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PONTONIINE SHRIMPS OF HERON ISLAND

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PONTONIINE SHRIMPS OF HERON ISLAND

by A. J. Bruce¹

Heron Island, in the Capricorn Island group, is a small coral cay, situated at 23°26.6'S., 151°54.8'E., near the southern end of the Great Barrier Reef system, approximately 40 nautical miles from the mainland at Cape Capricorn and 38 from Bustard Head. The island is surrounded by an extensive reef flat, of about 27 km², with a central lagoon, and the adjacent Wistari Reef, of about 25 km², lies to the southwest and is separated only by a narrow channel. The general features of these reefs have been described by Flood (1971) and Flood and Jell (1978), and the faunistic background by Mather and Bennett (1978).

The crustacean fauna of the Great Barrier Reef in general, and Heron Island in particular, have been little studied. The report on the decapod crustaceans collected by the Great Barrier Reef Expedition (1928-29) included reference to only 30 species of Caridea, of which only 8 belonged to the subfamily Pontoniinae. Scattered references to isolated species have also occurred but much of the crustacean fauna must still be considered as largely unknown. A study of the decapods associated with branching corals by Patton (1966) provided several new records to the Australian fauna, as well as important biological information, but little work has been subsequently published.

The caridean fauna of coral reefs presents a considerable variety of species, that are dominated by the members of three taxa, the Pontoniinae, the Alpheidae and the Hippolytidae. Although the shrimps are often abundant, they are frequently of small size and cryptic habits, so that they are rarely seen by casual observation. Many have adopted a "commensal" way of life, and are even less amenable to direct observation. This report deals only with the subfamily Pontoniinae, of which the vast majority of species lead commensal lives. The abundance and variety of potential hosts in the coral reef biotope is illustrated by the parallel abundance of these commensal shrimps, which exhibit a wide range of morphological adaptations to their particular niches and also often show a high degree of host specificity

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in their associations. The present study, of the fauna of a greatly restricted area provides a good illustration of the abundance and diversity of crustacean life present at the southern end of the Great Barrier Reef.

SYSTEMATIC ACCOUNT

Subfamily PONTONIINAE Kingsley, 1878

Allopontonia iaini Bruce

Northern Wistari reef, 80 ft., two specimens (one juvenile) on *Salmacis sphaeroides*, 16 April 1977.

The specimens agree closely with the colour pattern reported in the original description.

The species has not been previously reported from Australian waters, and the association represents a new host record. Previously known only from the type locality, Zanzibar, and Wasin Island, Kenya.

Anchistiooides compressus Paulson

Wistari reef, slope, 15 ft., one specimen, from unidentified sponge, 23 May 1977.

This species has not been previously recorded from Australian waters. It is known to associate with sponges of the genera *Haliclona* and *Caminus*.

The type locality is the Red Sea and the species is also known from East Africa, the Andaman Islands, Japan and the Tuamotu Islands.

Anchistiooides willeyi (Borradaile)

Heron Island, southern reef slope, 36 ft., two specimens from unidentified sponge, 20 April 1978. Northern reef slope, 38 ft., one specimen, from an unidentified sponge, 9 May 1978. Wistari reef, slope, 30 ft., three specimens, from unidentified sponge, 6 April 1979.

This species has been previously reported from One Tree Island in the Capricorn group. It is also known from Zanzibar, Kenya, Madagascar, the Maldives Islands, Indonesia and the type locality, New Britain.

Anchistus custoides Bruce

Heron Island, south western reef, at base of slope, 20 ft., one pair of specimens from *Atrina vexillum* (Born), 21 July 1976, and a

second pair from the same host at 10 ft., 16 August 1976, from the central lagoon.

Previously known only from the type locality, Gillett Cay, Swains Reefs; One Tree Island, Capricorn group, and from Palau, Caroline Islands.

Anchistus demani Kemp

Heron Island, southern reef flat, 1 ovigerous ♀, from *Tridacna* sp. 11 December 1968.

Previously recorded from One Tree Island, Capricorn group and otherwise known from the type locality in the Andaman Islands, Zanzibar, Kenya, Madagascar, the Comoro and Seychelle Islands, and from the Marshall Islands.

Apopontonia falcirostris Bruce

Heron Island, north western reef slope, 30 ft., 1 ovigerous ♀ in *Psammascus* sp., 26 April 1979, coll. J.P. Halversen.

The single example agrees very closely with the description of the holotype from north eastern Madagascar, at a depth of 210 ft. The host of this species has not been previously identified, and the present record is only the second known occurrence. The species is new to the Australian fauna.

Conchodytes meleagrinae Peters

Common in pairs in specimens of the black-lipped pearl oyster, *Pinctada margaritifera*, which are numerous on the reef flats.

First recorded from the Torres Straits in Australian waters (Bate, 1888) and subsequently from Bathurst Island, the Low Isles, Swains Reefs, and from One Tree Island in the Capricorn group. Its distribution extends throughout the Indo-West Pacific, from the northern Red Sea to Hawaii, but there are no records from south eastern Polynesia. Most reports are in association with *Pinctada margaritifera* L.

Conchodytes tridacnae Peters

Heron Island, north western reef flat, low water, 1 male, one ovigerous ♀, in *Tridacna maxima* L., 1 May 1979.

Rarely collected, but probably not uncommon in *Tridacna* spp. McNeill (1926) recorded this species from Northwest Island, Capricorn group, but did not identify the host. It is most probably from *Tridacna* sp. rather than *Pinna*, as the latter are uncommon or absent from these islands. The specimens reported upon by Miers (1884) from Warrior Reef, Torres Straits, also belong to this species, but the

specimen from Keppel Island is no longer identifiable. All are in the collection of the British Museum (Nat. Hist.).

The range of this species extends from East Africa to the Marshall Islands.

Coralliocaris graminea (Dana)

Abundant in corals of the genus *Acropora*, on Heron Island and Wistari reefs. This species was first reported from Heron Island by Patton (1966) and has also been recorded from the Low Isles (McNeill, 1968). It has been found in association with *Acropora corymbosa*, *A. cymbicyathus*, *A. diversa*, *A. hebes*, *A. squamosa* and *A. variabilis*.

The distribution of the species appears to extend throughout the Indo-West Pacific region, but the exact identity of some of the records concerned need verification due to confusion with *C. viridis*, (see below).

Coralliocaris superba (Dana)

An abundant associate of corals of the genus *Acropora* on the reef flat, lagoon bommies and the reef slope. First recorded from Heron Island by Patton (1966), it has been found in association with *A. diversa*, *A. pulchra*, *A. cymbicyathus* and *A. digitifera*.

Also recorded from Swain's Reefs, its range extends from the Red Sea to the Society Islands, but does not include Hawaii.

Coralliocaris venusta Kemp

Numerous examples of this species have been collected from corals of the genus *Acropora*, from the reef flat down to a depth of 60 ft. The hosts include *A. hyacinthus*. *C. venusta* exists in two colour forms, both of which occur on Heron Island.

Previously recorded from Heron Island by Patton (1966), who studied additional specimens from Willis Island and Restoration Rock, and from One Tree Island (Bruce, 1977a). Otherwise recorded from the Red Sea to the Ryukyu and Samoan Islands.

Coralliocaris viridis Bruce

Heron Island, outer reef flat, 1 ft., three specimens from *Acropora* sp., 16 April 1979. - Lagoon, 3 ft., in *Acropora* sp., one male, one ovigerous ♀, 21 October 1976. - Reef flat, 1 ft., 1 ovigerous ♀, in *Acropora* sp., 6 April 1978.

Apparently uncommon on Heron Island, *Acropora* species, where *C.*

graminea is dominant. This species has been previously reported from One Tree Island (Bruce, 1977a) but its exact distribution is obscure due to confusion of earlier records with *C. graminea*. The type locality is Mombasa, Kenya, and it is also known from the Isle Europa, the Maldives Islands, Ceylon and the Ryukyu Islands.

Dasella herdmaniae (Lebour)

Heron Island, north west reef slope, 50 ft., 1 specimen in unidentified ascidian, 5 June 1979.

Not previously recorded from Australian waters and known only from the type material from Madras, south India. Previously recorded from the ascidian *Herdmania momus* (Savigny) where it was found in association with the alpheid shrimp *Synalpheus herdmaniae*.

