

# A REPORT ON SOME CORAL REEF SHRIMPS FROM THE PHILIPPINE ISLANDS

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## Abstract

Records are provided of 21 species of shrimp from some coral reefs in the Philippine Islands, collected by Prof. Volker Storch in 1983. Most of the species noted are commensal associates of other marine animals and 15 have not been previously reported from the Philippines. One new species, *Periclimenaeus storchi*, is described. The possible identity of *Anchistia gracilis* Dana, 1852, known only from the lost holotype specimen from the Sulu Sea, is discussed and it is suggested that it is synonymous with *Harpiliopsis depressa* (Stimpson, 1860). The systematic positions of *Conchodytes biunguiculatus* (Paulson), *C. biunguiculatus* Kemp and *C. nipponensis* (De Haan) are discussed, and a new species, *C. kempii*, is designated.

## Introduction

A recent review of the pontoniine shrimp fauna of the Philippine Islands (Bruce and Svoboda 1984) indicated that only 24 species of this group had been recorded, reflecting the lack of study of that taxon. Other shallow water caridean taxa have also not received much more attention, and the shallow water fauna cannot yet be considered at all well known.

Through the kindness of Professor Volker Storch, a recent small collection of shrimps has been made available for study. The specimens were all obtained from shallow water coral reef biotope in March and April 1983. Most of the specimens were 'commensal' associates of other marine animals and include one new species as well as many species that are new to the fauna of the Philippine Islands. The specimens are now deposited in the collections of the Northern Territory Museum (NTM). Colour notes are based on photographs or data provided by the collector. CL. refers to the posterorbital carapace length, TL. to the total body length. Measurements are given in millimetres. Restricted synonymies are provided, fuller details of most species being available in Holthuis (1947, 1952) and Banner and Banner (1973, 1975).

The positions of the localities at which collections were made are shown in Figure 1.

## Systematic Account

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### PALAEEMONIDAE

#### *Palaemonella pottsi* Borradaile

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

*Palaemonella pottsi* — Kemp, 1922, Rec. Indian Mus., 24: 126-27; Bruce, 1970, Crustaceana: 279-84, figs. 3-7.

**Material examined.** (i) 1 ♂, 1 ovig. ♀, Moalboal, NTM. Cr. 006455. (ii) 1 ♂, 1 bopyridized ♀, same, NTM. Cr. 006456. (iii) 1 ♀, same, NTM. Cr. 006457. (iv) 1 ♂, same, NTM. Cr. 006458.

**Remarks.** The specimens show no differences from previous descriptions. The rostral dentition varies from 7-8/2, in the males, to 7-9/3 in the females.

**Colouration.** Semitransparent with red brown band extending from antennal peduncles along

Bruce, 1970

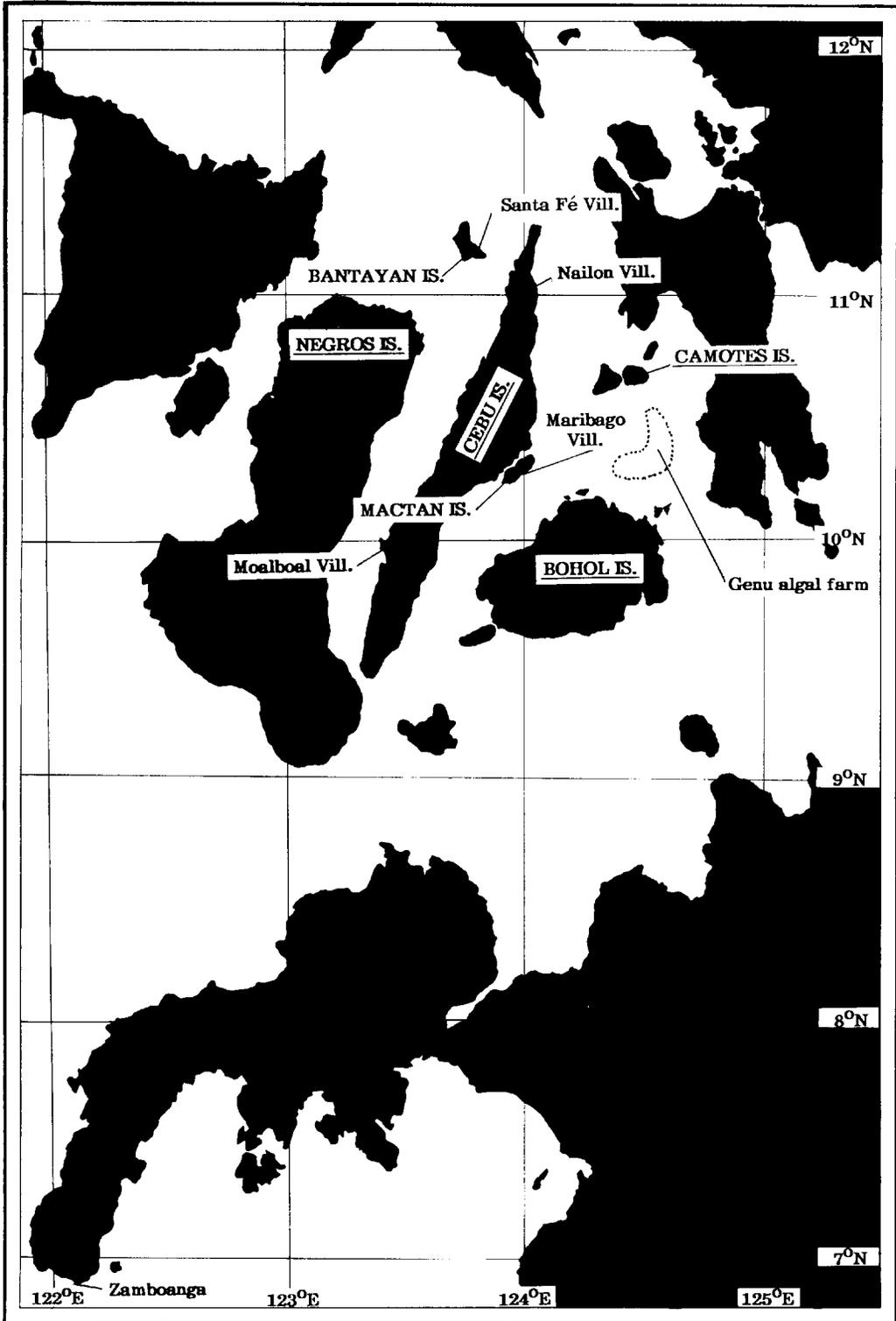


Fig. 1. Positions of localities sampled.

ventral body to telson; second pereopods more red brown, chelae paler (from colour photo).

**Host.** All specimens were obtained from unidentified crinoids.

**Parasites.** One specimen, from lot (ii), was host for a branchial bopyrid parasite (NTM. Cr. 006489), belonging to an undescribed genus and species (J.C. Markam, in press).

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Mabuaig, Torres Straits, Australia. Widely recorded, throughout most of the Indo-West Pacific region from East Africa to the Marshall Islands.

*Periclimenes amymone* De Man

*Periclimenes amymone* De Man, 1902, Abh. Senckenb. naturf. Ges., **25**: 289, pl. 25, fig. 53.

**Material examined.** 1 ♂, 1 ovig. ♀, Moalboal, NTM. Cr. 006459.

**Remarks.** The two specimens present no special features.

**Host.** *Acropora* sp. (Scleractinia).

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Ternate, Indonesia. Also known from Nicobar Islands, Singapore, Australia, New Caledonia, Solomon Islands, New Georgia, and Samoa.

*Periclimenes brevicarpalis* (Schenkel)

*Ancylocaris brevicarpalis* Schenkel, 1902, Verh. naturf. Ges. Basel, **13**: 563, pl. 13.

*Periclimenes (Ancylocaris) brevicarpalis* — Kemp, 1922, Rec. Indian Mus., **24**: 185–91, figs. 40–42, pl. 67.

*Periclimenes (Harpilius) brevicarpalis* — Holthuis, 1952, Siboga Exped. Mon., **39a**<sup>10</sup>: 69–73, fig. 27.

**Material examined.** 3 ♂, Nailon, Cebu, NTM. Cr. 006460.

**Remarks.** The specimens presented no special features. The dactyls of the ambulatory pereopods were simple, without minute accessory teeth, as reported for some specimens (Bruce, 1979).

