

THREE NEW SPECIES OF COMMENSAL SHRIMPS FROM PORT ESSINGTON, ARNHEM LAND, NORTHERN AUSTRALIA (CRUSTACEA: DECAPODA: PALAEMONIDAE)

A.J. BRUCE

Northern Territory Museum of Art and Sciences,
GPO Box 4646, Darwin, NT 5794, Australia.

ABSTRACT

Three new species of commensal caridean shrimps from Port Essington, Cobourg Peninsula Marine Park, Arnhem Land, are described and illustrated. *Periclimenes alegrias* sp. nov. is associated with the crinoids *Stephanometra spicata* Carpenter, *Lamprometra palmata* Müller and *Comanthina variabilis* Bell; *Periclimenaeus orontes* sp. nov. with the sponge *Jaspis stellifera* Carter and *Hamopontonia essingtoni* sp. nov. with the scleractinian coral *Stylophora pistillata* (Esper).

KEYWORDS: taxonomy, Crustacea, Palaemonidae, new species, commensals, Northern Australia.

INTRODUCTION

The caridean shrimp fauna of northern Australia has been little studied. In the course of a study carried out by the Northern Territory Museum of the marine fauna of Port Essington, in the Cobourg Peninsula Marine Park, three undescribed species of commensal palaemonid shrimps were discovered. These three species are described and illustrated in the following paper. The study of the Port Essington marine fauna was funded by the Australian Heritage Commission. I am most grateful to the following for the identifications of host animals; J.N.A. Hooper, L. Vail and Dr J.E.N. Veron, and the Master and crew of the F.V. "Alegrias", for the facilities provided at sea.

SYSTEMATICS

Periclimenes alegrias sp. nov.

(Figs 1A, 2-5, 15A-C)

Type material. HOLOTYPE - ♀ (ovigerous), Northern Territory Museum (NTM) Cr. 004071, Coral Bay, Port Essington, 11°11.2'S 132°02.8'E, Stn. CP/76, 2-4 m, 12 September 1985, coll. L Vail. PARATYPES - 1 ♀ (ovigerous), NTM Cr. 003223, same locality as holotype, Stn. CP/70, 3-6 m, 12 September 1985, coll. L Vail; 1 ♂, 1 ♀ (ovigerous), NTM Cr.000286, North West Vernon Island, 12°02.6'S 131°04.6'E, Stn. AJB/9, 15 m, 27 September 1982, coll. P Horner.

Description. Small sized shrimps, of robust smooth, sub-cylindrical body form, with male smaller and more slender than female.

Carapace smooth, glabrous. Rostrum moderately deep, horizontal and straight, about 0.7 of postorbital carapace length, slightly exceeding antennular peduncle; dorsal lamina with six or seven small acute teeth, first situated well in advance of postorbital margin, interspaces setose; ventral carina well developed, convex, unarmed and non-setose, lateral carinae feebly developed distally, expanded posteriorly over orbital region; supraorbital teeth and tubercles absent; orbit feebly developed dorsally; inferior orbital angle slightly produced, subacute; antennal spine well developed, acute, marginal and upwardly directed; hepatic spine more robust than antennal, situated at slightly lower and more posterior level, only slightly posterior to postorbital margin; branchiostegite normal, with anteroventral angle feebly produced, broadly rounded.

Abdominal segments smooth, glabrous; third segment not posterodorsally produced, fifth segment about 0.6 times length of sixth, sixth about 1.25 times longer than deep, with acute posterolateral and posteroventral angles; pleura all broadly rounded, first to third broadly expanded in female, fourth and fifth relatively small and feebly produced. Telson nearly 1.5 times sixth segment length, about 3.0 times longer than anterior width, sides straight, convergent to transverse posterior border, equal to about 0.36 of anterior width, slightly produced centrally, without median point; two pairs of small submarginal dorsal spines at about 0.66 and 0.8 of telson length; three pairs of posterior spines present, lateral spines small, subequal to dorsal spines, inter-

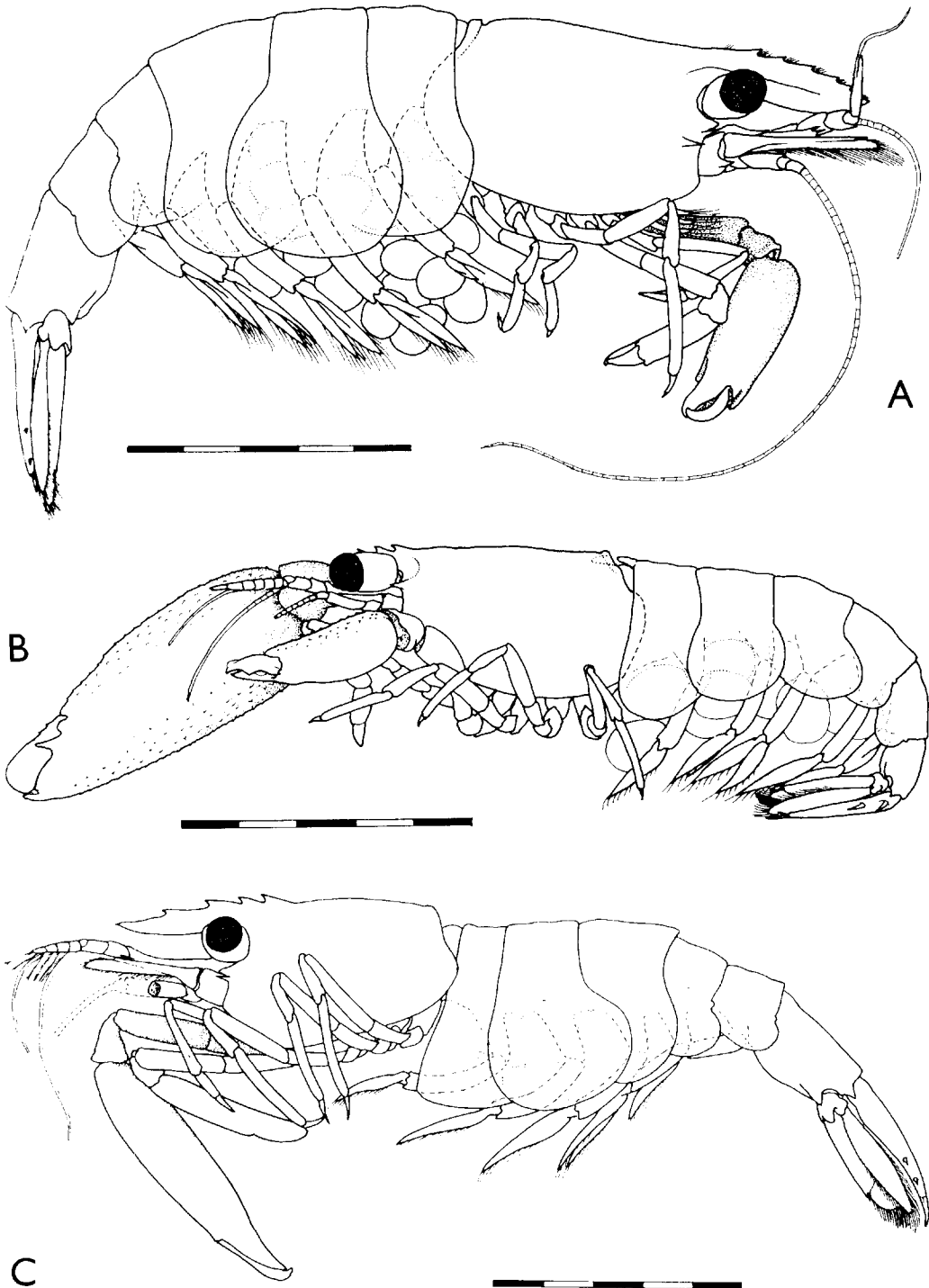


Fig. 1. A, *Periclimenes alegrias* holotype ♀ (ovigerous); B, *Periclimenaeus orontes* holotype ♀ (ovigerous); C, *Hamopontonia essingtoni* holotype ♀ (ovigerous). Scales 0.5 mm.

mediate spines large, about 0.13 of dorsal telson length, submedian spines about half length of intermediate spines, densely setulose medially and laterally.

Antennules with proximal segment broad, about 1.5 times longer than width distal to statocyst, stylocerite well developed, acute, exceeding half segment length; distolateral margin strongly produced, with acute tooth distinctly exceeding strong tooth at distal end of lateral margin; medial margin with acute

tooth ventrally at half length; statocyst normally developed with circular non-granular statolith, intermediate and distal segments short, intermediate slightly longer than distal, together equal to about 0.85 of proximal segment length; upper flagellum short, about 0.6 of postorbital carapace length, biramous with proximal three segments of rami fused, shorter ramus with three free segments, longer with about 12, about six groups of aesthetascs present.

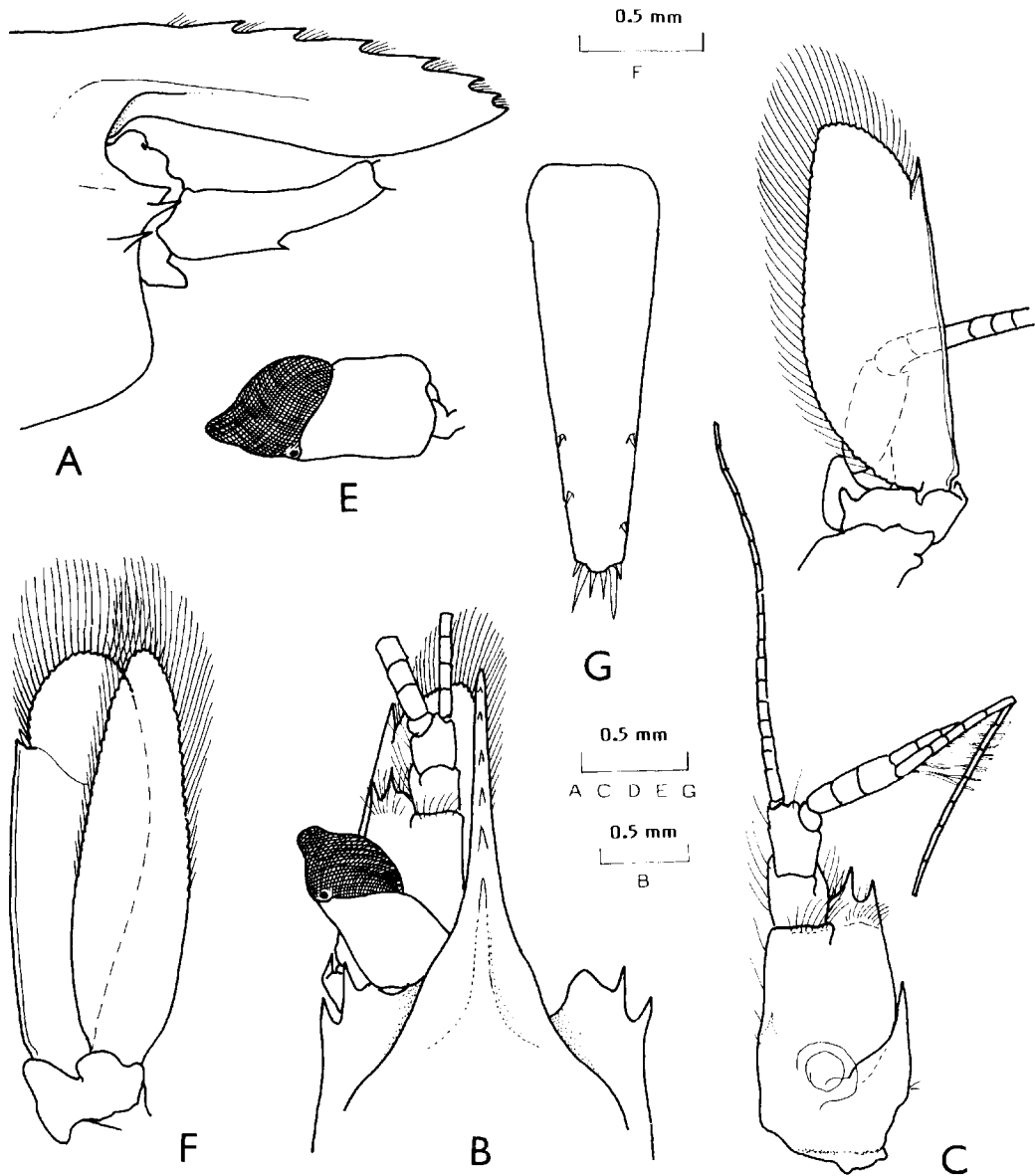


Fig. 2. *Periclimenes alegrias* holotype ♀ : **A**, anterior carapace and rostrum, lateral; **B**, same, dorsal; **C**, antennule; **D**, antenna; **E**, eye; **F**, uropod; **G**, telson.

