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REDESCRIPTIONS OF FIVE HONG KONG CARIDEANS FIRST DESCRIBED BY WILLIAM STIMPSON, 1860

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ABSTRACT

Five species of caridean shrimp, *Palaemon serrifer*, *Athanas dorsalis*, *Ogyrides orientalis*, *Tozeuma lanceolatum* and *Lysmata vittata*, all first described by William Stimpson, 1860, from Hong Kong and adjacent waters, are redescribed and illustrated. The detailed manuscript descriptions and illustrations prepared for publication by Stimpson, together with the specimens, including the type material, were all destroyed in the 1871 Chicago fire. A neotype is designated for *Athanas dorsalis* (Stimpson) and a stridulating function is also suggested for the unusual ventral telsonic ridges in the genus *Ogyrides*, in conjunction with a knob-like plectrum on the protopodite of the uropod.

INTRODUCTION

In March 1854, the ships of the North Pacific Exploring Expedition, consisting of U.S. naval sloop *Vincennes* and the brig *Porpoise*, accompanied by the steamer *John Hancock*, the schooner *James Fennimore Cooper* and the storeship *John Pendleton Kennedy*, arrived in Hong Kong, where they stayed for some six months. During this time collections of crustaceans were made, principally by William Stimpson, aboard the *Vincennes*, in the waters around Hong Kong and up to Taiwan. Subsequently, more northerly regions of the Pacific Ocean were explored. The extensive collections were sent to the Smithsonian Institution, Washington, on the completion of the expedition, where Stimpson was Curator of the invertebrate collection. In 1865, Stimpson became Secretary of the Chicago Academy of Sciences and the Smithsonian Institution collection of crustacea was transferred to Chicago so that he could continue his studies of the material collected. The whole crustacean collection, together with most of the associated manuscripts in preparation and drawings, was lost when the Academy of Sciences was destroyed in the great Chicago fire in 1871 (Deiss and Manning, 1981).

Little survived the Chicago fire. In 1860, Stimpson had published preliminary descriptions of many of the shrimps collected, with designations of many new genera (Stimpson, 1860). The descriptions were brief, in Latin and unillustrated, and many have proven difficult to recognize, particularly as virtually all the material collected was destroyed. Recently, some of the material studied by Stimpson has been discovered in other institutions, particularly the British Museum (Natural History), as syntypes of some

species had been distributed (Evans, 1967), but the vast majority of the shrimps described are not represented by any type material.

The present report provides illustrated redescrptions of five species of caridean shrimp first recorded by Stimpson from Hong Kong or adjacent waters, collected during the Second International Marine Workshop, held at Wu Kai Sha on Tolo Channel during April 1986. Collections were made mainly in the region of Tolo Channel and in Mirs Bay. The specimens are deposited in the collection of the Northern Territory Museum, Darwin, Australia.

Palaemon serrifer Stimpson
(Figures 1–6)

Restricted synonymy. *Leander serrifer* Stimpson, 1860: 41, *Palaemon serrifer* — Rathbun, 1902: 52. — Kemp, 1925: 305. — Holthuis, 1950, 83–86, (full synonymy).

Material examined. (i) 2 ovig. female, 2 male, Wu Kai Sha, intertidal, 6 April 1986, coll. A.J. Bruce, NTM Cr.003815. (ii) 17 (8 male, 8 ovig. female, 1 female) Wu Kai Sha, intertidal, 8 April 1986, coll. A.J. Bruce, NTM Cr.003850. (iii) 3 (1 male, 2 ovig. female) Wu Kai Sha, intertidal, 10 April 1986, coll. A.J. Bruce, NTM Cr.003807. (iv) 3 male, Wu Kai Sha, intertidal, 11 April 1986, coll. A.J. Bruce, NTM Cr.003905.

Description. A small robust palaemonid shrimp of subcylindrical body form. Carapace smooth, glabrous. Rostrum well developed, slightly exceeding antennular peduncle, subequal to postorbital carapace length in females, slightly longer in males, horizontal, straight in males, slightly upturned distally in some females, dorsal carina well developed with 8–13 evenly spaced acute teeth, with first two teeth posterior to the level of the posterior orbital margin, first seven teeth articulated or partially articulated, distal tooth smaller than proximal teeth, ventral carina well developed, deeper than dorsal, with three or four acute teeth, largest proximally, size decreasing distally, lateral carinae distinct, feeble, interstices between dorsal and ventral teeth with median plumose setae, proximal ventral carina with double row of ventrolateral plumose setae. Seventeen specimens (65%) had a rostral dentition of 2+8–9/3–4. Epigastric spine distinct, feebly articulated, at about 0.25 of postorbital carapace length. Orbit feebly developed, inferior orbital angle broadly produced, blunt; antennular spine well developed, marginal, exceeding inferior orbital angle; antennular spine robust, marginal, immediately below short branchiostegal groove; anterolateral angle of carapace not produced, blunt.

Abdominal segments smooth, glabrous; sixth segment about 1.5 times longer than fifth, 1.5 times longer than deep, compressed, posterolateral and posteroventral angles acutely produced; first to third segments with acute median ventral tooth in male, absent in female; pleura of first three segments broadly rounded, enlarged in females, fourth and fifth slightly produced, angular, not acute.

Telson about 1.2 times sixth abdominal segment length, narrow, ventrally strongly concave, tapering, about 3.7 times longer than anterior width, lateral borders feebly convex, dorsal surface convex with two pairs of small spines at about 0.55 and 0.75 of telson length, posterior telson margin about 0.35 of anterior telson width, angular, with conspicuous setose median point, lateral spines subequal to dorsal spines, intermediate spines well developed, 4.0 times longer than lateral spines, about 0.22 of telson length, submedian setae slender, ventral to median point, subequal to intermediate spine length, densely setulose.

Antennular peduncle slightly exceeded by both rostrum and scaphocerite, proximal segment about 2.2 times longer than central width, uniform, with anterolateral margin

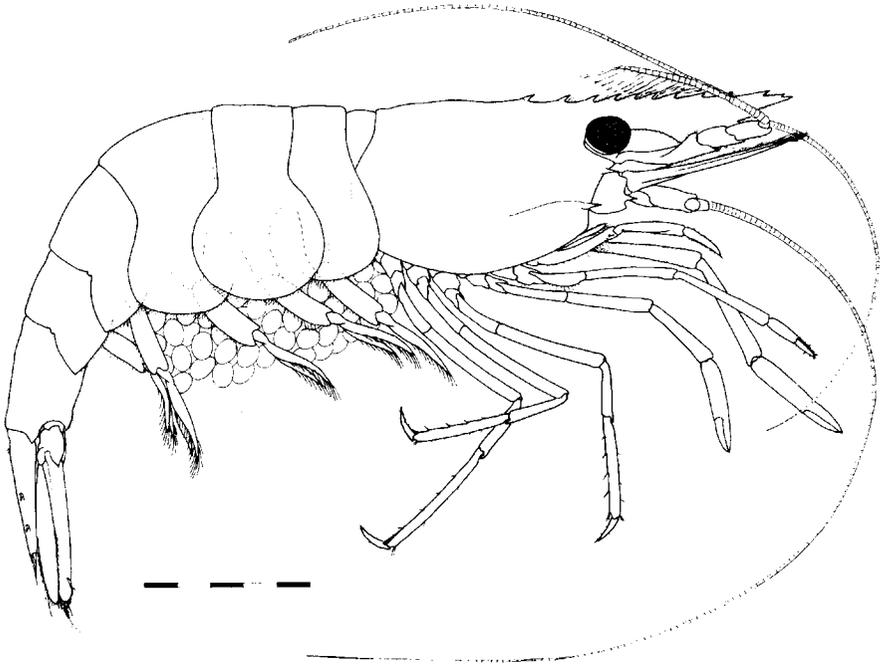


Figure 1. *Palaemon serrifer* Stimpson, ovigerous female, Mirs Bay, Hong Kong. Scale bar in millimetres.

produced, with acute distolateral tooth, exceeding distal lobe, stylocerite well developed, slender, acute, reaching about 0.5 of segment length, medial margin with small ventral tooth at midlength; statocyst well developed with granular statolith; intermediate segment about 1.5 times longer than wide dorsally, 0.3 of proximal segment length, lateral margin feebly expanded, medial and lateral borders setose, obliquely articulated with distal segment; distal segment about 2.5 times longer than wide dorsally, about 0.5 of proximal segment length, non-setose; upper flagellum biramous, rami fused for about 8–10 proximal segments, short free ramus stouter, about 14–20 segments, twice length of fused portion, bearing about 25–40 groups of aesthetascs, longer free ramus slender, filiform, about 3.5 times length of short ramus; lower flagellum slender, filiform, about 0.7 of longer upper ramus length.

Antenna with stout basicerite with large acute ventrolateral tooth; carpocerite short and stout, about 2.4 times longer than wide, compressed, reaching to about 0.36 of scaphocerite length, flagellum well developed, about 4.5 times postorbital carapace length; scaphocerite exceeding antennular peduncle, subequal to or slightly exceeded by rostral length, about 4.0 times longer than broad, greatest width at 0.25 of length, tapering distally to broadly produced bluntly angular anterior lamina, slightly exceeding strong distolateral tooth.

Eye with large globular cornea with conspicuous dorsal accessory pigment spot, stalk about as long as wide dorsally, length about 0.8 of corneal diameter.

Epistome with small "bec ocellaire". Mandible (right) with slender three segmented palp, proximal segments subcylindrical, subequal, distal segment 2.0 times proximal segment length, tapering, about 5.0 times longer than proximal width, with four simple setae distally; molar process robust, distally truncate, with three large blunt teeth,

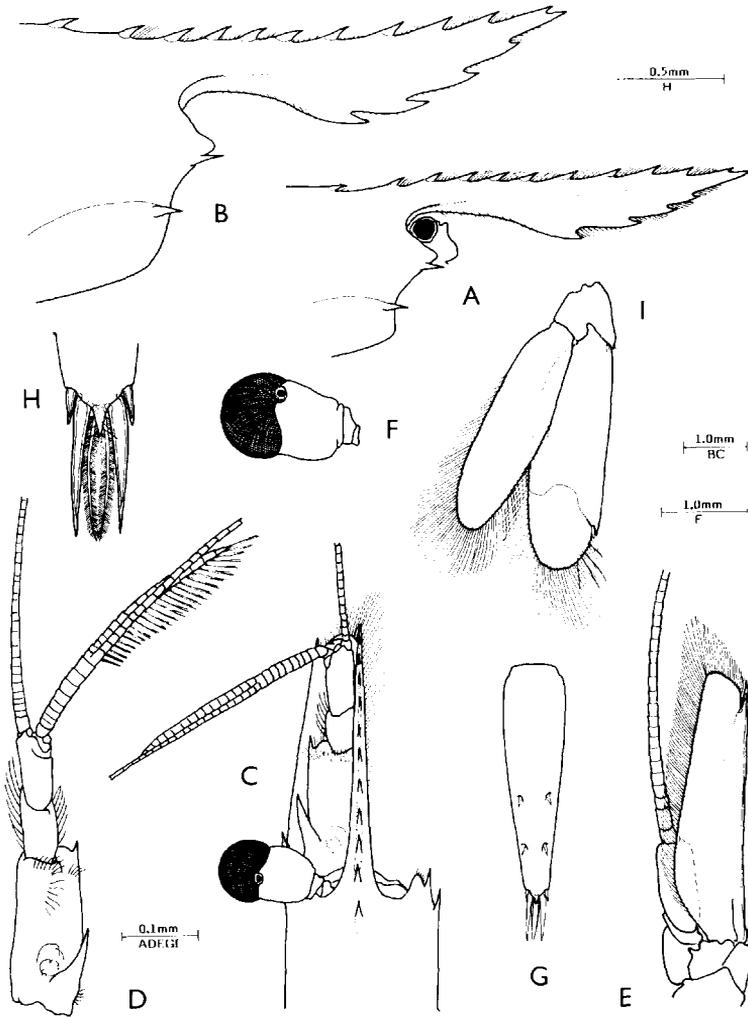


Figure 2. *Palaemon serrifer* Stimpson. A, anterior carapace and rostrum, male, lateral; B, same, female; C, anterior carapace, antennae, dorsal, male; D, antennule; E, antenna; F, eye, dorsal; G, telson; H, same, posterior spines; I, uropod.

sparsely setose; incisor process well developed, obliquely truncate distally with four acute teeth, outer teeth larger than inner. Maxillula with feebly bilobed palp, upper lobe small, lower lobe large with small hooked seta ventrally and single short simple seta; upper lacinia curved, not expanded, with about 15 simple spines distally, dorsal row spines larger than ventral spines; lower lacinia, short, tapering with numerous spiniform setae distally. Maxilla with short, simple, tapering, non-setose palp; basal endite well developed, deeply bilobed, upper lobe slightly larger than lower, both with numerous short simple setae distally; coxal endite obsolete; scaphognathite broad, about 2.7 times longer than wide, anterior lobe slightly emarginate medially, posterior lobe slightly longer than anterior lobe width, about 2.3 times longer than wide. First maxilli-

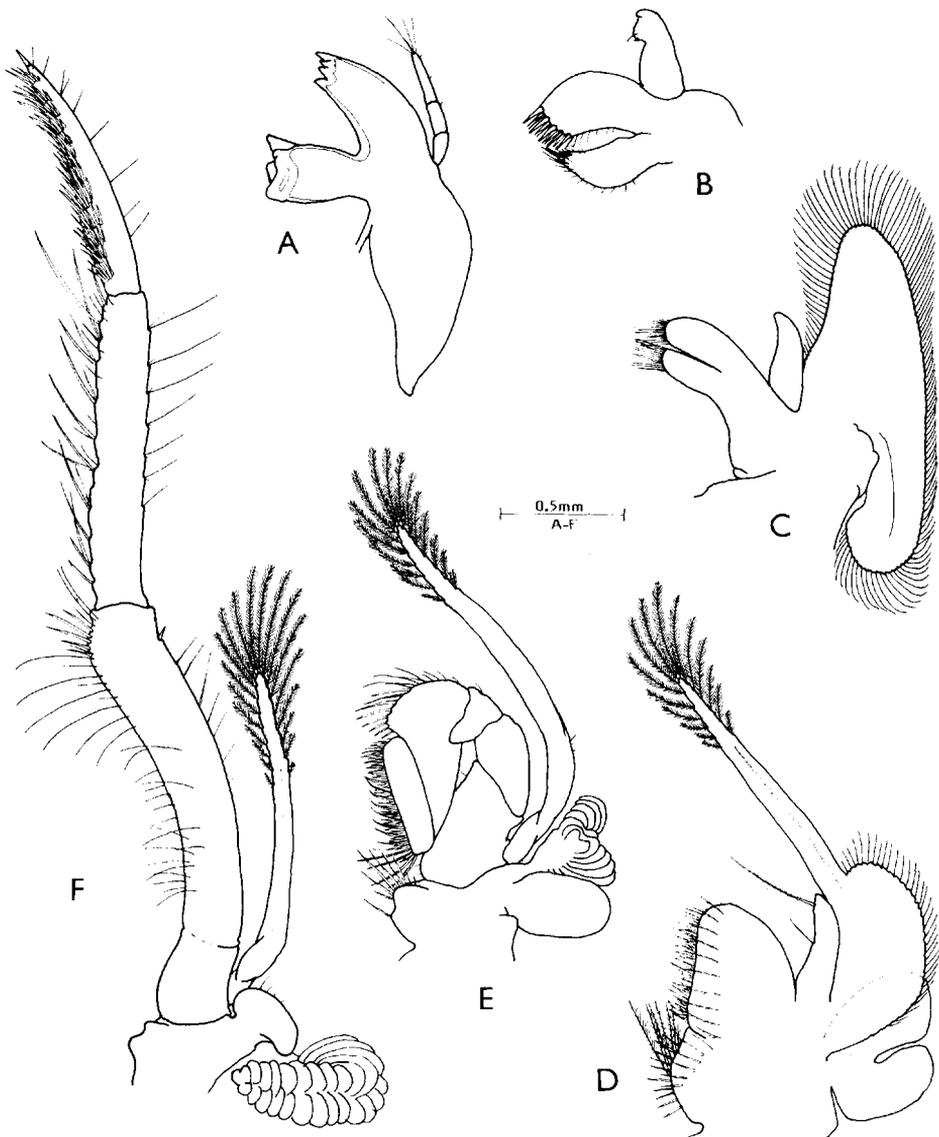


Figure 3. *Palaemon serrifer* Stimpson. A, mandible; B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped.

ped with tapering palp with long preterminal plumose seta and short, simple medial seta; basal endite broad, densely setose medially, with finely serrulate setae; exopod well developed with broad caridean lobe, distal third of flagellum with numerous long plumose setae; coxal endite broadly convex with central group of long coarsely setulose setae ventrally and shorter row of short spiniform setae dorsally, with deeply bilobed epipod laterally. Second maxilliped of normal form, dactylar segment narrow, about 4.0 times longer than broad dorsally, densely spinose medially, with coarsely serrulate spines; propod with about 10 strong ventral marginal spines; with long slender feebly

