On Pontoniinae (Crustacea, Decapoda, Palaemonidae) collected from ascidians

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ABSTRACT
A collection of Pontoniinae associated with ascidians is studied. This collection comprises species belonging to the genera *Ascidonia* Fransen, 2002; *Dactylonia* Fransen, 2002; *Odontonia* Fransen, 2002; *Rostronia* Fransen, 2002; *Pseudopontonia* Bruce, 1992; and *Periclimenaeus* Borradaile, 1915. Two species are described as new to science. *Odontonia maldivensis* n. sp. can be distinguished from its congeners by the following characters: 1) the absence of a ventral subdistal tooth of the rostrum; 2) the unguis of the ambulatory pereiopods having a distal region with about 25 transverse rows of serrate scales; 3) the absence of a distal accessory tooth on the corpus of the dactylus; and 4) the dactyli of the second chelipeds having a pile of long simple setae on the dorsal surface. *Periclimenaeus orbitocarinatus* n. sp. is characterized by a pronounced postorbital carina lacking in its congeners. New hosts are recorded for almost all species and their known geographical distribution is extended. A key to species of *Periclimenaeus* associated with compound ascidians is provided.

KEY WORDS
Crustacea,
Decapoda,
Palaemonidae,
Pontoniinae,
Ascidiacea,
new species.

RÉSUMÉ
Sur des Pontoniinae (Crustacea, Decapoda, Palaemonidae) récoltés dans des ascidies. Une collection de Pontoniinae associés à des ascidies est étudiée. Cette collection comprend des espèces appartenant aux genres *Ascidonia* Fransen, 2002 ; *Dactylonia* Fransen, 2002 ; *Odontonia* Fransen, 2002 ; *Rostronia* Fransen, 2002 ; *Pseudopontonia* Bruce, 1992 ; et *Periclimenaeus* Borradaile, 1915. Deux espèces sont nouvelles pour la science. *Odontonia maldivensis* n. sp. se distingue de ses congénères par les caractères suivants : 1) absence d'une dent subdistale ventrale sur le rostre ; 2) unguis des péréïopodes ambulatoires possédant une région distale avec environ 25 rangées transversales d'écailles dentelées ; 3) dactyle sans dent distale accessoire à la base de l'unguis ; et 4) dactyles des seconds chélipèdes ayant une touffe de longues soies simples sur la surface dorsale. *Periclimenaeus orbitocarinatus* n. sp. se caractérise par une carène postorbitale prononcée, manquante chez ses congénères. De nouveaux hôtes sont mentionnés pour presque toutes les espèces et leur répartition géographique est étendue. Une clé des espèces de *Periclimenaeus* associés avec des ascidies composées est présentée.

MOTS CLÉS
Crustacea,
Decapoda,
Palaemonidae,
Pontoniinae,
Ascidiacea,
espèces nouvelles.

INTRODUCTION

The collection reported upon was gathered by Dr C. Monniot and Dr F. Monniot (Muséum national d'Histoire naturelle, Paris) during the course of their studies of ascidians from various regions and mediated to me by Dr A. Crosnier (Muséum national d'Histoire naturelle, Paris). The identifications of the ascidians are by Drs F. & C. Monniot. In the collection, 18 species of shrimps are represented in the genera *Ascidonia* Fransen, 2002, *Dactylonia* Fransen, 2002, *Odontonia* Fransen, 2002, *Rostronia* Fransen, 2002, *Pseudopontonia* Bruce, 1992, and *Periclimenaeus* Borradaile, 1915. Two species are described as new: *Odontonia maldivensis* n. sp., and *Periclimenaeus orbitocarinatus* n. sp. A monograph, dealing with the first four genera, was published by Fransen in 2002. Species belonging to these genera are briefly reported upon here. The genus *Periclimenaeus* comprises about 60 species associated with both sponges and ascidians. Several species are only known from one or few specimens. Species belonging to this genus are treated more extensively. A key to the ascidian-associated species of the genus *Periclimenaeus* is provided.

A list of ascidian host species with their pontoniine associates recorded in this study is presented in Appendix.

Specimens are stored in the collections of the Muséum national d'Histoire naturelle, Paris (designated by the MNHN-Na catalogue numbers) and the Nationaal Natuurhistorisch Museum – Naturalis, Leiden (designated by the RMNH D catalogue numbers).

ABBREVIATIONS

pocl.	postorbital carapace length;
CRRF	Coral Reef Research Foundation;
ZMA	Zoological Museum Amsterdam.

The rostral formula is the number of dorsal rostral teeth/number of ventral rostral teeth, e.g., R = 3/0.

SYSTEMATICS

Family PALAEMONIDAE Rafinesque, 1815
Subfamily PONTONIINAE Kingsley, 1878
Genus *Ascidonia* Fransen, 2002

Ascidonia flavomaculata (Heller, 1864)

Pontonia flavomaculata Heller, 1864: 51 (type locality: Adriatic Sea).

Ascidonia flavomaculata – Fransen 2002: 215-227, figs 137-147, pls 7, 8.

MATERIAL EXAMINED. — **Lebanon.** Rmaïlé, 40 m, in *Ascidia mentula* Müller, 1776, 2.IX.1993, collected by Bitar, 1 ♂ pocl. 2.8 mm; 1 non-ovigerous ♀ pocl. 3.8 mm (MNHN-Na 15216).

REMARKS

The species has been recorded from NE Atlantic from Morocco to the Gulf of Guinea and from the western Mediterranean as far east as the Aegean Sea. This is the first record of the species from the eastern Mediterranean.

The species is known to associate with various species in the Cionidae and Ascidiidae.

Ascidonia miserabilis (Holthuis, 1951) (Fig. 1)

Pontonia miserabilis Holthuis, 1951: 148, pl. 47, figs d-i (type locality: off Vieques, Puerto Rico).

Ascidonia miserabilis – Fransen 2002: 227-236, figs 148-154.

MATERIAL EXAMINED. — **Guadeloupe.** Anse de Baille, Argent face sud, date unknown, in *Ascidia interrupta* Heller, 1878, 1 ♂ pocl. 1.7 mm; 1 ovigerous ♀ pocl. 1.7 mm (MNHN-Na 8228).