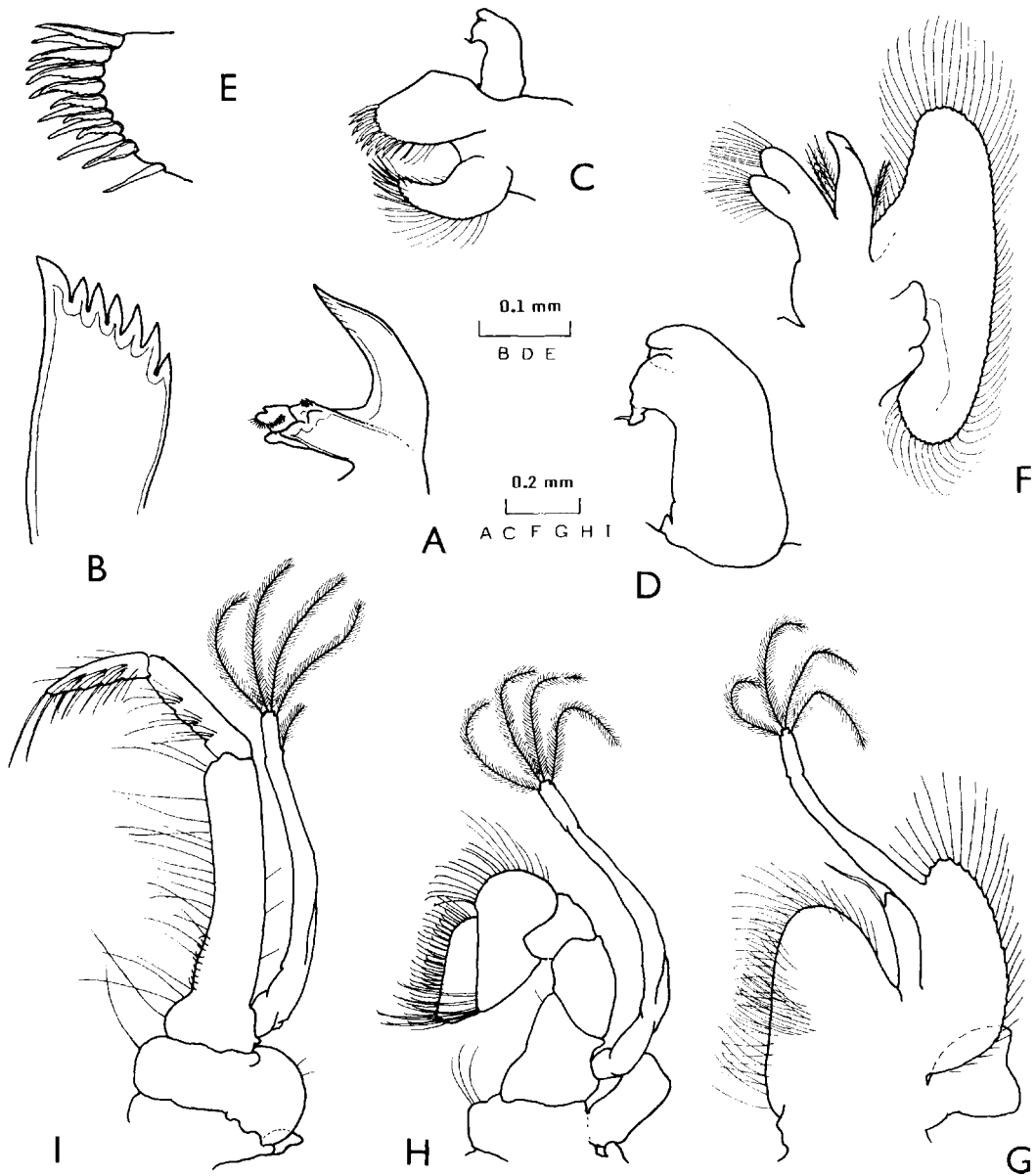


Fig. 3. *Periclimenes alegrias* holotype ♀; A, mandible (damaged); B, same, incisor process; C, maxillula; D, same, palp; E, same, distal upper lacinia; F, maxilla; G, first maxilliped; H, second maxilliped; I, third maxilliped.

Antenna with robust basicerite, with strong, acute distolateral tooth, antennal gland opening produced medially, ischiocerite and merocerite normal, carpoperite short, about twice as long as wide, extending to about 0.3 of lateral border of scaphocerite, flagellum well developed, about 3.0 times postorbital carapace length; scaphocerite exceeding antennular peduncle, about 2.6 times longer than greatest width, tapering

slightly distally, anterior margin bluntly angular, far overreaching strong distolateral tooth on straight lateral margin.

Eye well developed, cornea globular, conoidally produced posterodistally, obliquely attached to stalk, with distinct posterior accessory pigment spot; stalk subcylindrical, about as broad as average length.

Mandible robust, without palp, molar process (right) obliquely truncated distally with

five large blunt teeth and patches of short stout setae; incisor process well developed, broadened distally, cutting edge oblique with seven acute teeth, with distolateral tooth enlarged and laterally directed. Maxillula

normal, with feebly bilobed palp, lower lobe with ventral process bearing short simple setae, upper lacinia feebly broadened, distal margin rounded with 13-14 spines, robust spines serrated, more slender spines simple;

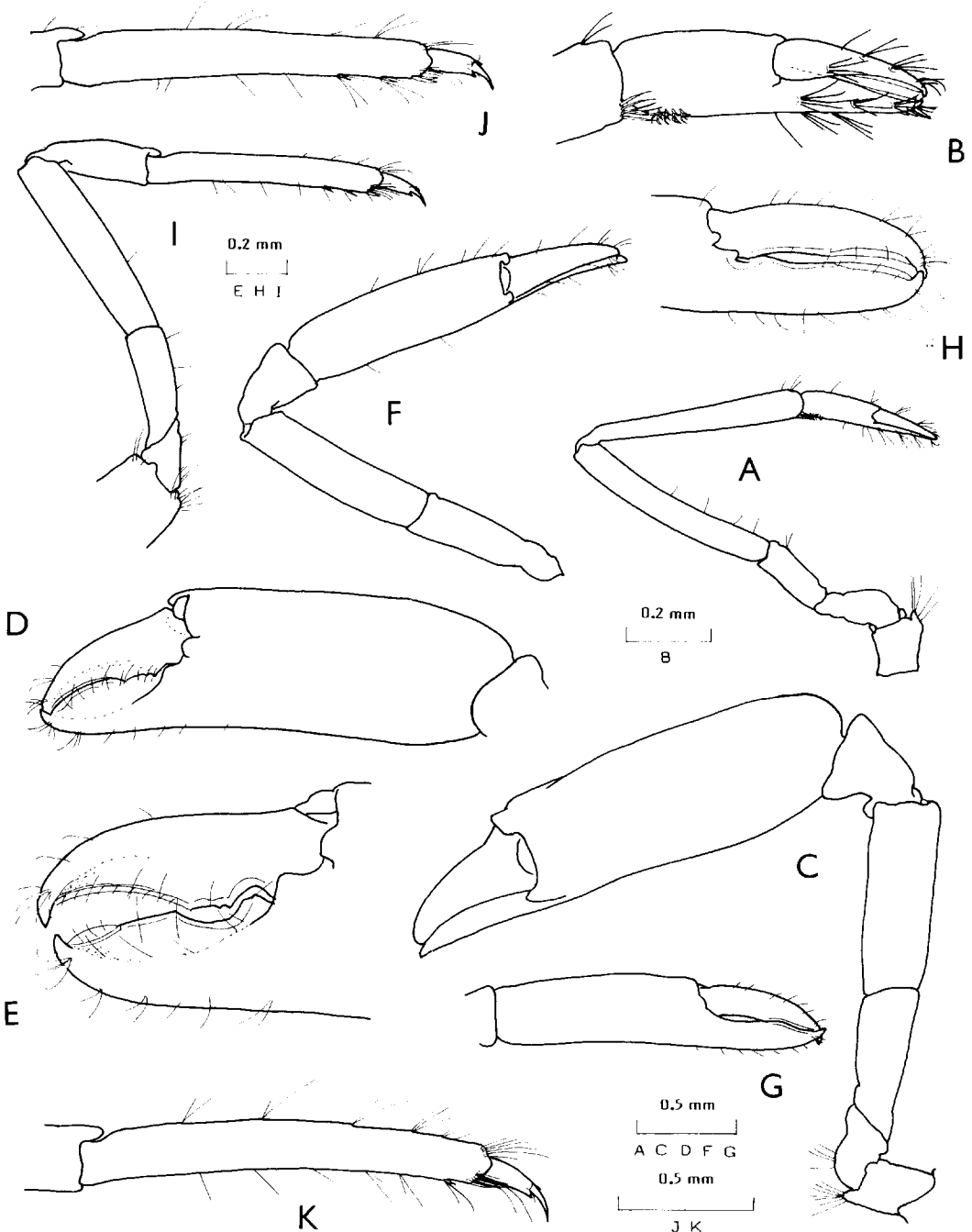


Fig. 4. *Periclimenes alegrias* holotype ♀ : **A**, first pereiopod; **B**, same, chela; **C**, major second pereiopod; **D**, same, chela; **E**, same, fingers; **F**, minor second pereiopod; **G**, same chela; **H**, same fingers; **I**, third pereiopod; **J**, same propod and dactyl; **K**, fifth pereiopod, propod and dactyl.

lower lacinia tapering with numerous sparsely serrulate setae ventrally, becoming spiniform distally. Maxilla with short tapering palp bearing setulose setae medially and laterally proximally, basal endite deeply bilobed, lobes subequal, distal lobe with about 11 simple setae distally, proximal lobe with about 15; coxal endite obsolete, medial border feebly convex; scaphognathite well developed, about 2.6 times longer than broad, anterior lobe broad, medial margin concave, posterior lobe large, subequal to length of anterior lobe. First maxilliped with subcylindrical palp bearing preterminal plumose seta, basal endite broadly rounded, sparsely setose medially with simple setae, separated by small notch from obsolete non-setose coxal endite; exopod with well developed flagellum with four plumose distal setae, caridean lobe large, epipod small, triangular, feebly bilobed. Second maxilliped with dactylar segment moderately broad, medial border densely armed with serrulate spines, propodal segment broadly rounded distally with numerous slender setae, setulose medially and simple laterally, carpal, ischiomer and basal segments normal, exopod with well developed flagellum with four plumose distal setae; coxa feebly produced medially with three simple setae, small subrectangular epipod without podobranch laterally. Third maxilliped with short endopod, reaching to about proximal end of carapocerite, ischiomerus and basis completely fused, combined segment about 5.7 times longer than central width, ischiomer portion subuniform, 4.5 times longer than wide, slightly expanded proximomedially with submarginal row of six short curved spines, medial border with sparse simple setae; penultimate segment about half length of antepenultimate segment, about 4.5 times longer than wide, uniform, with groups of short spiniform setae; terminal segment tapering distally, about 0.75 times length of penultimate segment, 4.0 times longer than proximal width, with long simple spiniform seta distally and numerous groups serrulate setae; basal region medially convex with three long setae, exopod with well developed flagellum with four terminal and one short preterminal plumose setae distally; coxal region medially convex with single simple seta, with low round lateral plate and rudimentary arthrobranch.

Epistome with anterolateral angles bluntly produced. Fourth thoracic sternite without fingerlike median process. Fifth to eighth sternites moderately broad, unarmed.

First pereopods moderately slender, extending to near distal border of scaphocerite; chela with palm subcylindrical, slightly compressed, about 2.1 times longer than deep; fingers slender, subequal to palm length, about 4.0 times longer than proximal depth, with small acute hooked tips, entire lateral cutting edges and numerous groups of setae; palm with five rows of short serrulate cleaning setae proximally; carpus about 1.6 times length of chela, about 8.0 times longer than distal width, slightly tapering proximally, with several long serrulate cleaning setae distally; merus slightly shorter than carpus, feebly bowed, about 7.4 times longer than wide, uniform; ischium 0.36 of meral length, about 2.6 times longer than central width; basis subequal to ischial length, coxa with small setose distoventral process.

