

## Deepwater Decapod Crustacea from Eastern Australia (Penaeidea and Caridea)

BRIAN KENSLEY<sup>1</sup>, H.A. TRANTER<sup>2</sup> AND D.J.G. GRIFFIN<sup>2</sup>

<sup>1</sup>National Museum of Natural History,  
NHB 163, Smithsonian Institution, Washington, D.C., 20560, U.S.A.

<sup>2</sup>Australian Museum,  
P.O. Box A285, Sydney South, NSW 2000, Australia.

**ABSTRACT.** A taxonomic report on deepwater shrimps and prawns from Eastern Australia, primarily New South Wales, is presented. The collection, which includes penaeideans and carideans, consists of 73 species. Of these, 46 represent new records for the Australian fauna, while ten species and one subspecies are described as new. These latter are: *Haliporoides cristatus*, *H. sibogae australiensis*, *Pasiphaea berentsae*, *P. kapala*, *P. longitaenia*, *Lebbeus yaldwyni*, *Merhippolyte chacei*, *Plesionika grahami*, *Glyphocrangon holthuisi*, *G. lowryi* and *G. novacastellum*. Locality data and diagnoses are provided for all the species. Zoogeographically, the collection is made up of two major components: those species having a widespread distribution in all the oceans, and those which are Indo-Pacific in distribution.

KENSLEY, B., H.A. TRANTER & D.J.G. GRIFFIN, 1987. Deepwater decapod Crustacea from eastern Australia (Penaeidea and Caridea). Records of the Australian Museum 39(5): 263–331.

### Contents

Introduction .....	265
Systematic Section .....	265
Infraorder PENAIDEA .....	265
Family Solenoceridae .....	265
*+ <i>Haliporoides cristatus</i> n. sp. ....	265
*+ <i>Haliporoides sibogae australiensis</i> n. ssp. ....	269
+ <i>Hymenopenaeus halli</i> Bruce .....	274
+ <i>Hymenopenaeus lucasi</i> (Bate) .....	275
+ <i>Hymenopenaeus propinquus</i> (de Man) .....	275
<i>Solenocera choprai</i> Nataraj .....	275
+ <i>Solenocera faxoni</i> de Man .....	275
+ <i>Solenocera rathbuni</i> Ramadan .....	275
Family Aristeidae .....	276
Subfamily Benthescyminae .....	276
+ <i>Benthescyminus investigatoris</i> Alcock & Anderson .....	276
<i>Gennadas bouvieri</i> Kemp .....	276
+ <i>Gennadas capensis</i> Calman .....	277
<i>Gennadas gilchristi</i> Calman .....	277

\* — new species or new subspecies

+ — new Australian record

<i>Gennadas incertus</i> (Bals)	278
<i>Gennadas kemp</i> Stebbing	278
<i>Gennadas propinquus</i> Rathbun	278
<i>Gennadas scutatus</i> Bouvier	279
<i>Gennadas tinayrei</i> Bouvier	279
Subfamily Aristeinae	279
<i>Aristaeomorpha foliacea</i> (Risso)	279
+ <i>Aristeus semidentatus</i> Bate	280
+ <i>Aristeus virilis</i> (Bate)	281
<i>Plesiopenaeus edwardsianus</i> (Johnson)	281
Family Penaeidae	281
<i>Funchalia villosa</i> (Bouvier)	281
+ <i>Funchalia woodwardi</i> Johnson	282
<i>Parapenaeus sextuberculatus</i> Kubo	282
+ <i>Penaeopsis eduardoi</i> Pérez Farfante	282
<i>Penaeus longistylis</i> Kubo	283
Infraorder CARIDEA	283
Family Oplophoridae	283
+ <i>Acanthephyra acutifrons</i> Bate	283
+ <i>Acanthephyra curtirostris</i> Wood-Mason	283
+ <i>Acanthephyra pelagica</i> (Risso)	284
<i>Acanthephyra quadrispinosa</i> Kemp	284
+ <i>Acanthephyra smithii</i> Kemp	285
+ <i>Janicella spinicauda</i> (A. Milne Edwards)	285
+ <i>Meningodora mollis</i> Smith	285
+ <i>Meningodora vesca</i> (Smith)	286
+ <i>Notostomus</i> cf. <i>crosnieri</i> MacPherson	286
<i>Notostomus elegans</i> A. Milne Edwards	287
+ <i>Notostomus gibbosus</i> A. Milne Edwards	288
<i>Oplophorus novaezeelandiae</i> de Man	289
<i>Oplophorus spinosus</i> (Brulle)	289
<i>Systellaspis debilis</i> (A. Milne Edwards)	290
Family Nematocarinidae	291
+ <i>Nematocarcinus gracilis</i> Bate	291
+ <i>Nematocarcinus undulatipes</i> Bate	291
Family Stylodactylidae	291
<i>Parastylodactylus</i> sp.	291
+ <i>Stylodactylus libratus</i> Chace	292
+ <i>Stylodactylus multidentatus</i> Kubo	293
Family Pasiphaeidae	293
+ <i>Eupasiphae gilesii</i> (Wood-Mason & Alcock)	293
+ <i>Parapasiphae sulcatifrons</i> Smith	293
*+ <i>Pasiphaea berentsae</i> n. sp.	294
*+ <i>Pasiphaea kapala</i> n. sp.	297
*+ <i>Pasiphaea longitaenia</i> n. sp.	301
Family Eugonatonotidae	304
+ <i>Eugonatonotus crassus</i> (A. Milne Edwards)	304
Family Rhynchocinetidae	304
<i>Lipkius holthuisi</i> Yaldwyn	304
Family Campylonotidae	304
<i>Campylonotus rathbunae</i> Schmitt	304
Family Hippolytidae	304
*+ <i>Lebbeus yaldwyni</i> n. sp.	304
*+ <i>Merhippolyte chacei</i> n. sp.	309
Family Pandalidae	312
<i>Chlorotocus novaezeelandiae</i> (Borradaile)	312
<i>Heterocarpus sibogae</i> de Man	312
+ <i>Heterocarpus woodmasoni</i> Alcock	313
+ <i>Plesionika alcocki</i> (Anderson)	313
+ <i>Plesionika bifurca</i> Alcock & Anderson	314

+ <i>Plesionika edwardsi</i> (Brandt) .....	314
*+ <i>Plesionika grahami</i> n. sp. ....	315
<i>Plesionika martia</i> (A. Milne Edwards) .....	316
+ <i>Plesionika reflexa</i> Chace .....	318
+ <i>Plesionika spinipes</i> Bate .....	319
<i>Stylopandalus richardi</i> (Coutiere) .....	319
Family Phyetocarididae .....	320
+ <i>Phyetocaris microphthalma</i> Chace .....	320
Family Glyphocrangonidae .....	320
<i>Glyphocrangon assimilis</i> de Man .....	320
*+ <i>Glyphocrangon holthuisi</i> n. sp. ....	321
*+ <i>Glyphocrangon lowryi</i> n. sp. ....	322
*+ <i>Glyphocrangon novacastellum</i> n. sp. ....	324
Family Crangonidae .....	327
<i>Pontocaris lacazei</i> (Gourret) .....	327
+ <i>Pontocaris rathbunae</i> (de Man) .....	327
Zoogeography .....	327
Acknowledgements .....	327
References .....	328

The deepwater shrimps and prawns of eastern Australia are at present known only from early work by the *Challenger* (Bate, 1888) and the *Endeavour* (Schmitt, 1926) expeditions. Most of the studies since that time have concerned the commercially important penaeideans and few of these studies have dealt with deepwater species. Griffiths & Brandt (1983) briefly summarised the distribution of some mesopelagic species. Racek & Dall, in a series of major papers, have dealt with the shallow water penaeideans of Australia. Published work on penaeidean and caridean decapod crustaceans from other geographic areas form a sound basis for studies of the local fauna. These include the works of Calman (1925, 1939), Chace, in a series of extremely significant papers (1940, 1983, 1984, 1985), Crosnier (1970, 1976, 1978, 1985), Crosnier & Forest (1973), Hayashi & Miyake (1969), Holthuis (1951, 1955), Kensley (1968, 1971, 1977, 1981), Kubo (1949), Pérez Farfante (1977), and Yaldwyn (1960, 1967).

Since 1971, the New South Wales State Fisheries (now the Fisheries Division of the NSW Department of Agriculture) has been carrying out a series of trawling surveys along the coast of New South Wales, extending into Queensland waters to the north and the Bass Strait to the south, with a view to understanding the distribution of prawns (see Australian Fisheries, November 1973, pp. 24–29). Well over 100 species of crabs, lobsters, and shrimps have been found as a result of these studies. Of these, more than 40 have been recognised in the last ten years.

The present paper is a report on the shrimps and prawns collected between 1971 and 1984. Seventy three species are recorded here. The sergestid

shrimps have not been dealt with, as these will form part of a separate study, along with the sergestid fauna of New Zealand. There are at least 13 species of sergestids in the NSW collection. One new species from this collection, *Cryptopenaeus crosnieri* Pérez Farfante & Kensley, 1985, was described in a separate paper.

The material on which this paper is based is deposited in the collections of the Australian Museum (AM); some paratypic material has been deposited in the Smithsonian Institution. Each species account includes the original reference to the species, and either references to all Australian literature relevant to that species, or to a recent adequate Australian treatment of the species. Also included is a list of material examined along with locality data, a remarks section where necessary, and a summary of the geographic and bathymetric distribution. Carapace length (cl) is used as the standard measurement. Within each family, genera and species are arranged alphabetically.

## SYSTEMATIC SECTION

### Infraorder PENAIDEA

#### Family SOLENOCERIDAE

##### *Haliporoides* Stebbing, 1914

##### *Haliporoides cristatus* n. sp.

Figs 1, 2, 5G–L

*Haliporoides* sp.—Potter & Dredge, 1985: 226.

**Type material.** New South Wales: HOLOTYPE: AM P35893, north-east of Point Danger, 27°55'S 154°03'E to

27°57'S 154°03'E, 629 m, demersal prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 1 ♂, 23.5 mm. PARATYPES: AM P35894, east of Broken Bay, 33°43'-39'S 151°54'-55'E, 477 m, demersal prawn trawl, *Kapala* (K83-14-07), 27 Oct 1983; 1 ♂ (juv.) 16.0 mm, 8 ♀, 16.8-22.6 mm. AMP21588, north-east of Point Danger, 28°01'S 154°00'E to 27°58'S 154°00'E, 542 m, demersal prawn trawl, *Kapala* (K78-17-10), 17 Aug 1978; 1 ♂, 21.0 mm. AMP21699, south-east of Cape Hawke, 32°22'S 152°58'E to 32°17'S 153°01'E, 463 m, demersal prawn trawl, *Kapala* (K75-08-03), 2 Oct 1975; 1 ♂, 17.0 mm. USNM 211386, south-east of Broken Bay, 33°40'S 151°54'E to 33°33'S 151°58'E, 250 m, demersal prawn trawl, *Kapala* (K74-15-25/26), 5 Dec 1974, 1 ♂, 18.8 mm, 4 ♀, 17.5-23.2 mm. USNM 211387, east of Broken Bay, 33°43'-39'S 151°54'-55'E, 477 m, demersal prawn trawl, *Kapala* (K83-14-07), 27 Oct 1983, 1 ♂, 20.5 mm, 4 ♀, 21.0-22.9 mm.

**Additional material examined.** New South Wales: AM P33171, north-east of Point Danger, 28°01'S 154°00'E to 27°58'S 154°00'E, 542 m, demersal prawn trawl, *Kapala* (K78-17-10), 17 Aug 1978; 8 ♀. AMP21585, north-east of Sydney, 33°43'S 151°49'E, 411 m, *Kapala*, 28 Sept 1975; 4 ♂, 3 ♀. AM P21767, north-east of Yamba, 29°26'S 153°49'E to 29°20'S 153°50'E, 450 m, demersal prawn trawl, *Kapala* (K75-09-08), 12 Oct 1975; 1 ♀. AMP24805, north-east of Batemans Bay, 35°28'S 150°50'E to 35°33'S 150°47'E, 594 m, demersal fish trawl, *Kapala* (K76-11-12), 8 July 1976; 5 ♀. AMP25064, east of Broken Bay, 33°34'S 152°08'E, 457 m, *Kapala*, 1 Nov 1976; 1 ♂, 2 ♀. AMP25206, south-east of Broken Bay, 33°42'S 151°52'E to 33°39'S 151°54'E, 446 m, demersal prawn trawl, *Kapala* (K76-24-01), 20 Dec 1976; 6 ♂, 1 ♀. AMP26819, south-east of Newcastle, 32°59'S 152°34'E to 33°02'S 152°31'E, 360 m, demersal prawn trawl, *Kapala* (K77-23-08), 7 Dec 1977; 1 ♂, 2 ♀. AMP33167, north-east of Port Jackson, 33°46'S 151°49'E to 33°44'S 151°51'E, 425 m, demersal prawn trawl, *Kapala* (K80-21-04), 16 Dec 1980; 1 ♂, 1 ♀. AMP35919, off Sydney, 33°46'S 151°50'E to 33°42'S 151°53'E, 414 m, demersal prawn trawl, *Kapala* (K80-06-01), 24 May 1980; 2 ♂, 1 ♀. AMP33170, north-east of Point Danger, 27°55'S 154°03'E to 27°57'S 154°03'E, 629 m, demersal prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 4 ♂, 5 ♀. AMP33172, south-east to east of Broken Bay, 33°43'S 151°52'E to 33°40'S 151°55'E, 405 m, demersal prawn trawl, *Kapala* (K77-12-01/02), 8 Aug 1977; 3 ♂, 1 ♀. AMP33168, north-east of Wollongong, 34°21'S 151°25'E to 34°19'S 151°27'E, 432 m, demersal prawn trawl, *Kapala* (K78-27-13), 13 Dec 1978; 2 ♀. Queensland: AMP25146, east of Fraser Island, 366 m, *Markwell Enterprise*; 9 ♀.

**Description.** Integument firm, with overall fine pile of very short setae. Rostrum just reaching base of antennular peduncle article 3, strongly arched over eye, uniform in height from orbital margin to first ventral tooth, then tapering abruptly to apex. Rostral and epigastric teeth:  $\frac{8+1}{2}$  to  $\frac{11+1}{4}$ , most frequent:  $\frac{10+1}{3}$ ; epigastric tooth situated about  $\frac{1}{3}$  carapace length from orbital margin; first rostral tooth situated just posterior of orbital margin. Adrostral carina strong, acute, running from orbital margin to base of rostral apex. Postrostral carina barely marked, obsolete at level of cervical groove. Pterygostomian spine strong, triangular, lacking

distinct keel, but basally rounded and extending into rounded hepatic carina. Hepatic sulcus deep. Cervical carina strong, rounded ventrally, obsolete at mid-dorsum. Suprahepatic spine subequal to hepatic spine. Posthepatic carina obsolete. Branchiocardiac carina rounded, sulcus relatively deep, not reaching posterior carapace margin. Postorbital spine subequal in strength to hepatic and suprahepatic spines. Submarginal carina acute, not quite reaching posterior margin of carapace.

Eye as illustrated.

Antennular peduncle about 0.6X length of carapace; prosartema not quite reaching distal margin of cornea; stylocerite short, basally broad, spine acute, falling considerably short of base of antennular peduncle article 2. Inner antennular flagellum 7X carapace length, outer flagellum 5X carapace length. Scaphocerite over-reaching antennular peduncle by about  $\frac{1}{8}$  of its own length, strongly rigid lateral margin ending in acute spine, falling short of apex of lamella; flagellum about 9X carapace length.

Mouthparts as figured.

Mandibular palp, second article almost 3X longer than wide, widest proximally; distal article about  $\frac{2}{3}$  length of proximal, slender, tapering, apically rounded. Maxilliped 3 extending beyond antennular peduncle by dactylus and half of propodus; dactylus slightly more slender and tapering in female than in male. Pereopod 1 reaching just beyond carapocerite in male and female; merus with distoventral movable spine and 3 fixed proximal spines; basis and ischium with distoventral fixed spine. Pereopod 2 reaching to base of antennular peduncle article 3 in female; almost to distal end of antennular peduncle article 2 in male. Pereopod 3 reaching by length of dactylus and propodus beyond antennular peduncle in female; by length of dactylus and half of propodus in male. Coxal plate of pereopod 3 in female expanded mesially, anterior surface hollowed, posterior surface strongly convex. Pereopod 4 extending beyond antennular peduncle by length of dactylus and  $\frac{3}{4}$  length of propodus in female. Pereopod 5 extending beyond antennular peduncle by length of dactylus, propodus and carpus in female. Pereopods increasing in length posteriorly; anteromesial spine on coxae of pereopods 3-5 in both sexes; in female, coxal spine on pereopod 4 largest; in male, coxal spines of pereopods 3 and 4 small, on 5, spine becomes broad, flattened, distally rounded, directed ventrolaterally. Abdomen with segments 4-6 mid-dorsally sharply keeled, ending posteriorly in very small spine. Abdominal segment 6 only slightly longer than broad, ventral margin evenly convex, with single small denticle (sometimes absent) posteriorly. Telson with median sulcus deepest in anterior half, flattening out posteriorly,

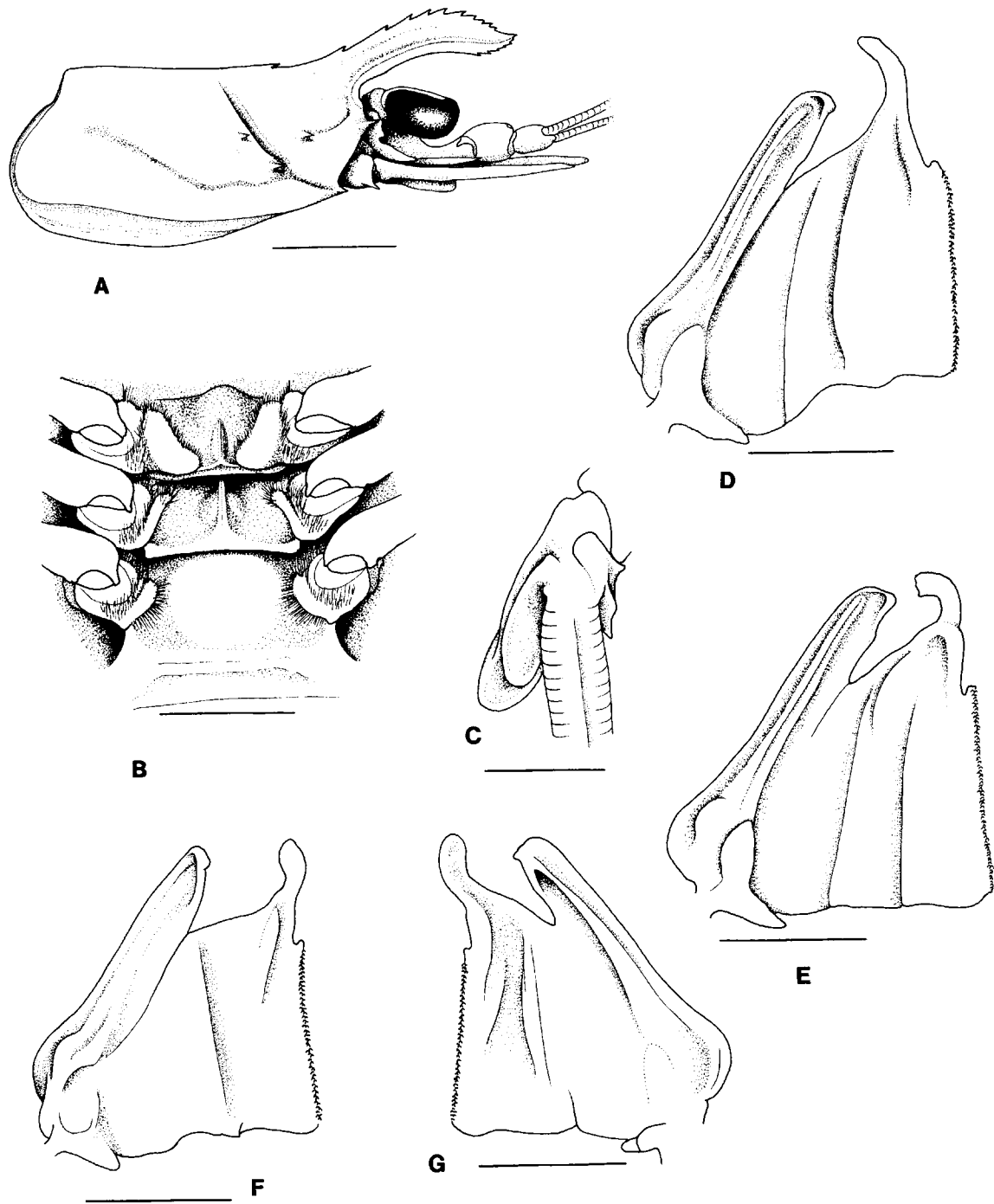
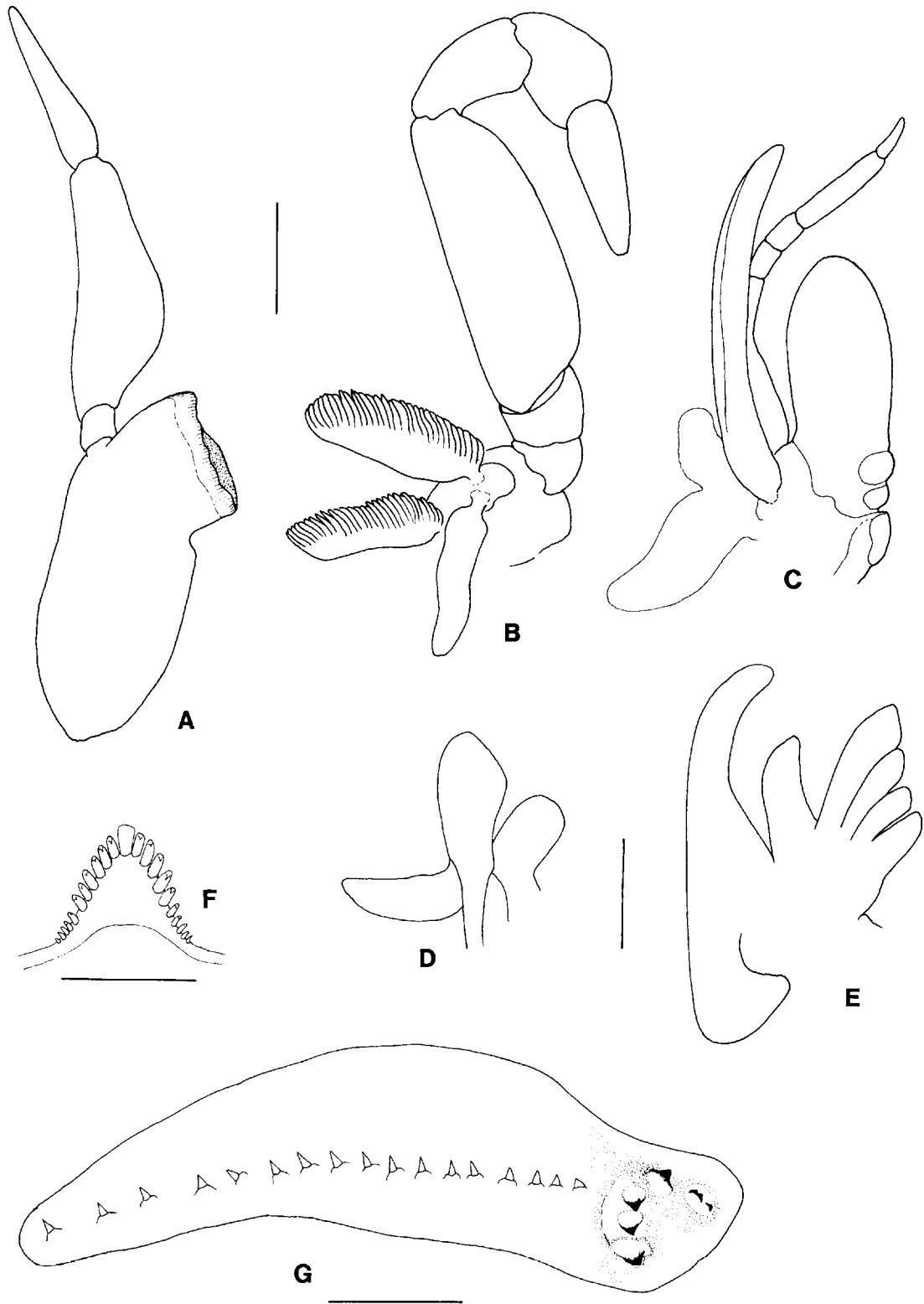


Fig. 1. *Haliporoides cristatus* n. sp. A, carapace in lateral view; B, thelycum; C, pleopod 2  $\delta$ , appendix masculina. Petasmata: D, cl 22.9 mm; E, cl 24.5 mm; F, cl 31.5 mm; G, cl 21.8 mm. (Scales: A = 10 mm, B = 5 mm, C = 2 mm, D-G = 3 mm).



**Fig. 2.** *Haliporoides cristatus* n. sp. A, mandible; B, maxilliped 2; C, maxilliped 1; D, maxilla 1; E, maxilla 2; F, prepyloric ossicle; G, zygocardiac ossicle and cardiac plate. (Scales: A-E = 3 mm, F, G = 1 mm).

ending anterior to lateral spines; latter continuous with ridges flanking sulcus. Meisal uropodal ramus over-reaching telson by 0.4 of its own length; lateral ramus over-reaching inner by almost 0.3X its own length, bearing strong distolateral spine at about distal four-fifths. Pleopod 3–5 in male with rounded mediodorsal ridge; latter less marked in female.

Thelycum with sternite XII having sharp strongly raised median crest; sternite XIII with strong acute anteroventrally directed median spine and ridge; sternite XIV smoothly convex, bearing numerous short setules.

Petasma with ventromedian lobule distally narrowed, laterally curved, apically rounded. Dorsolateral lobule, margin distally oblique; ventrolateral lobule with distally free part falling considerably short of, and about twice width of distal free part of ventromedian lobule; distal margin curved mesially towards apex, ventral costa proximally broad, tapering distally along outer margin of lobule.

Appendix masculina about 1.5X longer than broad, distally narrowed, ventrally hollowed, lacking any setae. Appendix interna roughly subelliptical, falling short of, and tucked into ventral hollow of appendix masculina; dorsolateral spur short, bluntly triangular.

**Remarks.** (See Remarks section of following species).

**Etymology.** The specific name, from the Latin, meaning a crest, refers to the crested condition of the rostrum of this species.

*Haliporoides sibogae australiensis* n. ssp.

Figs 3, 4, 5A–F

*Haliporus sibogae* de Man, 1907: 138.

*Haliporoides sibogae*.—Grey, Dall & Baker, 1983: 15, 40, pls 3, 47.

**Type material.** New South Wales: HOLOTYPE: AM P34381, east of Broken Bay, 33°43–39'S 151°54–55'E, 477 m, demersal prawn trawl, *Kapala* (K83-14-07), 27 Oct 1983; 1 ♂, 31.5 mm. PARATYPES: AM P35891, east of Broken Bay, 33°43–39'S 151°54–55'E, 477 m, demersal prawn trawl, *Kapala* (K83-14-07), 27 Oct 1983; 1 ♂, 15.8 mm, 8 ♀, 15.6–39.5 mm. AM P33023, north-east of Port Jackson, 33°46–44'S 151°49–51'E, 425 m, demersal prawn trawl, *Kapala* (K80-21-04), 16 Dec 1980; 1 ♀. AM P30798, 32 km east of Greenwell Point, near Nowra, 34°55'S 151°08'E, 400 m, trawl, 16 July 1980; 1 ♀. AM P19149, south-east of Broken Bay, 33°42'S 151°55'E to 33°40'S 151°57'E, 810 m, demersal prawn trawl, *Kapala* (K72-07-16), 7 Dec 1972; 1 ♀, 39.3 mm. AM P21050, north-east of Wollongong, 34°16'S 151°26'E to 34°22'S 151°23'E, 356 m, demersal prawn trawl, *Kapala* (K75-05-01), 8 Aug 1975; 1 ♀, 31.0 mm. USNM 211389, north-east of Point Danger, 27°55–57'S 154°03'E, 629 m, *Kapala* (K78-23-09), 6 Nov 1978; 2 ♂, 26.3–26.5 mm. USNM 211388, east of Broken Bay, 33°43–39'S 151°54–55'E, 477 m, demersal prawn trawl, *Kapala* (83-14-07), 27 Oct

1983; 1 ♂, 15.4 mm, 5 ♀, 20.5–39.5 mm.