Dasykaris ceratops Holthuis

Wistari Reef, northern side, at bottom of slope, 80 ft., 1 ovigerous ♀, on *Pterooides bankanense* Bleeker, 16 April 1977.

This species has also been reported from Lodestone Reef, Queensland, and further from Borneo Bank and Zanzibar. This host constitutes a new record.

Hamodactylus agabai Bruce

Heron Island, channel reef slope, 36 ft., on *Nephtheea* sp., 1 ovigerous ♀, 20 April 1978; idem, in *Nephtheea* sp., 2 juveniles, 20 April 1978; south east reef slope, 20 ft., 1 specimen on alcyonarian, 10 May 1978. Wistari Reef, north west slope, 15-20 ft., on *Nephtheea* sp., 2 ovigerous ♀, 18 May 1979.

Not previously recorded from Australian waters and known only from the northern Red Sea, where the types were found, also in association with alcyonarians, on *Lithophyton* sp.

Hamodactylus broschmai Holthuis

Heron Island, reef slope, 50 ft., 1 juvenile on *Subergorgia reticulata*, 20 September 1976; 90 ft., one specimen on gorgonian, 28 November 1976; 20 ft., 12 specimens (with 5 ovigerous ♀), on *Melithaea ocracea*, 18 January 1978; 60 ft., 4 specimens (2 ovigerous ♀), on gorgonian, 29 March 1978.

This species has not been previously recorded from Australian waters, but has been reported from Zanzibar, Kenya, Madagascar, Indonesia and new Caledonia, usually in association with gorgonian hosts. Both associations represent new host records.

Hamodactylus noumeae Bruce

Heron Island, 35 ft., 4 specimens (1 ovigerous ♀) on *Euplexora flava*, 26 July 1976; 50 ft., 1 juvenile, on *Subergorgia reticulata*, 20 September 1976; 90 ft., 1 ovigerous ♀, gorgonian indet, 28 November 1976. Wistari Reef, 40 ft., 1 ovigerous ♀ on *Pseudopteragorgia pinnata*, 15 September 1976; 85 ft., 1 ovigerous ♀, on gorgonian indet, 20 November 1978.

This species is new to the Australian fauna and the hosts all represent new association records. Known only from East Africa, Indonesia and New Caledonia.

Hamopontonia corallicola Bruce

Heron Island, reef flat, 1 male on *Goniopora*, 23 October 1976; 8-10 ft., 3 specimens on *Fungia actiniformis*, 27 October 1976; reef 2 ovigerous ♀ on *Goniopora* sp., 25 July 1977. Wistari Reef, north east end, 40 ft., 1 ovigerous ♀ on unidentified anemone, 10 April 1978; north east reef, 25 ft., 4 specimens on *Goniopora* sp., 8 May 1979.

Not previously recorded from Heron Island but reported from Peloris Island, Queensland (Bruce, 1977). Otherwise known only from the type locality, Hong Kong and southern Japan.

Harpiliopsis beaupresii (Audouin)

Abundant on corals of the genera *Stylophora* and *Pocillopora* on Heron Island and Wistari reefs. The commonest pontoniine shrimp found in association with these corals in this locality.

First recorded from Heron Island by Patton (1966) this species occurs throughout the Indo-West Pacific region, from the Red Sea to Hawaii, and Easter Island, although there appear to be no records from the greater part of the South Pacific islands east of the Marshall Islands.

Harpiliopsis depressa (Stimpson)

Comparatively uncommon at Heron Island in comparison with *H. beaupresii*, but occurring in the same host corals.

First recorded from Heron Island by Patton (1966) and also known from the Diamond Islets (Bruce, 1977a). Widespread throughout the Indo-West Pacific region from the Red Sea to Hawaii, and extending to the Galapagos Islands, California, Mexico, Costa Rica, Panama and Columbia in the Eastern Pacific region.

Harpiliopsis spinigera (Ortmann)

Heron Island, north western reef slope, 45 ft., 4 specimens (1 ovigerous ♀) on *Stylophora pistillata*, 5 June 1979. Wistari Reef, slope, 50 ft., 1 specimen from *Seriatopora hystrix*, 15 September 1976. Heron Island, north west reef, flat, low water, 1 male, 2 ovigerous ♀ and 1 juvenile, 16 April 1979.

Uncommon on local corals. Not previously recorded from Australian waters. Distribution uncertain through confusion with *H. depressa*, but probably occurring throughout most of the Indo-West Pacific region on *Pocillopora*, *Stylophora* and *Seriatopora* spp. Known from East Africa, Comoro, Seychelle and Maldive Islands, Andaman Islands, Celebes and the Samoan Islands. Also known from Panama.

Ischnopontonia lophos (Barnard)

Heron Island, eastern reef slope, 50 ft., 1 pair in *Galaxea fascicularis*, 14 June 1979.

This species has been previously recorded from Australia, from Great Palm, Orpheus and Fantôme Islands near Townsville (Bruce, 1971) and from One Tree Island (Bruce, 1977a), in all cases from *G. fascicularis*.

Jocaste japonica (Ortmann)

Common on corals of the genus *Acropora* on the reef flat and slope, down to a depth of 50 ft.

First recorded from Heron Island by Patton (1966), who reported more specimens from Willis Island and Restoration Rock. Also known from Swains Reefs (Bruce, 1977a).

Known throughout much of the Indo-West Pacific region, excluding the Red Sea, east to the Marshall Islands and New Caledonia.

Jocaste lucina (Nobili)

Abundant in corals of the genus *Acropora*, both on the reef flat and slope, down to a depth of 25 ft.

First recorded from Australia from Heron Island and Wistari Reef, Willis Island, Restoration Rock and Moreton Bay by Patton (1966) and subsequently from Swains' Reefs (Bruce, 1977a). This species has been recorded throughout the Indo-West Pacific region, from the Red Sea to the Society Islands, except for the Hawaiian Islands, where suitable hosts do not occur.

Onycocaris amakusensis Fujino & Miyake

Heron Island, central reef flat, low water, 1 ovigerous ♀, in *Callyspongia* sp., 12 December 1978.

This species has not been formally recorded from Australian waters and is known only from Zanzibar, Hong Kong and Japan and Hawaii.

Onycocaris monodoa Fujino & Miyake

Heron Island, south west reef crest, low water, in encrusting sponge on *Acropora*; 16 November 1977. 1 male, 1 ovigerous ♀ in *Paraesperella*, 10 October 1977.

Previously recorded only from the Amami Islands, Japan. New to the Australian fauna.

Onycocaris oligodentata Fujino & Miyake

Heron Island, southwest reef slope, 1 specimen, 55 ft., in *Spongionella* sp., 2 September 1976.

Not previously recorded from Australian waters and known only from the Amakusa Islands, Japan, and Hong Kong. The association with *Spongionella* represents a new host record.

Palaemonella pottsi (Borrdaile)

Heron Island, reef slope, 40-45 ft., 2 specimens, on crinoid, 10 July 1976; 1 ovigerous ♀, on *Comanthus parvicirrus*, coll. C. Messing, 27 March 1978. Wistari Reef, reef slope, 95 ft., 3 ♂, 2 ovigerous ♀, on three crinoid hosts, 11 October 1976; northern reef slope, 80 ft., 2 specimens on *Comanthina schlegeli*, 6 April 1978; idem, 85 ft., 1 ♂, 1 ovigerous ♀ on crinoid, 18 April 1978; idem, 80 ft., 1 ♂, 1 ovigerous ♀ on crinoid, 7 August 1978; idem, 60-80 ft., 1 ♂, 1 ovigerous ♀, 2 juveniles on *Comanthina schlegeli*, 9 July 1978; idem, 80 ft., 1 ♂, 1 ovigerous ♀ on *Comanthina schlegeli*, 4 July 1978.

Previously recorded in Australian waters from the type locality Mabuaig, Torres Straits (Borradaile, 1915) and also from One Tree Island, (Bruce, 1970, 1977a). Known from East Africa to the Marshall Islands. Commonly found in association with other pontoniine and alpheid shrimps on a variety of crinoid hosts.