REMARKS

Both specimens with all pereiopods detached. The largest minor chela, probably belonging to the male specimen as the chelae are relatively larger in males than in females compared to the postorbital carapace length, is different from those described by Fransen (2002) in which the fingers of the minor chela possess "several indistinct small teeth in proximal part of concave cutting edges". The dactylus as well as the fixed finger of the largest minor chela have one distinct proximal tooth (Fig. 1). The smaller minor chela, probably of the female, has the dactylus with one distinct proximal tooth and the fixed finger with one distinct proximal tooth followed by few indistinct teeth proximally.

The species has been recorded from various localities in the West Indies and possibly from the Caribbean coast of Colombia. This is the first record of the species from Guadeloupe.

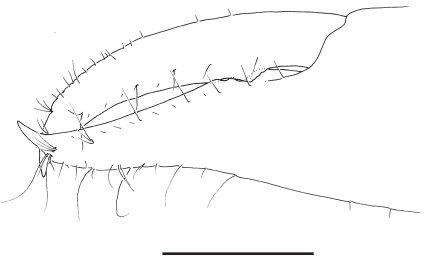

FIG. 1. — *Ascidonia miserabilis* (Holthuis, 1951), ♂, pocl. 1.7 mm, Guadeloupe (MNHN-Na 8228), chela of minor second pereiopod. Scale bar: 0.6 mm.

The species is only known with certainty from *Ascidia interrupta*.

Ascidonia quasipusilla (Chace, 1972)

Pontonia quasipusilla Chace, 1972: 41-43, fig. 10.

Ascidonia quasipusilla – Fransen 2002: 248-258, figs 163-170, pls 9, 10.

MATERIAL EXAMINED. — **Guadeloupe.** Caribbean Sea, Marina, Rivière Sens, in *Pyura momus* (Savigny, 1816) (probably erroneous identification, see Remarks), date unknown, 1 ♂ pocl. 2.2 mm (MNHN-Na 8231). — Rivière Sens, in *Microcosmus exasperatus* Heller, 1878, date unknown, 1 ovigerous ♀ pocl. 4.1 mm (MNHN-Na 8227).

REMARKS

The species has been recorded from Martinique and Antigua Island in the Caribbean and from the Mauritanian coast in the East Atlantic. This is the first record of the species for Guadeloupe.

The host *Pyura momus* is a synonym of *Herdmania momus* Savigny, 1816. This species is restricted to the Indo-West Pacific. According to P. Kott (pers. comm. A. J. Bruce) the ascidian species from Guadeloupe, which is figured by Monniot (1983), is different from *H. momus* s.s. The species is clearly a species of *Herdmania* and not of *Pyura*.

The host is only known for the Mauritanian specimens that were associated with *Pyura torpida* (Sluiter, 1898). The *Herdmania* from Guadeloupe and *Microcosmus exasperatus*, constitute new host records.

Genus *Rostronia* Fransen, 2002

Rostronia stylirostris (Holthuis, 1952)

Pontonia stylirostris Holthuis, 1952: 169, figs 82-84 (type locality: between Pulau Misool and New Guinea, 1°42.5'S, 130°47.5'W, 32 m).

Rostronia stylirostris – Fransen 2002: 260-270, figs 171-177.

MATERIAL EXAMINED. — **Moçambique.** Ibo Island, in lagoon, in *Ascidia sydneiensis* Stimpson, 1855, 11.XI.1995, 1 ovigerous ♀ pocl. 3.1 mm (MNHN-Na 15220).

REMARKS

Rostrum with two distal dorsal teeth. Fingers of minor chelae with 10 small teeth in proximal third of cutting edge.

The species has been recorded from the Red Sea, Oman and, Tanganyika, Australia, Misool, Indonesia, and New Guinea. This is the first record of the species for Moçambique.

Except for the reference to a "black ascidian" for the specimen from the Red Sea (Fransen 2002: 270) no hosts are known. *Ascidia sydneiensis* constitutes a new host record.

Genus *Dactylonia* Fransen, 2002

Dactylonia anachoreta (Kemp, 1922)

Pontonia anachoreta Kemp, 1922: 264, figs 93-95 (type locality: off Madras coast, 37 m, in ascidian).

Dactylonia anachoreta – Fransen 2002: 271-282, figs 178-184.

MATERIAL EXAMINED. — **Yemen.** Socotra, in *Polycarpa arnoldi* (Michaelsen, 1914), 1995, coll. Monniot, 1 ovigerous ♀ pocl. 3.4 mm (MNHN-Na 15221).

REMARKS

The specimen misses the major second chela. It can be easily identified by the long setae on the gaping fingers of the minor second pereiopod.

Dactylonia anachoreta is known from various localities in the Indian Ocean.

The species has been recorded from few species of the genus *Polycarpa. Polycarpa arnoldi* constitutes a new host record.

Dactylonia ascidicola (Borradaile, 1898)

Pontonia ascidicola Borradaile, 1898: 389 (type locality: Blanche Bay, New Britain, in ascidian).

Dactylonia ascidicola – Fransen 2002: 282-295, figs 185-193, pls 11, 12.

MATERIAL EXAMINED. — **Papua New Guinea.** 9°44.01'S, 150°44.41'E, in *Phallusia julinea* Sluiter, 1919, 30 m, 13.I.2002, coll. CRRF, 1 ovigerous ♀ pocl. 3.1 mm; 1 ♂ pocl. 2.6 mm (MNHN-Na 15222).
Cyclone Reef, 9°07.94'S, 149°29.32'E, crevice at 120 m, "trouvée à moitié sortie de l'oscule d'une ascidie du genre *Rhopalaea*", diving, 1 juvenile pocl. 2.2 mm (MNHN-Na 15224).
Philippines. Bohol Sea, Camiguin Island, W side of White Island, off-shore sand cay, 9°15.38'N, 124°39.12'E, 18 m, in *Ascidia ornata* Monniot & Monniot, 2001 (see Monniot & Monniot 2001: 306), 19.IV.1997, coll. CRRF, 1 ovigerous ♀ pocl. 4.3 mm; 1 ♂ pocl. 3.8 mm (MNHN-Na 15223).
Tahiti. *Ascidia divisa* Tokioka, 1953, date unknown, 1 ♂ pocl. 1.7 mm; 1 ovigerous ♀ pocl. 2.0 mm; 1 ♂ pocl. 1.7 mm; 1 juvenile pocl. 1.4 mm (MNHN-Na 8226).

