bay, 22°28.1'N, 114°22.05'E, sledge, 16 m, coll. A. Hirayama, 5 April 1986, NTM Cr.003917.

Remarks. The specimen agrees closely with the Banners (1981) figures. As noted by the Banners, the rostral carina bears numerous long setae, but in the present specimen these arise from longitudinal dorsolateral lines and not a median row. New to Hong Kong.

Distribution. Type locality, Banda, Indonesia. Otherwise known only from northern Australia and Madagascar.

Alpheus serenei Tiwari

Alpheus serenei Tiwari, 1963: 310–3 figs. 27–28; 1964: 314–5. — Banner & Banner, 1981: 196–197, fig. 60.

Material examined. 1 male, 1 female, Tolo Channel, 22°29.5'N, 114°18.5'E, 3–4, in coral block, coll. G. Oliver, NTM Cr.003934.

Remarks. The pair of specimens, which were found together in a coral cavity, agree well with the data of Tiwari (1963) and the Banners (1981), and the dactyls of the ambulatory pereiopods are minutely biunguiculate. In preserved material the chelae have a persistent purplish colouration. Closely related to *A. hippothoe* De Man, recorded from Tolo Channel by Harikoshi and Takeda (1982).

Colouration. General colouration a bright orange, most marked on chelae, and with submedian dark red spots dorsally on third abdominal segment.

Distribution. Type locality, Cauda, Vietnam. Also known from Xisha Islands, Singapore, Indonesia, the Philippines, Australia, and Red Sea, Somalia and Madagascar.

Athanas ornithorhynchus Banner and Banner

Athanas ornithorhynchus Banner and Banner, 1973: 319–321, fig. 8.

Material examined. 1 ovig. ♀, Peng Chau, Mirs Bay, depth?, in rubble, 15.4.86, coll. divers, NTM Cr.003952.

Remarks. Not previously recorded from Hong Kong and known only from the four original north and west Australian specimens.

The single Hong Kong specimen agrees precisely with the original description and represents a very considerable extension in geographical distribution for this species.

Colouration. General colour pattern of strong transverse bands. Frontal margin, rostrum and anterior margin of carapace bright red, carapace with anterior, middle and posterior bands of bright red, posterior margin of carapace with narrow transverse yellow band; anterior segments with broad transverse red band with centre, with narrow transverse yellow band anteriorly; antennal peduncles colourless, flagella purple; uropodal propod and exopod speckled reddish, endopod and telson transparent.

Distribution. Type locality, Van Diemen Gulf, northern Australia. Also known from Shark Bay and Cockburn Sound, Western Australia.

Athanas sibogae De Man, 1910

Restricted synonymy. *Athanas sibogae* — De Man, 1910: 314; 1911, 151, fig 6 — Banner and Banner, 1973: 321–324, fig. 9.

Material examined. (i) 2 ovig. female, Starfish Bay, 4 m, sandy mud, 4 April 1986, coll. divers, NTM Cr.003792. (ii) 1 ovig. female, Kai Kun Tan, 4–6 m, 5 April 1986, coll. P. Hutchings, NTM Cr.003810 (iii) 1 male, Breaker Reef, Mirs Bay, rubble, 25 m, 6 April 1986, coll. divers, NTM Cr.003821. (iv) 1 male, W. of Gruff Head, Mirs Bay, rubble 7 m, coll. divers, NTM Cr.003906. (v) 1 ovig. female, off Gruff Head, Mirs Bay, coral rubble, depth?, 14 April 1986, coll. divers, NTM Cr.003945. (vi) 1 male, 2 ovig. female, Tap Mun, rubble, 5–10 m, 16 April 1986, coll. P. Hutchings, NTM Cr.003972. (vii) 1 male, Long Harbour, Mirs Bay, rubble, 3 m, 7 April 1986, coll. divers, NTM Cr.003995.

Remarks. Not previously recorded from Hong Kong. The specimens agree well with previous descriptions and present no special features. Dr F.A. Chace, jr., has advised that this species should be correctly referred to *A. parvus* De Man, 1910, but for the present, this species is retained under the name of *A. sibogae*.

Distribution. Widespread throughout the Indo-West Pacific region from the Red Sea, to Japan, Australia and Cook and Samoan Islands.

Athanas hongkongensis sp.nov
(Figure 7–8)

Material examined. 2 ♀, Long Ke Wan, L.W., sandy beach, 8 April 1986, coll. R. Gibson, NTM Cr.003876.

Description. Rostrum slender, shallow, horizontal, acute, 3.0 times longer than width at base, lacking median carina, reaching to level of middle of intermediate segment of antennular peduncle; extracorreal tooth well developed, acute; infracorreal tooth acute, smaller than extracorreal, projecting anteriorly to about same level; pterygostomial angle broadly rounded; cardiac notch distinct.

Antennular peduncle with first segment about twice as long as distal width, subequal to combined length of second and third segments, with stout distal ventromedial tooth; stylocerite slender, acute, reaching to about level of tip of rostrum or 0.5 of intermediate peduncular segment length; intermediate and distal peduncular segments subequal in length; upper flagellum biramous, rami with proximal four segments fused, short free ramus with four segments bearing 3–6 groups of aesthetascs, longer free ramus with about 17–25 segments; lower flagellum slender, about 30–37 segments.

Antenna with stout basicerite bearing acute distoventral tooth; carpocerite robust, about 4.0 times longer than broad, compressed; flagella lacking; scaphocerite well developed, exceeding antennular peduncle, lateral margin straight with stout distal tooth slightly exceeding anterior lamella; lamella about 2.4 times longer than broad, greatest width proximal to mid-length, anterior margin rounded.

Third maxilliped slender, reaching to distal end of carpocerite; ischiomerus and basis fused, combined segment about 7.5 times longer than broad, tapering slightly distally, sparsely setose, penultimate segment 3.0 times longer than broad, subcylindrical, semiglabrous, about 0.36 of proximal segment length; terminal segment about 0.6 of proximal segment length, about 5.5 times longer than wide, tapering distally to stout simple terminal spine, with about 10 transverse groups of short stout serrulate setae medially; exopod well developed, reaching to distal end of proximal segment of endopod, with four long and several short plumose setae distally; coxa with small epipod laterally, with well developed lateral plate, distally acutely pointed.

First pereiopods subequal and similar, but different in each specimen. In specimen (i): first pereiopods short, reaching distally to exceed carpocerite by about 0.3 of palm length; palm about 2.0 times longer than deep, slightly compressed, fingers slender, about subequal to palm length, sharp, entire distal cutting edges, with feebly bidentate tips; carpus about 0.7 of chela length, 3.0 times longer than distal width, tapering proximally; merus about 1.6 times carpus length, 6.0 times longer than wide; ischium subequal to merus length, 5.5 times longer than wide; basis short and stout, without exopod; coxa robust, with small lateral epipod and dorsal setobranch. In specimen (ii): first pereiopods elongate and slender, exceeding carpocerite by about 0.5 of merus length; palm about 3.0 times longer than deep, slightly compressed, fingers slender, about 0.6

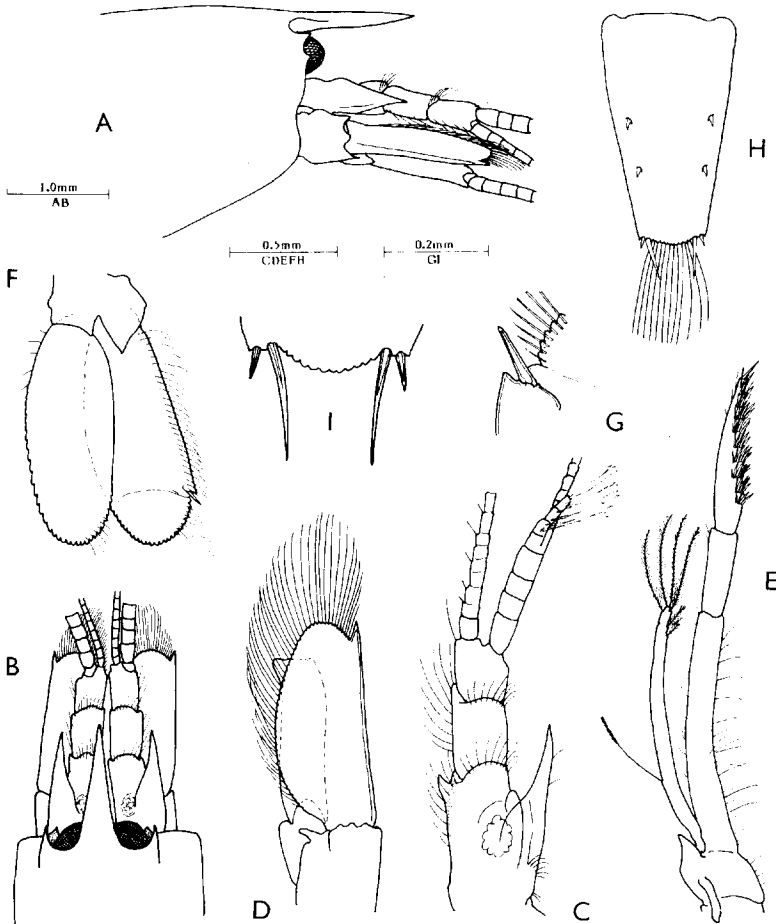


Figure 7. *Athanas hongkongensis* sp. nov., paratype female. A, anterior carapace and antennal peduncles, lateral; B, same, dorsal; C, antennule; D, antenna; E, third maxilliped; F, uropod; G, same, exopod, postero-lateral spines; H, telson; I, same, posterior margin.

of palm length, with sharp entire distal cutting edges, tips feebly bidentate; carpus slender, about 1.5 times chela length, 9.0 times longer than distal width, tapering gradually proximally; merus subequal to carpus length, 10.0 times longer than central width; ischium about 0.77 times meral length, tapering proximally, about 8.5 times longer than distal width; basis small, without exopod; coxa more robust, with epipod and setobranch; all segments devoid of teeth or spines.