**Additional material examined.** New South Wales: AM G6049, 35 mi east of Sydney, 1434 m; 9 ♀. AM P4696, east of Sydney, 272 m, *Gunundaal*, May 1920; 1 ♀. AM P4697, east of Sydney, 272 m, *Gunundaal*, May 1920; 1 ♀. AM P18020, south-east of Sydney, 34°19–13'S 151°24–28'E, 351–360 m, bottom trawl, *Kapala* (K71-10-03), 28 June 1971; 1 ♀. AM P18025, east of Long Reef, 33°41–44'S 151°55–53'E, 570 m, bottom trawl, *Kapala* (K71-07-01), 20 Apr 1971; 19 ♀. AM P19150, south-east to east of Broken Bay, 33°43'S 151°55'E to 33°37'S 152°02'E, 675 m, demersal prawn trawl, *Kapala* (K72-06-04), 19 Oct 1972; 1 ♀. AM P19151, east of Wollongong, 34°16'S 151°26'E, 366 m, *Kapala* (K71-10-03), 28 June 1971; 1 ♀. AM P19152, east to north-east of Port Jackson, 33°51'S 151°51'E to 33°45'S 151°55'E, 675 m, demersal prawn trawl, *Kapala* (K72-06-03), 19 Oct 1972; 5 ♂. AM P19644, transect from east of Newcastle to east of Sydney, 33°00–44'S 151°50'–152°31'E, 365 m, July 1972; 5 ♂. AM P20804, south-east of Cape Howe, 37°45'S 150°12'E to 37°38'S 150°16'E, 416 m, demersal fish trawl, *Kapala* (K75-03-02), 11 July 1975; 2 ♂, 2 ♀. AM P21688, north-east of Yamba, 29°26'S 153°49'E to 29°20'S 153°50'E, 450 m, demersal prawn trawl, *Kapala* (K75-09-08), 12 Oct 1975; 1 ♂, 1 ♀. AM P21698, south-east of Cape Hawke, 32°22'S 152°58'E to 32°17'S 153°01'E, 463 m, demersal prawn trawl, *Kapala* (K75-08-03), 2 Oct 1975; 1 ♂. AM P33016, off Sydney, 33°46'S 151°50'E to 33°42'S 151°53'E, 414 m, demersal prawn trawl, *Kapala* (K80-06-01), 24 May 1980; 4 ♂, 1 ♀. AM P33032, north-east of Point Danger, 27°55'S 154°03'E to 27°57'S 154°03'E, 629 m, demersal prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 3 ♂, 4 ♀. AM P32410, south-east of Newcastle, 32°59'S 152°34'E to 33°02'S 152°31'E, 360 m, demersal prawn trawl, *Kapala* (K77-23-08), 7 Dec 1977; 3 ♀. AM P33017, north-east of Point Danger, 28°01'S 154°00'E to 27°58'S 154°00'E, 542 m, demersal prawn trawl, *Kapala* (K78-17-10), 17 Aug 1978; 5 ♂, 14 ♀. AM P32411 and AM P32412, north-east of Jervis Bay, 34°50'S 151°15', 801 m, benthic dredge, *Kapala* (K78-27-04), 12 Dec 1978; 1 ♂, 3 ♀. AM P33021, north-east of Wollongong, 34°21'S 151°25'E to 34°19'S 151°27'E, 432 m, demersal prawn trawl, *Kapala* (K78-27-13), 13 Dec 1978; 5 ♂, 4 ♀. AM P33018, south-east of Broken Bay, 33°40'S 151°54'E to 33°33'S 151°58'E, 450 m, demersal prawn trawl, *Kapala* (K74-15-25/26), 5 Dec 1974; 2 ♂, 1 ♀. AM P33019, north-east of Broken Bay, 33°29'S 152°07'E to 33°32'S 152°04'E, 594 m, demersal fish trawl, *Kapala* (K76-16-08), 14 Oct 1976; 2 ♂, 2 ♀. AM P33020, off Shoalhaven Bight, 34°54–57'S 151°12–11'E, 540 m, demersal prawn trawl, *Kapala* (K78-27-06), 12 Dec 1978; 5 ♂, 3 ♀. Victoria: AM E6124, 40 mi south south-east of Genoa Peak, 363 m, *Endeavour*; 1 ♂, 1 ♀. AM E4828, off eastern slope of Gabo Island, 363 m, Nov 1913; 1 ♀. AM P9640, Gabo Island to Everard Grounds, 400 m, *Endeavour*, 28 Oct 1914; 1 ♂. AM P9641, Gabo Island to Everard Grounds, 400 m, *Endeavour*, 28 Oct 1914; 1 ♀. AM P18021, south-east of Gabo Island, 37°39'S 150°17'E to 37°45'S 150°13'E, 396–401 m, danish trawl, *Kapala* (K71-13-02), 30 July 1971; 2 ♂, 2 ♀. AM P18024, south-east of Gabo Island, 37°42'S 150°16'E to 37°39'S 150°17'E, 387 m, *Kapala* (K71-13-01), 30 July 1971; 9 ♂, 10 ♀.

**Description.** Integument firm, with overall fine pile of very short setules. Rostrum reaching to

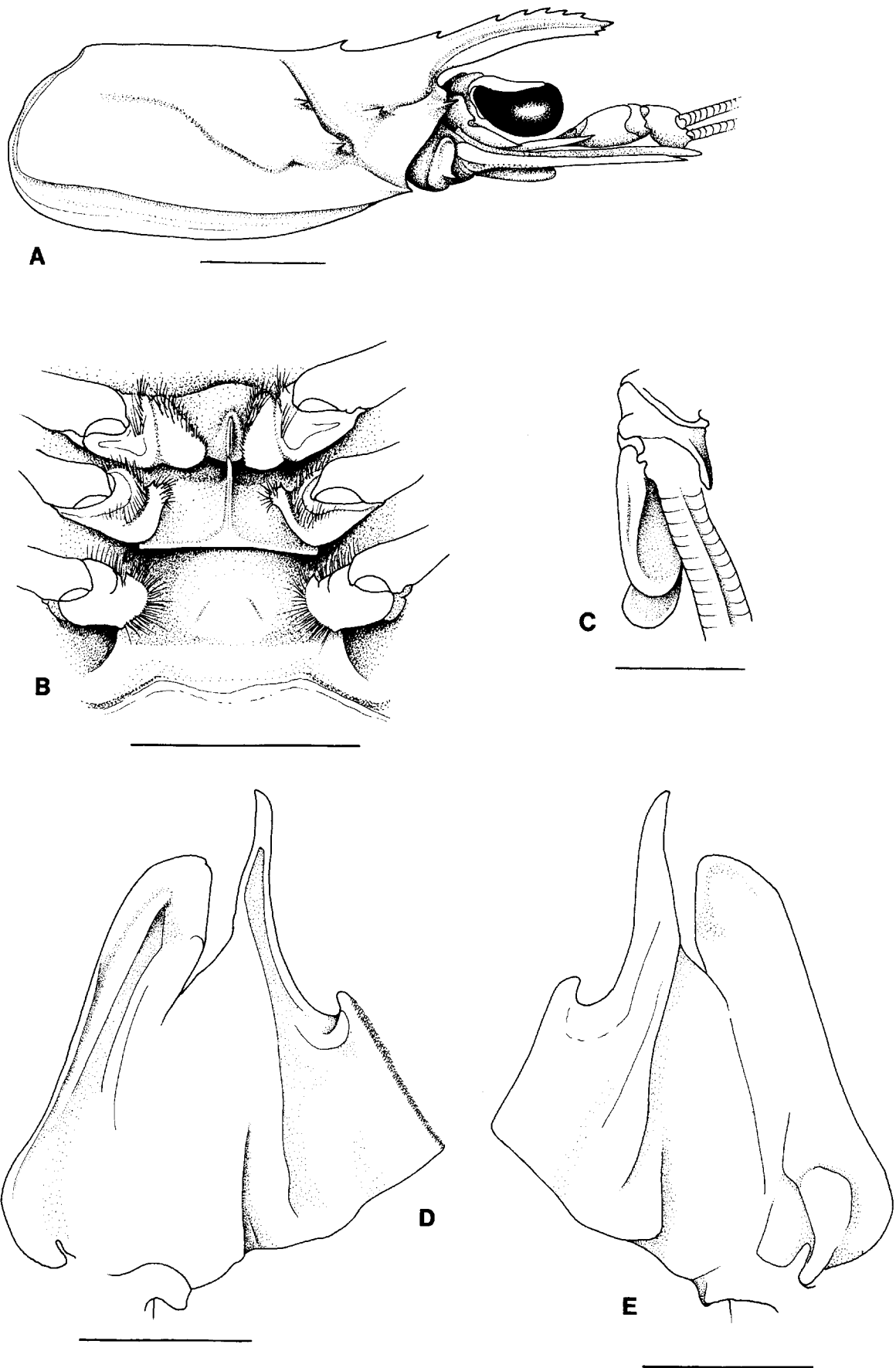


Fig. 3. *Haliporoides sibogae australiensis* n. ssp. A, carapace in lateral view; B, thelycum; C, pleopod 2  $\delta$ , appendix masculina; D,E, petasma cl 28.3 mm. (Scales: A,B = 10 mm, C = 2 mm, D,E = 3 mm).



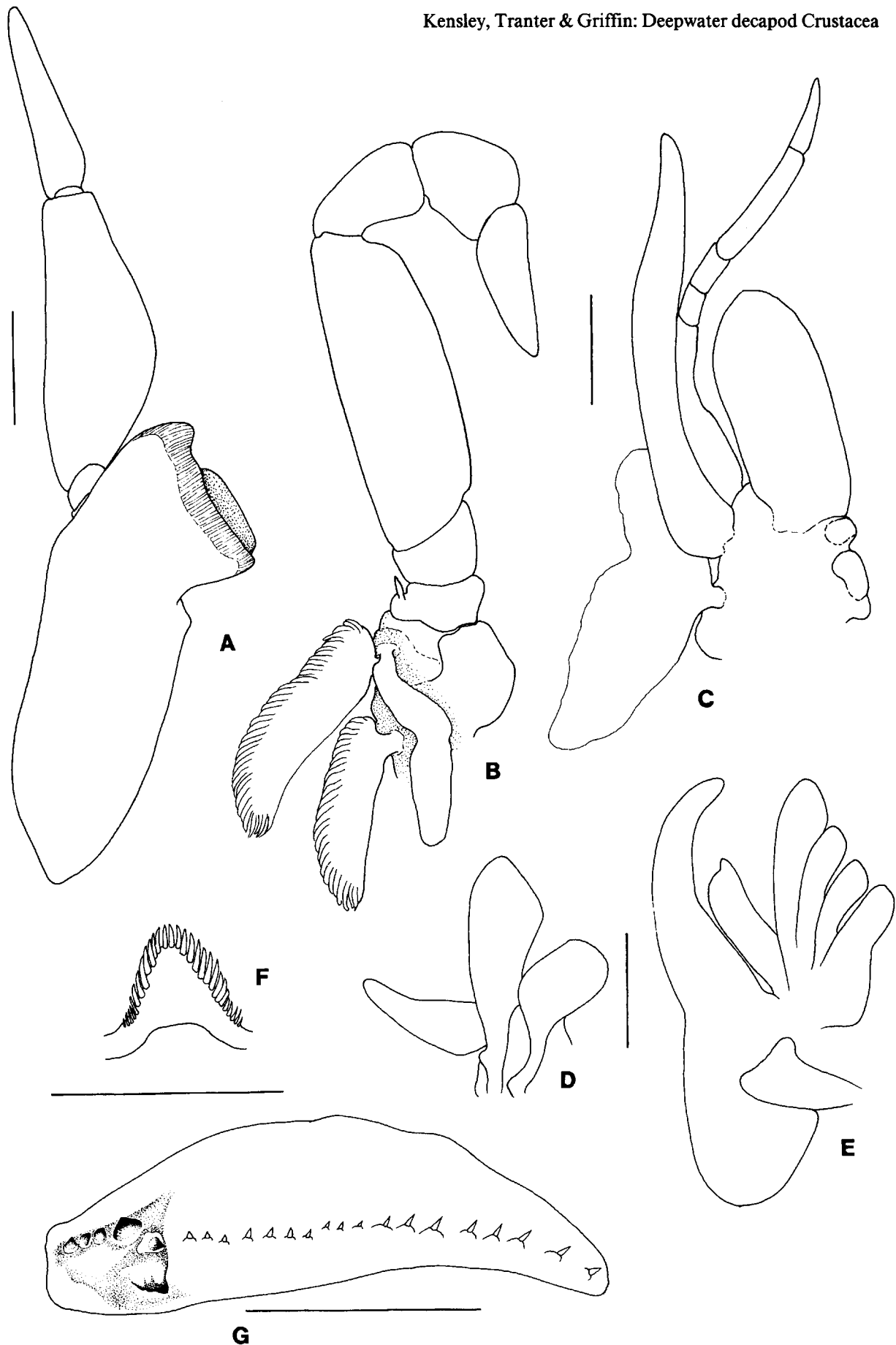


Fig. 4. *Haliporoides sibogae australiensis* n. ssp. A, mandible; B, maxilliped 2; C, maxilliped 1; D, maxilla 1; E, maxilla 2; F, prepyloric ossicle; G, zygocardiac ossicle and cardiac plate. (Scales: A-G = 3 mm).

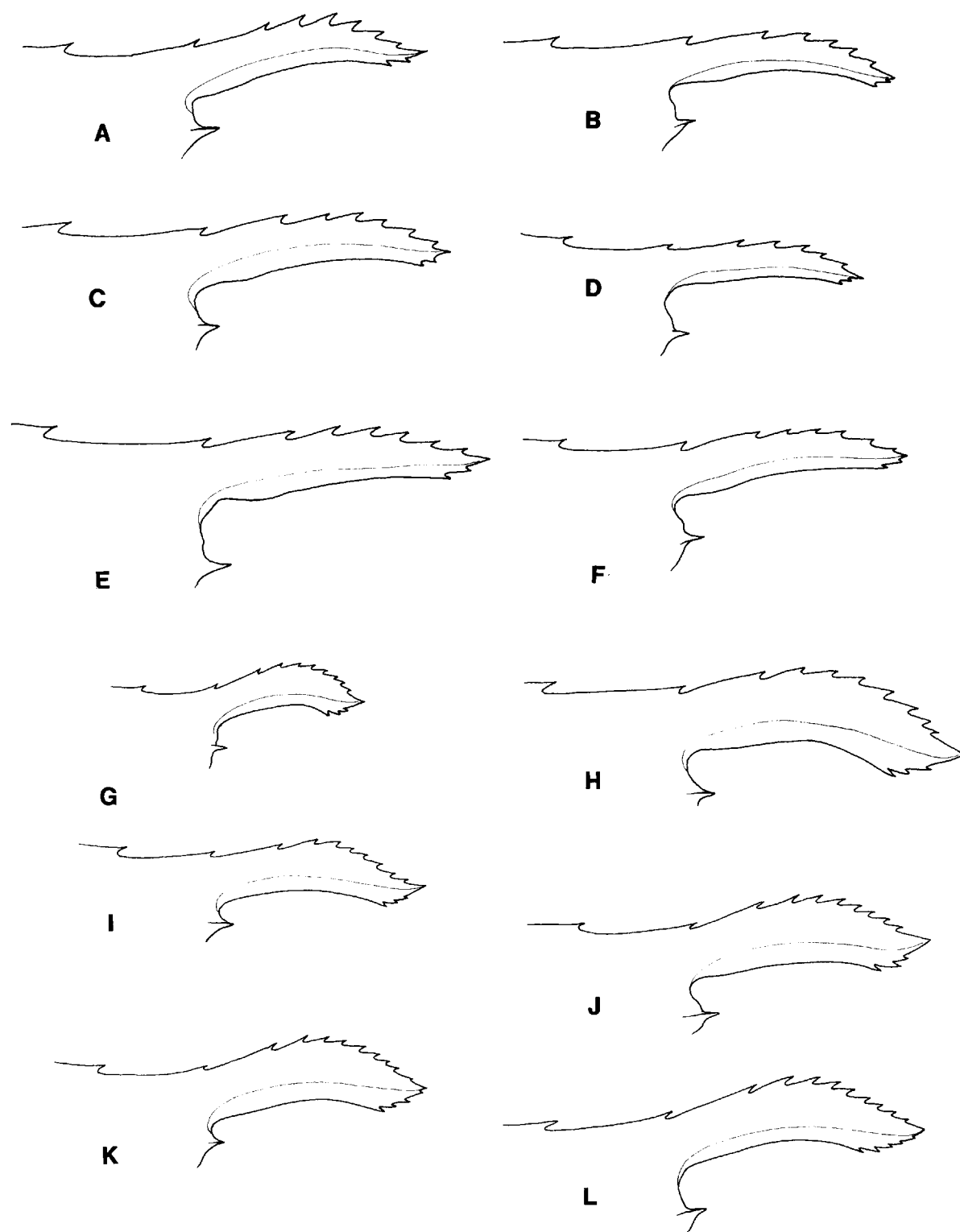


Fig. 5. Rostral variation. A-F, *Haliporoides sibogae australiensis* n. ssp. A, ♀ cl 29.9 mm; B, ♂ cl 27.6 mm; C, ♀ cl 33.9 mm; D, ♂ cl 28.1 mm; E, ♀ cl 35.0 mm; F, ♀ cl 29.0 mm; G-L, *Haliporoides cristatus* n. sp. G, ♂ cl 17.0 mm; H, ♀ cl 33.8 mm; I, ♂ cl 25.0 mm; J, ♀ cl 29.0 mm; K, ♀ cl 27.2 mm; L, ♀ cl 29.8 mm.

between midlength and distal margin of article 2 of antennular peduncle, subhorizontal to offset from carapace at angle of up to 30°, proximally low, tapering steadily to apex; straight to slightly arched over eye. Rostral and epigastric tooth-formula:  $\frac{6+1}{1}$  to  $\frac{8+1}{2}$ ; most frequent form  $\frac{7+1}{2}$ ; epigastric tooth situated at about 2/7 length of carapace from orbital margin; first rostral tooth situated over orbital margin. Adrostral carina strong, acute, running from orbital margin to base of rostral apex. Postrostral carina barely marked, obsolete anterior to cervical groove. Pterygostomian spine strong, narrowly triangular, with distinct carina continuous with anteriorly acute hepatic carina. Hepatic sulcus fairly deep, becoming obsolete just ventral to mid-dorsal line. Suprahepatic spine equal in strength to hepatic spine. Posthepatic carina absent. Branchiocardiac carina rounded, sulcus relatively deep anteroventrally, becoming posterodorsally obsolete well before posterior carapace margin. Postorbital spine stronger than hepatic and suprahepatic spines, keeled. Submarginal carina acute, reaching and extending dorsally along posterior carapace margin. Low inconspicuous rounded mid-dorsal tubercle near posterior margin visible only in large adults (cl 30♀ mm).

Eyes as illustrated.

Antennular peduncle about 0.6X carapace length; prosartema falling short of distal margin of eye and well short of base of peduncle article 2; stylocerite short, basally broad, spine acute, not reaching midlength of basal antennular peduncle article. Inner antennular flagellum 6X carapace length; outer flagellum 7X carapace length.

Scaphocerite over-reaching antennular peduncle by about 1/5 of its own length; strongly rigid lateral margin ending in acute spine falling short of apex of blade. Antennal flagellum at least 8X carapace length.

Mouthparts as figured.

Mandibular palp, second article 2.5X longer than wide, widest proximally; distal article slender, tapering, about 3/5 length of proximal article. Maxilliped 3 reaching beyond antennular peduncle by length of dactylus; latter slightly more slender in female than in male; ischium with distoventral fixed spine. Pereopod 1 reaching by length of the finger beyond carapace; merus with distocentral movable spine and 3 fixed proximal spines; basis and ischium with ventrodorsal fixed spine. Pereopod 2 reaching to base of antennular peduncle article 3 in male and female. Pereopod 3 reaching by length of fingers beyond antennular peduncle article 3 in male and female; coxal plate in female expanded mesially, anterior surface hollowed, posterior surface strongly convex. Pereopod 4 extending by length of dactylus and half of propodus beyond antennular peduncle in female, by length of dactylus and propodus in male. Pereopod 5

extending beyond antennular peduncle by length of dactylus, propodus and half of carpus in female, by dactylus, propodus, and distal 1/8 of carpus in male. Pereopods increasing in length posteriorly. Anteromesial spine on coxae of pereopods 3-5 in both sexes; in female, coxa 4 with largest spine; in male, spine on coxa 3 and 4 small, on 5 expanded anteroventrally, broad, flattened, distally rounded. Sternite XIII in male with midventrally directed strongly flattened spine.

Abdominal segments 4-6 mid-dorsally sharply keeled, ending posteriorly in very small spine. Abdominal segment 6 slightly longer than anterior width, ventral margin evenly convex, with single small denticle (sometimes absent) posteriorly. Telson with median sulcus deepest in anterior half, flattening out, ending at level of lateral spines; latter continuous with ridges flanking sulcus, posteriorly acute, anteriorly rounded. Mesial uropodal ramus over-reaching telson by 1/3 of its own length; lateral ramus over-reaching inner by about 1/4 of its own length, bearing strong distolateral spine at about distal five-sixths. Pleopods 3-5 in male with narrowly rounded mediodorsal ridge; ridge almost as strong in female.

Thelycum with sternite XII bearing strong raised median crest; sternite XIII with strong acute anteroventrally directed median spine and ridge; sternite XIV evenly convex, sometimes with faint hint of median papilla.

Petasma with ventromedial lobule distally narrowed, almost straight, apically narrowly rounded; dorsolateral lobule margin distally oblique. Ventrolateral lobule with distally free, broad, apically rounded part falling considerably short of ventromedial lobule, about 2-2.5X width of ventromedial lobule at base; distal margin curved mesially towards apex, ventral costa proximally submarginal, distally becoming more acute and extending almost to middle of surface of free part of lobule.

Appendix masculina about twice longer than broad, distally narrowed, ventrally strongly hollowed, lacking setae. Appendix interna roughly rectangular, not reaching apex of, and tucked into ventral hollow of appendix masculina; dorsolateral spur short, bluntly triangular.

**Remarks.** The two species described above belong to the genus *Haliporoides* (sensu Pérez Farfante, 1977a) for possessing the following characters: epigastric tooth separated from rostral teeth by long interval; suprahepatic spine present; orbital spine lacking; ventral antennular flagellum subcylindrical; dorsal antennular flagellum subcylindrical; lateral ramus of uropod armed with distolateral spine; telson with single pair of fixed lateral spines; podobranchs restricted to maxilliped 2.

Pérez Farfante (1977a: 290) asserts that in the

Indo-West Pacific, *Haliporoides triarthrus* Stebbing, and *H. sibogae* (de Man) belong to this genus. Crosnier (1978), dealing with the *Hymenopenaeus* complex in Madagascar, recognised the following taxa: *Hymenopenaeus sibogae madagascariensis* Crosnier, *H. lucasi* Bate, *H. halli* Bruce, *H. propinquus* (de Man), *H. furici* Crosnier, and *H. triarthrus vinroi* Crosnier. Of these, *H. lucasi*, *H. halli*, *H. furici* and *H. propinquus* are true *Hymenopenaeus*; by Pérez Farfante's definition (1977a), the remainder are true *Haliporoides*.

Crosnier (1978) provides a table for comparing the *sibogae* complex of species and subspecies, to which group the two present species obviously belong. *Haliporoides sibogae madagascariensis* is distinguished from the typical form (recorded from Indonesia, Australia, Japan, New Zealand, and the Chinese Sea), by having a slightly (but still overlapping) higher rostral count, a postrostral carina extending beyond the cervical groove, and a slightly more elevated and proportionally deeper rostrum. It would seem that while *H. sibogae australiense* is closely related to the two *sibogae* forms, having a rostral formula very similar to the two previously recognised *H. sibogae* forms, a postrostral carina ending anterior to the cervical groove, a suprahepatic spine of equal strength to that of the hepatic spine, a female sternite XIV lacking a longitudinal ridge, a ventromedian lobule of the petasma slender but not distally bent, and slightly different appendix masculina and zygocardiac ossicle structure, it is sufficiently and constantly different to warrant subspecific separation.

Schmitt (1926), in recording *Haliporus sibogae* from Victoria, Australia, mentions the rostral formula as ranging from  $\frac{7}{1}$  to  $\frac{9}{2}$ . Six specimens from the *Endeavour* material in the USNM collections were examined, as well as the *Endeavour* material in

the Australian Museum. All belong to the present subspecies (see Material examined). The high-crested rostral form (*H. cristatus*) bears some superficial resemblance to *H. triarthrus triarthrus* and *H. triarthrus vinroi*, from the east coast of South Africa, Mozambique, and Madagascar, but differs in some major respects (see Table 1). These include the rostral formula (the African species never having more than three ventral teeth), the postrostral carina (which extends posteriorly to the cervical groove in *H. triarthrus*), the ventromedian lobule of the petasma (much broader in the African species) and the female sternite XIV (which has a distinct median raised area in *H. triarthrus*). On the basis of these characters, *H. cristatus* can easily be separated from *H. triarthrus*.

Potter & Dredge (1985: 226) refer to an undescribed species of *Haliporoides* taken in southern and central Queensland waters, and also recorded from off New South Wales. This species, which is *H. cristatus*, "... is separated from *H. sibogae* by its yellowish hue, the greater curvature of the rostrum, and the distinctive white stripe on the dorsal portion of the uropod."

#### *Hymenopenaeus* Smith, 1882

##### *Hymenopenaeus halli* Bruce

*Hymenopenaeus halli* Bruce, 1966: 216, figs 1, 2.—  
Crosnier, 1978: 120, figs 39d, 40d, 42c, 43b, 45a-d, 46b, c.

**Material examined.** New South Wales: AM P33198, off New South Wales coast, demersal prawn trawl, *Kapala* (K78-23), Nov 1978; 1 ♂, 3 ♀. AM P33199, 33°47'S 151°55'E to 33°44'S 151°57'E, 890–900 m, demersal prawn trawl, *Kapala* (K78-28-16), 7 Dec 1978; 1 ♂, 2 juvs.

**Diagnosis.** Rostrum slender, straight, directed slightly obliquely, with 5–7 dorsal teeth well separated from 2 postrostral teeth; antennal,

	<i>H. sibogae</i>	<i>H. sibogae madagascariensis</i>	<i>H. triarthrus vinroi</i>	<i>H. sibogae australiensis</i>	<i>H. cristata</i>
Rostral formula (most frequent form in parentheses)	5+2/1 to 7+2/2 (5+2/2)	6+2/2 to 8+2/2 (6+2/2, 7+2/2)	8+2/2 to 12+2/2 (9+2/2)	5+2/1 to 6+2/2 (6+2/1)	7+2/3 to 9+2/3 (9+2/3)
Rostral shape	low, gentle curved	low, almost straight	high crested	low, almost straight to gently curved	high crested
Postrostral carina	stopping just anterior to cervical groove	ending posterior to cervical groove, half way to posterior margin	ending posterior to cervical groove, midway to posterior margin	ending anterior to cervical groove	ending anterior to cervical groove
Suprahepatic spine + Sternite XIV	small with longitudinal swelling	small with strong longitudinal swelling	minuscule almost indiscernible longitudinal swelling	= hepatic spine no longitudinal swelling	= hepatic spine no longitudinal swelling
Ventromedian lobule of petasma	short, pointed, ear-shaped	elongate (variable) pointed	broad, rounded	relatively elongate, rounded to subacute	relatively elongate, rounded
Lateral process of petasma	broad	broad	broad	moderately broad	narrow

Table 1. Comparison of five Indo-Pacific species of *Haliporoides*.

postantennal, hepatic, and branchiostegal spines present. Prosartema well developed; antennular flagella filiform, cylindrical. Telson with single pair of fixed lateral spines. Petasma with ventromedian lobule distally divided by deep slit into 2 subequal apically acute processes. Thelycum with sternal plate between bases of pereopod 5 having prominent medio-longitudinal ridge.

**Distribution.** Off Madagascar, Indonesia, South China Sea; 540–910 m.

#### *Hymenopenaus lucasi* (Bate)

*Solenocera lucasii* Bate, 1881: 185.

*Hymenopenaus lucasi*.—Crosnier, 1978: 115, figs 37f–h, 39c, 40c, 42d, 43a, 44, 46a.

**Material examined.** New South Wales: AM P33163, north-east of Danger Point, 27°55'S 154°03'E to 27°57'S 154°03'E, 629 m, demersal prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 1 ♀.

**Diagnosis.** Rostrum short, horizontal, with 6 or 7 dorsal teeth, of which 3 or 4 posterior to orbital margin but not separated by marked gap; ventrally convex but unarmed. Petasma with mesial process distally tapering, apically rounded; lateral process much shorter than mesial, distally truncate; lateral flap broadly convex. Thelycum with sternite between bases of pereopod 3 bipartite, with rounded anterior part and posterior ovate and medially ridged portion; sternite between pereopod 4 anterior rounded, posteriorly bilobed; sternite of pereopod 5 ovate.

**Distribution.** Madagascar, Seychelles, Maldives, Indonesia, Japan; 200–629 m.

#### *Hymenopenaus propinquus* (de Man)

*Haliporus propinquus* de Man, 1907: 140.

*Hymenopenaus propinquus*.—Crosnier, 1978: 124, figs 39e, 40e, 42e, 43c, 45e–h, 46d, e, 47a.

**Material examined.** New South Wales: AM P25130, east of Broken Bay, 33°35'S 152°01'E to 33°32'S 152°03'E, 810 m, demersal prawn trawl, *Kapala* (K76-24-03), 20 Dec 1976; 1 ♀. AM P25140, east of Broken Bay, 33°35'S 152°01'E to 33°32'S 152°03'E, 810 m, demersal prawn trawl, *Kapala* (K76-24-03), 20 Dec 1976; 6 ♂, 3 ♀. AM P26761, north-east of Norah Head, 33°11'S 152°24'E to 33°09'S 152°25'E, 720 m, demersal prawn trawl, *Kapala* (K77-23-10), 7 Dec 1977; 1 ♂, 3 ♀. AM P26774, south-east of Broken Bay, 33°40'S 151°56'E to 33°37'S 151°56'E, 711 m, demersal prawn trawl, *Kapala* (K77-23-06), 6 Dec 1977; 1 ♂, 6 ♀, 2 juvs. AM P26802, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 1 ♀. AM P26814, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 4 ♂, 12 ♀. AM P33014, north-east of Broken Bay, 33°27'S 152°09'E to 33°25'S 152°11'E, 874 m, demersal prawn trawl, *Kapala* (K77-23-13), 8 Dec 1977; 1 ♂, 2 ♀. AM P33013, east of Broken Bay, 33°35'S 152°00'E to 33°33'S

152°02'E, 810 m, demersal prawn trawl, *Kapala* (K77-23-12), 8 Dec 1977; 1 ♂, 1 ♀. AM P33012, north-east of Point Danger, 28°03'S 154°04'E to 28°01'S 154°04'E, 724 m, demersal prawn trawl, *Kapala* (K78-23-08), 6 Nov 1978; 9 ♂, 1 ♀. AM P33015, east of Broken Bay, 33°32'S 152°06'E to 33°334'S 152°05'E, 810 m, demersal prawn trawl, *Kapala* (K79-20-13), 6 Dec 1979; 1 ♀. AM P35918, south-east of Broken Bay, 33°43'S 151°56'E to 33°39'S 151°58'E, 631 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 3 ♂, 2 ♀.

**Diagnosis.** Rostrum slender, directed obliquely upward, armed dorsally with 6 teeth separated by marked gap from 2 postrostral teeth. Petasma with mesial process extending well beyond lateral process, distally rounded, lacking marginal spines at apex; lateral process broadly triangular. Thelycum with sternite between pereopod 4 with transverse rounded setose swelling anteriorly and rounded lateral process posteriorly; sternite between pereopods 5 more or less hemispherical, with anterior margin faintly sinuous, posteriorly broadly rounded, surface with 2 submedian depressions.

**Distribution.** Gulf of Aden, Zanzibar, Reunion, Madagascar, Maldives, Indonesia; 510–1080 m.

#### *Solenocera* Lucas, 1849

##### *Solenocera choprai* Nataraj

*Solenocera choprai* Nataraj, 1945: 91, figs 1–4.—Crosnier, 1978: 141, figs 49g, 51d, e, 52c, 53a–c, 54a, b, 55c, 56a–e, 58c, 59f; Grey, Dall & Baker, 1983: 42, pl. 4 (pl. 4 in this reference is of *Solenocera alticarinata* Kubo, 1949).