**Colouration.** Transparent, with brownish uropods.

**Host.** Anemone, unidentified.

**Distribution.** Previously recorded from the Philippine Islands, from the Sulu Sea (Holthuis 1952) and Canbyan Island (Cases and Storch 1981). Type locality: Ambon, Indonesia. Common and well known throughout most of the Indo-West Pacific region, from the Red Sea and East Africa to Japan and the Santa Cruz Islands.

*Periclimenes commensalis* Borradaile

*Periclimenes (Cristiger) commensalis* Borradaile, 1915, Ann. Mag. nat. Hist., (8) **15**: 211; 1917, Trans. Linn. Soc. Lond., Zool., (2) **17**: 364.

*Periclimenes (Periclimenes) commensalis* — Holthuis, 1952, Siboga Exped. Mon., **39a**<sup>10</sup>: 53–56, figs. 18–19.

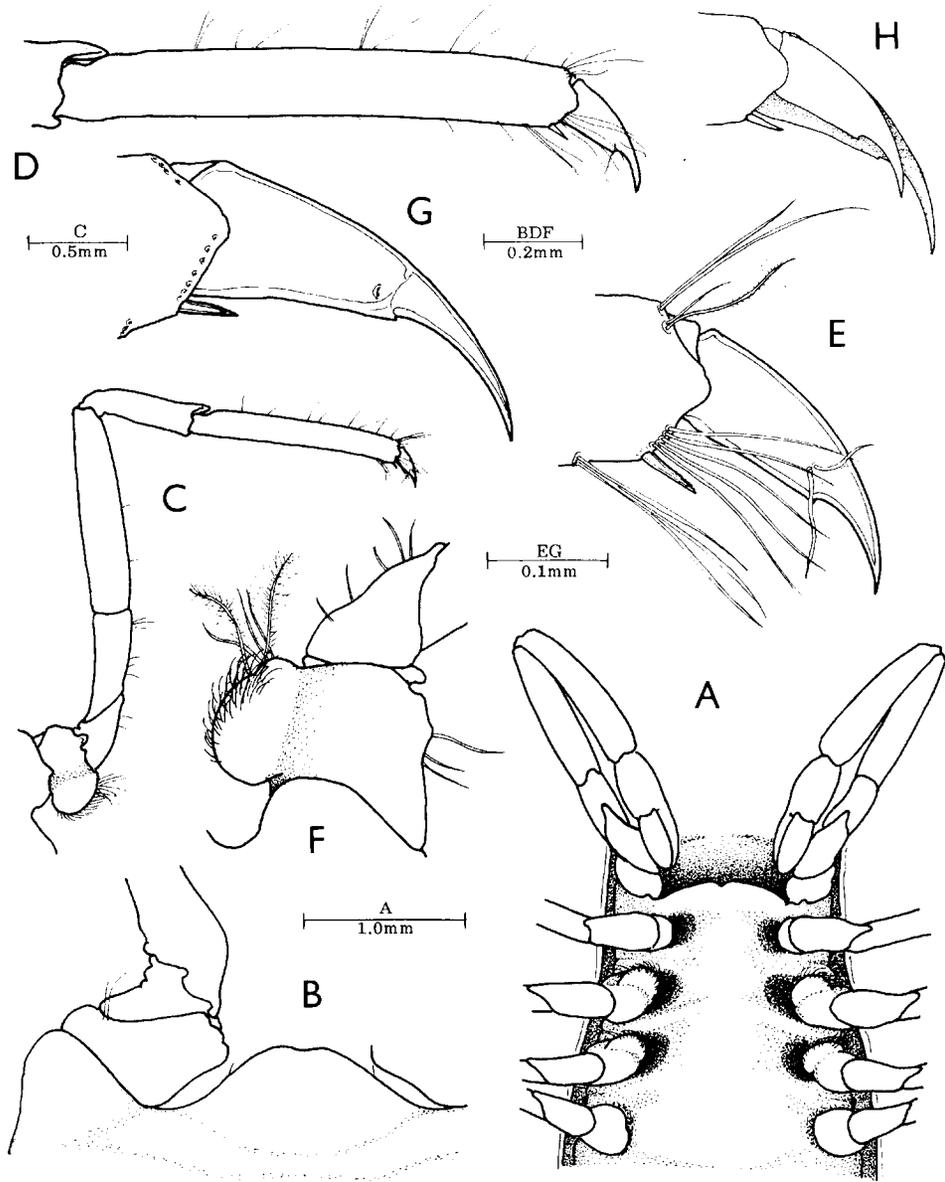
**Material examined.** 1 ♀, Moalboal, NTM. Cr. 006461.

**Remarks.** The specimen presented no special features. The rostral dentition was 5/1. The chelae of the second pereopods are subequal and similar, with the fingers subequal to palm length, cutting edges strongly serrate.

**Colouration.** White with red dots, especially on antennae and pereopods, eyestalks with light lines, uropods brilliantly orange.

**Host.** A light brown crinoid.

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Murray Island, Torres Straits, Australia. Also known from Zanzibar, Kenya, Moçambique, Indonesia, Japan (?), Hong Kong, New Caledonia, Solomon Islands, Marshall Islands and Fiji.



**Fig. 2.** *Periclimenes soror* Nobili, ovigerous females. A, thoracic sternites; B, fourth thoracic sternite and right first pereiopod coxa; C, third pereiopod; D, same, dactyl and propod; E, same, dactyl; F, same, coxa, medial; G, third pereiopod, dactyl. A-F, from *Culcita*; G, from *Acanthaster*. H, outline of third pereiopod dactyl from *Culcita* host superimposed on dactyl from *Acanthaster* host, propods of subequal length.

*Periclimenes soror* Nobili (Fig. 2)

*Periclimenes soror* Nobili, 1904, Bull Mus. Hist. nat., Paris, **10**: 232. — Bruce, 1976, Tethys, **8**(4): 229–306, figs. 1–6 (1978).

*Periclimenes bicolor* Edmondson, 1935, Occ.

Pap. Bishop. Mus., **10**(24): 10, fig. 3.

*Periclimenes (Periclimenes) soror* — Holthuis, 1952, Siboga Exped. Mon., **30a**<sup>10</sup>: 51–53, fig. 17.

**Material examined.** (i) 1 ♀, Santa Fé, NTM.

006462. (ii) 1 ♂, 1 ovig. ♀, Santa Fé, NTM. Cr. 006463. (iii) 1 ♀, 1 ovig. ♀, Genu Farm, NTM. Cr. 006464. (iv) 2 ♂, 1 ♀, 1 ovig. ♀, Genu Farm, NTM. Cr. 006465. (v) 6 (1 ovig. ♀), Maribago, Mactan Island, NTM. Cr. 006466.

**Remarks.** *Periclimenes bicolor* Edmondson was synonymized with *P. soror* by Holthuis (1952). *P. soror*, found most often in association with *Culcita* and *Protoreaster* species, is characterized by a uniform deep red colouration, most marked in ovigerous female specimens. *P. bicolor*, typically found in association with *Acanthaster*, has a lighter red colouration with a white or cream rostrum and dorsal band extending the whole body length. This colouration would appear to have significant protective value amongst the dorsal spines of the host. In contrast, *P. soror* is usually found on the ventral surface of its hosts. Bruce (1979) suggested that *P. soror* and *P. bicolor* were biologically distinct sibling species. The examination of the present specimens, from both *Culcita* and *Acanthaster* hosts, has failed to provide any clear morphological character than can be used to separate the two forms, with one possible exception. *P. bicolor* may yet prove to be a recognizable species.

The third pereopods in ovigerous females from both host genera were basically very similar, with a single small distoventral spine only, finely denticulate along its distodorsal edge, and with numerous simple setae. In the specimen from *Culcita*, the dactyl is about 0.25 of the propod length, with the unguis feebly demarkated, about 0.66 of the corpus length, the distoventral accessory tooth distinct. In a specimen from *Acanthaster*, the dactyl is about 0.3 of the propod length, with the unguis clearly demarkated, equal to about 0.85 of the corpus length, with accessory tooth very feebly developed. The length of the dactyl is about 2.5 times the distal width of the propod, whereas in the *Culcita* specimen, it is about 2.1. The *Acanthaster* form has the dactyl about 1.3 times the length of that of the *Culcita* form, for the same propod length.

