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PONTONIINE SHRIMPS IN THE COLLECTIONS OF THE AUSTRALIAN MUSEUM

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SUMMARY

The report provides details of twenty four species of pontoniine shrimp in the collections of the Australian Museum, principally from the Great Barrier Reef region of Queensland. Two new species are described and illustrated, *Anchistus custoides* sp.nov., and *A. australis* sp.nov., both associates of bivalve molluscs. Seven species are also added to the Australian fauna. Twenty species are considered to be obligate commensals of other marine invertebrates and where possible the hosts are identified. An unusual post-larval specimen, ?*Araiopontonia* sp., associated with a crinoid, is also described and illustrated.

INTRODUCTION

The pontoniine shrimp fauna of Australia, including the Great Barrier Reef, has been little studied. Shrimps of this subfamily of the Palaemonidae are particularly abundant in tropical and subtropical waters and, with the shrimps of the family Alpheidae, form the dominant components of the caridean fauna of the coral reef biotope. They are also of special interest on account of their wide range of specialized adaptations to living in permanent associations with a wide range of invertebrate host animals.

Spence Bate (1863) was the first to record a pontoniine shrimp from Australian waters. He reported *Anchistia aesopius* (= *Periclimenes aesopius*) from St. Vincent's Gulf. Most of the Indo-West Pacific species of the subfamily have a wide distribution throughout the region, but *P. aesopius* has not been subsequently reported from any locality outside South Australia. It is probably a commensal species, but its host has not been recorded. The closely related *P. holthuisi* Bruce is associated with a variety of coelenterate taxa and a similar association for *P. aesopius* is probable. The restricted distribution in southern Australia suggests that it may be an endemic relict. Subsequently a few isolated reports concerning mainly single species appeared in the scientific literature, until, in 1966, Patton reported upon sixteen species associated with the Queensland branching corals. In 1968 McNeill reported upon the decapod crustacea from the Great Barrier Reef Expedition, 1928-29, but this included only eight species of the subfamily Pontoniinae (McNeill, 1968). Further records of new species, were reported in Bruce (1969a, 1969b, 1970a), and a further eight species were added to the Australia fauna in Bruce (1971). A small collection of pontoniine shrimps from the vicinity of Townsville was also reported upon by Bruce (in press a).

The present collection provides details of twenty five taxa in the collections of the Australian Museum, Sydney. All except four species are considered to be obligate commensals, and where possible, the hosts of these have been identified. The material was collected by the staff of the museum in the course of their investigations into the ecology of the coral reefs of Queensland. The measurements given refer to the post-orbital carapace length of the specimens (CL.) Full synonymies for most of the species are to be found in Holthuis (1952).

SPECIES CHECK-LIST

- Palaemonella** Dana, 1852
 1. *P. rotumana* (Borradaile, 1898)
 2. *P. pottsi* (Borradaile, 1915)
Periclimenes Costa, 1844
 3. *P. lutescens* auct.
 4. *P. grandis* (Stimpson, 1860)
 5. *P. elegans* (Paulson, 1875)
 6. *P. amymone* De Man, 1902
 7. *P. ceratophthalmus* Borradaile, 1915
 8. *P. longirostris* (Borradaile, 1915)
Anchistus Borradaile, 1898
 9. *A. custos* (Forsskal, 1775)
 10. *A. gravieri* Kemp, 1922
 11. *A. demani* Kemp, 1922
 12. *A. custoides* sp. nov.
 13. *A. australis* sp. nov., forma *typica*
 14. *A. australis* sp. nov., forma *dendricauda*
Philarius Holthuis, 1952
 15. *P. gerlachei* (Nobili, 1905)
Ischnopontonia Bruce, 1966
 16. *I. lophos* (Barnard, 1962)
Harpiliopsis Borradaile, 1915
 17. *H. depressa* (Stimpson, 1860)
Coralliocaris Stimpson, 1860
 18. *C. superba* (Dana, 1852)
 19. *C. venusta* Kemp, 1922
 20. *C. viridis* Bruce, 1974
Jocaste Holthuis, 1952
 21. *J. lucina* (Ortmann, 1890)
 22. *J. japonica* (Nobili, 1901)
Conchodytes Peters, 1852
 23. *C. tridacnae* Peters, 1852
 24. *C. meleagrinae* Peters, 1852
 Incertae sedis
 25. ?*Araiopontonia* sp.

SYSTEMATIC ACCOUNT

1. ***Palaemonella rotumana*** (Borradaile)

Restricted synonymy:

Periclimenes (Falciger) rotumanus Borradaile, 1898: 1005, pl. 63.

Periclimenes (Harpilius) rotumanus — McNeill, 1968: 7,22.

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

MATERIAL EXAMINED: 1 ovig. ♀, CL 2.2 mm, North East Cay, Herald Group, 9 November 1964. 1♂, CL 3.7 mm, One Tree Is., Capricorn Group, November 1966.

HABITAT/HOST: No data.

DISTRIBUTION: Common and widespread throughout the whole Indo-West Pacific region, and has extended its range through the Suez Canal into the western Mediterranean Sea. Type locality, Rotuma, Fijian Islands.

REMARKS: The specimens correspond closely to Kemp's redescription. The female has six dorsal and two ventral rostral teeth, with the posterior two teeth situated on the carapace. The male has seven dorsal rostral teeth, the most distal being subapical, and two ventral teeth. The rostrum distinctly exceeds the antennular peduncle in the male, but is slightly shorter in the female. The post-orbital ridge is well marked in both specimens but bears no trace of the characteristic small tubercle reported by Kemp. The female specimen lacks both the second pereopods, which are present in the male and show a strong acute terminal spine on the distal dorsal border of the carpus, with a smaller blunter angulation medially. The female carried only 15 undeveloped ova, maximum length 0.5 mm.

The first record of this common species in Australian waters appears to be that of McNeill (1968) from the Low Isles, as *Periclimenes rotumanus*. This specimen has been re-examined and the presence of the mandibular palp confirmed. This species has also been recorded from Moreton Bay, Queensland.

2. ***Palaemonella pottsi* (Borradaile)**

Restricted synonymy:

Periclimenes (Falciger) pottsi Borradaile, 1915: 213; 1917, 374.

Periclimenes pottsi — Potts, 1915: 75, 81, 82.

Palaemonella pottsi — Kemp, 1922: 126-127. Holthuis, 1952: 7. Johnson, 1961: 57-58, 62, 63, 75, tab. 1. Bruce, 1970: 279-284, figs. 1, 3-7, pl. 1 figs. a-d.

MATERIAL EXAMINED: 1♂, CL 3.6 mm, One Tree Island, 140 ft, 28 November 1966, coll. F. Talbot.

HOST — *Comanthina schlegeli* (P. H. Carpenter) (Echinodermata: Crinoidea).

DISTRIBUTION: Type localities, Mabuig and Murray Island, Torres Strait. Also recorded from Singapore, New Caledonia, the Marshall Islands, Zanzibar and Kenya.

REMARKS: This specimen has been previously referred to in Bruce (1970). The rostrum bears eight well developed dorsal and three ventral rostral teeth, the two posterior dorsal teeth being situated on the carapace. All pereopods are detached but all except one of the first pereopods are present.

Potts reported that this species was abundant at Murray Island but scarce at Mabuig. The specimens were found in association with a *Comanthus* sp. In the case of the present specimen, a post-larval juvenile of *Araipontonia* sp. (see below) was found in association on the same host.

3. ***Periclimenes lutescens* auct.**

Restricted synonymy:

?*Harpilius lutescens* Kemp, 1922: 229 (key), 235-237, figs. 72-73.

Periclimenes (Harpilius) lutescens — Patton, 1966: 275, 288 (tab. 1), 290 (tab. 2).

Periclimenes lutescens — Bruce, 1971a: 2, 5; 1972: 409, 411, 412 (key), fig 1a; 1975: 27, fig. 15.

MATERIAL EXAMINED: 1 juv. ♀, CL 2.1 mm, Gillett Cay, Swains Reefs, October 1962.

HOST: *Seriatopora* sp. (Scleractinia)

DISTRIBUTION: Kemp reported upon specimens from the Red Sea, recorded by Tattersall (1921) as *Harpilius depressus*. The type locality for Dana's *Harpilius lutescens* s. str., is Tongatabu, Tonga Islands. Also recorded from Madagascar, Comoro and Seychelle Islands, Zanzibar, Tanganyika and Kenya in the Indian Ocean. Also from Singapore, Indonesia and Japan (as *P. amamiensis* Kubo). First recorded from the Great Barrier Reef by Patton (1966) from Restoration Rock, Heron Island and Wistari Reef.

REMARKS: The association with *Seriatopora* is unusual for this species, which is normally associated with corals of the genus *Acropora*. In other pontonine species, juveniles may occasionally be found in what must be considered as atypical hosts, but Patton's Willis Island specimens were also associated with *S. hystrix* (Dana).

The rostrum has seven dorsal and two ventral teeth and extends well beyond the antennular peduncle and also exceeds the scaphocerite. A distinct median spine is present ventrally on the fourth thoracic sternite. The dorsal telson spines are robust, the anterior pair at the middle of the telson length and the posterior pair at 0.75 of the telson length. The tip of the telson slightly exceeds the endopods of the uropods. The fingers of the second pereopods are not particularly bent inwards as described by Kemp and the dentition of the cutting edges is more feeble than shown in his illustration.

4. **Periclimenes grandis** (Stimpson)

Restricted synonymy:

Anchistia grandis Stimpson, 1860: 34.

Periclimenes (Ancylocaris) grandis — Kemp, 1922: 171 (key), 210-214, figs. 58-59, pl. 7 fig. 10.

Periclimenes (Harpilius) grandis — Holthuis, 1952: 11, 79-81.

MATERIAL EXAMINED: 2♀ (1 ovig.), CL 3.5 mm, Picnic Bay, Magnetic Island, 1 November, 1964.

HABITAT: Under dead coral, on sandy mud flat.

DISTRIBUTION: Type locality, Oshima, Japan. Common and wide-spread in the Indian Ocean and western Pacific Ocean to Indonesia and Japan. Not previously recorded from Australian waters.

REMARKS: The non-ovigerous female is infected by a hemiarthrinid bopyrid parasite.

5. **Periclimenes elegans** (Paulson)

Restricted synonymy:

Anchistia elegans Paulson, 1875: 113, pl. 7 fig. 1.

Periclimenes (Ancylocaris) elegans — Kemp, 1922: 171 (key), 215-218, figs. 60-63.

Periclimenes (Ancylocaris) elegans var. *dubius* — McNeill, 1926: 300.

Periclimenes (Harpilius) elegans — Holthuis, 1952: 11, 81-82, fig. 31. McNeill, 1968: 7, 22.

MATERIAL EXAMINED: 1♂, 1 ovig. ♀, 5 juv., CL 3.8, 3.8, 1.4-2.5 mm, West Cay, Diamond Islets, 24 November 1964.

HABITAT: No data.

DISTRIBUTION: Type locality, Red Sea. Common in the Indian Ocean, Indonesia, to the Palau Islands. Previously recorded from the Low Isles and Northwest Islet in Queensland by McNeill (1926, 1968).

REMARKS: This species is only doubtfully distinct from *P. grandis* (Stimpson), the differences in the armament of the carpus of the second pereopod are probably mainly due to changes resulting from growth after autotomy.

6. ***Periclimenes amymone* De Man**

Restricted synonymy:

Periclimenes amymone De Man, 1902: 829-833, pl. 25 fig. 53.

Periclimenes (Harpilius) amymone — Holthuis, 1952: 10, 82-83, fig. 32. Patton, 1966: 273, 288 tab. 1, 290 tab. 2, 291 tab. 3.

MATERIAL EXAMINED: 1 ovig. ♀, CL. 2.4 mm, no data. 1♂, One Tree Island, November 1966.

HABITAT/HOST: No data.

DISTRIBUTION: Type locality, Ternate, Indonesia. Also recorded from the Nicobar Islands, New Caledonia and Samoa. Recorded from Bet Reef, Restoration Rock, Heron Island, Wistari Reef and Moreton Bay, Queensland, by Patton (1966).

REMARKS: Of the shrimps studied by Patton (1966), this species was the only coral commensal to be found normally in association with both acroporid and pocilloporid corals. The ovigerous female carried 61 ova, greatest length 0.48 mm.

7. ***Periclimenes ceratophthalmus* Borradaile (Fig. 1.)**

Restricted synonymy:

Periclimenes ceratophthalmus Borradaile, 1915: 211; 1917: 324, 365, pl. 54 figs. 9a-b. Bruce, 1974: 192-193, fig. 2.

Periclimenes (Periclimenes) ceratophthalmus — Kemp, 1925: 325-325, fig. 18. Holthuis, 1952: 8, 56-57, fig. 20. Miyake & Fujino, 1968: 402-403, 431, fig. 2a-d.

MATERIAL EXAMINED: 1♂, CL. 2.4 mm, One Tree Island, Capricorn Group, 28 November 1962.

DESCRIPTION: A slender elongated shrimp with smooth carapace and abdomen.

The rostrum is long and slender, extending slightly beyond the antennular peduncle. The dorsal margin is convex and bears three small acute teeth on the distal quarter. The ventral margin is also convex but devoid of teeth. The midrib is well developed and is expanded and concave posteriorly where it is continuous with the superior orbital margin. The superior orbital margin is a broad lamina and bears a large acute supra-ocular spine. The inferior orbital angle is blunt and slightly produced. The antennal spine is small and slender and directed upwards, arising from the anterior margin of the carapace close to the inferior orbital angle. The lateral margin of the orbit is distinct and is continuous with the hepatic spine which is situated close to the antennal spine. The hepatic spine is directed anteriorly and is larger and more robust than the antennal spine. The antero-lateral margin of the carapace is not produced and is bluntly rounded.

The third abdominal segment is not produced posteriorly in the dorsal midline. The fifth segment is 0.6 times the length of the sixth, which is 1.2 times longer than its average depth. The posterior angle is well produced and acute. The postero-lateral angle is less markedly produced and blunter. The pleura of the first five segments are rounded. The telson is 1.6 times the length of the sixth abdominal segment. The tip is slightly damaged. The

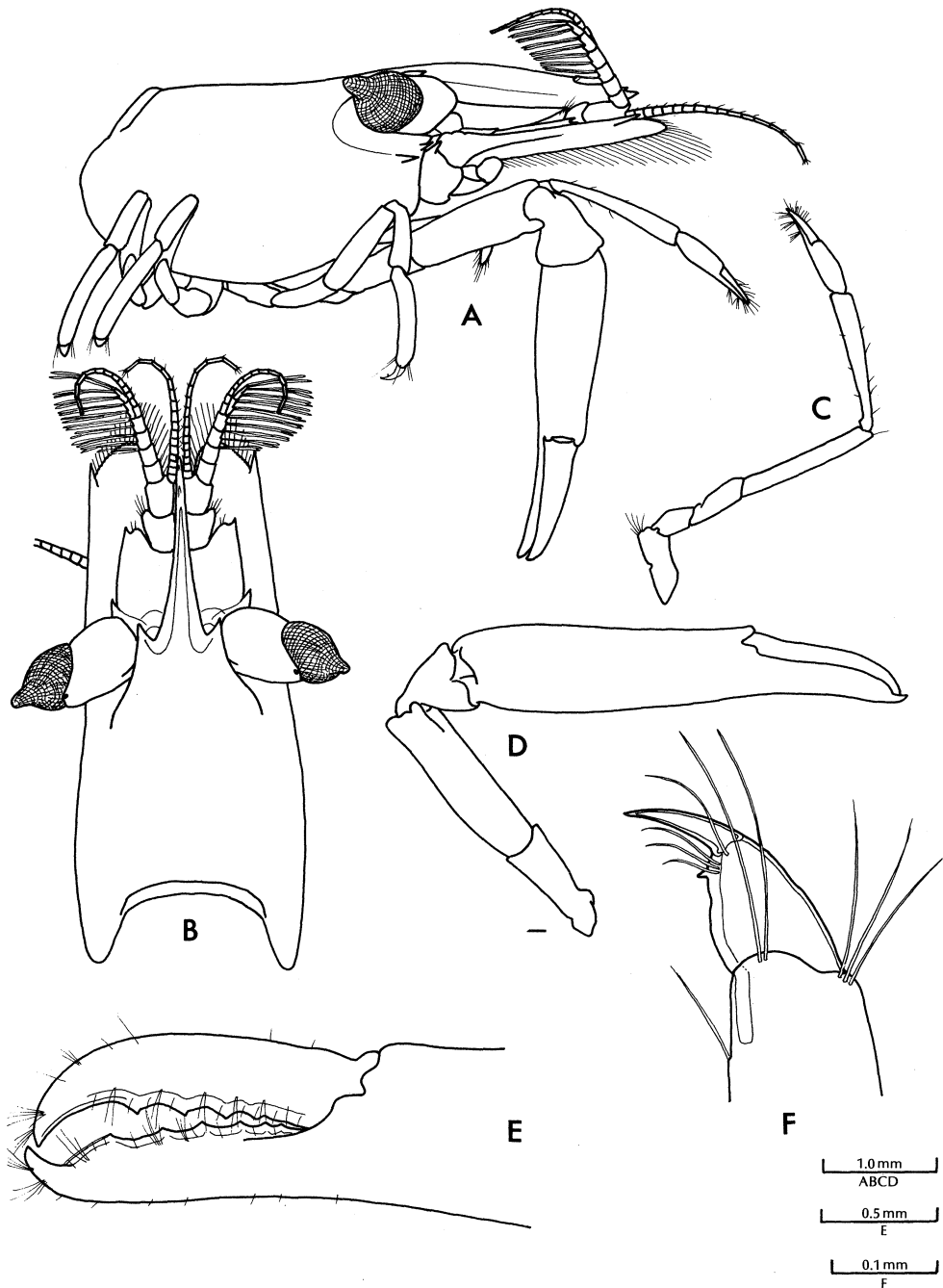


Fig. 1. *Periclimenes ceratophthalmus* Borradaile, male. A, carapace and appendages, lateral view. B, dorsal view. C, first pereiopod. D, second pereiopod. E, fingers of second pereiopod. F, dactylus of ambulatory pereiopod.

anterior pair of dorsal spines are situated close to the lateral margin of the telson at about the middle of its length. The posterior dorsal spines lie halfway between the anterior pair and the tip of the telson. The dorsal spines are slightly smaller than the lateral posterior telson spines. The intermediate spines are long and robust, distally blunt and equal to about one quarter of the length of the telson. The submedian spines are about half the length of the intermediate spines and are slender, acute and non-setose. The lateral spines are about 0.2 times the length of intermediate spines.