**Material examined.** New South Wales: AM P32479, east of Danger Point, 28°16'S 153°50'E to 28°12'S 153°51'E, 144 m, trawl, *Kapala* (K78-09-08), 2 June 1978; 1 ♂, 1 ♀, 1 juv.

**Diagnosis.** Rostrum not reaching beyond eye, ventrally gently convex, dorsally with 8 teeth, 4 of which postorbital. Carapace lacking pterygostomial spine; inferior margin of hepatic groove anterior to hepatic spine ending in small excavate area; mid-dorsal carina posterior to cervical groove lamelliform. Petasma with distal process of ventromedian lobule not markedly extending beyond dorsolateral lobule; both fringed distally with spines. Thelycum in female consisting of rectangular hollow between bases of pereopod 5.

**Distribution.** Gulf of Suez, Arabian Sea, Madagascar, India, north-western Australia, China Sea; 50–175 m.

##### *Solenocera faxoni* de Man

*Solenocera faxoni* de Man, 1907: 136; 1911: 52, pl. 5, fig. 13.—Kubo, 1949: 241, figs 8U, 20P, 27C–E, 45F, 66A, B, 72R, X, 80C, 97, 98E–G, 100.

**Material examined.** New South Wales: AM P32475, east of Terrigal, 33°26'S 152°05'E, 396 m, prawn trawl,

*Kapala* (K79-08-08), 18 July 1979; 1 ♀. AM P32476, east of Charlotte Head, 32°17'S 153°01'E, 360 m, prawn trawl, *Kapala* (K78-03-03), 5 Apr 1978; 1 ♂. AM P32477, east of North Solitary Is., 29°56'S 153°41'E to 29°53'S 153°41'E, 360 m, demersal prawn trawl, *Kapala* (K78-06-01), 25 Apr 1978; 2 ♂. AM P32480, east of Point Danger, 28°05'S 153°58'E, 405 m, trawl, *Kapala* (K78-09-04), 1 June 1978; 5 ♂, 6 ♀.

**Diagnosis.** Rostrum barely reaching as far as eye, ventrally convex, unarmed, dorsally with 6 teeth of which 3–4 postorbital. Carapace tomentose only in region of rostrum; with hepatic, postorbital, and antennal spines present, pterygostomina spine absent; inferior margin of hepatic groove anterior to hepatic spine markedly raised, ending anteriorly in broadly flattened acute branchiostegal spine overlapping sterygostomial margin. Thelycum between bases of pereopods 4 and 5 simple deep hollow, demarked anteriorly by lateral ridge, meeting anteromesially as narrow laterally acute contiguous lobes between bases of pereopod 4.

**Distribution.** Indonesia, Japan; 250–310 m.

#### *Solenocera rathbuni* Ramadan

*Solenocera rathbuni* Ramadan, 1938: 57.—Crosnier, 1978: 163, figs 49e, 52f, 55f, 57c, 59b,i, 62a–c, 63a–d.

**Material examined.** New South Wales: AM P32482, east of Point Danger, 28°16'S 153°50'E, 137 m, trawl, *Kapala* (K78-09-09), 2 June 1978; 1 ♀. AM P32483, east of Point Danger, 28°05'S 153°49'E, 137 m, trawl, *Kapala* (K78-09-14), 3 June 1978; 7 ♂, 13 ♀.

**Diagnosis.** Postrostral carina almost reaching posterior margin of carapace; pterygostomial and branchiostegal spines absent; anterior hepatic carina straight or very faintly sinuous, ending just short of carapace margin, not reflexed. Abdominal somite 1 rounded; somite 2 with faint mid-dorsal ridge; somites 3–6 strongly carinate, somite 6 with mid-dorsal spine on posterior margin. Petasma with distal process of ventromedian lobule extending well beyond dorsolateral lobule, both fringed with spinules; ventral costa distally rounded. Dorsolateral lobule distally fringed with spinules; ventrolateral lobule distally rounded. Thelycum with sternite XII having posterolateral raised tubercle bearing spine, hollowed area of coxa articulating on anterior face of tubercle. Sternite XIII similar to sternite XII. Sternite XIV with 2 low submedian setose patches near anterior margin; strong apically bifid tubercle at mid-sternite; posterior margin with median furrow and raised roughly rectangular lateral plate.

**Remarks.** The present material is all considerably larger than that reported by Crosnier (1978) from Madagascar (8.2–10.5 mm cl, as against 17.5–25.8 mm cl). The lectotype from Hawaii, too, has a carapace length of only 9.3 mm.

The rostrum, carapace, the pterygostomial

region, and the antennular flagellar apices all agree with Crosnier's description. Slight differences in the thelycum can be detected. Crosnier figures sternite XIV as having two well separated submedian tubercles and a lower anteromedian tubercle. In the present material, these three tubercles are situated closer together, on a large median boss.

Crosnier (1978) provides several dimensions characteristic of *S. rathbuni*. In all four of his specimens, the ratio of length of superior antennular flagellum to carapace length is always 1.3 or more. In the present material, this ratio ranges from 0.78–0.94 in females, 0.92–1.0 in males. This difference may be due to the immaturity of the Malagasy specimens. In Crosnier's material, the number of articles in the inferior antennular flagellum was 55–58 in males, 55–59 in females. In the present material, male counts range from 49–56, female counts 49–62.

**Distribution.** Madagascar, Hawaii; 80–110 m.

### Family ARISTEIDAE

#### Subfamily BENTHESICYMINAE

##### *Benthescymus* Bate, 1881

##### *Benthescymus investigatoris* Alcock & Anderson

*Benthescymus investigatoris* Alcock & Anderson, 1899: 282.—Crosnier, 1978: 21, figs 7c, d, 8c, d, 9, 10.

**Material examined.** New South Wales: AM P33024, south-east of Broken Bay, 33°39'S 152°06'E to 33°37'S 152°07'E, 990 m, demersal prawn trawl, *Kapala* (K79-20-15), 6 Dec 1979; 2 specimens.

**Diagnosis.** Podobranchs present on maxillipeds 2 and 3, and on pereopods 1–3. Telson with 4 pairs of movable lateral spines. Rostrum short, apically acute, with 2 dorsal teeth. Abdominal segment 5 ending posteriorly in tiny mediadorsal tooth. Thelycum of female with raised triangular area on sternite 12; sternite 13 with subcircular shield having rounded posteromedial process and 2 anterolateral subacute processes. Petasma of male distally expanded, broadly oval, distal margin lacking lobes.

**Distribution.** Indo-West Pacific: Hawaii, Fiji, Japan, Indonesia, Philippines, Andaman Sea, Gulf of Manrar, Saya de Malha, east Africa from Somalia to South Africa, Madagascar; 600–1525 m.

##### *Gennadas* Bate, 1881

##### *Gennadas bouvieri* Kemp

*Gennadas bouvieri* Kemp, 1909: 726, pl. 74, figs 1–4, pl. 75, figs 6, 7.—Kensley, 1971: 273, fig. 1; Crosnier, 1978: 34, figs 15a, 18a, b; Griffiths & Brandt, 1983: 614.

**Material examined.** New Caledonia: AM P32898, east of New Caledonia, 21°05'S 166°45'E, 0–925 m,

midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 2 specimens. AM P32899, east of New Caledonia, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 4 specimens.

New South Wales: AM P26590, south-east of Wollongong, 34°40'S 151°15'E to 34°35'S 151°17'E, 540 m, midwater trawl, *Kapala* (K77-19-05), 3 Nov 1977; 1 specimen. AM P32894, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 2 specimens. AM P32893, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 3 specimens. AM P32895, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 3 specimens. AM P32892, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 8 specimens. AM P32896, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 2 specimens. AM P32897, north-east of Norah Head, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 1 specimen.

**Diagnosis.** Antennal angle acute, infra-antennal angle quadrate. Thelycum of female with sternite 13 with rounded flap lifting posteriorly, flanked by small lateral process; sternite 14 with broad oval shield having elongate process on anterolateral corners. Petasma of male with external lobe bipartite, both lobules acute; median lobe bipartite, both lobes acute, directed towards each other; internal lobe low; accessory lobe broadly oval.

**Remarks.** Griffiths & Brandt (1983) record this species associated with a warm-core eddy off eastern Australia.

**Distribution.** Caribbean; west coast of South Africa; Indo-Pacific; 250–630 m.

#### *Gennadas capensis* Calman

*Gennadas capensis* Calman, 1925: 5, pl. 1, figs 1, 2.—Kensley, 1971: 277, fig. 3; Crosnier, 1978: 36, fig. 18c.

**Material examined.** New Caledonia: AM P32886, east of New Caledonia, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 8 specimens.

New South Wales: AM P32885, south-east of Port Jackson, 34°05'S 151°55'E to 34°10'S 152°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 5 specimens. AM P26600, north-east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 6 specimens. AM P26588, south-east of Wollongong, 34°40'S 151°15'E to 34°35'S 151°17'E, 540 m, midwater trawl, *Kapala* (K77-19-05), 3 Nov 1977; 2 specimens. AM P32881, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 4 specimens. AM P32880, east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 13 specimens.

AM P32882, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 13 specimens. AM P32884, north-east of Norah Head, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 3 specimens.

**Diagnosis.** Antennal angle acute, infra-antennal angle quadrate. Thelycum of female with W-shaped process on sternite 13, with median apex formed by concave process. Coxa of pereopod 2 bearing posteriorly-directed spoon-shaped process. Petasma of male with external lobe acute, triangular, with smaller scute lobule on median margin; median lobe truncate; internal lobe of 2 bluntly rounded lobules; accessory lobe low, bipartite.

**Distribution.** Caribbean; north-eastern Atlantic; west coast of South Africa; Indian Ocean; 250–630 m.

#### *Gennadas gilchristi* Calman

*Gennadas gilchristi* Calman, 1925: 6, pl. 1, figs 3, 4.—Kensley, 1971: 272, 273, 280, fig. 6; Griffiths & Brandt, 1983: 612, 614.

**Material examined.** New Caledonia: AM P32879, east of New Caledonia, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 1 specimen.

New South Wales: AM P32877, south-east of Port Jackson, 34°05'S 151°55'E to 34°10'S 151°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 221 specimens. AM P32878, south-east of Port Jackson to north-east of Wollongong, 34°02'S 152°12'E to 34°14'S 152°14'E, 0–600 m, midwater trawl, *Kapala* (JP71-8), 25–26 Mar 1971; 3 specimens. AM P32866, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 153 specimens. AM P32869, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 30 specimens. AM P32870, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 98 specimens. AM P32868, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 30 specimens. AM P32867, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 152°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 19 specimens. AM P26589, P26591, south-east of Wollongong, 34°40'S 151°15'E to 34°35'S 151°17'E, 540 m, midwater trawl, *Kapala* (K77-19-05), 3 Nov 1977; 10 specimens. AM P26592, P26593, P32873, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 11 specimens. AM P26595, north-east of Wollongong, 34°10'S 152°04'E to 34°12'S 152°02'E, 540 m, midwater trawl, *Kapala* (K77-18-01), 26 Oct 1977; 6 specimens. AM P26601, north-east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 21 specimens. AM P32865, north-east of Norah Head, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater

trawl, *Kapala* (K79-19-03), 28 Nov 1979; 37 specimens. AM P32872, south-east of Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 482 m, midwater trawl, *Kapala* (K79-19-02), 27 Nov 1979; 5 specimens. AM P32874, north-east of Norah Head, 33°08'S 152°48'E to 33°16'S 152°46'E, 630 m, midwater trawl, *Kapala* (K79-19-10), 29 Nov 1979; 1 specimen. AM P32876, east of Newcastle, 32°51'S 153°01'E to 32°59'S 152°54'E, 540 m, midwater trawl, *Kapala* (K79-19-08), 29 Nov 1979; 3 specimens. AM P32871, south-east of Norah Head, 33°23'S 152°37'E to 33°19'S 152°39'E, 666 m, midwater trawl, *Kapala* (K77-24-06), 13 Dec 1977; 1 specimen. AM P11487, 4.8 km east of Port Hacking, 200 m, haul 200/39, net 100, K. Sheard, CSIRO Fisheries Section, 6 July 1939; 1 specimen.

**Diagnosis.** Antennal and infra-antennal angles of carapace narrowly rounded. Thelycum of female with sternite 13 having bilobed process. Petasma of male with external lobe acute, median lobe of 2 diverging lobules, internal lobe acute, accessory lobe distally broadly rounded.

**Remarks.** This would appear to be the commonest species of *Gennadas* in Australian waters. Griffiths & Brandt (1983) give an account of its occurrence and abundance in a warm-core eddy in the Tasman Sea off eastern Australia, where it was more abundant outside and at the edge of the eddy than inside.

Of the material in the Australian Museum, 12 specimens were heavily parasitised by a nematode within the carapace. It is possible that this *Gennadas* is the intermediate host for some parasitic nematode of fish.

**Distribution.** Off the west coast of South Africa; Agulhas Basin; southern Indian Ocean; off eastern Australia; 100–1000 m.

#### *Gennadas incertus* (Balss)

*Amalopenaeus incertus* Balss, 1927: 265, figs 24–29.  
*Gennadas incertus*.—Kensley, 1971: 284, fig. 7; Crosnier, 1978: 37, figs 15b, 19a; Griffiths & Brandt, 1983: 614.

**Material examined.** New Caledonia: AM P35742, east of New Caledonia, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 5 specimens.

New South Wales: AM P35738, south-east of Port Jackson, 34°05'S 151°55'E to 34°10'S 152°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 1 specimen. AM P35739, east of Broken Bay, 33°33'S 152°18'E to 33°31'S 152°18'E, 216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 1 specimen. AM P35740, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 3 specimens. AM P35741, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 1 specimen.

**Diagnosis.** Antennal and infra-antennal angles of carapace acute. Thelycum of female with large

concave shield on sternite 12, shield on sternite 13 with acute anterolateral corners, sternite 14 with broad oval shield with anterior and posterior notch. Petasma of male with external lobe of 2 large diverging lobules, median lobe of slender outer and broad inner lobule, internal lobe simple, rounded, accessory lobe rounded, reaching as far as median and internal lobes.

**Remarks.** Griffiths & Brandt (1983) record this species associated with a warm-core eddy off eastern Australia.

**Distribution.** North east and north west Pacific; Indian Ocean; west coast of South Africa; 100–900 m.

#### *Gennadas kempii* Stebbing

*Gennadas kempii* Stebbing, 1914: 283, pl. 27.—Kensley, 1971: 285, fig. 8; Griffiths & Brandt, 1983: 614.

**Material examined.** New Caledonia: AM P32917, east of New Caledonia, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 2 specimens.

New South Wales: AM P32916, north-east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 1 specimen. AM P32914, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 2 specimens. AM P32915, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen.

**Diagnosis.** Antennal and infra-antennal angles of carapace rounded. Thelycum of female with triangular shield on sternite 12, rectangular shield on sternite 13, pentagonal shield on sternite 14. Petasma of male with acute external lobe, broad truncate median lobe, rounded internal lobe, accessory lobe rounded, flap-like.

**Remarks.** Griffiths & Brandt (1983) record this species associated with a warm-core eddy of eastern Australia.

**Distribution.** South west coast off South Africa; Indian Ocean; east coast of Australia; 250–800 m.

#### *Gennadas propinquus* Rathbun

*Gennadas propinquus* Rathbun, 1906: 907, fig. 61.—Crosnier, 1978: 38, fig. 16b, 18d, e; Kensley, 1981b: 19. *Gennadas clavicarpus* de Man, 1907: 144.—Kensley, 1971: 278, fig. 4; Griffiths & Brandt, 1983: 614.

**Material examined.** New Caledonia: AM P32910, east of New Caledonia, 21°05'E 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 6 specimens.

New South Wales: AM P32909, south-east of Port Jackson, 34°05'S 151°55'E to 34°10'S 152°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 1 specimen. AM P32904, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater



trawl, *Kapala* (K77-24-09), 14 Dec 1977; 8 specimens. AM P32902, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 3 specimens. AM P32901, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 1 specimen. AM P32906, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 4 specimens. AM P32903, east of Norah Head, 33°17'S 152°31'E to 33°19'S 152°31'E, 90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 6 specimens. AM P32905, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 1 specimen. AM P32900, east of Broken Bay, 33°33'S 152°18'E to 33°31'S 152°18'E, 216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 2 specimens. AM P26594, north-east of Wollongong, 34°10'S 152°04'E to 34°12'S 152°02'E, 540 m, midwater trawl, *Kapala* (K77-18-01), 26 Oct 1977; 1 specimen. AM P32907, east to north-east of Norah Head, 33°20'S 153°04'E to 33°12'S 153°13'E, 630 m, midwater trawl, *Kapala* (K79-19-05), 28 Nov 1979; 1 specimen.

**Diagnosis.** Antennal angle of carapace acute, infra-antennal angle quadrate. Thelycum of female with W-shaped process on sternite 13 closely connected to bluntly triangular shield on sternite 12; sternite 14 with 8-shaped process. Petasma of male, external lobe bipartite, large median lobe of 2 diverging acute lobules, internal lobe of 2 rounded lobules, accessory lobe a simple rounded flap.

**Remarks.** Griffiths & Brandt (1983) record this species (as *G. claviceps*) associated with a warm-core eddy in the Tasman Sea off eastern Australia.

**Distribution.** Widespread through Indo-Pacific; surface to 1200 m.

#### *Gennadas scutatus* Bouvier

*Gennadas scutatus* Bouvier, 1906: 748.—Kensley, 1971: 288, fig. 10; Crosnier, 1978: 43, figs 17a, 19c; Griffiths & Brandt, 1983: 614.

**Material examined.** New Caledonia: AM P32911, east of New Caledonia, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 3 specimens. AM P32912, east of New Caledonia, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 1 specimen.

New South Wales: AM P32913, east of Norah Head, 33°17'S 152°31'E to 33°19'S 152°31'E, 90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 1 specimen.

**Diagnosis.** Antennal and infra-antennal angles of carapace acute. Thelycum of female with sternite 12 triangular with seminal receptacles at base, sternite 13 triangular, sternite 14 with elongate flap extending forward over sternite 13 and reaching sternite 12. Petasma of male with external lobe of 2 rounded lobules, median lobe broad, of slender acute outer lobule and broadly truncate inner lobule; median lobe of 2 rounded lobules; accessory lobe a triangular flap.

**Remarks.** Griffiths & Brandt (1983) record this species associated with a warm-core eddy off eastern Australia.

**Distribution.** Caribbean; north-east and north-west Atlantic; west coast of South Africa; Indo-Pacific; surface to 600 m.

#### *Gennadas tinayrei* Bouvier

*Gennadas tinayrei* Bouvier, 1906: 10, figs 2–4, 14.—Kensley, 1971: 290, fig. 12; Crosnier, 1978: 44, figs 17b, 19d; Griffiths & Brandt, 1983: 614.

**Material examined.** New South Wales: AM P32888, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 1 specimen. AM P32890, east of Norah Head, 33°17'S 152°31'E to 33°19'S 152°31'E, 90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 1 specimen. AM P32887, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 2 specimens. AM P32891, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 1 specimen.

**Diagnosis.** Antennal angle of carapace subacute, infra-antennal angle acute. Thelycum of female with narrow median posteriorly directed process on sternite 11; sternite 13 with broadly triangular process flanked by two rounded processes on each side; sternite 14 with small rectangular shield. Petasma of male with external lobe faintly divided into 2 apical lobules; median lobe broad, low, convex; inner lobe of 2 rounded lobules; accessory lobe bluntly rounded.

**Remarks.** Griffiths & Brandt (1983) found this species associated with a warm-core eddy off eastern Australia.

**Distribution.** North-east and north-west Atlantic; off west coast of South Africa; Indo-Pacific; 100–600 m.

#### Subfamily ARISTEINAE

##### *Aristaeomorpha* Wood Mason, 1891

##### *Aristaeomorpha foliacea* (Risso)

*Penaeus foliaceus* Risso, 1827: 69, pl. 2, fig. 6.

*Aristaeomorpha foliacea*.—Schmitt, 1926: 313, pl. 57, figs 1–3; Crosnier, 1978: 54, figs 23, 24; Grey, Dall & Baker, 1983: 36, pl. 1.

**Material examined.** New South Wales: AM P17966, east of Long Reef, 33°41–44'S 151°55–53'E, 540 m, bottom trawl, *Kapala* (K71-07-01), 20 April 1971; 1 specimen. AM P17904, north-east of Coffs Harbour, 29°51'S 153°40'E, 205 m, bottom trawl, *Kapala* (K71-09-03), 11 May 1971; 17 specimens. AM P18023, north-east to east of North Solitary Island, 29°49'S 153°42'E to 29°59'S 153°38'E, 369 m, demersal prawn trawl, *Kapala* (K71-09-04), 12 May 1971; 1 specimen. AM P18011, south-east of Gabo Island, 37°39'S 150°17'E to 37°42'S

150°17'E, prawn trawl, *Kapala* (K71-13-01), 30 July 1971; 3 specimens. AM P18017, P18022, P18016, south-east of Gabo Island, 37°45'S 150°13'E to 37°39'S 150°17'E, 405 m, trawl, *Kapala* (K71-13-02), 30 July 1971; 3 specimens. AM P18981, south-east to east of Broken Bay, 33°43'S 151°55'E to 33°37'S 152°02'E, 675 m, demersal prawn trawl, *Kapala* (K72-06-04), 19 Oct 1972; 3 specimens. AM P19155, east of Sydney, 33°00'S 151°43'E to 33°54'S 151°47'E, 732m, bottom trawl, *Kapala* (K72-07-01), 6 Nov 1972; 1 specimen. AM P19154, south-east of Broken Bay, 33°44'S 151°55'E to 33°40'S 151°58'E, 720 m, demersal prawn trawl, *Kapala* (K72-07-04), 9 Nov 1972; 1 specimen. AM P19002, north-east of Port Jackson, 33°52'S 151°50'E to 33°48'S 151°54'E, 765 m, demersal prawn trawl, *Kapala* (K72-07-15), 7 Dec 1972; 1 specimen. AM P19003, south-east of Broken Bay, 33°42'S 151°55'E to 33°40'S 151°57'E, 810 m, demersal prawn trawl, *Kapala* (K72-07-16), 7 Dec 1972; 9 specimens. AM P21048, P21043, north-east of Wollongong, 34°16'S 151°26'E to 34°22'S 151°23'E, 356 m, demersal prawn trawl, *Kapala* (K75-05-01), 8 Aug 1975; 3 specimens. AM P21036, north-east of Wollongong, 34°21'S 151°24'E to 34°14'S 151°28'E, 400 m, demersal prawn trawl, *Kapala* (K75-05-02), 8 Aug 1975; 2 specimens. AM P21011, east of Broken Bay, 33°27'S 152°03'E to 33°30'S 152°07'E, 540 m, trawl, *Kapala* (K75-05-04), 19 Aug 1975; 4 specimens. AM P25152, east of Broken Bay, 33°35'S 152°01'E to 33°32'S 152°03'E, 810 m, demersal prawn trawl, *Kapala* (K76-24-03), 20 Dec 1976; 1 specimen. AM P25371, south-east to east of Broken Bay, 33°34'S 151°52'E to 33°40'S 151°55'E, 405 m, demersal prawn trawl, *Kapala* (K77-12-01/02), 8 Aug 1977; 5 specimens. AM P26816, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 11 specimens. AM P33080, north-east of Point Danger, 28°01'S 154°00'E to 27°58'S 154°00'E, 542 m, demersal prawn trawl, *Kapala* (K78-17-10), 17 Aug 1978; 1 specimen. AM P33078, north-east of Point Danger, 28°03'S 154°04'E to 28°01'S 154°04'E, 724 m, demersal prawn trawl, *Kapala* (K78-23-08), 6 Nov 1978; 5 specimens. AM P33079, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 8 specimens. Victoria: AM P18011, south-east of Gabo Island, 37°39'S 150°17'E to 37°42'S 150°16'E, 387 m, Danish trawl, *Kapala* (K71-13-01), 30 July 1971; 3 specimens. AM P18017, P18022, P18016, south-east of Gabo Island, 37°39-45'S 150°17-13'E, 396-401 m, Danish trawl, *Kapala* (K71-13-02), 30 July 1971; 3 specimens.

**Diagnosis.** Body pubescent. Rostrum fairly long, reaching beyond scaphocerite in adult females and young males, shorter in adult males; up to 9 dorsal rostral spines, no ventral spines. Hepatic spine present. Thelycum of female with sternite 13 bearing anteriorly directed oval shield, sternite 14 bearing rounded medial process. Petasma in male roughly rectangular, with distolateral corner somewhat produced.

**Distribution.** Mediterranean; north-east and north-west Atlantic; Caribbean; Gulf of Mexico; Indo-West Pacific to Japan and Fiji; southern and eastern Australia; New Zealand; 90-1300 m.

*Aristeus* Duvernoy, 1840

*Aristeus semidentatus* Bate

*Aristeus semidentatus* Bate, 1881: 189.—Crosnier, 1978: 68, fig. 26g.

**Material examined.** New South Wales: AM P26772, south-east of Broken Bay, 33°40-35'S 151°56-58'E, 714-732 m, demersal prawn trawl, *Kapala* (K77-23-06), 6 Dec 1977; 1 ♀. AM P26777, south-east of Broken Bay, 33°40-35'S 151°56-58'E, 714-732 m, demersal prawn trawl, *Kapala* (K77-23-06), 6 Dec 1977; 1 ♂, 1 ♀. AM P25143, east of Broken Bay, 33°30-27'S 152°05-07'E, 810 m, demersal prawn trawl, *Kapala* (K76-24-04), 21 Dec 1976; 1 ♀. AM P33196, east of Broken Bay, 33°32'S 152°06'E to 33°34'S 152°05'E, 810 m, demersal prawn trawl, *Kapala* (K79-20-13), 6 Dec 1979; 1 ♂, 1 ♀. AM P33197, south-east of Broken Bay, 33°39'S 152°06'E to 33°37'S 152°07'E, 990 m, demersal prawn trawl, *Kapala* (K79-20-15), 6 Dec 1979; 2 ♀, 8 juvs.

**Diagnosis.** Carapace glabrous; branchiostegal spine produced posteriorly into supporting, anteriorly keeled ridge. Subdistal spine on external face of merus of pereopods 1 and 2. Fingers of pereopods relatively short. Photophores present on pereopods.

**Remarks.** Crosnier (1978) presented two tables in which characters of four species of *Aristeus* from Madagascar were compared. These features of *A. semidentatus* from Madagascar were compared with those for the present Australian material (see Tables 2 and 3). It was found that the number of photophores on the carpus and propodus of pereopods 1, 2, 4, and 5 was consistently lower than Crosnier's figures. Further, the ratio of chela to carpus in pereopod 1, and the ratio of carpus to merus in pereopod 5 was consistently higher than Crosnier's figures. For the remaining features provided in the diagnosis by Crosnier (1978: 68), the

		No. Photophores			No. Photophores
Prd 1	carpus	6-8	Prd 4	carpus	7-12
	propodus	2-3		propodus	8-11
	dactyl	0		dactyl	0
Prd 2	carpus	0-2	Prd 5	carpus	8-13
	propodus	1-2		propodus	8-13
	dactyl	0		dactyl	8-10
Prd 3	carpus	0-3			
	propodus	1-2			
	dactyl	0			

Table 2. Pereopodal photophore counts for Australian specimens of *Aristeus semidentatus*.

	chela/carpus			carpus/merus	
	Prd 1	Prd 2	Prd 3	Prd 4	Prd 5
♀	1.11-1.23	0.88-0.97	0.75-1.04	1.02-1.08	1.24-1.37
♂	1.12-1.15	0.92-0.94	0.78	1.02	1.40

Table 3. Pereopodal carpus/merus ratios for Australian specimens of *Aristeus semidentatus*.

Australian material is in agreement.

The present material may be differentiated from *A. mabahissae* by the lower ratio of chela/carpus of pereopod 1, and the higher ratio of carpus/merus of pereopod 5.

*Aristeus virilis* (Bate)

*Hemipenaeus virilis* Bate, 1881: 187.

*Aristeus virilis*.—Crosnier, 1978: 61, figs 25a, b, 26a, b.

**Material examined.** New South Wales: AM P21683, P21684, north-east of Woolli, 29°49'S 153°44'E, 503 m, prawn trawl, *Kapala* (K75-09-03), 10 Oct 1975; 12 specimens. AM P21684, south-east of Clarence River, 29°37'S 153°46'E, 410 m, demersal prawn trawl, *Kapala* (K75-09-04), 10 Oct 1975; ? specimens. AM P21686, north-east of Yamba, 29°26'S 153°49'E to 29°20'S 153°50'E, 450 m, demersal prawn trawl, *Kapala* (K75-09-08), 12 Oct 1975; 1 specimen. AM P24485, east of Sydney, 33°35'S 151°59'E, 366 m, *Kapala* (K76-09-02), 24 June 1976; 1 specimen. AM P26770, north-east of Norah Head, 33°11'S 152°24'E to 33°09'S 152°25'E, 720 m, demersal prawn trawl, *Kapala* (K77-23-10), 7 Dec 1977; 1 specimen. AM P33003, north-east of North Solitary Island, 29°53'S 153°42'E to 29°50'S 153°43'E, 453 m, demersal prawn trawl, *Kapala* (K78-06-07), 26 April 1978; 1 specimen. AM P33002, north-east of Point Danger, 28°03'S 154°04'E to 28°01'S 154°04'E, 724 m, demersal prawn trawl, *Kapala* (K78-23-08), 6 Nov 1978; 1 specimen.

**Diagnosis.** Body pubescent. Single movable subdistal spine present on external surface of merus of third pereopods. Between 16 and 22 photophores on propodus of pereopod 5. Thelycum in female with sternite 13 bearing broadly ovate, setose, anteroventrally-directed process. Petasma of male distally broad, somewhat produced mediolaterally.

**Distribution.** Indo-West Pacific to New Caledonia, New Hebrides, and Japan; 400–900 m.

*Plesiopenaeus* Bate, 1881

*Plesiopenaeus edwardsianus* (Johnson)

*Penaeus edwardsianus* Johnson, 1867: 897.

*Plesiopenaeus edwardsianus*.—Crosnier, 1978: 88, figs 31a–c, 32a–c, 33a; Grey, Dall & Baker, 1983: 38, pl. 2.