Other features noted, in both forms, include the presence of thick oval plates, with setose medial edges, projecting medially from the coxae

of the third and fourth pereopods. These fit into deep fossae on the adjacent lateral part of each sternite, on adduction of the appendage. The thoracic sternites are comparatively broad and the fourth is provided with a conspicuous transverse plate, with a feeble median notch, that projects anteroventrally at about 45°, with a deep space present anteriorly, into which the fingers of the first pereopod chelae easily fit.

Edmondson (1935) reports that the upper antennular flagellum in *P. bicolor* is undivided, and so unique among *Periclimenes* species. In the present specimens, from *Acanthaster*, this flagellum is distinctly biramous, the fused portion consisting of 3 segments, the short free ramus of 2 segments and the long with 10, with 6 groups of aesthetascs present; the lower flagellum is short, with 18 segments only.

**Colouration.** Uniform dark purple red on *Bunaster* sp. (from colour photo). On *Acanthaster*, reddish with cream coloured median dorsal stripe. On *Culcita*, (i) uniformly densely spotted with red and white, or (ii) deep red.

**Hosts.** (i) *Acanthaster planci* (L.). (ii) ? *Bunaster* sp. (iii) *Culcita novaeguineae* Müller & Tröschel. (iv) *Culcita novaeguineae* Müller & Tröschel. (v) *Acanthaster planci* (L.). *P. soror* has not been previously reported in association with *Bunaster*.

**Distribution.** *P. soror* has been previously recorded from the Philippine Islands by Holthuis (1952) from Sepankot, Sulu Islands, and from Mactan and Sumilon Islands by Cases and Storch (1981). Type locality: Jibuti. Widespread throughout the Indo-West Pacific from the Red Sea and East Africa to Hawaii, and also now known from Panama (Bruce 1978).

*Periclimenes pilipes* Bruce & Zmarzly  
(Fig. 3A)

*Periclimenes pilipes* Bruce & Zmarzly, 1983, J. Crust. Biol., 3(4): 644–54, figs. 1–6.

**Material examined.** (i) 2 ♂, 1 ♀, Moalboal, NTM. Cr. 006467. (ii) 1 ♀, 1 juv., Moalboal, NTM. Cr. 006468.

**Remarks.** The specimens agree closely with the original description. The rostral dentition is: male 5–6/1–2; female: 6/1–2. The only difference noted is that, in the present specimens, the long setae on the propods of the ambulatory pereopods appear more rigid and straight. In the Marshall Island specimens, they appeared softer and more flexible. The specimens were found in association with *Palaemonella pottsii* and *Pontoniopsis comanthi*. The type material was found in association with *Comanthina schlegeli* (P.H. Carpenter) (Crinoidea: Comasteridae).

**Host.** Crinoidea, unidentified.

**Distribution.** Not previously recorded from the Philippine Islands. Known only from the type locality, Eniwetak Atoll, Marshall Islands, (Bruce and Zmarzly 1983).

*Periclimenes venustus* Bruce

*Periclimenes venustus* Bruce, in press.

**Material examined.** 1 ♀, Nailon, NTM. Cr. 006469.

**Remarks.** The single example has a rostral dentition of seven dorsal teeth, with the first two situated on the carapace, and no ventral teeth, but the extreme tip of the rostrum is missing. The fingers of the chelae on the second pereopods are similar to well developed specimens of the type material, with numerous small acute recurved teeth on the cutting edges of both dactyl and fixed finger, with 5 and 6 on the left and right dactyls and 7 on both fixed fingers. The propods of the ambulatory pereopods are provided with sparse short distal and distoventral spines, as in the type material. The specimen was initially identified on the basis of its morphological features, before a colour photo was available. The photo corresponded closely to the colour pattern of the type material and confirmed the usefulness of colour data in separating closely related shrimp species.

**Colouration.** Generally highly transparent, with narrow transverse bar across central dorsal

carapace, with few deep blue spots on branchiostegite; dorsal surface of third abdominal segment with large suboval patch of white, with pinkish tinge along anterior margin and pinkish median spot posteromedially; pleura with diffuse white patch posteriorly, narrow vertical blue bar anteriorly; antennae, eye, rostrum colourless; second pereopod with distal merus and carpus largely white, distal margins deep blue; ambulatory pereopods transparent (from colour transparency).

**Host.** Anemone, unidentified.

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Port Essington, northern Australia. Known only from northern Australia (Bruce in press).

*Anchistus custos* (Forskål)

*Cancer custos* Forskål, 1775, Descript. Anim., 21: 94.

*Anchistus inermis* Borradaile, 1898, Ann. Mag. nat. Hist., (7) 2: 387.

*Anchistus custos* — Holthuis, 1952, Siboga Exped. Mon., 39a<sup>10</sup>: 105–109, figs. 43–44.

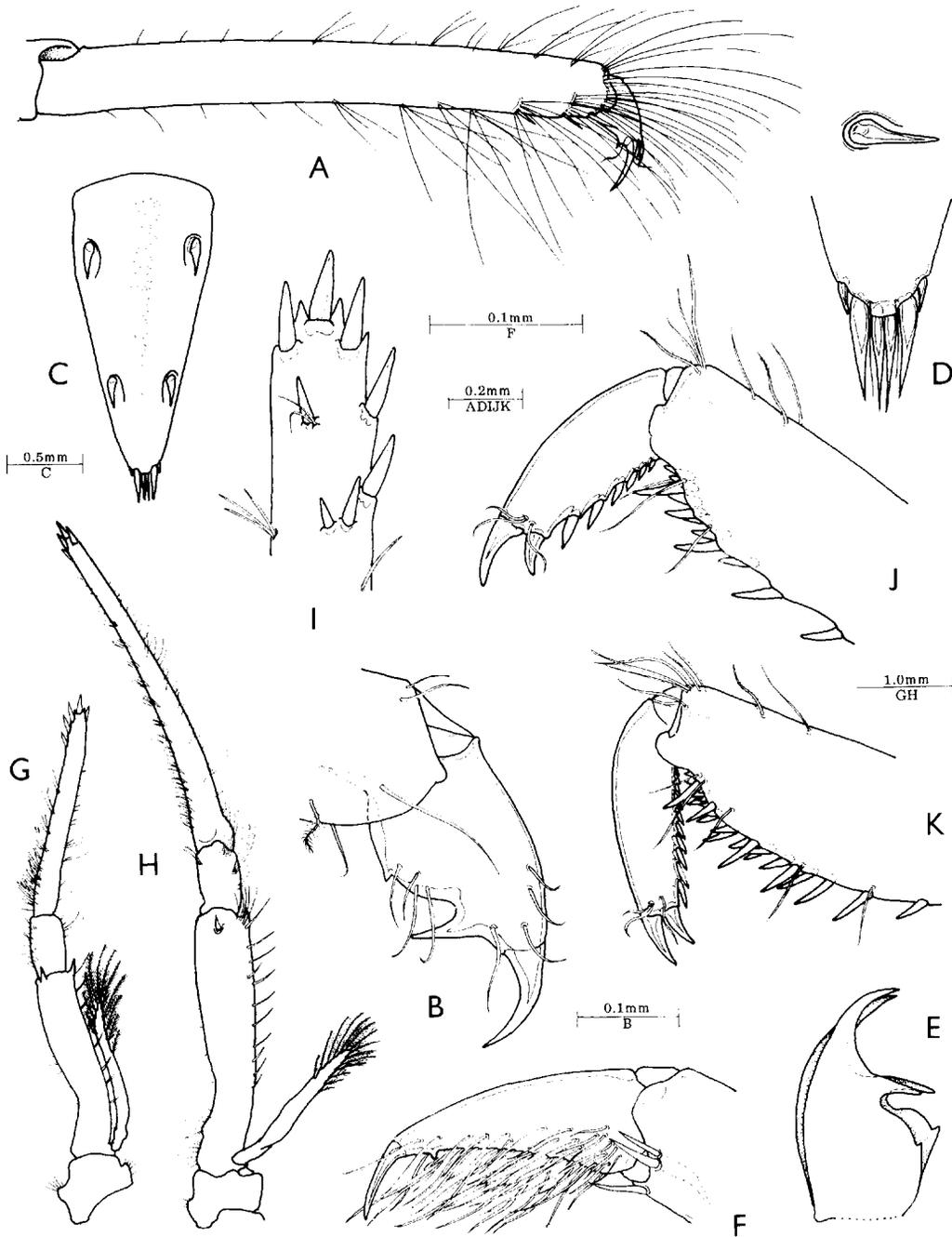
**Material examined.** 1 ♂, 1 ovig. ♀, Jingtungan Island, NW of Bohol Island, Visayan Sea, NTM. Cr. 006470.