REMARKS

The small specimen (MNHN-Na 15224) from Papua New Guinea has an aberrant telson with the left distal dorsal spine position occupied by two instead of one spine.

The species has been recorded from *Ascidia empheres* Sluiter, 1895, *Ascidia sydneiensis* and *Rhopalaea crassa* (Herdman, 1880). *Phallusia julinea*, *Ascidia divisa*, and *Ascidia ornata* constitute new host records.

The species has been recorded from the Indo-West Pacific from the Red Sea and Madagascar to Indonesia, the Philippines, New Guinea, and as far east as Guam and the Bismarck Archipelago. This is the first record of the species from Tahiti.

Dactylonia holthuisi Fransen, 2002

Dactylonia holthuisi Fransen, 2002: 295-306, figs 194-201, pl. 13A (type locality: Ambon, Indonesia, 03°45'S, 128°09'E, 25 m).

MATERIAL EXAMINED. — **Papua New Guinea.** Normanby Island, 10°06.33'S, 150°57.68'E, 18 m, in ascidian *Plurella colini* Monniot & Monniot, 2004 (see Monniot & Monniot 2004: 1), 19.I.2002, coll. CRRF, 3 ♂♂

pocl. 1.3, 2.0, 2.1 mm; 3 ovigerous ♀♀ pocl. 1.6, 1.6, 1.8 mm (MNHN-Na 15225).
02°39.49'S, 150°25.56'E, 15 m, in ascidian *Plurella monogyna* Monniot & Monniot, 2000, 2.VII.2003, coll. CRRF, 1 non-ovigerous ♀ pocl. 1.7 mm; 1 ovigerous ♀ pocl. 1.8 mm (MNHN-Na 15228).
02°39.49'S, 150°25.56'E, 15 m, in ascidian *Plurella*, 2.VII.2003, coll. CRRF, 2 ♂♂ pocl. 1.1 and 1.5 mm; 1 ovigerous ♀ pocl. 1.6 mm (MNHN-Na 15226).
Ndrova Island, 02°12.86'S, 147°13,68'E, 30 m, in ascidian *Plurella monogyna*, 24.VI.2003, coll. CRRF, 1 ♂ pocl. 1.8 mm; 1 ovigerous ♀ pocl. 1.8 mm (MNHN-Na 15227).

Remarks

This species is similar to *Dactylonia monnioti* (Bruce, 1990) from which it differs in not having a subdistal ventral tooth on the rostrum. None of the present specimens has a small ventral subdistal tooth on the rostrum as in the holotype specimen of *D. monnioti* (Bruce, 1990).

The species has only been recorded from Bali and Ambon, Indonesia. These are the first records of the species from Papua New Guinea.

The species has been recorded from the genus *Plurella*, but without the identification of the host to species level. This is the first record of the species from *Plurella monogyna*.

Genus *Odontonia* Fransen, 2002

Odontonia katoi (Kubo, 1940)

Pontonia katoi Kubo, 1940: 55, figs 21-23 (type locality: off Shimoda, Shizuoka Prefecture, Japan, in branchial cavity of ascidian *Halocynthia*).

Odontonia katoi – Fransen 2002: 339-352, figs 220-228, pls 15, 16.

Material examined. — **Philippines.** Mindanao, Davao, N side Talikud Island, Angel Cove, 6°57.59'N, 125°40.76'E, in *Polycarpa captiosa* (Sluiter, 1885) (MNHN S1 POL.B 362, see Monniot & Monniot 2001: 324), 27.III.1996, coll. CRRF, 1 ovigerous ♀ pocl. 3.0 mm; 1 ♂ pocl. 2.8 mm (MNHN-Na 15231).
Tonga Islands. 20°59.80'S, 175°12.85'W, 7 m, in *Polycarpa* sp., 19.XI.1997, coll. CRRF, 1 ovigerous ♀ pocl. 2.8 mm; 1 non-ovigerous ♀ pocl 3.3 mm; 1 ♂ pocl. 2.8 mm (MNHN-Na 15235).
Loyalty Islands. Lifou "près du wharf", 0-3 m, in *Polycarpa cryptocarpa* (Sluiter, 1885), data unknown, 1 ovigerous ♀ pocl. 3.1 mm; 1 ♂ pocl. 3.3 mm (MNHN-Na 15234).
New Caledonia. In *Polycarpa aurata* (Quoy & Gaimard, 1834), 1987, 1 ovigerous ♀ pocl. 3.4 mm; 1 ♂ pocl. 3.8 mm (MNHN-Na 15229).
Maldives. N Malé Atoll, Feydhoo Findhu Island, 04°12.88'N, 73°29.27'E, 2 m, in *Pyura gangelion* (Savigny, 1816) (MNHN S2 PYU 383, identified by Monniot & Monniot 2001: 344, identification on label by Monniot & Monniot as *Pyura albanyensis* Michaelsen, 1927), coll. CRRF, 1 ovigerous ♀ pocl. 2.8 mm; 1 ♂ pocl. 1.7 mm (MNHN-Na 15230).
Moçambique. Ibo Island, outer reef, 16.XI.1995, in *Polycarpa nigricans* (Heller, 1878), 1 ovigerous ♀ pocl. 1.7 mm (MNHN-Na 15232). — Falaise de Matemo, 1995, in *Polycarpa nigricans*, 1 specimen pocl. 1.5 mm (MNHN-Na 15233).
Red Sea. In *Pyura gangelion* (Savigny, 1816), 1897, coll. H. Coutière, ?1 ♂ pocl. 3.4 mm; 1 ovigerous ♀ pocl. 4.1 mm (MNHN-Na 8229).