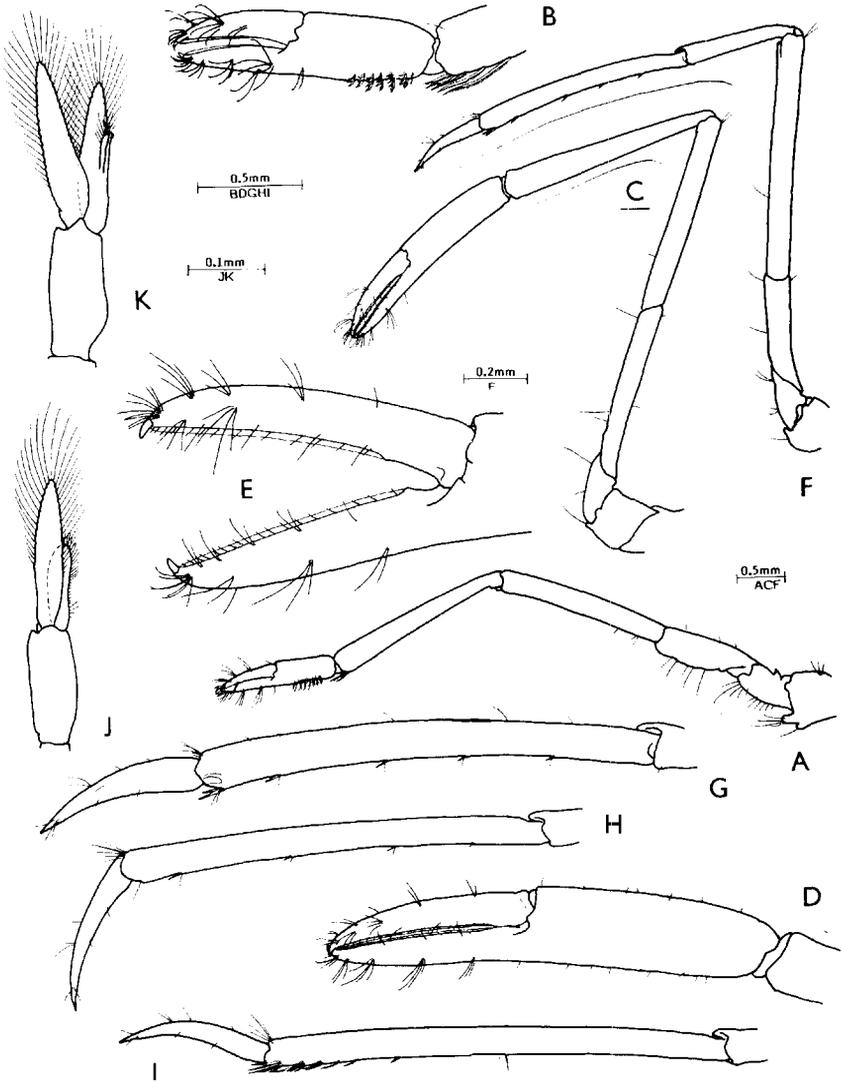


Figure 4. *Palaemon serrifer* Stimpson. A, first pereiopod; B, same, chela; C, second pereiopod; D, same, chela; E, same, fingers; F, third pereiopod; G, same, propod and dactyl; H, fourth pereiopod, propod and dactyl; I, fifth pereiopod, propod and dactyl; J, male first pleopod; K, male second pleopod.

serrulate spines distomedially; propod with about 10 strong marginal spines; carpus, ischiomerus and basis without special features, exopod as first maxilliped, lacking caridean lobe; coxa medially produced with numerous spiniform setae, with small oval epipod laterally bearing well developed podobranch. Third maxilliped with endopod slender, exceeding carpocerite by half distal segment length, ischiomerus and basis almost fully fused, junction indicated by medial and lateral notches, combined segment strongly bowed, uniform, about 6.5 times longer than central width, numerous slender

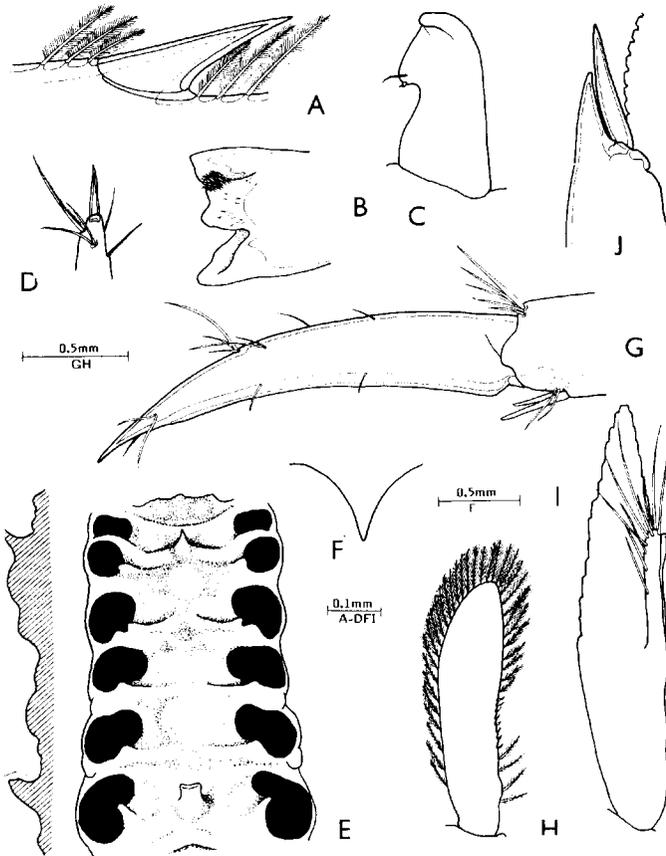


Figure 5. *Palaemon serrifer* Stimpson. A, fourth dorsal rostral tooth; B, molar process, right; C, maxillular palp; D, endopod of third maxilliped, terminal spine; E, thoracic sternites and median profile; F, fourth thoracic sternite, median process; G, third pereiopod, dactyl; H, male first pleopod, endopod; I, male second pleopod, endopod.

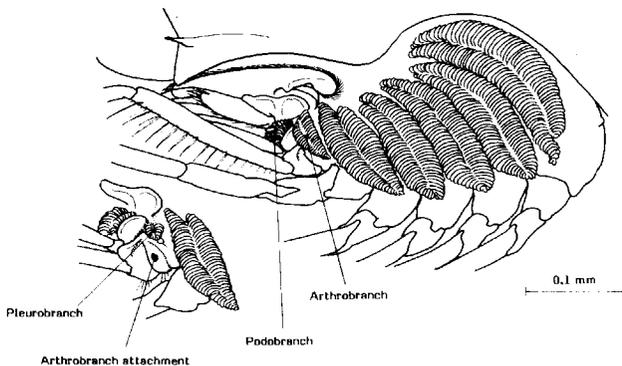


Figure 6. *Palaemon serrifer* Stimpson. Left branchiae, with detail of third maxilliped with arthrobranch removed.

setae medially, with group of 5–6 spiniform distolateral setae; penultimate segment about 0.7 of antepenultimate segment length, 6.0 times longer than wide, uniform, numerous setae laterally and spiniform setae medially; distal segment tapering, with small stout distal spine, about 0.8 of penultimate segment length, sparsely setose laterally, with numerous transverse rows of short densely serrulate spines medially; coxa feebly produced medially, non-setose, with oval lateral plate and well developed arthrobranch and small pleurobranch laterally.

Thoracic sternites moderately broad, fourth with broad, acute triangular tooth in both sexes, eighth with conspicuous blunt, peg-like median process in male only.

First pereiopods subequal, similar, slender, exceeding carpopocrite by chela and half carpus; chela subcylindrical, slightly compressed, about 2.1 times longer than deep, with about six transverse groups of short curved serrulate cleaning setae proximoventrally, fingers about 0.9 of palm length, with small acute hooked tips, dactylus about 4.0 times longer than proximal depth, with entire cutting edge over distal 0.7 of length, unarmed, with numerous groups of serrulate setae; fixed finger similar; carpus 1.6 times chela length, 8.0 times longer than distal width, tapering proximally, unarmed, with several long serrulate cleaning setae distoventrally; merus about 0.9 of carpus length, 8.0 times longer than central width, uniform, unarmed; ischium 0.5 of carpus length, 3.0 times longer than broad, medial margin carinate, setose; basis short, 0.33 of carpus length, medially setose; coxa with distoventral and ventral setose processes, without exopod or epipod.

Second pereiopods subequal, similar, moderately slender, exceeding scaphocerite by length of chela; palm of chela subcylindrical, about 3.2 times longer than deep, smooth, glabrous, fingers slender with short hooked tips, dactyl about 5.0 times longer than width at base, cutting edge sharp over distal 0.8 of length, entire, unarmed, with groups of setae and short bristle-like setae along cutting edge; fixed finger similar; carpus subequal to chela, about 8.5 times longer than distal width, tapered proximally, unarmed; merus about 0.95 of carpus length, 9.5 times longer than distal width, uniform, unarmed; ischium 0.9 of merus length, about 9.0 times longer than distal width, uniform, unarmed, sparsely setose; basis short, about 0.4 of ischium length, without special features; coxa robust, with very small distoventral process.

Third pereiopods moderately slender, extending to tip of scaphocerite; dactyl slender, simple, without distinctly demarcated unguis, about 5.5 times longer than proximal width, slightly curved, ventral, margin concave, sharp, corpus with paired distodorsal setae, dorsal setae at 0.6 of dorsal length, with scattered dorsolateral and ventrolateral setae; propod about 2.6 times dactyl length, uniform, about 13.0 times longer than distal width, with two short simple distoventral spines and four small separate ventral spines, distodorsal margin sparsely setose with group of short spiniform setae distally; carpus 0.5 of propod length, about 6.0 times longer than distal width, tapered proximally, unarmed; merus about 1.1 times propod length, uniform, about 8.5 times longer than distal width, slightly widened distally, unarmed; ischium subequal to carpus or half propod length, about 4.6 times longer than distal width, unarmed; basis about 0.6 of ischium length, normal; coxa with small distoventral process.

Fourth pereiopod similar to third, propod slightly shorter and more slender, with more feeble ventral spinulation. Fifth pereiopod also similar to third, propod subequal in length, more slender, with five transverse rows of serrulate setae distolaterally, one or two small ventral spinules only.

Male first pleopod with basipodite about 2.4 times longer than broad; exopod 1.2 times length of basipodite, 5.0 times longer than broad, with numerous densely plumose marginal setae; endopod about 0.6 of exopod length, 4.3 times longer than broad, distally rounded, proximal fourth of medial border with four short plumose

setae, second fourth with eight small curved spinules, distal half and most of lateral margin with numerous short plumose setae. Second pleopod with basipodite about 2.3 times longer than broad; exopod about 1.2 times basipodite length, 4.3 times longer than broad, with numerous densely plumose marginal setae; endopod about 0.9 of exopod length, appendices at 0.4 of medial margin length, appendix masculina slightly exceeding appendix interna, subcylindrical, 7.0 times longer than wide, with five lateral and five distal long simple setae; appendix interna with few distal concinni only.

Uropod distinctly exceeding telson spines; protopodite with acute distolateral lobe; exopod about 3.3 times longer than wide, greatest width centrally, lateral border straight with submarginal row of short setae ventrolaterally, posterolateral tooth acute with longer mobile spine medially, diaeresis well marked; endopod about 0.9 of exopod length, 3.6 times longer than broad.

Ova numerous and small, length *c.* 0.75 mm.

Measurements. Male: total length (approx.) 22.0 mm; carapace and rostrum, 8.3 mm; postorbital carapace, 3.7 mm; left second pereopod chela 2.0 mm, right 2.3 mm. Female: total length (approx.) 28.0 mm; carapace and rostrum, 14.3 mm; postorbital carapace, 7.4 mm; left second pereopod chela, 4.70 mm, right, 4.75 mm. Male, 3.6–4.8 mm postorbital carapace length. Female, 5.3–7.4 mm.

Colouration. Generally transparent with pattern of orange, white and black patches, spots and rows. Gastric region and dorsal carapace heavily speckled with small dark brown dots, with yellow-white spots in submedian postfrontal and postantennal positions; conspicuous lines of black dots obliquely across branchiostegite from antennal angle and centrally, with white spots in interspaces. Abdomen with transverse dorsal rows of dark brown dots on anterior and posterior margins of first segment, posterior second and third segments, feebly indicated rows on fourth and fifth segments, with scattered yellow-white dots dorsally on first, central on second and third segments, posteroventral angle of sixth, orange; first pleura with vertical stripe of black dots, oblique stripes across second and third, interspaces with scattered white dots, fourth and fifth similar, less marked. Antennal peduncle with distal white spot, proximal segment with distomedial white spot; scaphocerite with central longitudinal row of white dots with line of black dots along inner margin; antennal flagella orange red. Second pereopods with conspicuous orange patches proximal to dactylar hinge, at distal ends of carpus, merus and ischium, with group of purple-black dots proximal to dactylar hinge, at 0.25 and 0.70 of carpal length, 0.8 of meral length. First pereopod similar but less marked. Ambulatory pereopods with orange patches at distal ends of carpus and merus. Pleopods with lateral line of black along basipodite, with row of white posteriorly. Caudal fan with orange patch proximally to diaeresis of exopod. Ova olive green.

Remarks. The morphology agrees closely with previous descriptions, particularly those of Kemp (1925) and Holthuis (1950), although in the latter's Indonesian specimens the rostrum had up to 16 dorsal and 5 ventral teeth. The colour pattern also corresponds closely to the colour illustration provided by Chan and Yu (1985). *Palaemon serrifer* has been reported from the west coast of India to Indonesia, Taiwan, Japan, as far north as Vladivostok (Holthuis, 1950). *Palaemon pacifus* Stimpson, was also first reported from Hong Kong but no specimens were collected in 1986 that could be referred to that species, which can be distinguished by a longer rostrum than in *P. serrifer*, with the distal portion bearing two small subapical teeth. Similarly, no specimens were found referable to *Leander longicarpus*, first reported by Stimpson from Hong Kong and now referred to *Palaemon cincinnus* Dana (Holthuis, 1950).

Athanas dorsalis (Stimpson)
(Figures 7–12)

Restricted synonymy. *Arete dorsalis* Stimpson, 1860: 22. *Athanas dorsalis* — Banner and Banner, 1960: 151, fig. 5–6.

Material examined. (i) 3 ♀, Cape D'Aguilar, Hong Kong Island, 1 m, rocky headland, 11 April 1986, coll. A.J. Bruce, NTM Cr.003895. (ii) 1 female, 2 juv., S/598; 1 female, S/599; 1 male, S/60 S/600; 2 male, 1 female, 1 juv., S/602; 1 male, S/605, St. Stephen's Beach, Hong Kong, 16 September 1983. (iii) 1 male, 1 ovig. female, 1 juv., S/670, same, 18 October, 1983.

Description. Small robust alpheid shrimp of subcylindrical, slightly compressed body form.

Carapace smooth, glabrous. Rostrum short, about 0.25 of postorbital carapace length, triangular, slightly depressed, unarmed, acute in lateral view, dorsally convex, without carina, about 1.8 times longer than width at base, lateral borders feebly convex, with convex lower margin, reaching to middle of third segment of antennular peduncle, without orbitrostral process; orbit simple, with well developed triangular lateral corneal tooth only; anterolateral angle of branchiostegite not produced, bluntly rounded; cardiac notch distinct.

Abdominal segments smooth, glabrous; fifth sternite without median process, with transverse bar between bases of pleopods; sixth sternite with large triangular plate projecting posteriorly between bases of uropods; pleura of first three segments broadly rounded, fourth slightly produced, rounded, fifth bluntly angular; sixth segment about 1.3 times length of fifth, 0.9 times longer than deep, with articulated triangular plate at posteroventral angle, posterolateral angle produced, acute.

Telson almost 2.0 times sixth abdominal segment length, about 1.6 times longer than anterior width, lateral margins feebly convex, convergent, posterior margin about 0.4 of anterior width; two pairs of small submarginal dorsal spines at 0.7 and 0.8 of telson length; posterior margin convex, without median point, with about 16 long plumose

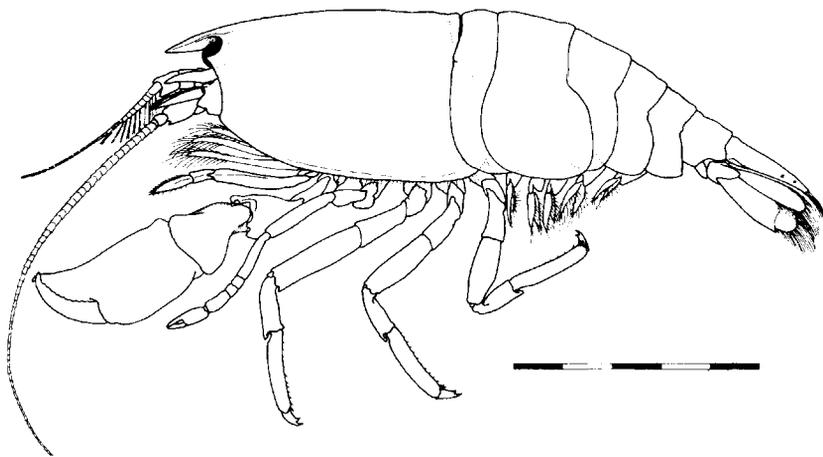


Figure 7. *Athanas dorsalis* (Stimpson), female, Cape D'Aguilar, Hong Kong. Scale bar in millimetres.