**Remarks.** The specimens of this well known species are quite typical, the palm of the first pereopod chela being deeply cannulate and the rostrum devoid of minute denticulations.

**Colouration.** Orange-red, female darker than male.

**Host.** *Pinna* sp. (Bivalvia).

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Loheia, Red Sea. Another well known commensal shrimp that occurs throughout most of the Indo-West Pacific region, from the Red Sea and East Africa to Fiji and from Hong Kong and Taiwan to South Australia.



**Fig. 3.** *Periclimenes pilipes* Bruce and Zmarzly, male. A, third pereiopod, propod and dactyl. *Conchodytes kempii* sp. nov. B, third pereiopod, dactyl; C, telson; D, same, posterior telson spines (dorsal spine inset); E, outline of third pereiopod dactyl of *C. kempii* sp. nov., superimposed on that of '*C. biunguiculatus*' Kemp, 1922, from Obock, in *Pinna* (coll. A. Svoboda, ♀, CL 8.0 mm, NTM. Cr. 001500). *Pontoniopsis comanthi* Borradaile, ovigerous female. F, third pereiopod, dactyl. *Thor amboinensis* De Man. G, third maxilliped, ovigerous female, CL 3.35 mm; H, same, male, CL 2.90 mm; I, same, tip of distal segment, ventral; J, K, third pereiopods, distal propods and dactyls, male.

*Harpiliopsis depressa* (Stimpson) (Fig. 4A)

*Harpilius depressus* Stimpson, 1860, Proc. Acad. nat. Sci. Philad., 1860: 38. — Kemp, 1922, Rec. Indian Mus., 24: 231–34, figs. 69–70.

*Harpiliopsis depressus* — Holthuis, 1952, Siboga Exped. Mon., 39a<sup>10</sup>: 182–84, fig. 90.

**Material examined.** 1 ♂, Moalboal, NTM. Cr. 006471.

**Remarks.** The single example lacks both the second pereiopods but is attributed to *H. depressa* on account of the relatively low position of the hepatic spine. The rostrum has a dentition of

seven dorsal and four ventral teeth, with the first two dorsal teeth semi-articulated and situated on the carapace.

The statement in Bruce and Svoboda (1984) that Holthuis (1952) considered *Anchistia gracilis* Dana, 1852, as *incertae sedis* is erroneous, as this species was listed as *Periclimenes* (*Periclimenes*) *gracilis*. None the less, a close resemblance between the two species *Harpiliopsis depressa* and *Anchistia gracilis* is readily apparent, especially if a specimen of *H. depressa* is posed in the same attitude as that of Dana's illustration of *A. gracilis* (Fig. 4B). Although Dana's name would have date priority over that of Stimpson, it has rarely featured in the scien-

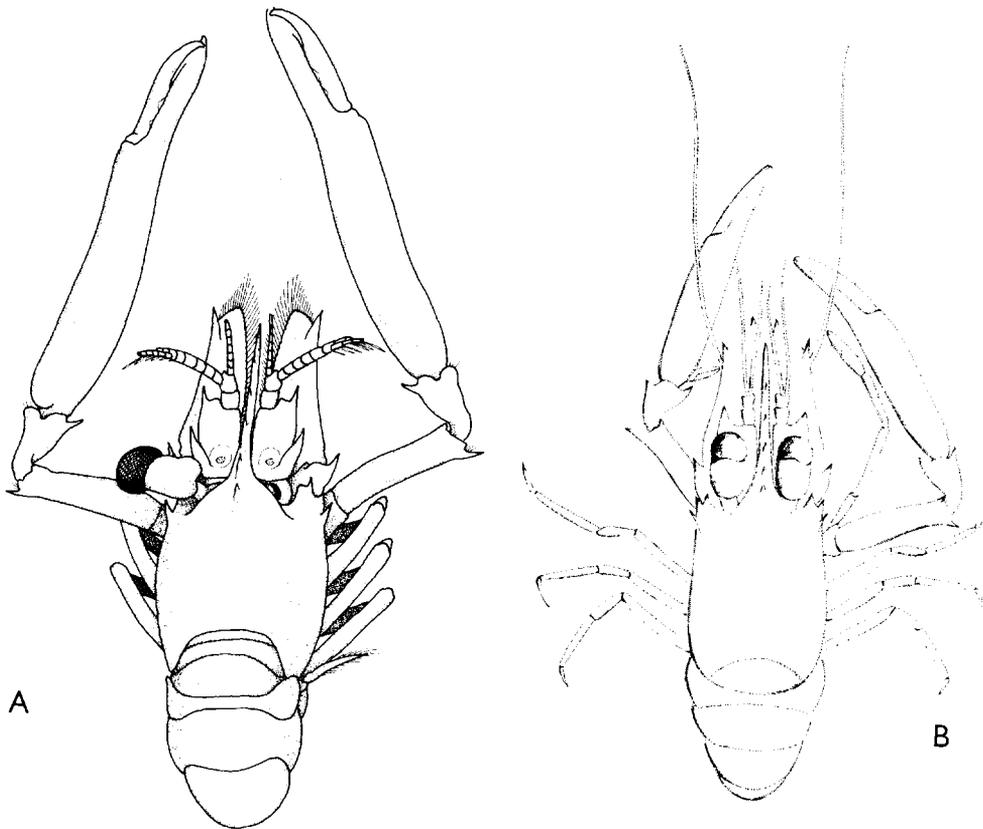


Fig. 4. *Harpiliopsis depressa* Stimpson, male, from Zanzibar, compared with *Anchistia gracilis* Dana, (from Dana, 1855).

tific literature and then only as listed citations, as there have been no subsequent reports referred to that species. Stimpson's name has received extensive use for one of the best known, commonest and most widely distributed of commensal shrimps, and it should therefore continue to remain in use. The type specimens of both Dana's and Stimpson's species are no longer in existence, having lost in the 1871 Chicago fire (Evans 1967). Kemp (1922) considered Dana's species a member of the genus *Periclimenes* and noted that the apparently acutely pointed scaphocerite shown in Dana's figure was probably an error. This appearance can be readily explained by the outline shown being that of the shape of the setal fringe and not of the actual lamella. The general armament of the second pereopods shows a close resemblance in the two figures, that is not exhibited by any known species of *Periclimenes*.

**Colouration.** No data.

**Host.** *Seriatopora* sp. (Scleractinia)

**Distribution.** Not previously definitely recorded from the Philippine Islands. Type locality: Hawaii. Extensively reported throughout most of the Indo-Pacific region, from the Red Sea and East Africa, to Hawaii, and the Galapagos Islands, Colombia, Panama, Costa Rica, Mexico and Baja California.

*Pontoniopsis comanthi* Borradaile (Fig. 3F)

*Pontoniopsis comanthi* Borradaile, 1915, Ann. Mag. nat. Hist., (8) 15: 213; 1917, Trans. Linn. Soc. Lond., Zool., (2) 17: 377, pl. 57, fig. 21. — Holthuis, 1952, Siboga Exped. Mon., 39a<sup>10</sup>: 153–56, figs. 70–71.

**Material examined.** 3 ♂, 3 ovig. ♀, Moalboal, NTM. Cr. 006472.

**Remarks.** The specimens presented no special features. The third ambulatory propod has a slender distoventral spine, with two similar smaller spines distomedially. Holthuis (1952) notes that the propod is without posterior spines

in his material from Lombok, but these may have been overlooked. The ventrolateral aspect of the corpus of the dactyl is densely setose.