Remarks

The unguis of ambulatory pereipods has three to five distal scales and one to three denticles on the flexor margin of the corpus. The ambulatory pereiopods look slightly more slender than in the typical form from Indonesian waters. Material from New Caledonia has one to three scales on the unguis of the ambulatory pereiopods and one to three denticles on the corpus. Material from the Maldives has the unguis of the ambulatory pereiopods with one to three scales and the distal part of the flexor margin of the corpus with only one denticle. The ovigerous female from Moçambique has the third left pereiopod with the distal flexor margin of the corpus of the dactylus with one tooth, the unguis has a row of about six distal scales. Other specimens from Moçambique have four small denticles on the distal part of the flexor margin of the corpus of the third pereiopod; the unguis has a row of about eight small scales. This is here regarded as intraspecific variation.

Odontonia katoi is known from various localities in the Indo-West Pacific. It is now recorded for the first time from the Red Sea, Moçambique, Maldives, Loyalty Islands, and Tonga Islands.

Polycarpa captiosa, *Polycarpa nigricans*, and *Pyura gangelion* consitute new host records.

Odontonia maldivensis n. sp.
(Figs 2-5)

TYPE MATERIAL. — **Maldives.** S Malé Atoll, ocean side North reef, 04°07.54'N, 73°30.55'E, 10 m, in *Polycarpa cryptocarpa* (Sluiter, 1885) (MHNH S1 POL.B 390, see Monniot & Monniot 2001: 324), 24.IX.1997, coll. CRRF, 1 ovigerous ♀ holotype pocl. 2.5 mm; 1 ♂ allotype pocl. 2.2 mm (MNHN-Na 15236).
In *Polycarpa* sp., III.2001, coll. C. Monniot, 1 ♂ paratype pocl. 1.6 mm; 1 ovigerous ♀ paratype pocl. 2.9 mm (RMNH D 51001).

ETYMOLOGY. — The species is named "maldivensis", after the locality where it was first recorded.

DISTRIBUTION. — Indo-West Pacific: Maldives.

DESCRIPTION

Body subcylindrical, somewhat depressed. Carapace smooth. Rostrum well developed, without dorsal teeth, overreaching antennular peduncle, reaching level of distal margin of scaphocerite, with broad, indistinct, shallow dorsal elevation over entire length and acute lateral carinae, with slightly straight to lightly convex ventral carina in distal part; distal end acute in lateral view, without subdistal ventral tooth, with few distal setae, blunt in dorsal view, broadened at base. Inferior orbital angle produced, directed inward. Antennal spine blunt, protruding rounded process, not separated by notch from inferior orbital angle. Anterolateral margin slightly produced, anterolateral angle not produced.

Abdomen smooth; sixth segment about 1.1 times longer than fifth, 1.6 times broader than long, posteroventral angle acute, posterolateral angle feebly produced, blunt; pleura of first five segments broadly rounded.

Telson twice as long as sixth abdominal segment, about twice as long as proximal width; lateral margins slightly convex, almost straight, convergent; posterior border without median process; two pairs of submarginal dorsal spines at about 0.27 and 0.65 of telson length; distal and proximal pair of spines of equal length, about 0.19 of telson length; posterior margin with three pairs of spines, lateral spines small, marginal, about one third of length of intermediate spines; submedian spines slightly longer than intermediate spines; both intermediate and submedian spines about as long as dorsal spines, but more slender.

Eyestalk short, about as long as broad, broader than diameter of hemispherical cornea.

Antennula with peduncle and flagella short. Basal segment about 1.1 times as long as proximal width, with acute produced distolateral tooth reaching distal margin of intermediate segment, anterior margin slightly developed, sinuous; ventromedial tooth large, acute, just proximal of mid-length of basal segment, submarginal; stylocerite short, reaching halfway basal segment, tip acute, lateral margin with six short plumose setae. Intermediate segment short, broader than long. Distal segment broader than long. Upper flagellum short, biramous, with four segments fused; short free ramus one-segmented; longer free ramus four-segmented. Lower flagellum with about six segments.

Antenna with basicerite short, laterally unarmed, with large rounded antennal gland tubercle medially; ischiocerite and merocerite normal; carpocerite extending beyond distal margin of lamina of scaphocerite, slender, 4.6 times longer than distal width; flagellum slightly longer than post-orbital carapace length; scaphocerite with lamina 1.9 times as long as wide, anterior margin narrow, rounded, lateral margin broadly convex; distolateral tooth robust, about 0.20 length of lamina (including distolateral tooth) slightly overreaching distal lamina, somewhat curved inward; incision between distolateral tooth and lamina rather deep.

Epistome with blunt anterior median carina; labrum normal, oval.

Paragnath well developed, alae with broad transverse more or less rectangular distal lobes, and small rounded more or less triangular ventromesial lobes; corpus very short, with shallow median excavation, bordered laterally by non-setose, oblique, carinae.

Second thoracic sternite with shallow indistinct rounded median elevation, without setae.

Third thoracic sternite unarmed.

Fourth thoracic sternite with low, medially notched, triangular plate formed by the fused lateral carinae.

Fifth thoracic sternite with well developed lateral plates with shallow central slit posteromedial to