The antennular peduncle is exceeded by the rostrum and reaches the level of the base of the antero-lateral spine of the scaphocerite. The proximal segment is about twice as long as wide. The stylocerite is well developed and acute, reaching to about the middle of the medial border of the segment. The antero-lateral margin is strongly produced and reaches to a level of 0.6 of the length of the intermediate segment of the peduncle. The antero-lateral lobe bears a medial lobe and a small lateral tooth. The intermediate and distal segments are subequal in length and equal to about two-thirds of the length of the basal segment. The intermediate segment has a well developed antero-lateral lobe. The lower antennular flagellum is short and filiform, consisting of fifteen cylindrical segments. The upper and lower rami of the upper flagellum are fused proximally for four segments. The shorter free ramus consists of two segments and the longer ramus of twelve segments. There are ten groups of aesthetascs.

The antennal flagellum is well developed and extends to the base of the telson. The carpoperite is subcylindrical and short, reaching to a point halfway between the tip of the stylocerite and the proximal end of the intermediate segment of the antennular peduncle. The merocerite and ischiocerite are normal and the basicerite bears a small acute dorso-lateral spine. The scaphocerite bears a large slender disto-lateral tooth. The lateral margin is straight. The lamella extends beyond the disto-lateral tooth and exceeds the tip of the rostrum, and is bluntly angled.

The eyes are well developed with large globular corneae that are produced distally to form a conoidal process. The cornea is situated obliquely on the eyestalk which is about 1.5 times longer than wide. A distinct accessory pigment spot is present close to the dorso-lateral corneal margin.

The mouthparts have not been dissected.

The first pereopod is slender and exceeds the scaphocerite by the chela and the distal quarter of the merus. The fingers of the chela are slender with entire cutting edges, and equal to 0.8 of the length of the palm. The carpus is 1.3 times the length of the chela and is broader distally than proximally. The merus is subequal to the carpus. The ischium is half the length of the merus and the basis is two-thirds of the length of the ischium. The coxa lacks a medial process. The second pereopods are well developed and robust. The chelae are similar but unequal, (64 : 50). The palm of the major chela is sub-cylindrical, slightly swollen proximally. The fingers are stout and equal to slightly more than half the length of the palm, (22 : 42). The dactylus is curved and the posterior two-thirds of the cutting edge bears four low acute teeth. The anterior part, which is entire, fits into a notch between the strongly hooked tip and the cutting edge of the fixed finger. The posterior three quarters of the cutting edge of the fixed finger bears a series of six teeth, which decrease in size proximally. The carpus is short, stout and unarmed, equal to about one fifth of the length of the chela. The merus is equal to two fifths of the length of the chela. It is flattened proximally and the upper and lower distomedial regions are produced as blunt lobes. The ischium is flattened and equal to two thirds of the length of the merus. The minor second pereopod is generally similar to the major, apart from the smaller size of the carpus and chela, in which the fingers are equal about four-fifths of the length of the palm (22 : 28). The fingers are more slender and more feebly armed. The ambulatory pereopods are moderately robust. In the third pereopod the dactylus is short and stout, curved, with a distinct unguis. A small accessory spine is present on the posterior border close to the base of the unguis. Several

setae arise from the disto-lateral aspect of the dactylus. The propodus is 5.4 times longer than wide, tapering slightly, with a few long setae distally. The lengths of the segments from dactylus to ischium are in the ratios, 10:42:26:40:31. All segments are unarmed. The sternite of the fourth thoracic somite lacks a median process.

The uropods extend posteriorly beyond the tips of the telson spines. The rami are narrow and the exopod slightly exceeds the endopod. The lateral margin of the exopod is feebly convex and bears a large mobile distal spine.

HOST: *Himerometra robusta* (P. H. Carpenter) (Echinodermata, Crinoidea).

DISTRIBUTION: Type locality, Hulule, Male Atoll, Maldive Islands. Subsequently recorded from the Maldive Islands by Kemp (1925), Indonesia and Palau. Reference to the occurrence of this species in the Torres Straits in Bruce (1974) is erroneous, and refers to *P. commensalis*. Also recorded recently from Zanzibar, Kenya and the Seychelle Islands.

REMARKS: A considerable amount of minor morphological variation appears to occur in this species. Borradaile's description is brief and the illustrations incomplete. The holotype is now without the ambulatory pereopods (Goodhart, *in litt.*) and the morphology of the dactylus of the walking legs is not known. In the present material and that of Fujino and Miyake from Palau, the accessory spine is very small, but the material from Farquhar (Bruce, 1974) and Kemp's specimen from the Maldive Islands show a large acute accessory spine. Kemp also notes that the dactylus is partly concealed by long setae on the distal end of the propod but these are not present in the Palau or One Tree Island specimens. The shape of the conoidal projection of the cornea is also subject to variation, but only Kemp's and Holthuis's material show the extreme form where the total length of the cornea is equal to that of the eyestalk, which is more than twice as long as wide. Holthuis (1952) has noted that, in his Indonesian specimen, the dorsal telson spines are particularly small, and this is apparently also found in the Palau material but clearly not present in the specimens from Farquhar or One Tree Island. The single Australian specimen appears to be most similar to the specimens from Palau.

8. *Periclimenes longirostris* (Borradaile)

Restricted synonymy:

Palaemonella longirostris Borradaile, 1915: 210; 1917: 323, 357, 359, pl. 53 fig. 5.

Periclimenes (Ancylocaris) proximus Kemp, 1922: 171 (key), 201-204, (51-53, figs.)

Periclimenes (Harpilius) longirostris — Holthuis, 1958: 3-6, fig. 1.

MATERIAL EXAMINED: 1♀, CL. 2.0 mm, North East Cay, Herald Group, 9 November 1964.

DISTRIBUTION: Type locality, Salomon Island, Fadiffolu Atoll, Maldive Islands. Subsequently recorded from the Red Sea, Maldive Islands, Seychelle Islands, Andaman Islands, and Papua. Not previously recorded from Australian seas.

REMARKS: The single example agrees well with the descriptions of Kemp (1925) and Holthuis (1958). The rostrum has eight dorsal and two ventral teeth. The two posterior dorsal teeth are situated on the carapace and the distal dorsal tooth is subapical. A slender median spine is present ventrally on the fourth thoracic sternite. The fourth and fifth pairs and the right third pereopods are lacking. In the second pereopods the relative proportions of the segments are: —

	dactyl	propod	carpus	merus	ischium
left	50	125	77	67	60
right	48	117	76	68	60

The cutting edge of each finger bears a pair of feebly developed teeth.

9. **Anchistus custos** (Forsskål)

Restricted synonymy:

Cancer custos Forsskal, 1775: 94

Anchistus inermis Miers, 1884: 291, pl. 32B. Rathbun, 1914: 656. Hedley, 1924: 146. Hale, 1927: 47, fig. 52.

Anchistus custos — Holthuis, 1952: 13, 105-109, figs. 33-34. McNeill, 1968: 7, 21. Bruce (in press a).

MATERIAL EXAMINED: 1 ovig. ♀, CL. 6.1 mm, Gillett Cay, Swains Reefs, 1962.

HABITAT/HOST: Not recorded.

DISTRIBUTION: Type locality, Lohei, Red Sea. Widespread and common in the Indo-West Pacific from the Red Sea and Mocambique to Fiji. Previously recorded in Australian waters from the Monte Bello Islands, Sharks Bay, St. Vincent's Gulf, Port Molle, Bowen and the Low Isles.

REMARKS: The specimen agrees precisely with the published descriptions except that of Kubo (1940). Previous Australian records of the species from St. Vincent's Gulf, Bowen and the Low Isles report the association of this species with bivalve molluscs of the genus *Pinna*.

The thoracic sternites are broad. The fourth is unarmed and the fifth forms a low transverse ridge posteriorly to the coxae of the second pereopods. The dorsal surface of the dactylus of the ambulatory pereopods is quite smooth and the dorsal telson spines are minute. The cannulate chela of the first pereopod is well developed and there is no trace of any rostral teeth. The ova are numerous and small, about 0.42 mm. in length.

10. **Anchistus gravieri** Kemp. (Figs. 2-3).

Anchistus gravieri Kemp, 1922: 249 (key), 252-255, figs. 82-84. Holthuis, 1952: 13.

nec Anchistus gravieri — McNeill, 1953: 89.

MATERIAL EXAMINED: 3 pairs, 21 October 1964; 26, 3 ovig. ♀, 24 October 1964; West Cay, Diamond Islets. 1 ovig. ♀, North East Cay, Herald Group, 12 November 1964.

MEASUREMENTS: CL. males 2.5-4.1 mm; females 3.7-8.0 mm. Smallest ovigerous female 6.1 mm.

HOST: *Hippopus hippopus* (L.) (Lamellibranchia, Tridacnidae).

DISTRIBUTION: Type locality, Vanikoro, Santa Cruz Islands.

REMARKS: This species is previously known only from the type material. The specimen referred to this species by McNeill (1953) has been re-examined and found to have a mobile hepatic spine, belonging therefore to the genus *Paranchistus* Holthuis, and the pair of specimens, obtained from *Pinna* sp., should be referred to *P. nobilii* Holthuis.

The specimens agree well with Kemp's original description but some small differences may be noted. In these Australian specimens the number of dorsal rostral teeth shows some variation; males: 3(3), 4(1), females: 2(4), 3(3). In one female the antennal spine was lacking from one side of the carapace. Kemp also reports that the basicerite bears a small tooth but this was not present in any of the specimens examined. Kemp reports that the fingers of the first pereopods are somewhat subspatulate. In the present specimens the fingers of the first pereopods are strongly subspatulate or even spatulate and have finely pectinate cutting edges. The dactyls of the ambulatory pereopods also have a very clearly defined unguis, the proximal margin of which is not shown in Kemp's figure. The holotype of Kemp's species is preserved in the collections of the Museum National d'Histoire Naturelle and, through the

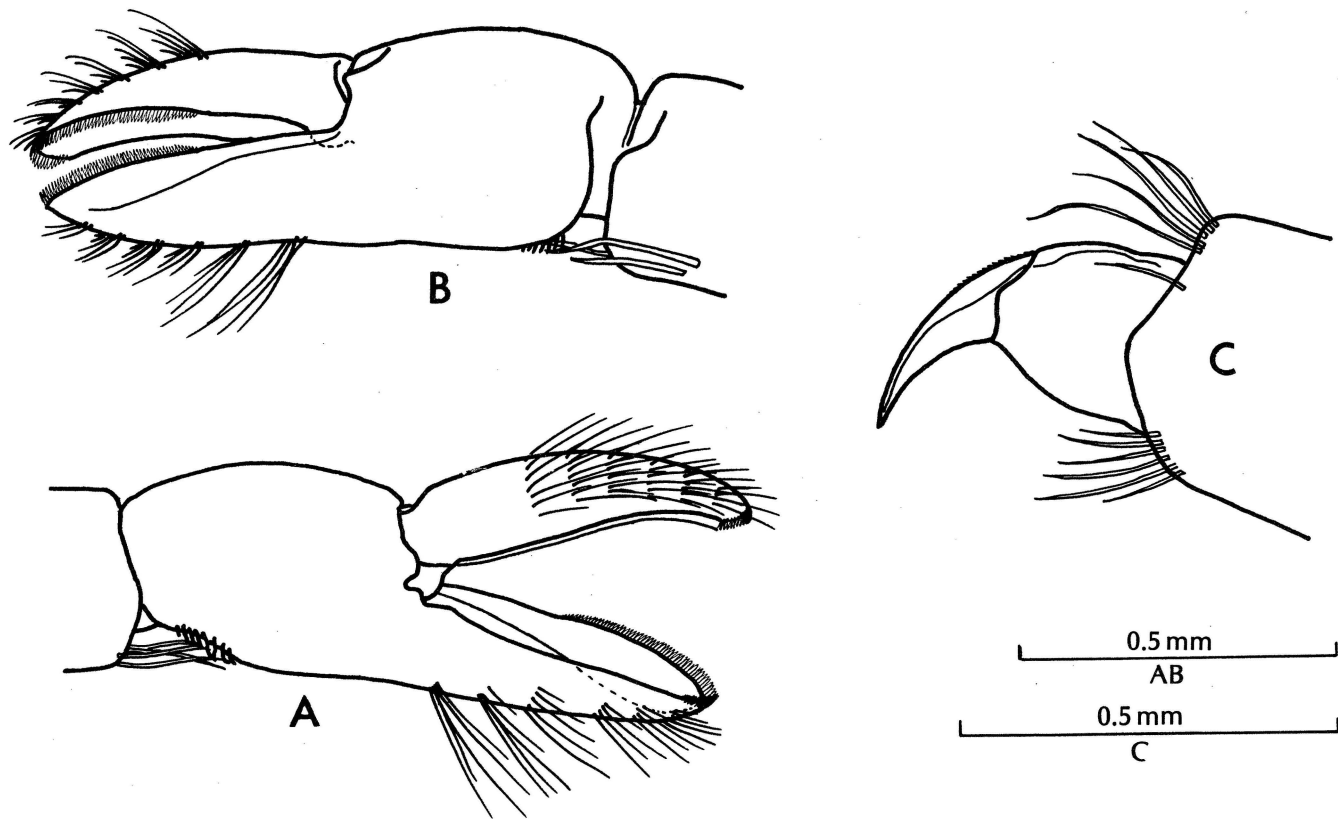


Fig. 2. *Anchistus gravieri* Kemp, holotype. A, chela of first pereiopod, medial view. B, lateral view. C, dactylus of ambulatory pereiopod.

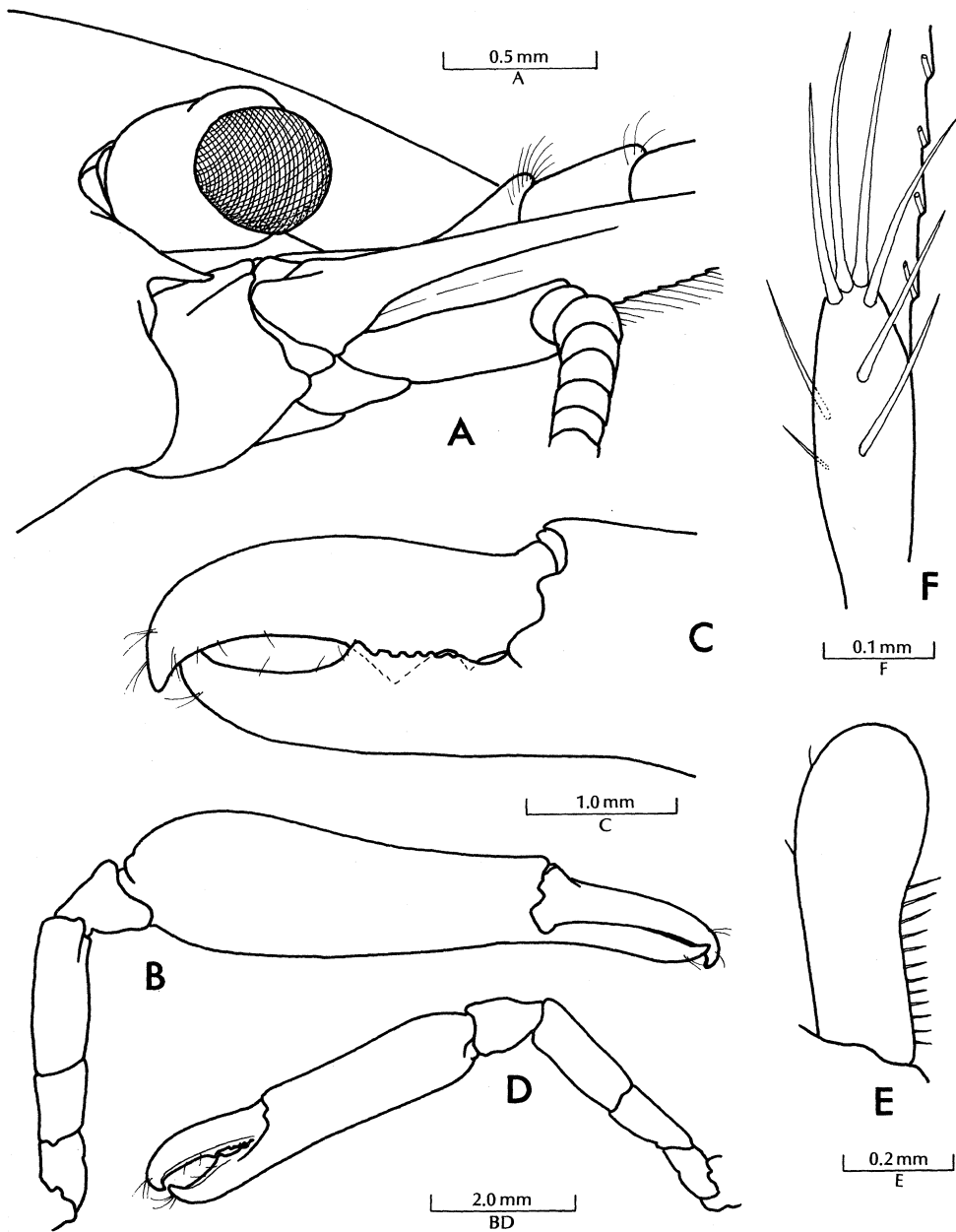


Fig. 3. *Anchistus gravieri* Kemp. A, anterior carapace and proximal antennal segments, female. B, major second pereiopod, male. C, fingers of male major chela. D, minor second pereiopod, male. E, endopod of male first pleopod. F, appendix masculina.

courtesy of Dr. J. Forest, has been re-examined, the pereopods being found to agree exactly with those of the Australian specimens. *Anchistus miersi* (De Man), usually found in association with *Tridacna squamosa*, has also been reported in association with *Hippopus hippopus* in the Marshall Islands by Holthuis (1953) and Fankboner (1972).