Second pereopods robust, unequal, chelae smooth. Major second pereopod chela with palm subcylindrical, compressed, about 2.3 times longer than central depth, chela slightly longer than postorbital carapace length; dactyl about 3.0 times longer than proximal depth, robust, about 0.5 of palm length, with stout acute hooked tip, distal half of cutting edge laterally situated, sharp, entire, proximal half blunt with small distal tooth and two small proximal teeth opposing diastema on fixed finger; fixed finger generally similar, distal sharp cutting edge only one fourth of whole length, blunt proximal edge with small obtuse tooth distally separated by diastema from two small blunt teeth opposing diastema on proximal dactylus; carpus short, stout, unarmed, distally expanded, about 0.28 of palm length; merus robust, about 3.0 times longer than wide, 0.55 of palm length, smooth, distoventral angle unarmed; ischium about 0.8 of merus length, about 2.9 times longer than distal width, slightly tapered proximally, unarmed; basis and coxa without special features. Minor second pereopod chela subequal to palm length of major chela, about 0.7 of postorbital carapace length; palm subcylindrical, slightly compressed, about 3.0 times longer central depth, slightly deeper distally than proximally; dactyl about 0.6 of palm length, about 4.4 times longer than proximal

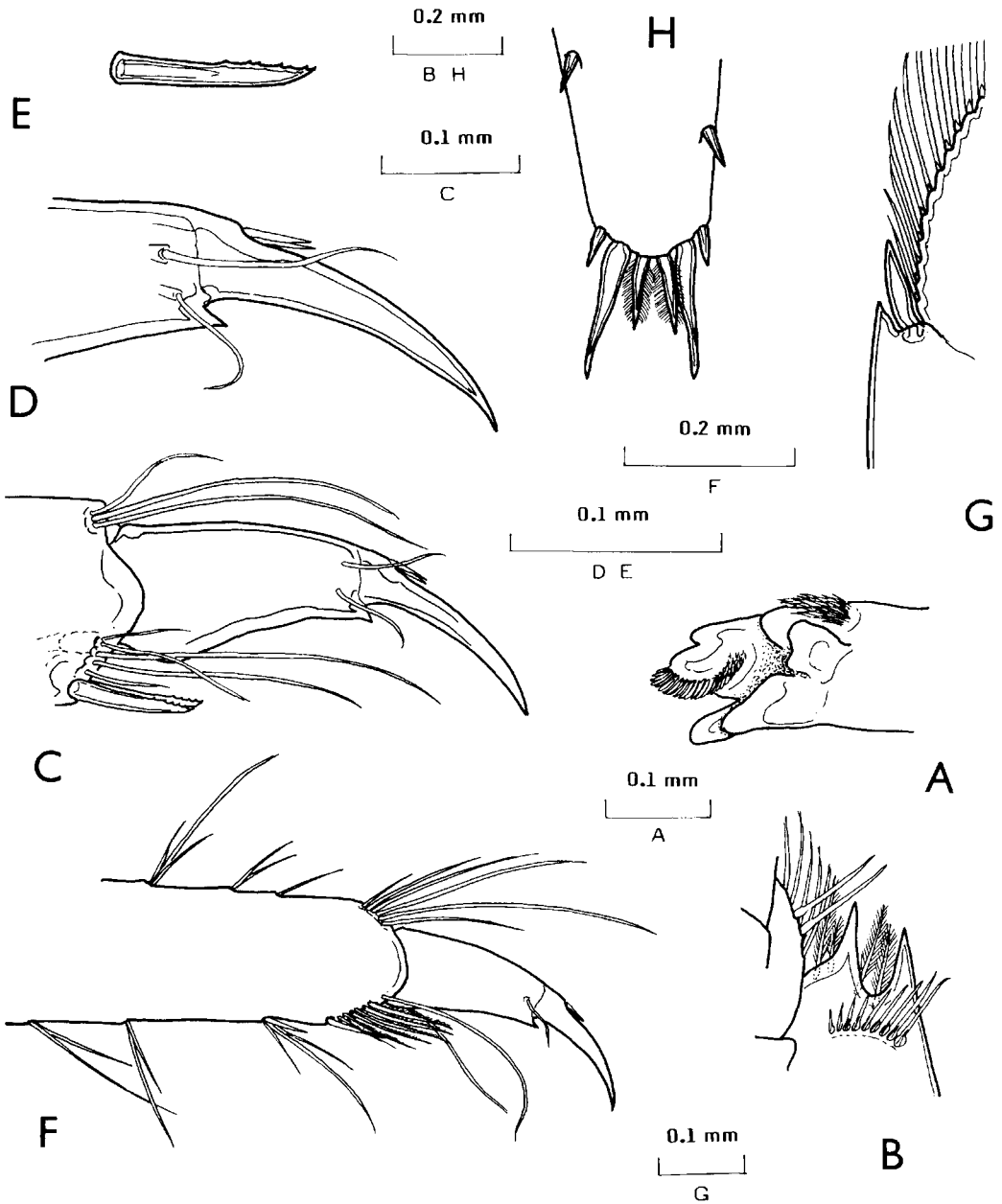


Fig. 5. *Periclimes alegrias* holotype ♀: **A**, molar process of right mandible; **B**, distolateral angle of proximal segment of antennular peduncle; **C**, third pereiopod, distal propod and dactyl; **D**, same unguis; **E**, same, distoventral spine of propod; **F**, fifth pereiopod, distal propod and dactyl; **G**, uropod, distolateral angle of exopod; **H**, telson posterior spines and posterior dorsal spines.

depth, with small acute hooked tip; fixed finger similar, cutting edges with distal halves sharp and closing, proximal halves blunt, gaping; carpus about 0.38 of palm length, unarmed; merus about 0.8 of palm length, 4.0 times longer than wide, unarmed, sub-

equal to major pereiopod merus length; proximal segments similar to major pereiopod but less robust.

Ambulatory pereiopods moderately slender. Third pereiopod extending anteriorly to slightly exceed distal border of scaphocrite,

dactylus strongly compressed, corpus about 1.8 times longer than proximal depth, distal depth half of proximal, with single small acute distoventral tooth with two short sensory setae distolaterally and one distomedially; unguis slender, curved, subequal to dorsal length of carpus, with pair of short spiniform setae proximodorsally; propod about 4.8 times dactylar length, about 7.6 times longer than proximal depth, slightly tapering distally, distoventral angle with pair of strong dorsally serrulate spines, ventral border with two single similar spines on distal fourth; carpus about half length of propod, about 3.2 times longer than central width, unarmed; merus about 0.9 of propod length, about 4.4 times longer than central width, uniform and unarmed; ischium about 0.6 of merus length, about 3.1 times longer than distal width, slightly narrowed proximally; basis and coxa without special features. Fourth and fifth pereopods similar to third. Propod of fifth pereopod about 1.1 times length of third, 8.0 times longer than proximal width, with single densely serrulate distoventral spine, and single ventral spine only, with numerous serrulate setae distoventrally.

Endopod of male first pleopod about 1.6 times longer than greatest width, distal two thirds expanded, subcircular, with single simple seta medially, proximal medial border with three short curved spines. Endopod of male second pleopod with corpus of appendix masculina slightly exceeding half segment length, about 3.0 times longer than wide, subcylindrical, with pair of slender simple distal spines, about equal to corpus length, and shorter preterminal ventromedial spine; appendix interna slightly exceeding corpus of appendix masculina, with few distal concinnuli only.

Uropod with protopodite with blunt posterolateral lobe; exopod distinctly exceeding telson, about 3.1 times longer than wide, lat-

eral margin feebly convex, entire, with small distolateral tooth, with larger mobile spine medially; endopod subequal to exopod, about 3.6 times longer than wide.

Ova about 50, of normal length.

Colouration. Body with median dorsal creamy longitudinal band, bordered by dark brown, becoming orange on dorsal rostral lamina; carapace with broad dorsolateral and ventrolateral creamy bands, separated by narrow band of brown; abdomen laterally transparent, pleura with upper and lower creamy longitudinal bands bordered dorsally by dark brown; telson mainly dark brown, uropods largely orange, especially distolaterally; scaphocerite bright orange laterally, dark brown medially; second pereopods medially orangish, laterally dark brown, first pereopods similar, less intense, ambulatory pereopods pallid.

Host. The specimens were all found in association with crinoid hosts. The holotype was found on *Stephanometra spicata* (Carpenter), the Coral Bay paratype on *Lamprometra palmata* (Müller) (Mariametridae) and the Vernon Island specimens were found on *Comanthina variabilis* (Bell) (Comasteridae).

Systematic Position. *P. alegrias* is most closely related to *P. cornutus* Borradaile, 1915, and to a lesser degree to *P. ceratophthalmus* Borradaile, 1915 and *P. amboinensis* (De Man, 1887) These three species are all crinoid associates (Bruce 1982) and were at one time placed together in the subgenus *Corniger* Borradaile, 1915. This subgenus was characterized by the presence of a conoidally produced cornea, a feature not found in other species of the genus *Periclimenes* Costa, 1844. *P. alegrias* may immediately be distinguished from all three species by its lack of supraorbital teeth, which are conspicuously developed in the other three species, together with a relatively

Measurements (mm)	Holotype ♀	Paratype ♀	Paratype ♀	Paratype ♂
	CP/76	CP/70	AJB/9	AJB/9
Total length (approx).	13.0	11.5	15.5	11.0
Carapace length (incl. rostrum)	4.75	4.0	5.4	3.5
Postorbital carapace	2.6	2.2	2.9	1.75
Major chela	2.7	2.4	2.75	2.25
Minor chela	1.8	1.85	2.5	1.6
Length of ova	0.6	0.6	0.6	—

better degree of development of the orbit. *P. ceratophthalmus* and *P. amboinensis* have relatively much more slender chelae on the second pereopods, but robust chelae are present in *P. cornutus* although less so than in *P. alegrias* (Bruce 1978a). *P. cornutus* and *P. ceratophthalmus* also lack the acute tooth present on the anterolateral lobe of the first segment of the antennular peduncle as in *P. alegrias*.

2. Supraorbital teeth absent; rostral dentition 6/0 *P. alegrias* sp.nov.
- Supraorbital teeth present 3
3. Rostrum exceeding antennular peduncle, rostral dentition 1+6-7/1; chelae of second pereopod long and slender *P. amboinensis* (De Man)
- Rostrum not exceeding antennular peduncle, rostral dentition 1+6/1; chelae of second pereopod short and stout *P. cornutus* Borradaile

Key to the *Periclimenes ceratophthalmus* Species Group

1. Cornea with conspicuous elongated terminal papilla; rostral dentition 3-5/0-2 *P. ceratophthalmus* Borradaile
- Cornea conoidally produced, without elongated papilla; rostral dentition 3-4/0-1 2

Remarks. *P. alegrias* and the closely related species are found in association with a variety of crinoid hosts belonging to three families. These associations are summarized in the following table, the hosts names, largely from Bruce (1983), are updated in accordance with Rowe, *et al.* (1986).

	<i>Periclimenes alegrias</i>	<i>Periclimenes ceratophthalmus</i>	<i>Periclimenes cornutus</i>	<i>Periclimenes amboinensis</i>
COMASTERIDAE				
<i>Capillaster multiradiatus</i>	—	—	—	—
<i>Comanthus briareus</i>	+	—	—	+
<i>Comanthus parvicirrus</i>	—	—	—	+
<i>Comanthus wahlbergii</i>	—	—	—	+
<i>Oxycomanthus bennetti</i>	—	—	—	+
HIMEROMETRIDAE				
<i>Himerometra robustipinna</i>	—	+	+	—
MARIAMETRIDAE				
<i>Dichrometra afra</i>	—	+	—	—
<i>Lamprometra klunzingeri</i>	—	+	—	—
<i>Lamprometra palmata</i>	+	—	—	—
<i>Stephanometra indica</i>	+	+	—	—
<i>Stephanometra spicata</i>	—	+	—	—

***Periclimenaeus orontes* sp.nov.**
(Figs 1B, 6-10)

Type material. HOLOTYPE - ♀ (ovigerous), NTM Cr. 000272, Orontes Reef, Port Essington, 11°03.6'S 132°05.0'E, Stn. CP/40, 3 m, 5 May 1982, coll. J.N.A. Hooper.

Description. A small sized shrimp of sub-cylindrical body form.

Carapace smooth, glabrous, with short, straight, horizontal, acute rostrum reaching to level of distal end of proximal segment antennular peduncle and distal corneal mar-

gin of anteroverted eye; equal to about 0.3 of postorbital carapace length; dorsal carina with six acute teeth, all situated distally to level of orbital notch, with size decreasing anteriorly, ventral border straight, non-setose, unarmed; lateral carinae feebly developed; orbit feebly developed, supraorbital teeth or tubercles lacking, antennal spine well developed; inferior orbital angle feebly produced; hepatic spine absent; anterolateral angle of carapace not produced, bluntly rounded.