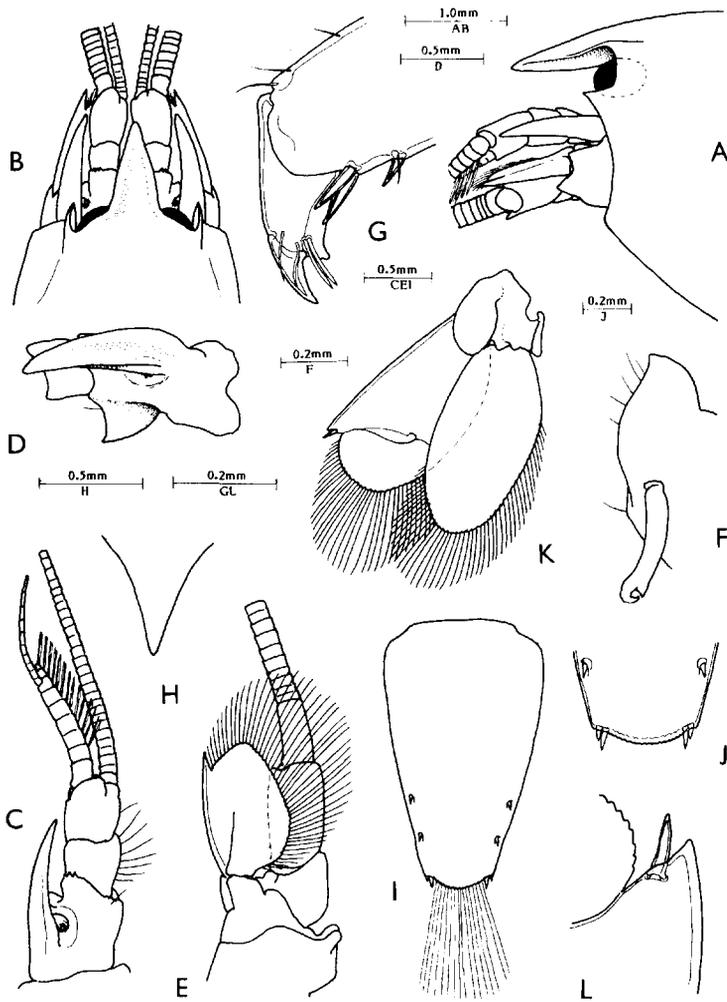


Figure 8. *Athanas dorsalis* (Stimpson), female, Cape D'Aguiar. A, anterior carapace, eye, antennal peduncles, lateral; B, same, dorsal; C, antennule; D, same, proximal peduncular segment, lateral; E, antenna; F, third maxilliped, lateral; G, third pereiopod, dactyl, lateral; H, sixth abdominal segment, posteroventral process; I, telson; J, same, posterior spines; K, uropod; L, same, posterolateral angle of exopod.

marginal setae, with two pairs of posterolateral spines, very small lateral spine and larger medial spine; anal tubercle absent.

Antennular peduncle distinctly exceeding rostrum by half length of distal segment, reaching to level of distal scaphocerite; proximal segment about as broad as long, obliquely articulated distally, with 2–3 small acute denticles on distodorsal margin; ventromedial margin with very large acute distally directed tooth; statocyst well developed; stylocerite very robust, slender, acute, reaching to about middle of distal segment of peduncle; intermediate segment about as wide as long, medially setose; distal segment about 1.1 times longer than wide, 1.2 times intermediate segment length;

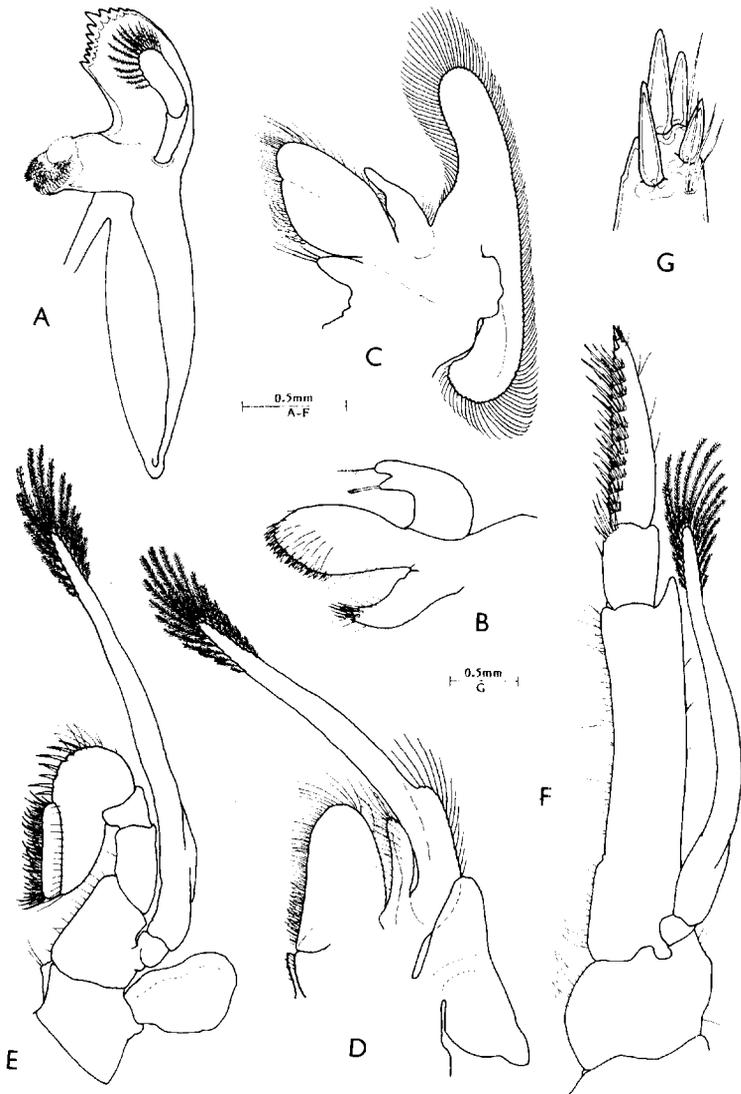


Figure 9. *Athanas dorsalis* (Stimpson), female, Cape D'Aguliar. A, mandible (left); B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped; G, same, distal spines of terminal segment, dorsal.

upper flagellum short, feebly biramous, rami fused for seven proximal segments, stout, shorter free ramus with two segments, longer ramus with 10 slender segments, equal to about 0.75 of postorbital carapace length, about 13 groups of aesthetascs present.

Antenna with stout basicerite with broad triangular ventrolateral tooth distally; carapocerite robust, about 1.9 times long than broad, subcylindrical, flagellum well developed, about 3.0 times postorbital carapace length; scaphocerite about subequal to antennular peduncle, lateral border convex with strong distolateral tooth, lamina broad, about 1.5 times longer than broad, distal margin produced, bluntly angular, slightly exceeding distolateral tooth.

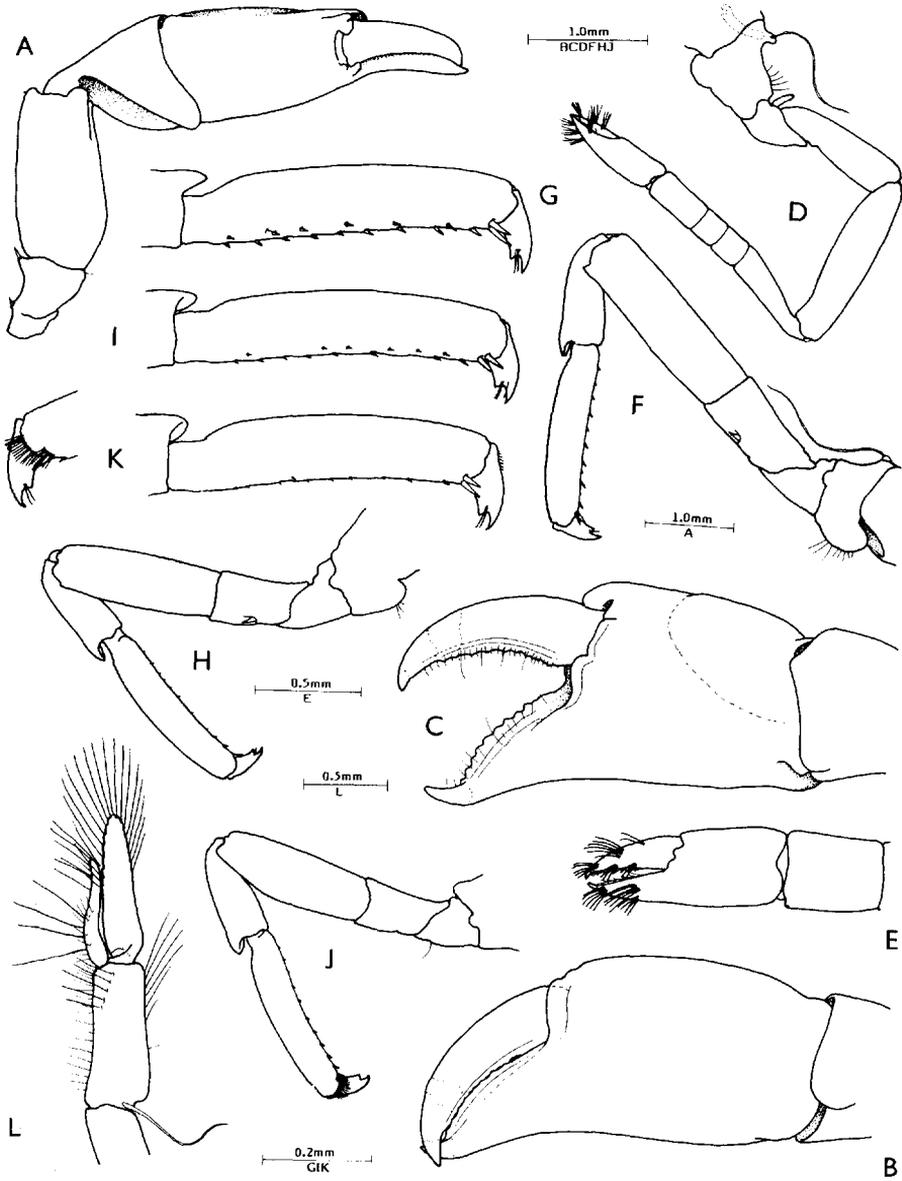


Figure 10. *Athanas dorsalis* (Stimpson), female, Cape D'Aguilar. A, right first pereiopod; B, same, chela, lateral; C, same, left chela, medial; D, second pereiopod; E, same, chela; F, third pereiopod; G, same, propod and dactyl; H, fourth pereiopod; I, same, propod and dactyl; J, fifth pereiopod; K, same, propod and dactyl, medial, and distal propod and dactyl, lateral; L, first pleopod.

Eye with well pigmented globular cornea, partly concealed by dorsal margin of carapace.

Mandible (left) with slender corpus; molar process small, obliquely truncate distally, without conspicuous teeth; incisor process well developed, short and broad, distally

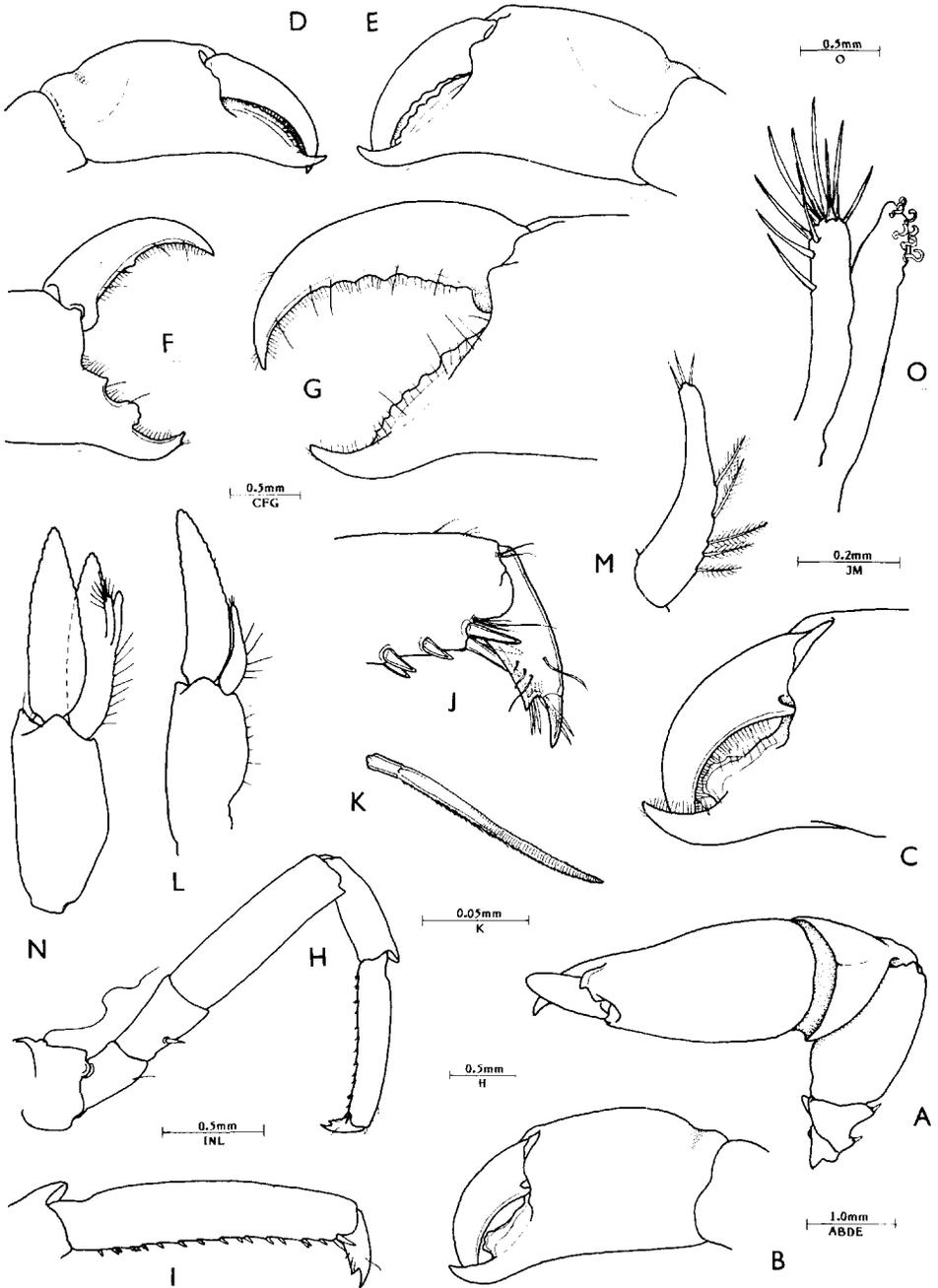


Figure 11. *Athanas dorsalis* (Stimpson), St. Stephen's Beach. A, major first pereiopod; B, same, chela, medial; C, same, fingers, medial; D, minor first pereiopod; E, major first pereiopod, chela, medial; F, major first pereiopod, fingers, lateral; G, major first pereiopod, fingers, medial; H, third pereiopod; I, same, propod; J, same, distal propod and dactyl; K, same, seta from medial side of dactylar corpus; L, first pleopod; M, same, endopod; N, second pleopod; O, same, appendix masculina and appendix interna; A-C, F, H-O, male. DEG, female.

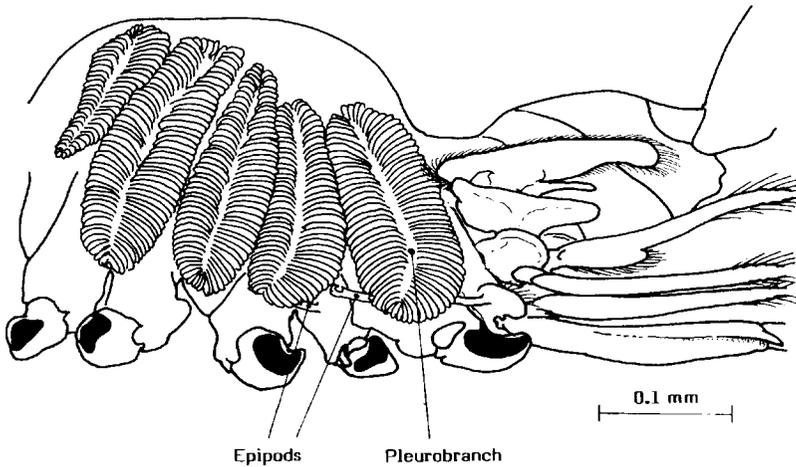


Figure 12. *Athanas dorsalis* (Stimpson), female, right branchial region, Cape D'Aguiar.

angulate with six acute teeth medially and four smaller teeth laterally; palp two segmented, proximal segment subcylindrical, glabrous, about 3.0 times longer than wide, distal segment flattened, about 2.7 times longer than wide, 1.3 times length of proximal segment, distomedial margins with numerous short plumose setae. Maxillula with bilobed palp, lobes subequal, upper lobe with slender feebly setulose seta, lower lobe with slender, distally serrulate spine; upper lacinia oval, about 2.0 times longer than wide with about 24 short distoventral spines and setae; lower lacinia slender, with several short spines distally. Maxilla with short tapering flattened palp with few short setae on central medial margin and short plumose setae on proximal lateral margin; basal endite well developed, broad, with median margin feebly notched, densely provided with short setae; coxal endite feebly produced, small, with three distal setae only; scaphognathite well developed, about 3.8 times longer than wide, anterior lobe 1.8 times longer than wide, medially emarginate and distally narrow, posterior lobe narrow, about 3.8 times longer than proximal width. First maxilliped with subcylindrical or flattened palp with numerous finely plumose setae medially; basal endite broad and elongated, 1.7 times longer than broad, medial and distal margins densely setose; coxal endite short, sparsely setose; exopod well developed, flagellum with small narrow caridean lobe proximally, distal fourth with numerous plumose setae; epipod large, triangular, about 2.5 times longer than broad. Second maxilliped with dactylar segment small, narrow, about 4.4 times longer than broad, densely spinose medially, spines mainly coarsely serrulate, simple distally; propod large, distally expanded, rounded, with 7 stout simple spines on medial margin and numerous setae; carpus and ischiomerus normal; basis with medial border feebly setose; exopod well developed, as first maxilliped but lacking caridean lobe; coxa feebly produced medially, process with two setae, with simple epipod without podobranch laterally. Third maxilliped robust, reaching to middle of carpcerite; ischiomerus and basis fused, junction indicated by small notch at 0.3 of medial margin, about 4.8 times longer than wide, uniform, with basal region slightly expanded medially.

medial margins sparsely setose, with strong acute distolateral process; penultimate segment about 1.5 times longer than broad, 0.16 of antepenultimate segment length, with transverse row of serrulate spines distomedially; terminal segment about 4.2 times longer than proximal width, tapering distally, tip with four strong spines distodorsally, medial surface with about 12 transverse rows of serrulate spines, lateral aspect sparsely setose; exopod well developed, as second maxilliped; coxa robust, medial margin convex, sparsely setose, laterally with well developed coxal plate, acutely pointed distally, with epipod on lateral aspect.