Second pereiopods slender, merus reaching to about proximal or distal basicerite; chela with subcylindrical palm, about 2.0 times longer than wide, fingers slender, simple, subequal to palm length, cutting edges distally sharp, entire, tips feebly bidentate, with articulated ungues; carpus five-segmented, articles in ratio 27:4:4:5:9; merus 0.8 of carpal length; ischium about 0.9 of merus length; basis normal; coxa with epipod and setobranch.

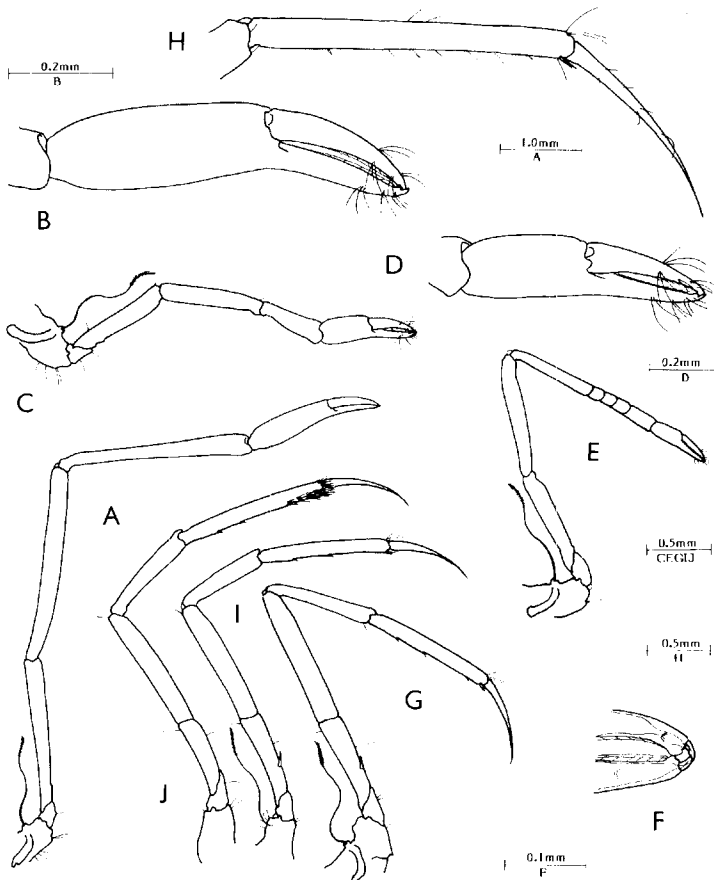


Figure 8. *Athanas hongkongensis* sp. nov. A, first pereiopod; B, same, chela; C, first pereiopod; D, same, chela; E, second pereiopod; F, same, tips of fingers; G, third pereiopod; H, same, propod and dactyl; I, fourth pereiopod; J, fifth pereiopod.

Ambulatory pereiopods slender, third pereiopod exceeding carpopocrite by 0.75 of propod length; dactyl long and slender, simple, without clearly demarcated unguis, feebly curved, about 10.5 times longer than proximal width, equal to about 0.66 of propod length, with sparse dorsolateral and ventrolateral setae; propod about 12.0 times longer than deep, uniform, with single slender distoventral spine, two single ventral spines and sparse setae; carpus about 0.66 of propod length, 6.5 times longer than distal width, tapering proximally, unarmed; merus slightly shorter than propod, about 6.3 times longer than wide, unarmed; ischium slightly shorter than carpus, about 4.2 times longer than distal width, tapering slightly proximally, with strong ventrolateral spine; basis normal; coxa with epipod and setobranth. Fourth pereiopod similar, propod subequal; coxa with setobranth, without epipod. Fifth pereiopod similar, propod 1.2 times longer, with 5 transverse rows of serrulate setae distolaterally, ischium without ventrolateral spine, coxa without epipod and setobranth.

Abdomen with pleural margins rounded; posterolateral angle of sixth segment with articulated triangular plate.

Uropods with dorsolateral angle of protopodite acute; exopod 2.5 times longer than broad, lateral margin straight, unarmed, densely setose ventrolaterally, small acute tooth distally with larger mobile spine medially, diaeresis feebly developed, posterior border rounded, devoid of spinules; endopod about 2.5 times longer than broad.

Telson about 1.6 times longer than proximal width, sides straight, convergent, posterior margin half width of anterior margin, two pairs of small dorsal spines at 0.46 and 0.67 of length, posterolateral angle with small acute tooth with short outer lateral spine and long slender inner lateral spine, posterior margin rounded with about 12 long marginal setae; anal tubercles absent.

Types. Specimen (ii), female, with elongate slender first pereopods is selected as holotype and specimen (i) female, with short first pereopods, is designated as paratype.

Measurements. Holotype: total length (approx.), 12 mm; carapace and rostrum, 5.5 mm; postorbital carapace, 4.2 mm; first pereopod carpus, 2.5 mm, chela 1.7 mm. Paratype: total length (approx.), 9.7 mm; carapace and rostrum, 3.2 mm; postorbital carapace, 2.5 mm; first pereopod, carpus, 0.75 mm, chela, 0.5 mm. Length of ova, 0.4 mm.

Systematic Position. *Athanas hongkongensis* is one of a small group of a *Athanas* species characterized by the presence on the ambulatory propods of a very long slender simple dactyls. In reporting on *A. gracilipes*, Banner and Banner (1978) noted that this group includes only three other Indo-West Pacific taxa, *A. tenuipes* De Man, 1910, *A. polymorphus* Kemp, 1915, and *Athanas* sp. near *polymorphus* Banner and Banner, 1966. Both *A. gracilipes* and *A. tenuipes* are deep-water species, *A. polymorphus* is readily distinguishable by the presence of an acute postmarginal pterygostomial tooth and it is to *A. sp. near polymorphus* that *A. hongkongensis* is most closely related.

A. hongkongensis may be readily distinguished from *Athanas* sp. near *polymorphus* by the absence of an acutely pointed pterygostomial angle of the branchiostegite. The rostrum is also much more slender in lateral view, and without a median carina bearing short, stiff setae. *A. sp. near polymorphus* is described as having the chelipeds sexually dimorphic and asymmetrical in both sexes. In *A. hongkongensis* they are symmetrical in the female but the condition in the male is not known. The small chela in *A. sp. near polymorphus* is similar to that of the specimen (i) of *A. hongkongensis*. The propod of the third ambulatory pereopod has two strong ventral spines, with a single spine on the dorsal margin, a feature lacking in *A. hongkongensis*, in which the dactyl distinctly exceeds half the propod length, whereas it is less than half the propod length in *A. sp. near polymorphus*. Finally, in *A. sp. near polymorphus* the posterior margin of the telson appears to have only a single short lateral spine, whereas *A. hongkongensis* has a short outer and a long slender inner lateral spine. *A. sp. near polymorphus* is also a shallow water species, known only from under intertidal rocks near Rayong, Thailand, and is known only from the type material.

A. hongkongensis differs from *A. gracilipes* Banner and Banner, 1978, in that the latter has a rostrum that fails to reach the distal margin of the proximal segment of the antennular peduncle, with the distolateral tooth of the scaphocerite distinctly exceeded by the lamella and with ambulatory propods devoid of ventral spines, with the ischium bearing two ventrolateral spines instead of one, and the dactyl distinctly less than half the propod length.

Athanas tenuipes may be conveniently distinguished from *A. hongkongensis* by the form of the telson, which possesses much larger dorsal spines and posterior spines which are contiguous in the midline.

Automate anacanthopus De Man
(Figure 9)

Automate anacanthopus De Man, 1910: 317; 1911: 139 (key), 142–144, pl. 1 fig. 3.
— Ledoyer, 1970: 127, pls. 17, 24a. — Banner and Banner, 1983: 82, 1985: 24.

Material examined. 1 ovig. female, Stn. T/28, Mirs Bay, 22°30.75'N, 114°22.7'E, 20 m, 10 April 1986, coll. A Hirayama, muddy sand — fine shell substrate, NTM Cr.003921.