Abdominal segments smooth and glabrous; first segment with anterior margin of posterior part of tergite produced as robust broad median lobe that fits beneath the posterior margin of carapace; third segment not posterodorsally produced, fifth segment subequal to sixth, sixth about 1.2 times longer than deep, depressed, with posterolateral and posteroventral angles feebly produced, blunt; pleura broadly rounded, first three feebly enlarged, fourth and fifth small, feebly produced. Telson equal to 2.0 times sixth abdominal segment length, about 2.1 times longer than anterior width, sides feebly concave, converging to rounded posterior margin, about 0.5 of anterior width; two pairs of large, robust subequal dorsal spines at 0.09

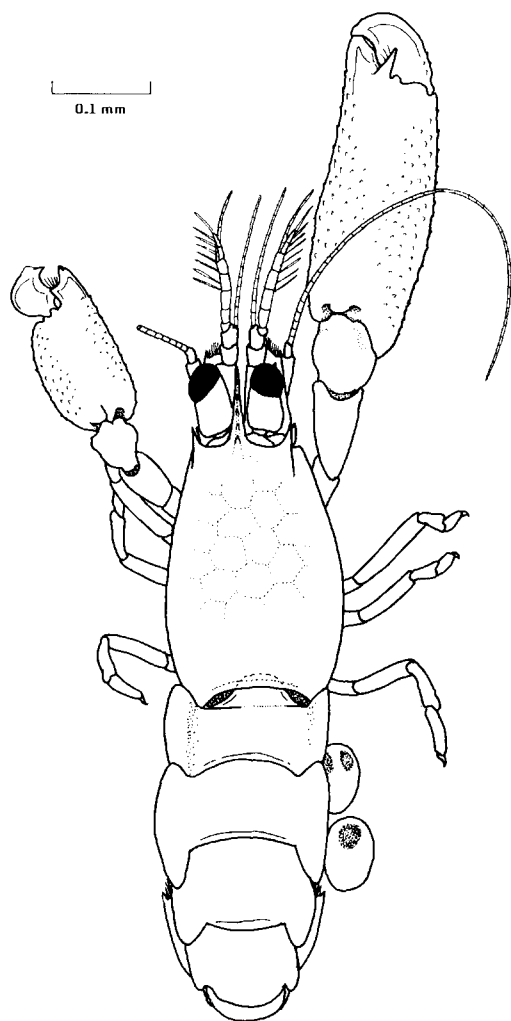


Fig. 6. *Periclimenes orontes* holotype ♀ (ovigerous),

dorsal.

and 0.28 of telson length, spines about 0.14 of telson length; three pairs of posterior spines, lateral spines small, slender, subdorsal; intermediate spines well developed, about 0.18 of telson length; submedian spines long and slender, densely setulose, well exceeding tips of intermediate spines, about 0.21 of telson length.

Antennule small and feebly developed, peduncle exceeding rostrum by intermediate and distal segments; proximal segment broad, about 1.8 times longer than wide, proximal lateral border strongly produced laterally, distal part strongly concave, distolateral margin strongly produced with stout distolateral tooth, medial margin with strong ventral tooth; stylocerite short and stout, phylliform, distally acute, not reaching half segment length, laterally with plumose setae, and gaping from lateral margin of segment; statocyst normal, with granular statolith; intermediate segment short and stout, about 0.22 of proximal segment length, with feeble lateral lamella; distal segment about 1.5 times intermediate segment length, 1.4 times longer than wide; upper flagellum biramous with four proximal segments of rami fused, shorter free ramus with single free segment only, larger ramus with 8 segments; about 8 groups of aesthetascs present.

Antenna with short stout basicerite with small acute lateral tooth; carpocerite about 3.6 times longer than broad, compressed, slightly broadened distally, flagellum about 2.0 times postorbital carapace length; scaphocerite distinctly exceeding rostrum and carpocerite, about 2.6 times longer than wide, greatest width at half length, anterior margin of lamella broadly rounded, distinctly exceeding small acute distolateral tooth of straight lateral margin.

Eye with oblique hemispherical cornea, without accessory pigment spot; stalk subcylindrical, slightly tapered distally, greatest length about 1.5 times proximal width.

Mandible (right) with robust corpus, without palp; molar process stout, obliquely truncated distally, dorsal and ventral margins with elongated low carinae separated by dense tuft of short setae laterally and small blunt tooth with adjacent setae medially; incisor process feebly developed, slender, tapered distally, truncate with three small subequal acute teeth. Maxillula with small, feebly bilobed palp, lower lobe with small

simple setae, upper lacinia slightly broadened, distally truncate with 10 stout simple spines and few setae; lower lacinia slender, distally tapered, with setulose setae

distally. Maxilla with tapering, subcylindrical non-setose palp; basal endite bilobed, proximal lobe distinctly smaller than distal, with 5 and 9 simple distal setae respectively; coxal

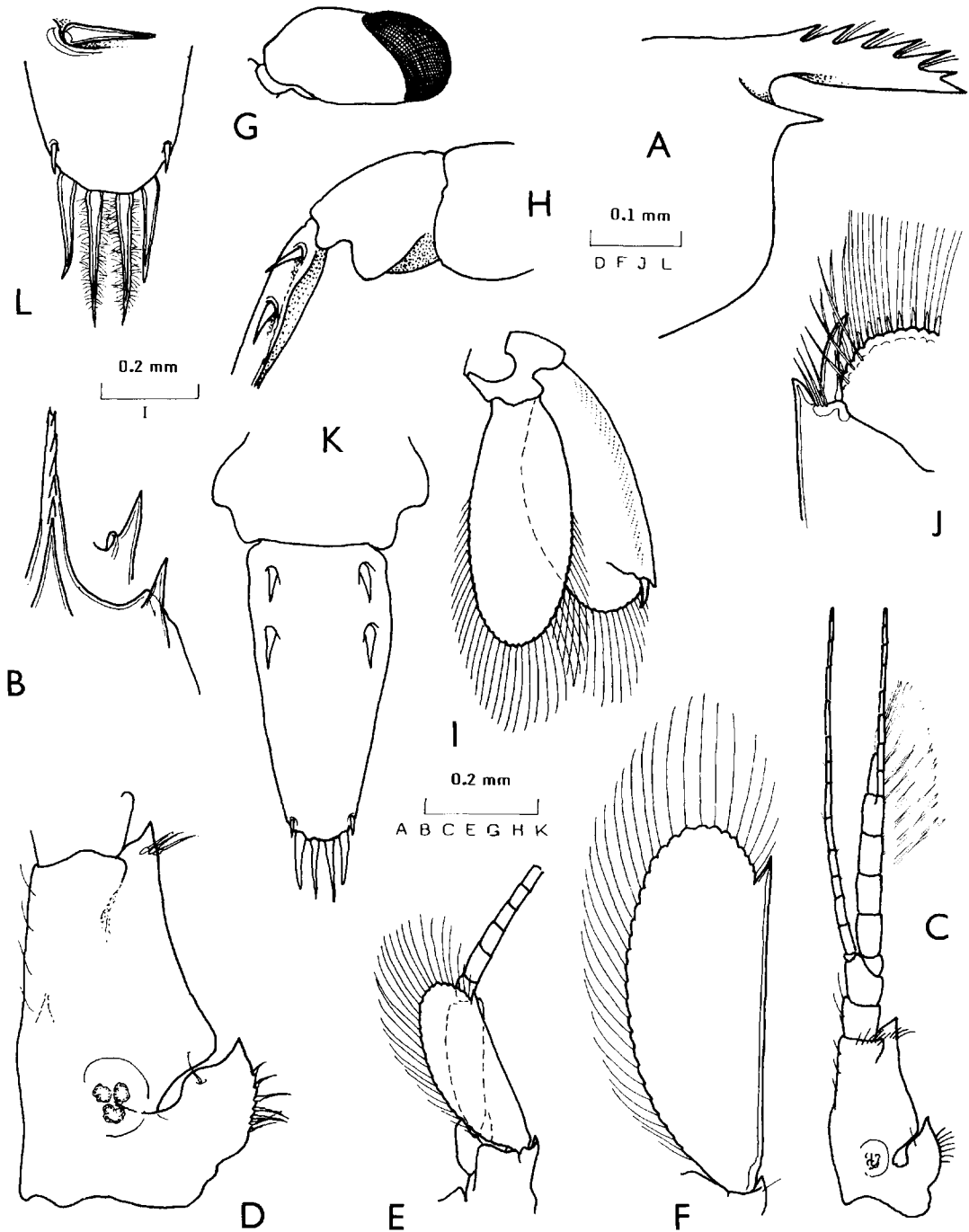


Fig. 7. *Periclimenes orontes* holotype ♀: **A**, anterior carapace and rostrum, lateral; **B**, right orbital region; **C**, antennule; **D**, same, proximal pedunaculum; **E**, antenna; **F**, scaphocerite; **G**, eye, dorsal; **H**, posterior abdomen, lateral; **I**, uropod; **J**, same, distolateral angle; **K**, telson; **L**, and same, posterior spines.

endite obsolete, median margin convex, non-setose, scaphognathite well developed, about 3.2 times longer than broad, anterior lobe narrowing distally, medial margin concave, posterior lobe well developed. First maxilliped with slender, subcylindrical palp with preterminal simple medial seta; basal endite broadly rounded, sparsely provided

with simple setae medially, exopod with well developed flagellum with four distal and one preterminal plumose setae, caridean lobe large and broad; coxal endite obsolete, small, convex, non-setose; epipod well developed, triangular, deeply bilobed. Second maxilliped endopod of normal form, dactylar segment sparsely setose with slender

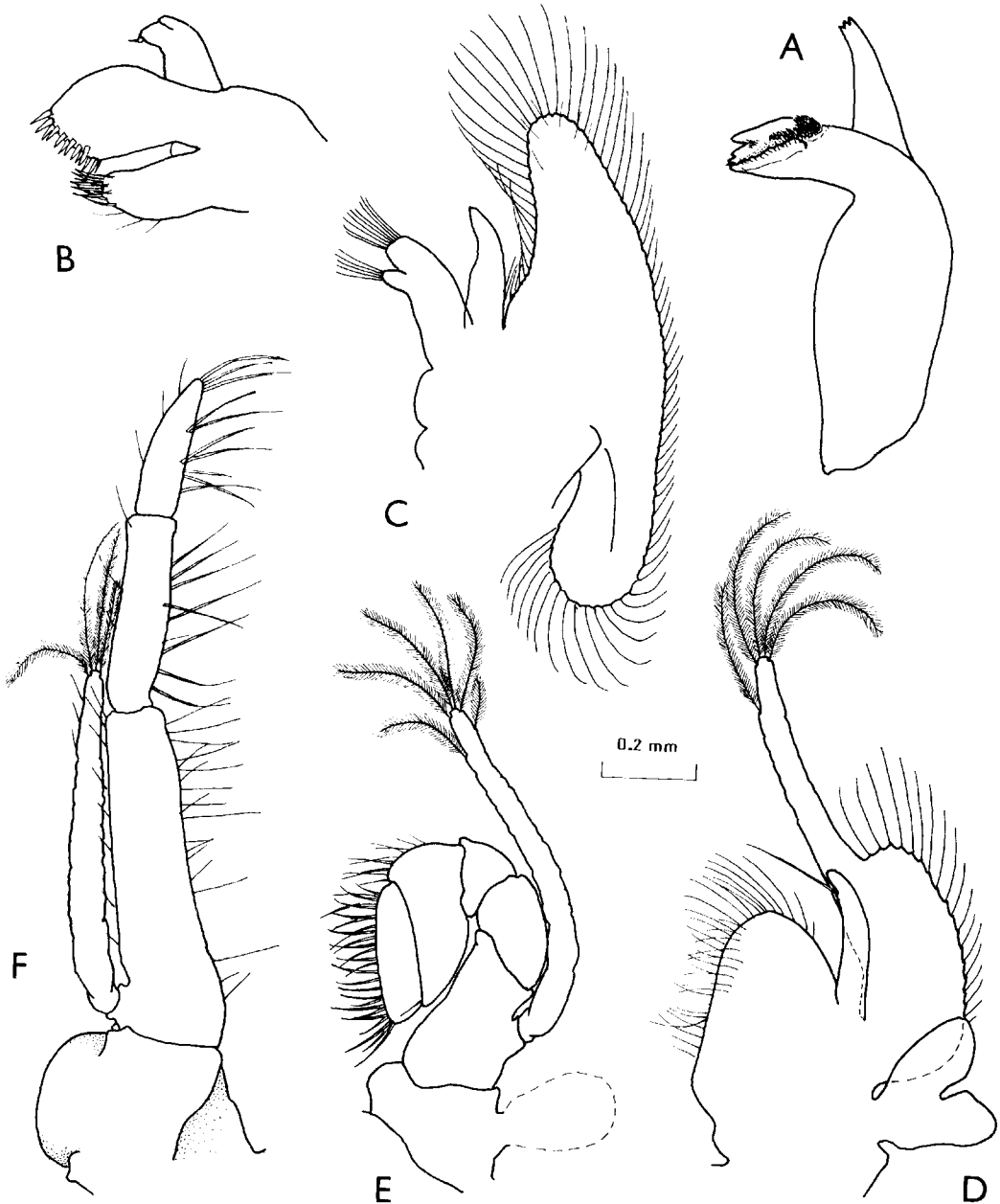


Fig. 8. *Periclimenes orontes* holotype ♀: **A**, mandible; **B**, maxillula; **C**, maxilla; **D**, first maxilliped; **E**, second maxilliped; **F**, third maxilliped.

spines; exopod well developed, with four terminal and two preterminal plumose setae distally; coxa slightly produced medially, non-setose, with small oval epipod without podobranch laterally. Third maxilliped with endopod extending anteriorly to level of ventromedial tooth of proximal segment of antennular peduncle; ischiomerus and basis fused, combined segment about 4.0 times longer than broad, uniform, about 0.57 of antepenultimate segment length, with sparse stouter setae medially; terminal segment about 3.5 times longer than proximal width, about 0.4 of antepenultimate segment length, sparsely setose; exopod slightly exceeding distal end of antepenultimate segment, with four plumose setae distally; coxa stout, medially excavate, with broad low lateral plate, without arthrobranch.