**Colouration.** Chestnut-brown.

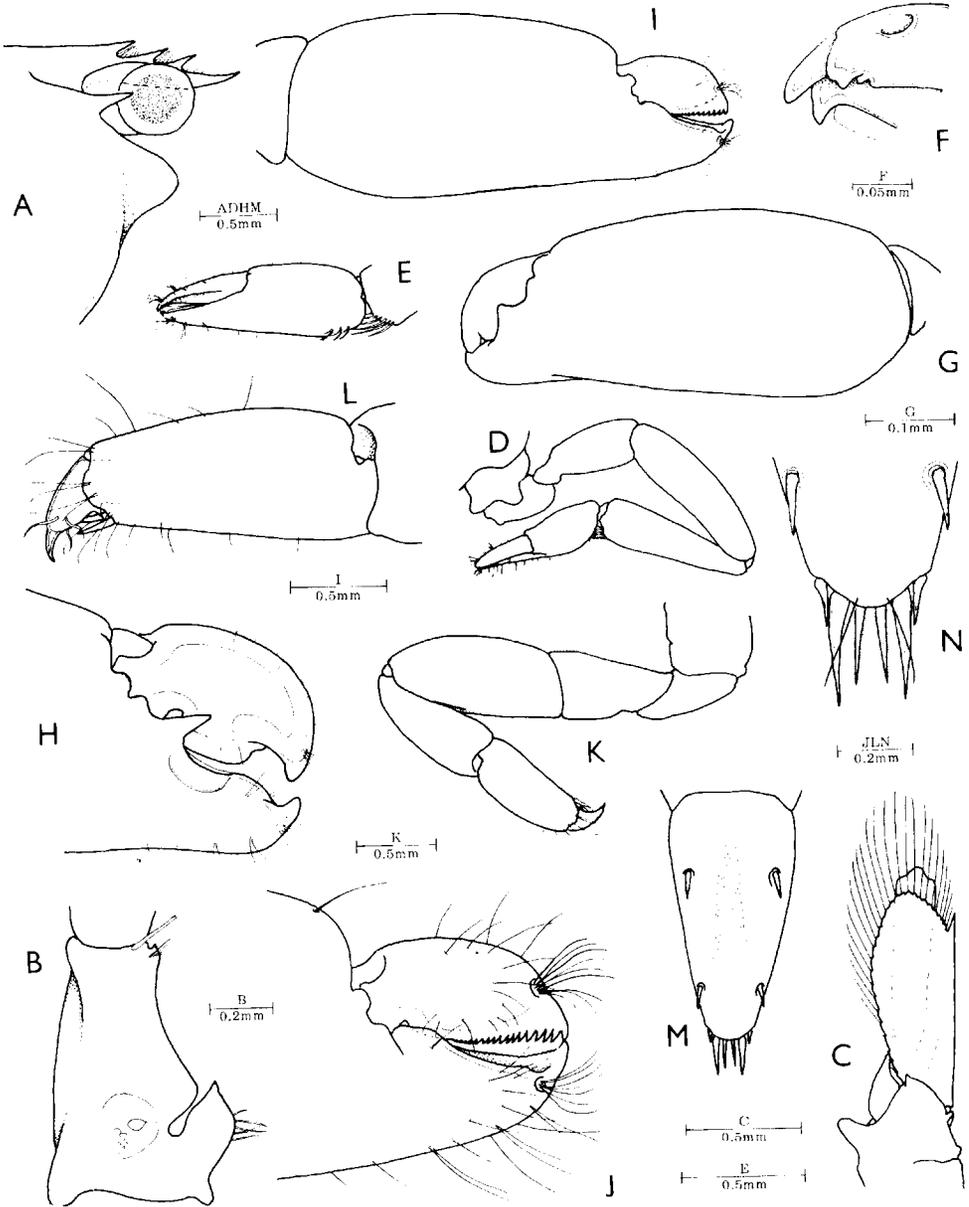
**Host.** Crinoid, unidentified.

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Mabuaig, Torres Stratis. Also known from the Red Sea, Kenya, Zanzibar, Indonesia, Great Barrier Reef, Fiji, Gilbert, Marianna and Marshall Islands.

*Periclimenaeus storchi* sp. nov. (Fig. 5)

**Material examined.** 1 ♂, 1 ovig. ♀, Cuaming Island, N. Of Bohol Island, Visayan Sea, NTM. Cr. 006473.

**Diagnosis.** Rostrum slender, with three acute dorsal teeth, no ventral teeth, orbit feebly developed, supraorbital tubercles or spines absent, antennal spine acute; anterolateral branchiostegite produced. First abdominal segment without anterodorsal lobe. Telson with well developed dorsal spines at 0.33 and 0.8 of dorsal length, about 0.11 of telson length. Proximal segment of antennular peduncle with acute phylliform stylocerite, distolateral angle with small acute tooth. Scaphocerite with acute distolateral tooth, not reaching distal margin of lamella. First pereopod robust, with fingers of chela broad, slightly shorter than palm; spatulate, dactyl without dorsal setal tuft, cutting edges entire, tips multidentate; chela about 0.9 of carpal length; carpus about 0.9 of meral length. Second pereopods unequal, major chela with well developed dactylar molar process and fixed finger fossa; dactyl about 0.33 of palm length; palm smooth; carpus, merus and ischium without tubercles or spines. Minor chela with dactyl about 0.33 of palm length, strongly compressed, semicircular, cutting edge feebly convex with about 20 acute recurved teeth, of decreasing size proximally, opposing into groove along cutting edge of fixed finger, inner margin of groove feebly tuberculate. Third pereopod very robust, dactyl lacking distal accessory tooth, with small



**Fig. 5.** *Periclimenaeus storchi* sp. nov. A, anterior carapace and rostrum; B, antennule, proximal segment of peduncle; C, antenna; D, first pereiopod; E, same, chela; F, same, tip of dactyl; G, second pereiopod, major chela; H, same, fingers, medial; I, second pereiopod, minor chela; J, same, fingers; K, third pereiopod; L, same, propod and dactyl; M, telson; N, same, posterior spines. A-F, K-N, female holotype. G-H, male allotype. I-J, detached, sex uncertain.

acute process proximally, about 0.35 of propod length; propod stout, about 2.3 times longer than proximal width, tapering distally, with 2 distoventral spines, ventral margin unarmed; carpus about 1.1 times propod length, merus about 1.5 times propod length. Fourth and fifth

pereiopods similar, less robust. Uropod with lateral margin of exopod with small distal tooth with larger distal spine medially.

**Measurements (mm).** Ovigerous female, carapace and rostrum, 2.65; postorbital

carapace, 2.25; major chela, 4.65: male, carapace and rostrum, 2.0; postorbital carapace, 1.85; major chela, 5.0. Length of ovum, 0.5.

**Host.** Tunicate, unidentified.

**Types.** The ovigerous female is designated as holotype and the associated male as allotype.

**Etymology.** The species is named in honour of the collector, Prof. V. Storch.

**Remarks.** *P. storchi* is most closely related to *P. nobilii* Bruce, which shares a characteristic dactylus on the ambulatory pereopod, with the corpus lacking a distal accessory tooth but possessing a small very acute proximal ventral process (Bruce, 1974). In its other major features, *P. storchi* shows a close resemblance to *P. nobilii*, but may be distinguished by the very robust third ambulatory pereopod, in which the propod is shorter than the carpus, the dactyl of the minor second pereopod has the cutting edge feebly convex rather than sinuous, with fewer teeth, strongly recurved rather than anteroverted, which oppose into a groove along the cutting edge of the fixed finger. In *P. nobilii* the second minor pereopod dactylus is more elongate, the dorsal telson spines are situated at about 0.35 and 0.65, with the dorsal spines about 0.16 of the telson length. Other differences are the presence of three instead of two dorsal rostral teeth, and the dactyl of the third pereopod being about 0.18 of the propod length, and the carpus is considerably shorter than the propod, about 0.7.

A noteworthy feature of *P. storchi* is the anterolateral margin of the carapace, which is produced as a membranous lobe, which lies over the basicerite, the rest of the branchiostegite being moderately well calcified. *P. nobilii* appears to lack any similar lobe.

*P. nobilii* was first collected from unrecorded locality in the Red Sea, and was noted as *Coralliocaris hecate* (anomalie) by Nobili, but not included in his report on Red Sea crustaceans, (Nobili 1906). The only subsequent record of the species has been from La Réunion (Bruce 1983a).