Remarks. Not previously known from Hong Kong. The single specimen has both of the first pair of pereiopods, and carries only very few ova, length 0.27 mm, attached to the second pleopod. The original specimens described by De Man (1910; 1911) possessed only a single minor pereiopod. Ledoyer (1970) described a major second pereiopod which differs distinctly from that of the present specimen, having the fingers widely gaping, with the lower margin of the palm deeply notched. This latter feature could be due to physical damage. In addition, the third pereiopod of the Hong Kong specimen is armed with a short stout distoventral spine and a long spiniform seta, rather than a long spine as in the Madagascan specimens. De Man reports that the pereiopods are devoid of spines and have only long and stout setae.

Distribution. Known previous only from the type locality, Indonesia, and Madagascar.

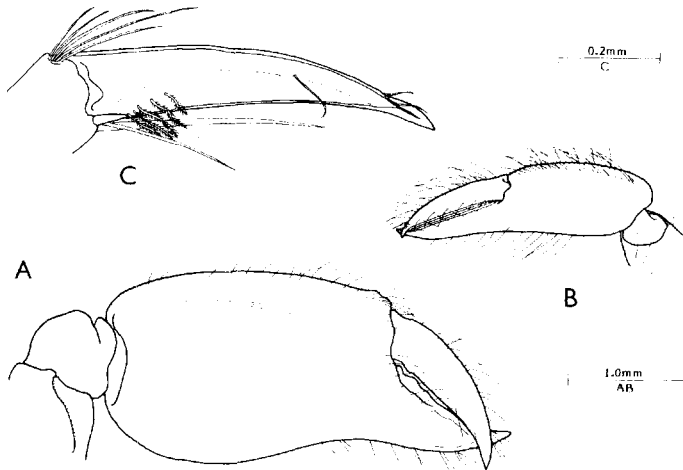


Figure 9. *Automate anacanthopus* De Man, female. A, major chela, medial; B, minor chela, medial; C, third pereiopod, dactyl.

Prionalpheus sp. aff. *triarticulatus* Banner and Banner*
(Figures 10–12)

Material examined. 1 male, 1 female, Tolo Channel, 5 m, April 1980, coll. B. Morton, in gallery of dead coral base, NTM Cr.005963.

*See addendum.

Description. Body smooth, glabrous and moderately compressed. Rostrum feebly developed, triangular, slightly broader than long, width about 0.1 of frontal width, not exceeding proximal segment of antennular peduncle, with lateral setae, ventral carina distinct, feeble; pterygostomial angle rectangular, not produced, cardiac notch distinct. Abdomen with anterior three pleura rounded, fourth and fifth bluntly angular, sixth segment 1.15 times longer than deep, posterolateral angle feebly developed, posteroventral angle with mobile triangular plate. Telson about 1.4 times length of sixth

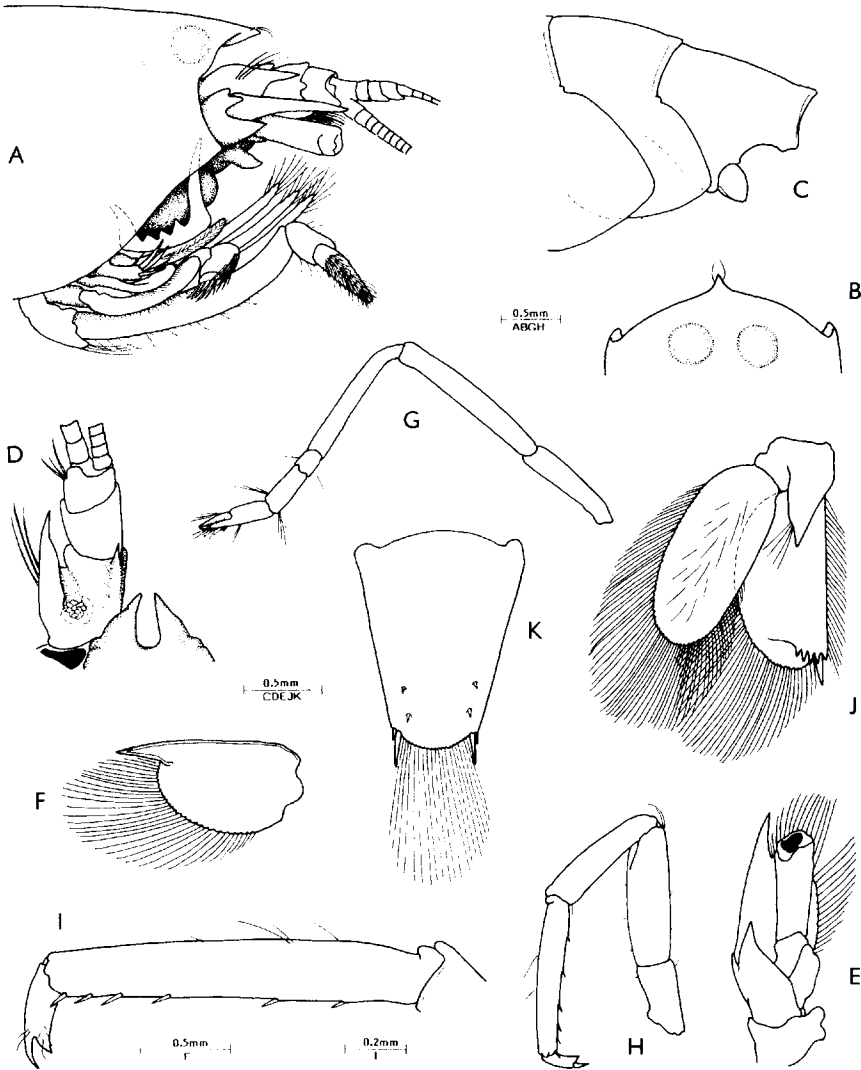


Figure 10. *Prionalpheus* sp. aff. *triariculatus* Banner and Banner. A, anterior carapace and antennae, right mouth parts removed; B, anterior carapace, dorsal; C, fifth and sixth abdominal segments; D, antennular peduncle and epistomal horns, ventral; E, antennal peduncle, ventral; F, scaphocerite; G, first pereopod; H, fifth pereopod. I, same, propod and dactyl; J, uropod, dorsal; K, telson.

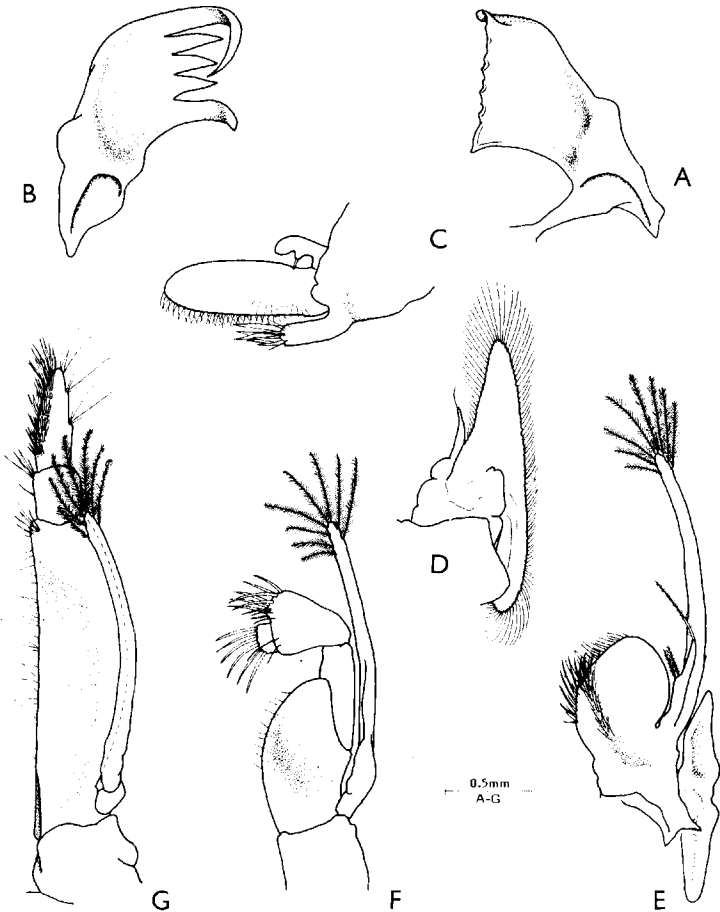


Figure 11. *Prionalpheus* sp. aff. *triariculatus* Banner and Banner. A, right mandible; B, left mandible; C, maxillula; D, maxilla; E, first maxilliped; F, second maxilliped; G, third maxilliped.

abdominal segment, 0.8 times longer than wide, lateral margins straight, convergent, with two pairs of small dorsal spines at 0.68 and 0.85 of telson length, anterior pair slightly more separated than posterior pair, posterior margin about 0.5 of anterior telson width, with two pairs of lateral spines, outer spine small, larger than dorsal spines, inner spine large, about 0.17 of telson length, inner margin broadly convex with about 20 long plumose setae.