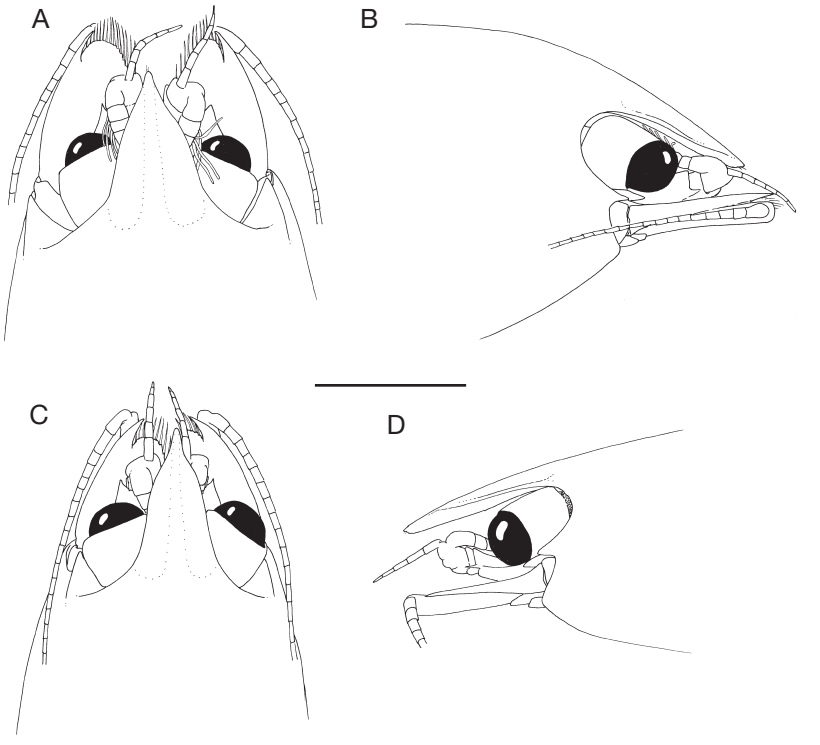

FIG. 2. — *Odontonia maldivensis* n. sp., Maldives (MNHN-Na 15236): **A**, **B**, ovigerous ♀ holotype, pocl. 2.5 mm; **C**, **D** ♂ allotype, pocl. 2.2 mm; **A**, **C**, anterior region, dorsal aspect; **B**, **D**, idem, lateral aspect. Scale bar: 1 mm.

second pereiopod coxae; coxae almost against each other in larger specimens.

Sixth to eighth thoracic sternites unarmed, broadening posteriorly.

Mandible with incisor process with eight acute distal teeth, row of about seven small denticles along medioventral margin; molar process robust with several blunt teeth, some fringed with setal brushes.

Maxillula with upper and lower laciniae rather small; distal lacinia rectangular with two rows of about 16 stout distal spines, almost devoid of setae; lower lacinia slender, triangular, with few short serrulate setae in distal part; palp feebly bilobed, large lobe with small ventral tubercle with single short recurved setae.

Maxilla with basal endite well developed, bilobed; distal lobe broader than proximal lobe, proximal lobe with four distal, long, simple setae, distal lobe with six distal, long, simple setae; coxal endite obsolete, median margin convex, non-setose; scaphognathite of moderate size, 3.1 times longer than wide, posterior lobe 2.3 times longer than wide, anterior lobe 1.5 times longer than proximal width; palp simple, longer than basal endite, slightly expanded proximally, blunt distally, without row of setae along lateral margin.

First maxilliped with coxal and basal endite partly fused, broad; basal endite fringed with rows of rather short, simple and finely serrulate setae along median and distal margins; coxal endite convex, distinctly separated from basal endite, with few simple setae medially; exopod well developed, flagellum with four long, plumose setae distally; caridean lobe rather small, narrow; epipod triangular, lobate; palp simple, rather short, non-setose.

Second maxilliped with endopod short, compact; dactylar segment about 2.7 times longer than broad,