**Material examined.** New South Wales: AM 19103, 33°43'–39'S 151°54'–58'E, 694 m, *Kapala* (K72-05-01), 19 Oct 1972; 7 specimens. AM P19089, south-east to east of Broken Bay, 33°43'S 151°55'E to 33°37'S 152°02'E, 675 m, demersal prawn trawl, *Kapala* (K72-06-04), 19 Oct 1972; 6 specimens. AM P19090, east of Sydney, 34°00'S 151°43'E, 732 m, *Kapala* (K72-07-01), 6 Nov 1972; 1 specimen. AM P19102, east of Long Reef, 33°43'–40'S 152°55'–57'E, 823 m, *Kapala* (K72-17-12), 7 Dec 1972; 3 specimens. AM P20494, east of Broken Bay, 33°38'–34'S 151°57'–152°01'E, 796 m, *Kapala* (K75-01-02), 2 April 1975; 2 specimens. AM P21005, P21006, east of Broken Bay, 33°32'S 152°04'E to 33°38'S 152°00'E, 810 m, demersal prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 6 specimens. AM P25155, P25193, north-east of Broken

Bay, 33°30'S 152°05'E to 33°27'S 152°07'E, 808 m, demersal prawn trawl, *Kapala* (K76-24-04), 21 Dec 1976; 25 specimens. AM P33084, south-east of Wollongong, 34°31'S 151°20'E to 34°34'S 151°19'E, 684 m, demersal prawn trawl, *Kapala* (K77-21-01), 21 Nov 1977; 2 specimens. AM P33085, south-east of Broken Bay, 33°40'S 151°56'E to 33°37'S 151°56'E, 711 m, demersal prawn trawl, *Kapala* (K77-23-06), 6 Dec 1977; 3 specimens. AM P26763, north-east of Norah Head, 33°11'S 152°24'E to 33°09'S 152°25'E, 720 m, demersal prawn trawl, *Kapala* (K77-23-10), 7 Dec 1977; 8 specimens. AM P33081, north-east of Danger Point, 28°03'S 154°04'E to 28°01'S 154°04'E, 724 m, demersal prawn trawl, *Kapala* (K78-23-08), 6 Nov 1978; 22 specimens. AM P33086, east of Broken Bay, 33°34'S 152°04'E to 33°31'S 152°06'E, 713 m, demersal prawn trawl, *Kapala* (K79-20-04), 4 Dec 1979; 1 specimen. AM P33083, off New South Wales, *Kapala* (K79-23); 3 specimens. AM P35917, east of Long Reef, 33°43'–39'S 151°56'–58'E, 630 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 1 specimen.

**Diagnosis.** Rostrum elongate, but becoming shorter in adult males, with 3 dorsal spines at base, ventral margin unarmed. Hepatic spine absent, postantennal spine absent. Podobranch present on pereopod 3. Epipodite on pereopod 4. Exopods lacking on pereopods. Abdominal segments 3–6 ending in small posterodorsal spine. Thelycum in female with small anteriorly directed spine on sternite 12; heart-shaped, anteriorly directed shield on sternite 13; roughly elongate rectangular shield on sternite 14. Scaphocerite of adult male modified, bearing slender distal prolongation.

**Distribution.** Widespread throughout the Indo-West Pacific and Atlantic Oceans; off New South Wales; 274–1850 m.

Family PENAEIDAE

*Funchalia* Johnson, 1867

*Funchalia villosa* (Bouvier)

*Hemipenaeopsis villosus* Bouvier, 1905: 981.

*Funchalia villosa*.—Dall, 1957: 163, fig. 9; Crosnier & Forest, 1973: 296; Casanova, 1976: 63; Casanova & Judkins, 1977: 125, 126; Kensley, 1977: 29, figs 8c, d; Crosnier, 1985: 869, figs 13a–e, 14b, c.

**Material examined.** New South Wales: AM P19464, north-east of Wollongong, 34°10'S 151°37'E to 34°14'S 151°35'E, 50 m, midwater trawl, *Kapala* (K73-01-01), 30 Apr 1973; 38 specimens. AM P32932, off Port Kembla, 34°28'S 151°29'E, 225 m, midwater trawl, *Kapala* (K74-05-JP1), 22 Jan 1974; 2 specimens. AM P26556, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 1 specimen. AM P26557, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 3 specimens. AM P30329, east of Broken Bay, 33°33'S 152°18'E to 33°31'S 152°18'E, 216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 20 specimens. AM P32920, north-east of Broken Bay, 33°31'S 152°20'E to

33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 10 specimens. AM P32919, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 15 specimens. AM P32931, south-east of Norah Head, 33°23'S 152°27'E to 33°19'S 152°39'E, 666 m, midwater trawl, *Kapala* (K77-24-06), 13 Dec 1977; 1 specimen. AM P32929, north-east of Norah Head, 33°16'S 152°29'E to 33°14'S 152°30'E, 36 m, midwater trawl, *Kapala* (K77-24-07), 13 Dec 1977; 26 specimens. AM P32921, east of Norah Head, 33°17'S 152°31'E to 33°19'S 152°31'E, 90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 27 specimens. AM P32922, south-east of Norah Head, 33°20'S 152°32'E to 33°24'S 152°31'E, 360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 39 specimens. AM P32918, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 19 specimens. AM P32923, north-east of Wollongong, 34°05'S 152°02'E to 34°13'S 152°00'E, 630 m, midwater trawl, *Kapala* (K77-24-11), 14 Dec 1977; 17 specimens. AM P32924, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 84 specimens. AM P32926, south-east of Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 482 m, midwater trawl, *Kapala* (K79-19-02), 27 Nov 1979; 6 specimens. AM P32925, north-east of Norah Head, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 20 specimens. AM P32927, east of Newcastle, 32°59'S 153°03'E to 32°51'S 153°01'E, 391 m, midwater trawl, *Kapala* (K79-19-07), 29 Nov 1979; 3 specimens. AM P32928, north-east of Norah Head, 33°08'S 152°48'E to 33°16'S 152°46'E, 630 m, midwater trawl, *Kapala* (K79-19-10), 29 Nov 1979; 1 specimen.

**Diagnosis.** Rostrum with 4–5 dorsal teeth, ventrally unarmed. Carapace with 1 epigastric tooth; hepatic spine absent in adults; antennal spine present; branchiocardiac ridge prominent. Fifth and sixth abdominal somites with prominent lateral ridges. Petasma asymmetrical, shorter ramus distally a simple lobe with broad apical angle; longer ramus distally deeply grooved and curved, with pair of blunt lateral knobs distally, blunt triangular projection on outer proximal margin. Thelycum forming deep receptacle, anterior plate between pereopod 4 bases cordiform, grooved, lateral edges curved ventrally, anteriorly acute; sternal plate roughly quadrangular, with anterolateral extensions fusing with anterior plate to form walls of seminal receptacle.

**Distribution.** Eastern and western Atlantic, Mediterranean, Caribbean, south-western Indian Ocean, off Lord Howe Island; 50–666 m.

*Funchalia woodwardi* Johnson

*Funchalia woodwardi* Johnson, 1867: 895  
*Funchalia woodwardi*.—Crosnier & Forest, 1973: 296;  
 Casanova, 1976: 64; Casanova & Judkins, 1977: 125;  
 Kensley, 1977: 29, fig. 8A, B.

**Material examined.** New South Wales: AM P26555, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 1 ♀.

**Diagnosis.** Rostrum with 10–12 dorsal teeth, ventrally Eral ridges. Petasma asymmetrical, shorter ramus distally a simple lobe with broad apical angle; longer ramus distally deeply grooved and curved, with pair of blunt lateral knobs distally, blunt triangular projection on outer proximal margin. Thelycum forming deep receptacle, anterior plate between pereopod 4 bases cordiform, grooved, lateral edges curved ventrally, anteriorly acute; sternal plate roughly quadrangular, with anterolateral extensions fusing with anterior plate to form walls of seminal receptacle.

**Distribution.** North-eastern Atlantic, Mediterranean, south-eastern South Africa; 250–540 m.

*Parapenaeus* Smith, 1885

*Parapenaeus sextuberculatus* Kubo

*Parapenaeus sextuberculatus* Kubo, 1949: 403, figs 7F, 21B, 28D–F, 47R, 61A,A', 75B,H, 78H, 143B,F.—Dall, 1957: 179; Hall, 1962: 31; Crosnier, 1985: 312, 330, figs 9a,d, 10a-c, 11a.

**Material examined.** New South Wales: AM P32469, south-east of Coffs Harbour, 30°20'S 153°16'E to 30°23'S 153°25'E, 279 m, demersal prawn trawl, *Kapala* (K77-13-05), 19 Aug 1977; 1 ♂. AM P32484, east of Brooms Head, 29°44–50'S 153°41–39'E, 162 m, trawl, *Kapala* (K78-21-10), 11 Oct 1978; 7 ♀. AM P32485, east of Brooms Head, 29°36–40'S 153°45–43'E, 270 m, trawl, *Kapala* (K78-06-04), 26 Apr 1978; 1 ♂. AM P32486, east of Sugarloaf Point, 32°06–03'S 153°04–05'E, 360 m, prawn trawl, *Kapala* (K77-13-01), 17 Aug 1977; 1 ♂, 1 ♀. AMP32487, east of Port Jackson, 33°53'S 151°50'E, 360 m, *Kapala* (K77-09-02), 4 July 1977; 2 ♀. AM P32489, east of Brooms Head, 29°47–49'S 153°41–40'E, 234 m, *Kapala* (K78-05-07), 19 Apr 1978; 3 ♂, 4 ♀. AM P32490, east of Brooms Head, 29°47–49'S 153°41–40'E, 234 m, *Kapala* (K78-05-07), 19 Apr 1978; 1 ♀.

**Diagnosis.** Rostrum very slightly arched, with 5–6 dorsal teeth, well separated from epigastric tooth. Branchiostegal spine present, situated on anterior carapace margin. Abdominal somite 6 less than twice length of somite 5. Thelycum with plate of sternite XIII having cordiform anteriorly directed process; sternite XIV with pair of anteriolateral somewhat transversely elongate tubercles, pair of rounded posterolateral tubercles, single low rounded posteromedian tubercle. Petasma distally broadly rounded and with small distal point, distolateral plate distally bifid and with rounded anterior and posterior ridges.

**Distribution.** Japan, Philippines, Indonesia, India, 140–320 m; Madagascar, 250–350 m.

*Penaeopsis* Bate, 1881

*Penaeopsis eduardoi* Pérez Farfante

*Penaeopsis eduardoi* Pérez Farfante, 1977b: 172, figs 1–4.

**Material examined.** New South Wales: AM P32462, east of Port Jackson, 33°46'S 151°49'E to 33°44'S 151°51'E, 425 m, trawl, *Kapala* (K80-21-01), 16 Dec 1980; 2 ♀. AM P32463, north-east of Danger Point, 29°53'S 153°42'E to 29°55'S 153°42'E, 405 m, trawl, *Kapala* (K78-06-06), 26 Apr 1978; 5 ♀. AM P32464, north-east of Danger Point, 27°55'S 154°03'E to 27°57'S 154°03'E, 540 m, trawl, *Kapala* (K78-23-09), 6 Nov 1978; 1 ♂, 3 ♀. AM P32465, east of Broken Bay, 33°27'–30'S 151°05'–03'E, 391 m, prawn trawl, *Kapala* (K79-12-07), 21 Aug 1979; 1 ♂. AM P32466, south-east of Cape Byron, 28°41'S 153°51'E to 28°44'S 153°52'E, 149 m, demersal prawn trawl, *Kapala* (K78-17-21), 18 Aug 1978; 1 ♂. AM P32467, off Sydney, 33°46'S 151°50'E to 33°42'S 151°53'E, 414 m, demersal prawn trawl, *Kapala* (K80-06-01), 24 May 1980; 1 ♂. AM P32468, north-east of Danger Point, 27°55'S 154°03'E to 27°57'S 154°03'E, 629 m, demersal prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 1 ♂. AM P32470, east of Long Reef, 33°42'–39'S 151°52'–54'E, 447 m, prawn trawl, *Kapala* (K74-24-01), 20 Dec 1976; 1 ♂. AM P32474, north-east of Danger Point, 28°01'S 154°00'E to 27°58'S 154°00'E, 542 m, demersal prawn trawl, *Kapala* (K78-17-10), 17 Aug 1978; 1 ♀. AM P32493, east of Sugarloaf Point, 32°19'–16'S 153°00'–02'E, 360 m, trawl, *Kapala* (K78-03-03), 5 Apr 1978; 4 ♀.

**Diagnosis.** Rostrum horizontal to slightly upturned, with 8–15 dorsal teeth; epigastric tooth well separated from rostral teeth. Telson bearing 2 pairs of articulated lateral spines; terminally hastate. Thelycum with plate of sternite XIV with caudally pedunculate posteromedian tubercle; sternite XIII with plate caudally bifid; sternite of XII basally broad, conical, directed anteriorly. Petasma with ventral costa produced into distal spine projecting well beyond cincinnuli.

**Distribution.** Bay of Bengal to Japan, Philippines, Indonesia, Taiwan, Fiji; 290–570 m.

*Penaeus* Fabricius, 1798

*Penaeus longistylis* Kubo

*Penaeus longistylis* Kubo, 1943: 200.—1949: 282, figs 7A, 24F,G, 49I, 58E, 73C,I, 77Q, 109–111; Hall, 1962: 15, fig. 81; Racek & Dall, 1965: 13, pl. 1, fig. 2; Grey, Dall & Baker, 1983: 50, pl. 8.

*Penaeus jejunos* Hall, 1956: 75; 1962: 16.

*Penaeus caesius* Dall, 1957: 143, fig. 2A–G.

**Material examined.** New South Wales: AM P33165, south-east of Coffs Harbour, 30°20'S 153°16'E to 30°23'S 153°25'E, 270 m, demersal prawn trawl, *Kapala* (K77-13-05), 19 Aug 1977; 1 ♀. AM P33166, south-east of Cape Hawke, 32°18'S 152°43'E to 32°12'S 152°43'E, 90 m, demersal prawn trawl, *Kapala* (K78-19-06), 12 Sept 1978; 2 ♂, 1 ♀. AM P33164, north-east of North Solitary Island, 29°44'S 153°41'E to 29°50'S 153°39'E, 160 m, demersal prawn trawl, *Kapala* (K78-21-10), 10 Oct 1978; 1 ♀.

**Diagnosis.** Rostrum with 12 dorsal teeth, single anteroventral tooth. Adrostral groove almost reaching posterior margin of carapace; median groove of postrostral carina much less than half length of carapace; hepatic carina and gastro-frontal

carina well developed. Stylocerite reaching or just falling short of distal end of basal antennular peduncle article. Pereopod 1 with stout ischial spine. Petasma with median lobe apically rounded, reaching as far as distal margin of lateral lobe. Thelycum with anterior plate anteriorly elongate, apically narrowly rounded; posterior plate between bases of pereopod 5 consisting of 2 plates meeting in midline, together forming broadly oval structure.

## Infraorder CARIDAE

### Family OPLOPHORIDAE

*Acanthephyra* A. Milne Edwards, 1881

*Acanthephyra acutifrons* Bate

*Acanthephyra acutifrons* Bate, 1888: 749, pl. 126 fig. 3.—Chace, 1940: 146–147, fig. 23; Holthuis, 1951: 28; Crosnier & Forest, 1973: 28, fig. 8b.

**Material examined.** New South Wales: AM P26836, 70 km east of Broken Bay, 33°29'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, J.R.Paxton, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen.

**Diagnosis.** Rostrum less than half carapace length, basally deep, 1 ventral spine; carapace dorsally carinate, denticulate anteriorly, carina behind branchiostegal spine very short; all abdominal segments carinate, segments 3–6 with a dorsal terminal spine; telson with 5–6 pairs of dorsolateral spinules.

**Remarks.** *Acanthephyra acutifrons* is the largest of the species of this genus collected off eastern Australia in this survey. This specimen is similar in size to the ovigerous female figured by Chace (1940). The denticles behind the rostrum are much less prominent than in the smaller specimen figured by Crosnier & Forest (1973). The sixth abdominal segment is short, dorsal length less than 1.5 times the posterior height.

This species is distinguished from the similar, but much smaller, *A. curtirostris* by the presence of a carina on the first abdominal segment, the very short carina behind the branchiostegal spine, the short sixth abdominal segment and the smaller number of dorsolateral spinules on the telson.

This species has not previously been recorded off eastern Australia.

**Distribution.** Indo-west Pacific, eastern and western Atlantic; 650–2400 m.

*Acanthephyra curtirostris* Wood-Mason

*Acanthephyra acutifrons* Bate, 1888: 749 (in part, see Kemp, 1906).

*Acanthephyra curtirostris* Wood-Mason in Wood-Mason & Alcock, 1891: 195.—1892: 364–365, fig. 5; Kemp, 1906: 22, 24; Chace, 1940: 143–144, fig. 21; Crosnier & Forest, 1973: 39–41, fig. 8a; Kensley, 1981a: 57; 1981b: 21.

**Material examined.** New Caledonia: AM P32863, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 1 ovig. ♀.

New South Wales: AM P26837, 70 km east of Broken Bay, 33°29'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen.

**Diagnosis.** Rostrum less than half carapace length, basally deep, 1 ventral spine. Carapace dorsally carinate, carina behind branchiostegal spine about 1/3 carapace length; first abdominal segment not carinate; segments 3–6 carinate with dorsal, terminal spine; telson with 8–9 pairs of dorsolateral spinules.

**Remarks.** *Acanthephyra curtirostris* is similar to *A. acutifrons* in having a short rostrum with one ventral spine. It is distinguished from that larger species by the presence of a longer carina behind the branchiostegal spine, the absence of a dorsal carina on the first abdominal segment, the presence of 8–9 pairs of dorsolateral spinules on the telson and a longer sixth abdominal segment in which the dorsal length is more than twice the posterior height.

**Distribution.** Indo-west Pacific, northeastern Atlantic, Caribbean; 630–4970 m.

#### *Acanthephyra pelagica* (Risso)

*Pandalus pelagicus* Risso, 1816: 79

*Acanthephyra pelagica*.—Holthuis, 1947: 315–316; Kensley, 1972: 40 (in key), fig. 18E, F; 1981a: 57; 1981b: 21; Crosnier & Forest, 1973: 29–31.

**Material examined.** New South Wales: AM P32853, 70 km east of Tuggerah Lake, 33°19'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen. AM P32854, 80 km east of Tuggerah Lake, 33°20'S 152°32'E to 33°24'S 152°31'E, 0–360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 1 specimen. AM P32855, 65 km east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 0–540 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 1 specimen. AM P26606, south-east of Port Hacking, 34°10'S 150°04'E to 34°12'S 150°02'E, 0–660 m, midwater trawl, *Kapala* (K77-18-01), 26 Oct 1977; 1 specimen. AM P32856, 80 km east of Lake Illawarra, 34°20'S 151°56'E to 34°25'S 151°54'E, 0–630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 4 specimens. AM P32857, off Lake Illawarra, 34°40'S 151°15'E to 34°35'S 151°17'E, 594–675 m, fish trawl, *Kapala* (K77-19-05), 3 Nov 1977; 1 specimen. AM P26607, east of Brush Island, 35°36'S 150°55'E to 35°39'S 150°52'E, 0–650 m midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 1 specimen.

**Diagnosis.** Rostrum more than half carapace length with evenly spaced spines on dorsal and ventral margins. No carina running entire length of carapace; first abdominal segment not carinate, segments 3–6 carinate with dorsal terminal spine; telson with 7–11 pairs of dorsolateral spinules.

**Remarks.** This species is distinguished from the more common *A. quadrispinosa* by the presence of

7–11 rather than four dorsolateral spinules on the telson.

These specimens were collected from 33°20'S to 35°40'S in trawls to a depth of 675 m.

**Distribution.** Indo-Pacific, north and south Atlantic, Mediterranean; 540–2166 m.

#### *Acanthephyra quadrispinosa* Kemp

*Acanthephyra quadrispinosa* Kemp, 1939: 576.—Kensley, 1968: 311; 1972: 40 (in key), fig. 18C, D; 1981a: 57; 1981b: 21.

**Material examined.** New Caledonia: AM P32832, 19°55'S 170°00'E, 0–500 m, midwater trawl, *Kimbla* (K4/71-8), 12 May 1971; 8 specimens. AM P32833, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 2 specimens. AM P32834, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 3 specimens.

New South Wales: AM P32841, off Port Stephens, 32°59'S 153°03'E to 32°51'S 153°01'E, 495 m, midwater trawl, *Kapala* (K75-19-07), 29 Nov 1979; 4 specimens (1 ovig. ♀). AM P32842, off Newcastle, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl *Kapala* (K79-19-03), 28 Nov 1979; 43 specimens. AM P32849, off Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 630 m, midwater trawl, *Kapala* (K79-19-02), 27 Nov 1979; 3 specimens. AM P32850, off Newcastle, 33°07'S 153°11'E to 33°01'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-06), 28 Nov 1979; 2 specimens. AM P32846, off Norah Head, 33°15'S 153°06'E to 33°20'S 153°04'E, 360 m midwater trawl, *Kapala* (K79-19-04), 28 Nov 1979; 1 specimen. AM P32847, off Norah Head, 33°20'S 153°04'E to 33°12'S 153°13'E, 630 m, midwater trawl, *Kapala* (K79-19-05), 28 Nov 1979; 2 specimens. AM P32839, 80 km east of Tuggerah Lake, 33°20'S 152°32'E to 33°24'S 152°31'E, 0–360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 57 specimens (1 ovig. ♀). AM P32848, 70 km east of Broken Bay, 33°19'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 29 specimens (1 ovig. ♀). AM P32843, 100 km east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 122 specimens (8 ovig. ♀). AM P32851, 65 km east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 0–540 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 8 specimens. AM P32844, 65 km east of Sydney Heads, 34°05'S 152°02'E to 34°13'S 152°00'E, 0–630 m, midwater trawl, *Kapala* (K77-24-11), 14 Dec 1977; 41 specimens (2 ovig. ♀). AM P32835, south-east of Sydney, 34°02'S 152°12'E to 34°14'S 152°14'E, 0–600 m, midwater trawl, *Kapala* (JP71-8), 25–26 Mar 1971; 19 specimens (2 ovig. ♀). AM P32836, south-east of Sydney, 34°05'S 151°55'E to 34°10'S 152°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 126 specimens (11 ovig. ♀). AM P32837, south-east of Sydney, 34°05'S 151°56'E to 34°09'S 152°05'E, 0–1200 m, midwater trawl, *Kapala* (JP71-1), 23 Mar 1971; 4 specimens (1 ovig. ♀). AM P32838, south-east of Sydney, 34°09'S 152°07'E to 34°14'S, 152°14'E, 0–250 m, midwater trawl, *Kapala* (JP71-4), 24–25 Mar 1971; 102 specimens (1 ovig. ♀). AM P26605, P26599, south-east of Port Hacking, 34°10'S 152°04'E to 34°12'S 152°02'E, 0–660 m, midwater trawl, *Kapala* (K77-18-01), 26 Oct

1977; 12 specimens (1 ovig. ♀). AM P32845, 80 km east of Lake Illawarra, 34°20'S 151°56'E to 34°25'S 151°54'E, 0–630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 14 specimens. AM P32852, off Lake Illawarra, 34°40'S 151°15'E to 34°35'S 151°17'E, 594–675 m, fish trawl, *Kapala* (K77-19-05), 3 Nov 1977; 17 specimens. AM P24773, east of Brush Island, 35°28'S 150°50'E to 35°33'S 150°47'E, 567–594 m, fish trawl, *Kapala* (K76-11-12), 8 July 1976; 1 specimen. AM P26562, P26563, east of Brush Island, 35°36'S 150°55'E to 35°39'S 150°52'E, 0–650 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 22 specimens. AM P32840, east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 0–540 m, fish trawl, *Kapala* (K77-19-03), 1 Nov 1977; 6 specimens.

**Diagnosis.** Rostrum more than half carapace length with evenly spaced spines on dorsal and ventral margins. No carina running entire length of carapace; first abdominal segment not carinate, segments 3–6 carinate with a dorsal terminal spine; telson with 4 pairs of dorsolateral spinules.

**Remarks.** *Acantheephyra quadrispinosa* was by far the most commonly caught species of *Acantheephyra*. Specimens were collected from 20°S to 22°S, off New Caledonia, in trawls to a depth of 925 m, and from 33°S to 37°30'S off New South Wales, in trawls to a depth of 1200 m.

**Colour.** Colour in life uniformly bright red.

**Distribution.** Indo-Pacific, south Atlantic; 250–1700 m.

#### *Acantheephyra smithii* Kemp

*Acantheephyra smithii* Kemp, 1939: 572–573, 577–578.—Hayashi & Miyake, 1969: 61–63, fig. 2.

**Material examined.** New Caledonia: AM P32858, 19°55'S 170°E, 0–550 m, midwater trawl, *Kimbla* (K4/71-8), 12 May 1971; 3 specimens. AM P32859, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 1 specimen.

New South Wales: AM P32860, 100 km east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 1 specimen. AM P32861, 70 km east of Broken Bay, 33°33'S 152°18'E to 33°35'S 152°17'E, 0–216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 2 specimens. AM P32862, 65 km east of Sydney Heads, 34°05'S 152°02'E to 34°13'S 152°00'E, 0–630 m, midwater trawl, *Kapala* (K77-24-11), 14 Dec 1977; 2 specimens (2 ovig. ♀).

**Diagnosis.** Rostrum more than half carapace length with evenly spaced spines on dorsal and ventral margins. Carina running entire length of carapace; first abdominal segment not carinate, a medial V-shaped indentation on posterior margin; segments 3–6 carinate with dorsal, terminal spine; telson with 4 pairs of dorsolateral spinules.

**Remarks.** In this species the carinae on abdominal segments 2–6 are high and end in a strong spine on segments 3–6; the pleura of the fourth and fifth abdominal segments are similar in shape and the sixth abdominal segment is short, the dorsal length is

about 1.5 times the posterior height. In *A. quadrispinosa* and *A. pelagica* there is no medial V-shaped indentation on the posterior margin of the first abdominal segment; on the fifth abdominal segment the posterolateral angle of the pleura is more strongly produced backwards than it is on the fourth segment and the dorsal length of the sixth segment is more than twice the posterior height.

These specimens were collected from 20°S to 34°S in trawls to a depth of 800 m.

*Acantheephyra smithii* has not previously been recorded from eastern Australian waters or further south than 24°S.

**Distribution.** Indian Ocean, western to central Pacific; 216–800 m.

#### *Janicella* Chace, 1986

##### *Janicella spinicauda* (A. Milne Edwards)

*Oplophorus spinicauda* A. Milne Edwards, 1883, pl. 30.—Chace, 1940: 184–186, fig. 54; Hayashi & Miyake, 1969: 68–69; Kensley, 1972: 38 (in key), figs 17D,E; 1981a: 58; 1981b: 22.

*Janicella spinicauda*.—Chace, 1986: 44, figs 23, 24.

**Material examined.** New Caledonia: AM P32864, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 1 ovig. ♀.

**Diagnosis.** Rostrum about twice carapace length, with spines on dorsal and ventral margins. Lateral margin of scaphocerite with 3 well spaced teeth in distal half. Third maxillipeds and first pereopods with foliaceous exopods. Only abdominal segments 2–4 carinate, each with prominent terminal dorsal spine. Telson with long spine on either side of base of setose terminal appendage.

**Remarks.** This species is distinguished from others in the genus by the presence of a strong terminal spine on the second abdominal segment and the form of the telson.

Our only specimen was collected off New Caledonia; *J. spinicauda* has not been recorded off New South Wales.

**Distribution.** Indo-Pacific, north and south Atlantic; 460–1120 m.

#### *Meningodora* Smith, 1882

##### *Meningodora mollis* Smith

*Meningodora mollis* Smith, 1882: 74, pl. 11, figs 8, 9, pl. 12, figs 5–9.—Kensley, 1972: 36 (in key), fig. 16I; Crosnier & Forest, 1973: 44–46, fig. 10c.

**Material examined.** New Caledonia: AM P33138, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 2 specimens.

**Diagnosis.** Rostrum short, not exceeding or only slightly exceeding eyes, with about 7 dorsal teeth, no ventral teeth; eyes slightly narrower than the eyestalk.

Dorsal margin of carapace carinate, without teeth in posterior three-quarters; only 1 lateral carina running entire length of carapace; first abdominal segment noncarinate; third segment without terminal dorsal spine or lobe; fourth to sixth segments carinate, with terminal dorsal spine.

**Remarks.** In these specimens the cornea is only slightly narrower than the eyes-stalk, i.e., they agree with the specimen figured by Crosnier & Forest (1973). The third abdominal segment is carinate dorsally and the propod of the third pereopod is 2.5 times as long as the dactyl. The short rostrum and the narrow cornea distinguish this species from *M. vesca*.

**Distribution.** Western and eastern Atlantic, Indian Ocean, western and eastern Pacific; 840–2160 m.

#### *Meningodora vesca* (Smith)

*Notostomus viscus* Smith, 1886: 189, 192 (nomen nudum).

*Notostomus vescus*.—Chace, 1940: 153–156, figs 29, 30.

*Meningodora vesca*.—Crosnier & Forest, 1973: 46–48, fig. 10d; Kensley, 1981b: 22.

**Material examined.** New Caledonia: AM P33139, 22°03'S 167°44'E, 0–800 m, midwater trawl, *Kimbla* (K4/71-11), 13 May 1971; 3 specimens.

New South Wales: AM P33140, 100 km east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 1 specimen. AM P19097, off Sydney, 34°05'S 151°55'E to 34°10'E 152°14'E, 0—about 950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 3 specimens. AM P26603, north-east of Cape Howe, 37°24'S 150°30'S to 37°28'S 150°33'E, 0–540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 2 specimens.

**Diagnosis.** Rostrum about  $\frac{1}{3}$  carapace length, with about 9–12 dorsal teeth and usually 1 or 2 ventral teeth. Cornea wider than eyestalk. Dorsal margin of carapace carinate, without teeth in posterior three-quarters; only 1 lateral carina running entire length of carapace; first abdominal segment not carinate; third segment without terminal dorsal spine or lobe; fourth to sixth segments carinate with a terminal dorsal spine.

**Remarks.** This species is distinguished from *M. mollis* by the longer rostrum and the larger cornea of the eye.

The specimens from off New South Wales were collected between 33°28'S and 37°28'S in trawls at depths to 950 m.

**Distribution.** South-western and south-eastern Atlantic, Indo-west Pacific; 615–5400 m.

*Notostomus* A. Milne Edwards, 1881

*Notostomus* cf. *crosnieri* MacPherson

*Notostomus crosnieri* MacPherson, 1984: 54, figs 6a, 7a, 8a,b.

*Notostomus auriculatus* Barnard, 1950: 670, figs 124h, i.—

Crosnier & Forest, 1973: 52–56, figs 14, 16c.