Antennular peduncle stout, proximal segment about as long as wide, with strong distoventral tooth medially, stylocerite well developed, acute, extending almost to distal border of intermediate segment, statocyst with small granular statolith; intermediate segment about 1.2 times longer than broad, 0.75 of length of proximal segment; distal segment obliquely articulated, short, as long as broad, about 0.45 of proximal segment length; upper flagellum with rami fused, short ramus robust with 4–5 segments only, 2–3 groups of aesthetascs, lower ramus slender, short; lower flagellum slender, 2.0 times length of longer ramus of upper flagellum.

Antenna with stout basicerite, with large, acute, ventro-lateral tooth; ischiocerite and

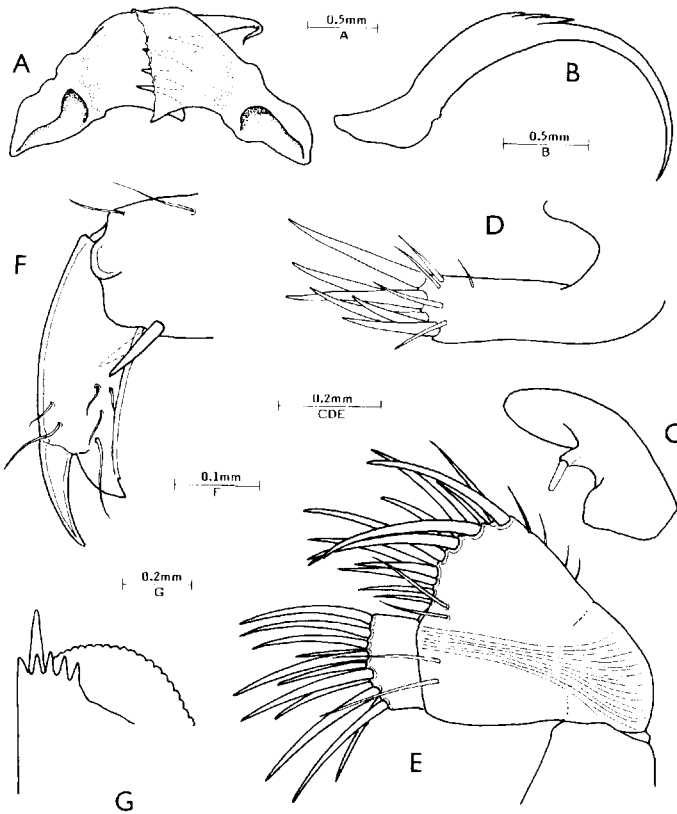


Figure 12. *Prionalpheus* sp. aff. *triariculatus* Banner and Banner. A, mandibles, dorsal aspect; B, left mandible, anterior aspect; C, maxillula, palp; D, same, lower lacinia; E, second maxilliped, dactylar and propodo-carpal segments; F, fifth pereopod, dactyl; G, uropod, distal exopod.

merocerite normal; carapocerite robust, about 3.5 times longer than distal width, distinctly exceeding distal margin of scaphocerite lamella, flagella lacking; scaphocerite well developed, with thick, feebly convex lateral margin, with stout acute distal tooth, about 0.25 of lateral length, extending far beyond lateral margin of lamella, lamella about 1.5 times longer than wide, anteromedial border strongly convex.

Eyes normally developed, completely concealed by dorsal carapace. Epistome with pair of acute submedian processes anteriorly.

Mandibles asymmetrical. Right mandible with corpus small, without palp, molar process absent, incisor process broadly expanded, dorsally concave, cutting edge medially truncate with four small notches, distal margin curved ventrally, proximal angle acute. Left mandible generally similar, cutting edge of incisor process with three very large acute teeth centrally, distomedial angle greatly elongated forming dorsally curved sickle-shaped tooth, with smaller curved tooth proximomedially. Maxillula with small bilobed palp, dorsal lobe larger than ventral, ventral lobe with single stout spine or seta (broken); upper lacinia large, elongate, about 3.0 times longer than wide, with double row of divergent short, simple setae ventrally; lower lacinia short, subcylindrical, about 4.0 times longer than broad, with six stout, feebly denticulate spines and some spiniform setae distally. Maxilla with small, slender, tapering palp with short simple terminal seta;

basal endites obsolete, medial margin convex, coxal endites lacking, medial margin convex; scaphognathite well developed, narrow, about 3.7 times longer than wide, anterior lobe narrowly triangular, posterior lobe narrow, posteriorly rounded. First maxilliped with slender simple, uni-segmented palp, with two short plumose setae at 0.5 of medial margin and long plumose terminal seta; basal endite well developed, ovoid, proximomedially thickened, with several marginal spines, distomedial margin thin, with spiniform simple setae; exopod well developed, without caridean lobe, flagellum with eight long plumose distal setae; coxa not clearly separated from basis medially, with narrow elongate bilobed epipod laterally. Second maxilliped with four segmented endopod; dactylar segment small, quadrangular, about 1.7 times wider than long, with ten strong simple spines distally; propodal and carpal segments fused, combined segment about 1.1 times wider than long, distally expanded with about 13 strong simple spines on distolateral angle; merus about 3.1 times longer than broad, transversely articulated with carpus, very obliquely articulated with ischium; ischium and basis completely fused, broad, dorsally concave, about 1.8 times longer than broad, medial margin broadly convex, sparsely setose, exopod well developed, flagellum with eight plumose distal setae; coxa robust, without branchial appendages. Third maxilliped with endopod well developed, operculiform; ischiomerus and basis completely fused, combined segment broadest centrally, about 3.35 times longer than wide, ventrally bowed, medially concave, medial margin straight, sparsely setose; penultimate segment short, about 0.18 of antepenultimate segment length, 1.2 times longer than broad, sparsely setose; terminal segment 0.32 of antepenultimate segment length, about 2.7 times longer than proximal width, feebly tapering distally, with about eight transverse rows of short serrulate spines medially, with length increasing distally, sparsely setose distally and laterally; exopod well developed, subequal to others, reaching distal margin of antepenultimate segment, with seven long plumose setae distally; coxa robust, with feeble lateral plate, without branchial appendages.

First pereopods lacking. One detached second pereopod preserved; chela small, palm subcylindrical, about 2.2 times longer than deep, fingers slender, tapering, simple, setose, about 0.9 of palm length; carpus three-segmented, longest segment proximally, in ratio of about 6:1:2, segments slender, subcylindrical; merus slightly exceeding length of first two carpal segments, about 7.0 times longer than central width, subcylindrical; ischium about 0.66 of merus length, about 4.5 times longer than distal width, slightly expanded distally. One right fifth pereopod preserved, attached to larger female specimen; dactyl with unguis distinct from corpus, simple, curved, 3.4 times longer than basal width, 0.55 of dorsal corpus length, corpus compressed, about 2.0 times longer than proximal depth, with large acute, strongly compressed disoventral accessory tooth, ventral margin concave, sharp, with single small distal denticle, lateral corpus with several simple setae; propod about 6.5 times longer than proximal depth, 3.8 times dactyl length, slightly tapering distally, with two posterodistal spines and five posterior spines; carpus robust, unarmed, 0.82 of propod length, 4.2 times longer than distal width; merus stout, unarmed, about 0.9 of carpus length, 3.2 times longer than central depth; ischium 0.5 of merus length, 2.0 times longer than distal width, unarmed.

Uropod with protopodite dorsolaterally armed with strong acute process; exopod with lateral margin straight, densely setose ventrally, with acute distolateral tooth, with four similar teeth along dorsolateral margin of diaeresis, stout mobile distolateral spine, lamella broad, 2.0 times longer than wide, distal protion beyond diaeresis reduced; endopod 2.3 times longer than broad, 1.1 times exopod length, sparsely setose dorsally.

Measurements. (i) Female, carapace length, 4.4 mm. (ii) Male, carapace length, 4.1 mm.

Systematic Position. The present incomplete specimens are considered to be most closely related to *Prionalpheus triarticulatus* Banner and Banner, 1910, the only species of the genus to have a triarticulate carpus on the second pereopods, the other species of the genus having four or five sub-segments on this appendage. However, these two Hong Kong specimens show a number of small but distinctive differences which suggest that they are not conspecific. As a complete description cannot be completed as the specimens lack many pereopods, including the first pair, the specimens are not designated as type material, and it is hoped that further specimens will in due course be obtained so that the description can be completed.

The Hong Kong specimens differ from the Fijian type material of *P. triarticulatus*, as described by Banner and Banner (1960), in having stouter, more robust epistomal horns, the pterygostomial angle of the branchiostegite bluntly angular instead of acutely produced, the rostrum not reaching the level of the distal margin of the first segment of the antennular peduncle, the stylocerite not exceeding the second segment of the antennular peduncle, the inner telson spines long, about 0.2 of telson length, much larger than dorsal spines, the dorsal spines small, all on the posterior 0.3 of the telson length, the distolateral tooth on the protopodite of the uropod very large (described as "small" in the holotype of *P. triarticulatus*) and the exopod of the uropod with a distinct distolateral tooth, with four further teeth along the dorsal lateral margin of the diaeresis. The presence of a minute accessory denticle on the ambulatory dactyl may also possibly be significant. The specimens reported from Lizard Island, Australian Great Barrier Reef (Banner and Banner, 1981) agree closely with the type material, except for small differences in the maxillula.