11. ***Anchistus demani* Kemp**

Restricted synonymy:

Anchistus demani Kemp, 1922: 249 (key), 256-259, figs. 86-88.

MATERIAL EXAMINED: 1♂, CL. 3.1 mm, One Tree Island, Capricorn Group, December, 1966.

HOST: *Tridacna maxima* (Röding) (Lamellibranchia, Tridacnidae).

DISTRIBUTION: Type locality, Port Blair, Andaman Islands. Also recorded from the Marshall Islands, Thailand, the Seychelle Islands, Zanzibar, Kenya and Madagascar. Not previously recorded from Australian waters.

REMARKS: This species has been previously recorded in association with *Tridacna maxima*, which appears to be the typical host.

The rostrum is more obliquely truncate than shown in Kemp's illustration and the pair of teeth are relatively slightly smaller. The inferior orbital angle is also less produced. In all other respects the specimen agrees exactly with Kemp's description. In addition, it may be noted that the fourth thoracic sternite is unarmed and that the posterolateral angle of the protopodite of the uropod is bluntly angled and not acute as in *A. miersi* (De Man).

12. ***Anchistus custoides* sp. nov.** (Figs. 4-6)

Anchistus inermis — Kubo, 1940: 48-51, figs. 15-17.

?*Anchistus custos* — Miyake & Fujino, 1968: 415-417, 431 tab. 1.

MATERIAL EXAMINED: 1♂, 1 ovig. ♀, CL. 5.2, 9.1 mm, Gillett Cay, Swains Reefs, October 1962. 1♂, 1 ovig. ♀, CL. 3.9, 7.0 mm, One Tree Island, Capricorn Group, November 1966.

DESCRIPTION: The body is robust, with a smooth carapace and rostrum, markedly swollen in the females. The rostrum is broad proximally, compressed distally, and also depressed, especially in the females. The rostrum is rounded distally and reaches to a level between the proximal and distal margins of the intermediate segment of the antennular peduncle. The midrib is feebly developed and is continuous posteriorly with the orbital margin. The anterior fourth of the upper margin is blunt and bears four minute teeth in both sexes and the anterior extremity bears one or two minute teeth in the females and two to four in the males. The ventral margin of the rostrum is sharp and generally convex. The inferior orbital angle is bluntly produced. A small acute antennal spine arises from the anterior margin of the carapace well below the level of the inferior orbital angle. Supra-orbital and hepatic spines are absent. The antero-lateral angle of the carapace is broadly rounded.

The third abdominal segment is not posteriorly produced in the dorsal midline. The pleura of the first five segments are broadly rounded. The sixth segment is about 1.4 times as long as the fifth and 1.6 times longer than its depth anteriorly. The posterior ventral angle is pointed and the posterior lateral angle is acutely produced. The telson is about 1.5 times as long as the sixth abdominal segment, about 2.5 times longer than its width anteriorly. The lateral margins are feebly convex and the distal margin is broadly rounded. There are two pairs of well developed dorsal spines, which are slightly longer than the lateral terminal spines. The anterior pair is situated at the beginning of the posterior third of the telson length and the posterior pair lies half way between the anterior pair and the posterior margin. There are three pairs of short robust terminal spines. The lateral pair are about half the length of the intermediate pair, which are swollen except for the distal fourth. The

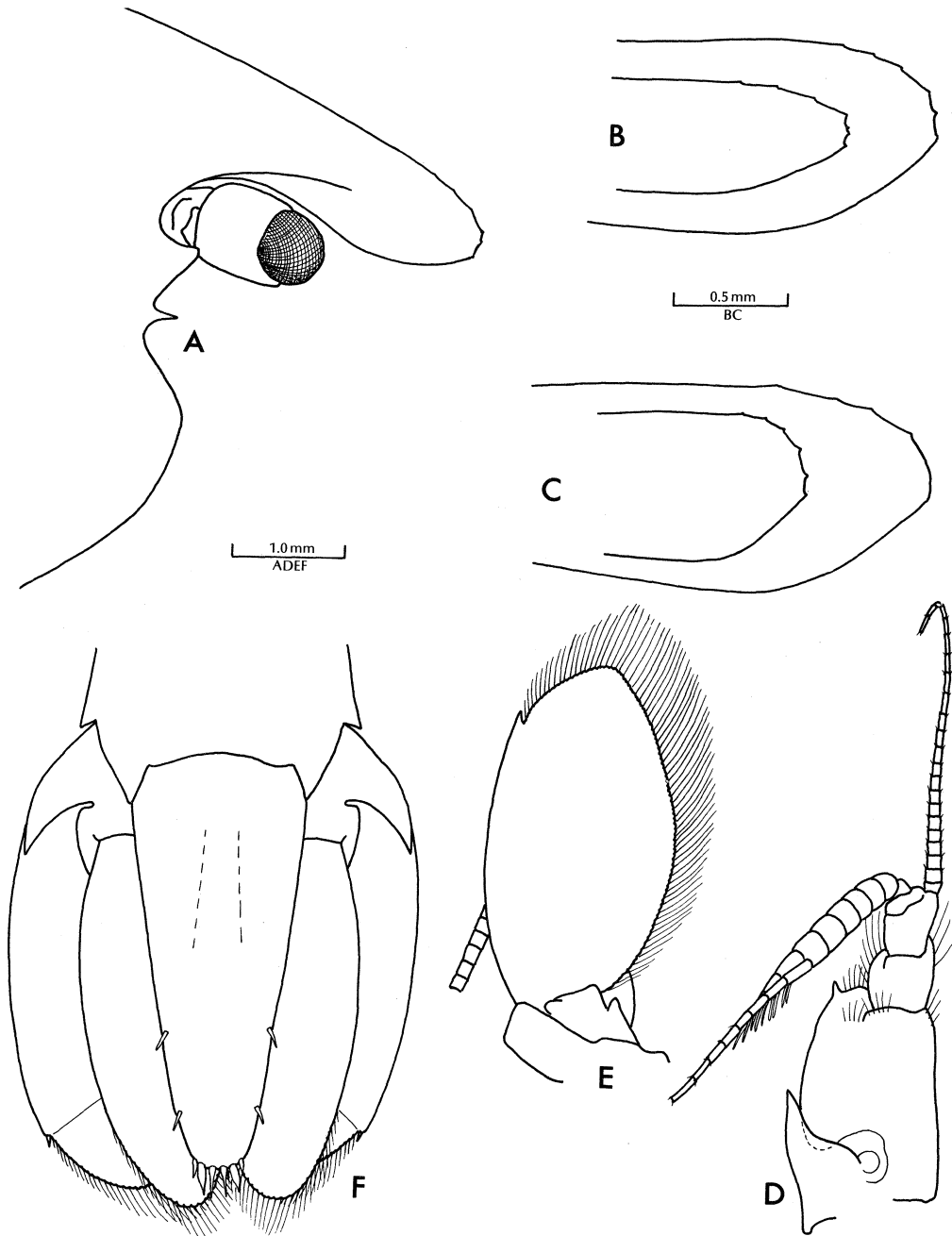


Fig. 4. *Anchistus custoides* sp. nov., A, anterior region of carapace, lateral aspect, female. B, tips of rostra of West Cay pair. C, tips of rostra of One Tree Island pair. D, antennule. E, antenna. F, uropods and telson.

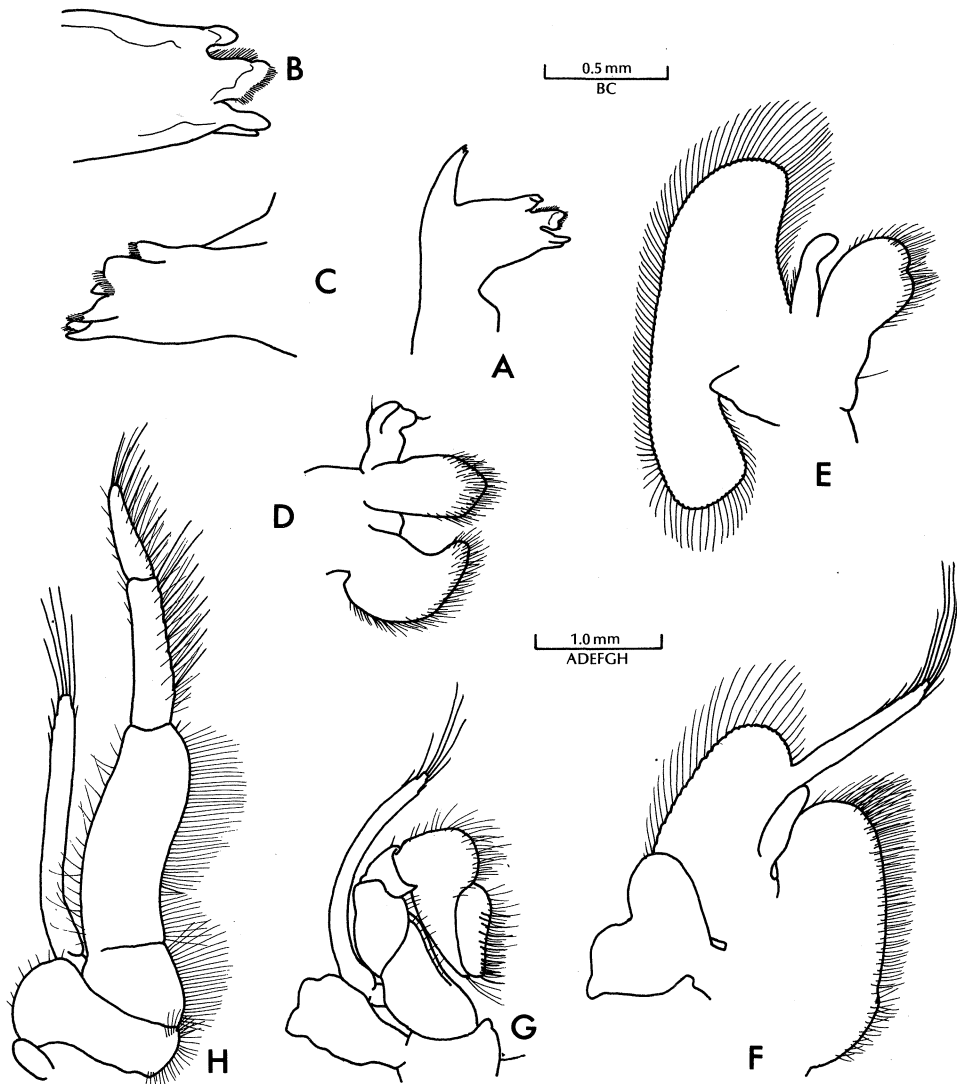


Fig. 5. *Anchistus custoides* sp. nov., A, mandible. B, molar process, ventral view. C, dorsal view. D, maxillula. E, maxilla. F, first maxilliped. G, second maxilliped. H, third maxilliped.

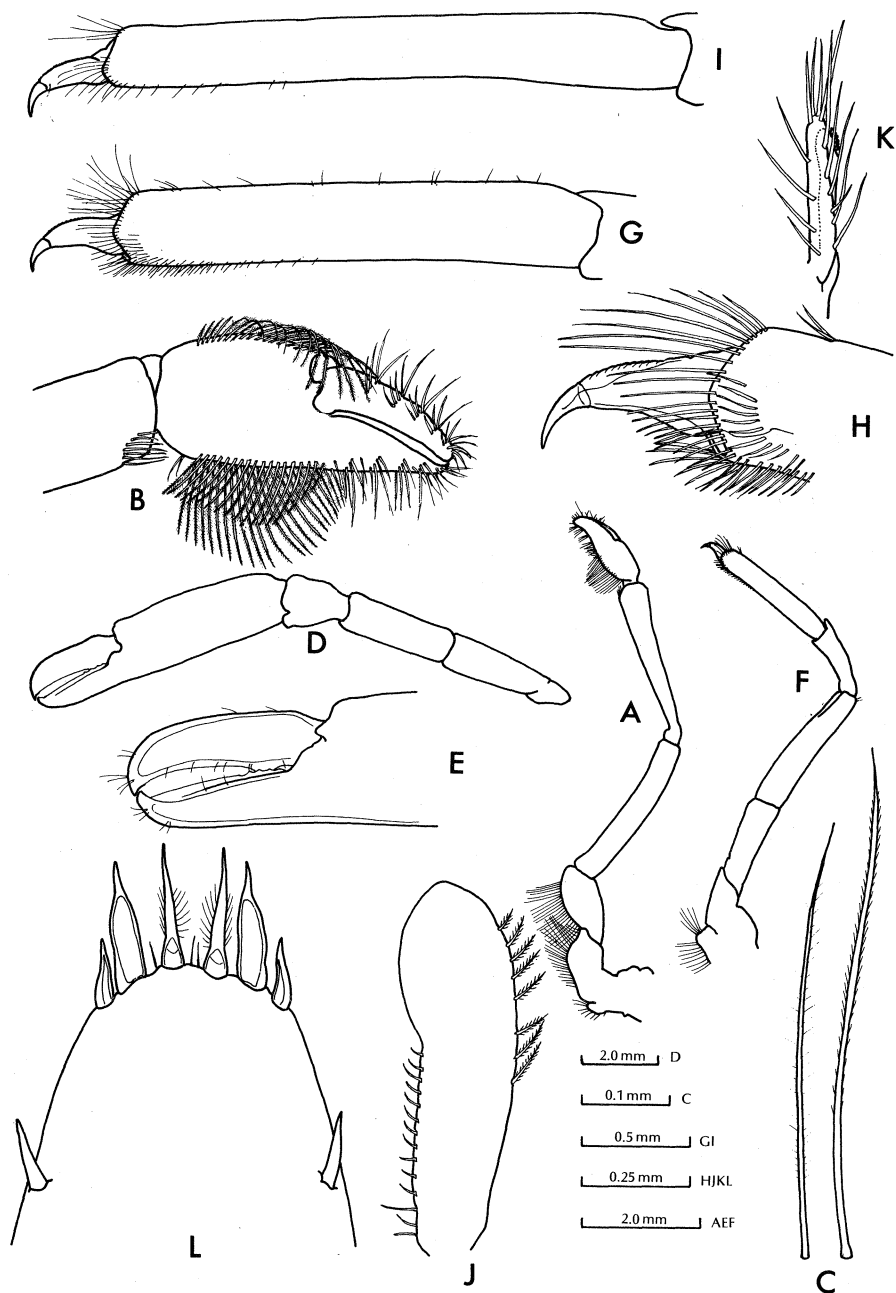


Fig. 6. *Anchistus custoides* sp. nov., female. A, first pereiopod. B, chela of first pereiopod. C, setae from chela of first pereiopod, from palm (left) and fingers (right). D, second pereiopod. E, fingers of second pereiopod. F, third pereiopod. G, dactylus and propodus of third pereiopod. H, dactylus of third pereiopod. I, dactylus and propodus of fifth pereiopod. J, endopod of male first pereiopod. K, appendix interna and appendix masculina. L, tip of telson, female.

submedian spines are also robust but not swollen, slightly shorter than the intermediate spines and sparsely setose. The terminal spines are slightly longer and more slender in the males than in the females.

