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NOTES ON CARIDEAN SHRIMPS COLLECTED DURING THE SNELLIUS-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, Philarius gerlachei* and *Jocaste japonica* (all Palaemonidae, 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 blanc 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 CARLGREN (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

Hippolyte amboinensis DE MAN, 1888: 535. *Thor amboinensis* - HOLTHUIS, 1947: 50 (synonymy); PATTON, 1966: 280, 281, tab. 1-3; FRANSEN, 1987: 526, 527, fig. 16A, B (list of hosts).

Material.—RMNH D 37367, 'Tyro' sta. 4.012. Pulau-pulau Maisel, reefflat 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 *Stichodactyla gigantea* (Forskål, 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°58.5'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-*

TABLE 1

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

station	*sex*	*pocl*	*drt*	*dts*	*remarks*
4.012	female	2.3	3	3	
	ov. female	2.4	2	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
4.096	female	1.6	2	3	
	juvenile	1.3	2	3	
	juvenile	1.2	2	3	
4.120	juvenile	1.1	3	0	
	male	1.7	3	5	
	ov. female	2.3	3	3	with bopyrid isopod
	ov. female	2.4	3	3	
4.147	juvenile	1.1	3	3	
	male	1.7	3	5	
4.158	juvenile	1.1	2	3	host *Actinodendron* spec.
	female	1.5	2	3	host *Actinodendron* spec.
	male	2.4	2	4	host *Stichodactyla gigantea*
	female	2.2	2	3	host *Stichodactyla gigantea*
	female	3.1	2	3	host *Stichodactyla gigantea* merus third pereiopod with tubercle
	female	2.2	2	2	host *Stichodactyla gigantea*
	female	1.6	2	3	host *Stichodactyla gigantea*
	female	2.1	2	5	host *Stichodactyla gigantea*
	female	1.6	2	0	host *Stichodactyla gigantea*
	female	1.7	2	-	host *Stichodactyla gigantea* telson broken
	ov. female	2.6	3	3	host *Stichodactyla gigantea*
	ov. female	2.8	3	3	host *Stichodactyla gigantea* with bopyrid isopod
	ov. female	2.9	3	3	host *Stichodactyla gigantea*
	ov. female	3.0	3	3	host *Stichodactyla gigantea*
	ov. female	3.2	3	4	host *Stichodactyla gigantea*
	ov. female	2.3	2	3	host *Stichodactyla gigantea*
	?	2.6	2	3	host *Stichodactyla gigantea*
	?	-	2	-	host *Stichodactyla gigantea* telson broken
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	

tactis spec., coll. J.C. den Hartog.—RMNH D 37369. 'Tyro' sta. 4.048. NE coast of Sumba, E of Melolo, 09°54'S 120°42.5'E, sandy reefflat and gradual slope, with scattered corals, scuba diving, snorkeling, depth to 12 m. 13.ix.1984. On *Stichodactyla haddoni* (Saville-Kent, 1893), with 1 *Amphiprion* spec., 3 *Periclimenes brevicarpalis* and 2 *Neopetrolisthes* spec., coll. J.C. den Hartog.— RMNH D 37371. 'Tyro' sta. 4.053. NE coast of Sumba, E of Melolo, 09°55'S 120°45'E, sandy middle part of extensive reefflat, snorkeling, 13.ix.1984. From *Stichodactyla haddoni*, with *Periclimenes brevicarpalis*, coll. J.C. den Hartog.—RMNH D 37370. 'Tyro' sta. 4.096. Komodo, NE cape, 8°29'S 119°34.1'E, scuba diving, snorkeling, edge of narrow coastal reef, sloping down to sandy bottom at 30 m, 19.ix.1984. On large brown *Stichodactyla gigantea*, coll. J.C. den Hartog.—RMNH D 37372. 'Tyro' sta. 4.120. N of Sumbawa, Bay of Sanggar, 8°20.5'S 118°15.7'E, snorkeling, coastal reef with sea grass, beach. 23.ix.1984. On *Stichodactyla gigantea* in sea grass bed, with 2 *Periclimenes brevicarpalis* and 1 *Neopetrolisthes* spec., coll. J.C. den Hartog.—RMNH D 37373. 'Tyro' sta. 4.147. NE Taka Bone Rate (Tiger Islands), western edge of reef Taka Garlarang, 06°27'S 121°12.5'E, scuba diving, snorkeling, 27.ix.1984. From *Actinodendron* spec., with 1 *Periclimenes* ? *holthuisi*, coll. J.C. den Hartog.—RMNH D 37374. Tyro sta. 4.158. SW Salayer, near cape Batu Kerapo, 06°23'S 120°27'E, intertidal of bay surrounded by cliffs, rocky littoral, coral sand, dense seagrass beds, snorkeling, 29.ix.1984. On *Actinodendron* spec. and *Stichodactyla gigantea*, coll. J.C. den Hartog.—RMNH D 37375. Tyro sta. 4.169. Photos RMNH Snellius-II F38; 12, 13. SW Salayer, NE of Pulau Bahuluang, 06°26'S 120°25.8'E, edge of offshore reef, snorkeling, 1.x.1984. On *Actinodendron* spec.—RMNH D 37376. Westcoast of Pulau Kudingareng Lompo, Spermonde Archipelago, SW Sulawesi, at 17 m depth. 19.xi.1984. On *Heliofungia actiniformis* (Quoy & Gaimard, 1833), with 4 *Periclimenes holthuisi*, Coll. B.W. Hoeksema.

Host range.—The records presented here add one actinian host genus (*Actinodendron*, Actinodrendonidae) to the list of 11 recorded previously (FRANSEN, 1987). Actiniaria: *Bartholomea annulata* (Lesueur, 1817), *Bunodosoma granuliferum* (Lesueur, 1817), *Condylactis gigantea* (Weinland, 1860), *Cryptodendrum adhesivum* Klunzinger, 1877, *Discosoma* spec. by Kemp (1922) (= presumably *Stichodactyla*[1]), *Heteractis malu* (Haddon & Shackleton, 1893), *Lebrunia danae* (Duchassaing & Michelotti, 1860), *Telmatactis rufa* (Verrill, 1900). Scleractinia: *Seriatopora* spec., *Pocillopora damicornis* (L.), *Acropora* ssp., *Stylophora pistillata* Esper, 1797. Crinoidea: *Comactinia echinoptera* (J. Müller, 1840). CRIALES (1984) mentioned *Thor amboinensis* from *Telmatactis rufa* (probably sensu CORRÊA, 1964 [= *Telmatactis cricoides* (Duchassaing, 1850), J.C. den Hartog pers. comm.]. *Thor amboinensis* was also recorded in association with a *Telmatactis* species on St. Helena, South Atlantic Ocean (observation J.C. den Hartog, 13.xi.1983, no specimens collected), and Gran Canaria (C.H.J.M. Fransen, 26.v.1988, 3 observed, 1 collected, RMNH D 37404). The species seems to have a wide range of hosts, mostly Actiniaria and Scleractinia.

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

Ancylocaris brevicarpalis SCHENKEL, 1902: 653, pl. 13, fig. 21. *Periclimenes (Harpilius) brevicarpalis*—HOLTHUIS, 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.