*Notostomus* sp. Holthuis & Sivertsen, 1967: 32–36, figs 4, 5.

**Material examined.** New South Wales: AM P33146, east of Port Stephens, 32°59'S 153°03'E to 32°51'S 153°01'E, 495 m, midwater trawl, *Kapala* (K79-19-07), 29 Nov 1979; 7 specimens (6 ovig. ♀). AM P33147, 70 km east of Broken Bay, 33°25'S 152°31'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen. AM P33148, 100 km east of Broken Bay, 33°28'S 152°33'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 4 specimens (1 ovig. ♀). AM P33149, south-east of Sydney, 34°05'S 151°55'E to 34°10'S 152°14'E, 0—about 950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 1 specimen. AM P26564, P26565, east of Brush Island, 35°36'S 150°55'E to 35°39'S 150°52'E, 0–650 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 2 specimens. AM P35915, east of Long Reef, 33°43'S 151°56'E to 33°39'S 151°58'E, 626–637 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 1 juv.

**Diagnosis.** Dorsal carina of carapace finely denticulate along whole length; 5 lateral carinae on posterior carapace. All abdominal segments carinate, segments 3–6 with a terminal medial spine. Upper lateral rostral carina extending behind the orbital margin; lower lateral rostral carina not continuous with gastro-orbital carina; gastro-orbital carina with anterior extremity produced laterally, appearing as an obtuse angle in dorsal view. Stylocerite reaching at least midlength of third segment of antennular peduncle.

**Remarks.** These specimens agree with the figure of the carapace of the type of *N. auriculatus* given by Barnard (1950). They also agree with the description and figures of incomplete specimens, from an albatross chick, given by Holthuis & Sivertsen (1967). In most respects they agree with the specimens figured and described as *N. auriculatus* by Crosnier & Forest (1973), but described as a new species, *N. crosnieri*, by MacPherson (1984).

The dorsal carina is as figured by Crosnier & Forest with an abrupt slope to the posterior carapace margin, anteriorly with the denticles changing to quite large teeth above the orbit. The upper lateral rostral carina extends posteriorly beyond the margin of the orbit and curves slightly ventrally; both upper and lower lateral carinae continue forwards onto the rostrum and are quite distinctly visible along at least two-thirds of its length. The anterior extremity of the gastro-orbital carina, in all our specimens, is produced into a rounded lobe, very clearly visible in dorsal view. This lobe was described and figured by Holthuis & Sivertsen and appears also to be shown in the figure given by Barnard. Crosnier & Forest (1973) do not say whether such a lobe was present on their specimens. On all our specimens the subhepatic and infrahepatic carinae meet posteriorly as shown in Barnard's figure rather than remaining separate as shown by Crosnier & Forest (1973) and MacPherson (1984, Fig. 7B).



The first abdominal segment is strongly indented medially on the posterior margin and the length of the dorsal carina is about half (i.e. 0.42–0.58) the length of the segment at its articulation with the second segment. This is still clearly less than the same measurement in *N. elegans* but greater than the 0.25–0.4 of Crosnier & Forest's specimens of *P. auriculatus*; further, the carina also lacks the small anterior spine present in Crosnier & Forest's specimens, and figured by MacPherson (1984, Fig. 8B).

The dorsal carina of the second abdominal segment is subequal (0.9–1.0) to the length of the segment at its articulation with the first segment, but there is no posterior spine on the carina as in Crosnier & Forest's specimens. The lengths of the pereopods agree with that given by Crosnier & Forest for their specimens. The carpus of pereopods 3 and 4 is more than one-third the length of the propod in the adult, the dactyl slightly more than one-quarter the length of the propod (see Table 4).

	cl 21.3 mm	cl 46.5 mm
Pereopod 3		
carpus/propod	0.34	0.39
dactyl/propod	0.28	0.28
Pereopod 4		
carpus/propod	0.32	0.38
dactyl/propod	0.28	0.26

Table 4. Pereopodal ratios for two specimens of *Notostomus* cf. *crosnieri*.

There are four to six pairs of dorsolateral spinules on the telson, rather than the three pairs in Crosnier & Forest's specimens.

The differences between our specimens from eastern Australia and those of Crosnier & Forest, and MacPherson from the Atlantic may only indicate geographic variability in a very widely occurring species. However, the differences are of an order used to distinguish other species from one another. It is possible, especially regarding the large number of specimens available to us and to Crosnier & Forest, and MacPherson, that the Australian material is a separate species (see Table 5).

These specimens can be distinguished from specimens of *N. elegans* using the characters of the upper lateral rostral carina teeth at the base of the rostrum, stylocerite, and first abdominal segment given by Crosnier & Forest (1973). We would add the presence of an anterior lobe on the gastro-orbital carina of *N. crosnieri*. Also, *N. crosnieri* lacks the carinae on the pleura of the abdominal segments present in *N. elegans*. On the third to fifth segment there is an oblique groove on the anterior part of the pleuron (shown in Crosnier & Forest, 1973, fig. 14) rather than the curved carina in *N. elegans*. Differences between the two species are also discussed under *N. elegans*.

These specimens were trawled at depths up to 900 m between 32°50'S and 35°40'S.

**Colour.** Colour in life of *N. cf. crosnieri* is uniformly bright red.

**Distribution.** Western and southern coasts of Africa, Tristan da Cunha, eastern Australia, south-eastern Pacific.

	<i>N. crosnieri</i> specimens	Eastern Australian specimens
rostral carinae	on basal 1/3 of rostrum	on 2/3 to 3/4 of rostrum
anterior of gastro-orbital carina	? produced	obtuse lobe
subhepatic & infrasubhepatic carinae	separate posteriorly, except a few specimens on 1 side	joining posteriorly in all specimens
1st abdominal segment carina	small anterior spine	no spine
Length 1st abdom. carina/1st. length 1st abdom. seg.	0.25–0.4	0.42–0.58
2nd abdominal segment carina	small posterior spine	no spine
dorsolateral spinules on telson	3 pairs	4–6 pairs
ovig. ♀, cl.	28–32.5 mm	42–50.5 mm

Table 5. Comparison of *Notostomus crosnieri* with Eastern Australian specimens.

#### *Notostomus elegans* A. Milne Edwards

*Notostomus elegans* A. Milne Edwards, 1881: 8; 1883, pl. 31.—Crosnier & Forest, 1973: 56–63, figs 15, 16a,b.

*Notostomus patentissimus* Bate, 1888: 826–829, pl. 133, fig. 1, pl. 134, figs 1, 2.

*Notostomus longirostris* Bate, 1888: 833, pl. 135, fig. 4.

**Material examined.** New South Wales: AM P33144, east of Port Stephens, 32°59'S 153°03'E to 32°51'S 153°01'E, 495 m, midwater trawl, *Kapala* (K79-19-07), 29 Nov 1979; 1 specimen. AM P33145, east of Newcastle, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 1 specimen. AM P35864, east of Newcastle, 33°07'S 153°11'E to 33°01'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-06), 28 Nov 1979; 1 specimen. AM P26604, north-east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 0–540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 2 specimens.

**Diagnosis.** Dorsal carina of carapace finely denticulate along its whole length; 5 lateral carinae on posterior carapace. All abdominal segments carinate, segments 3–6 with terminal medial spine. Upper lateral rostral carina not extending beyond orbital margin; lower lateral rostral carina not continuous with gastro-orbital carina; gastro-orbital carina not more strongly produced at posterior extremity. Tip of stylocerite reaching no further than midlength of second segment of antennular peduncle.

**Remarks.** These specimens agree with the description and figures of *N. elegans* given by Crosnier & Forest and the figures of the type of *N. westergreni* in the same paper (except for the denticle on the fifth pleuron). We have compared our

specimens with the types of *N. patentissimus* and *N. longirostris*, and in our opinion they are conspecific. They agree with the types in the following: 1) the upper lateral orbital carina which is horizontal, does not extend posteriorly behind the orbit; 2) the tip of the stylocerite reaches at least to the base and sometimes the midlength of the second segment of the antennular peduncle; 3) the spine on the scaphocerite (where still present) is subequal to, or less than the width across the scaphocerite at the base of the spine; 4) the dorsal carina slopes gradually to the posterior margin of the carapace; 5) the slope of the dorsal carina behind the orbit is similar; above the orbit the denticles of the carina are enlarged to only moderately sized teeth; 6) presence of a denticle at the posteroventral angle of the pleuron of the fifth abdominal segment; 7) the carina of the first abdominal segment is only moderately indented posteriorly; 8) the first and second abdominal segments have a submarginal carina on the pleuron; the first segment also has a carina in the form of an inverted 'Y' just below the articulation with the second segment; 9) presence of a carina curving posteriorly near the ventral margin on the anterior part of the pleura of abdominal segments 3–5; Crosnier & Forest (1973) noted that the spine at the tip of the scaphocerite is shorter in *N. elegans* than in *N. auriculatus*. To quantify this we have divided the length of the spine by the width across the scaphocerite at the base of the spine. In our specimens of *N. elegans* and the type of *N. longirostris* the spine is about four-fifths to subequal (0.8–0.90) to the width across the scaphocerite at the base of the spine. (The same ratio for *N. auriculatus* is 1.2–1.5.)

The anterior dorsal margin slopes slightly more steeply in *N. elegans* and in the types of *N. longirostris* and *N. patentissimus* than it does in *N. auriculatus*. We have measured the height of the dorsal carapace margin above the gastro-orbital carina both at the anterior extremity of the carina and at the point where the post-hepatic carina joins the gastro-orbital carina. In *N. elegans* the anterior height is about two-thirds (0.66–0.7) of the posterior height, while in *N. auriculatus* this ratio is about three-quarters (0.73–0.79).

On the other hand, the posterior dorsal margin, just anterior to the posterior carapace margin slopes more abruptly in *N. auriculatus* than in *N. elegans*.

The first abdominal segment is only moderately indented medially on the posterior margin while the length of the dorsal carina is about two-thirds to four-fifths the length of the segment at its articulation with the second segment.

The dactyls of pereopods 3 and 4 are less than one-fourth (0.2–0.23) the length of the propodi in *N. elegans* and the type of *N. longirostris*; the propodi and dactyls of pereopods 3–5 are detached in the type of *N. patentissimus*.

Crosnier & Forest (1973) stated that in *N. elegans* the submarginal carina usually extends anteriorly

beyond the infra-subhepatic carina while in *N. auriculatus* it usually ends behind the infra-subhepatic carina. In the types of *N. longirostris* and *N. patentissimus* and one of our specimens (cl 24 mm) of *N. elegans* the submarginal carina extends anteriorly beyond the tip of the infra-subhepatic carina; in two other specimens (cl 17, 50.5 mm) the tips of the two carinae are at the same level, while in two other specimens (cl 42, 44.5 mm) the tip of the submarginal carina is behind that of the infra-subhepatic carina as it is in all our specimens of *N. auriculatus*.

The type of *N. westergreni* Faxon has been examined by one of us (BK); it was found that the infra-subhepatic carina extends anteriorly beyond the submarginal carina. Perhaps this character, as demonstrated above, is too variable to be of any use in separating species.

Our specimens were trawled at depths up to 630 m between 32°51'S and 37°28'S. *N. elegans* has not been recorded previously from eastern Australian waters.

**Distribution.** North and tropical Atlantic, eastern Australia, Celebes Sea (*N. patentissimus*), Banda Sea (*N. longirostris*); 630–2780 m.

#### *Notostomus gibbosus* A. Milne Edwards

*Notostomus gibbosus* A. Milne Edwards, 1881: 7; 1883, pl. 32.—Crosnier & Forest, 1973: 49–51, fig. 13.

*Notostomus perlatus* Bate, Kemp, 1913: 66–68, pl. 7, fig. 10; Chace, 1940: 170–171, fig. 42.

**Material examined.** New South Wales: AMP33150, 65 km east of Broken Bay, 33°31'S 152°20'E, 569 m, midwater trawl, *Kapala* (K77-24-02, JP77-18), 12 Dec 1977; 1 specimen.

**Diagnosis.** Dorsal carina of carapace finely denticulate along its whole length; four lateral carinae on posterior carapace. All abdominal segments carinate, segments 3–6 with terminal medial spine; no upper lateral rostral carina; lower lateral rostral carina continuous with gastro-orbital carina.

**Remarks.** This specimen agrees well with the figure of *N. gibbosus* given by Crosnier & Forest (1973) and with the specimen described and figured as *N. perlatus* by Kemp (1913). A full synonymy for this species is given by Crosnier & Forest (1973).

This species has not been recorded before from Australian waters nor from so far south; previous records have been from tropical waters.

**Colour.** The colour of the preserved specimen is uniformly pale red with darker red carinae.

**Distribution.** Indo-west Pacific, eastern and western Atlantic; 569–3932 m.

*Oplophorus* H. Milne Edwards, 1837*Oplophorus novaezeelandiae* (de Man)

*Hoplophorus novae-zeelandiae* de Man, 1931: 369, figs. 1–20.

*Oplophorus novaezeelandiae*.—Yaldwyn, 1967: 3; Kensley, 1972: 38 (in key), fig. 17G,H; Crosnier & Forest, 1973: 26–27, fig. 5.

**Material examined.** New South Wales: AM P32795, 70 km east of Tuggerah Lake, 33°17'S 152°31'E to 33°19'S 152°31'E, 0–90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 2 specimens. AM P32791, 70 km east of Tuggerah Lake, 33°19'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 specimen. AM P32794, 80 km east of Tuggerah Lake, 33°20'S 152°34'E to 33°24'S 152°31'E, 0–360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 4 specimens. AM P32793, 90 km east of Tuggerah Lake, 33°25'S 152°32'E to 33°21'S 152°34'E, 0–360 m, midwater trawl, *Kapala* (K77-24-05), 13 Dec 1977; 1 specimen. AM P32796, off Port Hacking, 34°09'S 152°07'E to 34°20'S 152°02'E, approx. 550 m, midwater trawl, *Kapala* (JP71-2), 23 Mar 1971; 2 specimens. AM P32792, off Lake Illawarra, 34°40'S 151°15'E to 34°35'S 151°17'E, 594–675 m, fish trawl, *Kapala* (K77-19-05), 3 Nov 1977; 1 specimen. AM P32797, south of Montague Island, 36°24'S 150°18'E to 36°30'S 150°17'E, 126 m, fish trawl, *Kapala* (K77-19-01), 1 Nov 1977; 1 specimen. AM P32790, south-east of Twofold Bay, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, fish trawl, *Kapala* (K77-19-03), 1 Nov 1977; 2 specimens.

**Diagnosis.** Rostrum at least twice carapace length, with spines on dorsal and ventral margins. Lateral margin of scaphocerite smooth. Posterolateral angle of carapace without spine. Third maxilliped and first pereopod with foliaceous exopods. Sixth abdominal segment not carinate, segments 3–5 with a dorsal carina terminating in long spine.

**Remarks.** The smooth outer margin of the scaphocerite distinguishes *O. novaezeelandiae* from other species of this genus.

These specimens were collected from 33°S to 37°30'S in trawls to a depth of 675 m.

This species has not previously been recorded off the eastern coast of Australia.

**Distribution.** South-west Indian Ocean, south-west Pacific and south-west Atlantic; 90–725 m.

*Oplophorus spinosus* (Brulle)

*Palaemon spinosus* Brulle, 1839: 18.

*Oplophorus grimaldii*.—Chace, 1940: 187–189, fig. 55; Kensley, 1972: 38 (in key), fig. 17I,J.

*Oplophorus spinosus*.—Holthuis, 1949: 229–230; 1955, fig. 1a; Crosnier & Forest, 1973: 25.

**Material examined.** Queensland: AM P32829, north-east of Danger Point, 28°02'S 153°59'E to 27°59'S 153°59'E, 540 m, prawn trawl, *Kapala* (K78-09-05), 2 June 1978; 1 specimen. AM P32803, north-east of Danger Point, 28°03'S 154°04'E to 28°01'S 154°04'E, 720 m, prawn

trawl, *Kapala* (K78-23-08), 6 Nov 1978; 2 specimens. New South Wales: AM P17907, north-east of Coffs Harbour, 29°49'S 153°42'E to 29°59'S 153°38'E, 369 m, bottom trawl, *Kapala* (K71-09-04), 12 May 1971; 1 specimen. AM P32807, east of Newcastle, 32°51'S 153°01'E to 32°59'S 152°54'E, 630 m, midwater trawl, *Kapala* (K79-19-08), 29 Nov 1979; 1 specimen. AM P32834, east of Newcastle, 32°59'S 153°03'E to 32°51'S 153°01'E, 495 m, midwater trawl, *Kapala* (K79-19-07), 29 Nov 1979; 1 specimen. AM P32813, east of Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 630 m, midwater trawl, *Kapala* (K79-19-02), 27 Nov 1979; 6 specimens (2 ovig. ♀). AM P32806, south-east of Newcastle, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 31 specimens (9 ovig. ♀). AM P32805, south-east of Newcastle, 33°07'S 153°11'E to 33°01'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-06), 28 Nov 1979; 1 specimen. AM P18100, south-east of Newcastle, 33°11'S 152°23'E, 576 m, Danish trawl, *Kapala* (K71-14-01), 10 Aug 1971; 4 specimens. AM P32823, east of Norah Head, 33°15'S 153°06'E to 33°20'S 153°04'E, 360 m, midwater trawl, *Kapala* (K79-19-04), 28 Nov 1979; 1 specimen. AM P32819, 70 km east of Tuggerah Lake, 33°17'S 152°31'E to 33°19'S 152°31'E, 0–90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 17 specimens. AM P32804, east of Norah Head, 33°20'S 153°04'E to 33°12'S 153°13'E, 630 m, midwater trawl, *Kapala* (K79-19-05), 28 Nov 1979; 5 specimens (2 ovig. ♀). AM P32814, 80 km east of Tuggerah Lake, 33°20'S 152°32'E to 33°24'S 152°31'E, 0–360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 208 specimens (79 ovig. ♀). AM P32822, 90 km east of Tuggerah Lake, 33°23'S 152°37'E to 33°19'S 152°39'E, 0–540 m, midwater trawl, *Kapala* (K77-24-06), 13 Dec 1977; 2 specimens. AM P32821, 90 km east of Tuggerah Lake, 33°25'S 152°32'E to 33°21'S 152°32'E, 0–360 m, midwater trawl, *Kapala* (K77-24-05), 13 Dec 1977; 3 specimens. AM P32812, 70 km east of Broken Bay, 33°19'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 129 specimens (67 ovig. ♀). AM P32830, 100 km east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 88 specimens (30 ovig. ♀). AM P32817, 65 km east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 0–540 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 270 specimens (111 ovig. ♀). AM P32808, east of Broken Bay, 33°32'S 152°06'E to 33°34'S 152°05'E, 810 m, prawn trawl, *Kapala* (K79-20-13), 6 Dec 1979; 2 specimens (1 ovig. ♀). AM P21068, east of Broken Bay, 33°32'S 152°00'E to 33°38'S 152°04'E, 810 m, prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 1 specimen. AM P32809, east of Broken Bay, 33°34'S 152°04'E to 33°31'S 152°06'E, 720 m, prawn trawl, *Kapala* (K79-20-04), 4 Dec 1979; 1 specimen (ovig.). AM P30331, P32820, 70 km east of Broken Bay, 33°33'S 152°18'E to 33°35'S 152°17'E, 1–216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 14 specimens (6 ovig. ♀). AM P19386, east of Long Reef, 33°41'S 151°53'E to 33°49'S 151°47'E, 450–441 m, Danish trawl, *Kapala* (K71-12-04), 20 July 1971; 1 specimen. AM P18976, east of Long Reef, 33°42'S 152°50'E to 33°48'S 152°54'E, 765 m, bottom trawl, *Kapala* (K72-07-15), 7 Dec 1972; 5 specimens. AM P18988, east of Long Reef, 33°43'S 151°55'E to 33°37'S 152°02'E, 675 m, bottom trawl, *Kapala* (K72-06-04), 19 Oct 1972; 2 specimens (1 ovig. ♀). AM P18980, east of Long Reef, 33°44'S 151°55'E to 33°40'S 151°58'E, 720 m, bottom trawl, *Kapala* (K72-07-

04), Nov 1971; 2 specimens (1 ovig. ♀). AM P18989, east of Sydney, 33°51'S 151°51'E to 33°45'S 151°55'E, 675 m, bottom trawl, *Kapala* (K72-06-03), 19 Oct 1972; 1 specimen. AM P32835, east of Sydney, 34°02'S 152°12'E to 34°14'S 152°14'E, about 600 m, midwater trawl, *Kapala* (JP71-8), 25–26 Mar 1971; 3 specimens. AM P32816, 65 km east of Sydney Heads, 34°05'S 152°02'E to 34°13'S 152°00'E, 0–630 m, midwater trawl, *Kapala* (K77-24-11), 14 Dec 1977; 2 specimens (1 ovig. ♀). AM P32826, east of Sydney, 34°05'S 151°56'E to 34°09'S 152°05'E, to 1200 m, midwater trawl, *Kapala* (JP71-1), 23 Mar 1971; 3 specimens. AM P32827, east of Sydney, 34°05'S 151°55'E to 34°10'S 152°14'E, about 950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 2 specimens. AM P32800, south-east of Sydney, 34°10'S 152°16'E to 34°00'S 152°14'E, about 350 m, midwater trawl, *Kapala* (JP71-7), 25 Mar 1971; 18 specimens. AM P32799, south-east of Sydney, 34°10'S 151°59'E to 34°09'S 152°05'E, about 60 m, midwater trawl, *Kapala* (JP71-3), 24 Mar 1971; 22 specimens. AM P32828, south-east of Sydney, 34°09'S 152°07'E to 34°14'S 152°14'E, about 250 m, midwater trawl, *Kapala* (JP71-4), 24–25 Mar 1971; 1 specimen. AM P32798, south-east of Sydney, 34°09'S 152°07'E to 34°20'S 152°02'E, about 550 m, midwater trawl, *Kapala* (JP71-2), 23 Mar 1971; 67 specimens. AM P32801, 80 km east of Lake Illawarra, 34°20'S 151°56'E to 34°25'S 151°54'E, 0–630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 12 specimens (2 ovig. ♀). AM P32810, east of Kiama, 34°40'S 151°15'E to 34°35'S 151°17'E, 594–675 m, midwater trawl, *Kapala* (K77-19-05), 3 Nov 1977; 46 specimens (24 ovig. ♀). AM P32815, east of Nowra, 34°55'S 151°13'E to 34°53'S 151°14'E, 810 m, demersal trawl, *Kapala* (K78-27-05), 12 Dec 1978; 2 specimens (1 ovig. ♀). AM P32811, east of Brush Island, 35°36'S 150°55'E to 35°39'S 150°59'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 4 specimens (2 ovig. ♀). AM P21818, south of Montague Island, 36°24'S 150°18'E to 36°30'S 150°17'E, 126 m, bottom trawl, *Kapala* (K77-19-01), 1 Nov 1977; 6 specimens. AM 32802, south-east of Twofold Bay, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 13 specimens (1 ovig. ♀).

**Diagnosis.** Rostrum less than twice carapace length, with spines on dorsal and ventral margins. Lateral margin of scaphocerite spinose, inner margin with a distal barb. Anterolateral angle of carapace without a hooked spine. Third maxilliped and first pereopod with foliaceous exopods. Sixth abdominal segment not carinate, segments 3–5 with a dorsal carina terminating in long spine.

**Remarks.** In some of our specimens there is a tubercle at the posterolateral angle of the carapace but this is not curved forwards like the hooked spine in *O. gracilirostris*. In addition, the lateral carina above the orbit converges posteriorly towards the midline in *O. spinosus*, while in *O. gracilirostris* it is subparallel to the midline. *O. spinosus* is distinguished from *O. novaezeelandiae* by the scaphocerite which has a spinose, rather than a smooth, outer margin, and from *O. spinicauda* by the lack of a terminal spine dorsally on the second abdominal segment.

These specimens were collected between 28°S and 37°30'S in trawls down to 1200 m.

**Distribution.** West and east Atlantic, Indo-west Pacific; 75–1200 m.

*Systellaspis* Bate, 1888

*Systellaspis debilis* (A. Milne Edwards)

*Acanthephyra debilis* A. Milne Edwards, 1881: 13.

*Systellaspis debilis*.—Chace 1940: 181–184, figs 51–53; Kensley, 1972: 38, fig. 17B, C; Crosnier & Forest, 1973: 87–92, figs 26b, 27b.

**Material examined.** New Caledonia: AM P32983, 19°55'S 170°00'E, 0–550 m, midwater trawl, *Kimbla* (K4/71-8), 12 May 1971; 4 specimens. AM P32984, 19°52'S 170°00'E, 0–275 m, midwater trawl, *Kimbla* (K4/71-7), 12 May 1971; 20 specimens. AM P32985, 21°05'S 166°45'E, 0–925 m, midwater trawl, *Kimbla* (K4/71-5), 9 May 1971; 11 specimens (1 ovig. ♀).

New South Wales: AM P32998, 80–128 km east of Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 630 m, midwater trawl, *Kapala* (K79-15-02), 27 Nov 1979; 12 specimens. AM P32997, 80–128 km east of Newcastle, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 34 specimens (16 ovig. ♀). AM P32991, 70 km east of Tuggerah Lake, 33°17'S 152°31'E to 33°19'S 152°31'E, 0–90 m, midwater trawl, *Kapala* (K77-24-08), 13 Dec 1977; 12 specimens (1 ovig. ♀). AM P32994, 70 km east of Broken Bay, 33°19'S 152°25'E to 33°23'S 152°28'E, 0–630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 13 specimens (3 ovig. ♀). AM P32993, 80–128 km east of Tuggerah Lake, 33°20'S 153°04'E to 33°12'S 153°13'E, 630 m, midwater trawl, *Kapala* (K79-19-05), 28 Nov 1979; 34 specimens (11 ovig. ♀). AM P32992, 80 km east of Tuggerah Lake, 33°20'S 152°32'E to 33°24'S 152°31'E, 0–360 m, midwater trawl, *Kapala* (K77-24-09), 14 Dec 1977; 19 specimens (6 ovig. ♀). AM P30990, 90 km east of Tuggerah Lake, 33°23'S 152°37'E to 33°19'S 152°39'E, 0–540 m, midwater trawl, *Kapala* (K77-24-06), 13 Dec 1977; 2 specimens. AM P32996, 100 km east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 0–630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 21 specimens (7 ovig. ♀). AM P25061, east of Broken Bay, 33°30'S 152°05'E to 33°27'S 152°07'E, 806–810 m, trawl, *Kapala* (K76-24-04), 21 Dec 1976; 1 specimen. AM P32988, 65 km east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 0–540 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 14 specimens (5 ovig. ♀). AM P30330, 70 km east of Broken Bay, 33°33'S 152°18'E to 33°35'S 152°17'E, 216 m, midwater trawl, *Kapala* (K77-24-01), 12 Dec 1977; 16 specimens (4 ovig. ♀). AM P25124, east of Broken Bay, 33°35'S 152°01'E to 33°32'S 152°03'E, 810 m, midwater trawl, *Kapala* (K76-24-03), 20 Dec 1976; 1 ovig. ♀. AM P32987, east of Broken Bay, 33°35'S 152°00'E to 33°33'S 152°02'E, 810 m, demersal trawl, *Kapala* (K77-23-12), 8 Dec 1977; 1 specimen. AM P32982, south-east of Sydney, 34°02'S 152°12'E to 34°14'S 152°14'E, 0–600 m, midwater trawl, *Kapala* (JP71-8), 25–26 Mar 1971; 5 specimens. AM P32980, south-east of Sydney, 34°05'S 151°56'E, 0–1200 m, midwater trawl, *Kapala* (JP71-1), 23 Mar 1971; 126 specimens (5 ovig. ♀). AM P32981, south-east of Sydney, 34°05'S 151°22'E to 34°10'S 152°14'E, 0–950 m, midwater trawl, *Kapala* (JP71-6), 25 Mar 1971; 21 specimens. AM P32979, south-east of Sydney, 34°10'S 152°16'E to 34°00'S 152°14'E, about 350 m, midwater

trawl, *Kapala* (JP71-7), 25 Mar 1971; 1 specimen. AM P32977, south-east of Sydney, 34°10'S 151°59'E to 34°09'S 152°05'E, 0–60 m, midwater trawl, *Kapala* (JP71-3), 24 Mar 1971; 155 specimens (2 ovig. ♀). AM P32978, south-east of Sydney, 34°09'S 152°07'E to 34°14'S 152°14'E, 0—about 250 m, midwater trawl, *Kapala* (JP71-4), 24–25 Mar 1971; 2 specimens. AM P32976, south-east of Sydney, 34°09'S 152°07'E to 34°20'S 152°02'E, 0—about 550 m, midwater trawl, *Kapala*, (JP71-2), 23 Mar 1971; 1 specimen. AM P32999, 80 km east of Lake Illawarra, 34°20'S 151°56'E to 34°25'S 151°54'E, 0–630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 6 specimens (2 ovig. ♀). AM P33001, off Port Kembla, 34°28'S 151°29'E, 0–225 m, midwater trawl, *Kapala* (K74-05-JP1), 22 Jan 1974; 5 specimens. AM P32986, east of Kiama, 34°40'S 151°15'E to 34°35'S 151°17'E, 594–675 m, midwater trawl, *Kapala* (K77-19-05), 3 Nov 1977; 2 specimens. AM P32989, east of Brush Island, 35°36'S 150°55'E to 35°39'S 150°59'E, 540 m, lightfish net trawl, *Kapala* (K77-18-05), 27 Oct 1977; 8 specimens (1 ovig. ♀). AM P33000, off Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 0–540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 8 specimens (2 ovig. ♀).

**Diagnosis.** Rostrum slender, usually longer than carapace length, with evenly spaced spines on dorsal and ventral margins. No dorsal or lateral carina running the entire length of the carapace; only third and part of fourth abdominal segments carinate; third segment with a large terminal dorsal spine; posterior margin of fourth and fifth segments denticulate on either side of a small median spine.

**Remarks.** *S. debilis* is the only species of *Systellapsis* represented in this collection. This species is distinguished by the presence of denticulations on the posterior margin of the fourth and fifth abdominal segments.

These specimens were collected off New Caledonia between 19°50'S and 21°S in trawls at depths to 1200 m.

**Distribution.** Western and eastern Atlantic, Indo-west Pacific; 150–1500 m.

#### Family NEMATOCARCINIDAE

*Nematocarcinus* A. Milne Edwards, 1881

##### *Nematocarcinus gracilis* Bate

*Nematocarcinus gracilis* Bate, 1888: 815, pl. 132, fig. 8.—Chace, 1986: 71, fig. 38.