The eyes are well developed but small. The cornea is hemispherical and lies slightly obliquely on the eyestalk. A small accessory pigment spot is present. The eyestalk is subcylindrical and equal in length to about twice the diameter of the cornea.

The basal segment of the antennular peduncle is broad, one and a half times longer than wide. A well developed broad, acute stylocerite is present, reaching to the level of the middle of the basal segment. The lateral border is convex and the antero-lateral border is produced and bears a small slender acute tooth disto-laterally. A small acute tooth is present halfway along the ventral surface of the medial border. The intermediate and distal segments are stout and subequal, and equal together to about half the length of the basal segment. The lateral margin of the intermediate segment is produced to form a setose lobe. The upper flagellum has its two rami fused proximally for six segments. The shorter ramus consists of about eight segments. The lower ramus is filiform and consists of nineteen to twenty-four segments.

The basicerite is unarmed laterally and the carpocerite extends to the middle of the lateral border of the scaphocerite. The scaphocerite slightly exceeds the antennular peduncle and is almost twice as long as wide. The lateral border is strongly convex and bears a short stout tooth distally. The lamella distinctly exceeds the disto-lateral tooth and the anterior margin is broadly angled with the convex median border.

The mandible is without a palp. The incisor process is feebly developed and bears three small teeth distally, the central tooth being slightly smaller than the adjacent teeth. The molar process is robust and bears several processes fringed with short setae. The maxillula has the laciniae broadened, the lower more than the upper, and both densely margined with fine setae. The palp has the upper lobe very feebly developed. The lower lobe bears a simple seta. The maxilla bears a single broad but distally notched endite, densely fringed with fine setae. The palp is well developed, subcylindrical, with a few short setae on its lateral border basally. The scaphognathite is narrow. The first maxilliped shows no indentation between basis and coxa which form a continuous convex border densely fringed with fine simple setae. The palp is subcylindrical and bears a medial subterminal seta. The exopod is well developed with a distinct caridean lobe and a bilobed epipod is present. The second maxilliped shows no special features. A well developed exopod and a subrectangular epipod without a podobranch are present. The endopod of the third maxilliped extends to the mid-length of the carpocerite. The distal segment is slightly less than three quarters of the length of the penultimate segment. The combined length of the penultimate and terminal segments is slightly greater than the length of the antepenultimate segment, which is about three times longer than wide. The median borders of all segments are densely setose, with fine slender setae proximally, and stouter setae distally. The exopod is well developed and slightly exceeds the antepenultimate segment. A rounded epipod and a rudimentary arthrobranch are also present.

The slender first pereopod exceeds the scaphocerite by the chela in the males, and by one third of the length of the carpus in the females. The chela is slightly less than half the length of the carpus. The fingers are stout and sub-spatulate, subequal to the length of the broad palm, which is flattened medially and convex laterally, with a dense row of long finely plumose setae along the dactylar border and double row of similar setae along the opposite margin of the palm with tufts of serrated setae along the outer border of the fixed finger. The laterally situated cutting edges of the fingers are finely pectinate along the distal halves. The carpus is twice as wide distally as proximally and bears a few cleaning setae disto-ventrally. The merus is subcylindrical and slightly bowed. The ischium and basis are subequal, slightly longer than half the length of the merus, flattened and with a fringe of long slender setae along their ventral margins. The coxa bears a small setose disto-ventral knob. The second pereopods are small, similar and subequal and in the female, exceeding the carpocerite,

swollen in the proximal half, and about 1.6 times the length of the fingers. The fingers have distinctly hooked tips. The dactylus bears a single acute tooth at one third of the length of its cutting edge and the fixed finger bears a series of four similar small teeth proximally. The rest of the cutting edges of the fingers are entire. The carpus is short and stout, twice as wide distally as proximally, equal to about one third of the length of the palm, and unarmed. The merus and ischium are subequal in length and unarmed. The ambulatory pereiopods are moderately slender and similar. The third pereiopod exceeds the scaphocerite by one third of the length of the propodus. The dactylus is slender, simple, compressed bilaterally, moderately hooked and with a distinct unguis. Its upper surface, proximally to the unguis, is finely ridged transversely. The basal width of the dactylus is about half that of the propodus, which is about six times longer than the dactylus. The propodus is subcylindrical and unarmed, with its distal end notched dorsally and ventrally, and provided with numerous long fine distal setae and disto-ventral brushes of shorter setae. The carpus is equal to three fifths of the length of the propodus and is four sevenths of the length of the merus. The merus is 1.1 times the length of the propodus. Both carpus and merus are unarmed. The fourth pereiopod is similar to the third but is less setose distally. The fifth pereiopod is longer and more slender with relatively sparse setae distally. The propodus is nine times longer than wide and the merus is 0.94 times the length of the propodus. The dactylus of the ambulatory pereiopods can be moved through 180°. The second and third thoracic sternites are broad with low transverse ridges. The fourth sternite is without a median spine. The fifth is the narrowest and forms a low ridge with a feeble median notch immediately posteriorly to the second pereiopods. The sixth to eighth sternites are broad, unarmed and increase in size posteriorly.

The pleopods show no special features. The endopod of the first pleopod in the female is short and straight and distally rounded with numerous plumose setae. In the male the endopod is four times longer than wide and is slightly expanded distally. The proximal fifth of the medial border bears three fine setae, the intermediate two fifths bears eleven short curved spines and the distal border is bare. The distal half of the lateral border bears seven setae. The endopods of the second to fifth pleopods bear appendices internae in both sexes. The endopod of the second pleopod bears an appendix masculina. The appendix bears six spines along its lateral border and four along the medial border, with a group of four spines terminally. All spines are simple. The appendix masculina is slightly longer than the appendix interna. The uropods exceed the tip of the telson. The basipod is produced distolaterally as a long acute process. The lateral border of the exopod is convex and armed distally with a small mobile spinule. The ova are numerous and small, about 0.6 mm in length.

TYPES: The types are deposited in the collections of the Australian Museum. The ovigerous female from West Cay is selected as the holotype and the male as allotype, registration number P17531.

HOST: *Atrina vexillum* (Born) (Lamellibranchia, Pinnidae).

DISTRIBUTION: Type locality, West Cay, Diamond Islets. Otherwise known only from One Tree Island and the Palau Islands

REMARKS: *Anchistus custoides* is closely related to *Anchistus custos* but may be easily separated from that species by the presence of the following morphological features: —

- (1) minute dorsal and distal rostral teeth.
- (2) distinct acute antennal spine.
- (3) well developed dorsal telson spines.
- (4) a more robust penultimate segment of the third maxilliped with a narrower antepenultimate segment.

- (5) a non-cannulate chela on the first pereopods, with subspatulate fingers with finely pectinate cutting edges, and with upper and lower inner borders of the palm fringed with long plumose setae.
- (6) subterminal dorsal region of dactyls of ambulatory pereopods with fine transverse ridges.

Kubo (1940) described and illustrated some specimens of *Anchistus* in which he reported the presence of some rudimentary microscopical rostral teeth. A distinct antennal spine is visible in illustrations of both male and female and his illustration of the telson shows that the dorsal spines are quite well developed. The first pereopod is not described but its illustration does not show the characteristic cannulate appearance found in *A. custos*. In its general proportions it resembles that of *A. custoides* but the long marginal palmar setae are not shown. The similar setae found on the ischium are shown however. Kubo's specimens cannot belong to *A. custos* (Forsskål) and must be considered to belong to *A. custoides*. They are unfortunately no longer in existence (Kubo, in litt.) The specimens reported upon by Miyake and Fujino (1968), also from Palau and in association with *Atrina vexillum* are presumably conspecific with Kubo's material and should also be referred to *A. custoides*.

In the Indian Ocean, two species of shrimp have been reported in association with *Atrina vexillum*, *Anchistus custos* and *Paranchistus ornatus* Holthuis. The latter species appears to be the normal associate of this bivalve. Kemp (1922) recorded *A. custos* in *A. vexillum* in the Andaman Islands and the same association was reported from Zanzibar by Bruce (in Rosewater, 1961), while Hipeau-Jacquotte (1967) has provided detailed information on the associates of *A. vexillum* in Madagascar. Her studies show that *A. custos* may at times occur in numbers in *A. vexillum*, but in central East Africa *P. ornatus* is the normal associate (Bruce in press b.)

Johnson (1966) has shown that the highly specialized chela of the first pair of pereopods in *A. custos* is associated with the characteristic feeding habits of the shrimp. The modifications in *A. custoides* are similar. When the carpo-meral joint is flexed the chela is brought into opposition to the fringe of long plumose setae that arises from the ventral margins of the ischium and basis, and which appears to form a part of the same mechanism. On account of its specialized feeding mechanism Johnson has suggested that *Anchistus custos* should be separated from all other species and the genus *Anchistus* Borradaile considered monotypic. *Anchistus custoides* however, is intermediate morphologically between *A. custos* and the other species, which are therefore retained in the genus.

13. ***Anchistus australis* sp. nov., forma *typica*** (Figs 7-9)

MATERIAL EXAMINED: 7♂, 5♀ (4 ovig.), Stn. 1, Gillett Cay, Swain's Reef, October 1962. 1♂, Capre Cay, Swain's Reef, October 1962.

MEASUREMENTS: CL. males 1.3-3.9 mm; females 4.2-5.3 mm. Smallest ovigerous female 4.2 mm.

DESCRIPTION: The body is robust, with a smooth carapace and abdomen, slightly swollen in the ovigerous females. The rostrum is broad proximally and compressed distally, horizontal or slightly depressed, especially in females. The tip is acute, reaching to the middle of the intermediate segment of the antennular peduncle. The midrib is feebly developed. The distal fourth of lamina is armed with four or five long acute teeth in both sexes, with the exception of a single abnormal female which had a toothless rostrum. Ventrally a single small tooth is present close to the tip, although this is absent in one male. Tufts of long setae are present in the spaces between the rostral teeth. The orbit is feebly developed. The inferior orbital angle is bluntly rounded and scarcely produced. Supra-orbital, hepatic and antennal spines are absent. The antero-lateral angle of the carapace is bluntly obtuse.

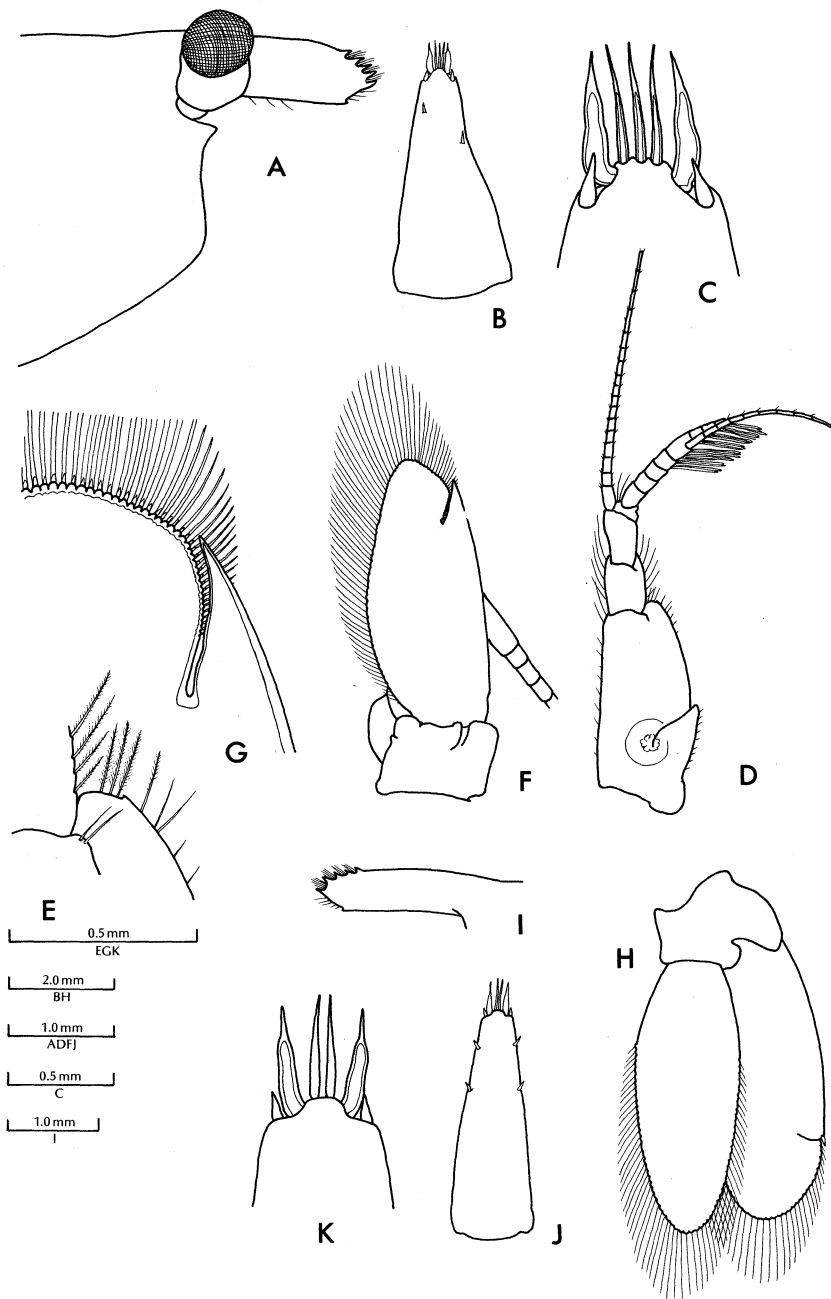


Fig. 7. *Anchistus australis* sp. nov., forma typica, female. A, anterior region of carapace. B, telson (abnormal). C, tip of telson. D, antennule. E, disto-lateral angle of proximal segment of antennular peduncle. F, antenna. G, disto-lateral spine of scaphocerite. H, uropod. Male: I, rostrum. J, telson (normal). K, tip of telson.

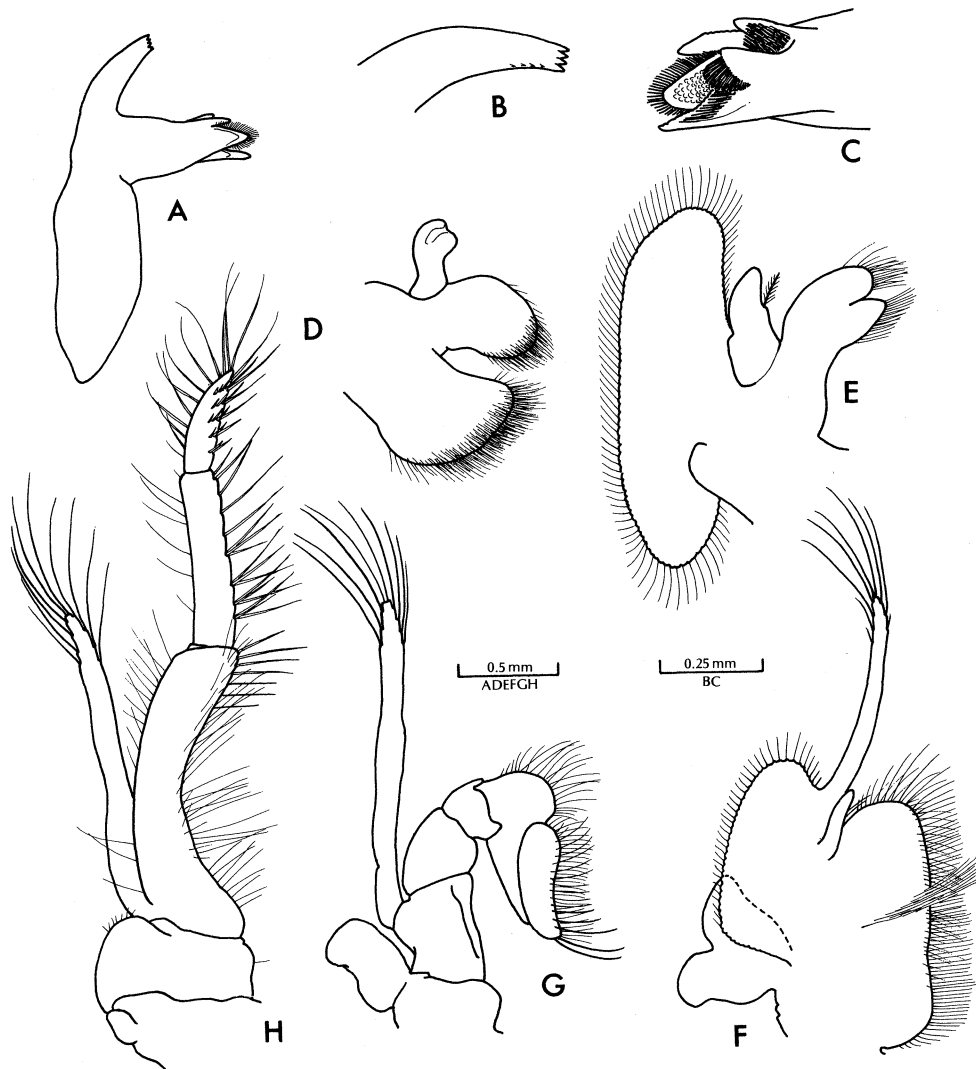


Fig. 8. *Anchistus australis* sp. nov., forma typica, female. A, mandible. B, incisor process. C, molar process. D, maxillula. E, maxilla. F, first maxilliped. G, second maxilliped. H, third maxilliped.