TABLE 2
Morphological data on *Periclimenes brevicarpalis*. pocl = post orbital carapax lenght (mm); rf = rostral formula.

sta.	*sex*	*pocl*	*rf*	*remarks*
4.001	larva	-		Host: *Cryptodendrum adhesivum*
	female	4.2	5/1	Host: *Cryptodendrum adhesivum*
4.012	female	4.8	5/1	Host: *Stichodactyla gigantea*
4.016	ov. female	4.3	6/1	Host: *Stichodactyla* spec.
4.044	female	5.4	6/1	Host: *Heterodactyla* spec. One pair of dorsal spines on telson
4.048	male	2.9	5/1	Host: *Stichodactyla* spec.
	female	4.0	5/1	Host: *Stichodactyla* spec.
	female	4.2	5/1	Host: *Stichodactyla* spec.
4.053	female	3.8	5/1	Host: *Heteractis aurora*
	female	3.3	5/1	Host: *Stichodactyla* spec.
4.096	female	4.2	6/1	Host: *Stichodactyla* spec.
	female	4.2	6/1	Host: *Stichodactyla haddoni*
	male	3.1	6/1	Host: *Stichodactyla haddoni*
	male	2.2	6/1	Host: *Stichodactyla haddoni*
4.114	female	5.1	6/1	Host: *Stichodactyla gigantea* with thoracic bopyrid
4.120	female	3.0	6/1	Host: *Stichodactyla gigantea*
	ov. female	2.3	6/1	Host: *Stichodactyla gigantea*
4.133	male	5.1	6/1	Host: *Macrodactyla doreensis*
	male	3.1	6/1	Host: *Heteractis magnifica*
	female	3.1	5/1	Host: *Heteractis magnifica*
	female	3.1	6/1	Host: *Macrodactyla doreensis*
	female	6.3	6/1	thoracic bopyrid
4.158	juvenile	1.3	6/1	Host: *Stichodactyla gigantea*
	juvenile	1.4	6/1	Host: *Stichodactyla gigantea*
	juvenile	2.1	6/1	Host: *Stichodactyla gigantea*
	male	2.7	6/1	Host: *Stichodactyla gigantea*
	female	4.1	5/1	Host: *Stichodactyla gigantea*
	female	4.4	5/1	Host: *Stichodactyla gigantea*
4.171	juvenile	2.7	5/1	Host: *Heterodactyla* spec.
	female	5.1	5/1	Host: *Heterodactyla* spec.

[1]In the older literature the name *Discosoma* (Rüppell & 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* Rüppell & Leuckart, 1828 is a genus of Corallimorpharia based on *Discosoma nummiforme* Rüppell & Leuckart, 1828 *cf.* Den Hartog, 1980: 34-40.)

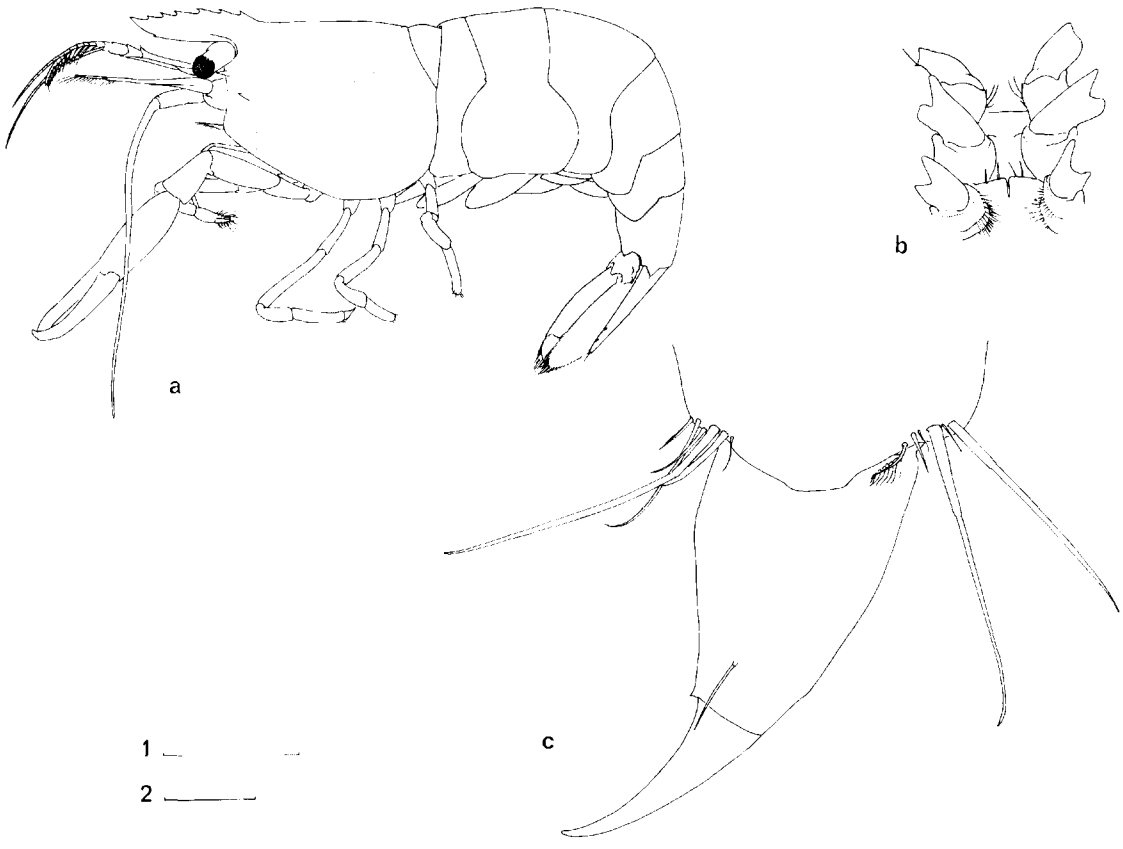

Fig. 1. a-c. *Periclimenes brevicarpalis* (Schenkel, 1902), Snellius-II sta. 4.114 female. a. Habitus; b. Ventral aspect thorax; c. Dactylus fourth right pereiopod. (Scale 1: a = 4 mm; b = 2 mm. Scale 2: c = 0.25 mm).

Material examined.—RMNH D 37377. 'Tyro' sta. 4.001. Ambon, Ambon Bay, near Tawiri, 3°42'S 128°7'E, cobble beach merging into highly disturbed reef with many dead corals, depth 0 to 5 m, visibility poor, 22/30.viii.1984. From *Cryptodendrum adhesivum*, coll. J.C. den Hartog.—RMNH D 37378. 'Tyro' sta. 4.012. Photo RMNH Snellius-II F8; 12, 13. Pulau-pulau Maisel, reefflat 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, 07.ix.1984. From large green *Stichodactyla gigantea*, with 2 *Thor amboinensis*, coll. J.C. den Hartog.—RMNH D 37398. 'Tyro' sta. 4.016. Tukang Besi Islands, southern reef of Karang Kaledupa, east of entrance, 5°56'S 123°48'E, gently sloping reef above sandy bottom, depth 1-10 m, scuba diving and snorkeling. 06/08.ix.1984. From *Stichodactyla* mertensi (specimen a), with *Neopetrolisthes* spec, coll. J.C. den Hartog.—RMNH D 37402. 'Tyro' sta. 4.044. Photo RMNH Snellius-II F10; 30, 31. R18; 0-6. Tukang Besi Island, SW of Taipabu, Binongko, 5°56'S 123°58.5'E, steeply sloping reef, down to 25 m, dense growth of stony and soft corals, scuba diving and snorkeling, 11.ix.1984. From *Heterodactyla* spec. (Thalassianthidae Milne-Edwards, 1857), at 6 m depth, coll. J.C. den Hartog.—RMNH D 37379. 'Tyro' sta. 4.048. NE coast of Sumba, E of Melolo, 09°54'S 120°42.5'E, sandy reefflat and gradual slope, with scattered corals, scuba diving, snorkeling, depth to 12 m, 13.ix.1984. From *Stichodactyla haddoni*, with 1 *Amphiprion* spec., ca. 10 *Thor amboinensis*, and 2 *Neopetrolisthes* spec., coll. J.C. den Hartog.—RMNH D 37380. 'Tyro' sta. 4.053. NE coast of Sumba, E of Melolo, 09°55'S 120°45'E, sandy middle part of extensive reefflat, snorkeling, 13.ix.1984. From *Heteractis aurora* and *Stichodactyla haddoni*, coll. J.C. den Hartog.—RMNH D 37381 and RMNH D 37403. 'Tyro' sta. 4.096. Komodo, NE cape, 8°29'S 119°34.1'E, scuba diving, snorkeling, edge of narrow coastal reef, sloping down to sandy bottom at 30 m, 19.ix.1984. From brown *Stichodactyla gigantea* and *Stichodactyla haddoni*, coll. J.C. den Hartog.—'Tyro' sta. 4.114 RMNH D 37386. Photo RMNH Snellius-II F28. N of Sumbawa, Bay of Sanggar, 8°19.2'S 118°14.4'E, snorkeling, scuba diving on lagoon side of reef barrier, 21.ix.1984. From *Stichodactyla gigantea*, coll. J.H.W. Krom.—RMNH D 37382. 'Tyro' sta. 120. N of Sumbawa, Bay of Sanggar, 8°20.5'S 118°15.7'E, snorkeling, scuba diving, coastal reef with seagrass. beach, 21/23.ix.1984. From *Stichodactyla gigantea*, with *Thor amboinensis* and 1 *Neopetrolisthes* spec., coll. J.C. den Hartog.—RMNH D 37383. 'Tyro' sta. 4.133. NE Taka Bone Rate (Tiger Island), E coast of Tarupa Kecil, 06°29'S 121°8'E, littoral zone, sandy beach, beachrock, seagrass, 24/26.ix.1984. From *Macrodactyla doreensis* and *Heteractis magnifica*, coll. J.C. den Hartog.—'Tyro' 4.158. RMNH D 37384. SW Salayer, near cape Batu Kerapo, 06°23'S 120°27'E, intertidal of bay surrounded by cliffs, rocky littoral, coral sand, dense seagrass beds, snorkeling, scuba diving, 29.ix.1984. From medium sized *Stichodactyla gigantea*, with 16 *Thor amboinensis*, coll. J.C. den Hartog.—RMNH D 37385. 'Tyro' sta. 4.171. Photo RMNH Snellius-II F38; 14-17. SW Salayer, offshore reef NW of Pulau Bahuluang, 06°27.3'S 120°25'E, edge of reef, scuba diving, 30.ix.1984. From *Heterodactyla* spec., coll. J.C. den Hartog.