First pereopod moderately robust, distal merus slightly exceeding carpoperite; chela stout, palm slightly swollen and compressed, about 1.3 times longer than greatest depth; dactylus subequal to palm length, about 3.0 times longer than distal width, tapering proximally; carpus about 1.2 times length of chela; merus bowed, about 4.2 times longer than wide, uniform, about 1.1 times carpal length; ischium, basis and coxa normal, without special features.

Second pereopods well developed, markedly unequal and dissimilar. Major chela about 1.6 times postorbital carapace length, palm swollen, subcylindrical, slightly compressed and tapering distally, dorsally tuberculate, with small acute tubercles; about 2.0 times longer than greatest depth; dactylus about twice as long as deep, semicircular, compressed, with stout blunt hooked tip distally and large molar process on cutting edge; fixed finger about as long as deep, with feeble hooked tip, cutting edge with large fossa for dactylar molar process, with conspicuous acute process on dorsal margin, carpus about 0.28 of palm length, about 1.3 times longer than broad, distally expanded, unarmed, non-tuberculate; merus robust, about 1.5 times longer than central width, 0.3 of palm length, ventrally tuberculate, without distoventral tooth; ischium about 0.8 of merus length, 1.4 times longer than distal width, compressed, tapered proximally, with single acute ventral tubercle; basis and coxa robust, without special features. Minor chela about 0.5 of major chela length, strongly compressed,

with acute tubercles dorsally, about 1.5 times longer than deep, slightly tapered distally; dactylus strongly compressed, about 1.6 times longer than deep, dorsal margin thickened over posterior three fourths but sharply carinate over distal fourth, tip acute, hooked, cutting edge sinuous, concave anteriorly, non-denticulate posterior part produced into stout recurved tooth; fixed finger much shorter than dactylus, about as long as deep, with small blunt tip, cutting edge with deep fossa for dactylar edge, with large triangular process on dorsal margin bearing numerous long simple setae distally; carpus about 0.4 of palm length, expanded distally, unarmed, non-tuberculate; merus about 1.2 of carpal length, 0.5 of palm length, about 1.8 times longer than broad, ventrally tuberculate, without distoventral tooth; ischium about 1.1 times meral length, about 2.0 times longer than distal width, tapered proximally, without ventral tubercles; basis and coxa as in major pereopod but less robust.

Ambulatory pereopods moderately robust, third pereopod exceeding carpoperite by length of dactylus. Dactylus of third pereopod strongly compressed, corpus about 1.5 times longer than deep, with pair of setae distolaterally and single seta distomedially, dorsal margin strongly convex, ventral border sharp with small acute preterminal distal tooth, otherwise unarmed, convex proximally with medial ventral flange; unguis simple, feebly distinct from corpus, curved, acute, about 2.0 times longer than basal width, about 0.45 of corpus length; propod about 4.0 times length of dactylus and 4.6 times longer than deep, slightly tapering distally, sparsely setose, with pair of strong distoventral spines and four smaller single ventral spines; carpus about 0.7 of propod length, about 3.0 times longer than distal width, unarmed; merus about 1.3 times propod length, 3.2 times longer than proximal width, slightly tapered distally, unarmed; ischium about 0.6 of meral length, tapering proximally, about 2.5 times longer than distal width, unarmed; basis slender, about 0.5 of meral length, coxa robust, both unarmed. Fourth and fifth pereopods similar, fifth more slender.

Uropods with posterolateral angle of propod feebly produced, rounded; exopod about 2.25 times longer than broad, lateral

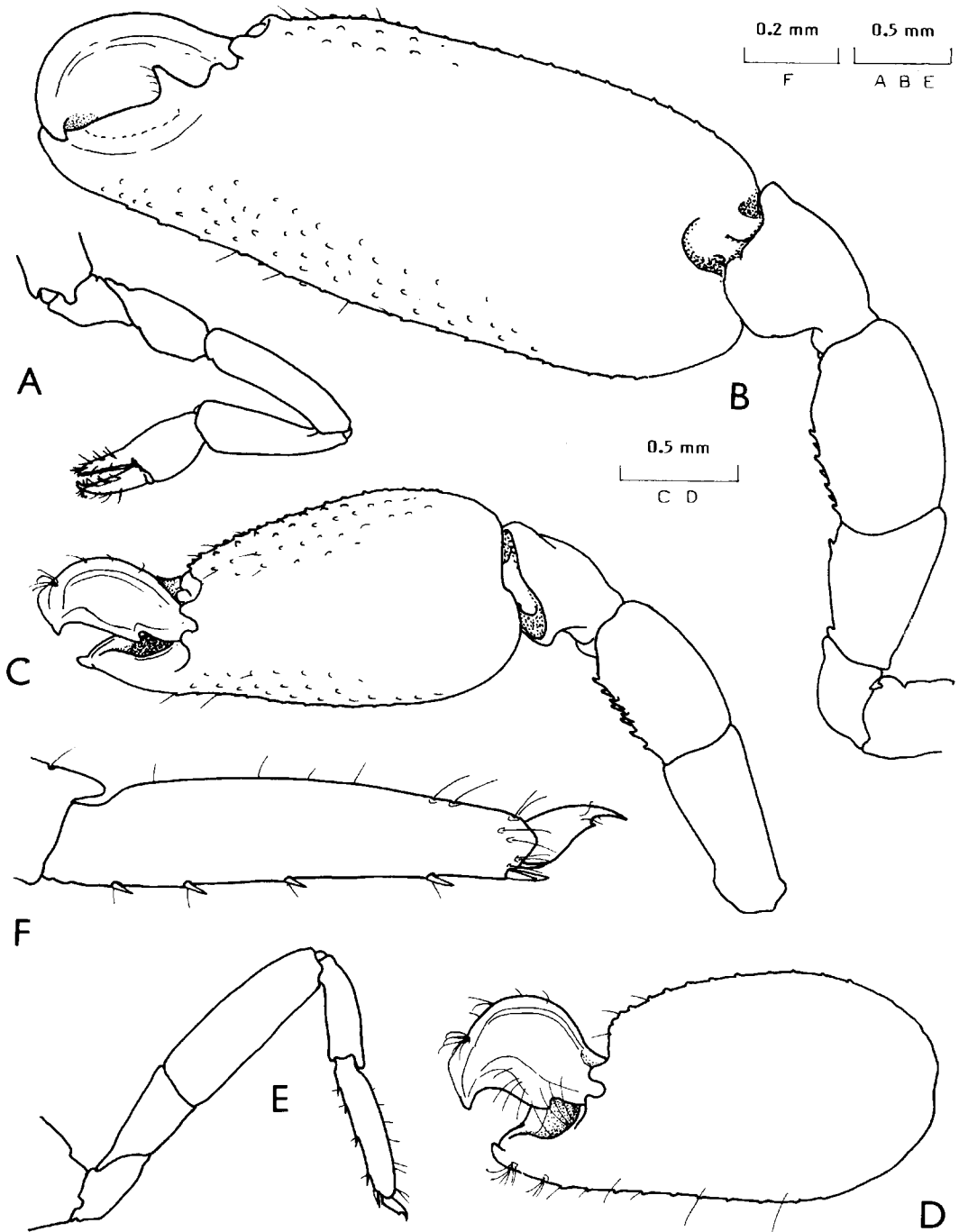


Fig. 9. *Periclimenes orontes* holotype ♀: **A**, molar process of right mandible; **B**, incisor process; **C**, maxillula, palp; **D**, same, distal upper lacinia; **E**, chela of first pereiopod; **F**, major second pereiopod, fingers of chela, ventral; **G**, minor second pereiopod, fingers of chela, dorsal; **H**, same, ventral; **I**, third pereiopod, dactylus; **J**, same, distal corpus and unguis.

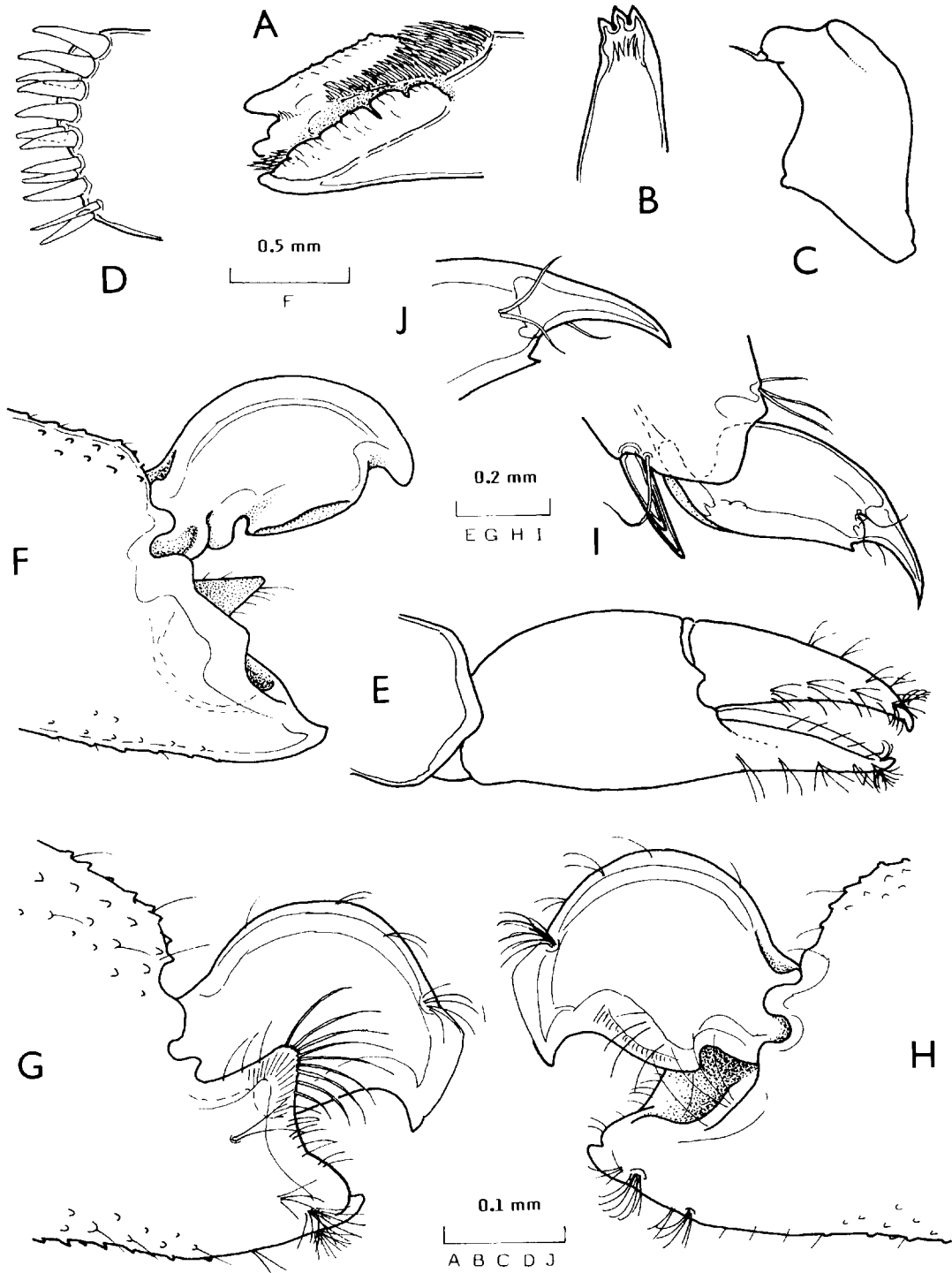


Fig. 10. *Periclimenes* ^{devis} *orontes* holotype ♀ : **A**, first pereiopod; **B**, major second pereiopod; **C**, minor second pereiopod; **D**, same, chela, ventral; **E**, third pereiopod; **F**, same, propod and dactyl.

border convex, without teeth or spines, with submarginal row of setae ventrally, distally with small acute tooth with single large curved mobile spine medially; endopod distinctly exceeding exopod, about 2.3 times longer than broad.