The precise micro-habitat occupied by *Prionalpheus* species remains unknown, as does the function of their abnormal mandibles. The present specimens were collected as an associated pair, as were the Lizard Island specimens. Other species of the genus are known from few specimens, although 9 of *P. sulu* were collected together from the southern Philippines. Associations in heterosexual pairs often suggests a commensal way of life, but this also occurs in some echinoderm predators such as *Hymenocera* and *Phyllognathia*. Other echinoderm associates such as *Gnathophyllum*, *Gnathophylloides* and *Levicaris* have unusual mouthparts, with operculate third maxillipeds. In the present specimens, it is noted that the ischiomerus-basis of the third maxillipeds forms an effective opercular cover for the mouthparts, also largely enclosing the exopods of the maxillipeds. The general form of the maxillula also shows a close resemblance to that of *Gnathophylloides* and *Levicaris*. However, in these genera the mandible has a distinct molar process and the incisor process is lacking. In the Hong Kong *Prionalpheus*, the mandible has a relatively small corpus with a distinct protuberance disto-laterally that could be a vestige of an incisor process, the large dentate process possibly being a very much modified molar process.

The other species of the genus are *P. fissipes* (Coutière), *P. brachytomeus* (Banner and Banner), and *P. sulu* Banner and Banner. A key for the separation of species is provided by Banner and Banner (1971), and their distribution is indicated in Fig. 13. All records are from shallow water, except for the unique specimen of *P. fissipes* which was collected from 91–137 m.

Synalpheus hastilicrassus Coutière
(Figure 17L–P)

Restricted synonymy. *Synalpheus hastilicrassus* Coutière, 1905: 875 pl. 72, fig. 12 — Banner and Banner, 1975: 353–356, fig. 21.

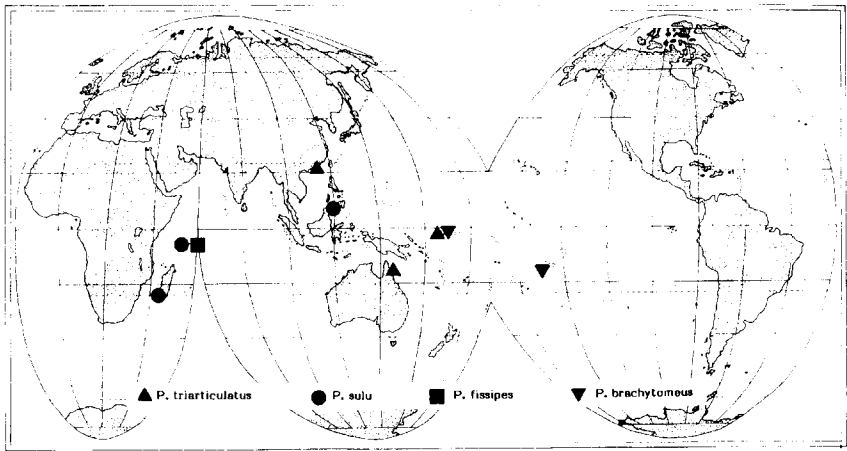


Figure 13. The distribution of the species of the genus *Prionalpheus* Banner and Banner.

Material examined. (i) 1 male, 1 female, 1 bopyridized male, PH HK-4, Kai Kun Tan 4–6 m, 5 April 1986, coll. P. Hutchings, NTM Cr.003911. (ii) 1 ovig. female, 1 bopyridized male, off Gruff Head, depth?, 14 April 1986, coll. divers, NTM Cr.003938.

Parasites. *Bopyrione* sp. (Isopoda: Bopyridae).

Remarks. Not previously recorded from Hong Kong, the specimens show no general differences from the Banners' description (1975) and it may be noted that the males lack appendices internae on the second to fifth pleopods and an appendix masculina on the second pleopod as is usual in *Synalpheus* species. The Gruff Head specimens were found together in sponges from coral rubble. The ovigerous female suggests that the male was fully functional although bopyridized.

Distribution. Type locality, Maldive Islands. Also known from East Africa and Indian Ocean, Gulf of Manaar, Indonesia, Philippines, Australia, Caroline and Marshall Islands and Fiji.

Synalpheus iocosta De Man
(Figure 17QR)

Restricted synonymy. *Synalpheus iocosta* De Man, 1909: 119; 1911: 235, fig. 33, Banner and Banner, 1973: 368, fig. 24 i-n.

Material examined. 1 male, 1 ovig. female, 1 juv., Long Harbour, 3 m, rubble, 17 April 1986, coll. divers, NTM Cr.003997.

Remarks. Not previously recorded from Hong Kong. The specimens agree well with the data provided by De Man (1911) and Banner and Banner (1973). The only minor point of difference noted is that in the Hong Kong specimens that unguis of the ambulatory dactyl is about 0.4 of the corpus length, whereas in Australian material it is about 0.12.

Distribution. Type locality, Aru Islands, Indonesia. Also known from south-west and north-east Australia; Banda, Indonesia; South China Sea at 45 m.

Hippolytidae Dana, 1852

Hippolyte ventricosa H. Milne-Edwards
(Figures 14–15)

Restricted synonymy. *Hippolyte ventricosa* H. Milne-Edwards, 1837: 371. — Kemp, 1914: 96. pl. 2 figs. 1–3 — Holthuis, 1947: 55–58, figs. 7–9.

Material examined. 1 ovig. ♀, Cape D'Aguiar, Hong Kong Island. 1 m in *Sargassum*, 11 April 1986, coll. A.J. Bruce, NTM Cr.003896.

Remarks. The single specimen is tentatively identified as *H. ventricosa* H. Milne Edwards, first reported from "les mers d'Asie", and not described in great detail. Holthuis (1947) considered that *H. ventricosa* was a single very widely distributed and highly variable species. If the present specimen is correctly referred to *H. ventricosa*, it does appear to represent a distinct taxon from the Australian taxa, *H. australiensis* Stimpson, a similarly sized species, synonymized with *H. ventricosa* in Holthuis' report. It seems possible that a complex of closely related species may exist and that further more detailed study of good material, from precisely known habitats, is desirable.

The Hong Kong specimen has a single proximal dorsal rostral tooth only, with two distal ventral teeth. Rostrum, carapace and abdominal tergites devoid of setae. Supraorbital spines well developed; antennal spine slender, submarginal; antennal spine large, remote from branchiostegal margin, fixed; inferior orbital angle slightly produced.

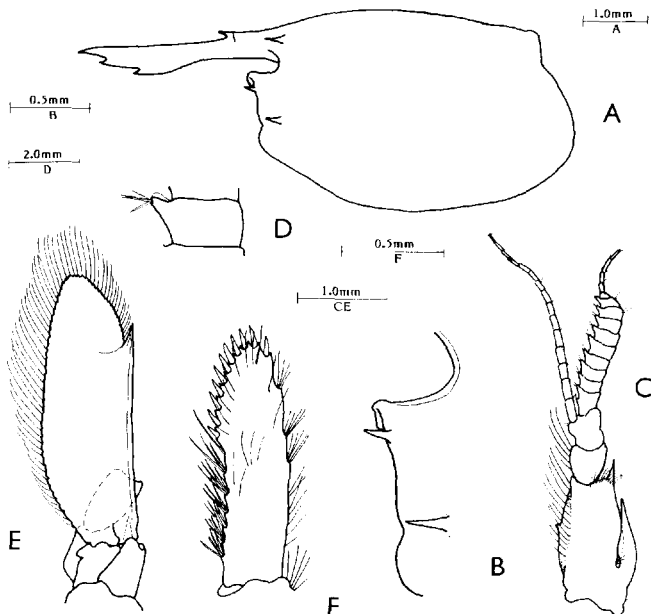


Figure 14. *Hippolyte ventricosa* H. Milne-Edwards, female, CL. 4.1 mm. A, carapace and rostrum; B, same, anterolateral margin; C, antennule; D, same, upper flagellum, ninth segment; E, antenna; F, third maxilliped, endopod, distal segment.