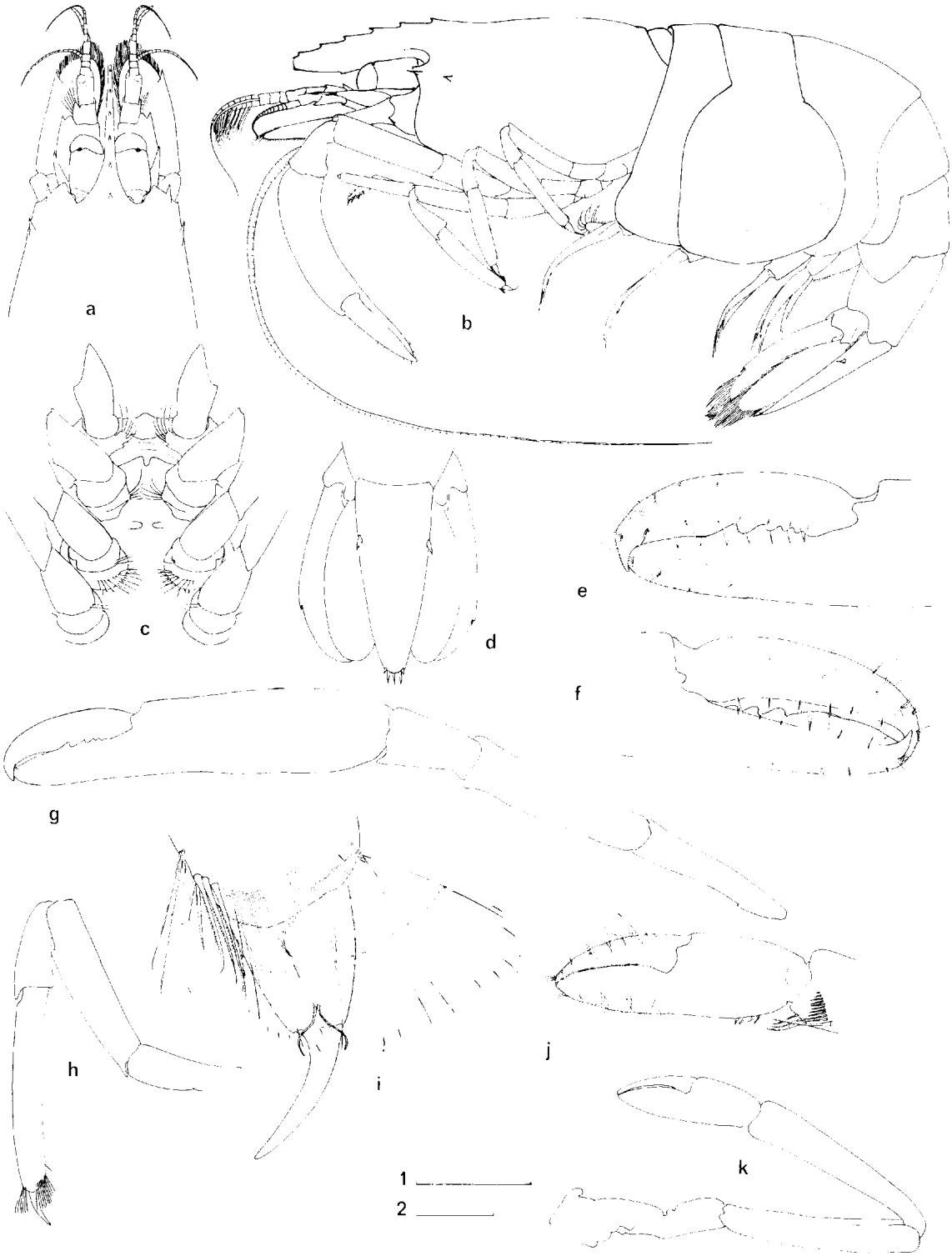

Fig. 2. a-k. *Periclimenes* aff. *inornatus* Kemp, 1922. Snellius-II sta. 4.096, female. a. Dorsal aspect anterior part; b. Habitus; c. Ventral aspect thorax; d. Telson and uropods; e. Chela second right pereiopod, lateral aspect; f. Same, medial aspect; g. Second right pereiopod; h. Third right pereiopod; 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 *Stichoactinia* sp.' in Indonesian waters. *Macrodactyla doreensis* is a new host record.

Distribution.—Known throughout the Indo-West Pacific region. Type-locality: Ujung Pandang, Sulawesi, Indonesia. Previously recorded in Indonesian waters by: SCHENKEL (1902: Ujung Pandang, Sulawesi), DE MAN (1902: Ternate), ZEHNTNER (1894: Ambon), HOLTHUIS (1952: throughout the Indonesian archipelago), and BRUCE (1983: Marsegu Island, Gorong Island and Gunung Api Island).

Periclimenes inornatus group

Periclimenes aff. **inornatus** Kemp, 1922
Fig. 2a-k

Periclimenes (*Ancylocaris*) *inornatus* KEMP, 1922: 170, 191-194, figs 43-46. *Periclimenes* (*Harpilius*) *inornatus*— HOLTHUIS, 1952: 11; PATTON, 1966: 274 fig. 2. *Periclimenes inornatus*—BRUCE, 1971: 10; BRUCE, 1976b: 103-106, 146, figs 10, 11; BRUCE, 1976c: 11,12; BRUCE, 1980b: 339; BRUCE, 1979a: 207; BRUCE & SVOBODA, 1983: 22, 40, fig. 15a; BRUCE, 1984: 146.

Material examined.—RMNH D 37387. 'Tyro' sta. 4.096. Komodo, NE cape, 8°29'S 119°34.1'E, scuba diving, snorkeling, edge of narrow coastal reef, sloping down to sandy bottom at 30 m. 19.ix.1984. From green and brown *Stichodactyla*, coll. J.C. den Hartog.

