NOTES ON CARIDEAN SHRIMPS COLLECTED DURING THE SNEILLIUS-II EXPEDITION. I. ASSOCIATES OF ANTHOZOA

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ABSTRACT
During the Snellius-II Expedition to Indonesian waters in 1984, ten species of shrimp were collected associated with Anthozoa (Actiniaria: 6 species; Corallimorpharia: 1 species; Scleractinia: 3 species). These species are: Thor amboinensis (Hippolytidae), Periclimenes brevicarpalis, P. aff. inornatus, P. ornatus, P. holthuisi, P. magnificus, Pliopontonia furtiva, Paratypton siebenrocki, Philiarius gerlachei and Jocaste japonica (all Palaeomidae, Pontoniinae). Four new associations and four new records for Indonesian waters were established. Biogeographical aspects, as well as taxonomic problems in some groups are discussed.

1. INTRODUCTION
The Indonesian pontoniinid shrimp fauna is relatively well known. Collecting started with Rumphius (1705) and at the turn of the present century De Man (1888, 1902) studied the fauna extensively. The last major work, concerning the Siboga and Snellius-I collections, was published by Holthuis (1952). The most recent publication on Indonesian pontoniinid shrimps, based on a collection of the Rumphius-II Expedition to Ambon, is from Bruce (1983). This study added 12 new records from Indonesian waters. In the four decades between these last two publications an overwhelming amount of papers, mainly by A.J. Bruce, from neighboring areas were published, including the descriptions of many new species. For the study of distributional patterns Indonesia still forms a blank area on the map. The Snellius-II Expedition therefore provides an opportunity to fill in some distributional gaps. From the ten species presented in this study four are recorded for the first time from Indonesian waters. In addition four new associations were found.

The present study comprises material from the Snellius-II Expedition, collected by J.C. den Hartog from Actiniaria. Added are some specimens collected by other members of the expedition. Hosts were also collected and included in the collection of the Rijksmuseum van Natuurlijke Historie (RMNH). In many cases the material was photographed alive to document the colour patterns. Slides are registered and stored.

The preliminary identifications of the sea anemone hosts were made by Mr. J.C. den Hartog, mainly by means of the reference works of Carlsgren (1949) and Dunn (1981).

Acknowledgements.—I like to thank Mr. J. C. den Hartog (RMNH) for the identification of actiniarian hosts, his guidance through the complex taxonomy of Actiniaria, and critically reading the manuscript. His field notebook revealed many interesting data. Mr. B. W. Hoeksema is acknowledged for the identification of the fungiid corals. I am most grateful to Dr. Kasim Moosa of the Centre for Oceanological Research and Development (PPPO-LIPI), Jakarta, for his hospitality and cooperation during my stay (December 1987) in Indonesia, where I studied part of the collection. I thank Prof. Dr. L.B. Holthuis for his continuing support.

2. DESCRIPTIONS AND OBSERVATIONS

HIPPOLYTIDAE
Thor amboinensis (De Man, 1888)

Table 1


Material.—RMNH D 37367. 'Tyro' sta. 4.012. Pulau-pulau Maisel, reef flat N of Mai, 5°28'S 127°31'E, snorkeling and handcollecting at low tide, depth at low tide 0 m, at high tide about 1.5 m, 7.ix.1984. On green Stichodactyia gigantea (Forskal, 1775), with Periclimenes brevicarpalis, coll. J.C. den Hartog.—RMNH D 37368. 'Tyro' sta. 4.044. Tukang Besi Islands, SW of Taipabu, Binongko, 5°56'S 123°58'E, steeply sloping reef, down to 25 m, dense growth of stony and soft corals, scuba diving, depth 3 m, 11.ix.1984. On Telma-
station & sex & pocl & dt & dts & remarks \\
4.012 & female & 2.3 & 3 & 3 & \\
 & ov. female & 2.4 & 3 & 3 & \\
4.044 & male & 1.6 & 2 & - & telson broken \\
 & ov. female & 2.3 & 2 & 4 & \\
4.048 & male & 1.9 & 2 & 2 & \\
4.053 & juvenile & 1.8 & 3 & 7/3 & dts: 7 left, 3 right \\
 & female & 1.6 & 2 & 3 & \\
 & juvenile & 1.3 & 2 & 3 & \\
 & juvenile & 1.2 & 2 & 3 & \\
4.120 & juvenile & 1.1 & 3 & 5 & with bopyrid isopod \\
 & male & 1.7 & 3 & 5 & \\
 & ov. female & 2.3 & 3 & 3 & \\
 & ov. female & 2.4 & 3 & 3 & \\
4.147 & juvenile & 1.1 & 3 & 3 & \\
 & male & 1.7 & 3 & 3 & \\
4.158 & juvenile & 1.1 & 2 & 3 & host Actinodendron spec. \\
 & female & 1.5 & 2 & 3 & \\
 & female & 2.4 & 2 & 4 & \\
 & female & 2.2 & 2 & 3 & \\
 & female & 3.1 & 2 & 3 & \\
 & female & 2.2 & 2 & 3 & \\
 & female & 1.6 & 2 & 3 & \\
 & female & 2.1 & 2 & 5 & \\
 & female & 1.6 & 2 & 0 & \\
 & female & 1.7 & 2 & - & \\
 & ov. female & 2.6 & 3 & 3 & \\
 & ov. female & 2.8 & 3 & 3 & \\
4.169 & juvenile & 1.0 & 3 & - & telson damaged \\
 & male & 1.6 & 3 & 3 & \\
 & female & 2.8 & 3 & 3 & \\
Sp. Arch. & female & 1.6 & 3 & 3 & 