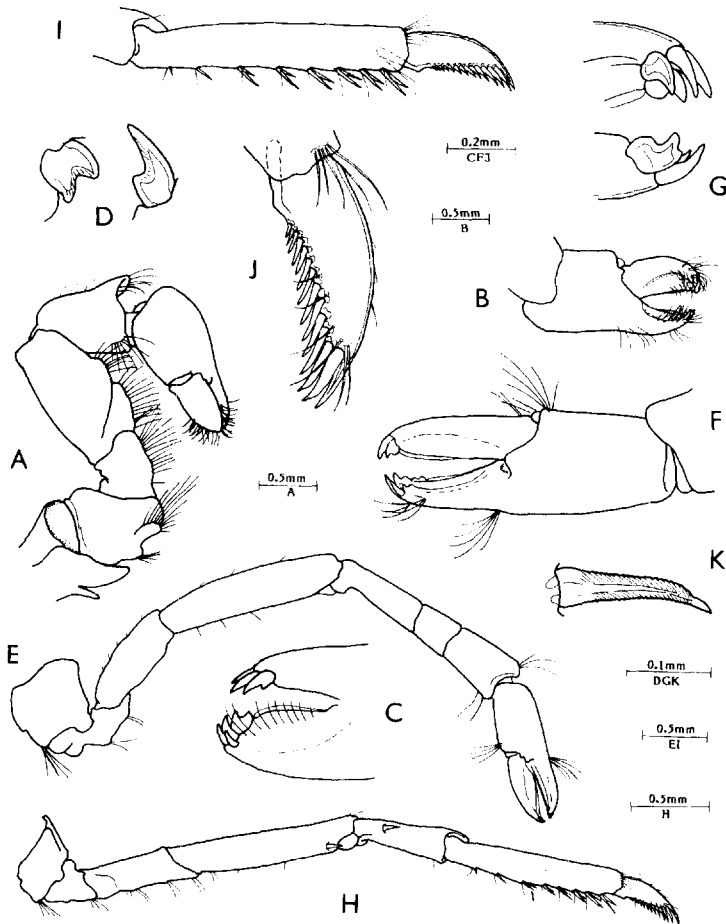


Figure 15. *Hippolyte ventricosa* H. Milne-Edwards, female. A, first pereiopod; B, same, chela; C, same, finger tips; D, same, detail of distal spines; E, second pereiopod; F, same, chela; G, same, finger tips; H, third pereiopod; I, same, propod and dactyl; J, same, dactyl; K, same, distal accessory spine.

with reflected inner flange. Antennule with upper flagellum uniramous, with nine stout segments proximally, each with distomedial setiferous process, with about 20 groups of aesthetascs ventrally, with four slender segments distally; lower flagellum slender, with 15 segments; proximal segments with small ventral medial tooth. Scaphocerite about 2.9 times longer than broad, distolateral spine well developed, distinct from distal part of lamella. Distal segment of third maxilliped about 3.5 times longer than broad, distal and lateral border with 11 stout simple spines, separated by small acute teeth, proximal lateral margin with dense groups of finely serrulate setae. First pereiopod robust, chela with fingers deeply subspatulate, tips of fingers with 3–4 strong spines, lateral spines bicuspid, proximal cutting edges entire, with numerous short coarsely serrulate setae. Second pereiopod with fingers of chela similar to first pereiopod, but subequal to palm length; carpus with segments as 23:12:20; merus slightly shorter than carpus. Ambulatory pereiopods slender, decreasing in length posteriorly. Third pereiopod (right) with dactylus

0.43 of propod length, compressed, about 3.4 times longer than proximal width, unguis fused to corpus, with 12 ventral accessory spines, size increasing regularly along ventral border, with largest spines distally, all with fine spiral ridging; propod about 6.5 times longer than wide, uniform, with eight groups of ventral spines, proximal two groups of single spine only, distal six groups of paired spines; carpus with well developed proximal lateral mobile spine; merus with distal ventrolateral mobile spine. Fourth and fifth pereopods generally similar, dactyls all with 13 accessory spines; propod ventral spines similar, carpus with lateral spine; third pereopod with two distal meral spines on left, fourth with one each side, fifth pereopod without meral spines.

The Hong kong specimen differs from the Hawaiian material described and illustrated by Hayashi (1975b) particularly in the smaller number of ventral rostral teeth, less produced inferior orbital angle, non-mobile antennal spine, presence of a single lateral meral spine instead of 2–3, and especially in the differences in the accessory spines of the ambulatory dactyls, in which the fifth or sixth are the longest, with the unguis about 0.3 of the fifth spine length. The specimens are of similar size and sex. The Hong Kong specimen also lacks tufts of setae on the abdomen as reported in Hayashi's material. The Indonesian specimens illustrated by Holthuis (1947) appear to have dactyls similar to Hayashi's specimens, but the carpal and meral spinulation is not shown. Australian north and north-east coast specimens of *Hippolyte* are usually very small in comparison with the specimens discussed above and have a post-orbital carapace length of about 1.7 mm, in contrast to 4.0 or more mm. Oviparous females also have ambulatory dactyls with about 8 accessory spines, propods with six groups of ventral spines, carpi with a single proximo-lateral spine and all three meri with two distolateral spines. Plumose setae are also generally present.

Holthuis (1947) considered *Hippolyte australiensis* (Stimpson, 1860) to be a synonym of *H. ventricosa* H. Milne Edwards. Stimpson's species was recorded from Port Jackson, New South Wales, and the specimens are no longer extant. Kemp (1914) reports that New South Wales specimens have a rostral dentition of 0/4–6, as in Stimpson's brief description, which contrasts with the northerly specimens, which have 1/1–2. Moreover, the three segmented second pereopod carpus has the distal segment distinctly longer than the proximal, which sequence is reversed in northern Australian specimens. The northern and southern representatives of *Hippolyte* both appear to be distinct from the form found in Hong Kong and may prove to be separate species on closer examination.

Distribution. Reported by Holthuis (1947) and Hayashi (1981) as occurring throughout the Indo-West Pacific region from South Africa to Hawaii.

Latreutes sp. A
(Figure 16A-E)

Material examined. 2 male, Stn. T/9, Mirs Bay, 22°26.5'N, 114°23.7'E, 16 m, trawl, 3 April 1986, coll. A.J. Bruce, NTM Cr.003801.

Remarks. The two specimens are similar but one has the rostrum badly damaged. They are characterized by the presence of a rostrum that is only slightly longer than the postorbital carapace length, straight, with a deep ventral lamina and a comparatively blunt tip, with 14 acute dorsal teeth extending over the whole dorsal carina distal to the orbital notch and 8 ventral teeth, situated on the distal third, with a reduced apical tooth; the inferior orbital angle is feebly produced with a robust, apparently non-articulated antennal spine superimposed; the pterygostomial angle is rounded and not produced, with

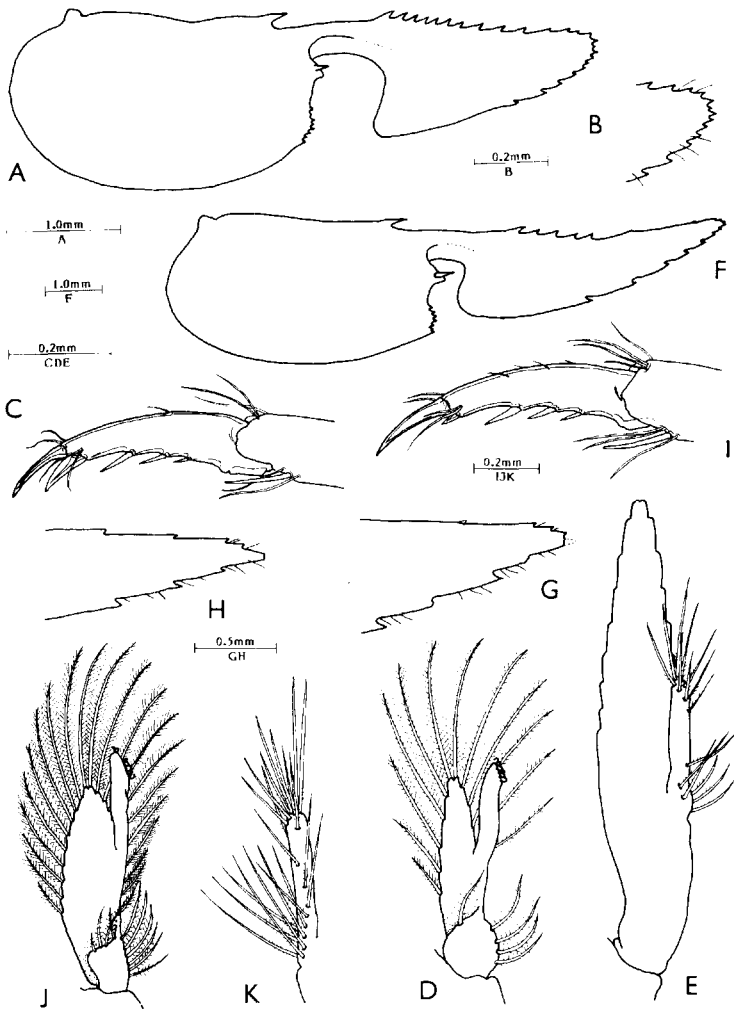


Figure 16. *Latreutes* sp. A. A, carapace and rostrum; B, tip of rostrum; C, fourth pereiopod, dactyl; D, endopod of first pleopod; E, endopod of second pleopod. *Latreutes* sp. B. F, carapace and rostrum; G, H, tips of rostra; I, third pereiopod, dactyl; J, endopod of first pleopod; K, appendix masculina.

about 8 small denticulations. The ambulatory pereiopods have dactyls with a slender unguis, about half the length of the dorsal margin of the corpus, with a large stout distal accessory spine and three smaller spines on the ventral margin of the corpus.