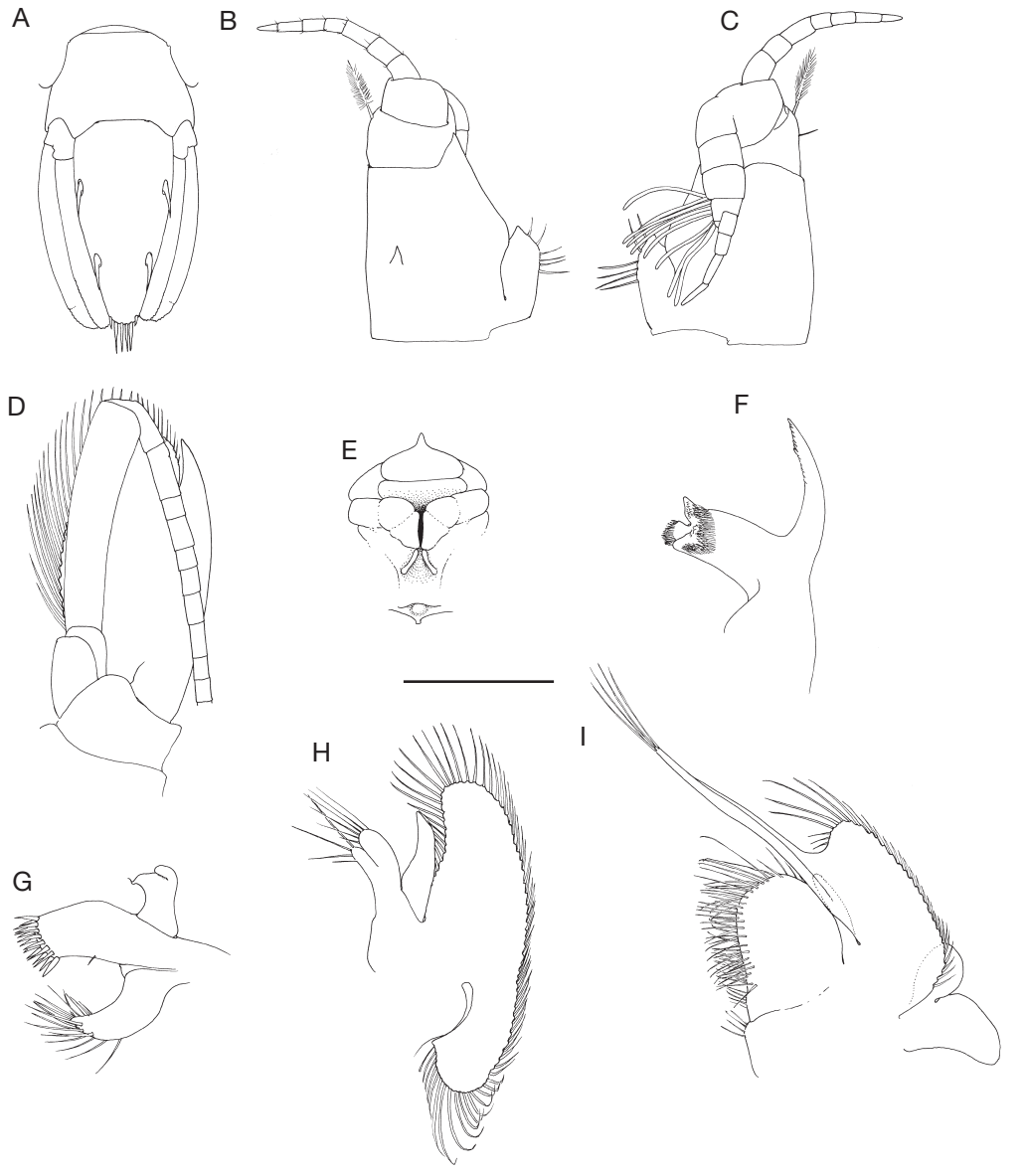

FIG. 3. — *Odontonia maldivensis* n. sp., Maldives, ovigerous ♀ holotype, pocl. 2.5 mm (MNHN-Na 15236): **A**, telson and uropods; **B**, antennula, ventral aspect; **C**, idem, dorsal aspect; **D**, antenna, ventral aspect; **E**, paragnath; **F**, mandible; **G**, maxillula; **H**, maxilla; **I**, first maxilliped. Scale bar: A, 1 mm; B-I, 0.6 mm.

fringed with short, coarsely serrulate, spiniform, and longer curled, finely serrulate setae medially; propodal segment with row of robust spines and few simple setae along expanded distomedian margin; one seta in distal part of ventrolateral margin; carpal segment short, broader than long, unarmed; meral segment without setae; ischial and basal segment partly fused, medially strongly excavate, without long plumose setae, basal part strongly convex medially; exopod long, with about six long plumose

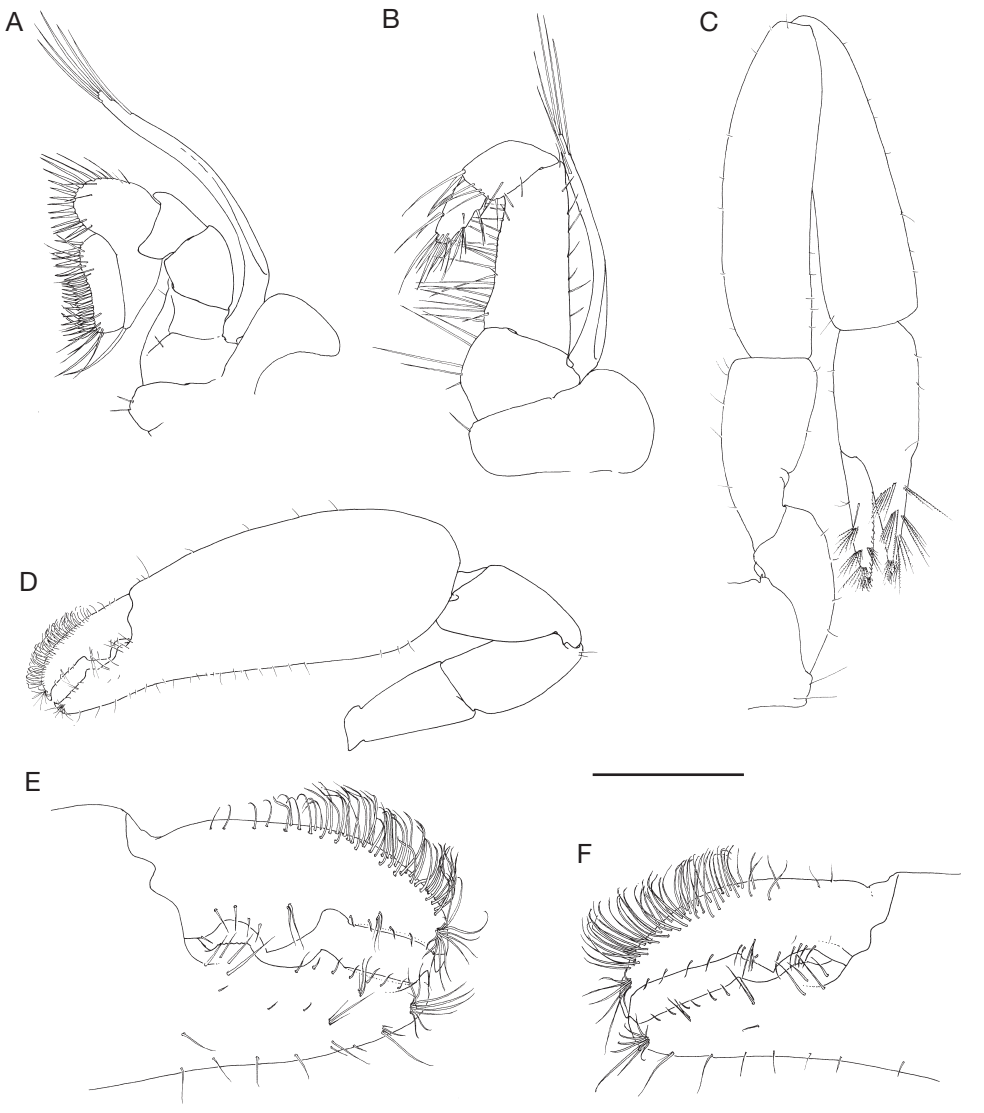

FIG. 4. — *Odontonia maldivensis* n. sp., Maldives, ovigerous ♀ holotype, pocl. 2.5 mm (MNHN-Na 15236): **A**, second maxilliped; **B**, third maxilliped; **C**, first pereiopod; **D**, major second pereiopod; **E**, idem, chela; **F**, minor second pereiopod, chela. Scale bar: A-C, E, F, 0.6 mm; D, 1.5 mm.

setae distally; coxal segment medially slightly produced, with few short simple setae, with proximally expanded epipod laterally.

Third maxilliped short, reaching with ultimate segment to distal margin of merocerite; with ischiomerus partly fused to basis, but with distinct suture, not broadened, about 2.3 times as long as broad, not tapered distally, somewhat flattened, with row of long simple setae along median margin, lateral margin with few simple setae; basal segment medially convex with few long simple setae on medial margin; exopod well developed, reaching just beyond distal margin of ischiomerus, with about ten long plumose setae in distal part; coxal segment

with small median process, with large lateral plate without setae laterally; without arthrobranch; ultimate and penultimate segments of equal length; penultimate segment almost twice as long as broad, somewhat flattened, with few long finely serrulate setae ventromedially; ultimate segment more slender, with groups of long coarsely serrulate setae ventromedially and distally.