Ova few, about 20, of normal size.

Measurements (mm).

Total length (approx.)	8.5
Carapace length (incl. rostrum)	3.0
Postorbital carapace length	2.4
Major chela	3.75
Minor chela	1.85
Ova length	0.6

Colouration. Transparent.

Host. *Jaspis stellifera* (Carter)(Jaspidae : Porifera).

Systematic position. The most remarkable features of *P. orontes* sp.nov., are the dorsal lobe on the first abdominal tergite and the chela of the minor second pereopod. A dorso-medial projection of the posterior part of the tergum of the first abdominal segment, fitting beneath the posteromedian margin of the carapace, has been described in few species of the genus, although it may have been overlooked in some of the earlier described species that are still little known. The species in which it has been reported are *P. ardeae* Bruce, 1970 from the Australian Great Barrier Reef and *P. lobiferus* Bruce, 1978 from Madagascar (Bruce 1970, 1978).

P. orontes may be readily distinguished from *P. lobiferus* by the absence of denticulations along the ventral border, in addition to the distal accessory tooth, of the corpus of the dactylus of the ambulatory pereopods. *P. lobiferus*, still known only from the holotype specimen, has nine dorsal rostral teeth, with a rostrum that far exceeds the anteroverged corneal margins and also lacks the characteristic chela of the minor second pereopod found in *P. orontes*. This chela shows a marked reduction of the fixed finger, which is much shorter than the dactylus, with a deeply cannulate cutting edge that houses the sharp dactylar cutting edge when the fingers are closed. The sharply carinate distal outer margin of the dactylus and the sharply sinuous cutting edge with a recurved posterior tooth occluding into a deep fossa appear without parallel in other species of

the genus. *P. ardeae* lacks denticulations along the ventral margin of the dactylar corpus and has eight dorsal rostral teeth, but is most easily distinguished from *P. orontes* and *P. lobiferus* by the chela of the first pereopods in which the dactylus bears a conspicuous dense tuft of setae dorsally.

The species of the genus *Periclimenaeus* known to have a dorsomedian lobe on the first abdominal tergum may be readily separated by the following key:

1. Rostrum with 6 dorsal teeth; minor second pereopod with distal outer margin of dactylus produced and carinate; cutting edge strongly sinuous with large proximal tooth, fitting into deep groove on fixed finger..... *P. orontes* sp.nov.
- Rostrum with 8-9 dorsal teeth 2
2. Ambulatory pereopods with ventral dactylar corpus denticulate; dactyl of first pereopod without conspicuous dorsal tuft of setae *P. lobiferus* Bruce
- Ambulatory pereopods with ventral dactylar corpus non-denticulate; dactyl of first pereopod chela with conspicuous dorsal tuft of setae *P. ardeae* Bruce

P. palauensis Miyake and Fujino appears to be very closely related to *P. ardeae* and may therefore belong to the above group of species (Miyake and Fujino 1986). However, the condition of the dorsum of the first abdominal segment in the only known specimen has not been described. *P. palauensis* may be readily distinguished from *P. ardeae* by the absence of spinulations on the chela of the major second pereopod, but it shares with *P. ardeae* the presence of the very characteristic group of setae on the dactyl of the first pereopods (Bruce 1978).

***Hamopontonia essingtoni* sp.nov.**

(Figs 1C, 11-14, 15 D-G)

Type material. HOLOTYPE - ♀ (ovigerous), NTM Cr. 004072A, Coral Bay, Port Essington, 11°11.05'S 132°03.4'E, Stn. CP/71, ca. 6 m, 13 September 1985. ALLOTYPE - ♂, NTM Cr.004072B, same data as holotype. PARATYPES - 11 specimens (6 ♀ ovigerous), NTM Cr. 004073, some data as holotype; 1 ♀ (ovigerous), Rijksmuseum van Natuurlijke Historie, Leiden RMNHD 36584, same data as holotype.

Description. Small sized shrimps of smooth, subcylindrical, slightly depressed body form, with males smaller and more slender than females.

Carapace smooth, glabrous. Rostrum slender, compressed, reaching to distal margin of intermediate segment of antennular peduncle, horizontal, slightly upturned distally, with apex acute, dorsal carina well developed, slightly elevated in male, with 4-6

acute teeth in female and 5-6 in males, first two teeth situated on carapace behind posterior orbital margin in female, first only in male, with setose interspaces; ventral carina obsolete, lower margin convex and non-setose; lateral carinae feebly developed. Supraorbital and hepatic spines absent; orbit undeveloped, inferior orbital angle produced, with small inner flange, antennal spine well developed, submarginal,

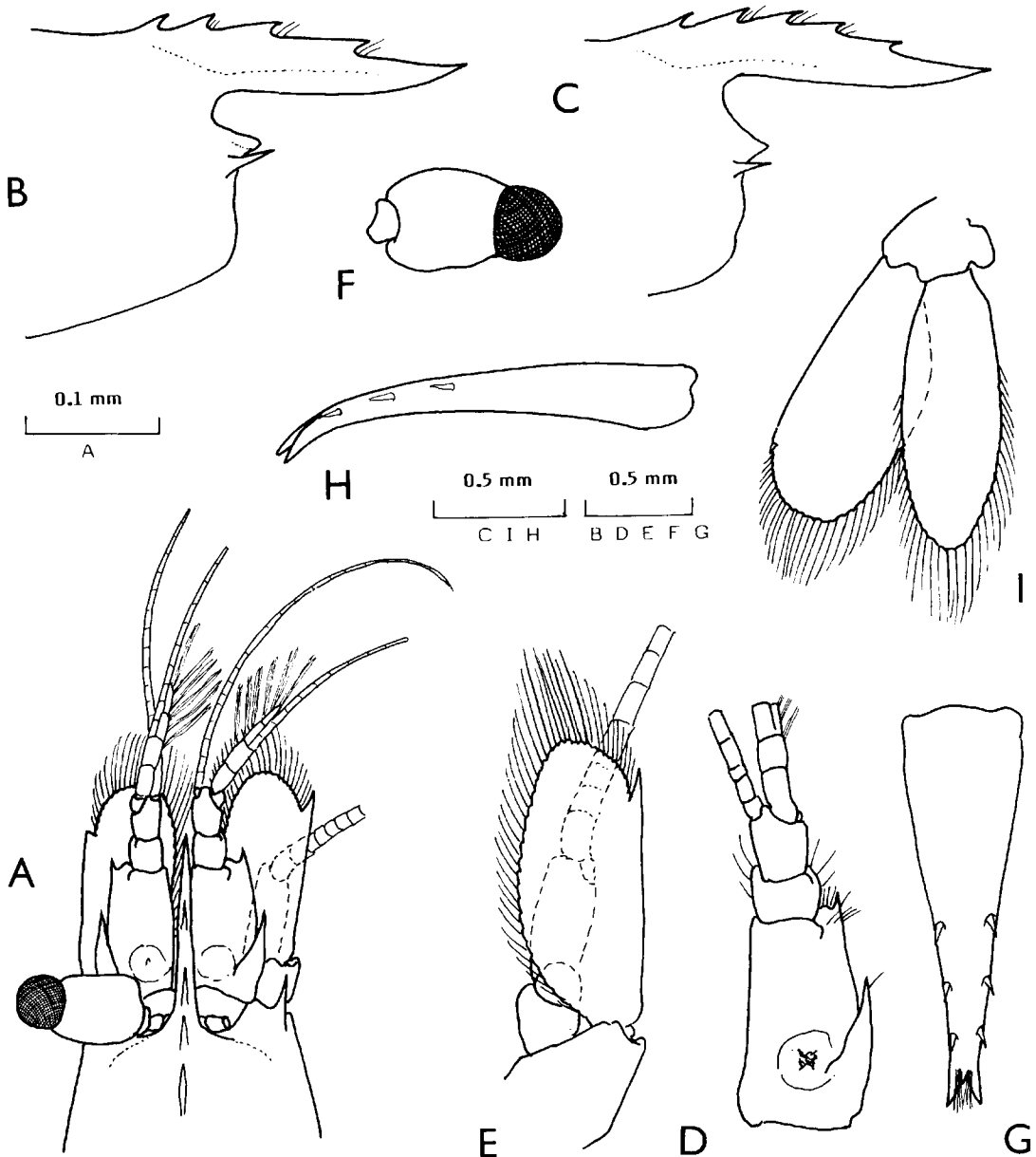


Fig. 11. *Homopontonia essingtoni* paratype ♀ except **A-C**: **A**, anterior carapace, rostrum and antennae, dorsal, holotype ♀; **B**, anterior carapace and rostrum, holotype ♀; **C**, same, allotype ♂; **D**, antennule; **E**, antenna; **F**, eye; **G**, telson, dorsal; **H**, same, lateral; **I**, uropod.

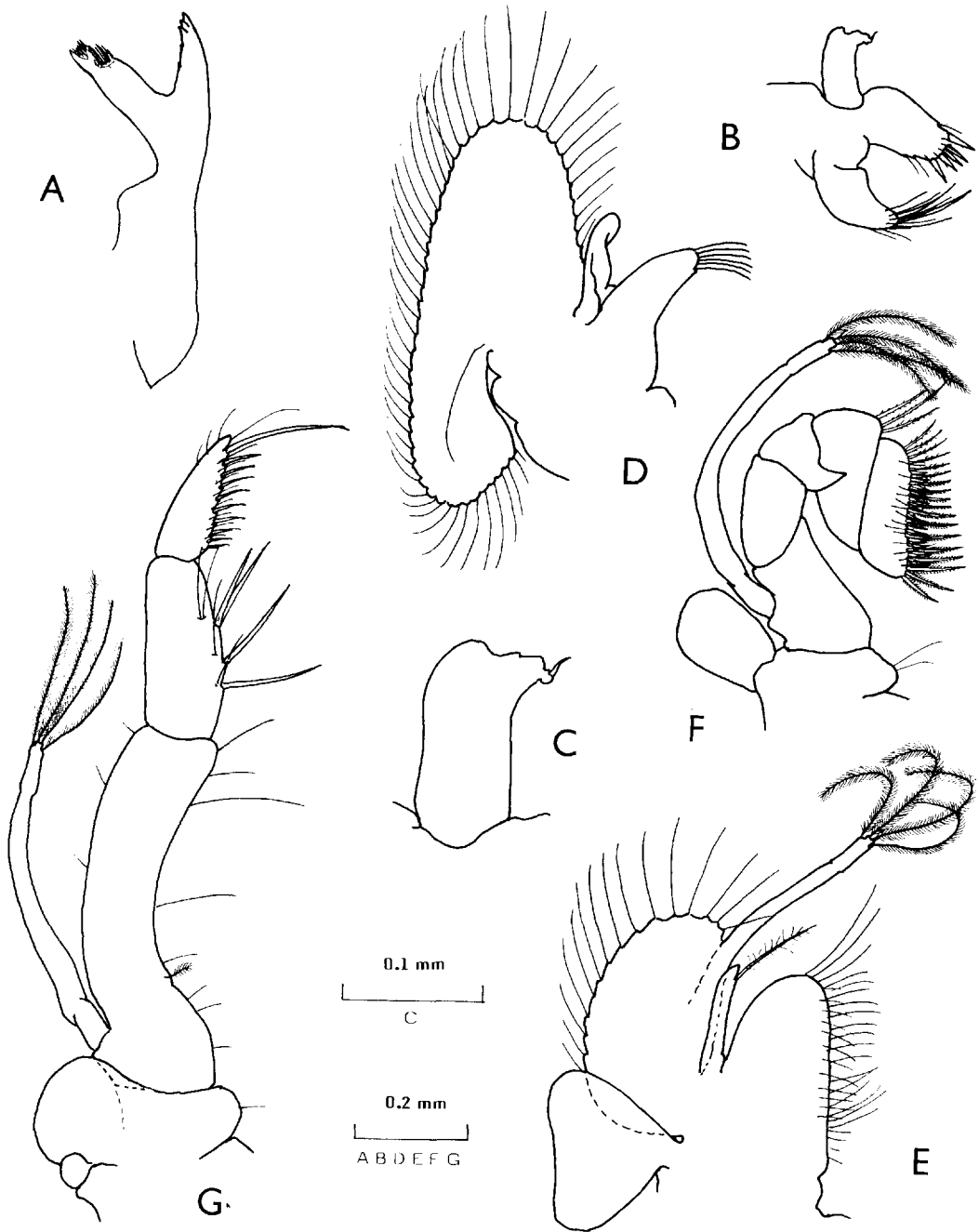


Fig. 12. *Hamopontonia essingtoni* holotype ♀: **A**, mandible; **B**, maxillula; **C**, same, palp; **D**, maxilla; **E**, first maxilliped; **F**, second maxilliped; **G**, third maxilliped.

upwardly directed in female, horizontal in male; branchiostegite normal with anteroventral angle broadly rounded, not produced.