First pereopods in females with large, subequal, similar chelae, exceeding carpocerite by whole of chela. Palm smooth, moderately compressed, about 1.5 times longer than deep, uniform; dactyl robust, strongly curved with stout hooked tip, about 0.8–1.0 of palm length, 3.0 times longer than proximal depth, cutting edge lateral, feebly crenulate, about 12 small low denticulations, numerous setae; fixed finger similar, about 1.75 times longer than proximal width, tip more acute, denticulations more marked; carpus stout, distally excavate, about as long as wide, unarmed; merus robust, about 2.0 times longer than wide, wider proximally, distoventral angles rounded; ischium about 0.5 of merus length, about 1.2 times longer than wide, 2.0 times wider distally than proximally, lateral margin with strong mobile distal spine and smaller spine at 0.3 of lateral length; basis with rudimentary exopod; coxa robust, with epipod and setobranch with single seta.

First pereopods in males with large, subequal chelae; palm smooth, oval in section, moderately compressed, about 1.4 times longer than deep, without acute distolateral process; dactyl robust, strongly curved, with stout hooked tip, about 0.8 of palm length, 3.1 times longer than proximal depth, cutting edge strongly concave, unarmed or with one acute tooth, with row of finely serrulate setae over whole length; fixed finger shorter than dactylus, about 1.5 times longer than deep, with large irregular tooth at about mid-length, sometimes with small acute tooth proximally, with numerous setae along cutting edge; carpus, merus, ischium, basis and coxa as in female.

Second pereopods slender, subequal, slightly exceeding carpocerite; chela with palm subcylindrical, moderately compressed, about 1.4 times longer than deep, fingers about 0.9 of palm length, dactyl about 3.0 times longer than proximal depth, tapering to acute hooked tip, cutting edges lateral, entire over distal 0.6 of length, unarmed, finger with numerous groups or rows of coarsely serrulate setae; carpus about 2.0 times palm length, four segmented, in ratio of about 3:1:1:2; merus about 1.7 times chela length, about 4.4 times longer than width, widest centrally, unarmed; ischium about 0.75 of merus length, 3.5 times longer than distal width, tapered proximally, unarmed, obliquely articulated with basis; basis 0.5 of ischial length, with rudimentary exopod, half size of first pereopod exopod; coxa stout, ventral border with rounded swelling proximally, with epipod and setobranch.

Third pereopods moderately robust, third exceeding carpocerite by half length of propod; dactyl stout, compressed, about 2.5 times longer than proximal width, corpus about 1.9 times longer than proximal depth, tapering with stout curved, obliquely articulated unguis distally, 2.9 times longer than wide, ventral margin of corpus sharp with short acute accessory tooth distally, lateral corpus with pair of short flattened setae distally and simple seta distodorsally; propod about 4.2 times longer than dactyl, 5.0 times longer than central width, uniform, but narrowed proximally, with three stout distoventral spines, ventral margin with outer row of 9 short spines and inner row of six smaller spines; carpus about 0.6 of propod length, 2.6 times longer than distal width, tapered proximally, unarmed, with well developed distodorsal lobe; merus about 1.1 times propod length, 3.5 times longer than broad, distoventral margin broadly rounded with acute ventral tooth, otherwise unarmed; ischium about 0.6 of merus length, 2.0

times longer than distal width, slightly tapered proximally, with single ventrolateral spine, obliquely articulated with basis; basis short, about 0.6 of ischial length, unarmed, without exopod; coxa robust, with setobranch, without epipod, ventral margin forming rounded protuberance, fitting into precoxal (?) fossa.

Fourth pereiopod similar to third; propod very slightly shorter and more slender, with smaller ventral spines; merus with more feeble distoventral tooth; ischium with ventrolateral spine; coxa with smaller rounded ventral process, without epipod and setobranch.

Fifth pereiopod similar to fourth; propod subequal, with two distoventral spines and two transverse rows of short finely serrulate setae distolaterally, single ventral row of 9 minute spinulae only; merus without distoventral tooth; ischium without ventral spine; coxa without ventral process, epipod and setobranch.

Thoracic sternites narrow and unarmed.

Female first pleopod with basipodite about 2.2 times longer than proximal width, tapering slightly distally, lateral border with about six long setae distally, medial border sparsely setose, posterior surface with single ovigerous seta proximally, oblique row of five plumose setae distomedially; exopod normal, subequal to basipodite length, with numerous plumose setae on margins of distal half; endopod slender, sinuous, about 0.6 of exopod length, about 6.0 times longer than proximal width, with long plumose setae proximally, shorter setae distally. Male first pleopod with basipodite about 2.0 times longer than broad; exopod subequal to basipodite length, 4.0 times longer than wide; endopod about 0.5 of exopod length, tapering distally, laterally curved, about 4.0 times longer than proximal width, with three short simple spines distally, five short plumose setae proximomedially. Second pleopod with basipodite about 1.2 times length of first, 2.0 times longer than wide; exopod subequal to basipodite length, 3.3 times longer than wide; endopod subequal to exopod length, about 3.7 times longer than wide, appendices at 0.5 of medial margin length; appendix masculina corpus about 5.5 times longer than wide, 0.25 of endopod length, with about 10 simple distomedial spines; appendix interna slightly longer than appendix masculina, with few distal concinnuli.

Uropod with short protopodite, distolateral lobe large, rounded; exopod subequal to telson length, lateral border very feebly convex with small acute distal tooth with larger mobile spine medially, about 1.8 times longer than broad, with conspicuous diacresis; endopod subequal to exopod, 2.0 times longer than broad.

Measurements. Total length (approx.), 13.5 mm; postorbital carapace length, 3.8 mm; first pereiopod chela, left, 3.3 mm, right, 3.3 mm.

Colouration. Almost entirely a uniform dark purple-black colour with a feeble indication of a paler median dorsal line down carapace and abdomen. Chelae with horn coloured tips, with preterminal white band on dactylus. Antennal flagella orange.

Host. All specimens were found in association with *Anthocidaris crassispinia* (Agassiz, 1863) (Echinodermata, Echinometridae).

Parasites. *Bopyrinella albida* Shiino, 1958 and *Anisarthrus* sp. (Isopoda, Bopyridae).

Remarks. The taxonomy of *Athanas dorsalis* (Stimpson) has been the subject of some discussion, much of which may have been due to the lack of a detailed description of Stimpson's material. The position cannot even now be considered satisfactorily resolved. Banner and Banner (1960) reported an extreme degree of variation in this species and placed *Athanas mascarinicus* Richters and *Arete maruteensis* Coutière in the synonymy

of *A. dorsalis*. Even the separation of *A. dorsalis* and *A. indicus* (Coutière) was left in some doubt. Other nominal species have also been placed in synonymy.

The present material from *Anthocidaris* from Hong Kong appears to correspond exactly to the material referred to *A. kominatoensis* Kubo, as redescribed by Suzuki (1970), i.e. they both show the presence of two pairs of epipods and three pairs of setobranchiae on the pereopods, have a rounded pterygostomial margin, lack an angular, sharply pointed process at the distolateral margin of the palm of the first pereopod chela and have lanceolate rostra. They also share the same host species and the same colour pattern. This conformity leaves uncertain the identity of *A. dorsalis* Suzuki, 1970, a species found in association with *Stomopneustes*.

Banner and Banner (1973) list four echinoid genera as Australian hosts for *A. dorsalis*., *Heliocidaris* Agassiz and Desor, *Centrostephanus* Peters, *Tripneustes* Agassiz, and *Echinothrix* Peters.* Suzuki (1970) reports associations with *Stomopneustes* Agassiz and Banner and Banner (1960) obtained two thirds of their non-Australian material referred to *A. dorsalis* from *Heterocentrotus* Brand. Several of these genera have very wide geographical distributions, extending from East Africa (where a very similar species of *Athanas* may also be found in association with *Echinometra* Gray) to the Hawaiian Islands.

There appears to be ample scope for further study on what would appear to be an "Athanas dorsalis species complex". Unfortunately many of the earlier records did not include any data on the associations. *Anthocidaris crassispina* should be considered the type-host for *Athanas dorsalis* (Stimpson). It seems unlikely that any are free-living and it is essential that further studies should be based upon material from accurately identified host animals, and that details of colouration should be taken into consideration, as well as the possibilities of morphological variations resulting from sexual ambiguity due to hermaphroditism, as reported by Suzuki (1970). To facilitate future studies, a ovigerous female specimen from Hong Kong has been selected as a neotype and is deposited in the collection of the Northern Territory Museum, catalogue number NTM Cr.003895. Duplicate specimens are also deposited in the Smithsonian Institution, British Museum (Natural History) and Rijksmuseum van Natuurlijke Historie.

Ogyrides orientalis (Stimpson)

(Figures 13–17)

Restricted synonymy. *Ogyris orientalis* Stimpson, 1860: 105. *Ogyrides orientalis* — De Man, 1922: 14.

Material examined. (i) 4 specs. (1 male, 3 female) Stn. T/4, 22°28.0'N, 114°22.3'E, Mirs Bay, 10 m, trawl, 5 April 1986, coll. A. Hirayama, NTM Cr.003915. (ii) 1 female, Stn. T/10, 22°27.0'N, 114°23.1'E, Mirs Bay, 8.5 m, dredge, 6 April 1986, coll. A. Hirayama, NTM Cr.004982.

Description. A small sized, slender, elongate, fragile shrimp, of subcylindrical body form. Carapace smooth, glabrous. Rostrum very short, acute, twice as long as width across base, depressed, tip reaching well beyond level of inferior orbital angles in dorsal view, with tuft of subterminal setae ventrally; four postrostral median spines on anterior third of carapace, of decreasing size posteriorly; orbital notch feebly developed, margin

*The fact that their material was derived from four host genera may help to account for the high degree of morphological variation found by the Banners.

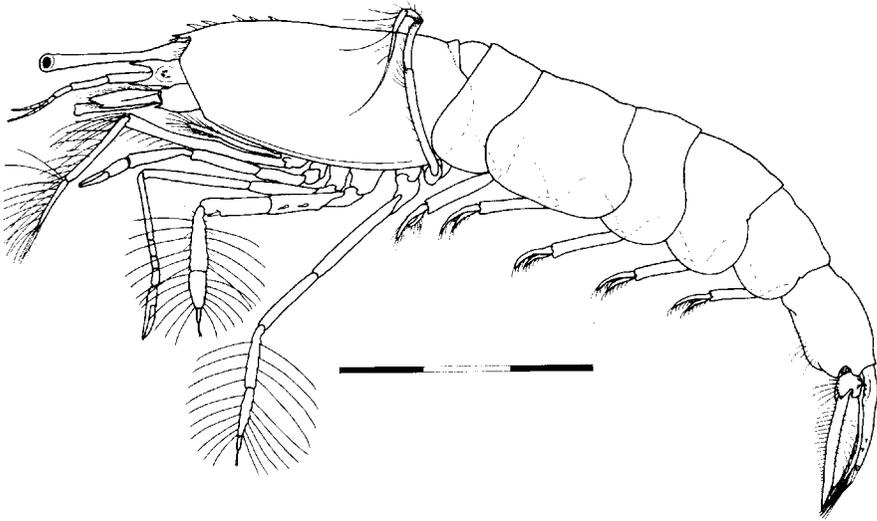


Figure 13. *Ogyrides orientalis* (Stimpson), female, Mirs Bay, Hong Kong. Scale bar in millimetres.

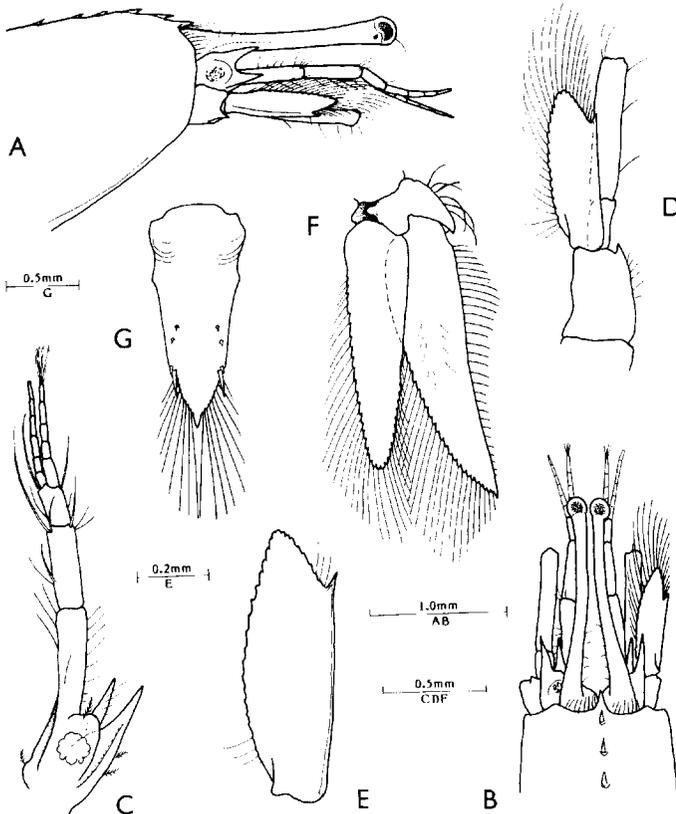


Figure 14. *Ogyrides orientalis* (Stimpson), female. A, anterior carapace, rostrum, eyes and antennal peduncles lateral; B, same, dorsal; C, antennule; D, antennal peduncle; E, scaphocerite; F, uropod; G, telson.

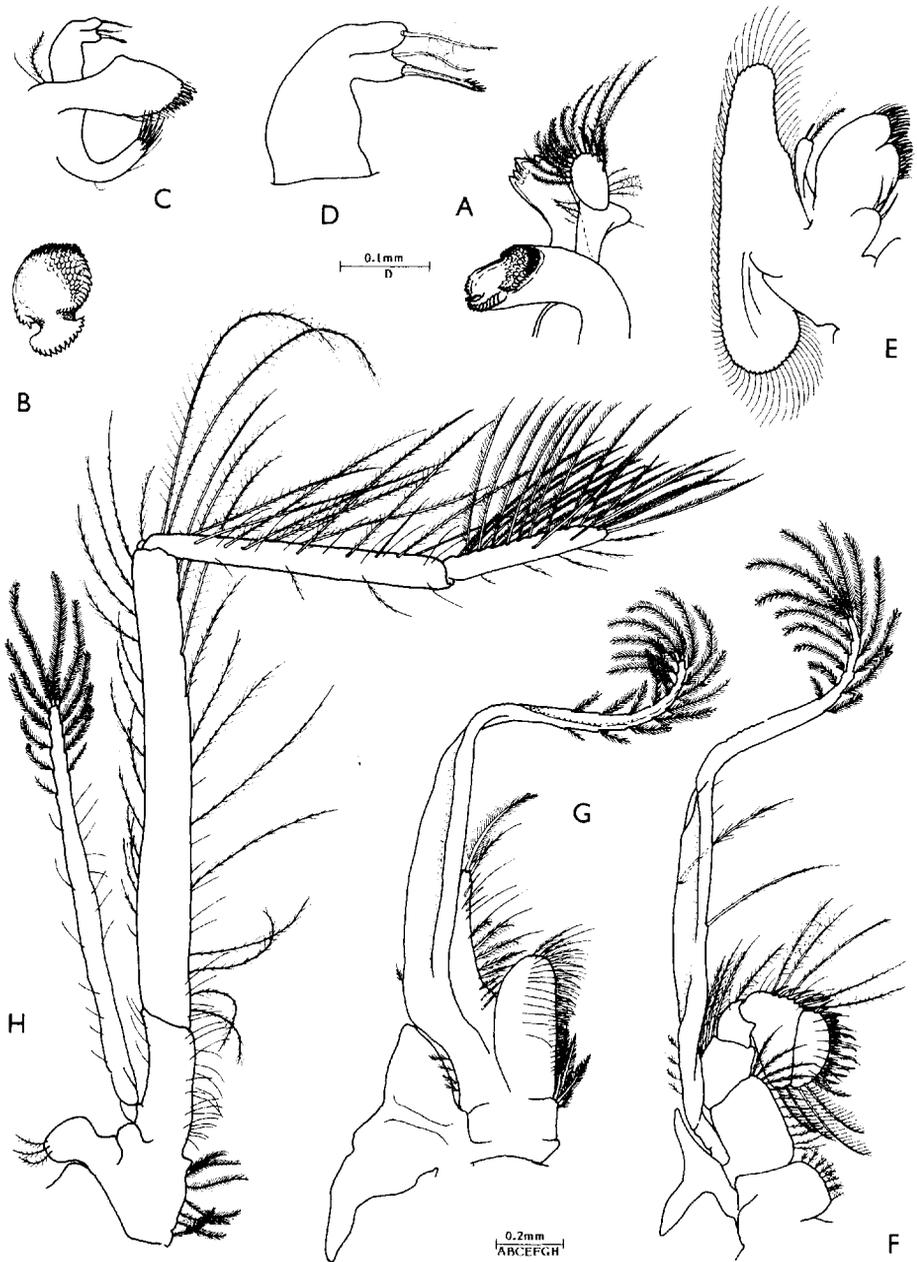


Figure 15. *Ogyrides orientalis* (Stimpson), female. A, mandible; B, molar process, occlusal surface; C, maxillula; D, same, palp; E, maxilla; F, first maxilliped; G, second maxilliped; H, third maxilliped.

setose; inferior orbital angle bluntly rounded, antennal tooth absent, pterygostomial angle of branchiostegite bluntly obtuse; cardiac notch absent, posterior marginal carina well developed.