First pereiopod stout, exceeding carpocerite with chela and two thirds of carpus; chela about three times longer than deep, slightly compressed; fingers as long as palm, cutting edges entire, with groups of many serrulate setae, tips slightly hooked; cleaning organ present, few serrulate setae in distal part of carpus and several short setae in proximal part of palm; carpus about 1.3 length of chela, 3.6 times longer than distal width, tapering proximally, unarmed; merus slightly longer than carpus, 3.8 times longer than central width, somewhat curved, without setae; ischium 0.5 times merus length, slightly expanded medially, without setae medially; basis as long as ischium, without setae medially; coxa with small ventral lobe with few short simple setae.

Second pereiopods subequal, similar. Major chela about 1.4 times post-orbital carapace length in female, about 1.6 times post-orbital carapace length in males, palm slightly swollen, slightly compressed, without carinae, with few short simple setae; dactylus 0.38 of palm length, about 3.6 times longer than deep, with one large triangular tooth at one third of cutting edge, distal part of cutting edge entire, straight, tip strongly hooked, dorsal surface with pile of long simple setae; fixed finger three times as long as deep, with broad flattened tooth with row of small denticles in proximal part, separated by shallow notch from triangular, acute tooth at midpoint of cutting edge, distal part of cutting edge entire, straight, tip strongly hooked, median fossa for reception of dactylar tooth not developed; carpus about 0.4 of palm length, about 1.7 times longer than distal width, strongly tapering proximally; merus as long as carpus, about 1.7 times longer than central width, distomedially excavate; ischium as long as merus, somewhat tapering proximally, with slightly protruded distomedial angle; basis and coxa without special features. Minor cheliped similar, dactylus slightly longer in relation to palm than in major chela; palm less swollen than in major chela.

Ambulatory pereiopods short, moderately stout. Dactylus of third pereiopod with corpus strongly compressed, about 1.8 times longer than proximal width, with single row of few simple setae along ventral margin and in distal part, accessory tooth absent, a shallow elevation present, ventral margin with one large forward directed blunt tooth at two thirds of ventral margin, without denticles distal to ventral tooth; unguis strongly curved, about 0.4 of corpus length, distally with about 25 rows of serrated transverse scales; propodus about 3.6 times dactylus length, about 5.5 times longer than proximal width, with two short, blunt, spines in distal part of flexor margin, with few long slender simple setae distally; carpus about 0.60 of propodus length, about 3.3 times longer than distal width, slightly tapering proximally, with indistinct distal lobe, unarmed; merus about as long as propodus, slightly swollen, about four times longer than central width, cylindrical, with short setae; ischium about 0.72 of merus length, 2.7 times longer than distal width; basis and coxa without special features. Fourth and fifth pereiopods similar.

First pleopod of female with endopod, half as long as exopod, with about 10 long distal setae when ovigerous, with row of long plumose setae on lateral margin.

Male first pleopod with endopod about three times longer than proximal width, somewhat tapering distally; median margin straight with row of 12 short simple setae, with few long plumose setae along lateral margin, distal part devoid of setae.

Endopod of second pereiopod with short appendix masculina, equal to about half length of appendix interna, with two very long setulose setae distally.

Uropods normal, with short unarmed protopodite; exopod broad, two times longer than central width, lateral margin strongly convex, without distolateral tooth, with minute spinule distolaterally; endopod exceeding exopod, about as long as telson, 2.8 times longer than wide.

Number of eggs *c.* 100. Embryo at point of hatching about 0.6 mm long.