Palaemonella rotumana Borradaile

Moderately common on the reef flat in and around bases of live corals and in dead coral colonies, but also occurring in similar habitats in deeper water, and has been collected down to a depth of 20

ft. Usually found only in ones and twos.

Previously reported from the Low Islands (as *Periclimenes rotumana*) by McNeill (1968), and from Moreton Bay and One Tree Island, Queensland by Bruce (1970, 1977a). This species occurs extensively throughout the Indo-West Pacific region from the northern Red Sea to Hawaii. It is a free-living micro-predator, and occurs in a wide variety of habitats to a depth of about 400 ft. (70 fm.). Its range also extends into the western Mediterranean Sea, but it has not been found in the Eastern Pacific region as yet.

Palaemonella spinulata Yokoya

Wistari reef, north west slope, 95 ft., under coral, 24 May 1977; north slope, 80 ft., 6 specimens (1 ovigerous ♀), under coral, 19 May 1978; north slope, 80 ft., 2 ovigerous ♀, 3 September, 1978.

Not previously recorded from Australian waters. Probably a free-living micro-predator, like *P. rotumana*, which it closely resembles. Recorded from Japan, Tanganyika and La Reunion only.

Paranchistus pycnodontae Bruce

Heron Island, central lagoon, 10 ft., in *Hyotissa* sp., 1 ♀ (holotype), 17 August 1976, with a specimen of *Onuxodon parvibrachium* (Fowler) [Carapidae].

There have been no subsequent collections of this species from Heron Island or elsewhere. The host was originally identified as *Pycnodonta hyotis* (L.) but is not correctly referable to that species.

Parapontonia nudirostris Bruce

Heron Island, channel, 60 ft., 1 specimen on *Himerometra robustipinna*, 19 October 1976; 1 specimen, 20 ft., 14 October 1977; 1 specimen, 50 ft., on *Himerometra robustipinna*, 30 March, 1978; 1 male, 1 juvenile, 20 ft., 26 April 1978; Wistari reef, 50 ft., 1 male on *Pontiometra andersoni*, 14 July 1978.

Known only from New Caledonia, Heron Island and One Tree Island, Capricorn Islands, and North Stradbroke Island, Queensland.

The above host records represent new host associations. The species has been previously found in association with *Tropiometra afra*.

Paratypton siebenrocki Balss

Patton (1966) reported the occurrence of this species at Heron Island, the first record for Australian waters. The specimen, an

ovigerous ♀, was found in association with the coral *Acropora squamosa* Brook (Bruce, 1969a). There have been no further occurrences.

Paratypton siebenrocki occurs throughout the Indo-West Pacific region from the Red Sea and La Reunion to the Marshall and Samoan Islands.

Periclimenaeus arabicus (Calman)

Heron Island, channel, 95 ft., 1 specimen in sponge, 24 May 1977; central reef flat, 1 male, 1 ovigerous ♀, in sponge, 2 ft., 27 July 1977; reef flat, 1 ovigerous ♀, in sponge, low water, 2 May 1978.

Not previously recorded from Australian waters. Reported from Jibouti and South Arabia; Kenya, Zanzibar and Tanganyika and from Japan. Previously reported in association with sponges of the genera *Callyspongia* and *Acarnus*.

Periclimenaeus ardeae Bruce

Heron Island, reef flat, low water, 1 ♂, 1 ovigerous ♀ in *Jaspis stellata* (Carter), 2 November 1976; 1 ♂, 2 ovigerous ♀, same host, 26 January 1978.

The type specimens of this species were first described from Heron Island and were from the same sponge (Bruce, 1969). The only other records of this species are from Kenya, in the sponge *Asteropus simplex* (Carter) from a depth of 126-140 ft.

Periclimenaeus bidentatus Bruce

Heron Island, south west reef, 40 ft., 1 ♂ and one ovigerous ♀, in *Arenochalina flamulata* (Lam.), 20 July 1976; patch reef, 55 ft., 1 specimen, in *Spongionella* sp., 2 September 1976.

The type specimens of this species were first described from Heron Island (Bruce, 1969). Specimens have also been reported from Kenya and Zanzibar in *Dysidea fragilis* and *Liosina paradoxa*. The present host associations have not been previously recorded.

Periclimenaeus diplosomatis Bruce

Known only from the type specimens, described from Heron Island, in association with the ascidian *Diplosoma rayneri* MacDonald, collected from the reef flat, 13 December 1978 (Bruce, in press).

Periclimenaeus djiboutensis Bruce

Heron Island, outer reef slope, 36 ft., 1 juvenile in sponge, 20 April 1978; outer slope, 37 ft., 1 ♂, in sponge, 9 May 1978.

Not previously recorded from Australian waters. Known only from Jibuti, Zanzibar and Madagascar. The only previous host record is from *Spongia officinalis* var. *ceylonicus* Dendy.

Periclimenaeus gorgonidarum (Balss)

Heron Island, channel, 60-80 ft., 1 ovigerous ♀ in unidentified sponge, 13 May 1979; Wistari Reef, 80 ft., 1 ♂, 1 ovigerous ♀, in *Siphonochalina* sp., 4 October 1978.

First described from Japan, there have been no subsequent reports of this species from other regions. The Japanese specimens were found in association with *Callyspongia confoederata*. *Periclimenaeus uropodialis* Barnard, from Mocambique and East Africa, is probably synonymous.

Periclimenaeus hecate (Nobili)

Heron Island, reef flat, low water, in tunicate encrusting *Pocillopora* base, 1 ♂, coll. A. Austin, no date, 1976; south east reef slope, 20 ft., 1 ♂, 1 ovigerous ♀ in *Diplosoma* sp., *?listerianum* (Milne-Edwards), 10 January 1978; north reef slope, 37 ft., 1 ♂, ? tunicate host, 9 May 1978. Wistari Reef, north west reef, 30 ft., 1 juvenile in a colonial tunicate, 26 April 1979.

Previously recorded from Australian waters only from Cape Joubert, Western Australia. Otherwise known from the Gulf of Aden, Kenya, the Comoro and Maldives Islands and Indonesia. Previously found in small encrusting colonies of *Didemnum* in Kenya.

Periclimenaeus odontodactylus Fujino & Miyake

Wistari Reef, north east slope, 35 ft., 1 ♂, 1 ovigerous ♀, in unidentified sponge, 18 June 1979.

This species has not previously been recorded from Australian waters and is known only from Amakusa Island, Japan, where specimens were found in the sponge *Ircinia fasciculata*.

Periclimenaeus ornatus Bruce

Heron Island, reef flat, low water, 1 ♂, 1 ovigerous ♀, in *Jaspis stellifera* (Carter), 2 November 1976; 1 ovigerous ♀, reef flat, low water, same host, 16 January 1977.

First described from specimens collected at Heron Island (Bruce, 1969), this species has since been reported from Zanzibar and Tanganyika. The host sponge has not been previously identified. *P. ornatus* occurs in association with *P. ardeae*.

Periclimenaeus pachydentatus Bruce

Heron Island, north west reef slope, 40 ft., 1 ♂, 1 ovigerous ♀, in *Sigillina deerata* (Sluiter), 27 April 1979.

Previously recorded from the type locality only, in the south east Gulf of Carpentaria, in association with the same host.

Periclimenaeus rhodope (Nobili)

Heron Island, reef flat, low water, 1 ♂, 1 ovigerous ♀, in encrusting sponge on *Acropora*, 26 March 1978.

Not previously recorded from Australian waters. Known only from Jibuti, Somalia, Kenya, Tanganyika and Zanzibar. An associate of sponges of the genus *Haliclona*.

Periclimenaeus tridentatus (Miers)

Heron Island, east reef slope, 25 ft., 1 ♂, 1 ovigerous ♀, in an ascidian, 4 November 1976. Wistari Reef, north west reef slope, 40 ft., 1 ♂, in *Diplosoma* sp., 12 June 1979.

Previously recorded from Australian waters from the type locality, Thursday Island, by Miers (1884). Also known from the Sulu Archipelago and Singapore, with some other dubious records. The host of this species *s. str.* has not been previously recorded.

Periclimenaeus tuamotae Bruce

Heron Island, outer reef slope, 37 ft., 7 specimens, 2 ovigerous ♀, in sponge, 9 May 1978.