Abdominal segments smooth, glabrous; third segment not posterodorsally produced,

fifth segment about 0.6 times length of sixth, sixth about 1.5 times longer than deep, with acute posterolateral and posteroventral angles; pleura all broadly rounded, with first to third enlarged in adult females. Telson about 1.65 times length of sixth of abdominal seg-

ment, about 3.2 times longer than anterior width, tapering posteriorly and ventrally concave longitudinally, posterior surface with three pairs of small subequal spines at 0.6, 0.75 and 0.9 of telson length; posterior margin armed with paired lateral ventrally curved hooklike processes, equal to about 0.1 of telson length, separated by small rounded median process with adjacent long simple setae.

Antennules normally developed, proximal segment of peduncle about 1.8 times longer than central width; stylocerite slender, acute, exceeding half segment length, statocyst normal with granular statolith; distolateral margin produced with small rounded lobe medially and acute tooth laterally, reaching to about half intermediate segment length, medial border with small acute tooth ventrally at half length; intermediate and distal peduncular segments equal to about 0.8 of proximal segment length; intermediate segment shorter and broader than distal segment, with small lateral lobe; upper flagellum short, equal to about 0.8 of postorbital carapace length, biramous, with first two segments of rami fused; shorter ramus with two free segments, longer ramus with ten, about six groups of aesthetascs present; lower flagellum slender, slightly longer than postorbital carapace length, about 21 segments.

Antenna with robust basicerite, without distolateral tooth; ischiocerite and basicerite normal; carpocerite short, about 2.1 times longer than broad, exceeding half length of scaphocerite; flagellum well developed, about 3.5 times postorbital carapace length; scaphocerite well developed, exceeding antennular peduncle distally, about 2.4 times longer than greatest width, at about half length, distal lamella bluntly angular, far exceeding strong distolateral tooth on straight lateral margin.

Eye well developed with small globular cornea, lacking distinct assessor pigment spot, situated transversely on stalk; stalk slightly longer than central width, about 1.3 times corneal diameter.

Mandible (right) moderately slender, without palp; molar process slender, obliquely truncated distally, with three small acute teeth posteriorly, surrounded by dense groups of setae, some serrulate, with tuberculate carina anterovertrally; incisor process slender with three acute teeth distally, largest

tooth medially, two small denticles on medial edge distally. Maxillula normal, palp feebly bilobed, lower lobe with small hooked seta; upper lacinia slender, with five acute simple spines distally and several slender setae; lower lacinia slender, sparsely setose, with several long slender setae distally. Maxilla with slender non-setiferous subcylindrical palp; basal endite simple, tapering distally with six slender simple distal setae; coxal endite absent, medially feebly convex; scaphognathite well developed, broad, about 2.3 times longer than width, anterior lobe with medial margin convex, not emarginate; posterior lobe large, slightly shorter than anterior lobe. First maxilliped with slender, subcylindrical palp with preterminal setulose setae, basal endite large, broadly rounded, medial margin sparsely setose with slender, feebly setulose setae, separated by small notch from reduced rounded non-setose coxal endite; exopod with well developed flagellum with four plumose distal setae, caridean lobe large and broad, epipod large and bluntly triangular. Second maxilliped of normal form, dactylar segment broad, with dense rows of long and short coarsely serrulate spines and setae medially; carpal segment acutely produced proximomedially, ischiomerus and basis normal, exopod well developed with four plumose distal setae, epipod oval, without podobranch. Third maxilliped with endopod reaching to middle of carpocerite; ischiomerus fused to basis, junction indicated by small median notch, ischiomerus portion of combined segment strongly bowed, broad, about 3.8 times longer than central width, very sparsely setose, few simple setae only; penultimate segment about 2.5 times longer than central width, tapering distally, about 0.6 of ischiomerus, with few long slender spines medially; distal segment about 0.75 of penultimate segment length, tapering strongly distally, about 3.0 times longer than proximal width, with numerous groups of short spines medially and single long slender preterminal spine; basis broadly convex medially, sparsely setose; exopod slender with four plumose terminal setae; coxa with small rounded lobe medially, not produced, and oval plate laterally, with (?) rudimentary arthrobranch.

Epistome unarmed. Fourth thoracic sternite without fingerlike median process, with

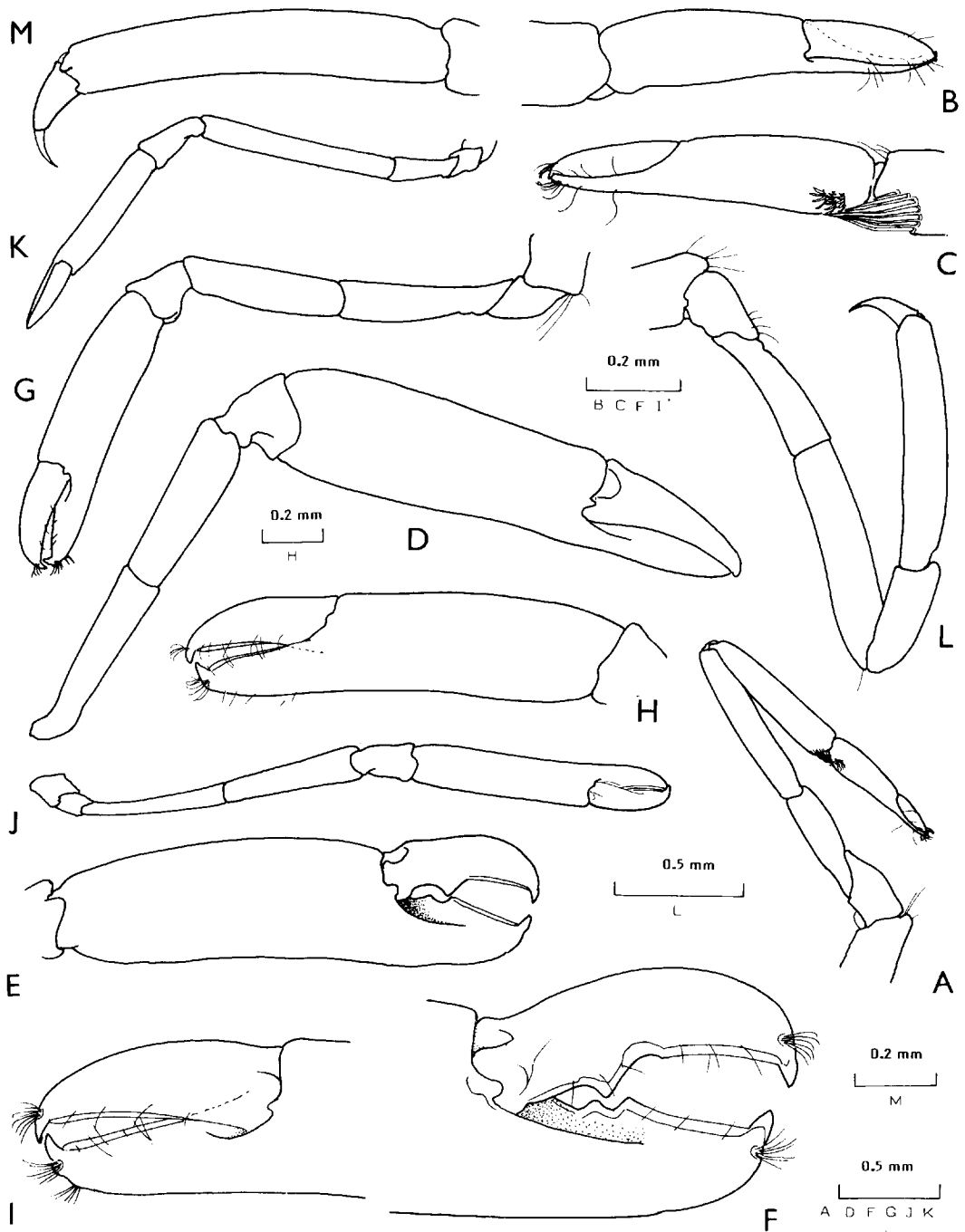


Fig. 13. *Hamopontonia essingtoni* paratype ♀ except J, K: A, first pereiopod; B, same, chela, dorsal; C, same, ventral; D, major second pereiopod; E, same, chela; F, same, fingers; G, minor second pereiopod; H, same, chela; I, same, fingers; J, major second pereiopod, allotype ♂; K, minor second pereiopod, allotype ♂; L, third pereiopod; M, same, propod and dactyl.

pair of low plates posteriorly separated by small median notch. Fourth to eight sternites moderately broad.

First pereopods slender, reaching anteriorly to distal end of antennular peduncle; chela slender, palm subcylindrical about 2.5 times longer than proximal width tapering slightly distally, fingers about 0.6 of palm length, compressed with laterally situated entire cutting edges, dactyl about 3.0 times longer than proximal width, with small hooked tip, fixed finger similar, with bidentate tip; palm with three transverse rows of short serrulate cleaning setae proximally; carpus about 1.25 times chela length, about 5.0 times longer than distal width, scarcely tapering, with transverse row of long cleaning setae distally; merus slightly longer than carpus, about 5.8 times longer than central width, ischium slightly shorter than chela, about 0.7 of merus length; basis about 0.5 of merus length; coxa slender, without medial process.

Second pereopods robust, of moderate size, unequal, relatively smaller in males than females. In female, major second pereopod with chela equal to about 1.6 times postorbital carapace length and minor about 0.9; male with major chela about 0.85 and minor 0.7. In female, major chela with palm smooth, subcylindrical, about 2.9 times longer than deep; dactylus compressed, about 0.5 of palm length, robust, about 3.5 times longer than central depth, dorsal border strongly convex, stout acute tooth distally, cutting edge with single large acute tooth proximally, distal half with sharp entire cutting edge; fixed finger about 2.0 times longer than proximal depth, cannulate proximally to house dactylus, distal cutting edge entire, proximal cutting edge with two small acute teeth, laterally to closed dactylus; carpus short and stout, unarmed, distally expanded, about 0.2 of palm length; merus about 0.55 of palm length, about 3.4 times longer than distal width, slightly narrowed proximally, unarmed; ischium about 1.12 of merus length and 0.6 of palm length, about 4.4 times longer than distal width, proximally tapering; basis and coxa robust, without special features. Minor chela about 0.6 of length of major chela, palm about 3.0 times longer than deep, fingers generally similar to major chela but less robust with unarmed cutting edge, dactyl about 2.6 times longer than pro-

ximal depth, 0.5 of palm length; other segments similar to major chela but smaller and less robust. In male, second pereopods relatively small, major chela about 1.2 times length of minor chela; merus of minor chela much longer than ischium, subequal to length of chela; merus of major chela shorter than ischium, much shorter than palm length.

Ambulatory pereopods moderately slender, third pereopod exceeding antennular peduncle by 0.3 of propod; dactylus robust, slightly compressed, corpus about 2.1 times longer than proximal depth, dorsal margin convex, ventral border sinuous, unarmed, with pairs of sensory setae distolaterally, unguis distinct, curved, about 0.6 of corpus length, 3.0 times longer than proximal width, simple; propod about 6.0 times longer than deep, slightly curved, about 3.8 times length of dactyl, with few simple setae distally, devoid of spines; carpus about 0.45 of propod length, 2.5 times longer than distal width, tapering proximally, unarmed; merus 0.95 of propod length, 4.7 times longer than wide, uniform and unarmed; ischium about 0.6 of merus length, tapering proximally, about 3.6 times longer than distal width; basis and coxa normal. Fourth and fifth pereopods similar, propod lengths subequal to third; coxa of fifth with transverse band of small spinules ventrally.

Male first pleopod with endopod about 2.5 times longer than distal width; feebly expanded distally, proximal half of medial margin with two simple setae proximally and four short hooked spines distally, distal lateral border with three short plumose setae only. Second pleopod with appendix masculina equal to about 0.3 of endopod length, corpus about 6.0 times longer than average width, with very long strong densely spinulose setae terminally, with similar shorter preterminal ventral seta and small simple distal lateral seta; appendix interna slender, overreaching corpus of appendix masculina, with few distomedial concinnuli only.

Uropod with protopodite posterolaterally unarmed; exopod broad, distally exceeded by posterior hooks of telson, about 2.2 times longer than wide, lateral margin almost straight, unarmed, with small distal mobile spine only; endopod slender, about 2.8 times longer than wide.

Ova about 25-30, of normal size.