TABLE 1
Morphological data on Thor amboinensis. pocl = post orbital carapax lenght (mm); dt = dorsal rostral teeth; dts = pairs of dorsal spines on telson; Sp. Arch. = Spermonde Archipelago.


Distribution.—The species has a circumtropical distribution and was also recorded from subtropical regions, i.e. Easter Island (Fransen, 1987) and the Canary Islands (see above).

**Palaemonidae**

*Pontoniinae*

**Periclimenes brevicarpalis** (Schenkel, 1902)

Fig. 1a-c, Table 2

Ancylacaris brevicarpalis Schenkel, 1902: 653, pl. 13, fig. 21. *Periclimenes* (Harpilius) brevicarpalis—Holthus, 1952: 10, 69-73, fig. 27. tab. 1 (full synonymy). *Periclimenes brevicarpalis*—Bruce, 1979c: 219; Bruce & Svoboda, 1983: 7-9 (colouration, host range, behaviour and ecology); Bruce, 1983: 879-880. fig. 7D. E.

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**TABLE 2**

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¹In the older literature the name *Discosoma* (Rupell & Leuckart, 1828) was generally in use for sea anemones presently included in *Stichodactyla* Brandt, 1835 (best known synonym is *Stoichactis* Haddon, 1898). In its correct sense *Discosoma* Rupell & Leuckart, 1828 is a genus of Corallimorpharia based on *Discosoma nummiforme* Rupell & Leuckart, 1828 cf. Den Hartog, 1980: 34-40.)

Fig. 1. a-c. Periclimenes brevicarpalis (Schenkel, 1902). Snellius-II sta. 4.114 female. a. Habitus; b. Ventral aspect thorax; c. Dactylius fourth right pereiopod. (Scale 1: a = 4 mm; b = 2 mm. Scale 2: c = 0.25 mm).
Fig. 2. a-k. *Periclimenes aff. inornatus* Kemp, 1922. Snellius-II sta. 4.096, female. a. Dorsal aspect anterior part; b. Habitus; c. Ventral aspect thorax; d. Telson and uropods; e. Chela second right pereiopod, lateral aspect; f. Same, medial aspect; g. Second right pereiopod; h. Third right pereiopod; i. Dactylus third right pereiopod; j. Chela first right pereiopod; k. First right pereiopod. (Scale 1: a, b = 2 mm; c, g, h, k = 1 mm. Scale 2: d = 2.5 mm; e, f, j = 1 mm; i = 0.25 mm).

Host range.—A list of known hosts is given by BRUCE & SVOBODA (1983). BRUCE (1983) recorded the species from Actinodendron spec. and ‘possibly from Stichoacontia sp.’ in Indonesian waters. Macrodactyla doreensis is a new host record.


**Periclimenes inornatus** group

*Periclimenes aff. inornatus* Kemp, 1922

Fig. 2a-k


Morphology of the specimens fits the description by BRUCE (1969a) except for the following features, (i) Shorter free ramus of upper antennular flagellum consisting of 6 or 7 segments. Difference with BRUCE, 1979b. (ii) Unguis of pereiopods three, four and five with minute spinulation at the proximal part. Pereiopod three, four and five with less setae on the proximal end of the propodus compared with pl. 1 fig. b. This could be normal in young specimens.