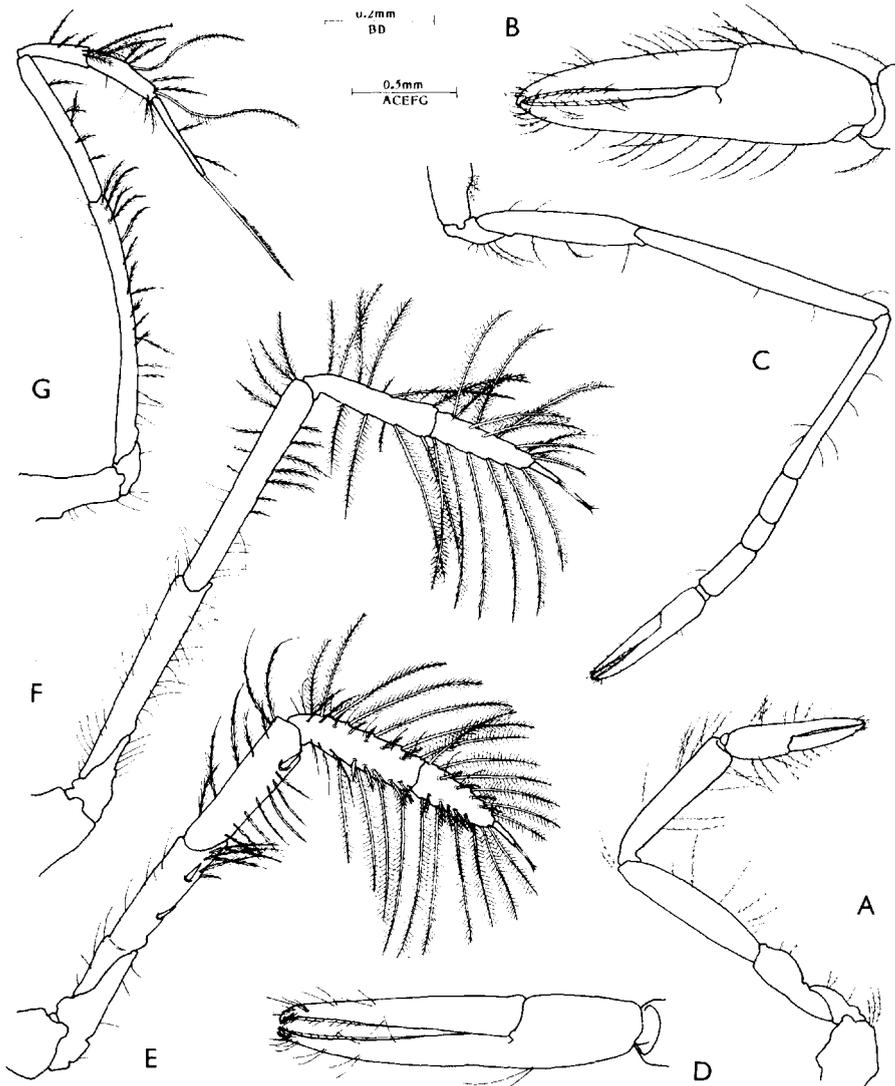


Figure 16. *Ogyrides orientalis* (Stimpson), female. A, first pereopod; B, same, chela; C, second pereopod; D, same, chela; E, third pereopod; F, fourth pereopod; G, fifth pereopod.

Abdominal segments smooth, glabrous, with the pleura of first five segments broadly rounded, non-setose; sixth segment about 1.35 times length of fifth, 1.6 times longer than deep, strongly compressed, with feeble semiacute posteroventral angle and small blunt posterolateral angle.

Telson ventrally curved, about 1.2 times sixth abdominal segment length, about 2.2 times longer than anterior width, lateral margins moderately convergent; glabrous, but with angular expansions at about 0.35 of length; two pairs of posterolateral spines present, at 0.75 of length, small lateral spine with much larger medial spine, 2.6 times as long; posterior border strongly produced, sides convex, with acute median process,

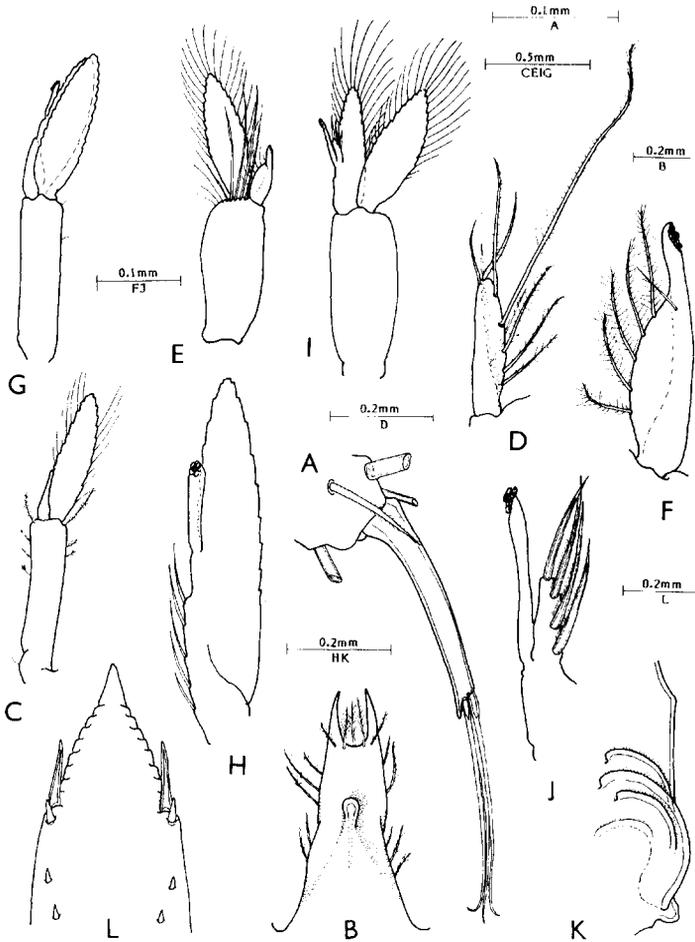


Figure 17. *Ogyrides orientalis* (Stimpson). A, fourth pereopod, dactyl; B, fifth thoracic sternite, sternal process; C, first pleopod, female; D, same, endopod; E, first pleopod, male; F, same, endopod; G, second pleopod, female; H, same, endopod; I, second pleopod, male; J, same, appendix interna and appendix masculina.

with about 8–9 long plumose marginal setae ventrally, except at tip; dorsal surface with two pairs of small spines at 0.55 and 0.6 of length, anterior pair closer to midline than posterior pair; ventral surface without anal tubercles, with three distinct semicircular ridges proximolaterally, central ridge confluent with lateral margin; fourth feebly developed ridge present proximally; lateral angulations without associated ridge.

Antennular peduncle distinctly exceeding carpopacrite, not reaching distal corneal margin; proximal segment proximally stout, with well developed statocyst, with two strong subequal teeth laterally, exceeding half segment length, distal segment slender, subcylindrical; without median ventral tooth, sparsely setose; intermediate segment subcylindrical, about 3.0 times longer than wide, with few long setae, about 0.5 of proximal segment length; distal segment about 0.5 of proximal segment length, 2.0 times longer than wide; upper flagellum uniramous, about 5 slender segments, with single

distal group of aesthetascs only; lower flagellum slender, slightly longer than upper, 6 slender segments only.

Antenna with stout basicerite, with small distoventral tooth; carpocerite subcylindrical, about 4.75 times longer than wide, uniform; flagella missing; scaphocerite reaching to near middle of intermediate segment of antennular peduncle, far exceeded by carpocerite, about 3.0 times longer than wide, distal lamella moderately acute, produced well beyond strong distolateral tooth at about 0.78 of length, medial margin densely setose, lateral border glabrous.

Eyes extremely long, mainly glabrous, few short setae proximally, exceeding length of antennular peduncle by diameter of cornea; cornea globular, well pigmented, with lateral accessory pigment spot; peduncle about 5.4 times longer than proximal width, 16.0 times longer than central width, broadly expanded proximomedially, feebly bowed and slightly expanded distally, equal to about 0.55 of postrostral carapace length.

Mandible with robust corpus; molar process (right) well developed, obliquely truncate distally, dorsolateral surface tessellate, fringed with setae, ventromedially expanded, multidentate; incisor process short and broad, with four acute teeth distally, outer teeth larger than inner, with small preterminal tooth laterally; palp robust, two segmented, proximal segment sparsely setose with distal lateral process, distal segment oval, compressed, with long plumose setae medially. Maxillula with endopod slender, upper lacinia distally broadened and obliquely truncate with about 8 stout simple spines distally and some setae; lower lacinia slender, subcylindrical, curved with about 8 long spines and some setae distally; palp bilobed, lobes subequal, upper lobe with short feebly setulose seta, lower lobe with stout, distally denticulate spine, with setulose seta in notch. Maxilla with subcylindrical or compressed palp with two short plumose setae distally; basal endite broadly expanded, bilobed, lower lobe slightly broader than upper; coxal endite small, simple, rounded, with three spines only; scaphognathite well developed, about 3.3 times longer than wide, posterior lobe broad and rounded, anterior lobe narrow. First maxilliped with long slender tapering palp with stout plumose terminal and preterminal setae, with short feebly plumose setae along medial margin; basal endite produced, narrow, with straight medial margin with numerous feebly setulose setae; coxal endite short, feebly bilobed (?) with three long setulose setae at distomedial angle; exopod well developed, with narrow caridean lobe feebly developed over proximal half, largely devoid of marginal plumose setae, distal half slender, with numerous plumose setae distally; epipod broadly triangular, feebly bilobed, with posterior lobe larger than anterior. Second maxilliped with distal segment of endopod almost semicircular, with numerous long and short distally serrulate spines; penultimate segment broad, with about 5 long coarsely setulose setae and 5 short stout spines along distal margin, proximal ends of distal and penultimate segments each with two long, very coarsely spinulate setae; carpus with single long lateral seta, ischiomerus with 3 feebly plumose lateral setae; basis with medial margin setose; exopod well developed, proximal half of ramus feebly laterally expanded, with single long plumose seta, medial margin with one simple seta, distal ramus with numerous plumose setae; coxa with medial border rounded, with several short pappose setae, epipod bilobed, with slender tapering pointed lobes, without podobranch. Third maxilliped with long slender endopod extending beyond corneal margin by most of distal segment; ischiomerus about 8.75 times longer than proximal width, slightly tapered distally, with numerous long sparsely setulose setae, distally unarmed; penultimate segment about 0.66 of ischiomerus length, about 10.0 times longer than wide, with numerous long sparsely setulose setae dorsally and laterally; terminal segment about 0.5 of penultimate segment length, with about 10 dorsomedial and 10 dorsolateral coarsely spinulate setae; basis about 0.3 of ischiomerus length, sparsely setose medially; exopod well developed, smaller than exopods of first and second

maxillipeds, subcylindrical with numerous distal plumose setae; coxa without medial process, medial border with feebly plumose setae, small suboval plate dorsolaterally, without epipod or arthrobranch.

First pereopods relatively robust, equal, similar, reaching to about level of distal carpoperite; chela with palm slightly compressed, about 1.5 times longer than deep, fingers slender, about 1.5 times palm length, with entire distal cutting edges and small hooked tips; carpus about 1.1 times chela length, about 4.7 times longer than distal width, slightly tapered proximally, dorsal and ventral margins sparsely setose; merus about 1.1 times carpus length, about 4.5 times longer than central width, deepest centrally, sparsely setose ventrally; ischium about 0.65 of merus length, sparsely setose ventrally; basis short, without special features; coxa robust, without epipod, setobranch or ventral process.

Second pereopods slender, subequal, similar, exceeding cornea by length of chela; chela with palm slightly compressed, about 1.9 times longer than deep, fingers slender, about 2.0 times palm length, with entire distal cutting edges and small hooked tips; carpus four segmented, about 2.4 times chela length, proximal segment slender, about 10 times longer than distal width, tapering slightly proximally, distal segments subcylindrical, in ratio 3.2:1.9:2.6:10; merus about 0.8 of carpus length, about 10.6 times longer than central width, slightly swollen centrally, sparsely setose; ischium about 0.5 of carpus length, about 6.0 times longer than wide, slightly broadened distally, sparsely setose; basis short, about 0.35 of ischium length; coxa slender, without ventral process, epipod or setobranch.

Third pereopod robust, reaching to about tip of scaphocerite; dactyl slender, small, subcylindrical, about 5.0 times longer than proximal width, with three long contiguous terminal setae; propod 3.0 times dactyl length, compressed, about 2.5 times longer than proximal width, with conspicuous dorsal and ventral fringes of 5–6 long coarsely setulose setae and 4–5 short serrulate dorsolateral and ventrolateral spines; carpus about 1.5 times propod length with about 7 long coarsely serrulate setae along dorsal border and 5 along ventral, with 5 short spines along both dorsolateral and ventrolateral margins; merus about 1.1 times carpus length, 3.5 times longer than distal width, slightly widened distally with strong mobile distolateral spine, dorsal and ventral margin with several coarsely setulose setae; ischium about 1.4 times merus length, 5.0 times longer than distal width, feebly tapered proximally, distal half with two strong mobile lateral spines, some long sparsely setulose setae distoventrally, otherwise sparsely setose; basis without special features, about subequal to carpus length; coxa robust, normal.

Fourth pereopod longer and more slender than third, extending to about distal end of scaphocerite; dactyl subcylindrical, slightly curved, about 5.0 times longer than width at base, with three long simple setae distally; propod 3.5 times propod length, 4.0 times longer than wide, with long coarsely serrulate setae along dorsolateral and ventral margins, and feebly setulose setae along dorsal margin; carpus about 1.25 times propod length, 4.0 times longer than distal width, with long feebly setulose setae along dorsal and ventral margins; merus unarmed, about 1.7 times merus length, with setulose setae distodorsally and ventrally; ischium unarmed, slightly shorter than merus, about 6.2 times longer than distal width, with numerous simple setae; basis and coxa without special features.

Fifth pereopod slender, extending anteriorly to about middle of scaphocerite; dactyl subcylindrical, tapering slightly distally, about 10.0 times longer than proximal width, with single long finely serrulate terminal setae, about 1.5 times dactyl length, and two feebly setulose dorsal setae; propod more robust, about 0.9 of dactyl length, about 4.0 times longer than central width, with two long feebly setulose setae and several shorter setae dorsally; carpus about 0.9 of propod length, about 3.6 times longer than

distal width, tapered proximally, with several short feebly setulose setae only; merus subcylindrical, about 2.0 times propod length, about 8.5 times longer than wide, uniform, unarmed, sparsely setose; ischium about 3.4 times propod length, 17.0 times longer than central width, subcylindrical, sparsely setose ventrally, unarmed; basis short, without special features; coxa slender and elongated, without processes.

Thoracic sternites narrow and unarmed except fourth; fourth with median anteriorly directed process extending between coxae of third pereopods, about 1.5 times longer than proximal width, sides slightly convergent, straight, with two acute processes distally, separated by U-shaped notch, with median tubercle dorsally at about midlength, sparsely setose.

Pleopods normally developed. Female first pleopod with endopod about 0.4 of exopod length, about 4.0 times longer than central width, with four short and one long plumose setae along medial margin and three short simple setae distally. Second pleopod with endopod subequal to exopod, with appendix interna at about half length of medial margin. Male first pleopod with basipodite broader than in female, about 2.1 times longer than broad with four long distoventral setae; endopod about 0.45 of endopod length, proximally about 3.0 times longer than broad, with five short feebly plumose setae laterally and slender appendix interna distomedially. Second pleopod with endopod subequal to exopod length about 0.6 of width; appendix masculina short, subcylindrical, corpus slightly tapering, with three medial and one distal spine, equal to about 0.2 of endopod length, 3.0 times longer than proximal width; appendix interna long and slender, twice appendix masculina length, at about 0.3 of length of medial border of endopod, about 0.4 of endopod length.

Uropod with protopodite short and broad, with dorsomedial process, posterolateral angle acute, lateral margin with plumose setae; endopod subequal to telson length, about 4.0 times longer than wide, broadest proximally, tapering distally to acute point, without posterolateral spines, lateral border feebly concave, strongly setose, with longer stiff setae proximally, perpendicular to margin, medial border densely setose; endopod about 0.8 of exopod length, about 3.7 times longer than proximal width, tapering, medial and lateral margins with plumose setae.

Measurements. Total length (approx.), 11.0 mm; postorbital carapace length, 2.6 m, eyestalk length, 1.5 mm.

Remarks. Recent authors (Fujino and Miyake, 1970) have considered *O. sibogae* (De Man, 1911) to be a synonym of *O. orientalis* Stimpson. De Man's illustrations show an amount of variation that strongly suggest that his material belonged to more than one species. The specimen from Siboga Stn. 102 was designated as the holotype and, as this was collected from the Sulu Sea at a depth 535 m, it is highly unlikely to be conspecific with Stimpson's material, collected in much shallower water, at about 16–90 m. The illustration of the holotype provided by De Man, shows that *O. sibogae* differs from *O. orientalis* as recorded in the present report, in the presence of a scaphocerite with the lateral tooth placed in a terminal position and the lamina tapering to the base of the tooth, with plumose setae medially only. The tip of the scaphocerite reaches to the level of the proximal margin of the cornea, which is far exceeded by the carpocerite. In *O. orientalis*, the eyestalks far exceed the carpocerite and the scaphocerite has the lateral tooth at about the level of half the eyestalk length and far outreached by the angularly produced lamella, which is densely setose on both medial and lateral margins.