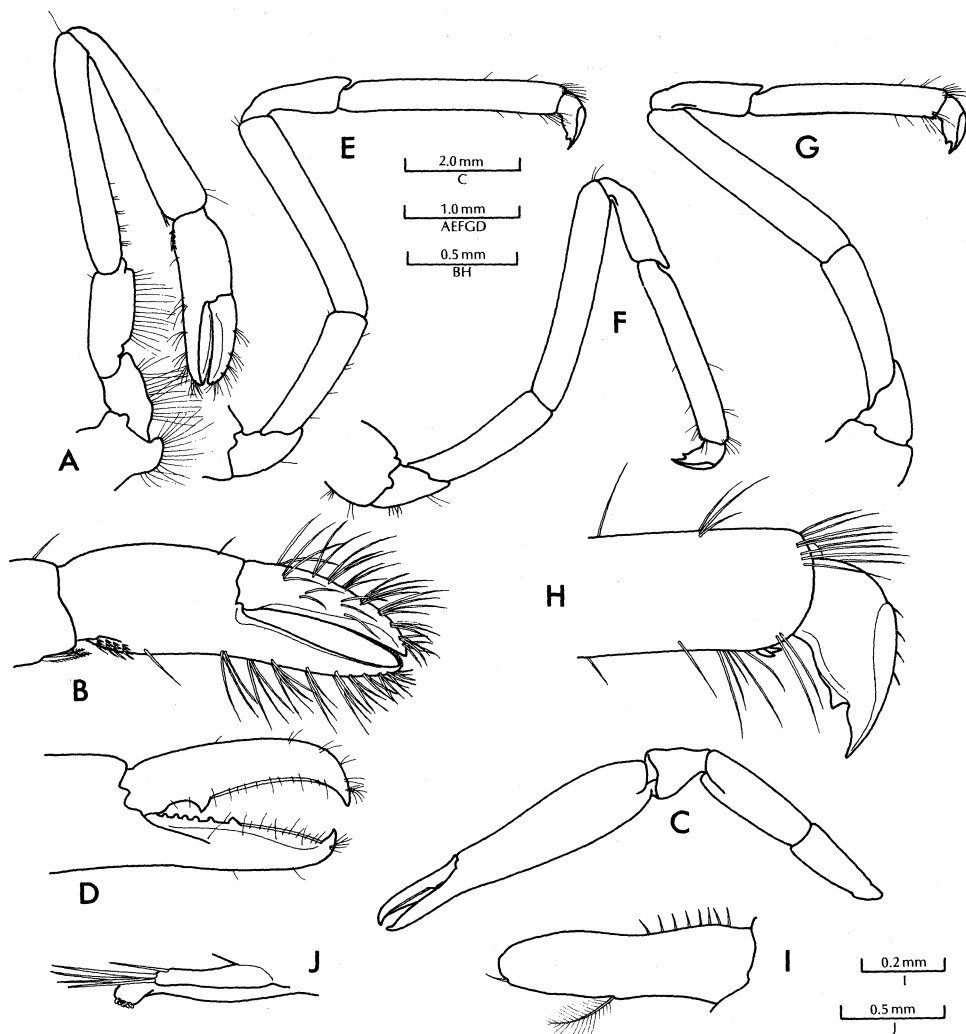


Fig. 9. *Anchistus australis* sp. nov., forma typica, female. A, first pereiopod. B, chela of first pereiopod. C, second pereiopod. D, fingers of chela of second pereiopod. E, third pereiopod. F, fourth pereiopod. G, fifth pereiopod. H, dactylus of fifth pereiopod. Male: I, endopod of first pleopod. J, appendix masculina and appendix interna.

The third abdominal segment is not produced posteriorly in the dorsal midline. The pleura of the abdominal segments are rounded. The sixth segment is 1.25 times longer than deep, with blunt postero-lateral and postero-ventral angles, and one and a half times longer than the fifth segment. The telson is about one and a half times longer than the sixth segment, tapering, about twice as long as its basal width in females and three times as long in males. The lateral margins are straight or feebly convex. There are two pairs of well developed dorsal spines situated sub-marginally at three and four fifths of the telson length. Three pairs of terminal spines are present. The lateral pair are slightly smaller than the dorsal spines. The intermediate spines are swollen for the proximal three quarters of their lengths and are about three times longer than the lateral spines. The submedian spines are sparsely setose, slender and slightly exceed the intermediate spines.

The eyes are well developed but small. The cornea is hemispherical and lies transversely upon the slightly wider eyestalk. A small accessory pigment spot is present dorsally. The eyestalk is subcylindrical, slightly expanded, flat, compressed proximally, about 1.3 times longer than the corneal diameter.

The basal segment of the antennular peduncle is twice as long as wide. The antero-lateral angle is produced, rounded, and bears a minute tooth. The lateral border is gently convex. The stylocerite is broad and blunt and is less than half the length of the segment. The intermediate and distal segments are subequal, equal to about three fifths of the length of the basal segment. The lateral border of the intermediate segment is produced to form a setose lobe. The lower flagellum is filiform, subequal to the peduncle and has seventeen segments in the dissected specimen. The upper flagellum is biramous with the two rami fused for the five proximal segments. The shorter ramus consists of three free segments and bears eight groups of aesthetascs. The longer ramus consists of nine free segments.

The basicerite of the antenna is unarmed laterally. The carpocerite extends to the middle of the lateral border of the scaphocerite. The antennal flagellum is well developed, slightly exceeding the telson. The scaphocerite is about 2.3 times longer than wide and far exceeds the antennular peduncle. The lateral border is distinctly convex and bears a large acute disto-lateral tooth. The lamina extends well beyond the antero-lateral tooth and is bluntly angled distally. The proximal part of the lateral margin of the lamina is inflected along the side of the antero-lateral tooth.

The mandible is without a palp. The incisor process is feebly developed and bears four small subequal teeth distally. Four small denticles are present on the distal part of the medial border. The molar process is robust and bears several stout processes and brushes and patches of setae. The maxillula has the upper lacinia short and broad, bluntly rounded with numerous simple setae. The lower lacinia is even broader and densely fringed with numerous setae. The palp is feebly bifid and without a seta. The maxilla bears a stout palp with a single short plumose seta in the middle of the medial border. A single large, broad bifid endite is present with slender simple setae distally on each lobe. The scaphognathite is well developed and narrow. The first maxilliped shows no separation into basal and coxal portions, the medial border being fringed with long slender setae. The palp is subcylindrical with two setae on the medial border. The exopod is well developed with a large caridean lobe. A bilobed epipod is also present. The second maxilliped shows no special features. A well developed exopod is present with a subrectangular epipod. The third maxilliped is slender. The terminal segment is about three fifths of the length of the penultimate segment. The anti-penultimate segment is not expanded and is subequal to the penultimate and terminal segment combined. The exopod is well developed and exceeds the length of the antipenultimate segment. A large, stout, rounded epipod is present and also a rudimentary arthrobranch. The medial borders of the segments of the endopod are sparsely setose with long slender plumose setae.

The first pereopod is slender and exceeds the scaphocerite by the length of the chela and one third of the carpus. The chela is robust with the fingers subequal to the palm. The

fingers are spatulate, with finely pectinate cutting edges laterally and entire edges medially, and numerous tufts of long setae. The carpus is slender, slightly expanded distally and 1.4 times the length of the chela. The merus is twice the length of the ischium and 1.1 times the length of the carpus. The basis is slightly shorter than the ischium and the coxa bears a large rounded medial lobe. The medial borders of ischium, basis and the coxal process bear fringes of long setae. The second pereopods are small, subequal and similar in the female. In the male they are markedly unequal, one being quite robust. The major second pereopod has a subcylindrical palm tapering distally, slightly more than twice the length of the dactylus. The dactylus is strongly hooked distally and distinctly exceeds the fixed finger. A single large acute triangular tooth is present on the proximal half of the cutting edge. The fixed finger bears 4-5 small teeth opposite the tooth on the dactylus, which opposes into a pit on the fixed finger, and a small acute tooth anterior at the middle of the cutting edge. The distal halves of the cutting edges are entire. The carpus is small and stout, triquetral, about one quarter of the length of the palm, and unarmed. The merus is robust, two and a quarter times longer than wide, and unarmed. The ischium is two thirds of the length of the merus and unarmed. The minor second pereopod and the chelae of the females are generally similar, smaller in size and less robust, with weaker teeth, than in the male major second pereopod. The ambulatory pereopods are moderately robust and generally similar. The fifth pereopod reaches anteriorly to the end of the carpopodite. The dactylus is short and stout, with the dorsal aspect flattened and minutely imbricate. The posterior margin bears a small acute tooth. The prododus is about four times the length of the dactylus with numerous simple setae distally. The disto-ventral ends of the fourth and fifth pereopods are armed with a pair of short stout spines that are absent from the third pereopod. The carpus is half the length of the propodus and the merus, which is subequal to the propodus. The ischium is two thirds of the length of the merus. The propodus of third, fourth and fifth pereopods have lengths in the ratio of 55 : 49 : 48 and the meri 57 : 57 : 59. The sternites of the second and third thoracic segments are broad and unarmed. The sternite of the fourth thoracic segment bears a broad transverse lamina with a distinct median notch. The fifth sternite bears a broad lamina, with a small median notch, posteriorly to the coxae of the second pereopods.

The pleopods show no special features. The endopod of the first male pleopod bears a single plumose seta in the middle of its lateral border. The distal border is rounded with a single small simple seta. The medial border is straight, with about eight short simple setae along the proximal half. The appendix masculina is short, exceeded by the appendix interna, with four long, robust, simple setae distally with a single subterminal seta on the lateral border. The uropods exceed the tip of the telson by one third of the telson length. The basipodite has a bluntly rounded postero-lateral angle. The lateral border of the exopod is feebly convex, with a small mobile spinule distally.

The ova are numerous and small. In a dissected female, carapace length 4.5 mms, 312 ova were being carried, greater diameter 0.48 mms.

TYPES: The types are deposited in the collections of the Australian Museum. The male from Capre Cay is selected as the holotype, registration number P17520.

HOST: *Tridacna whitleyi* Iredale (Lamellibranchia : Tridacnidae).

DISTRIBUTION: Type locality, Capre Cay, Swain's Reef.

REMARKS: *Anchistus australis* is most closely related to *Anchistus miersi* (De Man) and especially *A. demani* Kemp. It may be readily distinguished from the former by the absence of an antennal spine and from the latter by the acute and non-truncate anterior tip to the rostrum. The accessory spine on the dactyl of the ambulatory pereopods is much larger than in *A. demani* and the dorsal surface less strongly imbricate. The accessory spine is also less acute than in *A. miersi* and the dorsal surface of the dactylus is not hollowed to form a scoop. In *A. demani*, in addition, the antero-lateral margin of basal antennular segment is

unarmed, the fingers of the first pereopods are not pectinate and spatulate and the anterior pair of dorsal telson spines are situated at the middle of the telson length in contrast to *A. australis*. *A. australis* is a distinctly larger species than *A. demani*, in which Kemp states that the ovigerous females are about 10 mm. in length, *A. australis* having ovigerous females of 20 mms. and larger.

14. ***Anchistus australis* sp. nov., forma *dendricauda* (Fig. 10)**

MATERIAL EXAMINED: 1 ovig. ♀, CL. 6.0 mm, West Cay, Diamond Islets, 21 October 1964.

DESCRIPTION: Generally similar to *A. australis* forma *typica*, but with the dorsal margin of the rostrum bearing a series of eight slender acute teeth. The ventral margin bears a single small tooth. The intermediate posterior terminal spines of the telson terminate in a series of short blunt processes.

HOST: *Tridacna squamosa* Lam. (Lamellibranchia : Tridacnidae).

REMARKS: The exact status of this single specimen cannot be fully ascertained. All the specimens of *A. australis* obtained from *T. whitleyi* have four or five dorsal rostral teeth only and all lack the dendritic termination of the intermediate posterior telson spines. These spines however, may be of pathological origin. The present specimen is also large and associated with a different host. The examination of further specimens from known hosts is necessary to establish the exact relationships between the two taxa.

15. ***Philarius gerlachei* (Nobili) (Fig. 11.)**

Restricted synonymy:

Harpilius gerlachei Nobili, 1905: 160; 1906: 45, pl. 4. Kemp, 1922: 229 (key), 238-239, figs. 74-75.

Philarius gerlachei — Holthuis, 1952: 15, 152-153, fig. 69. Patton, 1966: 276, 288 tab. 1, 290 tab. 2. Bruce, 1972: 406-407, 413 (key).

MATERIAL EXAMINED: 1♂, CL. 3.3 mm, West Cay, Diamond Islets, 23 October 1964. 1♀, CL. 3.5 mm, One Tree Island, Capricorn Group, no date.

HABITAT/HOST: No data.

DISTRIBUTION: Type locality, off Arzana Island, Persian Gulf. Also recorded from the Red Sea, to Madagascar as far east as the Gilbert Islands and Samoa. Previously recorded from Australia by Patton (1966) at Willis Island, Bet Reef, Restoration Rock, Heron Island and Wistari Reef.

REMARKS: This species is normally associated with corals of the genus *Acropora* (Patton, 1966; Bruce, 1972).

The male specimen has a rostrum which slightly exceeds the length of the antennular peduncle and is armed with four dorsal and one large ventral tooth. There are no teeth posteriorly to the orbital margin. In the female there are five dorsal rostral teeth, the most posterior tooth over the anterior margin of the carapace. The orbital margins are very well marked. The first pereopods are missing in the male but present in the female. They are slender and exceed the scaphocerite, which bears a very strong disto-lateral spine, by two thirds of the length of the carpus. The chela is robust with stout fingers, slightly shorter than the palm in length and densely covered with short setae. The second pereopods are present in both specimens. The fingers are more slender in the male and armed with six small teeth whereas in the female five larger teeth are present upon each finger. The carpus is without a disto-lateral spine. The dactyli of the ambulatory pereopods are strongly compressed as well as being strongly hooked. They are surrounded by a dense brush of fine setae arising from the distal end of the propodus. A small triangular tooth is present medially

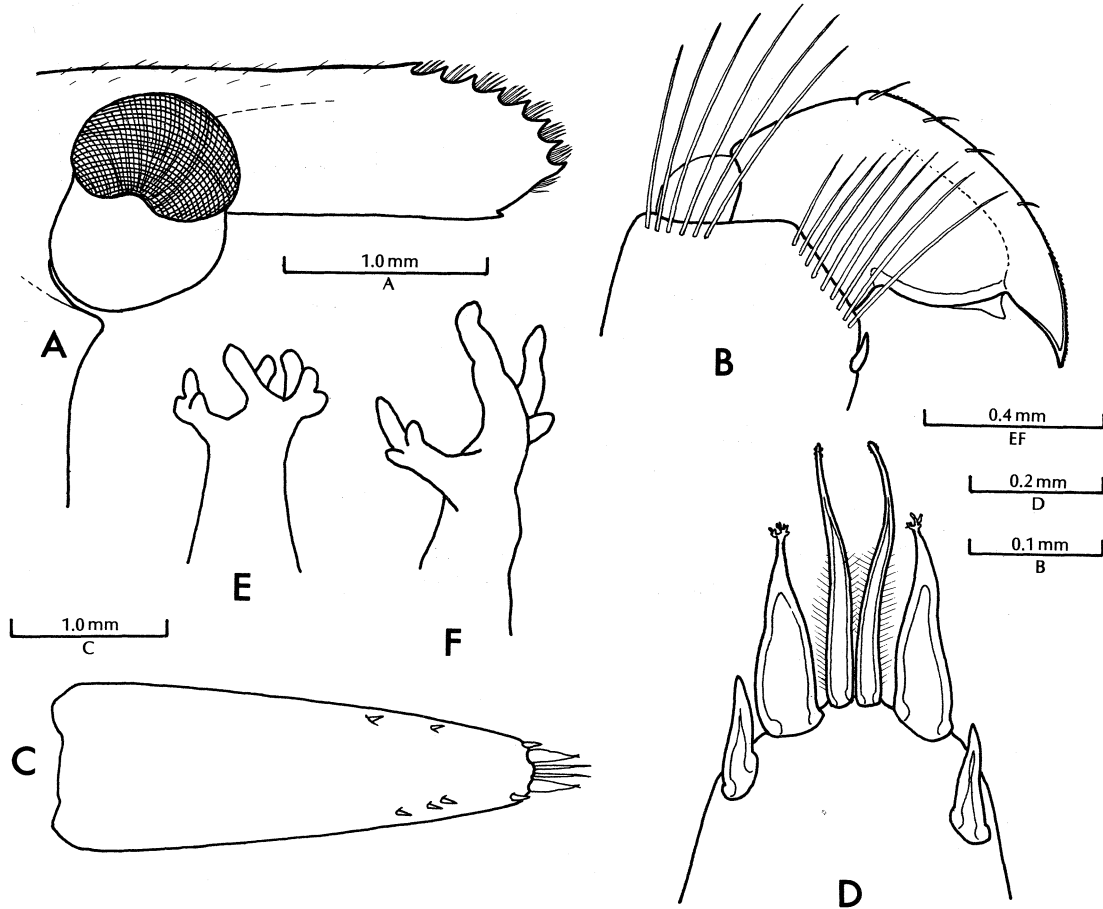


Fig. 10. *Anchistus australis* sp. nov., forma *dendricauda*, female. A, rostrum and orbital region. B, dactylus of ambulatory pereiopod. C, telson. D, tip of telson. E, tips of intermediate posterior telson spines.