Ridge on the fourth thoracic sternite strongly elevated with small deep notch as described by BRUCE & SVOBODA (1983) and colour pattern identical with descriptions in literature (only documented for specimens of sta. 4.044), made identification possible.

Host range.—Known from Entacmaea quadricolor (Rüppell & Leuckart, 1828) (cf. Bruce, 1979 as Radiantus malu; Bruce & Svoboda, 1983), Heteractis malu (Haddon & Shackleton, 1893) (cf. Suzuki & Hayashi, 1977 as Parasicyonis actinostroides and P. maxima Bruce & Svoboda, 1983) and Heterodactyla

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**TABLE 3**

Morphological data on *Periclimenes ornatus*. pocl = post orbital carapax length (mm); rf = rostral formula.
CARIDEAN SHRIMPS - ASSOCIATES OF ANTHOZOA

Fig. 3. a-h. *Periclimenes ornatus* Bruce, 1969. Snellius-II sta. 4.044, female. a. habitus; b. Dorsal aspect anterior part; c. Ventral aspect thorax; d. Telson; e. Distal part telson; f. Dactylus left fourth pereiopod; g. Third left pereiopod; h. Fourth left pereiopod; i. *Periclimenes ornatus* Bruce, 1969. Snellius-II sta. 4.114, ovigerous female, dactylus left fourth pereiopod; j. *Periclimenes ornatellus* Bruce, 1979, Holotype RMNH D 31989, ventral aspect thorax. (Scale 1: a and b = 2 mm; c, d, g, h and j = 1 mm. Scale 2: e, f and i = 0.25 mm).

*hemprichi* Ehrenberg, 1834 (cf. Bruce & Svoboda, 1983). The finding of the 2 specimens on *Heteractis magnifica* (Quoy & Gaimard, 1833) is a new host record. Striking is the fact that *Periclimenes inornatus* is also known to have this species as its host.

Distribution.—Known from Hong Kong (Bruce, 1969a, 1979c), Japan (Suzuki & Hayashi, 1977), Eniwetok Atoll, The Marshall Islands (Bruce, 1979b), the Red Sea (Bruce & Svoboda, 1983) and Kenya (cf. Bruce & Svoboda, 1983). Not previously recorded from Indonesian waters.

Remarks.—Three closely related species forming the *Periclimenes inornatus* group are *P. inornatus* Kemp, 1922, *P. ornatus* Bruce, 1969 and *P. ornatellus* Bruce, 1979. The morphological differences of these species are minute whereas the differences in colour pattern are prominent.

Remarks on the morphology.—Bruce (1969a:
266) in the original description of *P. ornatus* enumerated differences of the species with *P. inornatus* Kemp, 1922. The morphological differences mentioned are: '(1) Fingers of first pereiopod strongly subpatulate and subequal to palm. (2) Fingers of second pereiopod greater than half the length of the palm, with well developed teeth. (3) Feebly produced inferior orbital angle with slender antennal spine and robust hepatic spine.' In the description and drawings of *P. inornatus* Kemp, 1922 the following information concerning these morphological features is present: (1) The fingers are drawn 0.7 times as long as the palm. From text-fig. 45b can not be deduced whether the fingers are subpatulate. (2) In text-fig. 45b the fingers of the second pereiopod are 0.44 times the palm length. (3) A feebly produced inferior orbital angle is visible. The antennal spine is robust, the hepatic spine slender.

BRUCE (1976b) corrected some of the differences cited above. Dr. R.W. Ingle checked a syntype of *P. inornatus* in comparison of material of *P. ornatus* from the Seychelles, and found the fingers of the first pereiopod subequal to the palm length and subpatulate. Recurred teeth of the chela of the second pereiopods are visible in fig. 10e. The antennal spine and hepatic spine drawn by Bruce (fig. 10b) as are in *P. ornatus*, i.e. a slender antennal and a robust hepatic spine. BRUCE (1976b:106) stated: 'In the Seychelles specimens [of *P. inornatus*] the antennal spine is well developed, slender and acute, clearly demarcated from the carapace and distinctly exceeding the inferior orbital angle just as shown by Kemp. The hepatic spine in Kemp’s figure, in contrast to the Seychelles specimen in which it is particularly stout, appears less robust then the antennal.'