The male first pleopod has a small endopod with a well developed appendix interna that slightly exceeds the distal end of the lamella. The lamella is about 4.0 times longer than wide, with 12 plumose marginal setae, the proximal medial region is expanded and bears four setulose setae and the appendix interna arises from about the middle of the medial margin and bears about six distal concinnuli. The second pleopod bears an appendix masculina at about 0.3 of the medial margin length. The corpus is about 6.5

times longer than wide, with a proximal group of six ventromedial spines and nine distoventral spines, all feebly setulose proximally. Postorbital carapace length, 2.1 m.

Colouration. Generally semitransparent but grossly mottled with large reddish blotches.

Latreutes sp. B
(Figure 16F-K)

Material examined. 2 male, Stn. T/9, Mirs Bay, 22°26.5'N, 114°23.7'E, 16 m, trawl, 3 April 1986, coll. A.J. Bruce, NTM Cr.003802.

Remarks. Generally similar to *Latreutes* sp. A above, but of distinctly larger size and different colour pattern. *Latreutes* sp. B is a more slender form than sp. A, with the rostrum slightly upcurved and far exceeding the postorbital carapace length, with a shallower lamina. The dorsal margin bears seven small acute teeth with five grouped closely together near the middle of the rostral length and with two teeth close to the acute tip; ventral margin with seven small acute teeth spread over the distal half of the length. The posteroventral angle of the lower rostral carina is broadly rounded. The carapace has the inferior orbital angle acutely produced with a long slender, mobile, antennal spine superimposed and the pterygostomial angle is slightly produced with about seven small denticulations. The dactyls of the ambulatory pereiopods have a robust unguis, equal to about 0.4 of the dorsal length of the corpus; with a small slender distal accessory spine, and three smaller spines along ventral border of corpus.

The male first pleopod has the endopod about 3.5 times longer than wide, with a well developed appendix interna that distinctly exceeds the tip of the lamella. The lamella bears six short, feebly setulose setae proximomedially, the distal two thirds bears about 21 well developed plumose marginal setae. The second pleopod is similar to *Latreutes* A, but the appendix masculina is more densely spinose, with about 11 proximal spines and 12 distoventral spines. Postorbital carapace length c. 4.0 mm.

Colouration. General colouration deep blue, body speckled all over with small purple red dots and yellow dots and patches, most marked on abdomen; rostrum and second and third maxillipeds dark red-brown; pereiopods and pleopods transparent; caudal fan brownish, distally white.

Discussion. The two taxa noted above appear to represent distinct species on account of the differences in size, morphology and colouration. Elsewhere it is not uncommon for two species of *Latreutes* to be caught in the same haul and this is a common occurrence in East African waters, where *L. mucronatus* (Stimpson) and *L. pygmaeus* Nobili are often found together. The Mirs Bay specimens do not appear to conform to any of the descriptions available to the author and may represent undescribed species but, in view of the known variability in rostral morphology in *Latreutes* and the lack of any adult female specimens, which may well have quite a different rostral morphology, it is desirable that further material be obtained before any conclusions are drawn.

Thor paschalis (Heller)

Restricted synonymy. *Hippolyte paschalis* Heller, 1862: 276, pl. 3, fig. 24. *Thor paschalis* — Kemp, 1914: 94, pl. 1, figs. 6–10. — Holthuis, 1947: 49–50.

Material examined. (i) 2 specs., Breaker Reef, Mirs Bay, ?m, in rubble and algae, 6 April 1986, coll. divers, NTM Cr.003922. (ii) 1 ♀, 1 juv., Chek Chau, Mirs Bay, 2–10 m, in rubble, 10 April 1986, coll. P. Hutchings, NTM Cr.003892.

Remarks. Not previously recorded from Hong Kong. Generally a common Indo-West Pacific species. The present specimens present no special features.

Distribution. Type locality, Red Sea. Known from East Africa to Indonesia, Japan, eastern Australia and Marianas Islands.

Processidae Ortmann, 1896

Processa aequimana (Paulson)

Restricted synonymy. *Nika aequimana* Paulson, 1875: 97, pl. 14, figs 6, bc. *Processa aequimana* — Nobili, 1906: 79. — Hayashi, 1975: 80–84, figs. 10–11.

Material examined. 1 male, 1 female, 1 juv., Stn. T/L 58, off Flat Reef, Tolo Channel, 22°37.5'N, 114°16.8'E, 12 m, grab, 16 April 1986, coll. P. Shin, NTM Cr.003971.

Remarks. Not previously recorded from Hong Kong waters. The adult examples agree well with the data provided by Hayashi (1975a), but are slightly smaller, with postorbital carapace lengths of about 3.1 mm (cf. 4.3–4.6 mm).

Distribution. Type locality, Red Sea. Also known from Moçambique, Indonesia, Vietnam and Japan.

Processa demani Hayashi

Processa demani Hayashi, 1975: 98–102, figs. 19–20.

Material examined. 1 ♀, Mirs Bay, 12°31.5'N, 22°19.9'E, 18 m, grab, 5 April 1986, coll. A. Hirayama, NTM Cr.005245.

Remarks. The single example agrees closely with the original description. Postorbital carapace length 4.1 mm. New to the fauna of Hong Kong and not reported since the original description.

Distribution. Type locality, Great Kei Islands, Indonesia. Also known from Java and Vietnam.

Processa sulcata Hayashi

Processa sulcata Hayashi, 1975: 134–137, fig. 34.

Material examined. (i) 1 male, Starfish Bay, 4 m, sandy mud, 4 April 1986, coll. ?, NTM Cr.003787. (ii) 1 male, Stn. PH. HK-13, Chek Chau, Mirs Bay, 2–10 m, rubble 10 April, 1986, coll. P. Hutchings, NTM Cr.003893. (iii) 3 (1 ovig. female), Tolo Channel, N. side, opposite Gruff Head, 9 m, silty sandy shell substrate, 13 April 1986, coll.

Remarks. These specimens present no special features and agree well with Hayashi's description (Hayashi, 1975a). Not previously recorded from Hong Kong.

Distribution. Type locality, Genkai Sea, Fukuoka, Japan. Also known from elsewhere in Japan, Indonesia, Vietnam and South Africa.

Processa sp. A
(Figure 17A-G)

Material examined. 1 ♀, Mirs Bay, 12°31.5'N, 22°19.9'E, 18 m, 5 April 1986, coll. A. Hirayama, NTM Cr.005245.

Remarks. The single example appears most closely related to *P. longirostris* Hayashi, 1975, but differs in a number of minor characters, particularly the basicerite lacks a distolateral tooth, the second pereopods have 15 carpal segments, with the merus appearing unsegmented, and the merus of the third pereopod has four lateral spines. *P. longirostris* is known only from the type material from the Bay of Nha Trang, Vietnam.

Processa sp. B
(Figure 17H-K)

Material examined. 1 male, Stn. T/32, Mirs Bay, 22°37.7'N, 114°22.9'E, 18 m, muddy sand and fine shell grit, trawl, 10 April 1986, coll. A. Hirayama, NTM Cr.003925.

Remarks. The single example appears most closely related to *P. affinis* Hayashi, 1975. However, it lacks the unusual crenulations on the anterior margin of the last thoracic sternite and the lateral angle of the stylocerite bears a small acute tooth. In addition, the carpus of the second pereopods has 20 segments on the right and 11 on the left, as contrasted with 19 and 15 in *P. affinis*, and the segmentation of the merus can not be satisfactorily distinguished. *P. affinis* is known only from the holotype specimen, from the Soela Islands, Indonesia.

Pandalidae Haworth, 1825

Chlorotocella gracilis Balss

Chlorotocella gracilis Balss, 1914: 33, figs. 16–22. — Kemp, 1925: 278–279. — Johnson, 1961: 47. — Hayashi and Miyake, 1968: 12, fig. 1. — Chace, 1985: 11.

Material examined. 1 spec., Stn. T/5, Mirs bay, 22°27.6'S, 114°22.4'E, 20 m, trawl, 3 April 1986, coll. P. Shin, NTM Cr.003800.

Remarks. Not previously recorded from Hong Kong. The single example has a damaged abdomen and its sex cannot be determined. It shows no significant difference from earlier descriptions.

Distribution. Reported from Andaman and Nicobar Islands, Singapore, Indonesia, Philippines and Japan.