**Material examined.** New South Wales: AM P25059, east of Broken Bay, 33°30'–27'S 152°05'–07'E, 808 m, demersal prawn trawl, *Kapala* (K76-24-04), 21 Dec 1976; 1 ♂. AM P25099, east of Broken Bay, 33°30'–27'S 152°05'–07'E, 808 m, demersal prawn trawl, *Kapala* (K76-24-04), 21 Dec 1976; 1 ♀. AM P25128, east of Broken Bay, 33°30'–27'S 152°05'–07'E, 808 m, demersal prawn trawl, *Kapala* (K76-24-04), 21 Dec 1976; 2 ♂, 1 ♀.

**Diagnosis.** Rostrum nearly horizontal, not reaching end of antennular peduncle, with 13–22 evenly spaced, basally articulated, dorsal spines and single distal fixed ventral spine. Pleuron of

abdominal segment 5 with acute posteroventral tooth. Abdominal segment 6 lacking ventral tubercles. Pereopods 3 and 4 with dactyl shorter than propod.

**Distribution.** Arabian Sea to Hawaii; Philippines; 165–1170 m.

##### *Nematocarcinus undulatipes* Bate

*Nematocarcinus undulatipes* Bate, 1888: 801, pl. 130.—Chace, 1986: 76, figs 41, 42.

**Material examined.** New South Wales: AM P25096, east of Broken Bay, 33°30'–27'S 152°05'–07'E, 808 m, *Kapala* (K76-24-04), 21 Dec 1976; 1 ♂, 1 ♀. AM P25097, east of Broken Bay, 33°30'–27'S 152°05'–07'E, 808 m, *Kapala* (K76-24-04), 21 Dec 1976; 1 ♂. AM P25141, east of Broken Bay, 33°35'S 152°01'E, 810 m, *Kapala* (K76-24-03), 20 Dec 1976; 3 ♂, 2 ovig. ♀. AM P26762, south-east of Newcastle, 33°11'–09'S 152°24'E, 732 m, *Kapala* (K77-23-10), 7 Dec 1977; 6 ♂, 26 ovig. ♀, 1 ♀. AM P26764, south-east of Newcastle, 33°11'–09'S 152°24'E, 732 m, *Kapala* (K77-23-10), 7 Dec 1977; 13 ovig. ♀, 6 ♀. AM P26791, east of Broken Bay, 33°35'S 152°00'E, 823 m, *Kapala* (K77-23-12), 8 Dec 1977; 4 ovig. ♀, 1 ♀.

**Diagnosis.** Rostrum nearly horizontal, with 7–14 dorsal articulated teeth, posterior teeth closely spaced, becoming more widely spaced anteriorly; single distal ventral fixed tooth. Rostrum not, or barely reaching end of antennular peduncle. Pleuron of fifth abdominal segment with acute posteroventral tooth. Sixth abdominal segment lacking ventral tubercles.

**Distribution.** Western Indian Ocean, Philippines, Indonesia, to Kermadec Islands; 366–1269 m.

#### Family STYLODACTYLIDAE

*Parastylodactylus* Figueira, 1971

##### *Parastylodactylus* sp.

Fig. 6

**Material examined.** New South Wales: AM P35911, north-east of Danger Point, 27°55'S 154°03'E to 27°51'S 154°03'E, 540 m, prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 1 ovig. ♀, cl. 9.1 mm.

**Remarks.** The present specimen shows several differences from *P. bimaxillaris* (Bate, 1888) (see Chace, 1983: 8, fig. 4), the only species in the genus. These differences include the presence of a stronger posteroventral spine on abdominal somite 6; a stronger posteroventral spine on pleuron 5; three clumps of setae on the distal eyestalk (a single row in *P. bimaxillaris*); a larger carapace (length 9.1 mm as against 6.7–7.1 mm) in the ovigerous female; a higher rostral tooth count (40+/9+) against 20–22/5–9 in *P. bimaxillaris*; the merus of pereopod 2 bears eight to nine spines (unarmed in *P. bimaxillaris*); the posterior three pairs of pereopods are unarmed

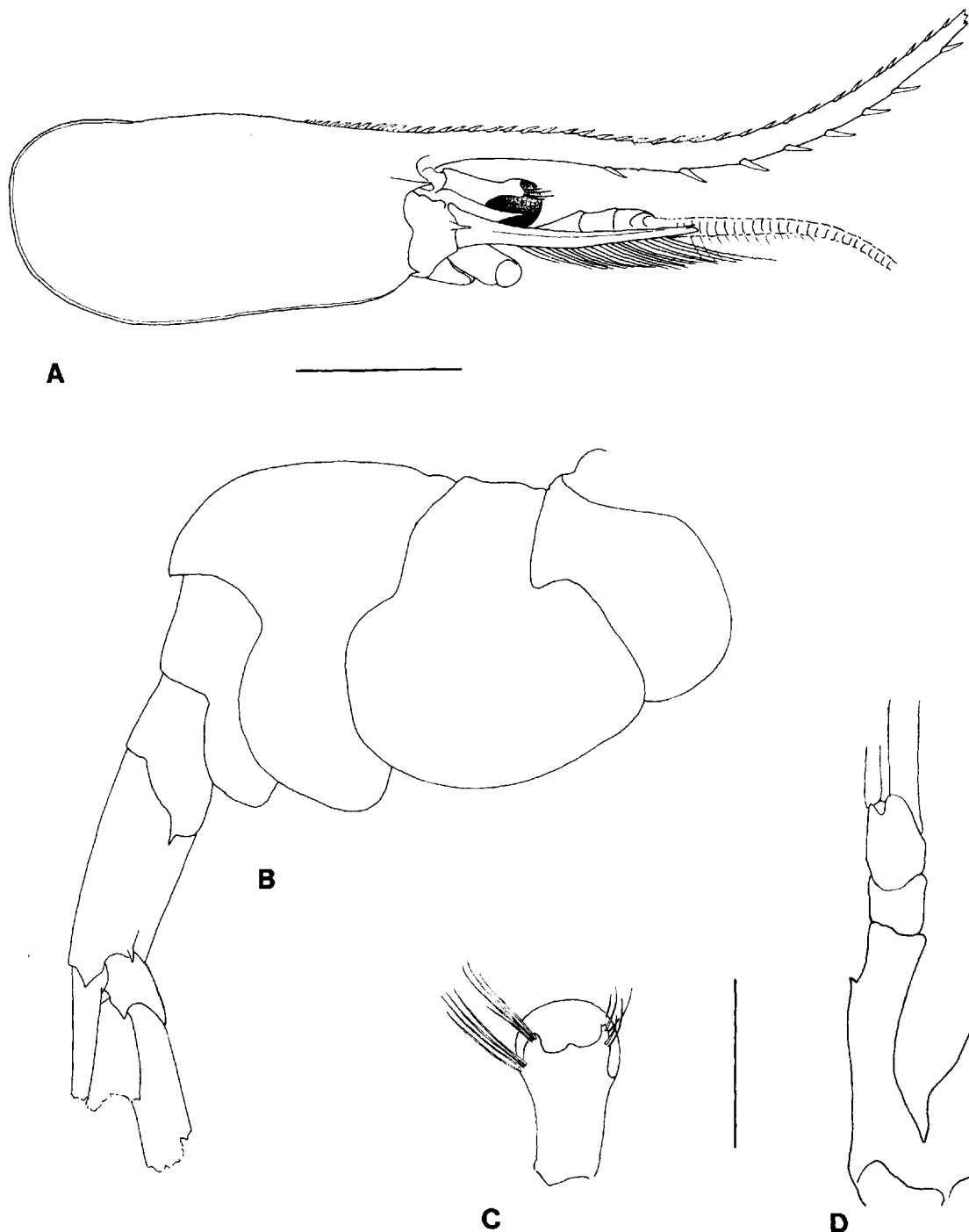
except for a single distal spine (*P. bimaxillaris* has two to three additional meral spines); and a basally more elongate stylocerite of the antennule than in *P. bimaxillaris*. These differences would indicate that this specimen belongs to an undescribed species of *Parastylodactylus*. Unfortunately, as the specimen has a damaged rostrum and tailfan, and lacks several of the pereopods, it was decided not to designate a new species.

*Stylodactylus* A. Milne Edwards, 1881

*Stylodactylus libratus* Chace

*Stylodactylus libratus* Chace, 1983: 12, fig. 5.

**Material examined.** New South Wales: AM P35909, north-east of Danger Point, 27°55'S 154°03'E to 27°57'S 154°03'E, 540 m, prawn trawl, *Kapala* (K78-23-09), 6 Nov 1979; 1 ♀, cl. 13.0 mm.



**Fig. 6.** *Parastylodactylus* sp. **A**, carapace in lateral view; **B**, abdomen in lateral view; **C**, eye; **D**, antenna 1; (Scales: A,B = 5 mm, C,D = 3 mm).

**Diagnosis.** Supraorbital spine large. Single spine below prominent branchiostegal spine. Rostrum almost horizontal, tooth format 22/5. All abdominal pleura rounded. Telson twice longer than wide, with 3 or 4 pairs of dorsal spines and strong mid-dorsal point on posterior margin flanked by 2 pairs of spines. Scaphocerite with 4–5 elongate spines on outer margin.

**Remarks.** The description of *Stylodactylus libratus* was based on a single male specimen, thus the degree of variation of morphological characters is unknown. While the present specimen agrees in most points with the description of *S. libratus*, a few differences are apparent: article 2 of the antennular peduncle is not subequal in length to article 3, but twice its length; there are fewer rostral teeth (22/5 as against 31/8); there is only one, not two secondary branchiostegal spines on the carapace; the pereopods exhibit a heavier dorsal and lateral spination than in *S. libratus*. As these differences, however, could be within the range of variation of the species, it is thought best not to describe the single specimen as a new species.

#### *Stylodactylus multidentatus* Kubo

*Stylodactylus multidentatus* Kubo, 1942: 34, figs 4,5.—Chace, 1983: 20, fig. 8.

**Material examined.** New South Wales: AM P21029, north-east of Wollongong, 34°16'–22'S 151°26'–23'E, 356 m, demersal prawn trawl, *Kapala* (K75-05-01), 8 Aug 1975; 1 male. AM P24475, east of Sydney, 33°39'–36'S 151°54'–57'E, 356 m, *Kapala* (K76-07-06), 27 May 1976; 1 female. AM P24484, east of Sydney, 33°35'–30'S 151°59'–152°02'E, 356 m, *Kapala* (K76-09-02), 24 June 1976; 1 male.

**Diagnosis.** Carapace with 2 spines on anteroventral margin; strong supraorbital spine present. Rostrum armed with 14–23 ventral spines. Antennal scale with spines on lateral margin. Abdominal pleura rounded. Posterior telsonic margin lacking median spine.

**Distribution.** Southern Japan; Philippines; 152–366 m.

#### Family PASIPHAEIDAE

*Eupasiphae* Wood-Mason & Alcock, 1893

*Eupasiphae gilesii* (Wood-Mason & Alcock)

*Parapasiphae* (*Eupasiphae*) *Gilesii* Wood-Mason & Alcock, 1893: 166.

*Eupasiphae gilesii*.—Crosnier & Forest, 1973: 150, fig. 44; Kensley, 1977: 32, fig. 10B.

**Material examined.** New South Wales: AM P26568, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 1 ♀. AM P26835, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 1 ovig. ♀, 1 juv.

AM P33066, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 1 juv. AM P33067, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 2 juvs. AM P33063, south-east of Newcastle, 33°03'S 152°58'E to 32°59'S 153°03'E, 482 m, midwater trawl, *Kapala* (K79-19-02), 27 Nov 1979; 1 ovig. ♀. AM P33062, north-east of Norah Head, 33°05'S 153°05'E to 33°13'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-03), 28 Nov 1979; 1 juv. AM P33064, south-east of Newcastle, 33°07'S 153°11'E to 33°01'S 153°05'E, 630 m, midwater trawl, *Kapala* (K79-19-06), 28 Nov 1979; 2 ♂. AM P33065, east of Newcastle, 32°59'S 153°03'E to 32°51'S 153°01'E, 391 m, midwater trawl, *Kapala* (K79-19-07), 29 Nov 1979; 1 ♂. AM P33068, south-east of Port Jackson to north-east of Wollongong, 34°02'S 152°12'E to 34°14'S 152°14'E, 0–600 m, midwater trawl, *Kapala* (JP71-8), 25 Mar 1971; 1 juv.

**Diagnosis.** Dorsal postrostral and carapace carina serrate throughout. Antennal and branchiostegal spines present. Mandibular palp of 2 articles. Maxilliped 3 with 2 arthrobranchs. Pereopod 4 shorter than either pereopods 3 or 5.

**Remarks.** This would seem to be the first Pacific record of a species widespread throughout the Atlantic and Indian oceans.

**Distribution.** Bermuda; Cape Verde Islands; Canary Islands; Madeira; off Natal, South Africa; Arabian Sea; Gulf of Oman; Andaman Sea; 340–770 m.

*Parapasiphae* Smith, 1884

*Parapasiphae sulcatifrons* Smith

*Parapasiphae sulcatifrons* Smith, 1884: 384, pl. 5, fig. 4, pl. 6, figs 1–7.

*Parapasiphae sulcatifrons*.—Crosnier & Forest, 1973: 142, fig. 41.

**Material examined.** New South Wales: AM P26566, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 1 ♀, 1 juv. AM P26567, north-east of Batemans Bay, 35°36'S 150°55'E to 35°39'S 150°56'E, 540 m, midwater trawl, *Kapala* (K77-18-05), 27 Oct 1977; 4 ♂, 4 ♀, 2 juvs. AM P33076, north-east of Cape Howe, 37°24'S 150°30'E to 37°28'S 150°33'E, 540 m, midwater trawl, *Kapala* (K77-19-03), 1 Nov 1977; 18 specimens. AM P33073, north-east of Broken Bay, 33°31'S 152°20'E to 33°28'S 152°22'E, 569 m, midwater trawl, *Kapala* (K77-24-02), 12 Dec 1977; 3 ♂, 3 ovig. ♀, 4 ♀. AM P33075, north-east of Broken Bay, 33°27'S 152°30'E to 33°23'S 152°32'E, 630 m, midwater trawl, *Kapala* (K77-24-03), 13 Dec 1977; 14 specimens. AM P33074, north-east to east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, midwater trawl, *Kapala* (K77-24-10), 14 Dec 1977; 27 juvs. AM P33077, north-east to east of Wollongong, 34°20'S 151°56'E to 34°25'S 151°54'E, 630 m, midwater trawl, *Kapala* (K77-24-12), 14 Dec 1977; 1 juv.

**Diagnosis.** Mandibular palp of 2 articles. Carapace lacking antennal and branchiostegal spines;

mid-dorsal carapace carina unarmed, anteriorly sulcate. Fingers of chela of pereopod 2 not longer than palm. Pereopod 4 shorter than either pereopods 3 or 5.

**Remarks.** This would seem to be the first record of the species from the western Pacific.

**Distribution.** North and south Atlantic; Indian Ocean; off west coast of U. S. A.; 500–5340 m.

*Pasiphaea* Savigny, 1816

*Pasiphaea berentsae* n. sp.

Figs 7–9

**Type material.** New South Wales: HOLOTYPE: AM P26768, north-east of Norah Head, 33°11'S 152°24'E to 33°09'S 152°25'E, 720 m, demersal prawn trawl, *Kapala*

(K77-23-10), 7 Dec 1977; 1 ovig. ♀, cl 47.2 mm. PARATYPES: AM P26797, north-east of Broken Bay, 33°27'S 152°09'E to 33°25'S 152°11'E, 874 m, demersal prawn trawl, *Kapala* (K77-23-13), 8 Dec 1977; 1 ♀, cl 43.1 mm. AM P26798, north-east of Broken Bay, 33°27'S 152°09'E to 33°25'S 152°11'E, 874 m, demersal prawn trawl, *Kapala* (K77-23-13), 8 Dec 1977; 2 ♂, cl 29.0, 30.8 mm, 13 ♀, cl 33.0–44.1 mm. AM P26779, south-east of Broken Bay, 33°40'–35'S 151°56'–58'E, 714–732 m, demersal prawn trawl *Kapala* (K77-23-05), 6 Dec 1977; 5 ♀, cl 30.0–37.4 mm. USNM 211394, north-east of Broken Bay, 33°27'S 152°09'E to 33°25'S 152°11'E, 874 m, demersal prawn trawl, *Kapala* (K77-23-13), 8 Dec 1977; 1 ovig. ♀, cl 37.8 mm, 1 ♀, cl 43.2 mm.

**Diagnosis.** Carapace dorsally carinate. Abdominal somites 2–6 dorsally carinate. Posterior margin of telson deeply notched. Pereopod 1, merus

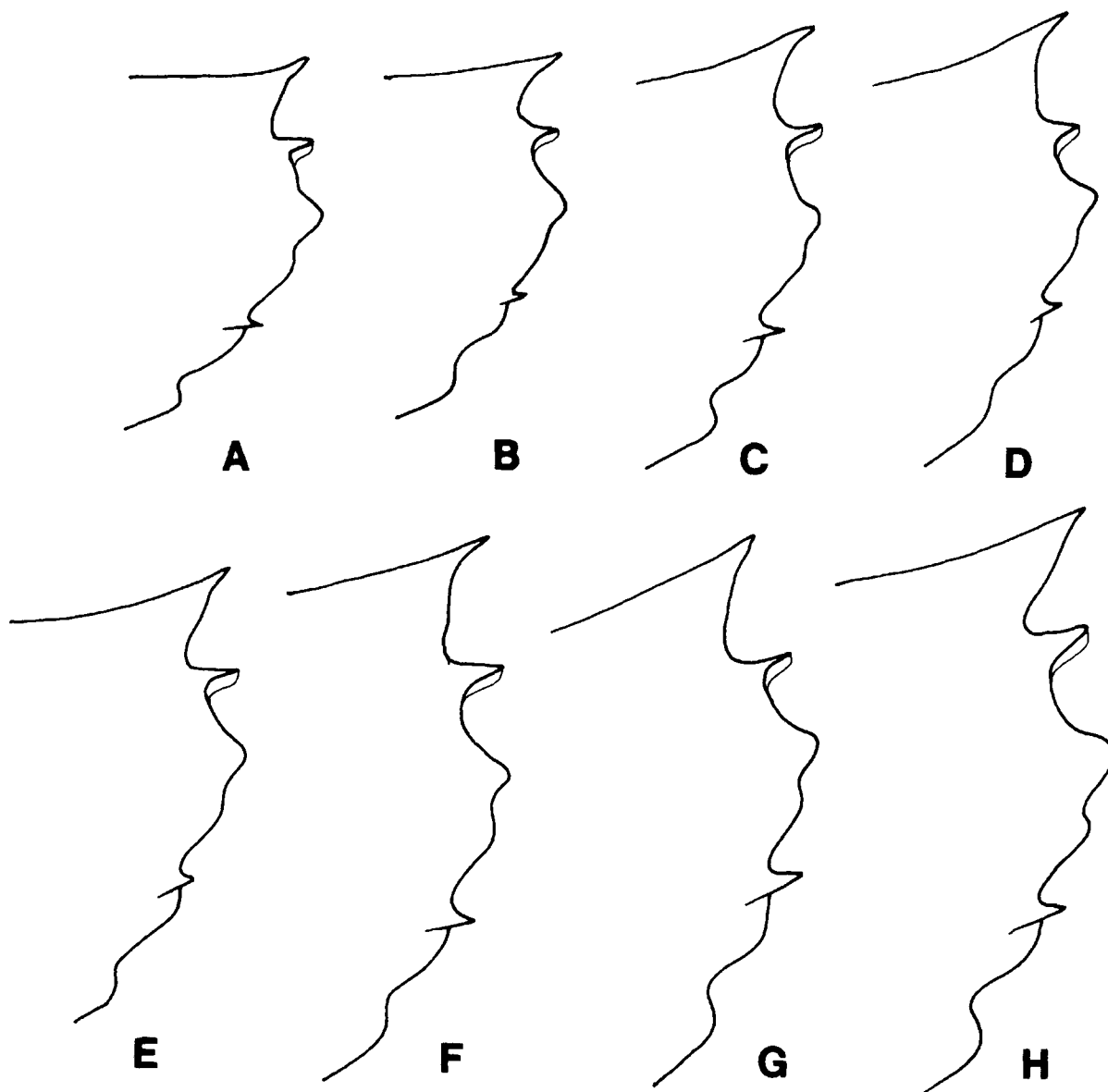


Fig. 7. *Pasiphaea berentsae* n. sp., anterior carapace variation. A, ♂ cl 30.8 mm; B, ♂ cl 29.0 mm; C, ♀ cl 33.0 mm; D, ♀ cl 40.5 mm; E, ovig. ♀ cl 37.8 mm; F, ♀ cl 33.0 mm; G, ♀ cl 42.5 mm; H, ♀ cl 44.1 mm.



armed with 0–3 spines; pereopod 2, merus armed with 12–17 spines, ischium with 0–1 spine, basis with 1–5 spines.

**Description.** Rostrum just reaching anterior carapace margin, directed obliquely upward, anteriorly narrowed into spine-like extremity, anterior margin oblique, slightly convex, straight, or slightly concave. Carapace dorsally carinate almost to posterior margin; with strong suprbranchial ridge extending almost to posterior margin; branchiostegal

spine marginal, strong, non-carinate. Abdominal somite 1 dorsally rounded; somites 2–6 dorsally carinate, all somites lacking posterodorsal spine. Pleuron 1 ventrally straight; pleuron 2 broadly rounded, pleura 3 and 4 ventrally straight, with rounded lobe-like extension anteriorly; pleuron 5 subrectangular, ventral margin faintly concave. Somite 6 1.5X length of somite 5, subequal to telson in length. Telson dorsally grooved, posterior margin deeply cleft, bearing 7 pairs of spines.

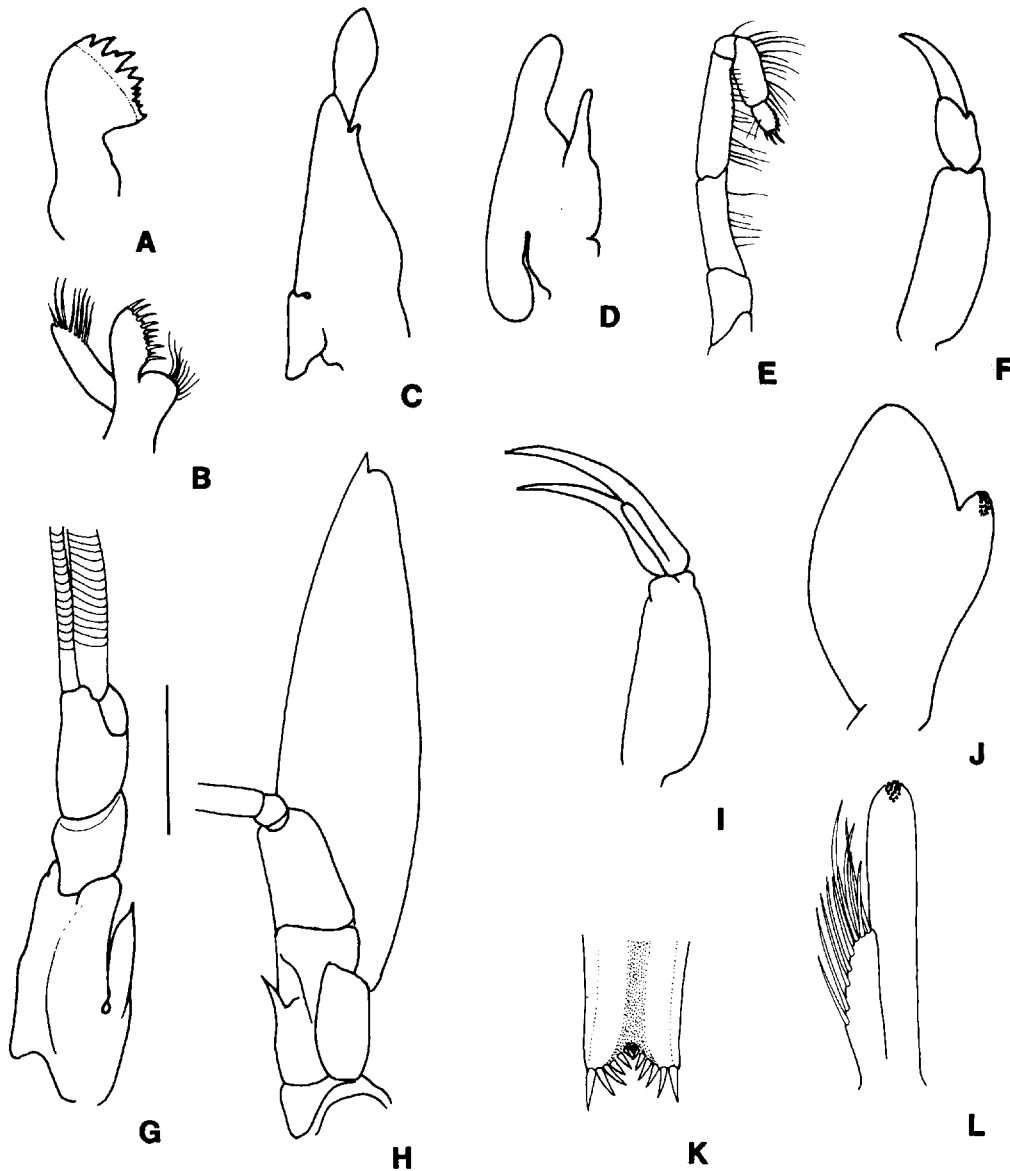


Fig. 8. *Pasiphae berentsae* n. sp. A, mandible; B, maxilla 1; C, maxilliped 1; D, maxilla 2; E, maxilliped 3; F, pleopod 1 ♂; G, antenna 1; H, antenna 2; I, pleopod 2 ♂; J, pleopod 1 ♂, endopod; K, apex of telson; L, pleopod 2 ♂, appendix masculina and appendix interna enlarged. (Scales: G=4 mm)

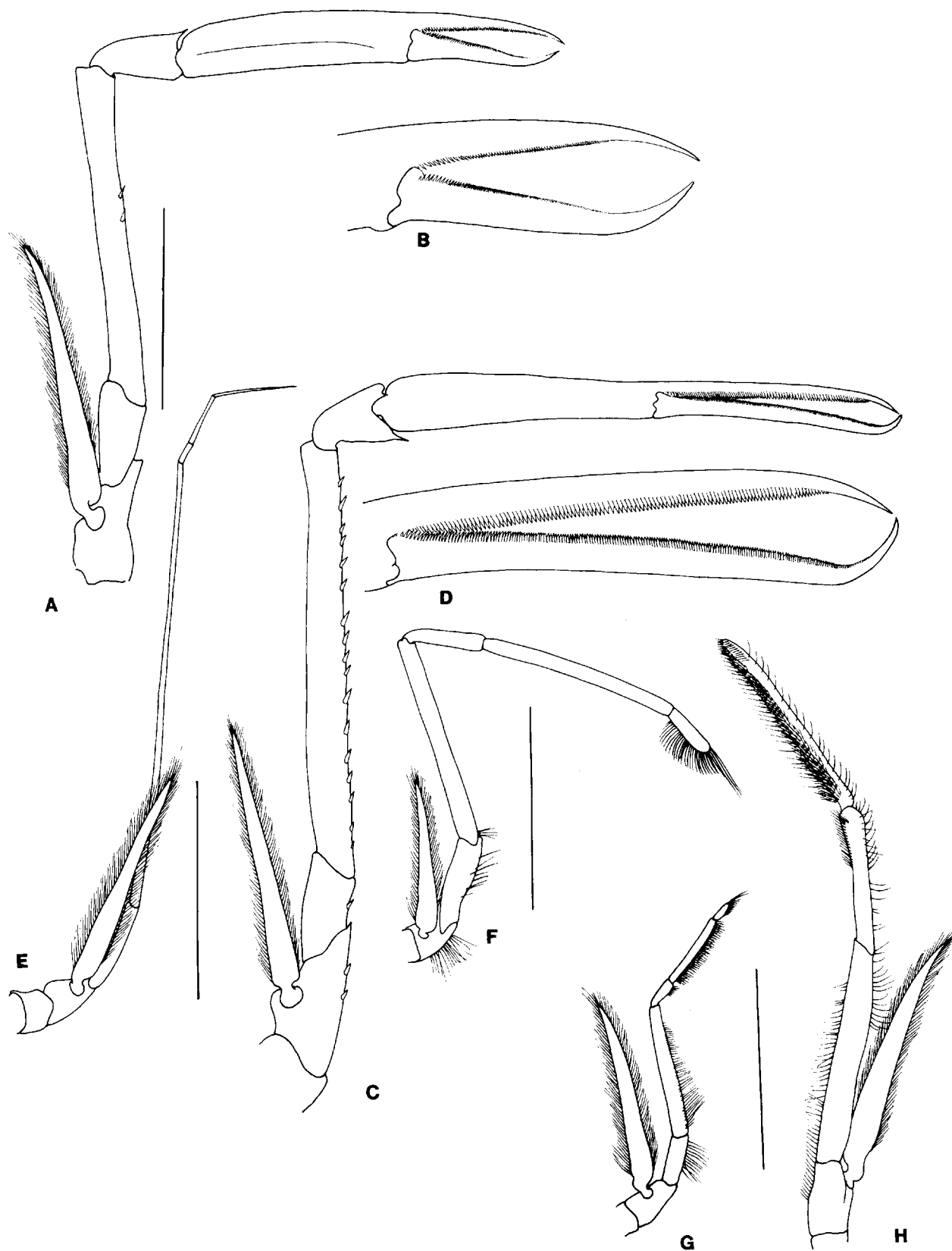


Fig. 9. *Pasiphae berentsae* n.sp. A, pereopod 1; B, pereopod 1, chela enlarged; C, pereopod 2; D, pereopod 2, chela enlarged; E, pereopod 3; F, pereopod 5; G, pereopod 4; H, maxilliped 3. (Scales: A, C, E-H = 10 mm).

Antenna 1, stylocerite twisted, distally acute, almost reaching distal margin of basal peduncular segment; segment 2 less than half length of basal segment, ventromesial margin with slight shoulder at about midlength. Antenna 2 overreaching peduncle of antenna 1 by slightly more than half of blade-length; scaphocerite with outer margin gently convex; distal spine extending well beyond apex of blade; strong elongate ventrodiscal spine on peduncle segment 2.