At this point the morphological differences between *P. inornatus* and *P. ornatus* as given with the description of *P. ornatus* seem doubtful. In a later publication BRUCE (1980b: 339) stated that *P. inornatus* and *P. ornatus* can be considered sibling species. BRUCE & SVOBODA (1983: 40, fig. 15) describe a new morphological character to distinguish between *P. inornatus* and *P. ornatus* in their ‘Key for the identification of the anemone associated species of the genus *Periclimenes*’. In *P. inornatus* the fourth thoracic sternite has a broad low transverse ridge with an open median notch (fig. 15a), whereas *P. ornatus* has the fourth thoracic sternite with a centrally elongated transverse ridge with a deep close median notch (fig. 15b). The *P. inornatus* specimen used for this comparison was from Heron Island, Australia. This last character is the only morphological difference remaining.

*Periclimenes ornatellus* was described by BRUCE (1979b). The minute spinulation on the unguis of the dactylus in the ambulatory pereiopods is the only morphological character differentiating it from *P. ornatus* Bruce. In the paratype of *Periclimenes ornatellus* studied (RMNH D 31989) (Fig. 3), the ridge on the fourth thoracic sternite is strongly elevated with a faint median notch. This character might prove useful to separate this species but more material should be examined to show its validity.

Remarks on colouration.—When Kemp described *P. inornatus* he compared it with a related species: *P. brevicarpalis*. In this context the colouration is mentioned as ‘Without colour when alive’ whereas the colouration of *P. brevicarpalis* is described as ‘Brilliantly colored when alive.’ On page 194 is written: “In life the specimen [P. inornatus] is almost completely transparent with a faint brownish tinge and with transparent eggs.” This is difficult to interpret. What was meant with ‘almost completely transparent’? The faint brownish tinge? Unfortunately the colouration of the syntypes cannot be checked anymore. PATTON (1966) noted the colour of *P. inornatus*: ‘Translucent with a reddish tinge.’

The colouration of *P. ornatus* Bruce, 1969, as given by Bruce (1969a): ‘Transparent with fine red spots over body and purple spots over appendages’. Bruce (1979) gave the colouration of specimens from Enitewok Atoll. ‘In ovigerous female: body semi-transparent, finely striated longitudinally with alternating rows of minute red and white chromatophores, extending also over the pleura, but with more conspicuous line of white chromatophores, outlined by lines of red chromatophores, running along the upper margin of the branchiostegite and pleura. A fine median of white extends along the length of the abdomen. The rostrum is colourless. The antennal peduncles and scaphocerite with purple and white spots, especially along the dorsum of the eyestalk and across the opthalmic somite. Cornea whitish. The lateral border of the exopod and the center of the endopod of the uropods have a line of purple and white spots. Telson colourless. The pereiopods are transparent, sparsely spotted with numerous paired purple and white chromatophores, in lines along the postero-dorsal margins of the segments but generally over the palm and fingers of the second pereiopods. Ova grayish.’

And the colour pattern as described for *P. ornatellus* Bruce, 1979b: ‘....body and appendages transparent. Eyestalks with a broad dorsal band of white extending across the opthalmic somite. Gastric mill white. A broad medial ventral band of white runs longitudinally from the posterior end of the stomach to the anterior end of the fifth abdominal segment. Stermites of first three abdominal somites finely striated longitudinally with red. Antennal peduncles, thoracic appendages and caudal fan colourless’.

Although all three species are mainly translucent, the ornamentation with purple spots, or white and red bands makes identification easy.
Fig. 4. a. *Periclimenes holthuisi* Bruce, 1969. Spermonde Arch. Habitus ovigerous female. b-c. *Periclimenes magnificus* Bruce, 1979, Snellius-II sta. 4.004c. b. Habitus ovigerous female; c. Habitus male.
(Scale: a = 2 mm; b and c = 4 mm)