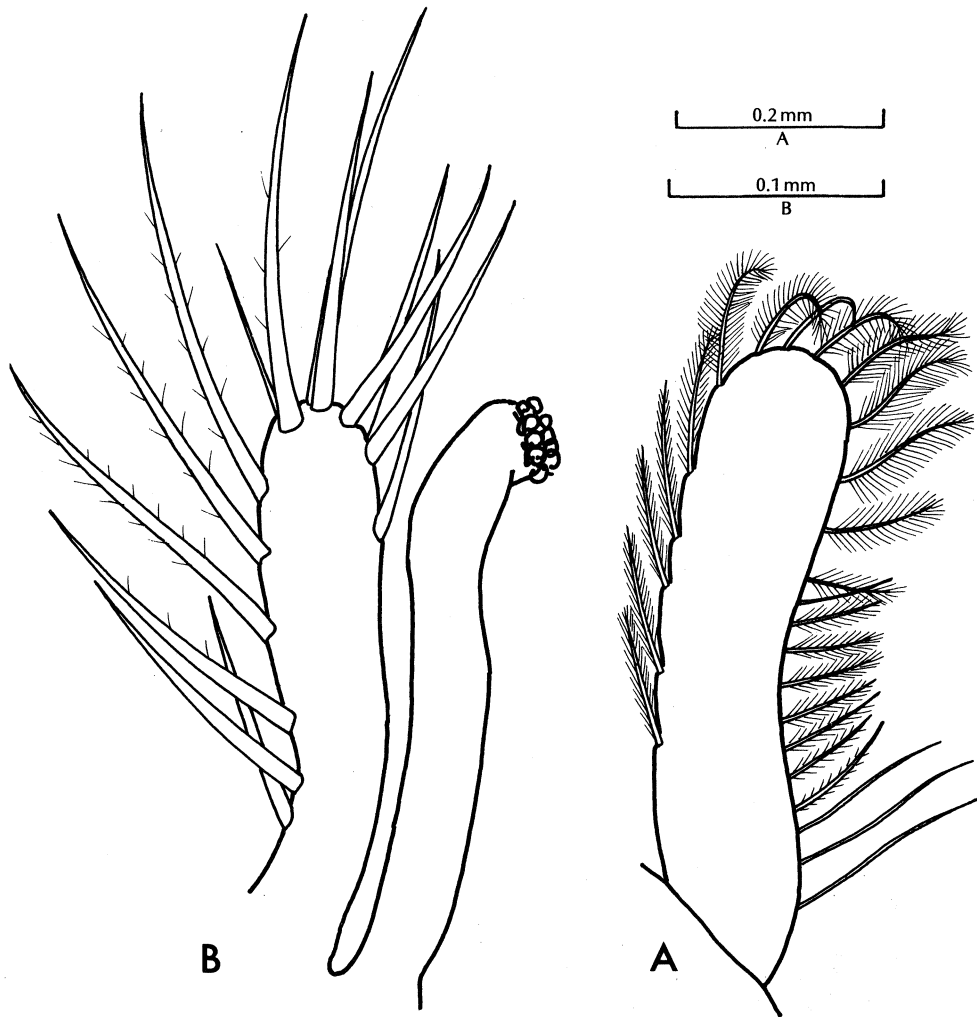


Fig. 11. *Philarius gerlachei* (Nobili), male. A, endopod of first pleopod. B, appendix masculina and appendix interna.

on the fourth thoracic segment. This tooth is relatively smaller and less conspicuous than the tooth present in this position in the syntypes held in the Museum National d'Histoire Naturelle, Paris. A similar process is also present in *P. imperialis* Kubo. The first male pleopod and appendix masculina have not been previously described and are now illustrated.

16. ***Ischnopontonia lophos* (Barnard)**

Restricted synonymy:

Philarius lophos Barnard, 1962: 242-243, fig. 2.

Ischnopontonia lophos — Bruce, 1966: 585-595, figs. 1-5; 1971: 19-20.

MATERIAL EXAMINED: 2♀ (1 ovig.), CL. 1.6, 1.6 mm, One Tree Island, Capricorn Group, no data.

HOST: *Galaxea fascicularis* (L.) (Scleractinea: Oculinidae).

DISTRIBUTION: Type locality, Inhaca Island, Mocambique. Also recorded from Kenya, Tanzania, Zanzibar, Madagascar, Comoro and Seychelle Islands, Singapore and Pulau Perhentian Besar. Previously recorded in Australian waters from Great Palm, Orpheus and Fantôme Islands, Townsville.

REMARKS: Both specimens agree well with the previous descriptions. Each specimen has ten dorsal rostral teeth. The only noteworthy difference is that the ovigerous female is particularly small, CL. 1.6 mm, in comparison with the Townsville specimens, CL. 2.1-2.5 mm. The ova are few in number, greatest length 0.5 mm.

17. ***Harpiliopsis depressa* (Stimpson) (Fig. 12 a-c).**

Restricted synonymy:

Harpilius depressus Stimpson, 1860: 38. Kemp, 1922: 228 (key), 231-234, fig. 69-70.

Harpiliopsis depressus — Borradaile, 1917: 324, 380, pl. 56 fig. 22. Holthuis, 1951: 70-75, pl. 21, 22 a-f; 1952: 16, 182-184, fig. 90. Patton, 1966: 277, 288 tab. 1, 290 tab. 2, 291 tab. 3.

MATERIAL EXAMINED: 4♂, 5♀ (4 ovig. ♀), West Cay, Diamond Islets, 23 October 1964.

MEASUREMENTS: CL. males, 2.3-2.7 mm; females 2.4-2.5 mm; ovigerous females 3.0-3.4 mm.

HOST: Not recorded, coral-head washings.

DISTRIBUTION: Type locality, Hawaii. Widespread and common in the Indo-West Pacific region; from the Red Sea to Mocambique and Madagascar as far as Hawaii, and also extending to the Galapagos Islands and the tropical west coast of America. Previously recorded by Patton (1966) from Australian waters: Willis Island, Restoration Rock, Heron Island and Wistari Reef.

REMARKS: The specimens agree with the description given by Kemp (1922). The number of rostral teeth varies as follows: — males $\frac{6}{3}$, $\frac{7}{3}$, $\frac{7}{4}$, $\frac{7}{4}$; non-ovigerous females $\frac{5}{3}$, $\frac{6}{3}$; ovigerous females $\frac{4}{3}$, $\frac{4}{4}$, $\frac{6}{4}$. Where there are more than five dorsal teeth, the additional teeth lie on the posterior third of the rostral lamina and are distinctly smaller and more slender than the robust anterior dorsal and ventral teeth. There is a transverse ridge across the fourth thoracic sternite. The pleura of the fourth and fifth abdominal segments are both pointed. The position of the dorsal telson spines is slightly variable. In most examples the posterior pair of spines lies halfway between the anterior pair, which is situated at the

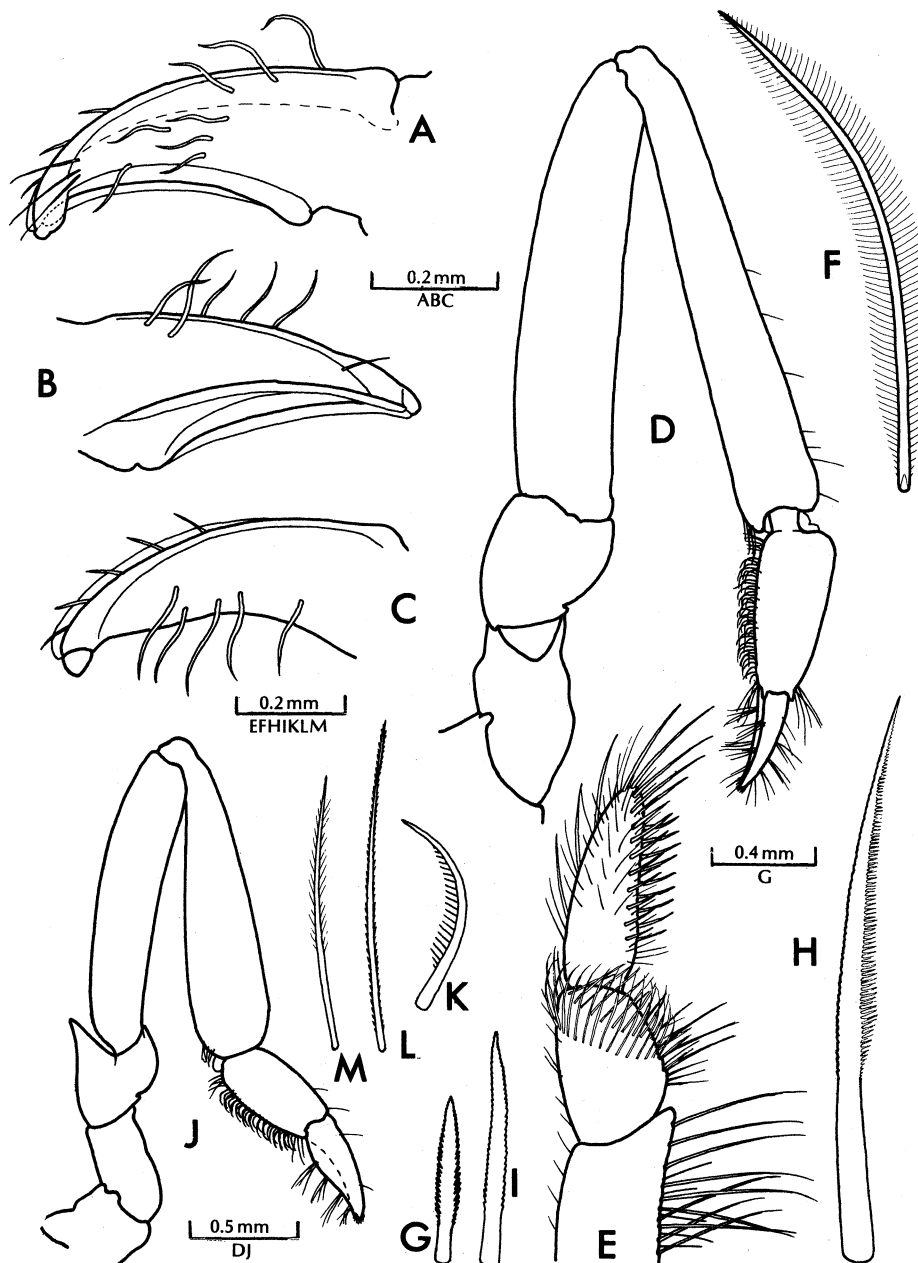


Fig. 12. *Harpiliopsis depressa* (Stimpson). Dactylus of ? fifth pereiopod. A, lateral. B, dorsal. C, dorso-lateral oblique. *Coralliocaris superba* (Dana). D, first pereiopod. *Coralliocaris viridis* Bruce. E, distal portion of endopod of third maxilliped, dorsal aspect. F, seta from antepenultimate segment. G, from inner margin of terminal segment. H, from tip of terminal segment. I, seta from second maxilliped, terminal segment. *Coralliocaris venusta* Kemp. J, first pereiopod. K, seta from ventral aspect of palm. L, M, setae from fingers.

middle of the telson length, and the posterior margin, but in some specimens they lie closer to the anterior pair. Most of the second pereopods have been preserved, although detached, but none have the slender characteristic of *H. spinigera* (Ortmann).

The dactylis of the ambulatory pereopods are stout, hooked and twisted. In the present collection they are rather blunt and with a pair of longitudinal carinae. One carina extends along the ventral margin of the dactyl and the other along the dorso-lateral aspect. Both carinae are bluntly rounded distally. A series of short, strong setae lie along the margin of the dorsal carina and a number of longer setae arise from the lateral aspect of the dactylus. The lateral aspect of the dactylus is strongly convex and the medial aspect is flattened.

This species is one of the best known coral commensal shrimps and is one of the few of the Indo-West Pacific species of the Pontoniinae that are also found in the Eastern Pacific region. Patton (1966) found his Barrier Reef specimens of this species in association with corals of the genera *Pocillopora*, *Stylophora* and *Seriatopora*. There have been no records from the rest of Australia.

18. ***Coralliocaris superba*** (Dana) (Figs. 12d).

Restricted synonymy:

Oedipus superba Dana, 1852: 25; 1852a: 573; 1855, pl. 37.

Coralliocaris superba — Stimpson, 1860: 38. Holthuis, 1952: 17, 189-191, fig. 91. Patton, 1966: 277, 288 tab. 1, 290 tab. 2. 292 tab. 4.

MATERIAL EXAMINED: 1♀, CL. 3.6 mm, Stn. 1, Swain's Reef, 1962.

HOST: Not recorded.

DISTRIBUTION: Type locality Tongatabu, Tonga Islands. Widespread and common throughout the Indo-West Pacific region from the Red Sea to Mocambique east to the Society Islands but absent from Hawaii. Previously recorded from Australian waters by Patton (1966) from Willis Island, Restoration Rock, Heron Island, Wistari Reef and Moreton Bay.

REMARKS: The single example, which is non-ovigerous and slightly macerated, has five dorsal and two ventral rostral teeth and shows no significant differences from the descriptions given by Kemp and Kubo. There is no median process on the fourth thoracic sternite. The whole of the ventral aspect of the palm of the chela of the first pereopods is provided with large numbers of short, curved setae which bear numerous perpendicular robust setules along the proximal two thirds of the anterior border. Groups of longer and more slender setae bearing rows of minute setules along anterior and posterior borders arise from the median aspect of the palm and the bases of the fingers. The fingers are distinctly shorter than the palm, slender and compressed, with the edges situated centrally.

19. ***Coralliocaris venusta*** Kemp (Figs. 12 j-m)

Restricted synonymy:

Coralliocaris venusta Kemp, 1922: 274-276, figs. 100-101, Holthuis, 1952: 17, 191-192, fig. 93. Patton, 1966: 277, 288 tab. 1.

MATERIAL EXAMINED: 1♀, CL. 2.3 mm, One Tree Island, Capricorn Group, no date.

HOST: Not recorded.

DISTRIBUTION: Type locality, Tholayiram Paar, Gulf of Manaar. Also known from Zanzibar, Kenya, Tanzania, Madagascar, the Seychelle Islands, Indonesia and Samoa. Previously recorded by Patton (1966) from Willis Island, Restoration Rock and Heron Island.

REMARKS: The single example agrees well with the original description. The rostrum bears only a single dorsal rostral tooth and no ventral teeth. The first pereopod is more robust than in *C. graminea* and *C. superba*. The mero-ischial joint is highly mobile and the disto-lateral angle of the ischium is produced in the form of an acute triangular process. The basis and coxa are non-setose. The palm of the chela is provided with a dense brush of serrated, hooked setae as in the two preceding species. The fingers are distinctly longer than in those species being almost subequal to the palm. The fingers are more robust and hollowed with the cutting edges situated along the lateral aspects. The cutting edges are entire and the dorsal edge of the dactylus is sharply carinate. The fixed finger is provided with numerous dense tufts of long minutely serrate setae. The sternite of the fourth thoracic segment is unarmed. This species is an obligate commensal of *Acropora* corals.

20. **Coralliocaris viridis** Bruce (Figs. 12 e-i)

Coralliocaris viridis Bruce, 1974: 222-224, fig. 1 a-b; 1974: 260 fig. 1, 262-263.

MATERIAL EXAMINED: 1♂, 1 ovig. ♀, CL. 2.4, 3.1 mm, One Tree Island, Capricorn Group, December 1966.

HOST: *Acropora* sp. (Scleractinea: Acroporidae).

DISTRIBUTION: Type locality, Mombasa, Kenya. Also known from Zanzibar and Madagascar. Not previously recorded from Australia.

REMARKS: Both specimens have four dorsal and one ventral rostral teeth. The dactyli of the ambulatory pereopods appear very similar to those of *J. japonica* (vide infra) but with simple instead of scalloped margins. The sternite of the fourth thoracic segment is unarmed. The distal half of the dorsal surface of the penultimate segment of the third maxilliped bears a double row of long finely plumose setae which curve distally to enclose a basket-like space. The distal segment bears numerous long, stout dentate setae. The antepenultimate segment is provided with long slender simple setae along its medial border. The first pereopod is very similar to that of *C. superba* (vide supra) except that the carpus is distinctly longer than the merus. The chelae of the second pereopods are subequal in the male but the right is distinctly larger than the left in the female. The ova are numerous, over 170, and 0.45 mm. in greatest diameter.

Patton (1966) reported numerous examples of the closely related *C. graminea* (Dana) from a number of localities off the Queensland coast, and it is possible that some of these should be referred to *C. viridis*, which was not recognized at that time. He notes that the colour pattern of his material is longitudinally striate, as is normally found in *C. graminea*. *C. viridis*, like *C. graminea* is an obligate associate of *Acropora* corals.