The specimen from Siboga Stn. 313, from 36 m, differs from both *O. orientalis* and *O. sibogae* holotype, particularly in the marked reduction of the rostral process, which fails to reach the level of the inferior orbital angles, the very attenuated eyestalks

and the shape of the scaphocerite, which has a terminal lateral tooth but has the distal lamella rounded. Subsequently De Man (1922) reported on some further specimens from Ambon, from 54 m. which are again distinct from *O. orientalis*. The scaphocerite is similar to that of the *O. sibogae* holotype and, in addition, the posterior margin of the telson is broadly rounded and not acutely pointed as in *O. orientalis*.

The unusual ridges on the proximal ventral region of the telson appear to be part of a stridulating mechanism. The dorsomedial part of the protopodite of the uropod bears a well developed rounded knob-like process that acts as the plectrum, striking across these ridges when the uropod is abducted. The presence of a telsonic stridulating mechanism should be included in the definition of both the genus and the family Ogyridae, as it is present in all known species.

The ecological niche occupied by *Ogyrides* species has not been precisely identified, although specimens always seem to be associated with soft substrates such as fine sands or soft muds, as in Mirs Bay, Hong Kong, and are considered to be burrowers (Banner and Banner, 1978). Holthuis (1977) suggests that *Ogyrides* species live buried in the substrate with the elongated eyestalks acting as periscopes. The present specimens, when freshly caught, all carried the very slender fifth pereopods in an elevated position over the posterior carapace, as shown in fig. 13, with the distal ends of the meri almost meeting over the posterior carapace. A similar arrangement is also found in some of the tube or burrow-dwelling thalassinids and may be involved with maintaining an optimum position in a permanent burrow. In association with the slender, subcylindrical body form of *Ogyrides* species, this suggests that they too may live in semi-permanent tubes or burrows rather than leading a mobile life and casually burrowing into the substrate, as is done by many penaeid, processid or crangonid shrimps. The conspicuous coarse setation of the third maxillipeds and second and third pereopods does not suggest a straining function, or a mechanism for creating water currents, and viewed from a head-on position does not appear to form an effective basket capable of retaining small animals such as copepods, small amphipods or other such prey. The disposition of the main setae, in dorsolateral and ventrolateral positions, contrasts with other crustaceans which may have raptorial habits, in which similar setae are disposed along the dorsomedial and ventromedial margins of segments. This arrangement suggests a mechanism for pushing substrate particles away from the body during the formation of a burrow or tube. Holthuis (1951) reports that specimens were obtained at a night light. Many *Leptochela* species are normally nocturnally planktonic in common with *Ogyrides* spp., which may only be temporarily planktonic as part of their reproductive cycle. Study of the behavior of live specimens would clearly be of interest, but their small size and fragile nature suggests that collecting undamaged specimens may prove difficult.

Tozeuma lanceolatum Stimpson
(Figures 18–22)

Restricted synonymy. *Tozeuma lanceolatum* Stimpson, 1860: 27.

Material examined. (i) 1 juv., T/9, 22°26.8'N, 114°23.7'E, Mirs Bay, 11 m, 3 April 1986, coll. A.J. Bruce, NTM Cr.003798. (ii) 1 male, 1 female, T/13, 22°31.3'N, 114°21.5'E, Mirs Bay, 10 m, 5 April 1986, coll. A.J. Bruce, NTM Cr.003807. (iii) 1 male, T/31, 22°32'N, 114°12.5'E, Mirs Bay, 10 m, 7 April 1986, coll. A.J. Bruce, NTM Cr.003840. (iv) 1 male, T/38, 22°22.2'N, 114°20.6'E, Mirs Bay, 9 m, 7 April 1986, coll. A.J. Bruce, NTM Cr.003845. (v) 1 male, 1 ovig. female, T/60, 22°28.25'N, 114°17.8'E, Tolo Channel, 8 m, 11 April 1986, coll. A.J. Bruce, NTM Cr.003899. (vi)

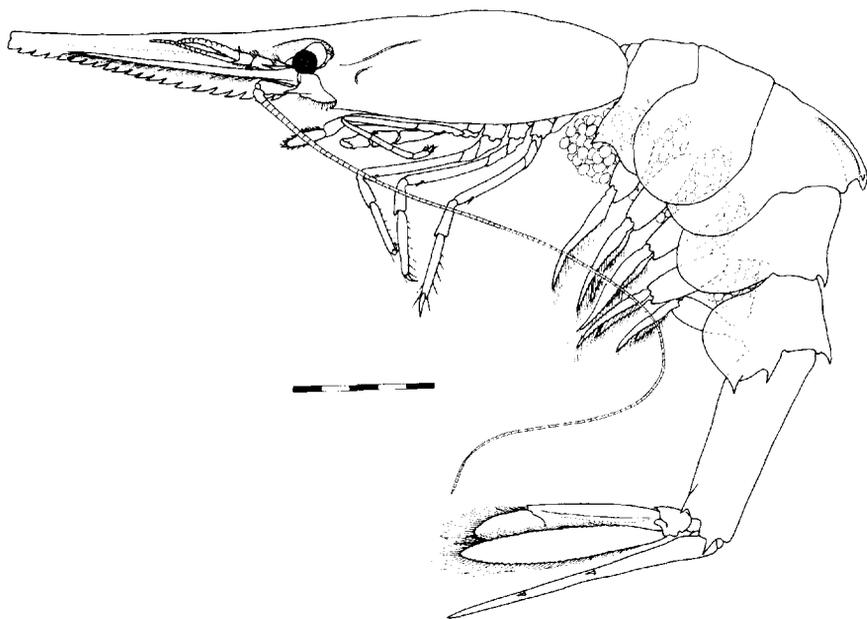


Figure 18. *Tozeuma lanceolatum* Stimpson, ovigerous female, Mirs Bay, Hong Kong. Scale bar in millimetres.

2 female, T/61, 22°28.7'N, 114°18.3'E, Tolo Channel, 12 m, 11 April 1986, coll. A.J. Bruce, NTM Cr.003900. (vii) 1 male, T/62, 22°29.0'N, 114°18.8'E, Tolo Channel, 11 April 1986, coll. A.J. Bruce, NTM Cr.003901.

Description. A small, markedly elongated, very strongly bilaterally compressed hippolytid shrimp. Carapace smooth, glabrous, elongated, strongly compressed, with greatly elongated, straight rostrum, from 2.0–3.0 times postorbital carapace length, or more, (all specimens except one had tip missing), tapering, with deep ventral lamina proximally, dorsal margin very feebly concave, unarmed, ventral border feebly concave, with numerous small acute, uniform teeth, from *c.* 20 to 40 plus, small lateral carina distinct throughout length; orbit feebly developed, inferior orbital angle distinct, obtuse; antennal spine small, marginal, close below inferior orbital angle; supraorbital and hepatic spines absent; anterolateral margin of carapace obtuse, with single well developed pterygostomial tooth; posterior ventral margin of branchiostegite with angular notch.

Abdomen smooth, glabrous, elongated, strongly compressed, first and second segments dorsally unarmed, third with well developed median dorsal carina with strongly thickened rim ending posteriorly with large medial tooth flanked by two smaller teeth, fourth and fifth segments without dorsal carinae but with strong acute posterior teeth; pleuron of first somite with anteroventral angle acute, inferior margin sinuous, second, third and fourth pleura broadly rounded, fifth broadly rounded anteriorly, posterior border with larger upper and smaller lower acute teeth; sixth segment about 2.7 times length of fifth, 3.0 times longer than anterior width, tapering slightly posteriorly, with well developed, acute posterolateral and posteroventral teeth, without posteromedian tooth. Telson about 1.4 times length of sixth abdominal segment, slender and tapering, length about 4.75 times longer than anterior width, (tip usually broken), with straight or

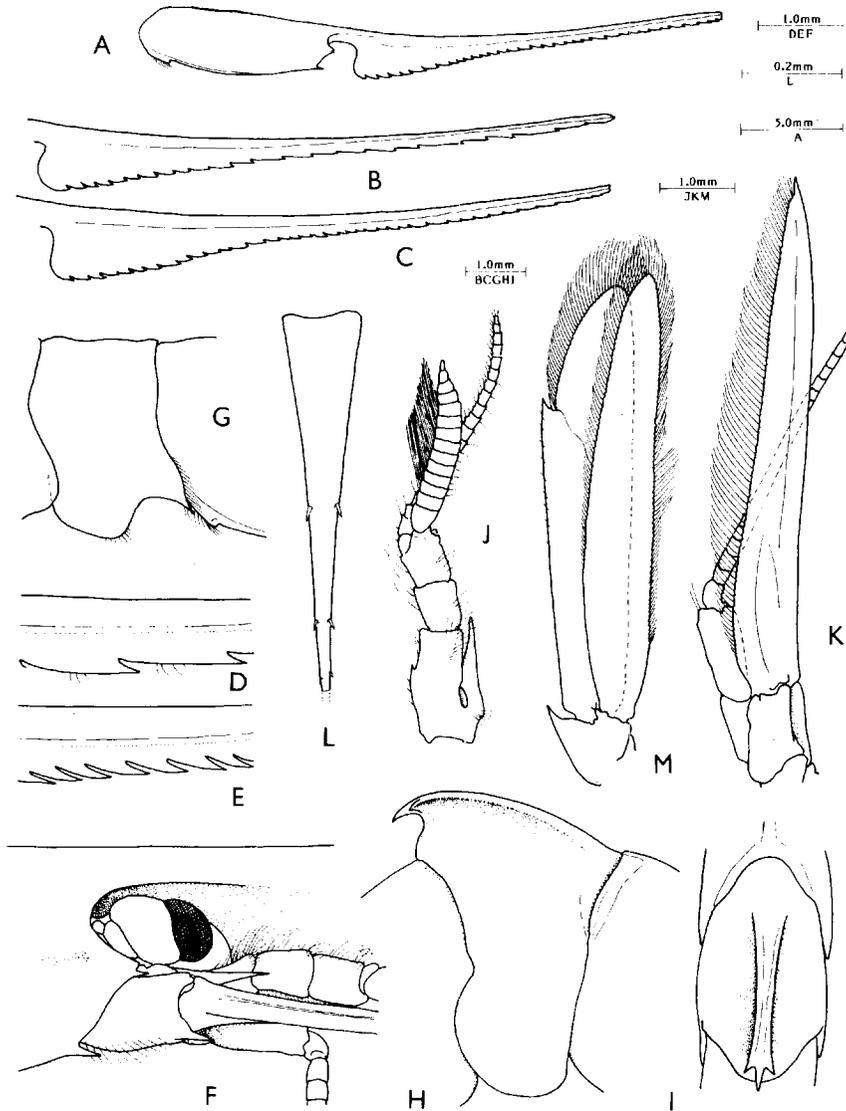


Figure 19. *Tozeuma lanceolatum* Stimpson. A, carapace and rostrum; B, C, rostra; D, E, details of ventral rostral dentition of B, C; F, orbital region; G, first abdominal segment and posterior branchiostegite; H, third abdominal segment, lateral; I, same, dorsal; J, antennule; K, antenna; L, telson; M, uropod.

feebly concave lateral margin, posterior width about 0.1 times anterior width, with three pairs of small dorsal spines, of decreasing size posteriorly, at about 0.5, 0.77 and 0.92 of telson length, posterior margin of telson bifurcate, with several slender simple setae in notch.

Antennule small, with peduncle extending only to about 0.3 of scaphocerite length; proximal segment robust, about 1.6 times longer than proximal width, statocyst obsolete,

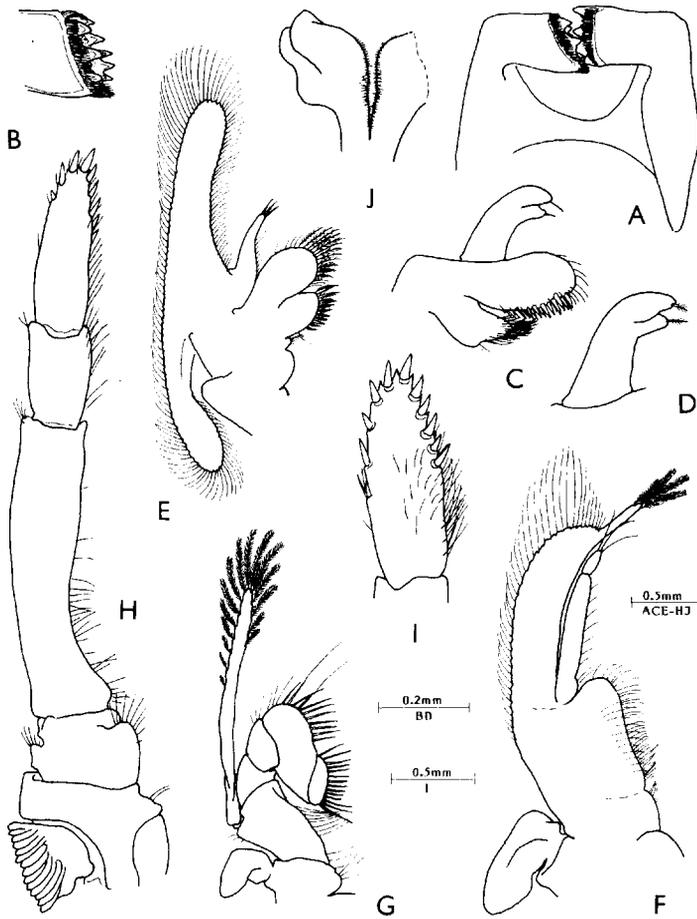


Figure 20. *Tozeuma lanceolatum* Stimpson. A, mandibles, dorsal; B, same, molar process; C, maxillula; D, same, palp; E, maxilla; F, first maxilliped; G, second maxilliped; H, third maxilliped; I, same, distal segment of endopod; J, paragnaths.

stylocerite well developed, slender and acute, exceeding distal margin of segment, median border with stout ventral tooth; intermediate segment about 1.1 times longer than distal width, 0.9 of proximal segment length; distal segment about 1.1 times longer than distal width, 0.5 of proximal segment length; upper flagellum uniramous, stout, about 14 segments, proximal 10–11 broad, distal 3–4 tapering, with numerous dense groups of aesthetascs on broad segments, length about 1.2 times peduncular length; lower flagellum slender, about 1.3 times length of upper flagellum, about 18 segments.

Antenna with stout basicerite with strong, slender distolateral tooth; carpcocerite short, subcylindrical, about 2.4 times longer than distal width, distinctly exceeding proximal segment of antennular peduncle, flagellum well developed, slender, filiform, about 2.75 times postorbital carapace length; scaphocerite elongated, extending to about half rostral length, far outreaching antennular flagella, tapering, about 8.0 times longer than proximal width; lateral margin feebly sinuous, strong, with stout distal tooth, lamella tapering throughout length becoming obsolete distally by distal tooth.

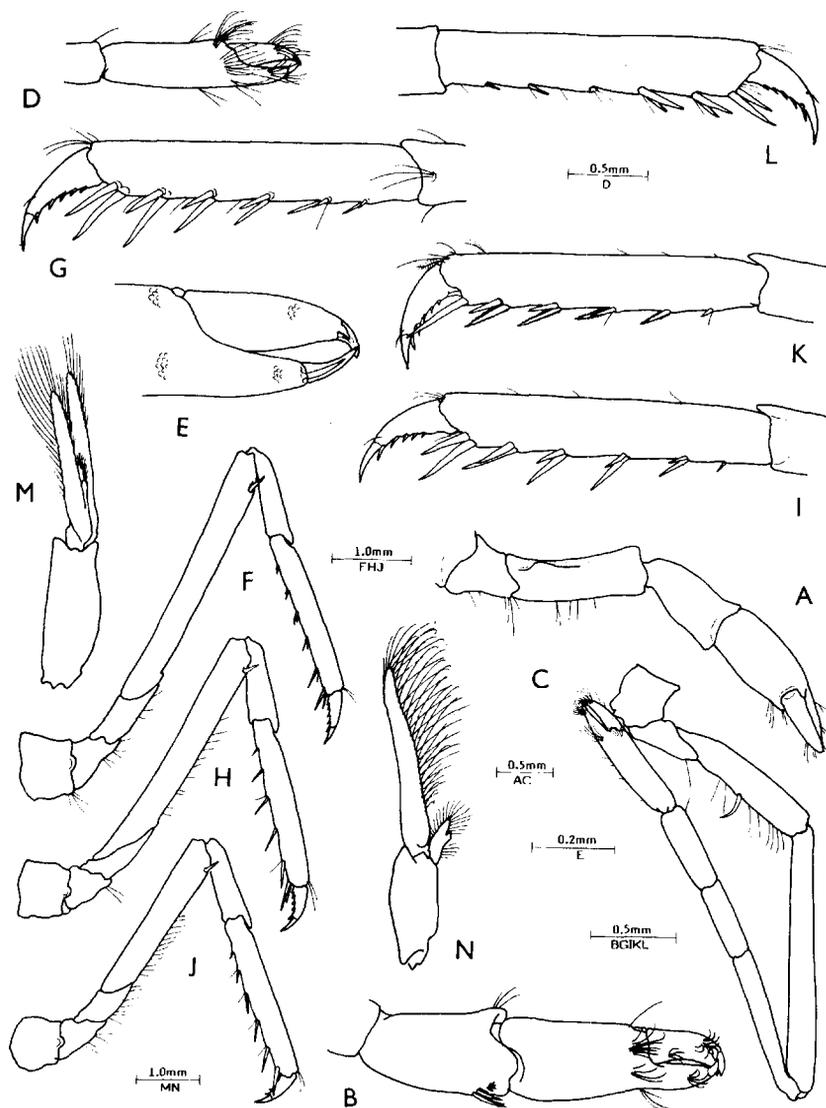


Figure 21. *Tozeuma lanceolatum* Stimpson. A, first pereopod; B, same, chela; C, second pereopod; D, same, chela; E, same, fingers; F, third pereopod; G, same, dactyl and propod; H, fourth pereopod; I, same, propod and dactyl; J, fifth pereopod; K, same, propod and dactyl; L, same, lateral aspect(?); M, male first pleopod; N, male second pleopod.