Not previously recorded from Australia. Known from Mururoa Atoll, Kenya and Tanganyika. Found in association with *Acarnus ternatus* in Kenyan waters.

Periclimenes affinis (Zehntner)

Wistari Reef, north west slope, 95 ft., on *Comatula cratera* (3), 9 specimens (3 ♂, 4 ovigerous ♀, 2 ♀), 11 October 1976; north reef slope, 80 ft., in *Comanthina schlegeli* (1), 7 specimens (1 ovigerous ♀) 6 April 1978; idem, 85 ft., on crinoid, 13 specimens, 18 April 1978;

idem, 85 ft., on crinoid, 5 specimens, 7 May 1978.

Generally found in association also with *Palaemonella pottsi* and *Periclimenes commensalis*. This species has not been previously found in Australian waters and is known only from New Caledonia, and the northern South China Sea.

Periclimenes amboinensis (De Man)

Wistari Reed, southern reef slope, 75 ft., on *Comantheria briareus*, 1 ♀, 27 January 1978; reef slope, 50 ft., on *Comaster bennetti*, 1 ♂, 1 ovigerous ♀, 14 July 1978.

This species has not been previously recorded from Australian waters and is known only from the original record from Amboin, Moluccan Islands, of which the holotype specimen is no longer extant.

Periclimenes amyomone De Man

First recorded from Australian waters at Heron Island by Patton (1966) in corals of the genera *Pocillopora*, *Stylophora* and *Acropora*. Also recorded from One Tree Island, also in the Capricorn group (Bruce, 1971). Known from the Nikobar Islands to the Samoan Islands. Generally common in branching corals at Heron Island.

Periclimenes brevicarpalis (Schenkel)

Relatively uncommon on giant anemones on Heron Island reef flat.

Only two specimens have been collected, on 27 May 1977 and 5 July 1978. Probably more common than these catches indicate but restricted due to absence of suitable hosts such as *Stoichactis* spp.

Known throughout most of the Indo-West Pacific region from the Red Sea to the Line Islands, but not from Hawaii or south eastern Polynesia.

Previously recorded from the Great Barrier Reef by Saville Kent (1893) from Torres Straits, the Low Isles, Cooktown, Port Denison, Magnetic Island and from the Monte Bello Islands.

Periclimenes brocketti Borradaile

Heron Island, reef slope, 1 ovigerous ♀, 2 juveniles on a yellow crinoid (? *Comanthina schlegeli*), 3 June 1978.

These specimens are provisionally referred to this species, which may prove to be a synonym of *P. affinis* (Zehntner). *P. brocketti* is known with certainty from the holotype specimen from the Maldives (Borradaile, 1915; Bruce, 1978).

Periclimenes ceratophthalmus Borradaile

Heron Island, north west reef, outer slope, 60 ft., 1 ♂ on *Himerometra robustipinna*, 7 June 1979.

This species has been previously recorded in Australian waters only from One Tree Island (Bruce, 1977a) where it was found in association with the same host. Also known from the Maldives Islands, Zanzibar, Kenya, the Seychelle Islands and Indonesia.

Periclimenes colemani Bruce

Known only from Heron Island, where the type material was collected from 36 ft., in association with the echinoid *Asthenosoma intermedium*, (Bruce, 1975a). One more specimen has since been collected from the same host at 30 ft., on 31 March 1977.

Periclimenes commensalis Borradaile

Heron Island, reef slope, 40 ft., crinoid host, 1 specimen 14 July 1976; 20 ft., crinoid host, 1 ♂, 1 ovigerous ♀, 17 April 1978; 20 ft., crinoid host, 3 specimens, 1 ovigerous ♀, 13 July 1978; 20 ft., 1 specimen on *Comanthus parvicirrus*, 14 July 1978. Wistari reef, north west slope, 95 ft., 3 specimens on crinoid host, 11 October 1976; reef slope, 80 ft., 1 specimen on *Comanthina schlegeli*, 6 April 1978; 1 ♂, 1 ovigerous ♀, 80 ft., on crinoid host, 7 April 1978; 1 specimen on crinoid, 40 ft., 10 April 1978; 3 specimens on *Comaster multifidus* at 70 ft., 9 July 1978.

Previously recorded from Australian waters in the Torres Straits (Borradaile, 1915) and from Moreton Bay (Bruce, 1971). Also known from East Africa to the Caroline and Solomon Islands, and New Caledonia. Not previously reported in association with *Comaster multifidus* or *Comanthina schlegeli*.

Periclimenes consobrinus De Man

Heron Island, southern reef flat, low water, one pair on *Pocillopora damicornis*, 12 August 1976.

Not previously recorded from Australian waters but some of the specimens reported from *Seriatopora* from Heron Island may have belonged to this species (Patton, pers. comm.) Otherwise known only from Ternate, Moluccan Islands, Kenya, Tanganyika and the Comoro Islands.

Periclimenes cornutus Borradaile

Wistari Reef, north east reef slope, 40-45 ft., 1 specimen, on *Himerometra robustipinna*, 21 July 1976.

The single example of this species is provisionally referred to this species, which may be a synonym of *P. amboinensis* (De Man). *P. cornutus* is known only from the type material from Male Atoll, Maldives Islands.

Periclimenes cristimanus Bruce

Heron Island, Wistari Reef channel, 10 ft., on *Echinothrix calamaris*, 1 specimen, 18 August 1976; 1 ovig. ♀, 2 juv., 55 ft., same host, 7 June 1978.

Not previously recorded from Australian waters and reported only from Singapore, the type locality, Hong Kong and Pulau Perhentian Besae. The association with *Echinothrix* represents a new host record, as this species has only been so far recorded in association with *Diadema* spp.

Periclimenes diversipes Kemp

Heron Island, west end of reef flat, inner zone, low water, in *Porites andrewsi*, 5 ovigerous ♀, 8 June 1979.

Moderately common, but less abundant than *P. madreporeae*. Adult females are generally smaller and easily distinguished by their colour pattern, with white speckling on pereiopods. Of widespread distribution, throughout the Indian Ocean to Singapore. Previously recorded from Australia by Patton (1966) with specimens from Restoration Rock, Queensland, but not from Heron Island. An associate of a wide variety of corals, including *Psammocora*, *Pocillopora*, *Stylophora*, *Seriatopora*, *Acropora*, *Montipora*, *Pavona*, *Porites*.

Periclimenes elegans (Paulson)

Heron Island, central reef flat, low water, 1 ♂, 7 September 1976.

Although only one specimen is noted above, this species is quite commonly seen on the reef flat, where it occurs by day under dead coral bases, etc... First recorded from the Capricorn Islands by McNeill (1926) (as *P. elegans* var. *dubius*) and later from Northwest Cape by Balss (1921). McNeill also recorded this species from the Low Isles (1968), and it also occurs on the Diamond Islets, Swains Reef, Queensland. Otherwise known from the Red Sea to Marshall Islands.

Periclimenes galene Holthuis

Heron Island, reef slope, 60 ft., 1 ovigerous ♀ on hydroid (*Lytocarpus philippinus*), 17 September 1978. Wistari Reef, northern reef, 80 ft., 1 ♂ on *Lytocarpus philippinus*, 2 November 1978; 85 ft., on *Lytocarpus* sp., 3 ovigerous ♀, 20 November 1978.

Not previously recorded from Australian waters. Originally described by Ambon and Menado, Indonesia and more recently from Zanzibar, Tanganyika and Kenya. Common on *Aglaophenia* in East African waters.

Periclimenes gonioporae Bruce

Heron Island, eastern reef, 20 ft., 1 ovigerous ♀ in *Montipora* sp., 21 July 1976; reef flat, low water, 1 specimen, on *Goniopora tenuidens*, 3 October 1976; reef flat pool, low water, 1 ovigerous ♀, on *Galaxea fascicularis*, 30 March 1978; 6 specimens (2 ovigerous ♀) on *Porites andrewsi*, low water, inner reef flat, 20 April 1979.

This species is new to the Australian fauna. It has only been previously recorded from East African waters, where it is associated with *Goniopora stutchberryi*, (Bruce, in press).