21. **Jocaste japonica** (Ortmann) (Fig. 13 d-e, g-h)

Restricted synonymy:

Coralliocaris superba var. *japonica*. Ortmann, 1890: 509, pl. 36 Fig. 22.

Jocaste lucina (partim) — Holthuis, 1952: 17, 193-195, Fig. 94.

Jocaste japonica — Patton, 1966: 279-280, 288 tab. 1, 390 tab. 2, Fig. 3b. Bruce, 1969: 298-300, Fig. 1.

MATERIAL EXAMINED: 1♂, CL. 2.7 mm, Swain's Reef, 1962. 1 ovig. ♀, CL. 2.7 mm, West Cay, Diamond Islets, 23 October 1964.

HOST: Not recorded.

DISTRIBUTION: Type locality, Kagoshima, Japan. Recorded from Kenya, Tanzania, Madagascar, Comoro Islands, Seychelle Islands, and Maldives Islands and Mauritius in the

Indian Ocean; South China Sea, Indonesia, New Caledonia, Palau Islands and the Marshall Islands. Recorded from Australia by Patton (1966) from Restoration Rock, Willis Island, Heron Island and Wistari Reef. The reference in Bruce (1969) to the occurrence of this species at Bet Rock is erroneous.

REMARKS: The specimens correspond with Patton's redefinition of Ortmann's species. The male has four dorsal and two ventral rostral teeth and the female has four dorsal and one ventral rostral tooth. In both specimens the minor second pereopod is missing. The first pereopods are very similar to those of *J. lucina*. The major second pereopod is more robust than in that species, and is about 3.3 times longer than broad. Dorso-ventral flattening of the palm is well marked and the disto-ventral meral spine has a convex distal margin. The carpus is unarmed. The dactylus of the ambulatory pereopods bears a distinct and strongly hooked unguis. A large hoof-shaped basal process is present. The outer rim of this process is formed by a row of small slightly overlapping scalloped plates. The central cavity enclosed by the rim appears to be filled with a dense mass of fine closely packed setae. The fourth thoracic sternite is broad and unarmed. The endopod of the male first pleopod is less expanded distally than in *J. lucina*. The proximal half of the medial border bears seven fine setae. The distal half is armed by three curved spines. The other margins are devoid of setae. On the second pleopod, the appendix masculina is greatly exceeded by the appendix masculina which bears about 8-10 concinni distally. The appendix masculina bears a single large, slightly curved, robust, strongly spinulate spine and a smaller straight simple spine distally. The median border bears a single spinulate spine subterminally and the lateral border bears a row of four spines distally. The proximal spine is feeble, the adjacent spine is simple and the longest and the two remaining spines bear a few setules only. The ova are numerous, 125 being present and have a major diameter of 0.57 mms.

22. **Jocaste lucina** (Nobili) (Fig. 13 a-c, f, i.)

Restricted synonymy:

Coralliocaris lucina Nobili, 1901: 5; 1906: 57.

Jocaste lucina (partim) — Holthuis, 1952: 17, 193-195, fig. 94

Jocaste lucina — Patton, 1966: 278-279, 288 tab; 1, 290 tab. 2, Fig. 2a. Bruce, 1969: 298-307, Fig. 2.

MATERIAL EXAMINED: 1♂, 1 ovig. ♀, CL. 2.4, 2.8 mm. West Cay, Diamond Islets, 23 October, 1964.

HOST: Not recorded.

DISTRIBUTION: Type locality, Eritrea. Widespread and common throughout most of the Indo-West Pacific region excluding Hawaii and Japan, from the Gulf of Aquaba to Madagascar to Johnson Island and Tahiti. Previously recorded from Australia by Patton (1966) from Restoration Rock, Wistari Reef, Willis Island, Heron Island and Moreton Bay. The reference in Bruce (1969) to the occurrence of this species at Bet Reef is erroneous.

REMARKS: The specimens agree exactly with the redefinition as given by Patton. The male has six dorsal and three ventral rostral teeth and the female has five and two respectively. The first pereopods are long and slender. The chela is slender and bilaterally compressed. The fingers are tapering, about half the length of the palm, and with entire cutting edges which gape proximally. The fingers bear some tufts of short serrated setae which are curved backwards towards the palm. There are no rows of setae along the margins of the palm. The major chela of the second pair of pereopods is comparatively slender, about 4.3 times longer than the greatest width of the palm, which is markedly dorso-ventrally flattened. The disto-ventral spine of the merus has a concave anterior margin. The carpus is unarmed. The dactyls of the ambulatory pereopods are very similar to those of *J. japonica* (vide supra). The fourth thoracic sternite is broad and unarmed.

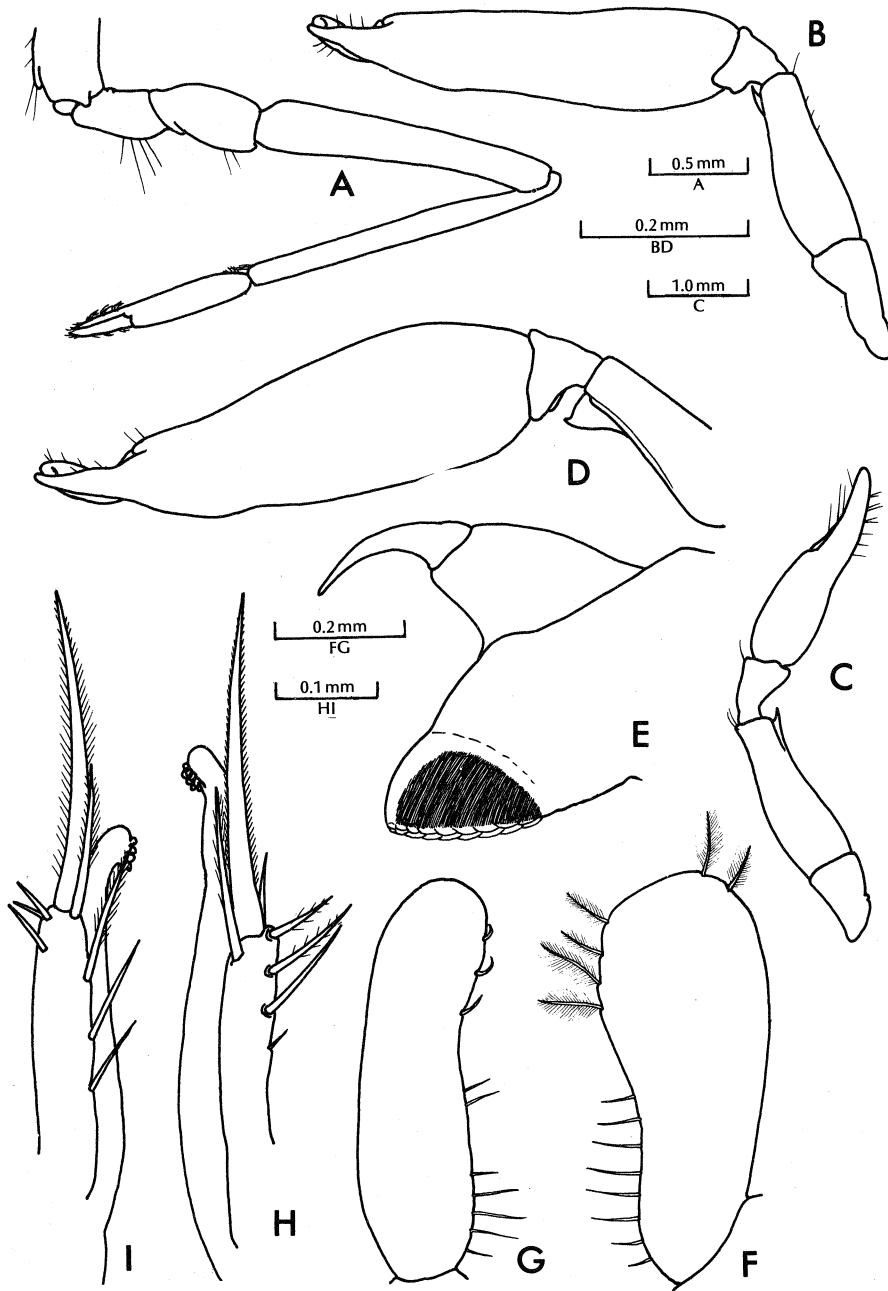


Fig. 13. *Jocaste lucina* (Nobili). A, first pereiopod. B, major second pereiopod. C, minor second pereiopod. F, endopod of male first pleopod. I, appendix masculina and appendix interna. *Jocaste japonica* (Ortmann). D, major second pereiopod. E, dactylus of ambulatory pereiopod. G, endopod of male first pleopod. H, appendix interna and appendix masculina.

The endopodite of the male first pleopod is expanded distally and bears a row of eight slender spines along the proximal half of the feebly concave medial border. The distal part of the medial border bears a row of four feebly plumose setae and a pair of densely plumose setae are situated subterminally on the lateral border. On the second pleopod the appendix interna, with four subterminal concinnuli, distinctly exceeds the appendix masculina. This process bears a single robust, slightly curved, strongly spinulate terminal spine. A row of four spines, which increase in length distally, arises from the medial border. The distal spine is markedly spinose and the penultimate spine is feebly spinulose. The distal end of the medial border bears three short simple spines.

The female carried 67 ova but a few had probably been lost. The major diameter of the ovum is about 0.43 mm.

This species is normally associated with corals of the genus *Acropora* and has been found on eleven different host species. The association of 23 specimens with two colonies of *Pocillopora verrucosa* (Ellis & Solander) at Willis Island is especially remarkable (Patton, 1966).

23. ***Conchodytes tridacnae*** Peters (Fig. 14 a-b)

Restricted synonymy:

Conchodytes tridacnae Peters, 1852: 288-289. Kemp, 1922: 280-285.

Pontonia tridacnae — McNeill, 1926: 300-301.

Conchodytes tridacnae (partim) — Holthuis, 1952: 17, 195-199, Fig. 95.

MATERIAL EXAMINED: 1 ovig. ♀, CL. 9.1 mm, West Cay, Diamond Islets, 23 October 1964. 1♂, 1 ovig. ♀, CL. 4.0, 4.8 mm, North East Cay, Herald Group, 12 November 1964. 1♂, 1 ovig. ♀, CL. 5.3, 7.6 mm, One Tree Island, Capricorn Group, December 1966.

HOSTS: *Tridacna squamosa* lam, *T. whiteleyi* Iredale and *T. maxima* Roding (Lamellibranchia: Tridacnidae).

DISTRIBUTION: Type locality, Ibo, Mocambique. Distribution of this species is rather uncertain due to its frequent confusion with *C. meleagrinae*. Probably common and widespread throughout most of the Indo-West Pacific region. Specimens of *Conchodytes* associated with *Tridacna* spp. have been reported from Samoa (Dana, 1852), Ryu-Kyu Islands and Bonin Islands (Kubo, 1940) Maldive Islands (Borradaile, 1917), Laccadive Islands and Andaman Islands (Kemp, 1922), the Marshall Islands (Holthuis, 1953), also Palau Islands (Miyake & Fujino, 1968). The only record of this species from Australian waters is from the Torres Straits (Kemp, 1922).

REMARKS: The specimen reported as free living from North West Islet, Capricorn Group, by McNeill (1926) may possibly belong to *C. meleagrinae* as no host was recorded. The present specimens correspond well to the information given by Borradaile, Kemp and Kubo. In all specimens the carpus of the first pereopod is distinctly longer than the merus. The fourth thoracic sternite is broad and unarmed. The fifth bears a low triangular ridge with a small median notch immediately posteriorly to the coxae of the second pereopods.

The endopod of the male first pleopod is about six times longer than wide. A row of slender spines is present along the proximal part of the medial border. These spines, thirteen in number, increase slightly in length distally and are non-plumose. The distal part of the medial border bears five long spines and two plumose setae. Seven long plumose setae are present on the distal half of the lateral border and there are two plumose terminal setae. The appendix masculina exceeds the tip of the appendix interna. Its distal end is armed with eight long finely spinulate setae.

The ovigerous female bears numerous ova. A dissected example, carapace length 9.1 mms., bore 725 ova, with a greater diameter of 0.74 mms.

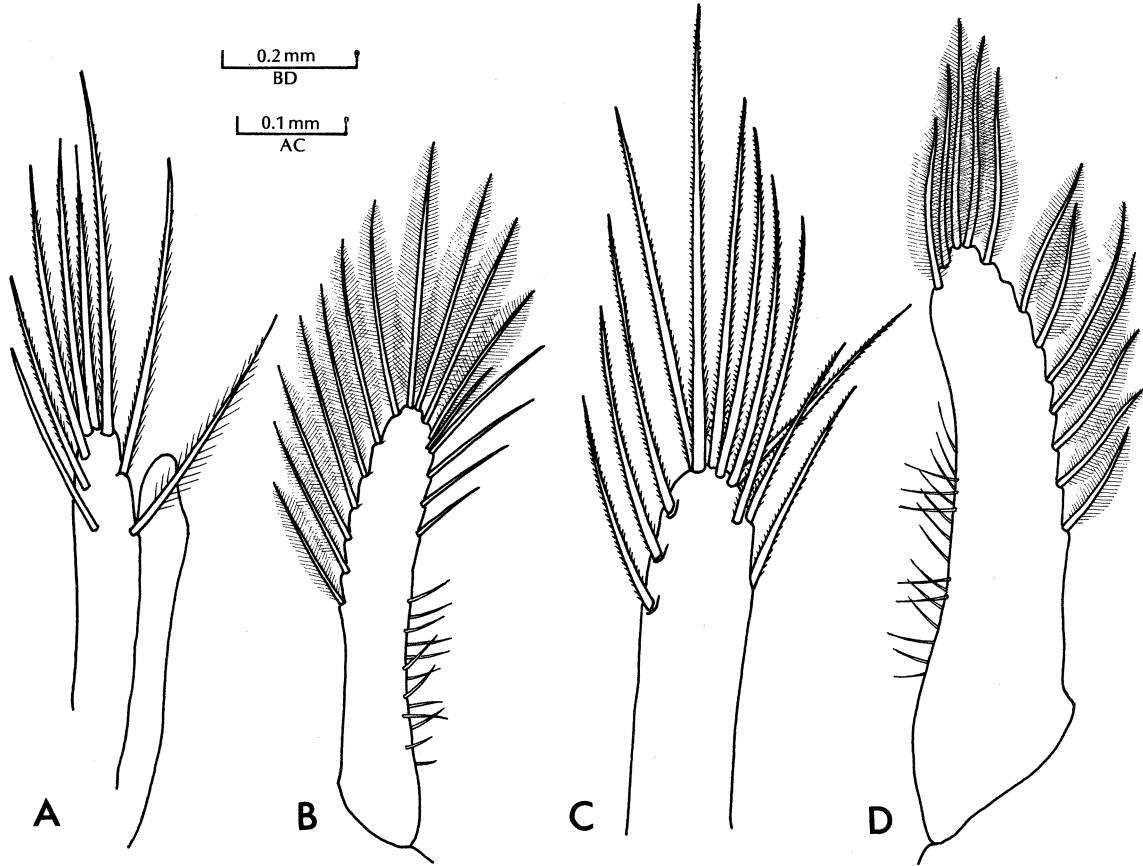


Fig. 14. *Conchodytes tridacnae* Peters. A, appendix masculina and appendix interna. B, endopod of male first pleopod. *Conchodytes meleagrina* Peters. C, appendix masculina. D, endopod of male first pleopod.

24. **Conchodytes meleagrinae** Peters (Fig. 14 c-d)

Restricted synonymy:

Conchodytes meleagrinae Peters, 1852: 289-290. Balss, 1921: 15.

?*Pontonia* (*Conchodytes*) *tridacnae* (partim). — Miers, 1884: 290.

Pontonia meleagrinae — Bate, 1888: 707, pl. 124 figs. 1-2. Thompson, 1901: 19.

Conchodytes tridacnae — McNeill, 1968: 7, 22.

MATERIAL EXAMINED: 4♂, 5♀ (4 ovig.), Gillett Cay, Swain's Reef, October 1962. 1 ovig. ♀, Heron Island, October 1962. 1♂, 1 ovig ♀, One Tree Island, Capricorn Group, November 1966.

MEASUREMENTS: CL. males, 4.0-5.7 mm; female 6.0 mm; ovigerous females 5.5-10.0 mm.

HOST: *Pinctada margaritifera* (L.) (Lamellibranchia: Pteriidae).

DISTRIBUTION: Type locality, Ibo, Mocambique. Also recorded from the Red Sea to Madagascar as far east as Hawaii. In Australia, reported from Warrior Reef (Miers, 1884), Torres Strait, (Bate, 1888; Kemp, 1922), N. W. Australia (Thompson, 1901), the Low Isles and Bat Reef (McNeill, 1968).

REMARKS: The specimens correspond well with published descriptions. In all cases the carpus of the first pereopod was distinctly shorter than the merus and the relative lengths of these two segments appears to be the easiest way of distinguishing between these two species as the disto-lateral angle of the basal segment of the antennular peduncle is variable. The sternite of the fourth thoracic sternite is the same as in *C. tridacnae*.