Epistome without special features. Mandible small, robust, without palp or incisor process; molar process stout, subcylindrical, obliquely truncate distally, with eight small acute peripheral teeth, surrounded by fringes of marginal setae. Maxillula with small bilobed palp, each lobe with single feebly setulose seta; upper lacinia not expanded, with about nine distoventral spines and numerous serrulate setae; lower lacinia short and stout, with numerous long serrulate distal setae. Maxilla with slender tapering palp with

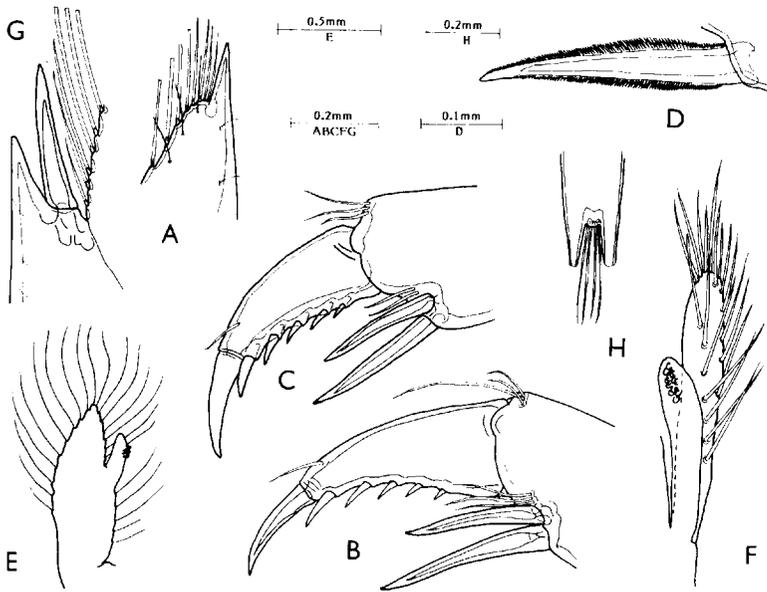


Figure 22. *Tozeuma lanceolatum* Stimpson. A, distal scaphocerite; B, third pereiopod, dactyl; C, fourth pereiopod, dactyl; D, fifth pereiopod, distoventral spine; E, male first pleopod, endopod; F, male second pleopod, appendix interna and appendix masculina; G, exopod of uropod, distolateral spine; H, posterior margin of telson.

three short simple distal setae; basis with endite well developed, bilobed, distal lobe rounded, larger than proximal, with about 13 slender setulose setae, proximal lobe rounded with about 10 short serrulate spines; coxal endite feebly bilobed with very reduced sparsely setose distal lobe, proximal lobe larger, non-setose; scaphognathite elongated, slender, about 6.0 times longer than wide, anterior and posterior lobes both well developed. First maxilliped with elongated slender two-segmented palp, proximal segment about 6.0 times longer than wide, uniform, sparsely setose medially, distal segment about 2.2 times longer than wide, about 0.22 of proximal segment length, with three short plumose setae distally; basal endite relatively elongated and narrow, sparsely setose medially, exopod well developed, flagellum short with four short plumose distal setae. caridean lobe narrow, elongate, exceeding endopod length; coxa with endite feebly developed, sparsely setose, epipod irregularly oval. Second maxilliped endopod with small, narrow distal segment, with numerous serrulate spines medially, penultimate segment large, broad, with setulose spines medially; carpus, ischiomerus normal, basis medially setose, with well developed exopod laterally with numerous plumose setae distally; coxa medially rounded, sparsely setose, with irregularly oval epipod without podobranch laterally. Third maxilliped robust, endopod exceeding distal margin of basicerite, ischiomerus distinct from basis, about 4.1 times longer than distal width, bowed, slightly narrowed subproximally, medial margin sparsely setose, otherwise mainly glabrous, penultimate segment about 0.33 of ischiomerus length, 1.6 times longer than central width, sparsely setose medially; terminal segment about 0.6 of ischiomerus length, about 2.6 times longer than central width, with 10 stout spines around distal medial and lateral borders, separated by small acute teeth distally, medial border setose; basis with sparsely setose rounded lobe medially, with small setose lateral process,

exopod absent; coxa robust, short, without special features, with well developed arthrobranch medially. Paragnath with lobes divided, glabrous, medial margin with short setae.

Thoracic sternites narrow, unarmed.

First pereopods similar, short and robust, slightly exceeding basicerite; chela with subcylindrical, slightly compressed and distally tapering palm, smooth, almost 2.0 times longer than greatest width, with groups of short setae distally, fingers short and stout, dactyl about 0.5 of palm length, about 0.4 of palm length, with three stout hooked spines at tip; large central spine present, flanked by smaller accessory spines, cutting edge entire, blunt, fixed finger similar, with two distal spines only; carpo-propodal joint with groups of serrulate cleaning setae ventrally, carpus about 1.8 times longer than distal width, slightly expanded distally, unarmed; merus about 3.6 times longer than central width, subcylindrical, about 0.8 of chela length, unarmed, with lateral flange, glabrous; ischium, short and stout, about 1.5 of merus length, about 1.2 times longer than proximal width; basis and coxa robust, without special features.

Second pereopods similar, subequal, slender; palm of chela subcylindrical, about 3.0 times longer than deep, with groups of setae distally, fingers slender, dactyl about 3.0 times longer than proximal width, compressed, slightly hooked distally with stout curved distal spine with smaller spine adjacent, fixed finger shorter than dactylus with single large curved spine distally, both fingers with groups of short setae, cutting edges simple; carpus about 2.2 times chela length, three segmented, proximal segment equal to combined length of second and third, third slightly longer than second, all segments slender, about 11.0 times longer than distal segment width, all segments tapering slightly proximally; merus about 0.85 of carpus length, 2.0 times chela length, about 8.5 times longer than distal width, subcylindrical, slightly tapered proximally, unarmed; ischium 0.6 of merus length, slightly compressed, about 4.8 times longer than distal width, sparsely setose ventrally, with single strong curved spine at half length; basis and coxa without special features.

Ambulatory pereopods moderately robust, third reaching to middle of carpoperite, dactyl similar in male and female, with corpus strongly compressed, tapering, about 2.1 times longer than proximal width, lower border armed with series of five spines, of increasing size distally, with single distal dorsolateral sensory seta, unguis distinct from corpus, stout, curved and simple, about 4.5 times longer than proximal width, equal to 0.5 of corpus length; propod about 5.8 times longer than wide, uniform, compressed, about 2.9 times longer than dactyl, with six pairs of simple spines ventrally, of increasing length distally, distolateral spines 0.2 of propod length, medial spines shorter than lateral; carpus about 0.5 of propod length, about 0.27 of propod length, slightly tapered proximally, about 3.6 times longer than distal width, unarmed; merus about 1.6 times propod length, 8.0 times longer than distal width, slightly tapered proximally, with single strong mobile distoventral spine; ischium about 0.28 of meral length, about 3.0 times longer than central width; basis slender, coxa robust, both without special features, unarmed. Fourth and fifth pereopods similar to third, propods of subequal length, proximal ventral spines single, not paired, on both, lateral ventral spines of fifth densely serrulate, merus of fourth and fifth with strong mobile distoventral spines. All pereopods lacking epipods and arthrobranches.

Pleopods well developed, basipodite with distoventral angle acute; endopod of male first pleopod small, about 0.25 of exopod length, 2.5 times longer than broad, with numerous plumose setae along medial and lateral border and small appendix interna at 0.6 of median border length. Endopod of male second pleopod about 0.90 of exopod length.

Uropod with protopodite with acute posterolateral tooth; exopod 5.0 times longer than broad, broadest at level of distoventral spine, lateral border straight; sparsely

setose, with acute distolateral tooth with small mobile spine medially, endopod slender, slightly exceeding exopod, greatest width proximally, about 6.5 times longer than wide, both rami with margins densely setose.

Ova numerous and small, length *c.* 0.55 mm.

Colouration. (1) Juvenile: mainly transparent with lower half of body pinkish, extending onto endopod of uropod and distal telson; distal rostrum feebly banded with dark brown; antennae and pereopods transparent. (2) Adult male, female: largely coarsely mottled with dark brown, body also finely speckled with small yellow dots; rostrum strongly barred with dark brown, caudal fan similar; ambulatory pereopods transparent.

Measurements. Largest female: total length (approx.) 60.0 mm; postrostral carapace length, 11.0 mm; rostrum and carapace, 32.5 mm.

Remarks. *Tozeuma lanceolatum* can be readily distinguished from all other species of the genus by the tridentate dorsal carina on the third abdominal segment, although this unusual feature was not noted in Stimpson's original description. Stimpson did note that the species was common in Hong Kong waters and this is still the case. No other species of *Tozeuma* have been captured in Hong Kong waters, so there seems no reason to doubt that the present specimens do represent Stimpson's species, his description being otherwise in good, if limited agreement. The only other record located for *T. lanceolatum* is that of Johnson (1961) from Singapore. Through the kindness of Ms Yang Chan Man it has been possible to examine some of Johnson's specimens and it can be confirmed that they are identical with those of Hong Kong.

Lysmata vittata (Stimpson)
(Figures 23–28)

Restricted synonymy. *Hippolysmata vittata* Stimpson, 1860: 95. *Lysmata* (*Hippolysmata*) *vittata* — Kubo, 1951: 284–287, figs. 13N, 14EF, 16.

Material examined. 1 ovig. female, T/5, 22°27.5'N, 114°22.4'E, Mirs Bay, 10 m. trawl, 3 April 1986, coll. P. Shin, NTM Cr.004983.

Description. A small, moderately robust hippolytid shrimp of subcylindrical body form. Carapace smooth, glabrous. Rostrum about 0.6 of postorbital carapace length, reaching to slightly beyond distal end of intermediate segment of antennular peduncle, slightly depressed, tip very slightly up-turned; dorsal carina distinct with six acute teeth, first tooth situated on carapace immediately posterior to orbital margin, teeth subequal, decreasing in size slightly distally, subequally spaced, with interstices sparsely setose; ventral carina distinct distally, with three small acute teeth, all distal to level of penultimate dorsal tooth, non-setose; lateral carina distinct, narrow. Epigastric tooth well developed, at 0.25 of postorbital carapace length. Orbit feebly developed, inferior orbital angle feebly convex, setose with small acute process medioventrally; antennal spine well developed, slender, acute, marginal; anterolateral angle of branchiostegite with small acute pterygostomial tooth; hepatic spine absent.

Abdominal segments smooth, glabrous, with pleura of first three segments small, rounded, fourth angular, fifth slightly produced posteroventrally, acute; sixth segment about 1.6 times length of fifth, 1.4 times longer than deep, with small acute, setose posteroventral angle and acute posterolateral angle.

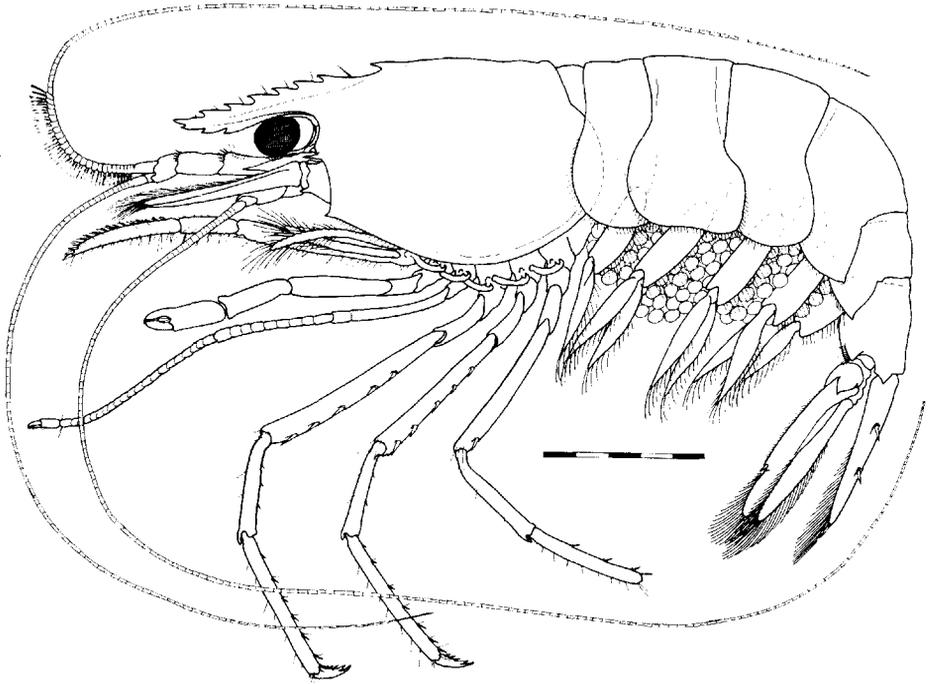


Figure 23. *Lysmata vittata* (Stimpson), ovigerous female, Mirs Bay, Hong Kong. Scale bar in millimetres.

Telson about 1.7 times length of sixth abdominal segment, 2.5 times longer than proximal width, lateral margins convergent, very feebly convex, densely setose ventrally, posterior margin about 0.2 of anterior width; two pairs of stout, erect dorsal spines at 0.37 and 0.64 of telson length; posterior margin feebly convex with small acute median point, with two pairs of spines laterally, very small outer spines and larger inner spines, more slender and longer than dorsal telson spines, but tips missing, central region with pair of long densely plumose setae.

Antennular peduncle distinctly exceeding rostrum, subequal to anterior margin of scaphocerite; proximal segment about 2.4 times longer than proximal width, tapering distally, with four small dorsolateral spines distally, medial aspect strongly flattened vertically, with small acute tooth ventrally; statocyst obsolete, stylocerite well developed, slender, acute, reaching to half segment length; intermediate segment about 1.7 times longer than wide, subcylindrical, obliquely articulated, with four small dorsolateral spines distally; distal segment subequal to intermediate, half length of proximal, 1.6 times longer than wide, with single distal dorsolateral spine; upper flagellum uniramous, with about 25 proximal segments thickened, segmentation obscure proximally, bearing about 46 groups of aesthetascs, distal segment obliquely articulated, with long slender filamentous distal flagellum, equal to about 4.0 times postorbital carapace length; lower flagellum slender, filamentous, equal to about 3.5 times postorbital carapace length.

Antenna with stout basicerite with strong ventrolateral tooth; carpcerite short and stout, compressed, 2.0 times longer than wide, about 0.3 of scaphocerite length, flagellum well developed, filamentous, equal to about 5.5 times postorbital carapace length; scaphocerite slightly exceeding antennular peduncle, lateral border very feebly

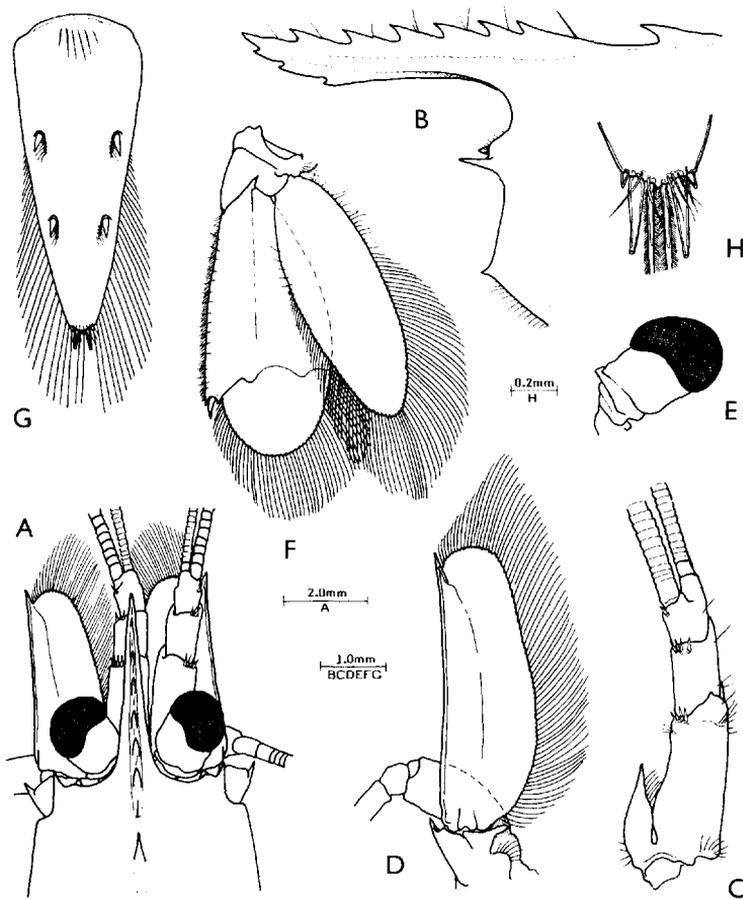


Figure 24. *Lysmata vittata* (Stimpson), female. A, anterior carapace, eyes, antennal peduncles, dorsal; B, anterior carapace and rostrum, lateral; C, antennular peduncle; D, antennal peduncle; E, eye; F, uropod; G, telson; H, same, posterior spines.

concave, with strong distolateral tooth, lamella about 3.0 times longer than wide, widest proximally, broadly rounded distally, about level with tip of distolateral tooth.