Only one female specimen with abdominal bopyrid parasite. Morphology as described by KEMP (1922) and BRUCE (1976b). Aberrant features are the single pair of dorsal telsonal spines and the single median proximal telsonal spine. This is probably due to damage and regeneration of the telson. The palm of the left second pereiopod is strongly recurved.

The only character by which it can be morphologically distinguished from the *P. ornatus* specimens is the lower transverse ridge on the fourth thoracic sternite, which bears a broad shallow notch.

Host range.—Originally described from a species of *Discosoma* by KEMP (1922) on which it occurred together with *P. brevicarpalis*. On this species *P. brevicarpalis* was often recorded. BRUCE (1971, 1976b) recorded *P. inornatus* on *Heteractis magnifica* (Quoy & Gaimard, 1833). PATTON (1966) mentions the species from several Scleractinia: *Pocillopora damicornis, P. verrucosa, Stylophora hystrix, S. pistillata*, and *Acropora* spp.

Distribution.—Kenya (BRUCE, 1976c); Grand Comoro Island near Madagascar (BRUCE, 1971); Seychelles Islands (BRUCE, 1971, 1976b); Andaman Islands (KEMP, 1922) Maldive and Laccadive Islands, Bay of Bengal, Marianna Island (BRUCE, 1976b; 1984). *P. inornatus* was not previously recorded from Indonesian waters.

Periclimenes ornatus Bruce, 1969
Fig. 3a-i, Table 3

Periclimenes ornatus BRUCE, 1969a: 266; SUZUKI & HAYASHI, 1977: 198, figs 2e, 3e, 4, pl.2 fig. 2.; BRUCE, 1979a: 207; BRUCE, 1979b: 218, fig. 3B, pl. 1 fig. B.; BRUCE, 1979c: 226-227; BRUCE, 1980b: 339; BRUCE & SVOBODA, 1983: 12, 23, 37, 40, fig. 15a.

Material examined.—RMNH D 37388. 'Tyro' sta. 4.044. Photo RMNH Snellius-II F11; 4-10. Tukang Besi Islands, SW of Taipabu, Binongko, 5°56'S 123°58.5'E, steeply sloping reef, down to 25 m, dense growth of stony and soft corals, scuba diving, 11.ix.1984. From *Heteractis magnifica*, coll. J.C. den Hartog.—RMNH D 37389. 'Tyro' sta. 4.114. N of Sumbawa, Bay of Sanggar, 8°19.2'S 118°14.4'E, snorkeling, scuba diving, lagoon side of reef barrier, 21/22.ix.1984. From *Entacmaea quadricolor* (Rüppell & Leuckart, 1828) with 2 specimens of *Premnas biaculeatus*, coll. J.C. den Hartog.

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 colourpattern 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 *Radianthus malu*; Bruce & Svoboda, 1983), *Heteractis malu* (Haddon & Shackleton, 1893) (*cf.* Suzuki & Hayashi, 1977 as *Parasicyonis actinostroides* and *P. maxima* Bruce & Svoboda, 1983) and *Heterodactyla*

TABLE 3
Morphological data on *Periclimenes ornatus*. pocl = post orbital carapax lenght (mm); rf = rostral formula.

station	*sex*	*pocl*	*rf*	*remarks*
4.044	female	2.7	6/1	fifth right pereiopod regenerating
	female	1.7	7/1	
4.114	ov.female	2.8	7/1	

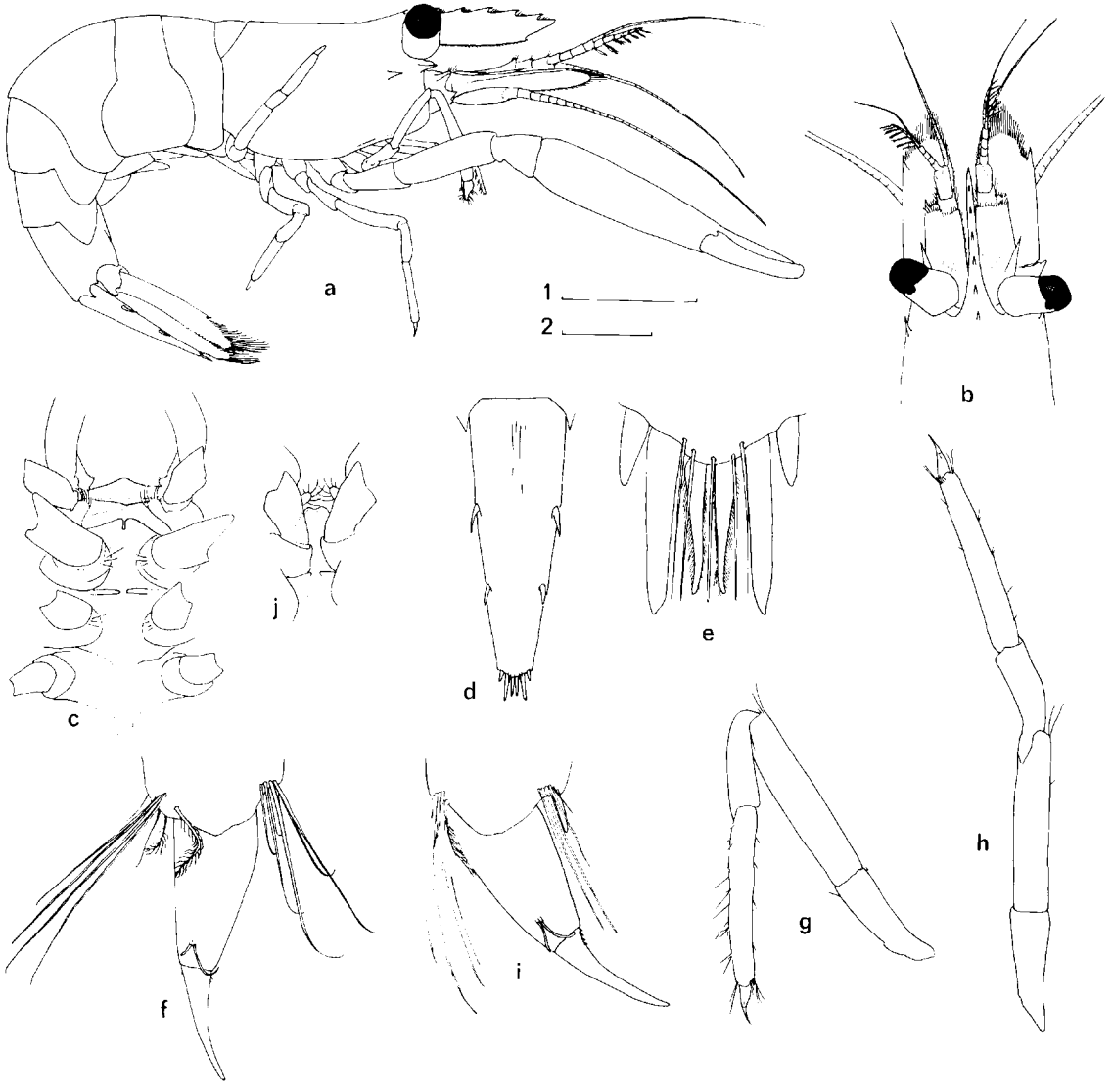

Fig. 3. a-h. *Periclimenes ornatus* Bruce, 1969. Snellius-II sta. 4.044, female. a. habitus; b. Dorsal aspect anterior part; c. Ventral aspect thorax; d. Telson; e. Distal part telson; f. Dactylus left fourth pereiopod; g. Third left pereiopod; h. Fourth left pereiopod; i. *Periclimenes ornatus* Bruce, 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 subspatulate 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 subspatulate. (2) In text-fig. 45b the fingers of the second pereiopod are 0.44 times the palmlength. (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. inornatus* from the Seychelles, and found the fingers of the first pereiopod subequal to the palmlength and subspatulate. Recurved teeth of the chelae of the second pereiopods are visible in fig. 10e. The antennal spine and hepatic spine drawn by Bruce (fig. 10b) are as 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. 3j), 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 interprete. 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 of Enitewok Atoll. 'In ovigerous female: body semitransparent, 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 ophthalmic 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 ophthalmic 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. Sternites 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.