*Conchodytes kemp* sp. nov. (Fig. 3B–E)

*Conchodytes biunguiculatus* — Kemp, 1922, Rec. Indian Mus., 24: 279, 280–82, fig. 103. — Holthuis, 1952, Siboga Exped. Mon., 39a<sup>10</sup>: 17, 199–200. — Jacquotte, 1973, Tethys, supp. 5: 96–112, fig. 1, a<sup>3</sup>, b<sup>1</sup>, c<sup>1</sup>, d<sup>1</sup>, e<sup>1</sup>; fig. 2, b<sup>3</sup>, c<sup>3</sup>, f<sup>3</sup>; fig. 3a<sup>3</sup>, b<sup>3</sup>; fig. 4a<sup>3</sup>, b<sup>3</sup>, c<sup>3</sup>, d<sup>3</sup>; fig. 6c; fig. 7, a<sup>3</sup>, b<sup>3</sup>, c<sup>3</sup>, d<sup>3</sup>; fig. 8, a<sup>3</sup>, b<sup>3</sup>, c<sup>3</sup>, d<sup>3</sup>. — Bruce, 1978, Zool. Journ. Linn. Soc., Lond., 62: 206, 280. — Bruce, 1983b, Biogeogr. Ecol. Seychelle Is., 148, 163.

**Material.** 1 ♂, 1 ovig. ♀, Moalboal, NTM. Cr. 006474.

**Remarks.** In his original description of *Pontonia biunguiculata*, Paulson (1875) clearly illustrates that the lateral pair of posterior telson spines are preterminal and that the proximal protuberance on the corpus of the dactyl of the ambulatory pereopods is without an acute tooth. These features are characteristic of *Hymenocera nipponensis* De Haan, as *Conchodytes nipponensis*, according to Kemp (1922). *C. nipponensis* (De Haan) must therefore be considered a junior synonym of *C. biunguiculatus* (Paulson), leaving the taxon referred to *C. biunguiculatus* by Kemp without a name. To rectify this situation, the new name of *C. kemp* is now proposed. The type material of both *Pontonia biunguiculata* Paulson and *H. nipponensis* De Haan is no longer in existence. Kemp studied 60 specimens of his *C. biunguiculatus*, all from *Pinna bicolor*, from the Andaman Islands and notes that large females reach a length of 35 mm.

Attempts to study Kemp's material in the Zoological Museum of India have not met with success. A pair of specimens from the Andaman Islands, a male, CL 8.7 mm, and an ovigerous female, CL 9.2 mm, identified by Kemp, has been donated to the Muséum National d'Historie Naturelle, Paris, (MNHN Na. 1957), and the female is now selected as the holotype and the male as the allotype of *C. kemp*.

The two Philippines specimens provisionally referred to this taxon are adult but small, with carapace lengths of male 2.5 mm, female 3.75 mm respectively. Hipeau-Jacquotte (1973) indicates that Madagascar specimens, found in association with *Pinna* and *Atrina*, are com-

paratively large, with average carapace lengths of about — male 8.2 mm, female 10.4 mm, but varying slightly with host and season. No minimal size for an ovigerous female is indicated. Zanzibar ovigerous females have a carapace length of about 8.0 mm, in association with *Pinna*, — considerably larger than the present specimens.

Although the present specimens conform closely to the previous descriptions of *C. biunguiculatus*, the ambulatory dactyl does show slight differences in that the basal protuberance is very poorly developed and could be described as obsolete. Superimposition of the outlines of the dactyls readily illustrates this difference. Fig. 3E shows the outline of the third ambulatory dactyl of the present specimens superimposed upon that of an ovigerous female of '*C. biunguiculatus* Kemp, 1922', collected from a *Pinna* at Obock, Jibouti, by A. Svoboda, postorbital carapace length 8.0 mm. That of the Philippine specimens is distinctly more slender with a less convex dorsal margin; less broad proximally, with a less produced basal protuberance. This feature, combined with the small size, and the associations with a host at a new family level, suggest that a new taxon may be involved, but further specimens from the same host are necessary for this to be confirmed. The telson appears exactly as in Kemp's figure (fig. 103d). The exopod of the uropod is without a distolateral tooth, but a small slender spine is present.

The species of the genus *Conchodytes* Peters, 1852, may be conveniently separated by the following key.

Key to the species of *Conchodytes* Peters, 1852.

1. Dactyls of ambulatory pereopods with strong distal accessory tooth . . . . . 2
  - Dactyls of ambulatory pereopods lacking strong distal accessory tooth . . . . .  
 . . . . . *C. monodactylus* Holthuis
2. Lateral pair of posterior telson spines subdorsal and pre-terminal . . . . .  
 . . . . . *C. biunguiculatus* (Paulson)
  - Lateral pair of posterior telson spines in normal marginal position . . . . . 3
3. Basal process of ambulatory dactyl very

- feebly developed . . . . . *C. maculatus* Bruce
- Basal process of ambulatory dactyl well developed . . . . . 4
- 4. Basal process of ambulatory dactyl with small acute tooth . . . . . *C. kemp* sp. nov.
  - Basal process of ambulatory dactyl unarmed . . . . . 5
- 5. First pereopod with carpus and merus subequal . . . . . *C. tridacnae* Peters
  - First pereopod with carpus distinctly shorter than merus . . . . .  
 . . . . . *C. meleagrinae* Peters

The presence or absence of a proximal protuberance on the dactyls of the third to fifth pereopods is the primary character distinguishing *Pontonia* Latreille from *Conchodytes* Peters. Comparison of the dactyls of the present species with those of *P. katoi* Kubo, shows how closely the dactyls may resemble each other, and how closely related *Conchodytes* is to *Pontonia*. In *Conchodytes*, the chelae of the second pereopods are generally subequal, similar and subcylindrical, where as in *Pontonia*, they may be unequal, dissimilar and compressed.

**Colouration.** No data.

**Host.** *Isognomon isognomon* (L.) (Bivalvia: Isognomonidae).

**Distribution.** Not previously recorded from the Philippines. Type locality: Andaman Islands. Also known with certainty from Red Sea, Kenya, Zanzibar, Madagascar, Seychelle Islands, Indonesia, Taiwan and the Marshall Islands. Probably many of the records of *Conchodytes* from *Pinna* need re-examination to establish the full distribution of *C. kemp*, particularly the early records of *C. tridacnae* and *C. meleagrinae* from pinnid hosts.

*Tuleariocaris zanzibarica* Bruce

*Tuleariocaris zanzibarica* Bruce, 1967, Zool. Verhand., Leiden, 87: 33–34, figs. 13–18.

**Material examined.** 1 ovig. ♀, Genu Farm, NTM. Cr. 006475.

**Remarks.** The single specimen agrees well with the original description. The rostrum has nine dorsal teeth, but lacks ventral teeth. The proximal segment of the antennular peduncle has three acute distolateral teeth on each side.

**Colouration.** Reddish brown, with one white lateral stripe.

**Host.** *Diadema* sp. (Echinoderma: Echinoidea).

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Zanzibar. Also recorded from Kenya, Madagascar, Solomon Islands and Japan.

#### GNATHOPHYLLIDAE

*Gnathophyllum americanum* Guérin

*Gnathophyllum americanum* Guérin, 1855, Sagra's Historia Cuba, Hist. nat., 7: 20; atlas, VIII, pl. 2, fig. 14. — Holthuis, 1949, Zool. Meded., Leiden, 30(15): 244–50, figs. 5–6.

**Material examined.** 1 ♀, Genu Farm, NTM. Cr. 006476.

**Remarks.** The single example has a rostral dentition of 6/1. The fourth and subsequent sternites are moderately broad. The fourth is without a slender, median process and the fifth bears low transverse carinae separated by a small median notch. The sixth to eighth sternites are unarmed. The specimen was found in a *Montipora* colony, but is not considered to be a commensal.

**Colouration.** Generally whitish, carapace and first five abdominal segments strongly transversely barred with dark brown bands; second pereopod whitish, distal palm, dark brown, narrowly bordered with orange; posterior margin of sixth abdominal segment orange; caudal fan proximally whitish, distolaterally transparent, with preterminal orange spot on exopod (from colour photo).