Mandible (right) with corpus robust, with groups of short plumose lateral setae centrally and simple setae distolaterally; molar process robust, subcylindrical, distally truncate, with three stout blunt teeth dorsally and dense fringe of minute setae ventrally, extending broadly over ventral surface of process; incisor process and palp completely lacking. Maxillula with palp feebly bilobed, small upper lobe with four short simple setae, larger lobe with one spiniform seta and two slender setae; upper lacinia broad, oval, with numerous short simple spines and setae marginally; lower lacinia short, slender and tapering with numerous spiniform setae distally. Maxilla with well developed simple tapering palp with two terminal setae, medial border sparsely setose proximally, lateral border with numerous short plumose setae proximally; basal endite well developed, deeply bilobed, upper lobe expanded, rounded, densely setose medially, lower lobe longer and narrower, densely setose medially; coxal endite feebly developed, simple, sparsely

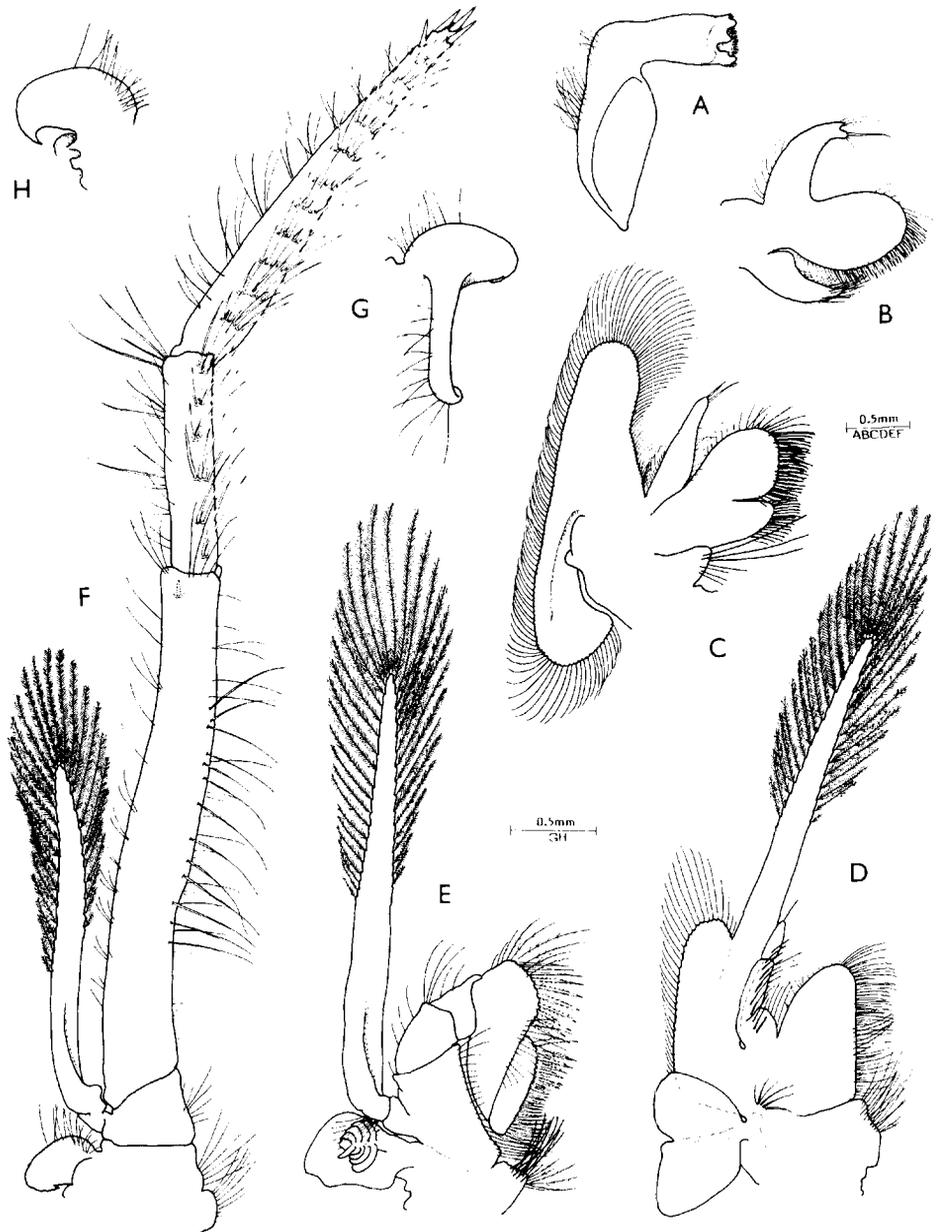


Figure 25. *Lysmata vittata* (Stimpson), female. A, mandible; B, maxillula; C, maxilla; D, first maxilliped; E, second maxilliped; F, third maxilliped; G, same, coxal lateral plate.

provided with long setae; scaphognathite well developed, narrow, about 3.5 times longer than central width, width subequal to length of posterior lobe. First maxilliped with elongated flattened endopod, simple or feebly three segmented, devoid of setae, extending beyond level of distal margin of caridean lobe; basal endite well developed,

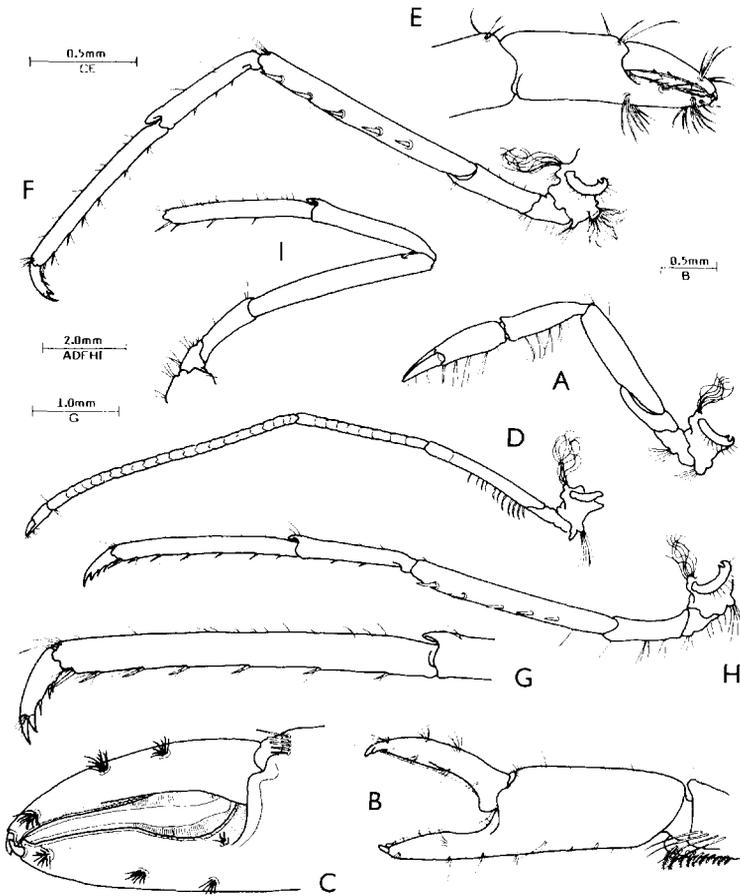


Figure 26. *Lysmata vittata* (Stimpson), female. A, first pereiopod; B, same, chela; C, same, fingers; D, second pereiopod, left; E, same, chela; F, third pereiopod; G, same, propod and dactyl; H, fourth pereiopod; I, fifth pereiopod.

narrow, simple, densely setose medially; coxal endite distinct, slightly produced proximally, with numerous long setulose setae medially; exopod well developed, with narrow caridean lobe, flagellum robust, densely provided with long plumose setae over distal half; epipod large, bilobed, lobes subequal. Second maxilliped with dactylar segment narrow, densely spinose, propod with distomedial angle rounded with 10 long marginal spines medially; carpus, merus and ischiobasis normal, merus with sparse setae along medial margin, long setae proximally; exopod well developed, as in first maxilliped, lacking caridean lobe; coxa angularly produced medially, with numerous long setae; irregularly suboval epipod with small podobranch present laterally. Third maxilliped with endopod slender, distal segment extending far beyond scaphocerite or antennular peduncle; ischiomerus slightly bowed, subcylindrical distally, compressed proximally, about 7.5 times longer than proximal width, slightly tapering distally, with small distoventral spine laterally, lateral border sparsely setose, medial margin with scattered longer setae; penultimate segment about 0.43 of ischiomerus length, subcylindrical, about 4.5 times longer than wide, with six groups of serrulate spines medially

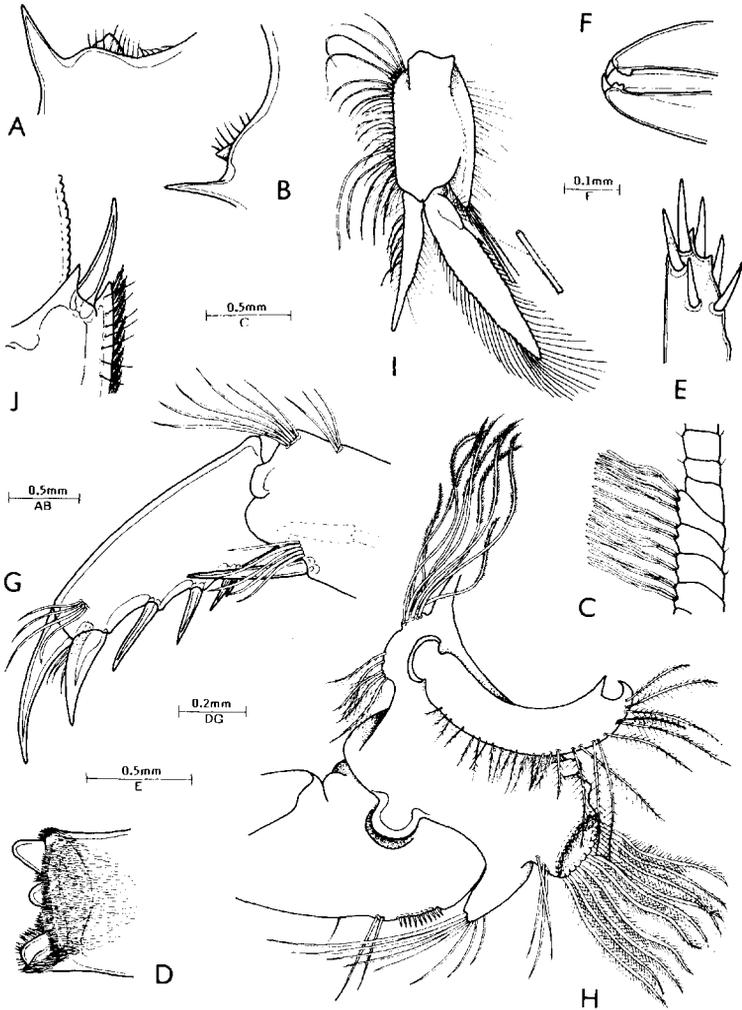


Figure 27. *Lysmata vittata* (Stimpson), female. A, orbital region, dorsal; B, same, lateral; C, antennule, upper flagellum, distal end of fused rami; D, mandible, distal molar process; E, third maxilliped, tip of terminal segment; F, second pereopod, tips of fingers; G, third pereopod, dactyl; H, same, coxo-basal joint, lateral; I, first pleopod, detail of seta (inset).

and long setulose setae laterally; terminal segment about 0.8 of ischiomerus length, 7.0 times longer than proximal width, tapering distally with six strong spines distodorsally, four terminal spines separated by small acute teeth, medial margin covered by 10–11 transverse rows of serrulate spines, lateral surface sparsely setose; basis distinct from ischiomerus, about 0.15 of ischiomerus length, few long setae only medially, with well developed exopod, as in second maxilliped, laterally; coxa feebly produced proximomedially, setose, with conspicuous oval lateral plate, with small acute pointed recurved tip laterally, bearing epipod on outer surface.

First pereopod moderately robust, short, extending to about level of distal end of antennular peduncle; chela with palm smooth, subcylindrical, slightly compressed, about

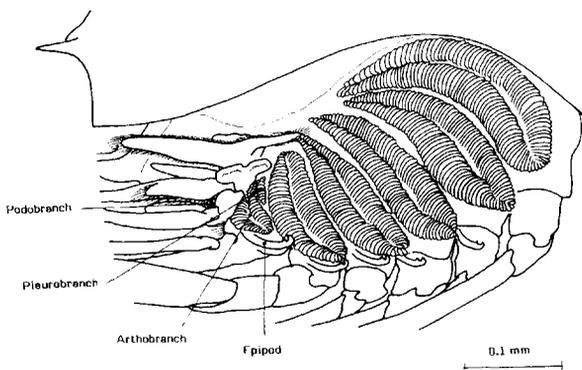


Figure 28. *Lysmata vittata* (Stimpson), female, Darwin, Australia, branchial region.

2.0 times longer than distal width, slightly tapered proximally, fingers similar, about 0.75 of palm length, dactyl about 5.5 times longer than central depth, feebly spatulate with lateral cutting edge, proximal cutting edge concave, distal cutting edge shallow, proximal cutting edge deep, both entire, tip with small blunt spine and short acute tooth, with numerous groups of setae; fixed finger similar; closed fingers appear to gape proximally but gap largely closed by highly transparent membranous cutting edge; carpus about 0.8 of chela length, 3.5 times longer than central width, expanded distally, with groups of long and short setae distoventrally, tapered proximally; merus about 1.5 times carpus length, about 4.5 times longer than central width, tapered slightly, distally unarmed, very obliquely articulated with ischium proximally; ischium about 0.9 of merus length, unarmed; basis normal, short; coxa robust, with epipod and setobranch with several setae.

Second pereopods similar, slender, slightly unequal, left extending to about end of third maxilliped, right distinctly exceeding tip. Left chela with palm slightly compressed, about 1.9 times longer than deep, fingers slender, tapering, about 3.5 times longer than deep with small hooked distal spines preceded by irregular tooth, cutting edges lateral, entire; carpus elongated, slender, 21 segments, about 7.0 times chela length; merus 0.5 of carpus length, 9 segments, about 11.0 times longer than distal width; ischium subequal to meral length, about 10 times longer than proximal width, tapered slightly distally, with one distal segment feebly indicated, ventral margin with 11 recurved spines proximally; basis normal, about 2.6 of ischial length, obliquely articulated; coxa with setobranch and epipod laterally, ventrally with small finger-like process distally and round setose process proximally. Left second pereopod similar, chela subequal to right chela length, carpus with 19 segments, merus with 9 segments, ischium unsegmented, with 11 ventral spines, otherwise similar.

Third pereopods moderately robust, extending to exceed third maxilliped by half propod length; dactyl strongly compressed, corpus about 2.3 times longer than proximal depth, tapering distally with long slender, simple curved unguis distally, about 3.5 times longer than proximal width, corpus with very robust distal accessory spine, 3.0 times longer than proximal width, 0.6 of unguis length, with 3 more slender spines, of decreasing size proximally, along ventral margin, (with addition extra spine proximally on left), corpus with small groups of short setae distolaterally; propod about 4.0 times dactyl length, about 10.5 times longer than proximal width, tapering very slightly

distally, sparsely setose, with long distoventral spine and six ventral spines, of decreasing size proximally, subequally spaced; carpus about 0.65 of propod length, 6.0 times longer than distal width, slightly tapered proximally, with three small ventromedial spines; merus about 1.25 times propod length, about 9.5 times longer than central width, subuniform, with large distolateral spine and four lateral spines; ischium obliquely articulated with merus, about 0.27 of merus length, unarmed; basis without special features; coxa robust, with setobranche and epipod, ventral border with small setiferous process distally, subcylindrical opening of oviduct proximally, margin surrounded by short plumose setae.

Fourth pereopod similar to third, propod slightly shorter, with slightly smaller ventral spines, carpus with two ventromedial spines only; merus about 0.9 of third merus length, with five lateral spines; coxa with setobranche, epipod and ventral setiferous process.

Fifth pereopod more slender, propod about 0.8 of third propod length, with four ventral spines only, carpus without ventromedial spines; merus with single distoventral spine only; coxa with setobranche only.

Thoracic sternites narrow and unarmed.

First pleopod with basipodite broad, 2.0 times longer than wide, with strong distolateral angle bearing three long rigid finely serrulate setae, lateral border finely setose, medial border densely setose with row of 8 ovigerous setae proximally and 5 distally; endopod slender about 0.75 of exopod length, about 0.68 times longer than proximal width, tapering to slender distal process, medial and lateral margins setose for 0.75 of length, medial margin with 5 ovigerous setae, distal fourth subcylindrical, bare.

Uropod with protopodite short, posterolateral lobe acutely pointed, setose; exopod subequal to telson length, about 2.2 times longer than wide, broadest distally, lateral margin almost straight, densely setose submarginally, with strong distal spine between two short acute teeth, diaeresis well marked.

Ova numerous and small, length *c.* 0.6 mm.

Measurements. Total length (approx.) 31 mm; postorbital carapace length 7.3 mm; rostrum and carapace, 12.0 mm.

Colouration. Generally semitransparent with olive green ovary, with numerous fine red longitudinal striae.

Remarks. Several authors (De Man, 1907; Kemp, 1914; Holthuis, 1945; Kubo, 1951) have provided illustrated reports on *Lysmata vittata* subsequent to Stimpson (1860). The present description confirms the details provided by these authors, except for minor details of non-specific value. *Lysmata vittata* occurs extensively throughout most of the Indo-West Pacific region from East Africa to Japan, Australia and the Philippines.

DISCUSSION

Stimpson (1860) described eleven new taxa of marine carideans from Hong Kong waters. During the 1986 Workshop only five of these were re-collected. Of the species not collected, were *Crangon carinicauda*, referred to the genus *Pontophilus* by De Man (1922) and presumably to *Philocheiras*, as redefined by Chace (1984); *Nika macrognaatha*, now referred to *Processa* (Hayashi, 1975); *Rhynchocyclus mucronatus*, now referred to *Latreutes* (Holthuis, 1945), and *Alpheus avarus*, considered a *nomen dubium* by Banner and Banner (1978), possibly referring to *A. strenuus* Dana, and

Leander pacificus and *L. longicarpus*, both now placed in the genus *Palaemon*, and the latter species referred to *P. concinnus* Dana. Further search may provide examples of some of these species but the marine environment has changed considerably since Stimpson's time and it is quite probable that some of these no longer occur in Hong Kong's waters.

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