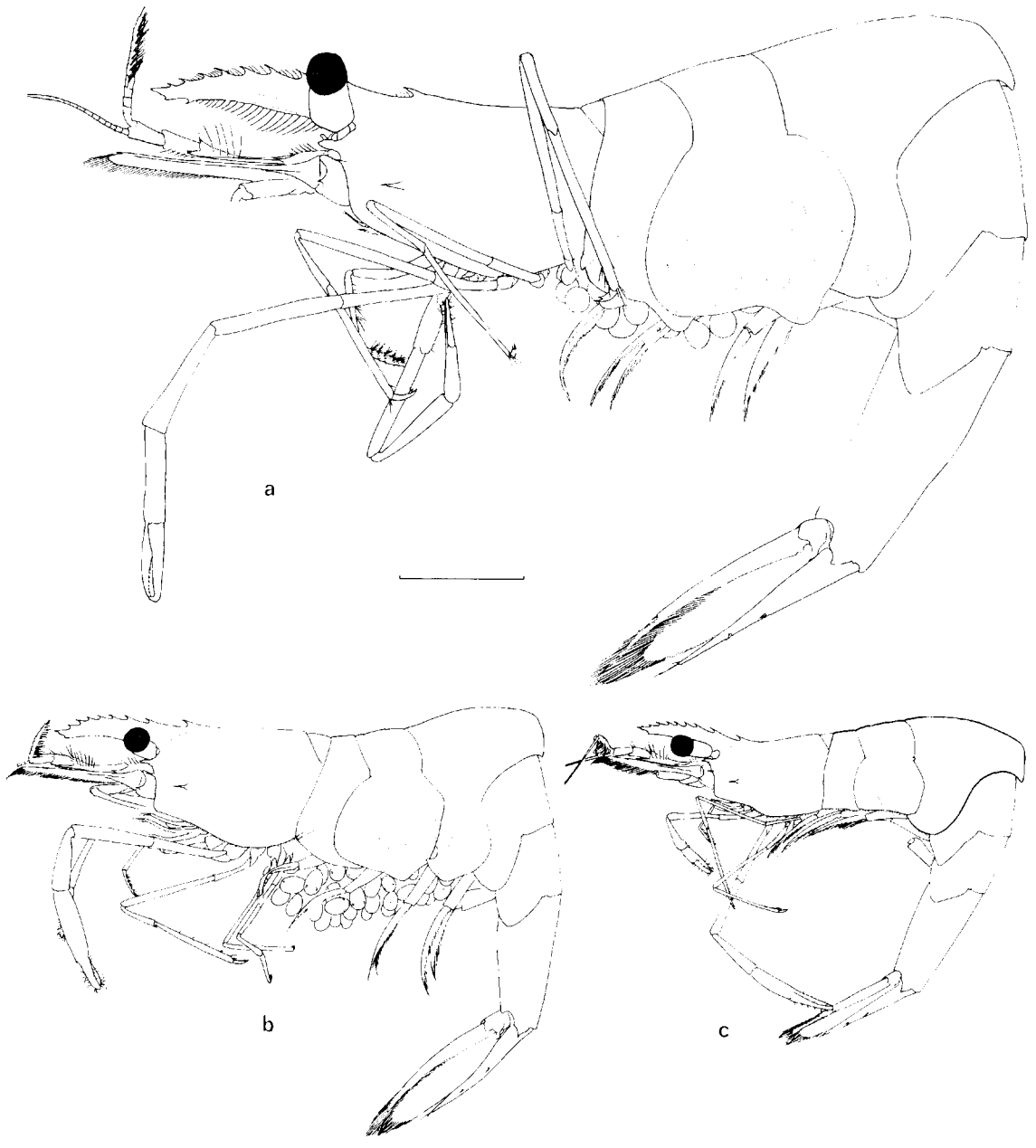

Fig. 4. a. *Periclimenes holthuisi* Bruce, 1969. Spermonde Arch. Habitus ovigerous female. b-c. *Periclimenes magnificus* Bruce, 1979, Snellius-II sta. 4.004c. b. Habitus ovigerous female; c. Habitus male.
(Scale: a = 2 mm; b and c = 4 mm)

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) aesopius*—HOLTHUIS, 1952: 34, figs 5, 6. (non Bate, 1863). *Periclimenes aesopius*—BRUCE, 1966: 21, figs 3b, 4e, f. *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: 205, textfig. 6, pl.1 fig. D; BRUCE, 1980b: 339, 340, 341; BRUCE & SVOBODA, 1983: 10,,23, 24, 37, 40, 41, fig. 3; BRUCE, 1984: 146 BRUCE, 1986b: 469.