**Periclimenes holthuisi** group

*Periclimenes holthuisi* Bruce, 1969

Figs 4a, 5a-b, 6a-f, 7a-g

*Urocaris longicaudata*—Pearson, 1905: 78, pl. 1 fig. 5. *Periclimenes (Periclimenes) aesopus*—Holtius, 1952: 34, figs 5, 6. (non Bate, 1863). *Periclimenes aesopus*—Bruce, 1966: 21, figs 3b, 4e, 1. *Periclimenes holthuisi* Bruce, 1969a: 258, 259; Bruce, 1972b: 300-302; Bruce, 1973: 300. Read, 1974: 15, 16 fig (colour); Suzuki & Hayashi, 1977: 197, figs 2d, 3d. 4; Bruce, 1977c: 225, fig. 7; Bruce, 1977a: 71, 72, fig (colour); Bruce, 1978: 170; Bruce, 1979a: 206, textfig. 6, p.1 fig. D; Bruce, 1980c: 339, 340, 341; Bruce & Svoboda, 1983: 10, 23, 24, 37, 40, 41, fig. 3; Bruce, 1984: 146. 225, 300-302; Bruce, 1972b: 300-302; Bruce, 1973: 300. Read, 1974: 15, 16 fig (colour); Suzuki & Hayashi, 1977: 197, figs 2d, 3d. 4; Bruce, 1977c: 225, fig. 7; Bruce, 1977a: 71, 72, fig (colour); Bruce, 1978: 170; Bruce, 1979a: 206, textfig. 6, p.1 fig. D; Bruce, 1980c: 339, 340, 341; Bruce & Svoboda, 1983: 10, 23, 24, 37, 40, 41, fig. 3; Bruce, 1984: 146. 1977a: 71, 72, fig (colour); Bruce, 1978: 170; Bruce, 1979a: 206, textfig. 6, p.1 fig. D; Bruce, 1980c: 339, 340, 341; Bruce & Svoboda, 1983: 10, 23, 24, 37, 40, 41, fig. 3; Bruce, 1984: 146.

**Material examined.**—'Tyro' sta. 4.114/124. Photo RMNH Snellius-
Fig. 5. a-b. Periclimenes holthuisi Bruce, 1969, Spermonde Arch. a. Dorsal aspect anterior part ovigerous female; b. Dorsal aspect anterior part male. c-d. Periclimenes aff. holthuisi Snellius II sta. 147. c. Dorsal aspect anterior part female; d. Lateral aspect anterior part female. e-g. Periclimenes magnificus Bruce, 1979, Snellius II sta. 484c. e. Dorsal aspect anterior part ovigerous female; f. Dorsal aspect anterior part male; g. Lateral aspect anterior part ovigerous female. (Scale = 2 mm).


Host range.—Mentioned from several Actiniaria. Dofleinia armata Wassilieff, 1908 (SUZUKI & HAYASHI, 1977); Entacmaea quadricolor (Rüppell & Leuckart, 1828) (BRUCE & SVOBODA, 1983, and SUZUKI & HAYASHI, 1977 (as Parasicyonis actinostroides); ? Heteractis spec. (SUZUKI & HAYASHI, 1977, as Radianthus 'maculata'); Radianthus ritteri (Kwietenewsksi, 1898) [ = Heteractis magnifica (Quoy & Gaimard, 1833)] by READ (1974). BRUCE (1972b) recorded the species from a rhizostomatous scyphozoan (Cassiopea andromeda Forskål), and READ (1974) reported P. holthuisi from fungiid corals of the species Heliofungia actiniformis (Quoy & Gaimard, 1833) (mentioned as Fungia actiniformis).

Distribution.—Widely distributed in the Indo-West
Fig. 6. Chela second pereiopods. a-f. *Periclimenes holthuisi* Bruce, 1969. Spermonde Arch., ovigerous female pocl. 5.3 mm. a. Right; b. Left. ovigerous female pocl. 4.1 mm; c. Right; d. Left; e. Right; f. Left; g-h. *Periclimenes aff. holthuisi* Snellius-II sta. 4.147, female. g. Left; h. Right; i-m. *Periclimenes magnificus* Bruce, 1979. Snellius-II sta. 4.004c. Ovigerous female. i. Right; j. Left. Male; k. Right. Snellius-II sta. 4.048. Female; l. Right; m. Left. (Scale = 1 mm)
Fig. 7. a-g. *Periclimenes holthuisi* Bruce, 1969. a. Spermonde Arch., telson ovigerous female; b. Spermonde Arch., telson male; c. Ventral aspect of thorax; d. Right second pereiopod female; e. Dactylus of right third pereiopod female; f. Third right pereiopod female; g. First right pereiopod female; h. *Periclimenes aff. holthuisi*, Snellius-II sta. 4.147, telson female. i-p. *Periclimenes magnificus* Bruce, 1979. i. Snellius-II sta. 4.004c, telson male; j. Telson ovigerous female; k. Endopod
Periclimenes cf. holtiui
Figs. 5c-d, 6g-h, 7h

Material examined.—RMNH D 37931; ‘Tyro’ sta. 4.147. NE Taka Bone Rate (Tiger Island), eastern edge of reef Taka Garifang, 06°27’S 121°12.5’E, scuba diving, snorkeling, 27.ix.1988. From Acrinodendron spec., with 2 Thor ambonensis; coll. J.C. den Hartog.