Mouthparts as illustrated. Maxilliped 3 not quite reaching distal spine of scaphocerite; distal segment apically subacute, about 1.4X length of segment 2, with dense bands of spines on ventral margin, and subterminal clump of ventrally directed spines; segment 2 with dense patch of ventrodiscal setae.

Pereopod 1 over-reaching scaphocerite by half length of fingers of chela; fingers about 0.6X length of palm; palm about 2.6X length of carpus; merus 4X length of carpus, with 0–3 spines on posterior margin.

Pereopod 2 over-reaching scaphocerite by length of fingers of chela; palm about 1.2X length of fingers; carpus slightly less than ¼ length of palm, with strong ventrodiscal spine; merus 7X length of carpus, with 12–17 spines on posterior margin; ischium with 0–1 posterior spine; basis with 1–5 posterior spines.

Pereopod 3 very slender, reaching to distal margin of merus of pereopod 1.

Pereopod 4 shorter than either pereopod 3 or 5, reaching to distal margin of carpus of pereopod 5; dactylus ovate, setose; propodus with dense band of setae on ventral margin. Pereopod 5 reaching to midlength of merus of pereopod 2; dactylus distally rounded, with fringe of setae on posteroventral margins; propodus almost 4X length of dactylus, 2.5X length of carpus.

Pleopod 1 of male, endopod roughly ovate, with rounded lobe bearing tiny hooks on mesial margin. Pleopod 2 of male with appendix masculina half length of appendix interna, bearing 12 elongate spines on mesial and distal margins.

Inner uropodal ramus exceeding telson by ¼ of its length; outer ramus exceeding inner by ¼ of its length.

**Remarks.** *Pasiphaea berentsae* differs from *P. meiringnaudei* Kensley, 1977, which it closely resembles, in having fewer spines on the segments of pereopod 2, in having a shorter stylocerite, a shallower telsonic notch, more spines on the appendix masculina, and in the female becoming ovigerous at a smaller size (cl 50 to 58 mm in the South African species).

While many of the diagnostic characters of this species agree with those of *P. tarda* Kroyer, the shape of the rostrum and the telsonic notch differ markedly.

The species is most easily separated from *P. barnardi* Yaldwyn, 1971, by the possession of spination on the bases of pereopod 2.

**Etymology.** The species is named for Penelope B. Berents of the Australian Museum, in thanks for her

assistance with the sorting and cataloguing of the *Kapala* collection.

**Distribution.** Off New South Wales, 720–874 m.

*Pasiphaea kapala* n. sp.

Figs 10–12

**Type material.** New South Wales: HOLOTYPE: AM P33133, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 1 ♂, cl 24.5 mm. PARATYPES: AM P26789, east of Broken Bay, 33°35'–33°S 152°00'–02'E, 823 m, demersal prawn trawl, *Kapala* (K77-23-12), 8 Dec 1977; 27 ♂, cl 22.5–28.2 mm, 23 ♀, cl 22.6–26.0 mm. USNM 211393, north-east of Yamba, 29°26'S 153°49'E to 29°20'S 153°50'E, 450 m, demersal prawn trawl, *Kapala* (K75-09-08), 12 Oct 1975; 20 ♂, cl 22.0–25.6 mm, 20 ♀, cl 22.0–25.8 mm.

**Additional material examined.** New South Wales: AM P20999, east of Broken Bay, 33°32'S 152°04'E to 33°38'S 152°00'E, 810 m, demersal prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♀. AM P21070, east of Broken Bay, 33°32'S 152°04'E to 33°38'S 152°00'E, 810 m, demersal prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♂. AM P21075, east of Broken Bay, 33°32'S 152°04'E to 33°38'S 152°00'E, 810 m, demersal prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♂. AM P24766, east of Sydney, 33°35'S 151°59'E, 584 m, *Kapala* (K76-09-02), 24 June 1976; 1 ♀. AM P26807, north-east of Norah Head, 33°08'S 152°27'E to 33°10'S 152°24'E, 580 m, demersal prawn trawl, *Kapala* (K77-23-09), 7 Dec 1977; 10 ♂, 8 ♀. AM P25211, south-east of Broken Bay, 33°42'S 151°52'E to 33°39'S 151°54'E, 446 m, demersal prawn trawl, *Kapala* (K76-24-01), 20 Dec 1976; 1 ♂, 1 ♀. AM P33132, south-east of Wollongong, 34°31'S 151°20'E to 34°34'S 151°19'E, 684 m, demersal prawn trawl, *Kapala* (K77-21-01), 21 Nov 1977; 1 ♂. AM P33130, north-east of east of Broken Bay, 33°28'S 152°34'E to 33°36'S 152°35'E, 630 m, demersal prawn trawl, *Kapala* (K77-24-10), 14 Dec 1977; 2 juvs. AM P33135, north-east of Port Jackson, 33°47'S 151°55'E to 33°44'S 151°57'E, 806 m, demersal prawn trawl, *Kapala* (K78-26-16), 7 Dec 1978; 6 ♂, 1 ovig. ♀ cl 26.9 mm, 1 ♀. AM P33134, north-east of Point Danger, 28°03'S 154°04'E to 28°01'S 154°04'E, 724 m, demersal prawn trawl, *Kapala* (K78-23-08), 6 Nov 1978; 1 ♂. AM P33136, north-east of Jervis Bay, 34°55'S 151°13'E to 34°53'S 151°14'E, 810 m, demersal prawn trawl, *Kapala* (K78-27-05), 12 Dec 1978; 1 ♂, 2 ♀. AM P33137, north-east of North Solitary Island, 29°50'S 153°43'E to 29°48'S 153°44'E, 495 m, demersal prawn trawl, *Kapala* (K78-06-02), 25 Apr 1978; 1 ♂, 2 ovig. ♀ cl 26.1, 30.5 mm. AM P33131, east of Broken Bay, 33°32'S 152°06'E to 33°34'S 152°05'E, 820 m, demersal prawn trawl, *Kapala* (K79-20-13), 6 Dec 1979; 2 ♂. AM P21787, east of Clarence River, 29°26'–20'S 153°49'–50'E, 500 m, *Kapala* (K75-09-08), 12 Oct 1975; 22 ♂, 18 ♀. AM P26807, south-east of Newcastle, 33°08'–10'S 152°27'–24'E, 586 m, demersal trawl, *Kapala* (K77-23-09), 7 Dec 1977; 11 ♂, 7 ♀. AM P25211, east of Broken Bay, 33°43'–39'S 151°52'–54'E, 450 m, *Kapala* (K76-24-03), 20 Dec 1976; 1 ♂, 1 ♀. AM P24770, east of Broken Bay, 33°40'–37'S 151°54'–56'E, 500 m, *Kapala*, 20 July 1976; 1 ♂. AM P26810, east of Broken Bay, 33°35'–33'S, 152°00'–02'E, 823 m, demersal trawl, *Kapala* (K77-23-12), 8 Dec 1977; 1 ♂. AM P20999, east of Broken Bay, 33°32'–38'S 152°00'–04'E, 900 m, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♀. AM

P24766, east of Sydney, 33°35'–30'S 151°59'–152°02'E, 400 m, *Kapala* (K76-09-02), 24 June 1976; 1 ovig. ♀. AM P21075, east of Broken Bay, 33°32'–38'S 152°00'–04'E, 900 m, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♀. AM P21070, east of Broken Bay, 33°32'–38'S 152°00'–04'E, 900 m, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♂. AM P35914, south-east of Broken Bay, 33°43'S 151°56'E to 33°39'S 151°58'E, 631 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 1 ovig. ♀, 3 ♀.

**Diagnosis.** Carapace dorsally rounded. All abdominal segments dorsally rounded. Posterior

margin of telson truncate to very slightly notched. Merus of pereopod 1 unarmed; merus of pereopod 2 with 7–8 spines on posterior margin.

**Description.** Rostrum barely, or not reaching anterior carapace margin, directed obliquely upward, often with faint convexity on anterior margin, anteriorly usually narrowly acute, lacking any posterior carina. Carapace dorsally rounded, branchiostegal spine marginal, short unkeeled; low rounded suprbranchial ridge present. All abdominal somites dorsally rounded, lacking mid-dorsal spine

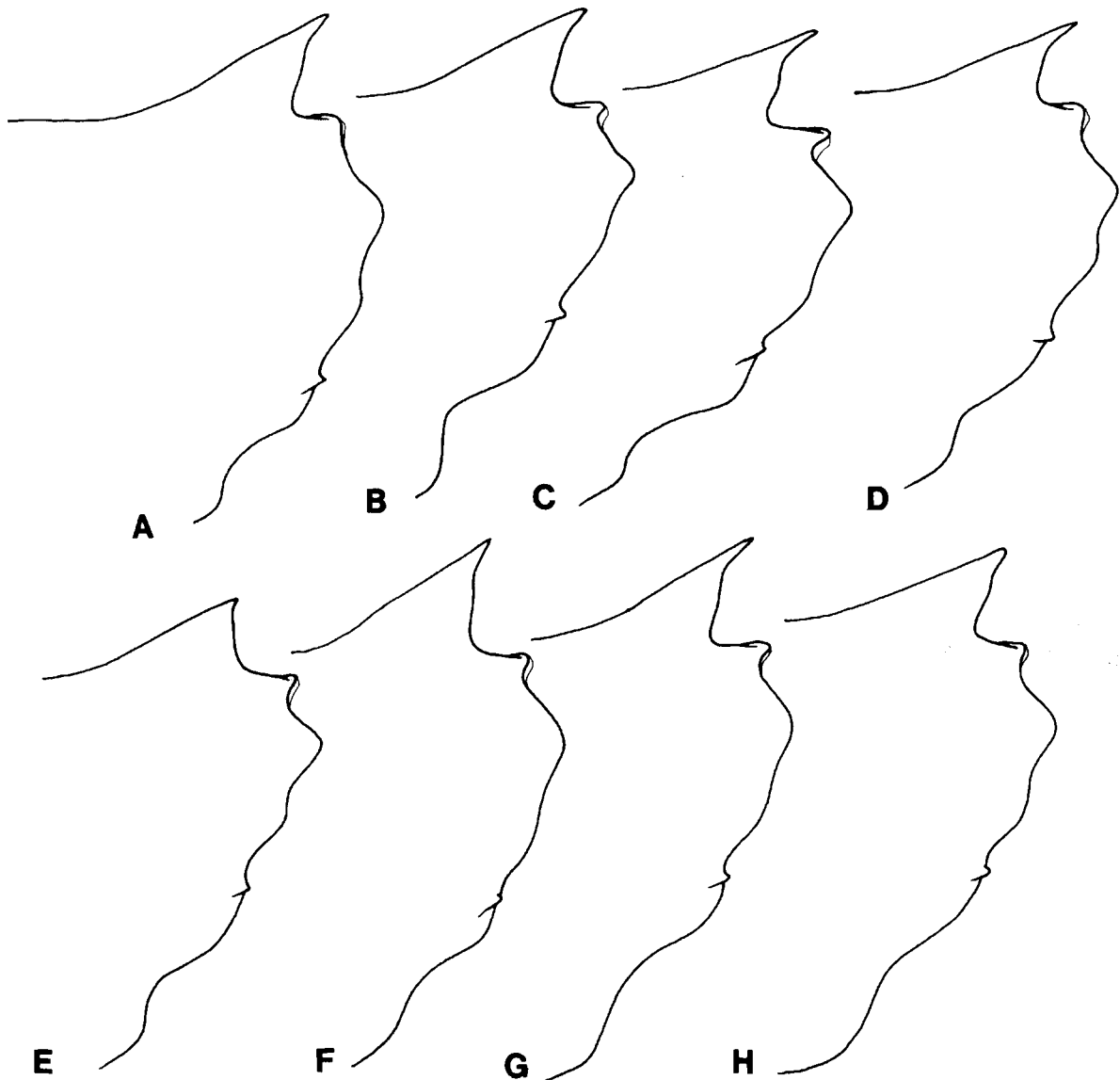


Fig. 10. *Pasiphae kapala* n.sp., anterior carapace variation. A, ♂ cl 24.5 mm; B, ♂ cl 24.0 mm; C, ♂ cl 23.8 mm; D, ♂ cl 22.6 mm; E, ♂ 23.0 mm; F, ♀ cl 24.5 mm; G, ♀ cl 25.0 mm; H, ♀ cl 22.6 mm.

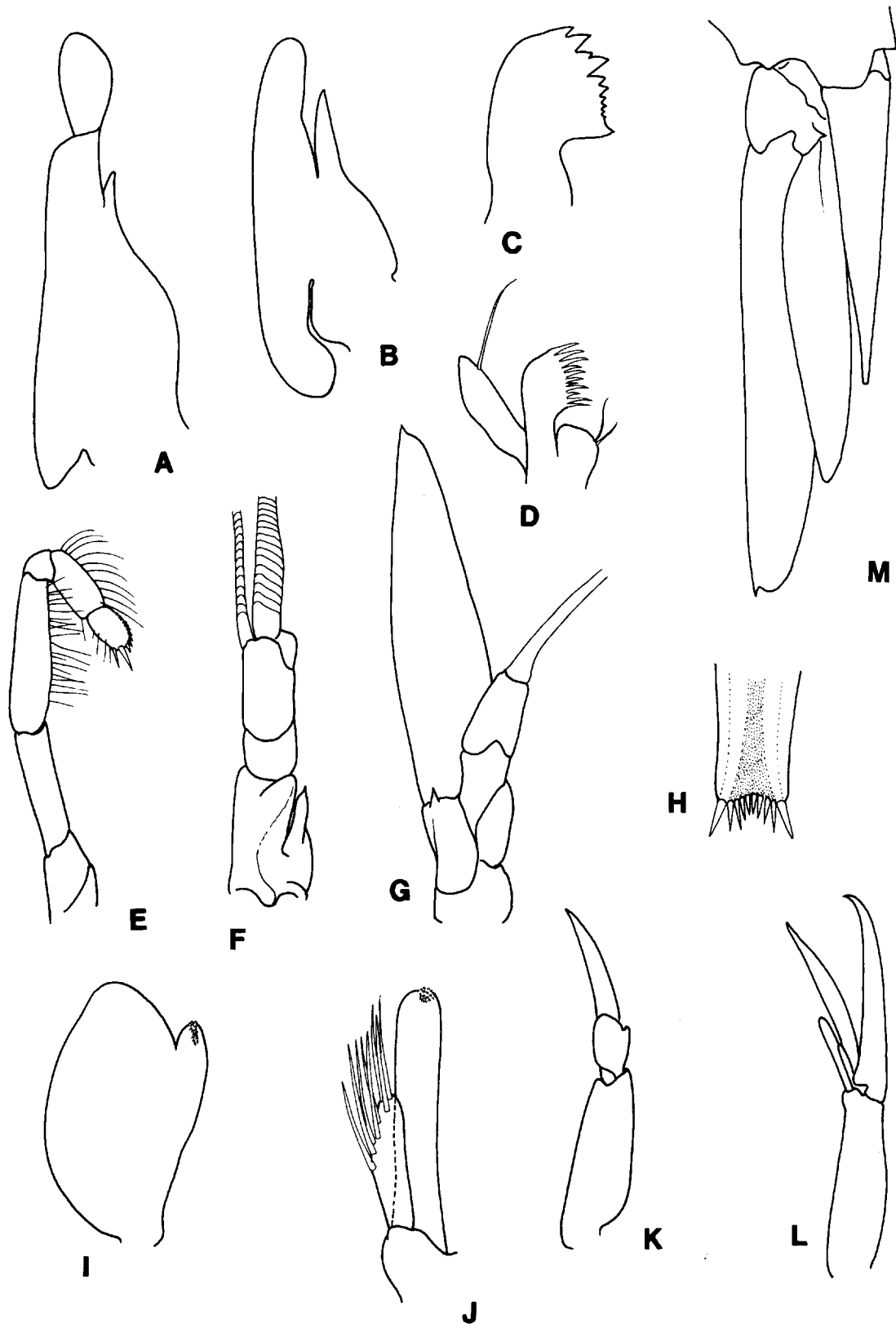


Fig. 11. *Pasiphae kapala* n.sp. A, maxilliped 1; B, maxilla 2; C, mandible; D, maxilla 1; E, maxilliped 3; F, antenna 1; G, antenna 2; H, apex of telson; I, pleopod 1 ♂, endopod; J, pleopod 2 ♂, appendix interna and appendix masculina enlarged; K, pleopod 1 ♂; L, pleopod 2 ♂.

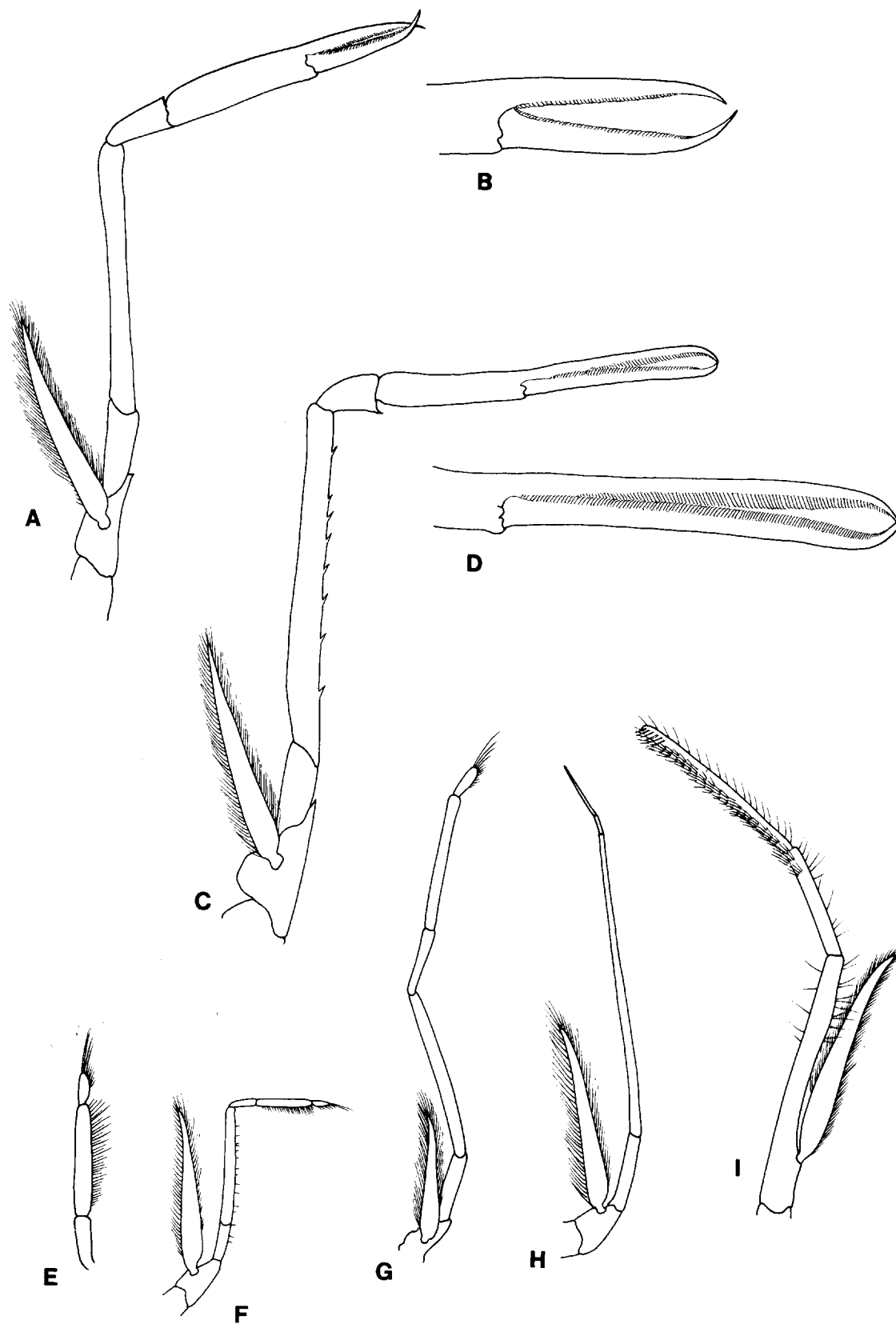


Fig. 12. *Pasiphae kapala* n. sp. A, pereopod 1; B, pereopod 1 chela enlarged; C, pereopod 2; D, pereopod 2, chela enlarged; E, pereopod 4, two distal articles enlarged; F, pereopod 4; G, pereopod 5; H, pereopod 3; I, maxilliped 3.

on posterior margin. Pleura of somites 1 and 2 ventrally broadly rounded; pleura of 3–5 with ventral margin almost straight, somewhat produced anteriorly into rounded lobe; somite 6, 1.4X longer than somite 5, only slightly shorter than telson. Latter with posterior margin truncate to very shallowly notched, bearing 5 pairs of spines.

Antenna 1 with stylocerite almost reaching distal margin of basal peduncular segment, twisted, distally acute; segment 2 about half length of segment 1, somewhat more than half length of segment 3.

Antenna 2, scaphocerite over-reaching antenna 1 peduncle by half its length, tapering distally to short triangular spine extending past apex of blade; peduncular segment 2 with ventrodorsal spine.

Mouthparts as illustrated. Maxilliped 3 not quite reaching distal spine of scaphocerite; terminal segment slightly rounded, with row of short spines on mesial surface, single row of setae on anterior margin; posterior margin with rows of short spines; penultimate segment 0.6X length of terminal segment.

Pereopod 1 over-reaching scaphocerite by  $\frac{2}{3}$  length of fingers of chela; fingers  $\frac{3}{4}$  length of palm; carpus half length of palm; merus subequal in length to chela, posterior margin unarmed.

Pereopod 2 over-reaching scaphocerite by  $\frac{2}{3}$  length of fingers of chela; fingers subequal in length to palm plus carpus; merus subequal in length to chela, with 7–8 spines on posterior margin.

Pereopod 3 very slender, reaching midlength of merus of pereopod 2; propodus  $\frac{1}{3}$  length of dactylus.

Pereopod 4 shorter than pereopods 3 or 5, reaching to distal end of carpus of pereopod 5; dactylus ovate, with setae increasing in length distally; propodus 3.5X length of dactylus, with close-set setae on posterior margin.

Pereopod 5 reaching anteriorly almost as far as distal end of pereopod 3; dactylus ovate, with setae increasing in length distally; propodus 4X length of dactylus; carpus half length of propodus.

Pleopod 1 in male with endopod roughly ovate, with rounded lobe bearing tiny hooks on mesial margin. Pleopod 2 in male with appendix masculina 0.5–0.6X length of appendix interna, bearing about 8 elongate spines on distal and outer margins; appendix interna with small patch of minute hooks on rounded apex.

Inner uropodal ramus over-reaching telsonic apex by about 0.3X its length; outer uropodal ramus over-reaching inner ramus by 0.25 of its length.

**Remarks.** The present species belongs to that group of species characterised by a rounded carapace and rounded abdominal somites, and a telsonic apex regarded as very faintly notched. The armature of the meri of pereopods 1 and 2 (0 and 7–8 spines respectively), however, separates this species from *P. poeyi* Chace, and *P. americana* Faxon (which has the branchiostegal spine arising posterior to the anterior margin), which have one to two spines on pereopod 2.

The meral armature also separates this species from a second group of species which usually has more than 0 and 1–2 spines on pereopods 1 to 2 respectively.

**Etymology.** The species is named for the research vessel of the New South Wales Department of Fisheries, the FRV *Kapala*.

**Distribution.** Off New South Wales, 446–900 m.

*Pasiphaea longitaenia* n. sp.

Figs 13, 14

**Type material.** New South Wales: HOLOTYPE: AM P35196, east of Long Reef Point, 33°43'S 151°56'E to 33°39'S 151°58'E, 626–637 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 1 ♂, cl 23.1 mm. PARATYPES: AM P24772, east of Broken Bay, 33°41'S 151°55'E, 457 m, demersal prawn trawl, *Kapala* (K76-24-01), 20 July 1976; 1 ♂, cl 22.3 mm, 2 ♀, cl 24.0, 26.0 mm. AM P24771, east of Broken Bay, 33°41'S 151°55'E, 457 m, demersal prawn trawl, *Kapala* (K76-24-01), 20 July 1976; 1 ♀ cl 24.1 mm (rostrum damaged). USNM 211395, east of Long Reef Point, 33°43'S 151°56'E to 33°39'S 151°58'E, 626–637 m, demersal fish trawl, *Kapala* (K84-16-03), 25 Sept 1984; 1 ♂, cl 26.5 mm.

**Diagnosis.** Carapace dorsally rounded. Abdominal somites 1–5 dorsally rounded, somite 6 dorsally carinate. Telson posteriorly truncate. Merus of pereopod 1 armed with about 9 spines; merus of pereopod 2 armed with about 19 spines on posterior margin.

**Description.** Rostrum low, triangular, not reaching anterior carapace margin. Carapace mid-dorsally rounded; branchiostegal spine short, marginal; faint rounded suprabranchial ridge present. Abdominal somites 1–5 dorsally rounded, somite 6 subcarinate. Pleura of somites 1 and 2 ventrally broadly rounded, of 3 and 4 with rounded anteriorly directed lobes; of 5 ventrally straight, posteroventrally rectangular; somite 5 about  $\frac{2}{3}$  length of somite 6, latter ending with slight mid-dorsal spine on posterior margin. Telson  $\frac{2}{3}$  length of somite 6, with shallow mid-dorsal longitudinal groove; posterior margin truncate, bearing single median, and 4 pairs of lateral spines, outermost pair longest.

Antenna 1, basal segment with slight shoulder at about midlength of ventromesial margin; stylocerite twisted, apically acute, reaching distal margin of basal segment; segment 2 about half length of basal segment.

Antenna 2 reaching by slightly more than half length of scaphocerite blade beyond antennular peduncle; distal scaphocerite spine reaching well beyond apex of blade; second peduncular segment with distal spine at outer and at mesial distal angles.

Mouthparts as illustrated. Maxilliped 3 reaching to distal  $\frac{3}{4}$  of scaphocerite, distal segment narrow, parallel-sided, apically subacute, with ventral fringe of spines, 1.6X length of penultimate segment.

Pereopod 1 reaching beyond scaphocerite by length of fingers of chela; fingers  $\frac{2}{3}$  length of palm; carpus

about  $\frac{1}{4}$  length of merus; latter armed with 9–12 spines on posterior margin; basis with posterodistal margin produced into strong spine.

Pereopod 2 reaching slightly beyond fingers of pereopod 1, and by  $\frac{2}{3}$  length of fingers beyond scaphocerite; fingers subequal in length to palm; merus shorter than chela, armed with 17–19 spines on posterior margin; basis with strong posterodistal spine.

Pereopod 3 very slender, anteriorly reaching carpus of pereopod 2.

Pereopod 4 shorter than pereopods 3 or 5, reaching proximal fourth of propodus of pereopod 5; propodus

3.5X length of dactylus, with posterior fringe of spine-setae.

Pereopod 5 reaching slightly beyond midlength of merus of pereopod 3; dactylus ovate, with setae increasing in length distally; propodus 6X length of dactylus, 2.5X length of carpus; merus 3X length of carpus.

Pleopod 1 of male, endopod elongate ovate, with rounded lobe on mesial margin bearing small patch of hooks. Pleopod 2 of male with appendix masculina about  $\frac{2}{3}$  length of appendix interna, bearing 10 spines on distal and outer margins; appendix interna distally rounded, with small terminal patch of minute hooks.

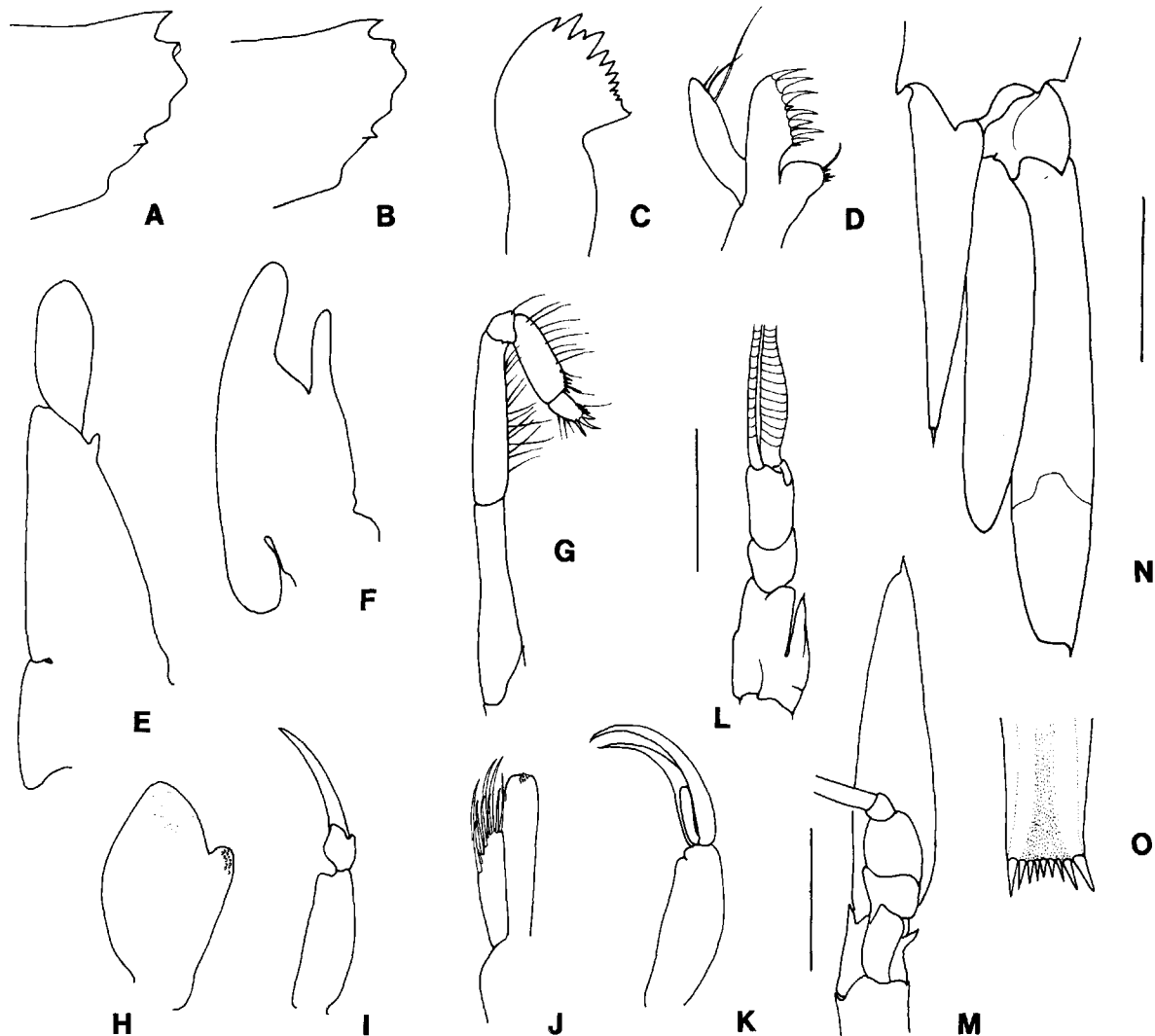


Fig. 13. *Pasiphae longitaenia* n.sp. A, anterior carapace, ♀ cl 26.0 mm; B, anterior carapace, ♀ cl 24.0 mm; C, mandible; D, maxilla 1; E, maxilliped 1; F, maxilla 2; G, maxilliped 3; H, pleopod 1 ♂, endopod; I, pleopod 1 ♂; J, pleopod 2 ♂, appendix interna and appendix masculina enlarged; K, pleopod 2 ♂; L, antenna 1; M, antenna 2; N, telson and uropod in lateral view; O, apex of telson. (Scales: L-N = 5 mm).