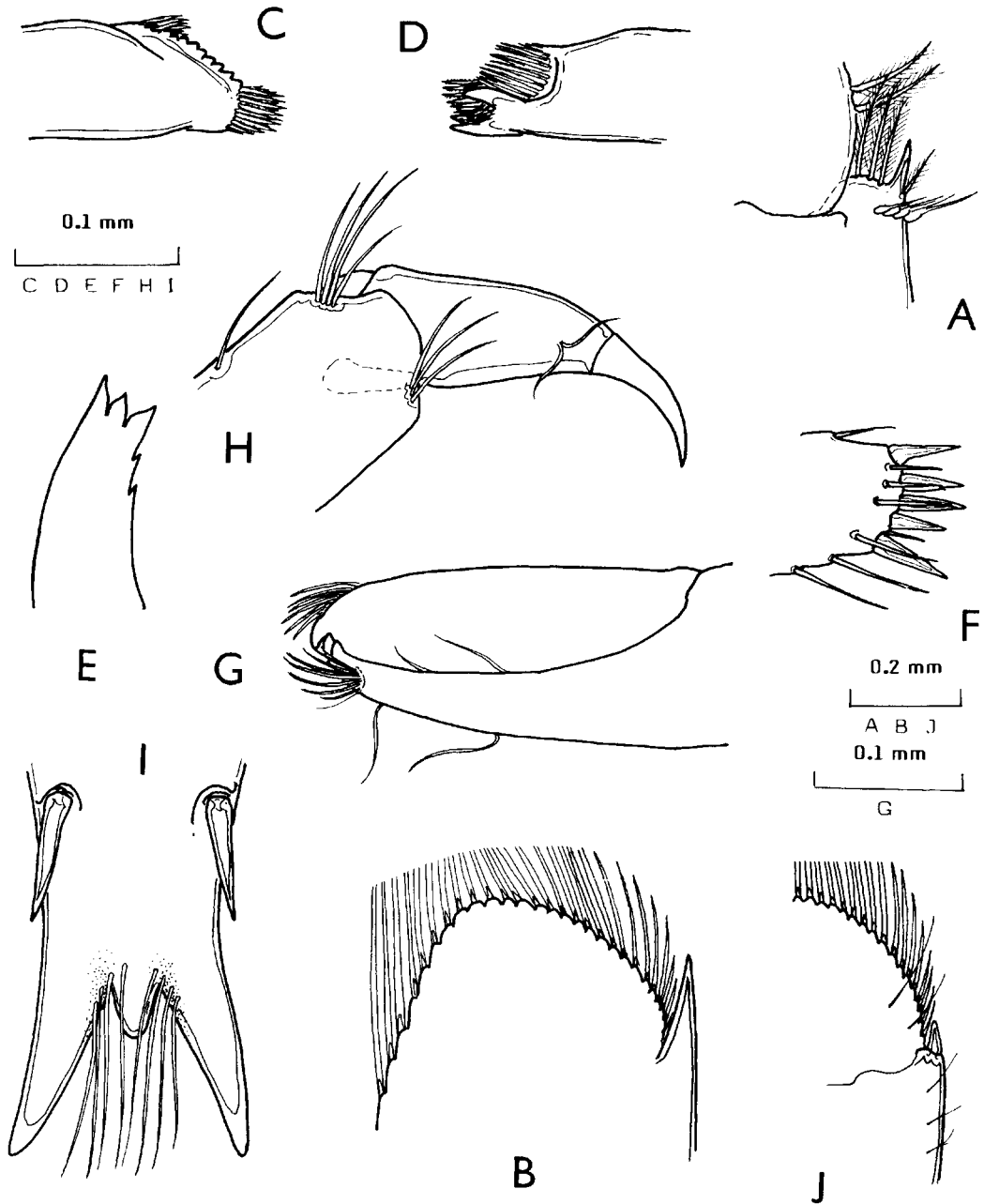
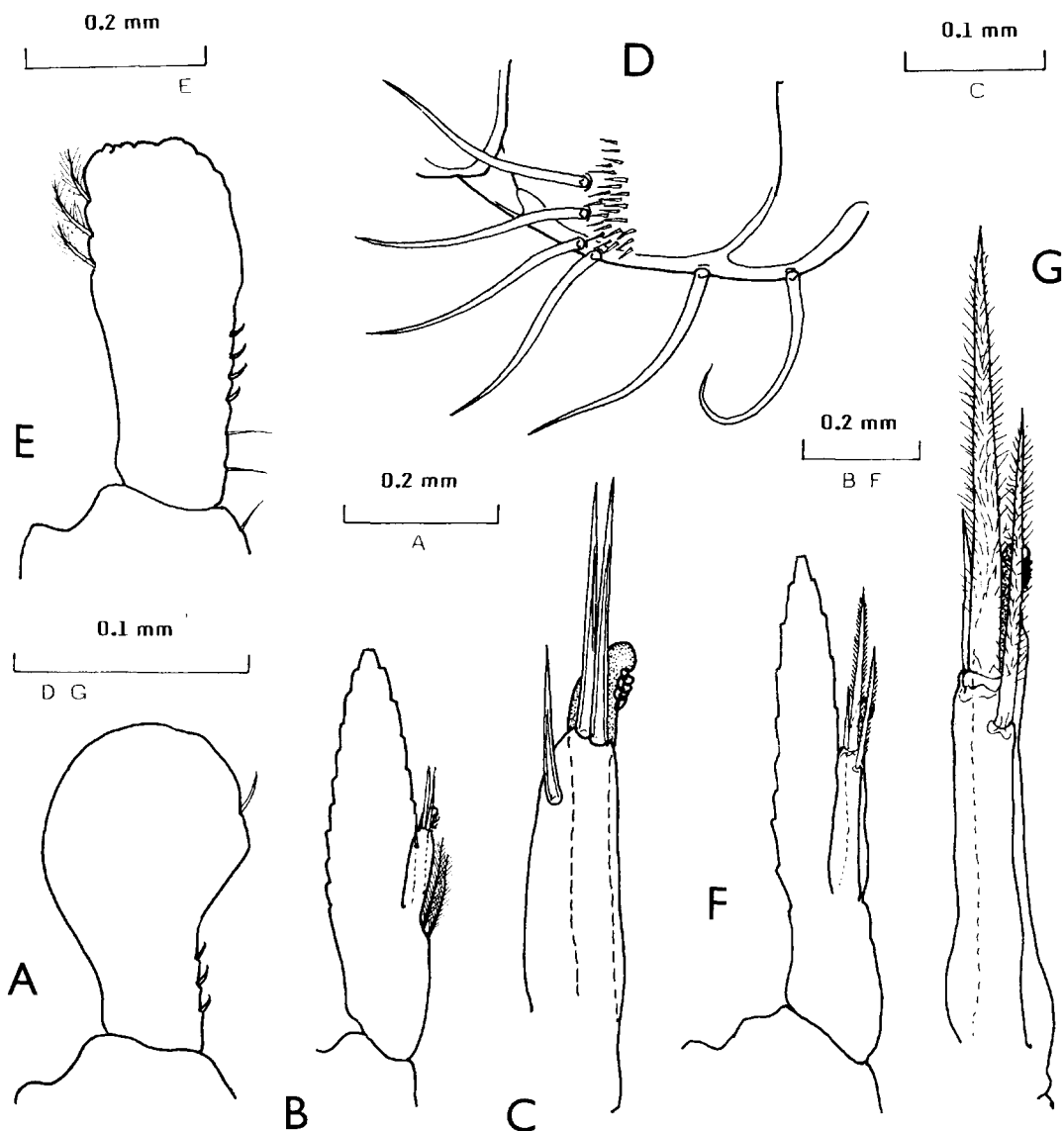


Fig. 14. *Hamopontonia essingtoni* paratype ♀ except C-F: **A**, distolateral angle of proximal segment of antennular peduncle; **B**, distal end of scaphocerite; **C**, **D**, molar process of mandible, dorsal and ventral aspects, holotype ♀; **E**, incisor process of mandible, holotype ♀; **F**, distal end of upper lacinia of maxillula, holotype ♀; **G**, fingers of chela of first pereiopod; **H**, dactyl and distal propod of third pereiopod; **I**, posterior margin of telson; **J**, posterior margin or telson distolateral angle of escopod.



Periclimenes essingtoni paratype ♂: **A**, first pleopod, endopod; **B**, second pleopod, endopod; **C**, appendices masculina and interna. *Hamopontonia essingtoni* paratype ♂ except **D**: **D**, fifth pereopod, coxa, paratype ♀; **E**, first pleopod, endopod; **F**, second pleopod; **G**, same, appendices masculina and interna.

Measurements (mm).	Holotype ♀	Allotype ♂
Total length (approx.)	8.5	7.0
Carapace length (incl. rostrum)	3.2	2.6
Postorbital carapace length	2.1	1.5
Major chela	3.4	1.3
Minor chela	1.95	1.1
Ova length	0.6	—

Colouration. Details not noted in this field. The live specimens were largely transparent with numerous small white patches.

Host. Both lots of specimens were collected from *Stylophora pistillata* (Esper) (Coelenterata, Scleractinia).

Systematic Position. The present specimens are closely related to the only other

known species of the genus, *H. corallicola* Bruce 1970, first reported from Hong Kong in association with *Goniopora stokesi* Milne-Edwards and Haime, (Bruce, 1970a). This species has since been found to be particularly common in association with the fungiid coral *Heliofungia actiniformis* Quoy and Gaimard and also to associate with the anemone *Entacmaea quadricolor* (Rüppell and Leuckart) (as *Parasicyonis actinostroides*) in Japanese waters (Suzuki and Hayashi 1977). *H. essingtoni* may be readily distinguished from *H. corallicola* by the presence of a small blunt median process between the two strong hooklike distal processes of the telson. In addition, *H. essingtoni* is of much smaller size than *H. corallicola* when adult, associates with a different host animal and possesses a distinctive colour pattern in life. This pattern, of numerous small white patches on a transparent animal, closely resembles that of *Fennera chacei* Holthuis, 1951, of similar size and associations (see Bruce 1986), for which the present specimens were unfortunately first mistaken when collected. *H. corallicola* usually shows a single large conspicuous oval white dorsal spot on the central carapace and another on the third abdominal segment. These spots closely resemble the size and appearance of the acrosomes of *H. actiniformis* and facilitate concealment of the shrimps among the hosts tentacles. A single specimen of *H. corallicola* was also found on *Heliofungia* at the same station as *H. essingtoni*.

REFERENCES

- Borradaile, L.A. 1915 Notes on Carides. *Annals and Magazine of Natural History* (8) **15**:205-213.

- Bruce, A.J. 1970 Further preliminary descriptions of new species of the genus *Periclimenaeus* Borradaile, 1915 (Crustacea, Decapoda Natantia, Pontoniinae). *Zoologisches Mededelingen, Leiden* **44**(21):305-315.
- Bruce, A.J. 1970a Notes on some Indopacific Pontoniinae, XV. *Hamopontonia corallicola* gen.nov., sp.nov., a new pontoniine shrimp from Hong Kong. *Crustaceana* **18**:37-48.
- Bruce, A.J. 1978 A report on a collection of pontoniine shrimps from Madagascar and adjacent seas. *Zoological Journal of the Linnean Society* **62**:205-290
- Bruce, A.J. 1978a The re-examination of some pontoniine shrimp types first described by L.A. Borradaile (Decapoda, Palaemonidae). *Crustaceana* **34**(3):251-268.
- Bruce, A.J. 1982 The shrimps associated with the Indowest Pacific echinoderms, with the description of a new species in the genus *Periclimenes* Costa, 1884 (Crustacea: Pontoniinae). *Memoirs of the Australian Museum* **16**: 191-216.
- Bruce, A.J. 1983 Expedition Rumphius II (1975). Crustacés parasites, commensaux, etc. (Th. Monod ed. IX Crustacés Décapodes (1^{ere} partie: Natantia Pontoniinae). *Bulletin du Museum nationale d'Histoire Naturelle, Paris* (4) **5**(A3):871-902.
- Bruce, A.J. 1986 Logerende a koralrevet-rfmer i samliv med mange andre dyr. *Naturens Verden*:161-176.
- Miyake, S. and Fujino, T. 1968 Pontoniinid shrimps from the Palau Islands (Crustacea, Decapoda, Palaemonidae). *Journal of the Faculty of Agriculture, Kyushu Imperial University* **10**(3):399-431.
- Rowe, F.W.E., Hoggett, A.K., Birtles, R.A., and Vail, L.L., 1986. Revision of some comasterid genera from Australia (Echinodermata: Crinoidea), with descriptions of two new genera and nine new species. *Zoological Journal of the Linnean Society* **86**:197-277.
- Suzuki, K. and Hayashi, K.I. 1977 Five caridean shrimps associated with sea anemones in Central Japan. *Publications of Seto Marine Biological Laboratory* **24**(1-3):193-208.

Accepted 10 September 1986