Material examined.—'Tyro' sta. 4.114/124. Photo RMNH Snellius-

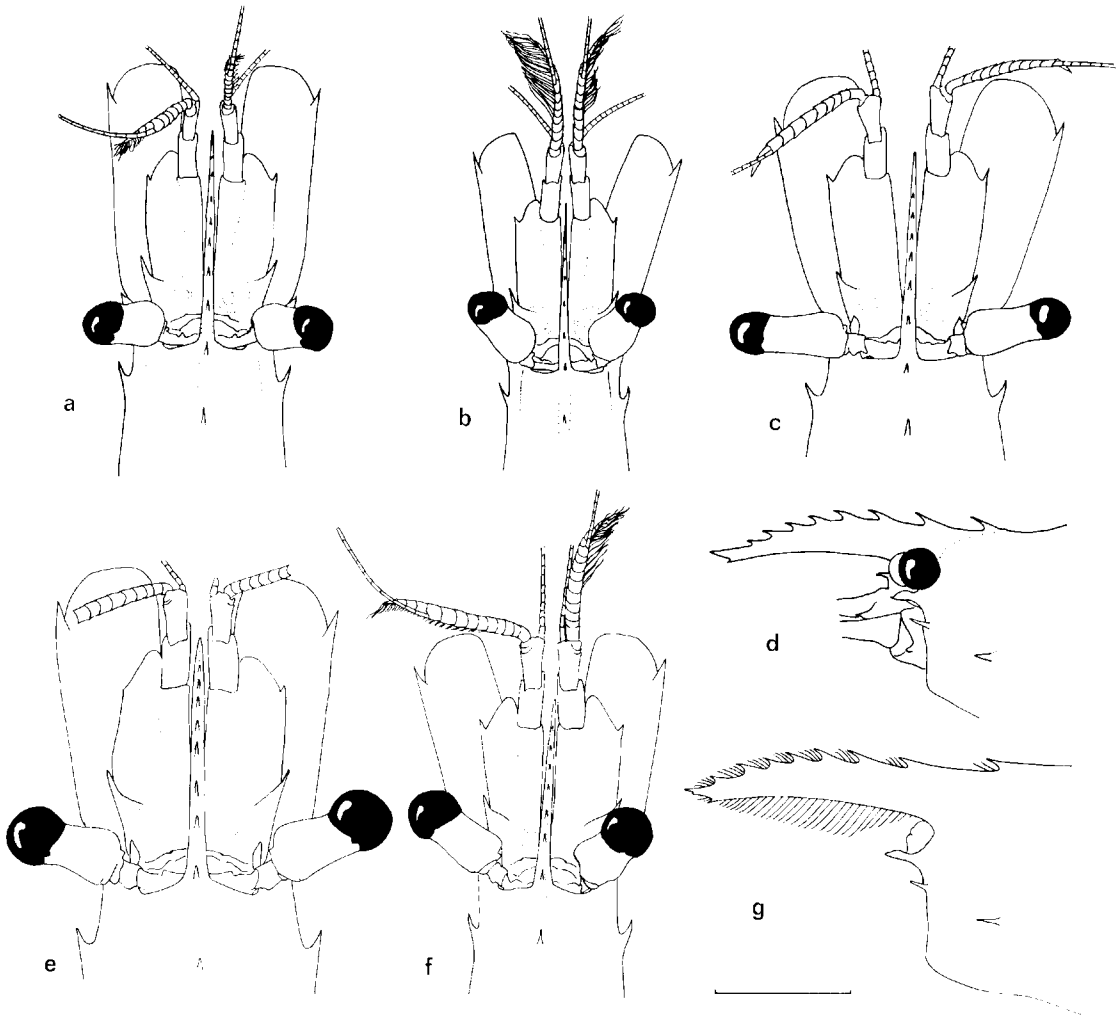

Fig. 5. a-b. *Periclimenes holthuisi* Bruce, 1969, Spermonde Arch. a. Dorsal aspect anterior part ovigerous female; b. Dorsal aspect anterior part male. c-d. *Periclimenes* aff. *holthuisi* Snellius-II sta. 4.147. c. Dorsal aspect anterior part female; d. lateral aspect anterior part female. e-g. *Periclimenes magnificus* Bruce, 1979, Snellius-II sta. 4.004c. e. Dorsal aspect anterior part ovigerous female; f. Dorsal aspect anterior part male; g. Lateral aspect anterior part ovigerous female. (Scale = 2 mm).

IIR39: 15, 16 and RMNH Snellius-II R37; 6-15. N of Sumbawa, Bay of Sanggar, 8°19.2'S 118°14.4'E, snorkeling, scuba diving, lagoon side of reef barrier, and outer part of reef barrier. 21/22.ix.1984. Photographed on *Dofleinia armata* (RMNH Snellius-II R39) and *Entacmaea quadricolor* (RMNH Snellius-II R37).—RMNH D 37390. Westcoast of Pulau Kudingareng Lompo, Spermonde Archipelago, SW Sulawesi, at 17 m depth. 19.xi.1984. On *Heliofungia actiniformis* (Quoy & Gaimard, 1833). Coll. B.W. Hoeksema.

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* (Kwietniewski, 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

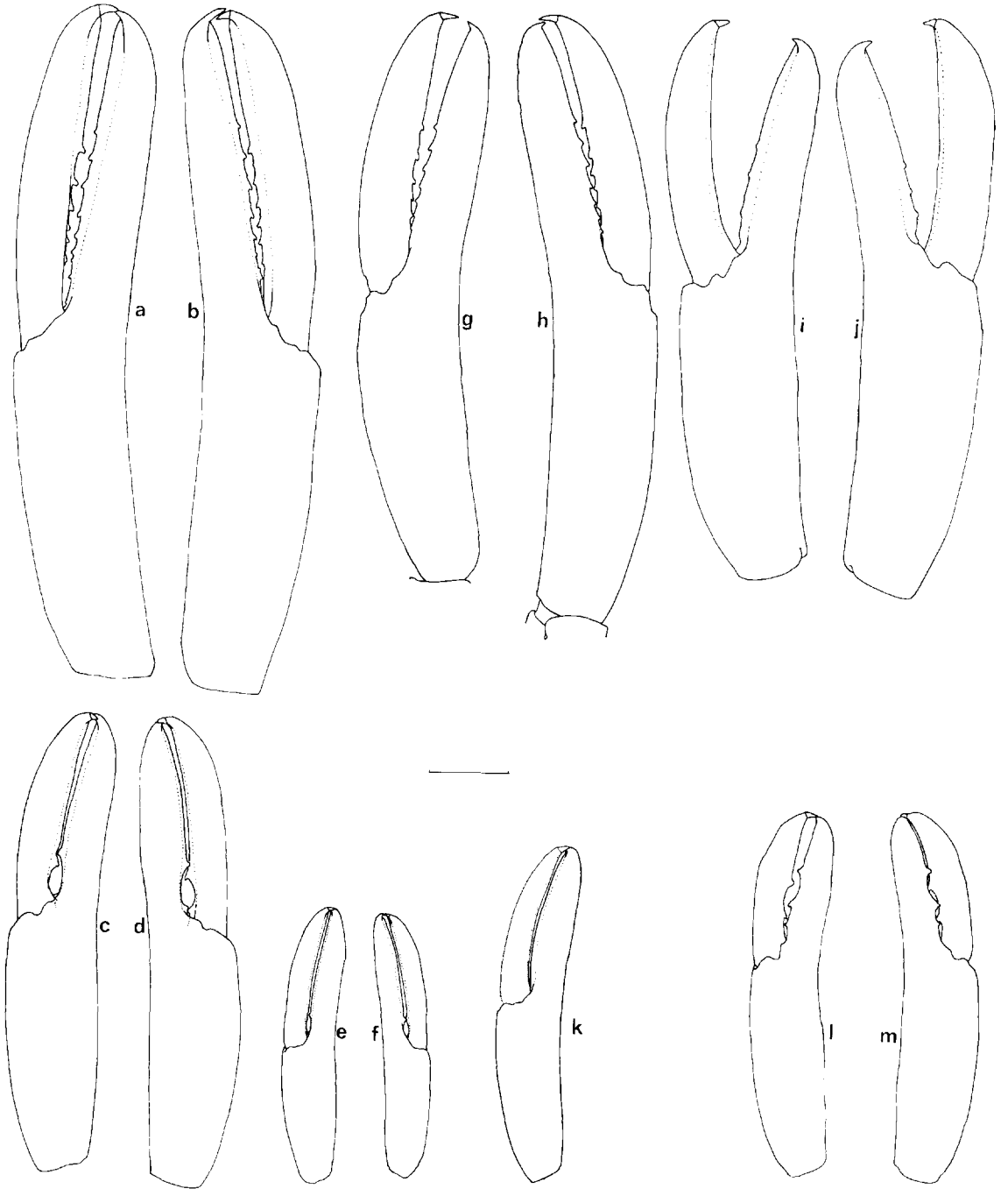

Fig. 6. Chela second pereiopods. a-f. *Periclimenes holthuisi* Bruce, 1969. Spermonde Arch., ovigerous female pocl. 5.3 mm. a. Right; b. Left. ovigerous female pocl. 4.1 mm; c. Right; d. Left: Male; e. Right; f. Left; g-h. *Periclimenes* aff. *holthuisi* Snellius-II sta. 4.147, female. g. Left; h. Right; 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)