Periclimenes granulimanus Bruce

Wistari Reef, north reef slope, 80 ft., 1 specimen on a bushy hydroid, *Lytocarpus philippinus*, 7 April 1978.

Previously known only from the holotype specimen found in north west Madagascar in 1970 at Tany Keli, on an unidentified antipatharian. Found in association with *P. nilandensis*, *P. psamthe* and *P. toloensis*.

Periclimenes holthuisi Bruce

Heron Island, bommie, 40 ft., on unidentified anemone, 1 juvenile, 19 July 1976; sand bottom, 55 ft., 3 juveniles on unidentified alcyonarian, 19 October 1976. Wistari Reef, north west slope, sand, 2 ovigerous ♀, on *Catalaphyllia plicata*, 10 October 1976; north west slope base, 75 ft., sand near *Goniopora*, 3 specimens, 1 ovigerous ♀ on *Catalaphyllia*, 19 May 1978; south reef, 70 ft., 1 specimen on *Goniopora*, 20 December 1978.

Many more specimens have been observed but not collected. Frequently seen in deep water in association with *Periclimenes magnificus* on the coral *Catalaphyllia* or the anemone *Dofleini*.

Previously recorded from Bowen, Peloris Island and Moreton Bay, Queensland, in Australian waters (Bruce, 1971, 1977; Wadley, 1978). Also known from Zanzibar, the Seychelle and Maldives Islands, Ceylon, Indonesia, New Guinea, Hong Kong, Japan, Caroline Islands and New Caledonia.

Periclimenes imperator Bruce

Wistari Reef, north west reef, 75 ft., 1 specimen on *Hexabranchus*

sanguinieus, 11 October 1976. Several other examples have been observed, but not collected, on this host.

Previously recorded on Heron Island (Bruce, 1971, 1976a) and from Undine Reef, Orpheus and Lizard Islands. Occurs commonly throughout the Indo-West Pacific region from the northern Red Sea to Hawaii, often on *Hexabranchus* but also on a variety of holothurian hosts.

Periclimenes incertus Borradaile

Heron Island, bommie, 40 ft., several specimens on *Arenochalina flammula* (Lamm.), 20 July 1976. Wistari Reef, north east reef, 40-45 ft., 6 specimens, 3 ovigerous ♀, on *Leucetta microraphis* Haekel, 21 July 1976; in channel, 50 ft., 1 ovigerous ♀, host not located, 15 September 1976.

Previously recorded from Australian waters only from Northwest Cape (Balss, 1921, as *Palaemonella biunguiculatus*). Otherwise recorded from Aden, Kenya, Zanzibar, Tanganyika, Madagascar, Maldives and Andaman Islands, Ceylon and Indonesia. Both host species represent new host records.

Periclimenes inornatus Kemp

Heron Island, northern reef slope, 4 specimens, 2 ovigerous ♀, on *Radianthus* sp., 30-60 ft., 19 October 1976; outer reef slope, 36 ft., 4 specimens on *Radianthus* sp., 20 April 1978; north west reef slope,

Not previously recorded from Australian waters. Known from Zanzibar and Kenya, Comoro, Maldives and Andaman Islands and the South China Sea. Usually found on giant anemones in deeper water than *P. brevicarpalis*, which is common intertidally in many localities.

Periclimenes kempfi Bruce

Heron Island, reef flat, low water, 1 ovigerous ♀, on *Microscopicaria pachycladus*, coll. L. Shinkarenko, 16 August 1976; central reef flat pool, 4 specimens (3 ovigerous ♀), on *Limnalia peristyla*, 24 October 1976; idem, 5 specimens (2 ovigerous ♀), on *Sarcophyton* sp., 6 April 1978; idem, 4 specimens (1 ovigerous ♀) on *Sarcophyton* sp., 7 January 1978, reef slope, 12 specimens; 2 juveniles on *Nephthya* sp., 20 April 1978.

New to the Australian fauna, and apparently quite common on alcyonarians in shallow water. Previously recorded from only the Red Sea, Kenya, Zanzibar, Andaman Islands and Singapore. The associations with *Microscopicaria* and *Limnalia* represent new host records.

Periclimenes lanipes Kemp

Wistari Reef, sand bottom, 1 km north of reef, 80 ft., 12 specimens, 11 juveniles, on *Euryale aspera*, 4 October 1978.

The specimens differ slightly from typical material in that postero-ventral angle of the pleuron of the fifth abdominal segment is acutely pointed.

Previously recorded in Queensland waters from Double Island Point (Bruce, 1971). Also known from Somalia, northern South China Sea, New Caledonia and Madagascar.

Periclimenes lutescens auct.

Common, usually in pairs, on corals of the genus *Acropora* at Heron Island. First reported from Heron Island by Patton (1966) and also recorded from Swains Reef (Bruce, 1977a). Known to occur from the Red Sea to Japan, and probably throughout the rest of the Indo-West Pacific region where branching species of *Acropora* are to be found.

Periclimenes madreporeae Bruce

Common on a variety of coral hosts at Heron Island. This species was first reported from the locality as *P. inornatus* by Patton (1966). It has been found in association with *Pocillopora*, *Stylophora*, *Seriatopora*, *Acropora*, *Turbinaria*, *Montipora* and *Acrhelia*. Known only from the Capricorn Islands and Solomon Islands.

Periclimenes magnificus Bruce

First described from specimens collected at Heron Island in association with the coral *Catalaphyllia plicata* at 80 ft., off Wistari Reef (Bruce, 1979). Several more specimens have been obtained from the same host and also from the anemone *Dofleinia armata*. The species is also now known to occur in Japan.

Periclimenes nilandensis Borradaile

Wistari Reef, northern reef slope, 80 ft., on *Lytocarpus philippinus*, 14 specimens, 7 April 1978.

Found in association with *P. psamathe*, *P. granulimanus* and *P. toloensis*. Not previously recorded as a hydroid associate.

New to the Australian fauna. Previously known from Zanzibar, Kenya, Madagascar, the Maldives Islands, Indonesia and the northern South China Sea, in association with gorgonians.

Periclimenes ornatellus Bruce

Heron Island, central reef flat, low water, 1 ♂, on unidentified anemone, 10 December 1978.

Previously recorded only from Eniwetok Atoll, Marshall Islands also on an unidentified anemone. The present specimen shows the same colour pattern as the type material and similar but less marked spinulations of the unguis of the dactyls of the ambulatory pereiopods.

Periclimenes ornatus Bruce

Heron Island, bommie, 20 ft., 1 specimen on *Radianthus* sp., 21 July 1976.

Not previously recorded from Australia. Known from Kenya, Hong Kong, Japan and Marshall Islands only. In Japanese waters this species is associated with the anemones *Parasicyonis actinostrodes* and *P. maxima* (Suzuki & Hayashi, 1977).

Periclimenes psamathe De Man

Wistari Reef, north east reef slope, 80 ft., 73 specimens on *Lytocarpus philippinus*, 7 April 1978; 16 specimens, 80 ft., same host, 2 November 1978; 11 juveniles, 85 ft., same host, 20 November 1978.

The above specimens were associated with *P. galene*, *P. nilandensis* and *P. granulimanus* as well as *P. toloensis*. Recorded previously from East Africa, Madagascar, Chagos and Maldive Islands, Indonesia, South China Sea, Japan, Caroline Islands and New Caledonia. Not previously recorded from Australia. Earlier records have indicated associations with gorgonian hosts and this species has not been previously found on hydroids.

Periclimenes seychellensis Borradaile

Collected frequently, but only in small numbers; mainly from regions of algal growth on the reef flat.

Not previously recorded from Australian waters but common throughout the Indian Ocean, Singapore, Indonesia, to Papua. A free-living micro-predator, without commensal associations.

Periclimenes soror Nobili

A common associate of asteroids on Heron Island and Wistari Reefs, extending from the reef flat down to a depth of 100 ft. The commonest host is probably *Acanthaster planci* but other hosts include *Culcita novae-guineae*, *Echinoaster luzonicus* and 5 specimens have been collected

on *Halityle regularis*. *Halityle regularis* and *Echineaster luzonicus* represent new host records.

Two conspicuous colour forms occur; red and white on *Acanthaster* and purple on *Culcita* and other hosts.