**Distribution.** Not previously recorded from the

Philippine Islands. Type locality: Cuba. Known throughout the Indo-West Pacific region from the Red Sea to the Tuamotu Islands, and from the Canary Islands, Florida, Bermuda, Caribbean Sea and Gulf of Mexico.

#### HIPPOLYTIDAE

*Saron marmoratus* (Olivier)

*Palaemon marmoratus* Olivier, 1811, Encycl. meth. Hist. nat., 8: 663.

*Saron marmoratus* — Ortmann, 1894, Denkschr. med. naturw. Ges. Jena, 8: 15. — Miyake & Hayashi, 1966, Journ. Fac. Agric., Kyushu Univ., 14(1): 143–46, fig. 1.

**Material examined.** 1 ♂, 1 ovig. ♀, Genu Farm, NTM. Cr. 006477.

**Remarks.** The specimens agree with previous information, such as Miyake and Hayashi (1966). The male has a rostral dentition of 6/8 and the female, 6/7, both with three teeth situated on the carapace. The meri of the ambulatory pereopods each bear two large distolateral spines.

**Colouration.** With white patches outlined in red on a ground of olive brown dots; pereopods with white and green bands.

**Distribution.** Previously recorded from Luzon by Castro de Elera (1895) and Cebu (Thallwitz 1891; 1892). Type locality: Australia. Well known throughout the whole Indo-West Pacific region from the Red Sea to Moçambique, Japan, to Society, Marquesa and Hawaiian Islands.

*Thor amboinensis* (De Man) (Fig. 3G–K)

*Hippolyte amboinensis* De Man, 1888, Arch. Naturges., 53(1): 535.

*Thor amboinensis* — Holthuis, 1947, Siboga Exped. Mon., 39a<sup>10</sup>: 50. — Miyake and Hayashi, 1966, Journ. Fac. Agric., Kyushu Univ., 14(1): 152–54, figs. 5–6. — Chace, 1972, Smithsonian Contrib. Zool., 98: 130–33, figs. 55–56.

**Material examined.** (i) 1 ovig. ♀, Nailon, NTM. Cr. 006578. (ii) 2 ♂, 2 ovig. , Genu Farm, NTM. Cr. 006497.

**Remarks.** The specimens agree well with the previous descriptions provided by Kemp (1916) and Miyake and Hayashi (1966). The males have a rostral dentition of 3/0 and the females, 2-3/0, all with the tip of the rostrum simple and acute. The meri of the third and fourth pereopods have a single distolateral spine and that of the fifth is unarmed. The telson has three pairs of dorsal spines and four pairs of posterior spines.

Chace (1972), in comparing Atlantic specimens with Indo-West Pacific specimens of this species, reported that, in the latter, the males did not show the development of prehensile third ambulatory pereopods. In the present specimens; both males do show the presence of prehensile third pereopods, better developed in the smaller specimen. Chace noted that two forms occurred, and these appear to be represented in the present specimens, one being much more spinose than the other, as shown in Figs. 3J, 3K.

The third maxilliped also show marked hypertrophy in the males, with the distal segment of the endopod becoming relatively elongated and tapering. It is armed with eight stout distal spines in both sexes. The proximal segment of the endopod bears a strong disto-dorsal tooth in male and female, but with a distomedial spine in the male and a distomedial tooth in the female. The dorsal margin bears a row of strong spiniform setae in both sexes.

**Colouration.** 'Body with two white stripes and several white patches, four median dorsal and two laterally on each side of abdomen; proximal uropods brown, distal parts white with brown dot.'

**Host.** Anemone, unidentified.

**Distribution.** Not previously recorded from the Philippine Islands. Type locality: Ambon, Indonesia. Also known from Kenya, Madagascar, Andaman and Nicobar Islands, Indonesia,

Australia, Palau Islands, Marshall Islands, and Ryukyu Islands.

## ALPHEIDAE

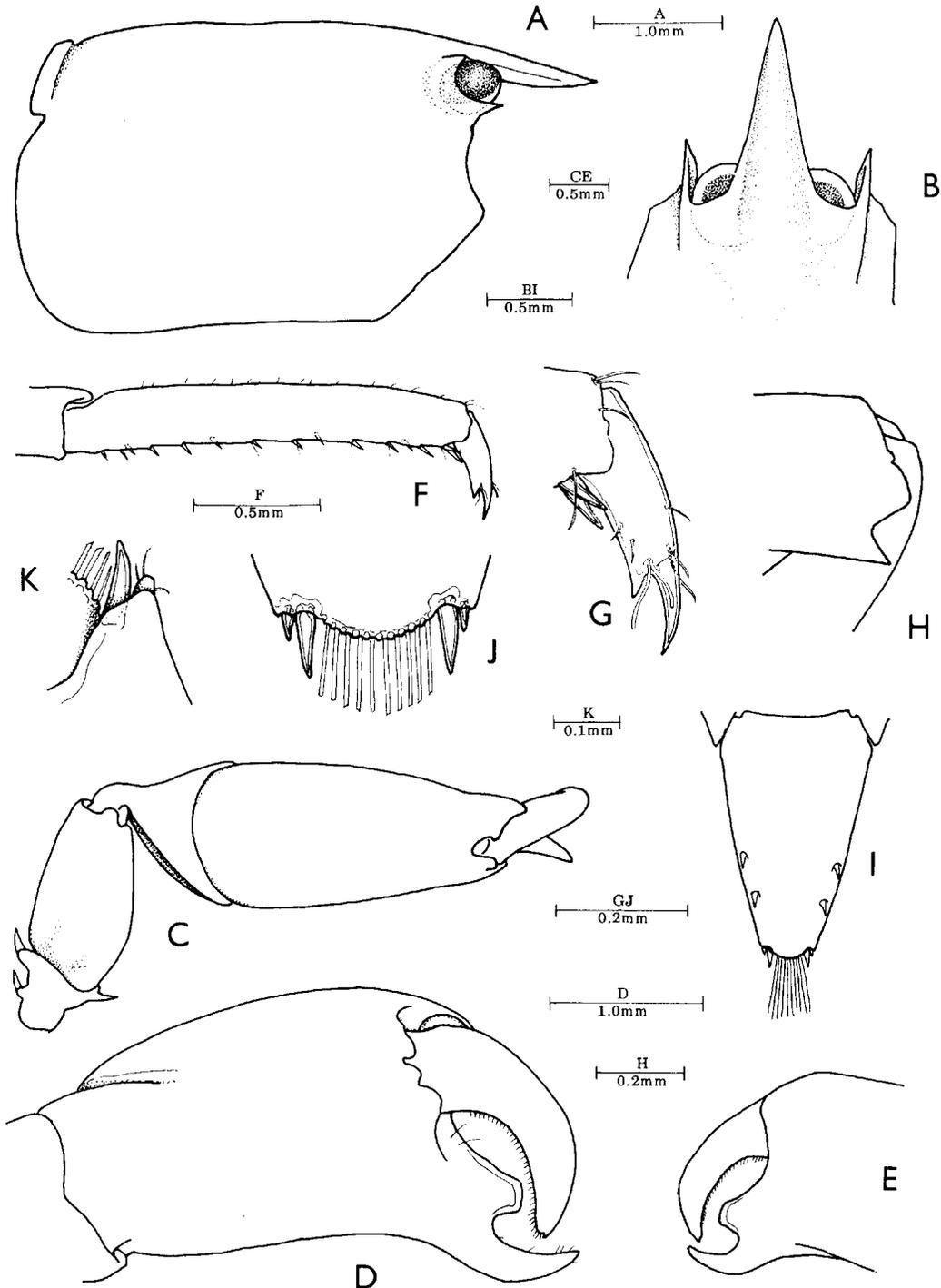
*Athanas kominatoensis* Kubo (Fig. 6)

*Athanas kominatoensis* Kubo, 1942, Zool. Mag. (Tokyo), 54(2): 82-87, figs. 1-2. — Suzuki, 1970, Sci. Rep. Yokohama Nat. Univ., II, 17: 2-5, figs. 1-3.