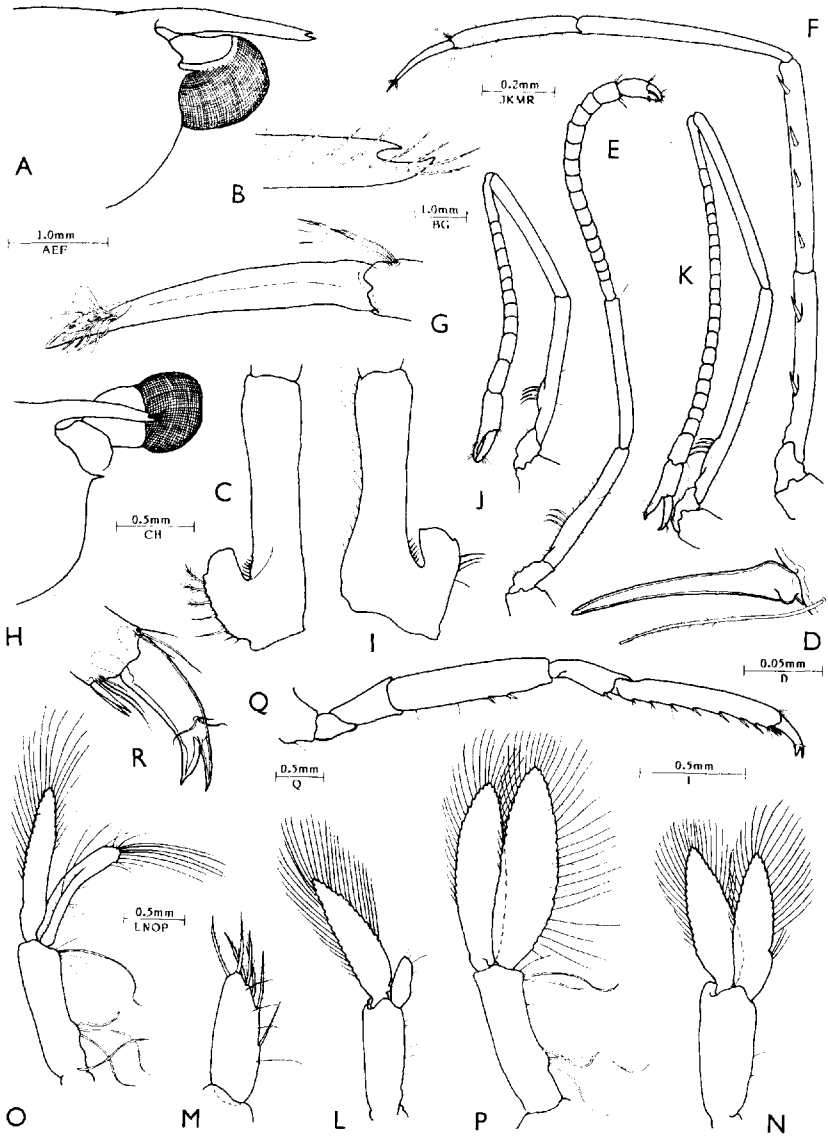


Figure 17. *Processa* sp. A. female. A, anterior carapace and rostrum; B, tip of rostrum; C, antennular peduncle, proximal segment, slightly oblique; D, same, proximo-lateral seta; E, second pereiopod; F, third pereiopod; G, same, dactyl. *Processa* sp. B. male. H, anterior carapace and rostrum; I, antennular peduncle; J, second pereiopod, (?); K, same, ?. *Synalpheus hastilicrassus* Coutière. L, male first pleopod; M, same, endopod; N, same second pleopod; O, female first pleopod; P, female second pleopod. *Synalpheus iocosta* De Man. Q, third pereiopod; R, same, dactyl.

Crangonidae Haworth, 1825

Philocheras lowisi (Kemp)

Pontophilus lowisi Kemp, 1916: 356 (key), 361–367, fig. 2, pl. 8. — De Man, 1920: 253 (table), 263 (key).

Material examined. 1 ovig. ♀. Stn. T/2, Mirs Bay, 22°28.8'E, 114°23.1'E, 21 m, trawl, 5 April 1986, coll. A. Hirayama, NTM Cr.004563.

Remarks. Not previously recorded from Hong Kong. The single example agrees with Kemp's description. It has a total body length of c. 8.4 mm, but the tip of the telson is lacking, and a postorbital carapace length of 2.05 mm. Kemp suggest that it is the smallest known macruran but some hippolytid shrimps, such as *Thorella cobourgi* Bruce (1983) appear to be even smaller. The undeveloped ova of the present specimen, only two in number, have a length of 0.4 mm, similar to Kemp's material.

Distribution. Known only from the original material collected in the Andaman Islands.

Stenopodidae Claus, 1872

Microprosthema validum Stimpson

Restricted synonymy. *Microprosthema valida* Stimpson 1860: 114. *Microprosthema validum* — Holthuis, 1946: 50, pl. 3, fig. 4. — Baba, Nakasone and Takeda, 1968: 174–177, fig. 1. — Saint Laurent, 1981: 167–169, fig. 7.

Material examined. (i) 1 spec., Mirs Bay, 22°29.5'N, 114°18.5'E, 3–4 m, 13 April, 1986, coll. G. Oliver, NTM Cr.003935. (ii) 1 male, 1 female, Chek Chau, Mirs Bay, in rubble, 14 April 1986, coll. P. Hutchings, NTM Cr.003942. (iii) 2 male, 2 female, Peng Chau, Mirs Bay, depth?, 15 April, 1986, collector?, NTM Cr.003954. (iv) 1 spec., Long Harbour, Mirs Bay, 3 m, in rubble, 17 April 1986, coll. divers, NTM Cr.003996.

Remarks. Not previously recorded from Hong Kong. Three lots of specimens (ii–iii) were found as associated male–female pairs. Habitat apparently in silty rocky or coral rubble. I am grateful to Dr J. Goy for confirming the identification of these specimens, as several closely related species appear to be present in the Indo–West Pacific region.

Distribution. Type locality, Amami Island, Japan. Also known from Jibouti, Mauritius, Chagos Archipelago, Malaysia, Indonesia, Philippines, Ryukyu Islands, north and eastern Australia.

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ADDENDUM

Prionalpheus mortoni sp. nov.

Prionalpheus sp., aff. *triarticulatus* vide supra, p. 628.

Subsequent to the completion of this contribution, a further search of preserved material revealed the existence of three of the first pereopods that could safely be attributed to the specimens of this taxon described above. Two of these, which appear to constitute a natural pair (the third being rather softer) are illustrated in Figure 18, but it is not certain to which specimen they belong.

The appendages show a close general resemblance to the illustration of a first pereopod of the holotype specimen of *P. triarticulatus* provided by Banner and Banner (1960), but are distinctly more robust. The chelae are subequal and similar, with the dactylus positioned ventrally when *in situ*. The palm is about 1.6–1.75 times longer than deep, moderately compressed, with the ventral margin rather irregular, with numerous long simple setae. The dactylus is simple, equal to about 0.5 of the palm length, 5.0 times longer than the proximal depth, with a strong distal tooth; the cutting edge is entire, laterally situated, and the dorsal border is densely provided with short setulose setae. The fixed finger is rather broader proximally, with a well developed lateral cutting edge, feebly dentate, with a distinct groove medially into which the dactylar cutting edge will oppose, with a distal notch lateral to the terminal tooth. The surface of the fixed finger medial to the groove is densely provided with scattered, short, lateral setae and small groups of longer medial setae, both simple. The carpus is short and stout, distally feebly excavate, and sparsely setose. The merus is about 2.2 times longer than the distal width, unarmed, except for three strong spines along dorsal margin, ventral margin deeply excavate. The ischium is short and stout, about 0.6 of the merus length, with a single distolateral spine.

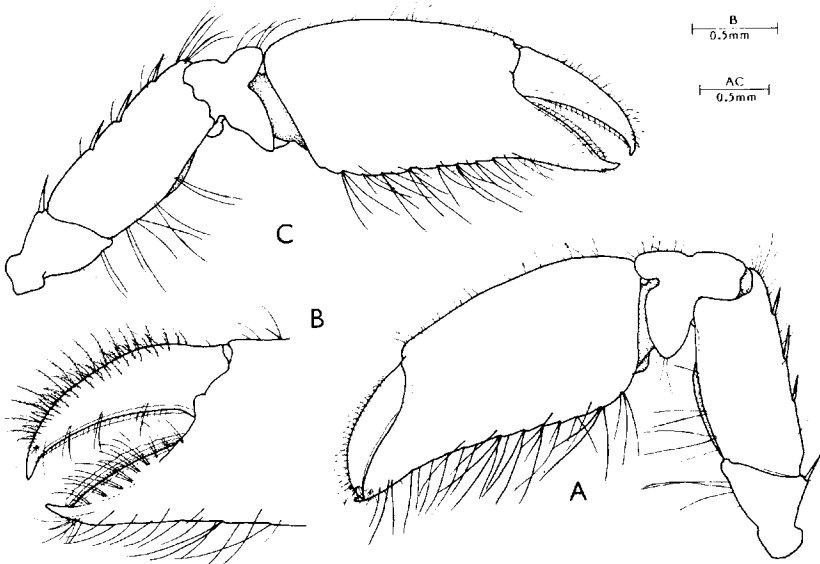


Figure 18. *Prionalpheus mortoni* sp. nov., type material. A, left first pereopod; B, right first pereopod; C, same, fingers of chela.

In *P. triarticulatus* s. str., the fingers of the first pereiopod are subequal to the palm length, apparently without a groove medially to the cutting edge of the fixed finger and without lateral spines on the merus and ischium. Combined with the morphological differences noted above, the differences between the present chelae and that of the Fijian type specimen indicate that the Hong Kong specimens are sufficiently different to justify their placement in a separate taxon. The specimens are therefore named *Prionolpheus mortoni* sp. nov., in honour of Professor B. Morton, and the male specimen is designated as the holotype.