First recorded in Australian waters from Green and Fairfax Islands (Bruce, 1971) and extending south to Cutaway, New South Wales, while also occurring in the Dampier Islands, Western Australia (Bruce, 1976). Common throughout the Indo-West Pacific region from the Red Sea to Hawaii and the Tuamotu Islands, as far east as Panama.

Periclimenes spiniferus De Man

Probably the most abundant pontoniine shrimp, at least on the reef flat, where it occurs in the bases of live and dead coral colonies in large numbers.

First recorded in Australian waters from Northwest Islet, Capricorn Islands, by McNeill (1926) and also reported from Heron Island by Patton (1966) and the Low Isles by McNeill (1968). Widely distributes throughout most of the Indo-West Pacific region, except the north west, from Kenya to Tahiti. A free-living species.

Periclimenes tenuipes Borradaile

Wistari Reef, in coral cave, 80 ft., 1 ♂, 2 ovigerous ♀, coll. W. Deas, 13 July 1976; northern part of reef, 45 ft., 1 specimen, 30 March 1977.

Not previously recorded from Australian waters. Recorded in small numbers from East Africa to the Marshall Islands. Usually appears free-living but also reported to be associated with anemones (Reed, 1974).

Periclimenes tenuis Bruce

Heron Island, reef slope, 1 specimen on *Himerometra magnipinna*, 9 July 1978; 1 ♂, 2 ovigerous ♀, Wistari Reef, on crinoid, 13 July 1978.

New to the Australian fauna. Previously recorded only from Zanzibar and Eylath, northern Red Sea. Previously found in association with *Tropiometra carinata* and *Heterometra carinata*.

Periclimenes toloensis Bruce

Wistari Reef, north west slope, 80 ft., on hydroid, *Lytocarpus philippinus*, 7 April 1978; northern reef slope, 80 ft., 6 specimens (2 ovigerous ♀), same host, 2 November 1978.

New to the fauna of Australia. Previously recorded only from the type locality Tolo Channel, Hong Kong, and from Zanzibar. The host of the type species was not identifiable and these records present the first host records for this species.

Philarius gerlachei (Nobili)

Patton (1966) recorded 4 specimens from *Acropora* at Heron Island. A dozen more specimens were obtained since, all from *Acropora* colonies in shallow water. Both this species and *P. imperialis* are distinctly less common than *Periclimenes lutescens*.

Also known from Willis Island, Bet Reef and Restoration Rock in Australian waters, its range extends from the Red Sea to the Samoan Islands.

Philarius imperialis (Kubo)

Three specimens were recorded by Patton (1966) from *Acropora* colonies at Heron Island. A further 15 specimens have since been collected from the same hosts, down to a depth of 65 ft.

The distribution of this species extends from the northern Red Sea to the Marshall Islands.

Philarius lifuensis (Borradaile)

Heron Island, south west slope, 20 ft., on *Acropora* sp., 1 ♂, 1 ovigerous ♀, 30 July 1976; north west reef slope, 40 ft., on *Acropora* sp., 1 ♂, 1 ovigerous ♀, 29 May 1979. Wistari Reef, 60 ft., on *Acropora* sp., 1 ♂, 1 ovigerous ♀, 14 September 1976; in channel 60 ft., on *Acropora* sp., 1 ♂, 1 ovigerous ♀, 15 September 1976.

This rare species has not been previously recorded from Australian waters and is known only from the holotype specimen collected from Lifu, Loyalty Islands and described by Borradaile in 1898. Like other species of the genus, it is an associate of *Acropora* corals but appears to inhabit greater depths and does not occur on the reef flat. It is to be redescribed in detail elsewhere.

Platycaris latirostris Bruce

Heron Island, eastern reef slope, 50 ft., 1 pair, in *Galaxea fascicularis*, 14 June 1979.

Not previously recorded from Australian waters. Known from Kenya, Zanzibar, Tanganyika, Mocambique, Madagascar, Comoro and Seychelle Islands and Indonesia.

The present specimens were found in association with specimens of *Ischnopontonia lophos* and *Racilius compressus*. All are specific to *Galaxea fascicularis*.

Pliopontonia furtiva Bruce

Wistari Reef, reef slope, 25 ft., on zoanthid, 1 ♂, 1 ovigerous ♀, 7 May 1979.

First recorded from Australian waters at Heron Island by N. Coleman (1977). Originally described from Kenya and not known from other localities as yet. The types were associated with the corallimorph *Rhodactis rhodostoma*.

Pontonia ardeae Bruce

Three pairs of specimens were collected from Wistari Reef, in *Chama pacifica* at a depth of 60 ft. on 3 May 1979. These are the type specimens and only known examples of this species as yet (Bruce, in press a).

Pontonia katoi Kubo

Wistari Reef, 80 ft., 1 ♂, 1 ovigerous ♀ in *Cnemidocarpa pedata*, coll. C. Hawkins, 6 November 1978; 1 ovigerous ♀, 60 ft., 3 May 1979. Heron Island, 2 ♂, 2 ovigerous ♀ in *Styela* sp., 15 December 1978; 3 specimens (1 ovigerous ♀) in *Polycarpa* sp., 4 May 1979; 3 specimens in *Polycarpa* sp., 40 ft., 29 May 1979.

Several closely related species have also been collected but *P. katoi* is always readily distinguished by its characteristic colour pattern.

Previously recorded from Australian waters at Coil Reef, Queensland (Bruce, 1977). Also known from Tanganyika, Indonesia and Japan. The association with *Cnemidocarpa* represents a new host record. Previous hosts include *Herdmania*, *Cynthia*, *Polycarpa*, *Styela* and *Microcosmos*.

Pontonia okai Kemp

Heron Island, 1 juvenile, from unidentified ascidian, coll. J.E.N. Veron, 24 May 1977. 1 ♂, 1 ovigerous ♀, in *Ascidia* sp., 50 ft., 5 June 1979.

This species has not been previously recorded from Australia and is known only from the type locality off Cape Negrais, Burma, and from Kenya, Indonesia and the northern South China Sea.

Pontonides sp. aff. *unciger* Calman

Wistari Reef, 75 ft., on *Cirripathes anguinis*. 1 ♂, 1 ovigerous ♀. coll. N. Quinn, 2 December 1978.

This pair of specimens are considered to be conspecific with those reported upon and illustrated by Davis and Cohen (1968), which are distinct from *P. unciger* Calman s. str.

Pontoniopsis comanthi Borradaile

Heron Island, isolated bommie on south east reef, 20 ft., 1 specimen on *Comatula pectinata*, 31 July 1976; idem, 20 ft., on crinoid, 1 ♂, 1 ovigerous ♀, 17 April 1978; 1 ovigerous ♀, crinoid, 13 July 1978. Wistari Reef, 70 ft., on *Capillaster multiradiatus*, 9 July 1979; on *Comatula purpurea*, 40-65 ft., 1 ♂, 1 ovigerous ♀, 15 September 1976.

First described from Australia, from specimens from Mabuaig, Torres Straits, and subsequently recorded from the Red Sea, Kenya, Zanzibar, Indonesia and the Marshall Islands. The host records have been previously noted in Bruce (1979a).

Propontonia pellucida Bruce

Heron Island, southern reef flat, low water, 1 ♂, 1 ovigerous ♀, on *Lobophyton* sp., coll. M. Bruce, 28 September 1977.

Not previously recorded from Australia. This record is the first indication of the occurrence of this species outside the Indian Ocean, where it has been recorded, in association with alcyonarians, from Zanzibar, Kenya, the Comoro Islands and the Seychelle Islands.

Stegopontonia commensalis Nobili

A single example of this species was recorded by Gillett and McNeill (1959), from *Diadema setosum*. No further specimens of this species have been obtained.

Sparsely distributed from Kenya to Hawaii. No records from elsewhere in Australian waters.

Thaumastocaris streptopus Kemp

Heron Island, south eastern reef, on bommie, 40 ft. in *Arenochalina flammula*, 1 juvenile, 20 July 1976. Wistari Reef, north east reef, 40-45 ft., in *Leucetta microraphis*, 1 specimen, 21 July 1976.

Not previously recorded from Australian waters. First reported

from Noumea, New Caledonia, and also known from East Africa, Madagascar, Indonesia and the Marshall Islands.