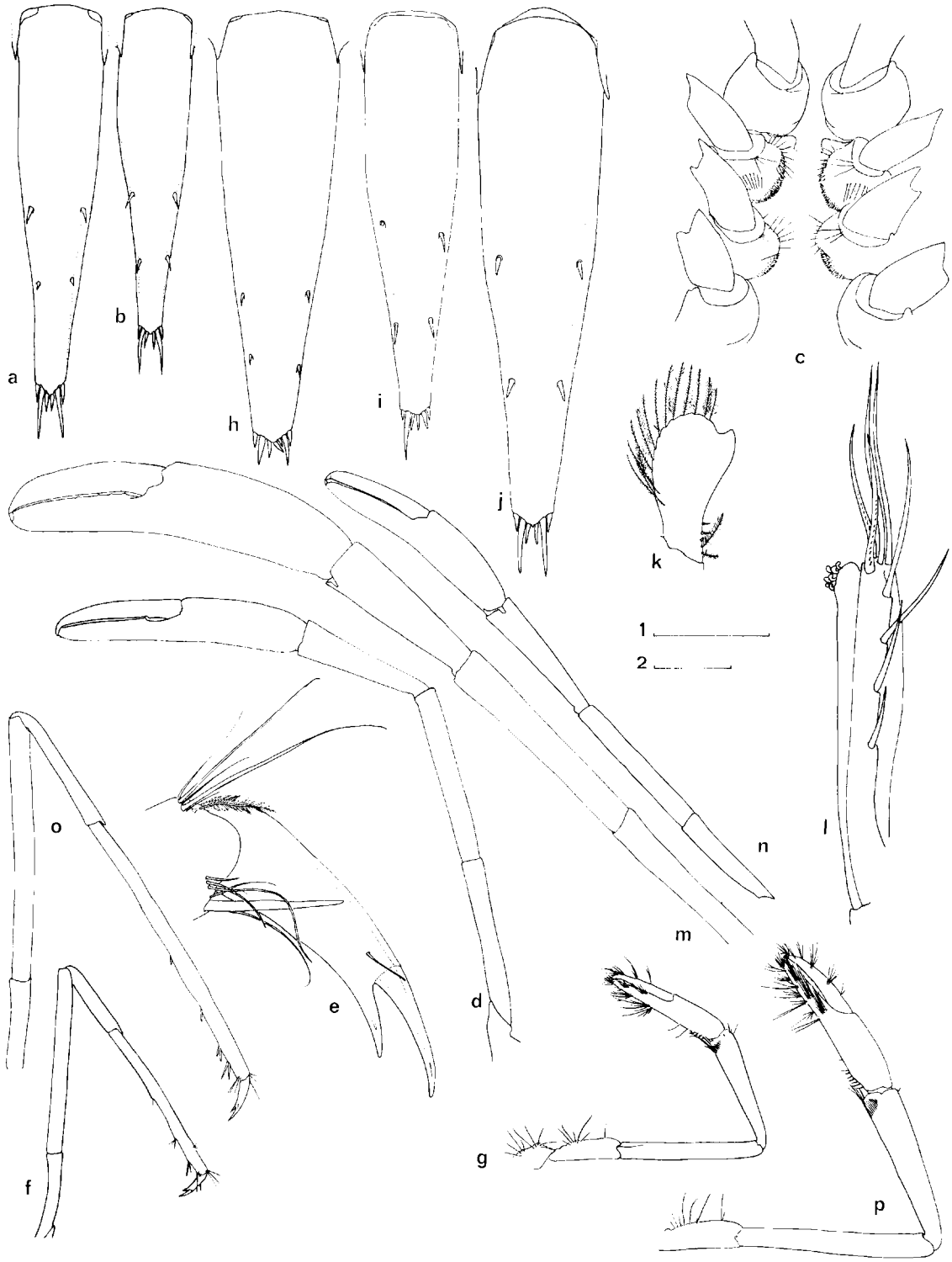

Fig. 7. a-g. *Periclimenes holthuisi* Bruce, 1969. a. Spermonde Arch., telson ovigerous female; b. Spermonde Arch., telson male; c. Ventral aspect of thorax; d. Right second pereiopod female; e. Dactylus of right third pereiopod female; f. Third right pereiopod female; g. First right pereiopod female; 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

TABLE 4

Morphological data on *Periclimenes magnificus* and *P. holthuisi*. pocl = post orbital carapax lenght (mm); the dentation of the second chela is notated as dactylus/fixed finger; location of the dorsal spines on the telson is measured from the proximal edge and related to the total telson lenght; spines on the propods are given from distal to proximal; Sp. Arch. = Spermonde Archipelago.

species	*Periclimenes magnificus*			*Periclimenes holthuisi*						
station	4.004c	4.004c	4.048	4.048	Sp. Arch.	Sp. Arch.	Sp. Arch.	Sp. Arch.	Sp. Arch.	4.147
sex	male	ovig. female	female	female	male	ovig. female	ovig. female	ovig. female	ovig. female	female
pocl	3.2	4.6	2.9	3.1	2.6	3.6	4.1	5.3	4.2	3.8
rostral formula	9/1	8/2	8/2	8/2	8/1	8/2	9/2	9/2	9/2	8/1
carpus2/palm2 left	0.9	0.83	0.71	0.66	1.46	0.97	1.12	0.80	---	0.75
carpus2/palm2 right	0.9	0.83	0.71	0.72	1.64	0.94	1.02	0.82	---	0.75
dent.chela 2 left	0/0	0/3	3/3	3/3	2/2	2/2	2/2	6/6	---	6/6
dent.chela 2 right	0/0	0/4	3/3	3/3	2/2	2/2	2/2	6/6	---	6/6
palm 2 l/w left	2.9	2.7	2.92	3.12	2.83	2.58	2.8	3.2	---	3.3
palm 2 l/w right	2.9	2.6	2.87	3.04	2.59	2.72	2.8	3.2	---	3.3
palm2/chela2 l	--	.57	.59	.68	.49	.66	.52	.51	.55	.52
palm2/chela2 r	.54	.54	.61	.63	.50	.66	.52	.51	.54	.57
carpus1/chela1 left	1.00	1.02	1.00	1.00	0.95	1.00	1.00	1.17	1.12	1.03
carpus1/chela1 right	1.00	1.00	1.00	1.00	0.98	1.00	1.00	1.17	1.12	1.05
scaphocerite l/w	2.8	2.5	2.8	3.05	3.8	3.64	3.5	2.45	2.86	2.6
uropod exop. l/w	2.8	2.0	2.6	2.65	3.45	3.08	3.2	2.20	2.66	2.8
telson sp left	.50-.77	.48-.71	.56-.74	.57-.76	.57-.78	.52-.73	.52-.71	.56-.76	.50-.71	.66.80
telson sp right	.58-.75	.48-.71	.53-.73	.56-.76	.58-.77	.51-.75	.52-.70	.56-.76	.49-.69	.64-.82
bec ocellaire	-	-	-	-	+	+	+	+	+	+
fused ant. segm. left	10	8	7	8	8	8	8	10	9	9
fused ant. segm. right	10	-	7	9	8	7	8	10	9	10
spines prop. per 3 l	21110	21111	21100	21110	22111	22210	22211	20000	22100	-----
spines prop. per 3 r	-----	22111	21110	22110	22111	22110	22210	21000	-----	-----
spines prop. per 4 l	-----	21111	21100	22100	22111	22210	23221	21000	22211	21000
spines prop. per 4 r	22111	21111	22110	22110	22211	22210	-----	21000	23221	21000
spines prop. per 5 l	12211	-----	12100	-----	12221	12221	13210	11000	12211	-----
spines prop. per 5 r	12111	11000	-----	-----	12221	12210	13330	11000	-----	11000

Pacific. Previously recorded from Indonesian waters by HOLTHUIS (1952).

Periclimenes *cf.* **holthuisi**

Figs. 5c-d, 6g-h, 7h

Material examined.—RMNH D 37391. 'Tyro' sta. 4.147. NE Taka Bone Rate (Tiger Islands), western edge of reef Taka Garlarang, 06°27'S 121°12.5'E, scuba diving, snorkeling, 27.ix.1988. From *Acrinodendron* spec., with 2 *Thor amboinensis*, coll. J.C. den Hartog.

Periclimenes magnificus Bruce, 1979

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

Periclimenes magnificus BRUCE, 1979a: 195-208, textfig. 1-5, pl.1 fig. A-C; BRUCE, 1980b: 339, 341; BRUCE, 1980a: 40, 41, 51, fig. (colour); BRUCE & SVOBODA, 1983: 23, 34, 40, 41; BRUCE, 1986a: 162, fig. 3 (colour).

Material examined.—RMNH D 37392. 'Tyro' sta. 4.004c. Photo RMNH Snellius-II F5; 20-26. Ambon, Ambon Bay, inner bay near Poka 3°39'S 128°12'E. Coral rubble, scarce corals and sponges, depth 3-9 m, 04.ix.1984. From *Dofleinia armata*, coll. H.A. ten Hove.—RMNH D 37393. 'Tyro' sta. 4.048. NE coast of Sumba, E of Melolo, 09°54'S 120°42.5'E, sandy reefflat and gradual slope, with scattered corals, scuba diving, snorkeling, depth to 12 m, 13.ix.1984. Host unknown. 'Tyro' sta. 4.069. Photo RMNH Snellius-II R28;10-14. E of Komodo, Teluk Slawi, northern cape of entrance, 8°36'S 119°31.2'E, snorkeling, scuba diving to 16 m, reef gently sloping to 8 m, below coral heads and sand, 19.ix.1984. One female photographed on *Dofleinia armata*.— Kudingareng Keke (west side), Spermonde Archipelago, SW Sulawesi, iv.1986. Coll. B.W. Hoeksema. 1 adult and 2 juveniles photographed on *Fungia fragilis* (Alcock). Slide collection B.W. Hoeksema.