Periclimenes magnificus Bruce, 1979
Figs. 4b-c, 5e-g, 6i-m, 7i-p, Tables 4, 5


Host range.—Periclimenes magnificus is known as an associate of Actinia. BRUCE (1979a) recorded the species from Dolieiaria armata Wassilieff, 1908. BRUCE & SVOBODA (1983: 34) mentioned it from an Alcyonarian of the genus Lobophytum. Its associated occurrence with the coral Fungia fragilis adds a new type of host.

Distribution.—Previously only known from Queensland, Australia (BRUCE, 1979a). The present records are the first from Indonesian waters.

Remarks.—As stated by BRUCE (1980b: 339) P. holtiuii and P. magnificus can be considered sib-
ling species. They seem to have an overlap in their geographical as well as host range. The difference in colouration is striking. The morphological differences seem minute. The Snellius-II material could be identified from colour slides taken of a part of the material collected. Subsequently the specimens were checked on the distinguishing features given by Bruce (1979a). The results are summarized in Table 5.

Some of the differences detected by Bruce were related to sexual dimorphism which occurs in both species (Table 5, i, iii), some other differences seem useless because of their wide and overlapping variation within the two species (Table 5, iv, vi, vii). The most constant morphological difference is the absence of a 'bec ocellaire' in P. magnificus and its presence in P. holthuisi. The linked occurrence of this morphological character and the colour pattern should be checked in material of both species from different populations.

**Pliopontonia furtiva** Bruce, 1973

![Fig. 8](image)

*TABLE 5*

Comparison of descriptions of *Periclimenes magnificus* and *P. holthuisi* by Bruce (1979) and present observations on Snellius-II material.

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<td>(i) Minute spinulation along median margin of coxae of third and fourth pereiopods in <em>P. magnificus</em> [female holotype] lacking in <em>P. holthuisi</em> [male holotype].</td>
<td>Minute spinulation in females of both species and absent in males of both species. Feature sex related.</td>
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<tr>
<td>(ii) <em>P. magnificus</em> lacks a &quot;bec ocellaire&quot; on the opithalamic somite. In <em>P. holthuisi</em> this feature is distinct.</td>
<td>'Bec ocellaire' prominent in all <em>P. holthuisi</em> material and absent in <em>P. magnificus</em> specimens.</td>
</tr>
<tr>
<td>(iii) In <em>P. holthuisi</em> carpus of second pereiopod subequal to the palm length, in <em>P. magnificus</em> distinctly shorter.</td>
<td>In both species carpus2/palm2 ratio in males is larger than in females.</td>
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<td>(iv) In <em>P. magnificus</em> carpus of first pereiopod slightly shorter than the chela, in <em>P. holthuisi</em> distinctly longer.</td>
<td>Length ratio carpus1/chela1 of the two species is similar.</td>
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<td>(v) Appendages in <em>P. magnificus</em> generally more robust than in <em>P. holthuisi</em>, i.e., the scaphocerite is 2.4 times longer than wide, as opposed to 3.3 times in <em>P. holthuisi</em>; palm of chela of second pereiopod 3.0 times longer than broad and 0.2 of the chela length, and exopod of uropod is 2.0 times longer than broad, compared with 2.8 times in <em>P. holthuisi</em>.</td>
<td>Appendages in <em>P. magnificus</em> generally more robust than in <em>P. holthuisi</em> but overlap is large.</td>
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<td>(vi) In <em>P. holthuisi</em> propods of ambulatory pereiopods more heavily spinoe, with spines distributed along the whole length of the ventral border, i.e., 1,1,1,2,2,2 as opposed to 0,0,0,1,2,2 for same positions in <em>P. magnificus</em>.</td>
<td>A striking difference occurs in spinulation of specimens of both species; differences even occur between right and left legs. The character seems too variable in each of the two species to be of diagnostic value.</td>
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<td>(vii) In <em>P. magnificus</em> anterior dorsal telson spines at 0.5 of telson length and posterior at 0.75. In <em>P. holthuisi</em>, spines at 0.5 and 0.7, i.e. posterior pair nearer the anterior pair than the posterior margin.</td>
<td>The position of the anterior and posterior pair of spines is variable in both species. The overlap is complete. Occasionally the difference between the left and right side of the telson is prominent.</td>
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Fig. 8. *Pliopontonia furtiva* Bruce, 1973. Lateral habitus. (scale 2 mm).