This sponge associate has been previously reported in association with sponges of the genera *Siphonochalina*, *Callyspongia*, *Haliclona*, *Petrosia*, *Acarnus* and so *Leucetta* and *Arenochalina* represent new host records.

Typton australis Bruce

Heron Island, southern reef flat, low water, in sponge, 1 ♂, 1 ovigerous ♀, 10 January 1979.

Previously known only from the type specimen collected from Chinaman's Reef, Queensland (Bruce, 1973). Not recorded from outside Australian waters.

Typton bawii Bruce

Heron Island, western reef flat, low water, in sponge, 1 ovigerous ♀, 17 January 1979.

Not previously recorded from Australian waters. First recorded from Zanzibar, and subsequently from Kenya, in association with the sponge *Iotrochota baculifera*.

Typton dentatus Fujino & Miyake

Heron Island, reef flat, in rubble, low water, in *Reniera* sp., 1 ♂, 1 ♀, 4 January 1979.

Previously known only from the type specimens collected in the Ryukyu Islands. The host sponge had not been previously identified.

Typton wasini Bruce

Heron Island, reef slope, 70 ft., in *Dysidea* sp., 3 specimens, 6 May 1976; central reef flat, low water, in sponge, 2 ♂, 3 ovigerous ♀, 11 November 1976; southern reef slope, 37 ft., 3 specimens (1 ovigerous ♀), in sponge, 9 May 1978; southern reef crest rubble, in sponge, low water, 1 ♂, 3 June 1978; Shark Bay, in sponge in coral rubble, low water, 1 specimen, 8 June 1978.

Not previously recorded from Australian waters and known only from the type locality, Wasin Island, Kenya. One lot of specimens (8 June 1978) were found in a sponge in association with an undescribed species of *Typton*.

Zenopontonia noverca (Kemp)

Heron Island, 80 ft., 5 specimens, on *Pentaceraster regularis*, 22 February 1978. Wistari Reef, north west slope base, 80 ft., on *Pentaceraster* sp., 16 April 1977; idem, 1 ♂, 1 ovigerous ♀, 75 ft., on asteroid, 16 July 1977.

Previously reported from Bowen, Queensland (Bruce, 1971, 1975). Otherwise reported from the type locality, Noumea, New Caledonia, Zanzibar and Madagascar only. The association with *Pentaceraster regularis* represents a new host record. The previously reported hosts include *Pentaceraster alveolatus*, *P. tuberculatus* and *P. mammillatus* as well as *Culcita*, *Protoreaster* and *Halityle* spp.

DISCUSSION

This report confirms the presence of 100 species of previously described pontoniine shrimps, belonging to 31 different genera, on the Heron Island-Wistari reefs, at the southern end of the Great Barrier Reef system. Of these, 47 species are recorded from Australian waters for the first time. A number of undescribed species have also been collected during the course of this study, but are not included in this report. These belong particularly to the genera *Periclimenaeus*, associated with sponges and ascidians, and *Pontonia*, also associated with ascidians. This study, carried out from 1976 to 1979, provides a detailed picture of the variety of pontoniine shrimps occurring in a restricted coral reef locality, although it is certain that more species remain to be identified. Little comparable data exists for the number of species of this subfamily that occur in similarly restricted localities in other parts of the tropics, or for other coral reefs. Such studies as have been carried out appear to have been of a more general nature, spread over wider areas, or over shorter periods of time. There is no reason to suppose that the Heron Island-Wistari reef pontoniine fauna is particularly rich and it is likely that similar studies of other subtropical reefs would produce evidence of a similar number of species. More tropical reefs could well possess a richer fauna, as some biotopes, such as sea grass beds, are lacking from the Heron Island reefs, and some groups of potential hosts, such as echinoids and bushy gorgonians, are poorly represented. Of the species recorded from Heron Island reefs only six, *Paranchistus pychnodontae*, *Periclimenaeus diplosomatis*, *Periclimenaeus pachydentatus*, *Periclimenes colemani*, *Pontonia ardeae* and *Typton australis*, all fairly recently described, have not yet been found to occur in non-Australian waters. There is no reason to suppose that these species are endemic.

Most of the species recorded are of widespread Indo-West Pacific distribution, ranging from the Red Sea and East Africa to the Hawaiian Islands. Of the 100 species recorded, 75 are also known from the western Indian Ocean, 10 species are known from Hawaii (out of the 18 pontoniine shrimps known to occur there), and 4 species also range as far east as the western seaboard of America (*Periclimenes soror*, *Harpiliopsis depressa*, *Harpiliopsis spinigera* and *Fennera chacei*).

Table 1

Species	Hosts	Porifera	Hydrozoa	Antipatharia	Alcyonacea	Gorgonacea	Pennatulacea	Corallimorpharia	Actiniaria	Scleractinia	Gastropoda	Bivalvia	Crinoidea	Holothuroidea	Echincidea	Asterocidea	Ophiuroidea	Ascidiae	Free-living	Reef flat	Reef slope	Slope base	
1 <i>Allopontonia iaini*</i>																			x	x			
2 <i>Anchistiooides compressus*</i>	x																		x				
3 <i>Anchistiooides willeyi</i>	x																		x				
4 <i>Anchistus custoides</i>									x											x			
5 <i>Anchistus demani</i>									x										x				
6 <i>Apopontonia falcirostris*</i>	x																		x				
7 <i>Conchodytes meleagrinae</i>										x									x				
8 <i>Conchodytes tridacnae</i>										x									x				
9 <i>Coralliocaris graminea</i>						x													x	x			
10 <i>Coralliocaris superba</i>					x														x	x			
11 <i>Coralliocaris venusta</i>					x														x	x			
12 <i>Coralliocaris viridis</i>					x														x				
13 <i>Dasella herdmaniae*</i>											x							x	x				
14 <i>Dasycaris ceratops</i>				x																x			
15 <i>Hamodactylus aqabai*</i>		x																		x			
16 <i>Hamodactylus boschmai*</i>		x																	x				
17 <i>Hamodactylus noumeae*</i>	x																		x				
18 <i>Hamopontonia corallicola</i>						x													x	x			
19 <i>Harpiliopsis beaupresii</i>						x													x				
20 <i>Harpiliopsis depressa</i>						x													x				
21 <i>Harpiliopsis spinigera*</i>						x													x	x			
22 <i>Ischnopontonia lophos</i>						x													x				
23 <i>Jocaste japonica</i>						x													x	x			
24 <i>Jocaste lucina</i>						x													x	x			
25 <i>Onycocaris amakusensis*</i>	x																		x				
26 <i>Onycocaris monodoa*</i>	x																		x				
27 <i>Onycocaris oligodentata*</i>	x																		x				
28 <i>Palaemonella pottsi</i>							x										x		x				
29 <i>Palaemonella rotumana</i>																		x	x	x			
30 <i>Palaemonella spinulata</i>																		x	x				
31 <i>Paranchistus pycnodontae</i> ++								x										x					
32 <i>Parapontonia nudirostris*</i>								x								x			x				
33 <i>Paratypton siebenrocki</i>							x											x					
34 <i>Periclimenaeus arabicus</i>	x																	x	x	x			
35 <i>Periclimenaeus ardeae</i>	x																	x					
36 <i>Periclimenaeus bidentatus</i>	x																		x				
37 <i>Periclimenaeus diplosomatis</i> ++																x	x						
38 <i>Periclimenaeus djiboutensis*</i>	x																		x				
39 <i>Periclimenaeus gorgonidarum*</i>	x																		x				
40 <i>Periclimenaeus hecate</i>																	x	x	x				
41 <i>Periclimenaeus odontodactylus*</i>	x																		x				
42 <i>Periclimenaeus ornatus</i>	x																	x					
43 <i>Periclimenaeus pachydentatus</i> +																	x	x					