In a dissected specimen the endopod of the male first pleopod bears a row of eighteen slender spines along the central portion of the medial border. The lateral border bears nine plumose setae, with two similar setae situated terminally and with a pair of plumose setae at the distal end of the medial border. The disto-medial border is without the slender non-plumose setae found in *C. tridacnae*. The appendix masculina is exceeded by the appendix interna. The extremity of the appendix is armed with four long slender finely serrated setae. Three similar setae are present on the medial border and five on the lateral border.

The ova are numerous, a dissected female, carapace length 10.0 mms, bore 479 eggs, with a greater diameter of 0.65 mms.

Pontonia tridacnae reported by McNeill (1926), from North West Islet, may possibly belong to this species. Its host was not recorded.

Incertae sedis25. **?*Araiopontonia* sp.** (Fig. 15-16).

MATERIAL EXAMINED: 1 spm. damaged, CL. 1.5 mm, One Tree Island, Capricorn Group, 140 ft., 28 November 1966, coll. F. Talbot.

DESCRIPTION: Very small in size and slender, not depressed.

Carapace smooth. Rostrum well developed and acute, equal to the postocular carapace length, compressed distally. The dorsal margin is slightly elevated posteriorly and five dorsal teeth are present. These teeth are acute and directed anteriorly with their posterior margins parallel to the ventral margin of the rostrum. The interval between teeth decreases slightly towards the rostral tip. The ventral margin is straight, except at the tip, and lacks teeth. The midrib is well developed, expanded posteriorly and is convex immediately anteriorly to a pair of large blunt supra-ocular spines which form the superior part of the orbit. The inferior orbital angle is feebly produced and blunt. A well developed antennal spine is present on

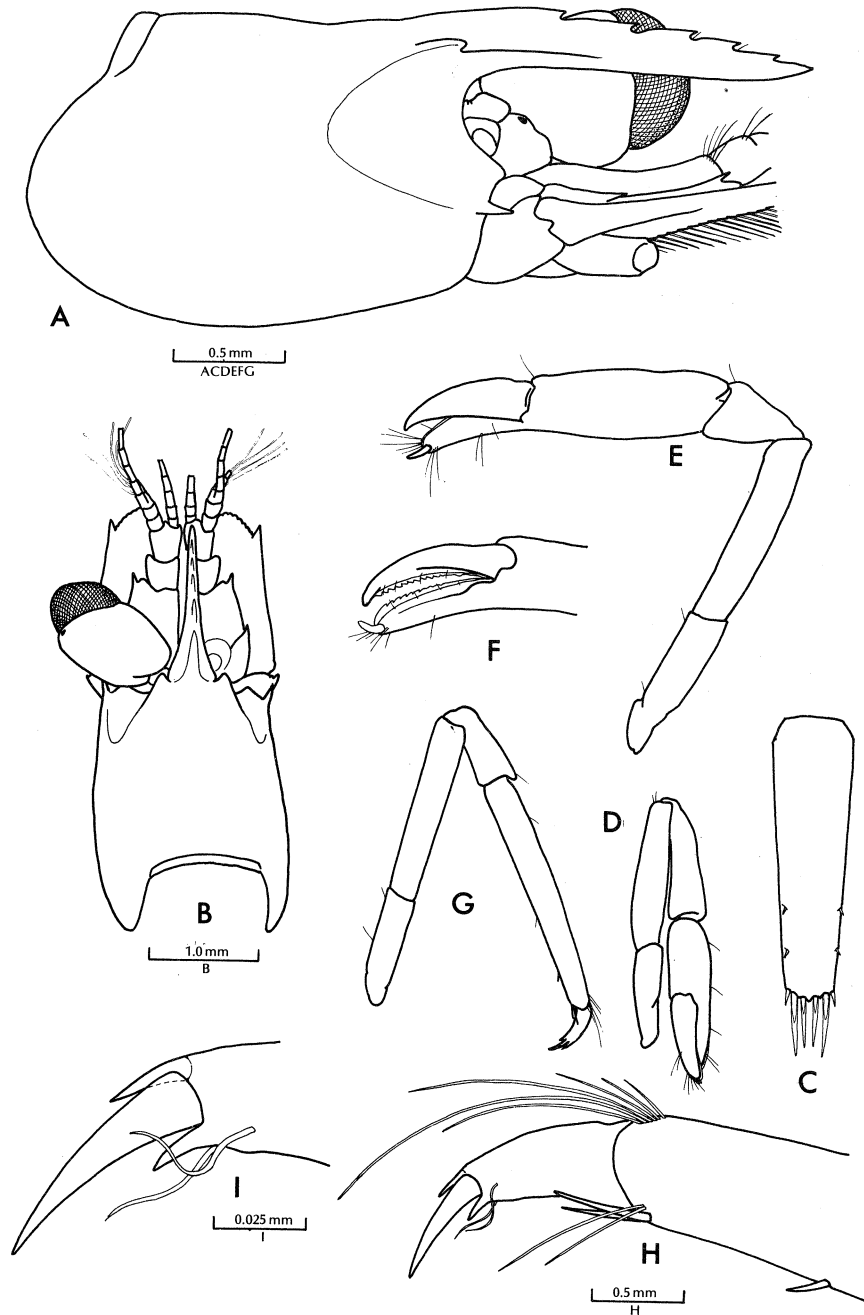


Fig. 15. *?Araiopontonia* sp. A, carapace and antennal region, lateral view. B, Carapace and antennae, dorsal view. C, telson. D, first pereiopod, E, second pereiopod. F, fingers of second pereiopod. G, third pereiopod (?). H, dactylus of (? third pereiopod). I, tip of dactylus of (? third pereiopod).

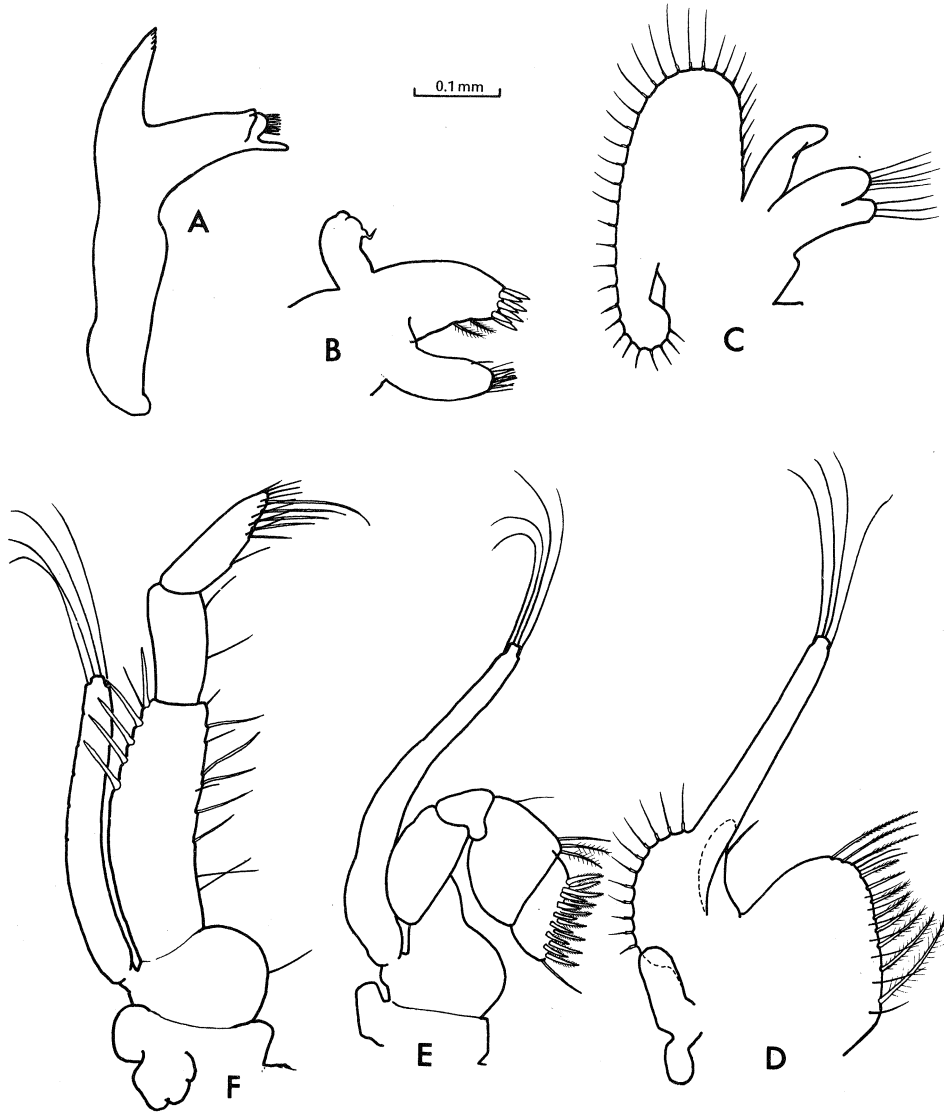


Fig. 16. ?*Araiopontonia* sp. A, mandible. B, maxillula. C, maxilla. D, first maxilliped. E, second maxilliped. F, third maxilliped.

the anterior margin of the carapace at a level well below the inferior orbital angle, where it forms the antero-lateral margin of the orbit. The hepatic spine is absent. The antero-lateral angle of the carapace is obtusely rounded.

The abdomen is smooth and the third segment is not produced in the dorsal midline. The pleura of the first five segments are broadly rounded. The fifth segment is about half the length of the sixth segment and sub-equal to its depth. The posterior angle of the sixth segment is bluntly produced. The telson is narrow, straight sided, feebly tapering and slightly longer than the sixth abdominal segment. The distal margin is truncated. There are three pairs of terminal spines. The intermediate spines are long strong and slender, equal to slightly less than a quarter of the length of the telson. The submedian spines are also long and slender but are slightly shorter and less robust than the intermediate spines. The lateral spines are short and stout and equal to about one third of the length of the submedian spines. Two pairs of very small submarginal dorsal spines are present. The anterior pair is situated at two thirds of the telson length from the anterior margin and the posterior pair lies half way between the anterior pair and the posterior margin.

The antennular peduncle slightly exceeds the tip of the rostrum. The proximal segment is broad with an acute stylocerite reaching to the middle of its lateral border. The antero-lateral border is produced and bears a well developed tooth. A small lobe is present medially to the disto-lateral tooth. The intermediate and distal segments are short and stout, subequal in length and together equal about two thirds of the length of proximal segment. The disto-lateral border of the intermediate segment is slightly produced. The antennular flagella are damaged. The upper flagellum consists of two rami which are fused for the two proximal segments. The shorter ramus consists of two segments and bears two groups of aesthetascs. Five segments are still present on the lower ramus. Only four segments of the lower flagellum are still present.

The flagella are missing from the antennae. The basicerite bears a small blunt lateral process. The carpoperite is short and cylindrical. The scaphocerite is broad with a straight lateral border armed distally with a strong tooth. The lamina is roundly angled distally and distinctly exceeds the disto-lateral spine.

The eye is large with an obliquely orientated hemispherical cornea. The eyestalk is robust with a maximum length about 1.5 times the breadth. The width of the stalk is distinctly greater than the diameter of the cornea. A small accessory pigment spot is present close to the corneal margin dorsally.

The mandible is without a palp. The molar process is robust with a long finger-like process posteriorly. The medial dorsal border bears a small number of long stout setae. The incisor process is slender with five small distal teeth. The maxillula bears a small feebly bilobed palp. The lower lobe bears a small uncinata seta. The upper lacinia is stout and tapers distally, bearing seven stout spines at its distal end and two plumose setae on its lower border. The lower lacinia is slender with a few short slender simple setae distally. The maxilla bears a stout, non-setose palp. A broad bifid endite is present with five simple setae on the distal lobe and three on the proximal lobe. A feebly developed process is present on the medial border proximal to the endite. The scaphognathite is well developed, broad anteriorly and very narrow posteriorly. The first maxilliped has a well developed palp bearing a single non-plumose seta at two thirds of its length. The endite is broadly rounded distally and with an entire medial border, slightly emarginated proximally, bearing a few long plumose setae proximally and spinulose setae distally. The exopod is well developed and has a small caridean lobe. The epipod is small and distinctly bilobed. The second maxilliped has a dactylus bearing short stout spinulose setae. The propodus is broad, 1.5 times longer than wide and with a few plumose setae at the antero-medial angle. The exopod is well developed but the epipod is small, sub-rectangular and without a podobranch. The third maxilliped has a normally developed endopod. The terminal and penultimate segments are subequal in length and together slightly shorter than the

antepenultimate segment. The terminal segment bears a few long slender non-serrated setae and a number of short simple setae along the distal half of its medial border. The penultimate segment bears only two simple setae medially. The antepenultimate segment is three times longer than wide and bears sparse simple setae along its medial border. The distal third of its lateral border is armed with a row of five stout similar spines, which are equal in length to the width of the segment. The exopod is well developed and slightly exceeds the antepenultimate segment. The basis is obscurely separated from the ischiomerus and from the coxa. Its lateral border is short and bears the exopod while the medial border is much longer and strongly convex, bearing a single simple seta. The coxal segment is short with a small median lobe and a small rounded epipod laterally. A large arthrobranchial rudiment is present.

The first pereopod is short and stout. The fingers are broadly sub-spatulate, with entire cutting edges and are longer than the palm which is subcylindrical. The carpus is distinctly shorter than the chela (61 : 83) and is slender, narrower proximally than distally and unarmed. The merus is slightly shorter than the chela (76 : 83) but is distinctly longer than the ischium (83 : 54). Only the left second pereopod is preserved. The chela is robust with a cylindrical palm, slightly swollen in the middle. The fingers are stout and about 0.3 times the length of the palm. The fixed finger bears a stout curved peglike process distally, separated by a deep notch from the cutting edge which bears a row of acute proximally directed teeth. A few long setae are also present. The dactylus fits into the notch between the tip and the cutting edge of the fixed finger. The cutting edge is similarly serrated but the teeth are more numerous and more acute. The carpus is short, stout and unarmed, nearly three times as wide distally as proximally and about half of the length of the palm and the ischium is about 0.8 of the length of the merus: both segments are unarmed. The ambulatory pereopods are slender. In the third pereopod the dactylus is a quarter of the length of the propodus. The unguis is very clearly marked and is about 0.6 times the length of the main part of the dactylus, which bears well marked anterior and posterior accessory spines, thereby giving the dactylus a trianguiculate appearance. A pair of lateral setae are also present. The propodus tapers slightly distally and is about 7.8 times longer than wide. A pair of stout spines are present at the distal end of the posterior border with a single smaller seta proximally. Several long slender setae arise from the distal end of the posterior border. The carpus is short and relatively stout, 0.38 times the length of the propodus and unarmed. The merus is slightly more robust than the propodus and 1.7 times the length of the ischium. Both merus and ischium are unarmed. The fourth and fifth pereopods, only present on the left side, appear generally similar. The sternite of the fourth thoracic segment lacks a median process. The endopod of the first pleopod is a small rounded, non-setose lobe. The endopods of the second to fifth pleopods are well developed with appendices internae on the medial borders. The uropods are well developed, with the exopod extending beyond the endopod, which in turn exceeds the tip of the telson. The lateral margin of the exopod is straight and non-setose, with a small mobile spinule distally. The posterior border is rounded and heavily setose.

HOST: *Comanthina schlegeli* (P. H. Carpenter) (Echinodermata: Crinoidea).

REMARKS: The specimen was found on the same host crinoid as the specimen of *Palaemonella pottsii* referred to above.

The very small size of the single specimen indicates that it is juvenile, probably the first post-larval stage.

The most noteworthy features of the present specimen are the dentate rostrum, the supraocular teeth and the lack of the hepatic spine. In the genus *Periclimenes*, which this species otherwise closely resembles, the hepatic spine is present in the first larval stage. This combination of features is found only in *Araiopontonia*, a monospecific genus at present represented by a single specimen of *A. odontorhyncha* Fujino & Miyake (1970). *Araiopontonia* is closely related to *Parapontonia* Bruce (1968) in which genus the only

species, *P. nudirostris*, is known to associate with crinoids, so that a similar association probably occurs in the case of *Araiopontonia*. The dactylus of the ambulatory pereopods in the present specimen shows a particularly close resemblance to that of *A. odontorhyncha*, with a well developed acute accessory spine on the ventral border and also a slender spine on the dorsal aspect, at the base of the unguis. This feature is also present, but less well developed in *Periclimenes commensalis* Borradaile, a species that has already been recorded from crinoids in Queensland (Bruce, 1971)

The mouthparts also show a close resemblance to both *A. odontorhyncha* and *P. commensalis* but differ conspicuously from both in the remarkable series of large spiniform setae on the disto-lateral margin of the ischiomerus of the third maxilliped. These are without parallel in any other pontoniine species but some small spines may exist in this situation in the adults of some species, such as *Periclimenes elegans* (Paulson, 1875) and *P. grandis*, (Bruce, 1976). The One Tree Island shrimp has a normal incisor process on the mandible, and lacks the broadly expanded process found in *A. odontorhyncha*. The endite of the maxilla is bilobed, as in *A. odontorhyncha* and also in most commensal species of *Periclimenes*, and is not simple as in *P. commensalis*, (Bruce, 1971). The simple palp in this specimen of *P. commensalis* however, may be atypical and due to individual variation only.

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