**Material examined.** (i) 11 spec. (3 ovig. ♀), Bantayan Island, NTM. Cr. 006479. (ii) 1 ♂, Santa Fé, NTM. Cr. 006480.

**Remarks.** The rostrum is lanceolate, dorsally convex, expanding broadly slightly posterior to eyes, reaching almost to distal end of antennular peduncle, about 2.0 times longer than proximal width, infracorneal angle acute, pterygostomial angle blunt. Sixth abdominal segment with large ventral posteriorly projecting tongue in female, absent in male; telson about 1.6 times longer than anterior width, with small dorsal spines at 0.6 and 0.7 of length, posterior width about 0.36 of anterior, margin convex, setose with small outer and larger inner lateral spines. First pereopods with massive chelae, outer margin of palm distally blunt, ischium with strong distomedial tooth and two stout lateral spines on protuberances, basis with rudimentary exopod, coxa with setobranch and epipod. Second pereopod basis with smaller rudimentary exopod, with setobranch and epipod. Third pereopod coxa with setobranch, without epipod, basis without exopod, with well developed acute distoventral meral tooth, propod about 6.5 times longer than central width, with about 15 small ventral spines, with 9-10 in major row, 5 in more medial row; dactyl about 0.26 of propod length, more than 2.0 times width of distal end of propod.

The specimens agree well with the description given by Suzuki (1970), who reports on specimens found in Japanese waters in association with *Anthocidaris crassispinosa* (A. Agassiz), and where *A. indicus* (Coutière) was



**Fig. 6.** *Athanas kominatoensis* Kubo, ovigerous female. A, carapace and rostrum; B, anterior carapace and rostrum, dorsal; C, first pereiopod; D, same, chela; E, same, distal palm and fingers, lateral; F, third pereiopod, propod and dactyl; G, same, dactyl; H, same, mero-carpal joint, lateral; I, telson; J, same, posterior spines; K, exopod of uropod, deitrolateral angle.

found in association with *Echinometra matthei*. Bruce (1990) found *A. dorsalis* in association with *Anthocidaris crassispinosa* in Hong Kong. Banner and Banner (1973) consider that *A. kominatoensis* is a junior synonym of *A. indicus*. It seems that this conclusion could well be premature and that a further study of this species complex, based only on specimens from positively identified hosts, is still required. Chace (1988) considers that this species is probably a synonym of *S. indicus* in reference to the Banners (1973) record of that species from the Philippines. The Banners considered that *A. indicus* was a highly variable species, both in morphology and colouration, but apparently lumped together specimens from four echinoid genera (*Echinometra*, *Diadema*, *Echinothrix* and *Centrostephanus*). The hosts of their Philippine specimens were not recorded.

**Colouration.** No data.

**Distribution.** Not previously from the Philippine Islands. Type locality: Kominato, Japan. Recorded only from Japanese waters.

*Aretopsis amabilis* De Man

*Aretopsis amabilis* De Man, 1910, Tijdschr. ned. dierk. Vereen., 11(4): 311; 1911, Siboga Exped. Mon., 39a<sup>1</sup>: 171, fig. 1. — Banner & Banner, 1973, Rec. Aust. Mus., 28: 330–33, fig. 12; 1978; Micronesica, 14(2): 237. — Chace, 1988, Smithsonian Contrib. Zool. 466: 60.

**Material examined.** (i) 1 ♂, Maribago, Mactan Island, NTM. Cr. 006481. (ii) 1 juv., Visayan Sea, NTM. Cr. 006482.

**Remarks.** The specimens agree well with previously published descriptions. The mandible has a well developed two-segmented palp, the chelae of the second pereopods are markedly unequal and the telson bears two pairs of posterior marginal spines.

**Colouration.** (i) Carapace dorsally brown, lateral parts becoming white and then red; chelipeds dorsally brown, ventrally white, edges of fingers

orange; abdomen brown, laterally white. (ii) Dorsally yellow, becoming brownish laterally; with thin lines of white dots along branchiostegite and pleura; chelae yellowish; proximal uropods brownish, distal fringe yellowish.

**Host.** *Dardanus lagopodes* (Forskål, (Decapoda: Diogenidae), in *Voluta* and *Trochus* shells.

**Distribution.** Recently recorded for the first time from the Philippines by Chace (1988). Type locality: Pulau Kaniungan Ketjil, Makassar Straits. Recorded from the Red Sea to the Marshall Islands.

*Alpheus* sp.

**Material examined.** 1 ♀, Mactan Island, NTM. Cr. 006483.

**Remarks.** The single example is a member of the 'brevirostris' group and cannot be precisely identified as it lacks the major second pereopod. The group at present contains 33 species, of which 10 have now been recorded from the Philippines (Chace 1988). Several species of this group have been reported to have goby associates in their burrows, e.g., *A. brevisrostris* (Olivier), *A. brevicristatus* De Haan, *A. djiboutensis* De Man, *A. rapax* Fabricius and *A. rapacida* De Man, which have not yet been reported from the Philippines (Karplus, 1987). Polunin and Lubbock (1977) reported on the colour patterns of seven types of *Alpheus* associated with gobies in the Seychelle Islands, but none of those correspond to that of the Philippines specimen, which also appears distinct from the colour patterns of *Alpheus* spp. from Taiwan, illustrated by Jeng and Chang (1985).

The present specimen has a carapace length of 9.5 mm, the carapace is smooth, with the dorsal rostral carina short, reaching the posterior margin of the orbital hoods only; the minor second pereopod has the palm, about 1.8 times longer than broad, with the fingers slender, about 1.5 times palm length, dactylus 7.0 times longer than proximal width, fingers with long setae along outer margins, without balaeniceps setae, merus distoventrally unarmed; third

pereiopod with subspatulate dactyl, merus unarmed.

**Colouration.** Anterior carapace brown; branchiostegite and pleura with bluish green margin; anterior abdomen with transverse orange bar; chelae brown; pereiopods blue with yellow joints; uropods brown with yellow dot with blue margin.

**Associate.** The specimen was observed by the collector to be associated with gobies.

*Synalpheus carinatus* (De Man)

*Alpheus carinatus* De Man, 1888, Arch. Naturgesch., 53(1): 508, pl. 22, fig. 2.

*Synalpheus carinatus* — De Man, 1911, Siboga Exped. Min., 30a 1(2): 210, pl. 6, fig. 23. — Banner & Banner, 1975, Rec. Aust. Mus., 29(12): 283–85, figs. 1, 2n.

**Material examined.** 1 ♂, 1 ♀, Moalboal, NTM. Cr. 006484.

**Remarks.** The two specimens are referred to *S. carinatus* on account of the very well developed postrostral and orbital carinae and humped gastric region, the lack of a sickle-shaped dactylus on the minor first pereiopod chela and absence of a distoventral meral tooth on the third pereiopod. However, the ventral aspect of the merus of the minor first pereiopod lacks an acute tooth, as shown in Banner (1975, fig. 1e).

**Colouration.** Generally translucent pinkish white, with reddish antennal flagella; fingers of major chela dense opaque white; cornea black, stomach dark brown with white striae laterally.

**Host.** Crinoid, unidentified.

**Distribution.** Not previously recorded from the

Philippine Islands. Type locality: Ambon, Indonesia. Also known from Indonesia, Malaysia, northern South China Sea, Australia, Caroline, Marshall and Gilbert Islands.

*Synalpheus demani* Borradaile

*Synalpheus demani* Borradaile, 1900, Willey's Zool. Res., 4: 416. — Banner and Banner, 1975, Rec. Aust. Mus., 29(12): 324–26, fig. 13.

**Material examined.** (i) 1 ♂, 1 ♀, Moalboal, NTM. Cr. 006485. (ii) 2 ♂, 2 ♀, Moalboal, NTM. Cr. 006486. (iii) 1 ♂, 1 ovig. ♀, Moalboal, NTM. Cr. 006487.

**Remarks.** The specimens agree precisely with the description by Banner and Banner (1975). The species has been previously recorded in association with *Comanthina schlegeli* (Carpenter).

**Colouration.** Body uniform very dark purple-red; appendages more reddish.

**Host.** Crinoids, unidentified.

**Distribution.** First recorded from the Philippines by Bate (1888), as *S. spiniger*, collected by the Challenger Expedition, and more recently by Chace (1988). Type locality: Lifu, Loyalty Islands. Also known from the Red Sea, Japan, Australia, Loyalty and Marshall Islands.

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