Species	Hosts	Porifera	Hydrozoa	Antipatharia	Alcyonocea	Gorgonacea	Pennatulacea	Corallimorpharia	Actiniaria	Scleractinia	Gastropoda	Bivalvia	Crinoidea	Holothuroidea	Echinoidea	Asteroidea	Ophiuroidea	Ascidiae	Free-living	Reef flat	Reef slope	Slope base	
44 <i>Periclimenaeus quadridentatus*</i>	x																		x				
45 <i>Periclimenaeus rhodope*</i>	x																		x	x			
46 <i>Periclimenaeus tridentatus</i>																		x	x				
47 <i>Periclimenaeus tuamotoae*</i>	x																		x	x			
48 <i>Periclimenes affinis*</i>											x								x	x			
49 <i>Periclimenes amboinensis*</i>											x								x	x			
50 <i>Periclimenes amymone</i>			x									x							x				
51 <i>Periclimenes brevicarpalis</i>		x											x						x				
52 <i>Periclimenes brocketti*</i>				x										x					x				
53 <i>Periclimenes ceratophthalmus</i>				x										x					x	x			
54 <i>Periclimenes colemani</i>					x								x			x			x	x			
55 <i>Periclimenes commensalis</i>						x							x						x				
56 <i>Periclimenes consobrinus*</i>		x											x						x				
57 <i>Periclimenes cornutus</i>						x							x						x				
58 <i>Periclimenes cristimanus*</i>							x						x						x	x			
59 <i>Periclimenes diversipes</i>					x								x						x				
60 <i>Periclimenes elegans</i>						x												x	x				
61 <i>Periclimenes galene*</i>	x																		x				
62 <i>Periclimenes gonioporae*</i>				x															x				
63 <i>Periclimenes granulimanus*</i>	x					x													x				
64 <i>Periclimenes holthuisi</i>					x	x													x	x			
65 <i>Periclimenes imperator</i>							x							x					x	x			
66 <i>Periclimenes incertus</i>	x							x											x				
67 <i>Periclimenes inoratus*</i>			x																x				
68 <i>Periclimenes kempfi</i>		x																	x	x			
69 <i>Periclimenes lanipes</i>									x									x		x			
70 <i>Periclimenes lutescens</i>					x														x	x			
71 <i>Periclimenes madreporeae</i>						x													x				
72 <i>Periclimenes magnificus</i>							x	x											x	x			
73 <i>Periclimenes nilandensis*</i>	x					x														x			
74 <i>Periclimenes ornatellus*</i>				x															x				
75 <i>Periclimenes ornatus*</i>					x														x				
76 <i>Periclimenes psamathe*</i>		x																	x				
77 <i>Periclimenes seychellensis</i>																			x	x			
78 <i>Periclimenes soror</i>										x								x	x	x			
79 <i>Periclimenes spiniferus</i>											x								x	x	x		
80 <i>Periclimenes tenuipes*</i>										x									x	x			
81 <i>Periclimenes tenuis*</i>											x								x		x		
82 <i>Periclimenes toloensis*</i>	x											x								x			
83 <i>Philaris gerlachei</i>						x													x				
84 <i>Philaris imperialis</i>						x													x	x			
85 <i>Philaris lifuensis*</i>						x													x				
86 <i>Platycaris latirostris*</i>							x												x				
87 <i>Pliopontonia furtiva</i>			x																x				
88 <i>Pontonia ardeae</i>										x									x				

Species	Hosts	Porifera	Hydrozoa	Antipatharia	Alcyonocea	Gorgonacea	Pennatulacea	Corallimorpharia	Actiniaria	Scleractinia	Gastropoda	Bivalvia	Crinoidea	Holothuroidea	Echinoidea	Astroidea	Ophiuroidea	Ascidiae	Free-living	Reef flat	Reef slope	Slope base
89 <i>Pontonia katoi</i>																		x		x		
90 <i>Pontonia okai</i> *																		x		x		
91 <i>Pontonidea aff. unciger</i> *	x																		x		x	
92 <i>Pontoniopsis comanthi</i>													x							x		
93 <i>Propontonia pellucida</i> *	x																		x			
94 <i>Stegopontonia commensalis</i>													x					x		x		
95 <i>Thaumastocaris streptopus</i> *	x																			x		
96 <i>Typton australis</i>	x																		x			
97 <i>Typton bawii</i> *	x																		x			
98 <i>Typton dentatus</i> *	x																		x			
99 <i>Typton wasini</i>	x																	x	x			
100 <i>Zenopontonia neverca</i>												x						x	x	x	x	

* Species new to Australia

+ Species not known outside Australian waters

++ Species known only from Heron Island

Six of the species collected are considered to be free-living, - *Palaemonella rotumana*, *P. spinulata*, *Periclimenes elegans*, *P. seychellensis*, *P. spiniferus* and *P. tenuipes*, although one of these, *P. tenuipes*, has been reported from the Palau Islands as a commensal of anemones and feeding upon the host's mucus (Read, 1974). No species have been noted as indulging in fish-cleaning behaviour, as has been recorded for several closely related species of *Periclimenes* occurring in the Caribbean region.

The remaining 94 species are commensal associates of various other marine invertebrates, that is to say, they are to be found in permanent obligatory associations with selected host animals only and not in other situations (Bruce, 1976a). These associations are summarized in table 1. The range of host animals is extensive and involves five phyla. The choice of hosts is dominated by the Coelenterata, with 41 species of associated shrimp, of which 24 are commensals of scleractinian corals. Fourteen genera are associated with coelenterates and ten with the scleractinia. The Porifera are hosts for 21 species of seven genera and the Echinodermata are hosts to 18 species of six genera only. Of the remaining 14 species, 7, of three genera, are associates of ascidians, and 7, of five genera, are commensals of molluscs. Of particular interest is the occurrence of five species in association with hydroids which have rarely been recorded as hosts for commensal shrimps. These hydroid associates have been associated with gorgonians in other parts of their ranges.

The purpose of the present study is to assess the diversity of the caridean fauna at a simple restricted coral reef locality. Several studies have provided data on the caridean fauna of tropical localities but unfortunately their results can not be considered to be strictly comparable. The methods employed have been different or not described, and the emphasis, extent, depth range and duration of sampling have generally not been clearly indicated. The extensive use of scuba techniques during the Heron Island survey have enabled many species to be collected that would not have otherwise been obtained.

Localities for which some comparable information is available include Inhaca Island, southern Mocambique (MacNae & Kalk, 1958); Eylath, Gulf of Aqaba (Holthuis, 1958); Singapore (Johnson, 1960); Malindi, central Kenya (Bruce, 1970) and Amakusa Island, southern Japan (Kikuchi & Miyaki, 1978). The Malindi study was based on a 3 day survey only, and the species list can not be considered as anywhere near complete. The other surveys all appear to have covered a considerable period of time. Johnson (1960) considered that the Singapore fauna was impoverished due to fresh water influence, but some species have recently been added to his list and are included in the Singapore total (Bruce, 1979a). The results of these studies are summarized below:-

<u>Locality</u>	<u>Genera</u>	<u>Species</u>
Eylath	7	12
Malindi	13	32
Inhaca Island	6	10
Singapore	11	28
Amakusa Island	9	17
Heron Island	31	100
Heron Island reef flat only	15	47

It is quite certain that further detailed study of the caridean fauna of all these localities would produce a considerable increase in the number of species recorded, so that the apparent discrepancy in numbers would be less marked. The number of species recorded from Heron Island, together with some new species as yet undescribed, suggests that a pontoniine fauna of about 150 species is probably present above a depth of 30 metres. Possibly more tropical localities will support a richer fauna. It may be noted that the Heron Island fauna is comparable with that of Zanzibar Island (Bruce, 1974), which has 91 species of 28 genera. Many of the species are common to both localities. Zanzibar is a large island, with an extensive leeward reef system, with extensive areas of mangrove, sea grasses and muddy or silty substrates that are not represented at Heron Island, although present at many other localities on the Great Barrier Reef.

It is probable that, for the localities listed, collection was mainly limited to reef flat or shallow water species. In table 1, the habitats of the various Heron Island species are approximately indicated, although the division of habitats into reef flat, slope and base is not precisely defined. This classification indicates that 47 species of fifteen genera are present on the reef flat, a total much closer to that of the other localities. The classification also indicates that the species diversity on the slope is higher than on the reef, with 64 species of 23 genera being present. The species found in the two regions are largely mutually exclusive, only 16 being found in both zones, and of these, 9 are associates of scleractinian hosts.

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