Inner uropodal ramus slightly less than  $\frac{3}{4}$  length of outer ramus, over-reaching telsonic apex by about  $\frac{1}{3}$  of its length; outer ramus with truncate-rounded distal margin.

**Remarks.** The carapace and abdominal features of this species mentioned in the diagnosis bear some similarity to *P. truncata* Rathbun, 1906, from Hawaii. The new species may be distinguished from the latter by the following points: the rostrum is more elongate, with the anterior margin more oblique than in the Hawaiian species; abdominal somite 6 is subcarinate (narrowly rounded) in *P. longitaenia*

acutely carinate in *P. truncata*; the fingers of pereopod 1 in *P. truncata* are three-fourths the length of the palm, two-thirds the length in *P. longitaenia*; the fingers of pereopod 2 are slightly longer than the palm in *P. truncata*, subequal to the palm in *P. longitaenia*; finally, the merus of pereopod 2 in *P. longitaenia* bears more spines (17–19 as against 13–16).

**Etymology.** The species name, the Latinised form of 'long reef', is derived from the type locality, Long Reef Point, N.S.W.

**Distribution.** Off New South Wales, 457–637 m.

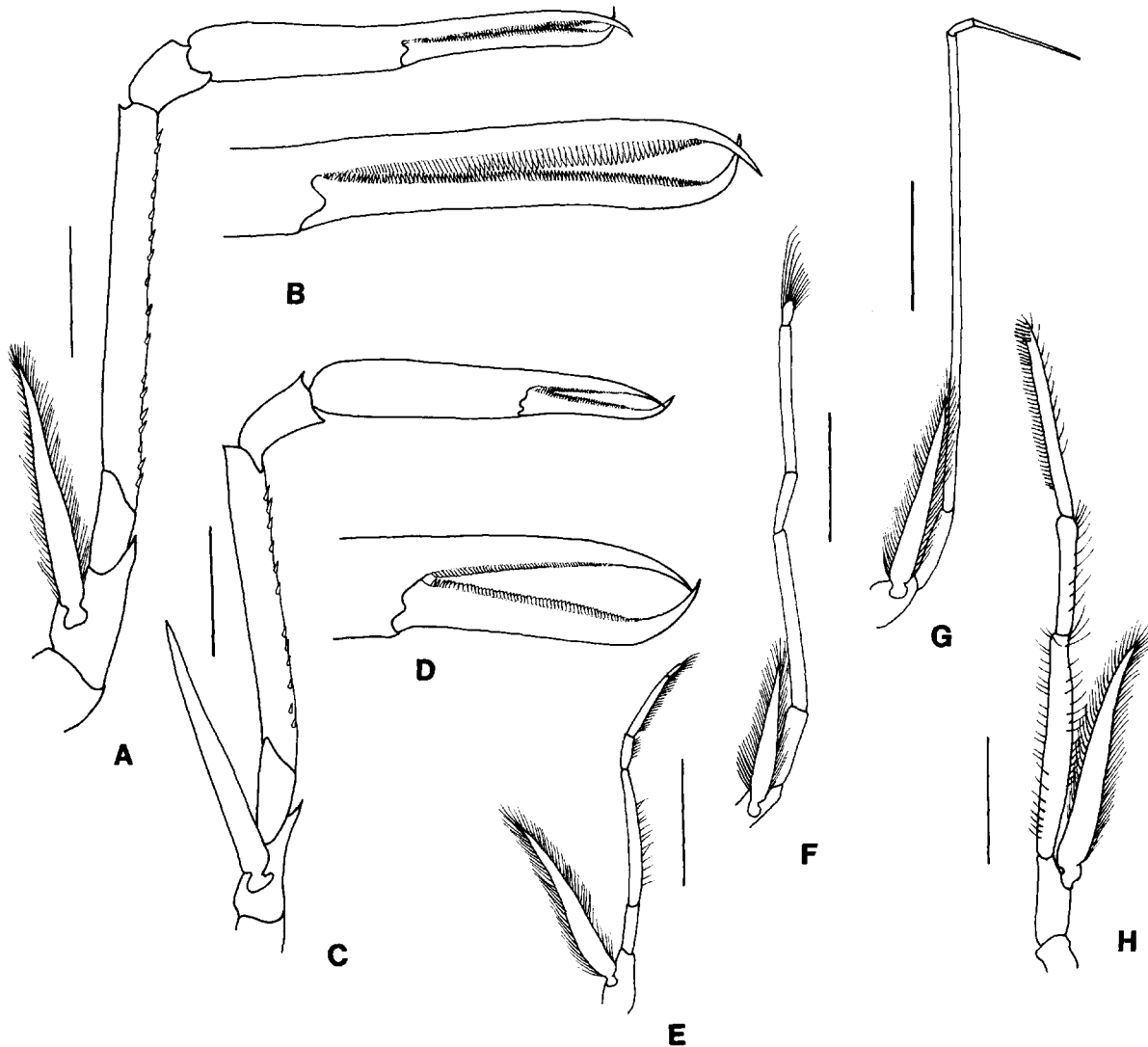


Fig. 14. *Pasiphae longitaenia* n.sp. A, pereopod 1; B, pereopod 1, chela enlarged; C, pereopod 2; D, pereopod 2, chela enlarged; E, pereopod 4; F, pereopod 5; G, pereopod 3; H, maxilliped 3. (Scales: A, C, E-H = 5 mm).

## Family EUGONATONOTIDAE

*Eugonatonotus* Schmitt, 1926*Eugonatonotus crassus* (A. Milne Edwards)

*Gonatonotus crassus* A. Milne Edwards, 1881: 10.—Kubo, 1937: 94–98, figs 1–3.

*Eugonatonotus crassus*.—Holthuis, 1955: 39–40, fig. 18; Thompson, 1966: 129–135.

**Material examined.** Queensland: AM P33141, north-east of Danger Point, 27°55'S 154°03'E to 27°57'S 154°03'E, 540 m, prawn trawl, *Kapala* (K78-23-09), 6 Nov 1978; 5 specimens.

**Diagnosis.** Rostrum subequal to carapace length, curved distally, with about 8 spines on both dorsal and ventral margins; pereopods 1 and 2 chelate, fingers of chelae short, armed with black horny spines; carpus of pereopod 2 entire; pereopods with exopods; carapace dorsally carinate with about 10 movable spines anteriorly, lateral carapace with 3 carinae; only third and fourth abdominal somites carinate, carina of third somite with spine at distal third, and pair of submedial spines on posterior margin, fourth and fifth somites with more than 2 spines on posterior margin.

**Remarks.** These specimens, all females (cl 34.8–38.7 mm), agree well with description and figures given by Kubo (1937). They differ in having the rostrum slightly longer (1.1–1.2) than the carapace and resembling the figure given by Kubo for the male rostrum rather than that for the female. Also, the ventral spine on the second segment of the antennal peduncle reaches a third rather than halfway along the scaphocerite, and the telson is slightly shorter, rather than subequal to the uropods. These few differences may be explained by the larger size of our specimens; in Kubo's specimens the carapace length of the largest female was 22 mm. In our specimens there are 10–12 movable spines dorsally on the carapace, while on the rostrum there are 8–10 dorsal spines and 7–8 ventral spines.

This species has not previously been recorded from eastern Australia.

**Distribution.** Western Pacific, western Atlantic.

## Family RHYNCHOCINETIDAE

*Lipkius* Yaldwyn, 1960*Lipkius holthuisi* Yaldwyn

*Lipkius holthuisi* Yaldwyn, 1960: 16, figs 1–16.—Thompson, 1966: 129, 130, 136, 138.

**Material examined.** New South Wales: AM P21000, east of Broken Bay, 33°32'S 152°04'E to 33°38'S 152°00'E, 810 m, demersal prawn trawl, *Kapala* (K75-05-05), 19 Aug 1975; 1 ♀ cl 32.5 mm (rostrum damaged). AM P26559, east of Broken Bay, 33°35'S 152°01'E to 33°32'S 152°03'E, 810 m, demersal prawn trawl, *Kapala* (K76-24-03), 20 Dec 1976; 1 ♀ cl 33.2 mm (rostrum damaged).

**Diagnosis.** Rostrum long, slender, immovable,

armed with movable teeth proximally, more widely spaced fixed teeth distally. Carapace lacking carinae. Rudimentary exopods on pereopods 1–3. Anteriorly projecting, ventral, bifid plate between bases of pereopods 2–5.

**Distribution.** Cook Strait to Chatham Rise, New South Wales; 400–810 m.

## Family CAMPYLONOTIDAE

*Campylonotus* Bate, 1888*Campylonotus rathbunae* Schmitt

*Campylonotus rathbunae* Schmitt, 1926: 373–377, pl. 67, figs 1–5.—Yaldwyn, 1960: 20–27, figs 2–4.

**Material examined.** New South Wales: AM P19093, east of Long Reef, 33°51'S 151°51'E to 33°45'S 151°55'E, 675 m, trawl, *Kapala* (K72-06-03), 19 Oct 1972; 1 specimen. AM P24774, east of Brush Island, 35°28'S 150°50'E to 35°33'S 150°47'E, 567–594 m, fish trawl, *Kapala* (K76-11-12), 8 July 1976; 1 ovig. ♀. Victoria: AM P33142, south-east of Gabo Island, 37°48'S 150°13'E to 37°45'S 150°15'E, 486 m, fishtrawl, *Kapala* (K77-10-08), 13 July 1977; 1 ovig. ♀. AM P20802, south-east of Gabo Island, 37°36'S 150°17'E to 37°43'S 150°15'E, 540 m, fish trawl, *Kapala* (K75-03-04), 11 July 1975; 1 ovig. ♀. AM P33143, P26803, south-east of Gabo Island, 37°43'S 150°17'E to 37°40'S 150°17'E, 630 m, prawn trawl, *Kapala* (K77-22-04), 30 Nov 1977; 24 specimens. Western Australia: AM P21956, Great Australian Bight, 33°28'S 127°15'E to 33°31'S 127°19'E, 640–650 m, otter trawl, J.R. Paxton on *Dmitry Mendeleev*, 28 Feb 1976; 7 specimens.

**Diagnosis.** Rostrum narrow with 2 large basal teeth, first of which standing at or behind middle of carapace, ventral margin of rostrum with 3–4 teeth; pereopods 1 and 2 chelate; pereopod 2 subequal, carpus entire; pereopods without exopods. Carapace with 2 lateral carinae. Abdomen armed with posterior dorsal spines on segments 3–5, and on anterior part of third segment by prominent tubercle, segments 1, 2, and 6 without carinae.

**Remarks.** This species has been figured and described in detail by Yaldwyn (1960). The only previous record from Australian waters was from the Great Australian Bight (Schmitt, 1926).

These specimens were collected between 33°S and 38°S and between 127°E and 150°E in trawls at depths to 650 m.

**Distribution.** Southern and southeast Australia, southeast New Zealand; 400–650 m.

## Family HIPPOLYTIDAE

*Lebbeus* White, 1847*Lebbeus yaldwyni* n. sp.

Figs 15–17

**Type material.** New South Wales: HOLOTYPE: AM P26561, east of Sydney, 33°43'S 151°51'–53'E, 450 m, *Kapala* (K77-04-13), 6 May 1977; 1 ovig. ♀, cl 11.5 mm.

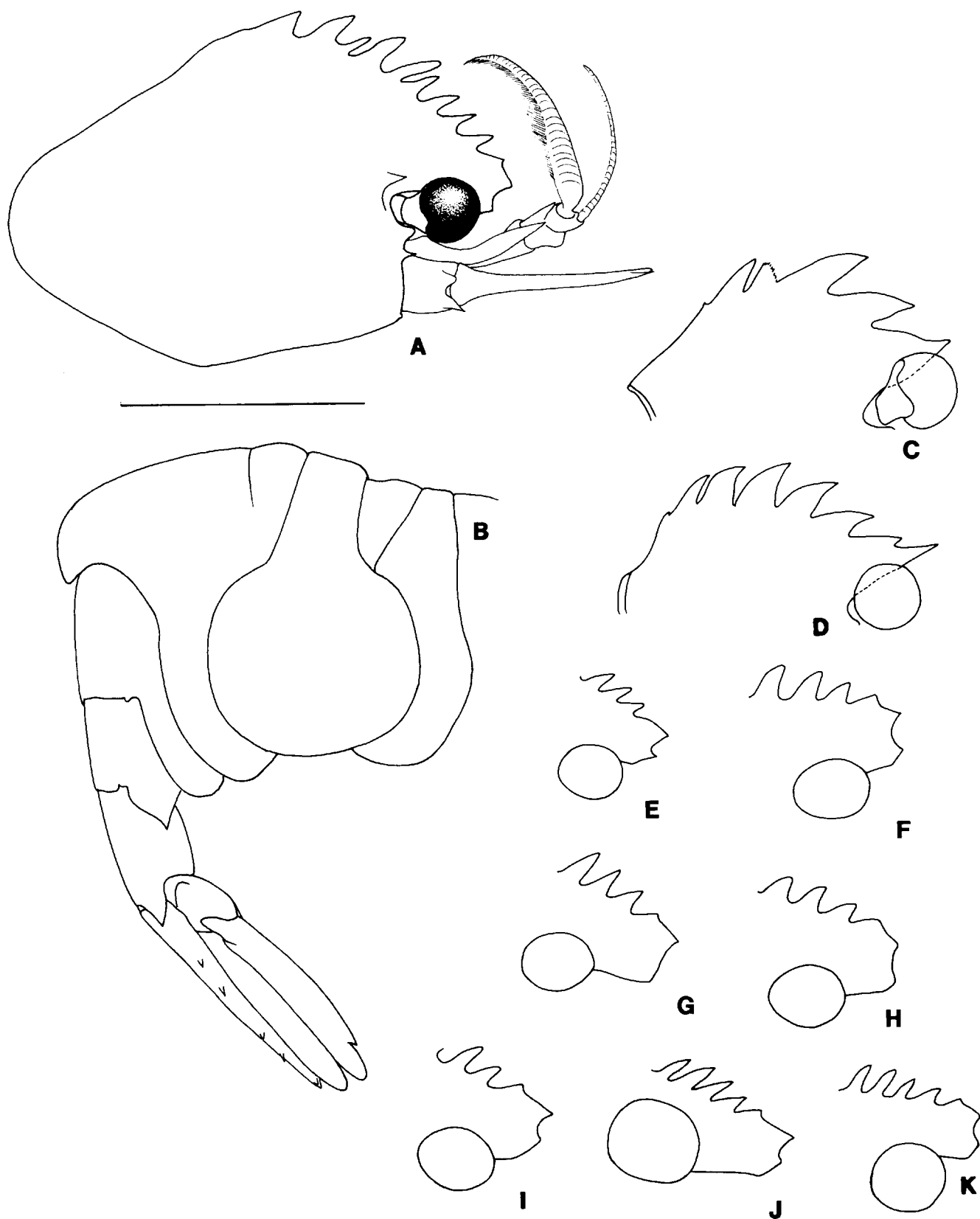
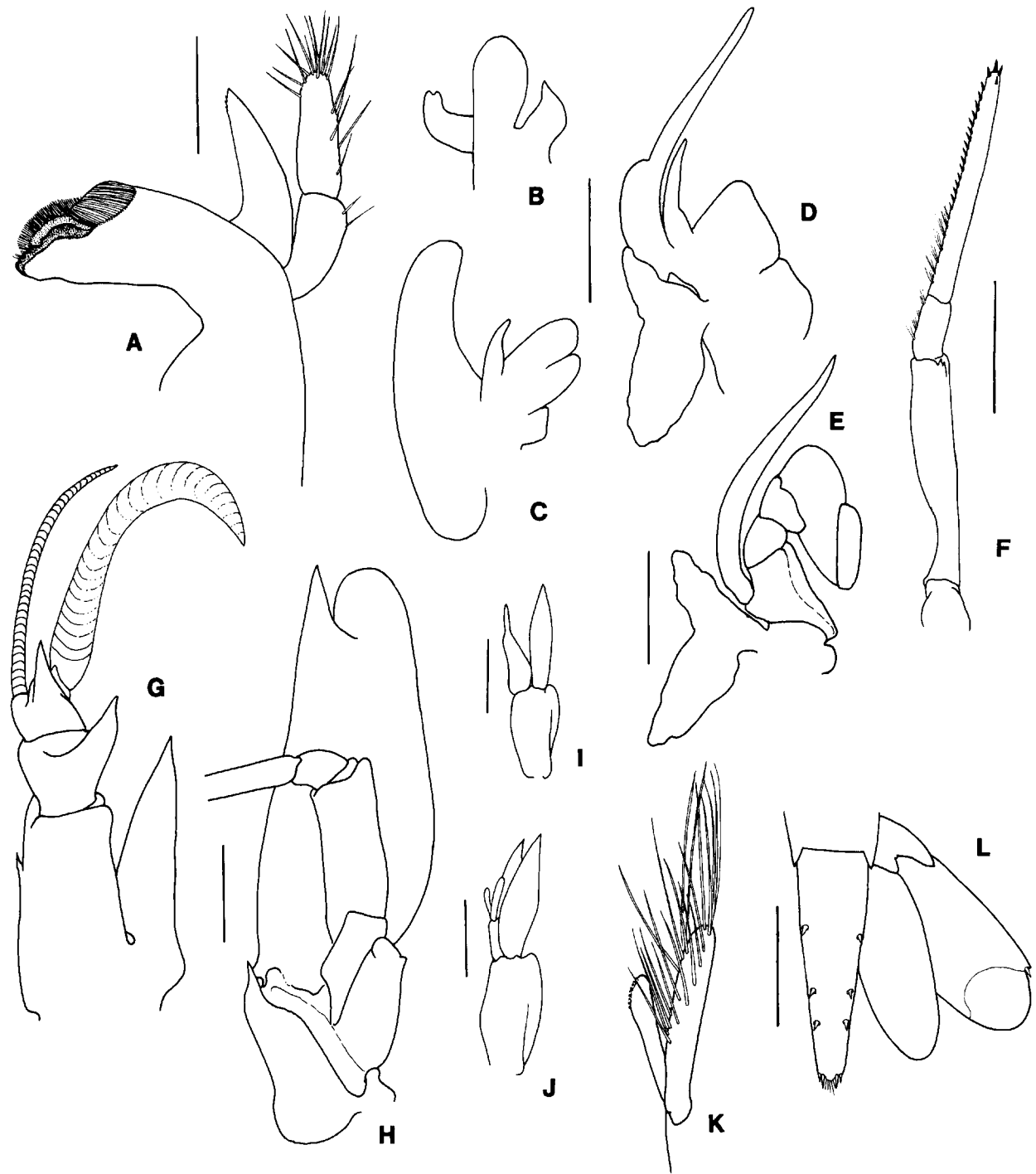


Fig. 15. *Lebbeus yaldwyni* n.sp. A, carapace in lateral view; B, abdomen in lateral view. *Lebbeus compressus* Holthuis: C, dorsal carapace of holotype; D, Specimen from Tosa, Japan, cl 8.9 mm. Rostral variation in *L. yaldwyni* n.sp. E-I, AM P26840; J, AM P24769; K, AM P26561. (Scales: A, B = 10 mm).



**Fig. 16.** *Lebbeus yaldwyni* n.sp. **A**, mandible; **B**, maxilla 1; **C**, maxilla 2; **D**, maxilliped 1; **E**, maxilliped 2; **F**, maxilliped 3; **G**, antenna 1; **H**, antenna 2; **I**, pleopod 1 ♂; **J**, pleopod 2 ♂; **K**, pleopod 2 ♂, appendix interna and appendix masculina enlarged; **L**, telson and right uropod. (Scales: A-E = 1 mm, F = 5 mm, G,H = 2 mm, I,J = 3 mm, L = 5 mm).

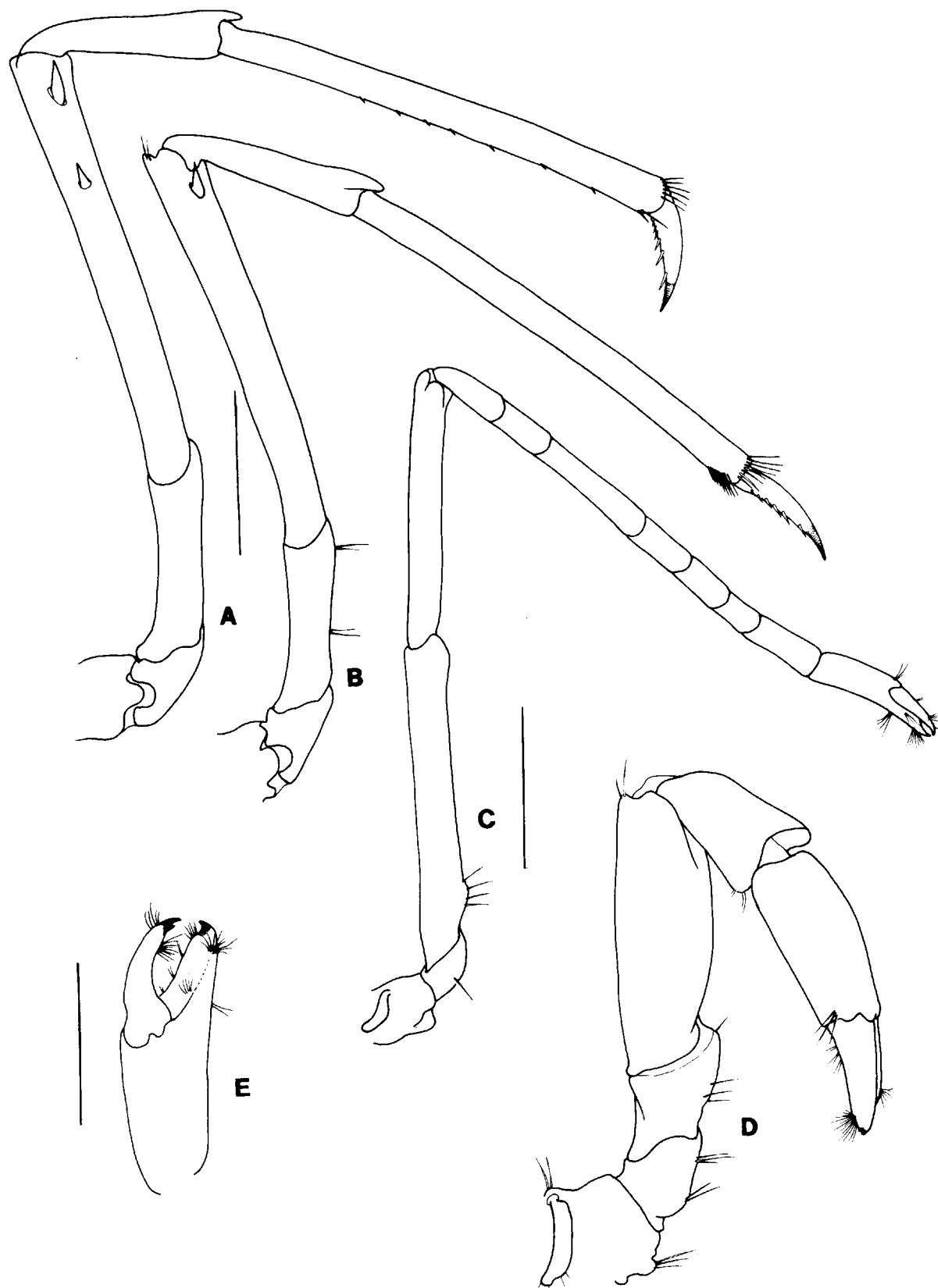


Fig. 17. *Lebbeus yaldwyni* n.sp. A, pereopod 3; B, pereopod 5; C, pereopod 2; D, pereopod 1; E, chela of pereopod 1. (Scales: A-E = 3 mm).

PARATYPES: AMP33109, east of Sydney, 33°43'S 151°51'—53'E, 450 m, *Kapala* (K77-04-13), 6 May 1977; 1 ovig. ♀, cl 11.7 mm. AM P24769, east of Batemans Bay, 34°44'S 150°37'E to 35°47'S 150°35'E, 420 m, *Kapala* (K76-11-08), 7 July 1976; 1 ♂, cl 5.1 mm. AM P21825, east of Sydney, 33°51'S 151°45'E to 33°47'S 151°48'E, 470 m, *Kapala* (K75-12-01), 11 Dec 1975; 1 ♀, cl 7.8 mm. AM P26840, east of Brush Island, 35°31'S 150°45'—47'E, 190 m, demersal prawn trawl, *Kapala* (K77-21-04), 22 Nov 1977; 5 ♀, cl 8.5—11.6 mm. USNM 221396, east of Brush Island, 35°31'S 150°45'—47'E, 190 m, *Kapala* (K77-21-04), 22 Nov 1977; 2 ♀, cl 11.0—11.3 mm.

**Diagnosis.** Carapace high-crested, dentate to posterior margin; rostrum a continuation of carapace crest, broad anterior to eye, apically variable from truncate-concave to acutely triangular, but reaching only short distance anterior to eye. Antennal, supra-orbital, and pterygostomial spine present, branchiostegal spine absent. Abdominal somites dorsally rounded. Mandibular palp of 2 articles. Maxilliped 3 lacking exopod. Pereopod 2, carpus of 7 articles. Pereopods lacking arthrobranchs.

**Description.** Carapace with broad dentate mid-dorsal crest extending almost from posterior margin onto rostrum, sloping anteroventrally; rostral-postrostral tooth count: 9—11/0—1. Rostrum variable, anteriorly obliquely truncate or hollowed, reaching almost to distal margin of basal antennular article. Carapace with single strong marginal supraorbital spine, marginal antennal spine, pterygostomial angle with rounded papilla (not quite a spine); lateral carapace with faint hepatic groove; low rounded suprbranchial ridge present.

All abdominal somites dorsally rounded. Pleura of somites 1—4 ventrally rounded, of somite 2 subcircular, of somite 4 elongate-oval; posteroventral angle of pleuron 5 acute. Somite 3 dorsally strongly hooded and curved, with rounded mid-dorsal suggestion of ridge in posterior three-fourths. Somite 5  $\frac{3}{4}$  length of somite 6. Latter with almost rectangular posteroventral corner; lobe overlapping lateral base of telson acute-spinose. Telson dorsally gently convex, with 3—5 pairs of dorsolateral spines, tapering to convex posterior margin bearing short outer, and longer inner pair of spines, with several fine setae between longer pair of spines.

Cornea of eye much wider than eyestalk, well pigmented.

Antennular stylocerite lanceolate, distally acute, extending well beyond distal margin of basal peduncular article. Distal margin of basal article bearing row of plumose setae; mesial margin with spine at distal two-thirds; second article with strong triangular spine at outer distal angle; third article with strong triangular spine directed anteriorly; inner flagellum slender, shorter than ventral flagellum; latter robust, tapering distally, of about 20 setigerous articles.

Antennal scaphocerite with outer margin almost straight, ending strong spine not extending beyond

rounded distal margin of blade; latter widest at proximal third; basal antennal article bearing strong ventral spine; flagellum extending posteriorly to level of third abdominal somite.

Mandibular palp of 2 articles, distal setose article slightly longer than proximal article; incisor flattened, slender, tapering to acute apex, bearing 4 or 5 fine distal serrations; molar stout, grinding surface oblique-truncate.

Maxilla 1, maxilla 2, maxilliped 1, and maxilliped 2 as figured.

Maxilliped 3 extending beyond scaphocerite by half length of distal article, distal article flattened, parallel-sided for most of its length, with single row of 19—20 corneous spines on mesial margin.

Pereopod 1 reaching distal  $\frac{2}{3}$  of scaphocerite, robust, fingers slightly shorter than palm; corneous acute tip of fixed finger fitting between 2 corneous apical spines of dactyl.

Pereopod 2 extending beyond scaphocerite by length of chela; carpus almost 1.75X length of merus, composed of 7 articles; ischium slightly longer than merus.

Pereopod 3 over-reaching scaphocerite by half length of propodus plus dactyl; dactyl with corneous apical spine and 6 smaller spines on flexor margin; propodus with 5 or 6 spines on distal half of flexor margin; carpus slightly less than half length of propodus, unarmed; merus with distal spine on outer surface, smaller spine at about distal two-thirds.

Pereopods 4 and 5 each extending anteriorly slightly less than pereopod 3, of similar proportions to pereopod 3, each with single distal spine on outer surface of merus.

Pereopods 1—5 each with single pleurobranch; epipod present on pereopods 1 and 2.

Uropodal basis with outer distal lobe apically narrowly rounded; outer ramus slightly longer than inner, with fixed marginal tooth and movable spine at about distal three-fourths.

**Colour.** Carapace with 4—6 curved lateral scarlet stripes running from ventral margin onto rostral-postrostral crest; latter with few additional stripes or blotches. Abdominal pleuron 1 with 3 broad bands; pleuron 2 with 2 bands; pleuron 3 with 1 band; somite 1 and 2 with single band running from pleuron; somite 3 with 3 bands. Remainder of abdomen pale pink-white. Bases of antennae, maxilliped 3, pereopod 1 up to carpus, and pereopods 2—5 bases orange red; distal articles of appendages transparent pink.

**Remarks.** From Holthuis' discussion (1947) of the species of *Lebbeus*, and Wicksten & Méndez' (1982) key to the eastern Pacific species, the present material would belong to the group possessing epipods on the first two pairs of pereopods. This group includes *L. brandtii* (Brazhnikov, 1907), *L. grandimanus* (Brazhnikov, 1907), *L. polaris* (Sabine, 1824) (= *L. unalaskensis* Rathbun, 1902), *L. scrippi*