13 show the prominent white cornea and eyestalks as well as the white bar at the proximal dorsal part of the rostrum and the bands along the posterior border of the branchiostegite. Dorsal surface of gastric mill and the lateral lobes of the hepatopancreas are also white. As the photos only show the dorsal aspect of the shrimp, the ventral white transverse bands are only faintly visible through the translucent shrimp. The vertical white bands on the abdominal pleurae are present. White bands on the second to fifth pereiopods, are inconspicuous.

Host range.—The species is only known from the corallimorpharian genus *Discosoma* (Rüppell & Leuckart, 1828).

Distribution.—Previously known from Kenya. This is the first record of the species from Indonesian waters.

Paratypton siebenrocki Balss, 1914

Fig. 9

*Paratypton siebenrocki* Balss, 1914: 83, fig. 1; Balss, 1915: 27, figs 18-25; Borradaile, 1921: 1, figs 1-11; Kemp, 1922: 286; Holthuis, 1952: 19; Patton, 1966: 273; Bruce, 1969b: 171-186, figs 1-5, pl. 1; Bruce, 1972a: 402, 407, 408, 413; Bruce, 1974: 197-198, fig. 6; Bruce, 1980c: 237-246, figs 1-5; Bruce, 1983: 897-898; Bruce, 1984: 149.

Material examined.—RMNH D 37395. ‘Tyro’ sta. 4.122. N of Sumbawa, Bay of Sanggar, 8°20.3'S 118°16.4'E, snorkeling, sea grass, algae, depth to 8 m, 21 ix 1984. Encapsulated in *Acropora* branches. 1 ovigerous female, pocl. 3.5 mm, coll. H.A. ten Hove.

Host range.—Occurs encapsulated in *Acropora* corals.

Distribution.—Known from the Indo-West Pacific. Bruce (1984) recorded the species for the first time in Indonesian waters (Gorong Island).

*Philarius gerlachei* (Nobili, 1905)


Material examined.—RMNH D 37396. ‘Tyro’ sta. 4.122. N of Sumbawa, Bay of Sanggar, 8°20.3'S 118°16.4'E, snorkeling, sea grass, algae, depth to 8 m, 21 ix 1984. On *Acropora* branches. 1 ovigerous female, pocl. 3.5 mm, coll. H.A. ten Hove.

Host range.—In known from the Indo-West Pacific. Bruce (1984) recorded the species for the first time in Indonesian waters (Gorong Island).
Host range.—Known as a species associated with scleractinian corals of the genus *Acropora*.

Distribution.—Occurs throughout the Indo-West Pacific. Recorded from Indonesia by HOLTHUIS (1952).

**Jocaste japonica** (Ortmann, 1890)


Material examined.—RMNH D 37397. ‘Tyro’ sta. 4.122, N of Sumbawa, Bay of Sanggar, 8°20.3’S 118°16.4’E, snorkeling, sea grass, algae, depth to 8 m. 21.ix.1984. On Acropora branches. 1 juv., pocl. 1.9 mm, coll. H.A. ten Hove.

Host range.—Recorded from several *Acropora* species.

Distribution.—Widespread in the Indo-West Pacific. Recorded from Indonesia by: DE MAN, 1902 (Ternate), HOLTHUIS, 1952 (several localities) and BRUCE, 1983 (Misool Island, Gorong Island).

### 3. CONCLUSIONS

Observations of pontoniid shrimps in the field, where ecology and colour patterns can be studied, has given the taxonomy of this subfamily new impulses. As shown in the present study the knowledge of colour patterns in particular is necessary for the identification of several groups of sibling species. More observations in the field are necessary to check which characters are variable within populations and which characters vary between populations in different regions. Co-operation with coelenterate taxonomists is indispensable for the study of host relationships.

Collecting of both host and shrimp offers the possibility of checking their relation.

### 4. REFERENCES


CARIDEAN SHRIMPS - ASSOCIATES OF ANTHOZOA


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