Host range.—*Periclimenes magnificus* is known as an associate of Actiniaria. BRUCE (1979a) recorded the species from *Dofleinia 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 of the species from Indonesian waters.

Remarks.—As stated by BRUCE (1980b: 339) *P. holthuisi* and *P. magnificus* can be considered sib-

of first right male pleopod; l. appendix interna and appendix masculina of second right male pleopod; m. Right second pereiopod ovigerous female; n. Right second pereiopod male; o. Third right pereiopod female; p. First right pereiopod female. (Scale 1: a, b, c, h, i, j = 1 mm. Scale 2: k = 1 mm, e, l = 0.25 mm; d, f, m, n, o, p = 2.5 mm)

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

Pliopontonia furtiva BRUCE, 1973: 97-109, fig. 1-5, pl. 1 1976a: 87; 1976d: 482.

Material examined.—RMNH D 37394. 'Tyro' sta. 4.048. 1 ovigerous female. pocl. 3.9 mm. Photos from shrimp on host: RMNH Snellius-II H1; 7-9, 11, 13. NE coast of Sumba, E of Melolo, 09°54'S 120°42.5'E, sandy reefflat and gradual slope, with scattered corals, scuba diving, snorkeling, depth 0-5 m, 13.ix.1984. On *Discosoma* (*sensu* DEN HARTOG, 1980: 37) spec. (Corallimorpharia, Discosomatidae), previously this species would have been referred to *Rhodactis*, Milne Edwards & Haime, 1851.

Remarks.—So far the species was only known from its holotype, found by A.J. Bruce in 1971. The ovigerous female was collected from *Rhodactis rhodostoma* (Ehrenberg, 1834) in shallow coastal waters off Kenya.

The specimen collected during the Snellius-II Expedition differs from the holotype by its dorsal, rostral dentation, *i.e.* 7 versus 4 in the holotype. I assume that the rostrum of the holotype has been damaged and partly regenerated, forming the aberrant S-shaped ventral apical margin. More topotypical specimens should be collected to confirm this assumption.

The colour pattern is quite similar to the Kenya specimen. Both specimens have a translucent body with white bands. Photos RMNH Snellius-II H1; 11,

TABLE 5
Comparison of descriptions of *Periclimenes magnificus* and *P. holthuisi* by BRUCE (1979) and present observations on Snellius-II material.

Bruce 1979	Snellius-II
(i) Minute spinulation along median margin of coxae of third and fourth pereiopods in *P. magnificus* [female holotype] lacking in *P. holthuisi* [male holotype].	Minute spinulation in females of both species and absent in males of both species. Feature sex related
(ii) *P. magnificus* lacks a "bec ocellaire" on the ophthalmic somite. In *P. holthuisi* this feature is distinct.	'Bec ocellaire' prominent in all *P. holthuisi* material and absent in *P. magnificus* specimens.
(iii) In *P. holthuisi* carpus of second pereiopod subequal to the palm length, in *P. magnificus* distinctly shorter.	In both species carpus2/palm2 ratio in males is larger than in females.
(iv) In *P. magnificus* carpus of first pereiopod slightly shorter than the chela, in *P. holthuisi* distinctly longer.	Length ratio carpus1/chela1 of the two species is similar.
(v) Appendages in *P. magnificus* generally more robust than in P. holthuisi, *i.e.*, the scaphocerite is 2.4 times longer than wide, as opposed to 3.3 times in *P. holthuisi;* 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 *P. holthuisi.*	Appendages in *P. magnificus* generally more robust than in *P. holthuisi* but overlap is large.
(vi) In *P. holthuisi* propods of ambulatory pereiopods more heavily spinose, with spines distributed along the whole length of the ventral border, i.e., 1,1,1,2,2,2 as opposed to 0,0,0,0,1,2,2 for same positions in *P. magnificus.*	A striking difference occurs in spination 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.
(vii) In *P. magnificus* anterior dorsal telson spines at 0.5 of telson length and posterior at 0.75. In *P. holthuisi,* spines at 0.5 and 0.7, i.e. posterior pair nearer the anterior pair than the posterior margin.	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.

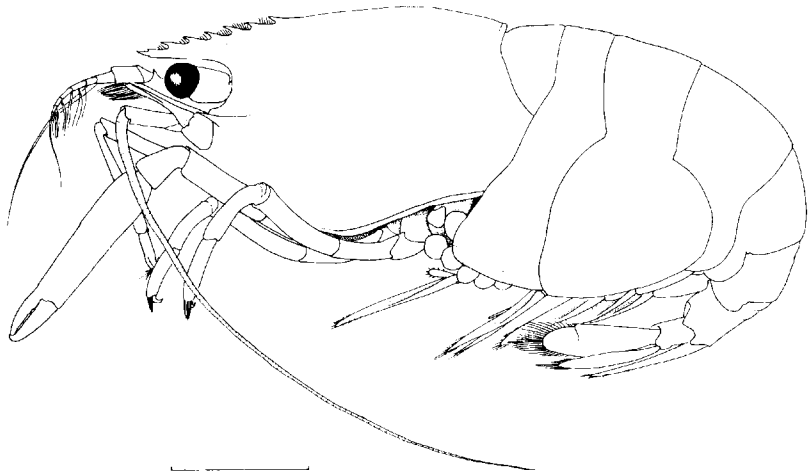

Fig. 8. *Pliopontonia furtiva* Bruce, 1973. Lateral habitus. (scale 2mm).

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* branch. 1 ovigerous female, pocl. 6.4 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)

Harpilius Gerlachei Nobili, 1905: 160; Kemp, 1922: 238, fig. 74, 75. *Philarius gerlachei*—Holthuis, 1952: 15; Bruce, 1977b: 62-65, fig. 11; Bruce, 1982: 170, 171, fig. 7c; Bruce & Svoboda, 1983: 38; Bruce, 1984: 148; Holthuis, 1986: 269.

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.

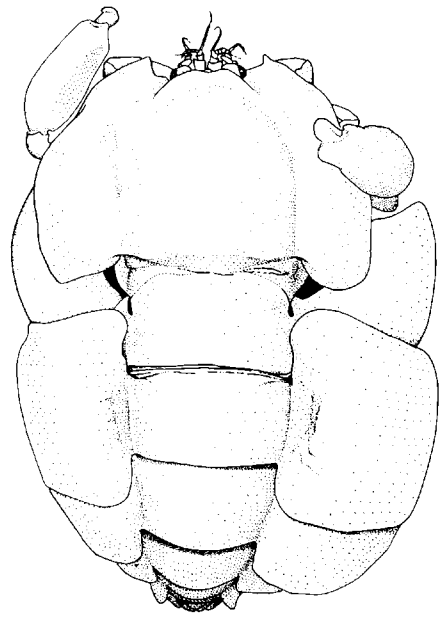

Fig. 9. *Paratypton siebenrocki* Balss, 1914. Dorsal habitus. (scale 4 mm).

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)

Jocaste japonica BRUCE, 1974: 198-199, fig. 7. (restricted synonymy); BRUCE, 1975: 27 colourfigs; BRUCE, 1976b: 128, 148, figs 23A,B, 24; BRUCE, 1977a: 74, colourfig.; BRUCE, 1977b: 68, fig. 13d, e, g, h; BRUCE, 1983: 897; BRUCE, 1984: 149.

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 pontoniinid 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 indespensable for the study of host relationships.

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

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