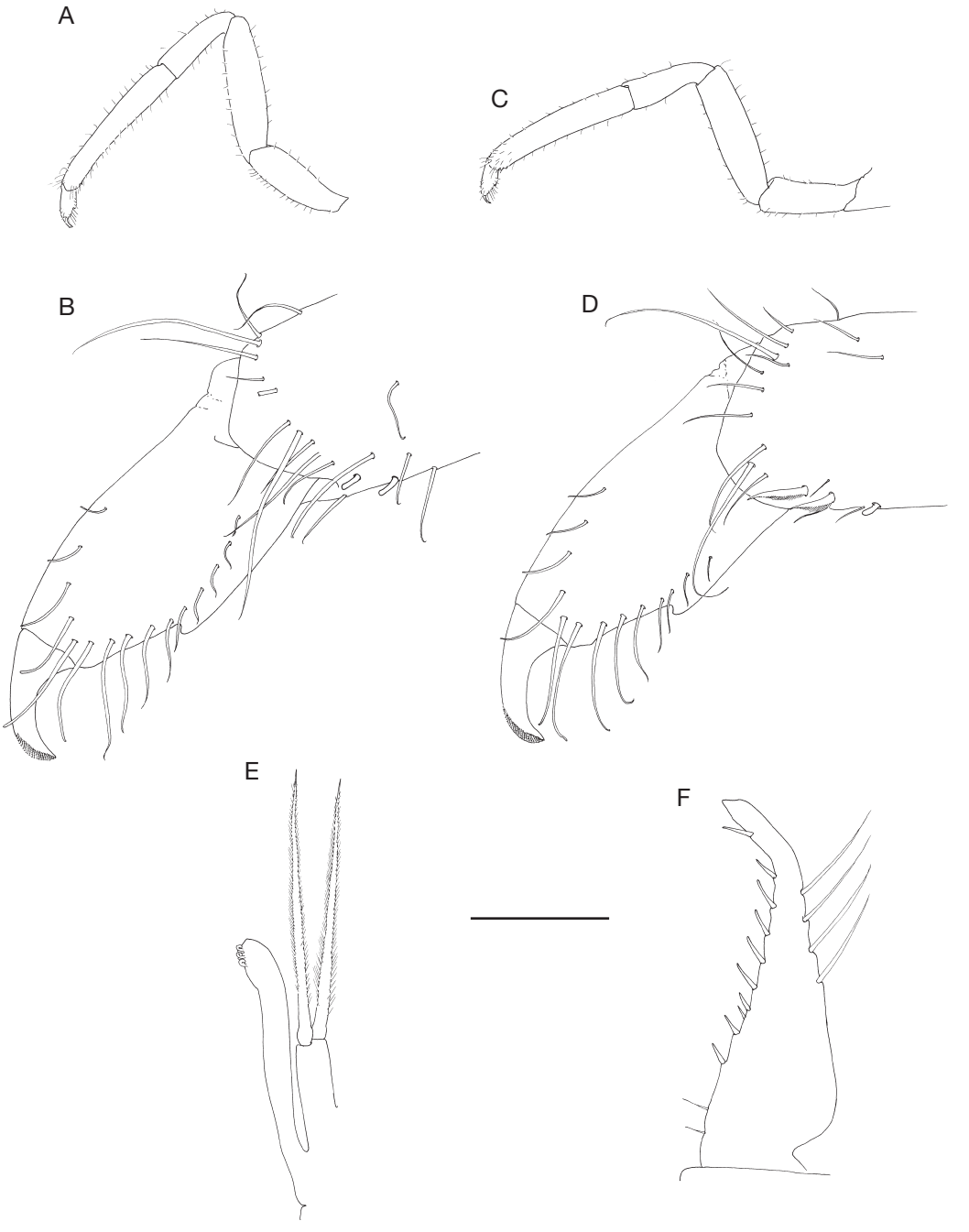

FIG. 5. — *Odontonia maldivensis* n. sp., Maldives (MNHN-Na 15236): **A**-**D**, ovigerous ♀ holotype, pocl. 2.5 mm; **E**, **F**, ♂ allotype, pocl. 2.2 mm; **A**, third pereiopod; **B**, idem, dactylus; **C**, fifth pereiopod; **D**, idem, dactylus; **E**, appendix interna and appendix masculina of second pleopod; **F**, endopod of first pleopod. Scale bar: A, C, 1.5 mm; B, D-F, 0.15 mm.

Sexual dimorphism
Males generally similar to females, usually of smaller size, with relatively large chela on second pereiopods.

Size
This is a small sized species. The ovigerous female pocl. is 2.5 mm, 2.2 mm in the male.

Coloration
Whole body covered with rather small red chromatophores (based on preserved material in alcohol).

HOST
Solitary ascidians of the family Styelidae: *Polycarpa cryptocarpa*.

REMARKS
The present species is most closely related to *Odontonia rufopunctata*. From this species it differs in the following characters: 1) the ventral subdistal tooth of the rostrum is absent; 2) the unguis of the ambulatory pereiopods has a distal region with about 25 transverse rows of serrate scales; 3) the distal accessory tooth on the corpus of the dactylus is absent; and 4) the dactyli of the second chelipeds have a pile of long simple setae on the dorsal surface. The new species shares the absence of a distal accessory tooth on the corpus of the dactylus with *O. simplicipes* (Bruce, 1996) and *O. seychellensis* Fransen, 2002. It differs from these species in having a distal region with transverse rows of serrate scales on the unguis of the ambulatory pereiopods.

Odontonia rufopunctata Fransen, 2002
(Fig. 6A)

Odontonia rufopunctata Fransen, 2002: 352, figs 229-234, pl. 17 (type locality: Kudingareng Keke, Spermonde Archipelago, SW Sulawesi, Indonesia, 20 m, in ascidian).

MATERIAL EXAMINED. — **Papua New Guinea.** Boia Boia, Waga Island, 10°12.26'S, 150°44.75'E, 20 m, in *Polycarpa pigmentata* (Herdman, 1906), 27.V.1998, coll. CRRF, 1 ovigerous ♀ pocl. 2.3 mm; 1 ♂ pocl. 2.3 mm (MNHN-Na 15239).
Louisiade Archipelago, Deboyne Lagoon, Nivani Island, 10°47.46'S, 152°23.03'E, in *Polycarpa camptos* F. Monniot & C. Monniot, 2001 (MNHN S1 POL.B 422, see Monniot & Monniot 2001: 324), 1 ovigerous ♀ pocl. 3.1 mm; 1 ♂ pocl. 2.2 mm (MNHN-Na 15238).

REMARKS
Similar to *O. katoi*. The dactyli of the ambulatory pereiopods are short and stout. The dactylus of the third pereiopod has the corpus moderately compressed, about 1.6 times longer than its proximal width, with a single row of few simple setae along the ventral margin and in distal part; the accessory tooth is terminal, acute, perpendicular to the flexor margin; the ventral margin of the corpus has one large forward directed tooth at distal two thirds of the flexor margin; the flexor margin is without denticles between the ventral tooth and the accessory tooth; the unguis is strongly curved, about 0.4 of the corpus length, with row of up to 10 small scales distally.

This species has been recorded from Bali and Sulawesi, Indonesia. It is now recorded for the first time from Papua New Guinea.

The species has been recorded in association with an unidentified solitary ascidian. *Polycarpa pigmentata* and *P. camptos* constitute new host records.

Odontonia sibogae (Bruce, 1972)

Pontonia sibogae Bruce, 1972: 182, fig. 1 (type locality: Curtis Channel, Port Curtis, Queensland, Australia).

Odontonia sibogae – Fransen 2002: 371-382, figs 241-246, pl. 19.

MATERIAL EXAMINED. — **Papua New Guinea.** Brooker Channel, 11°03.09'S, 152°28.62'E, 3 m, in *Polycarpa aurata* (Quoy & Gaimard, 1834), 1.VI.1998, coll. CRRF, 1 ♂ pocl. 4.3 mm (MNHN-Na 15240).

REMARKS
All except one ambulatory pereiopods missing, remaining pereiopod detached, with dactylus broken.

The species has been recorded from various places in the Indo-West Pacific, from along the East African coast to Indonesia, Australia and New Caledonia. This is the first record of the species from Papua New Guinea.

It is known to live in association with solitary ascidians from the genera *Styela*, *Pyura*, *Rhopalaea*

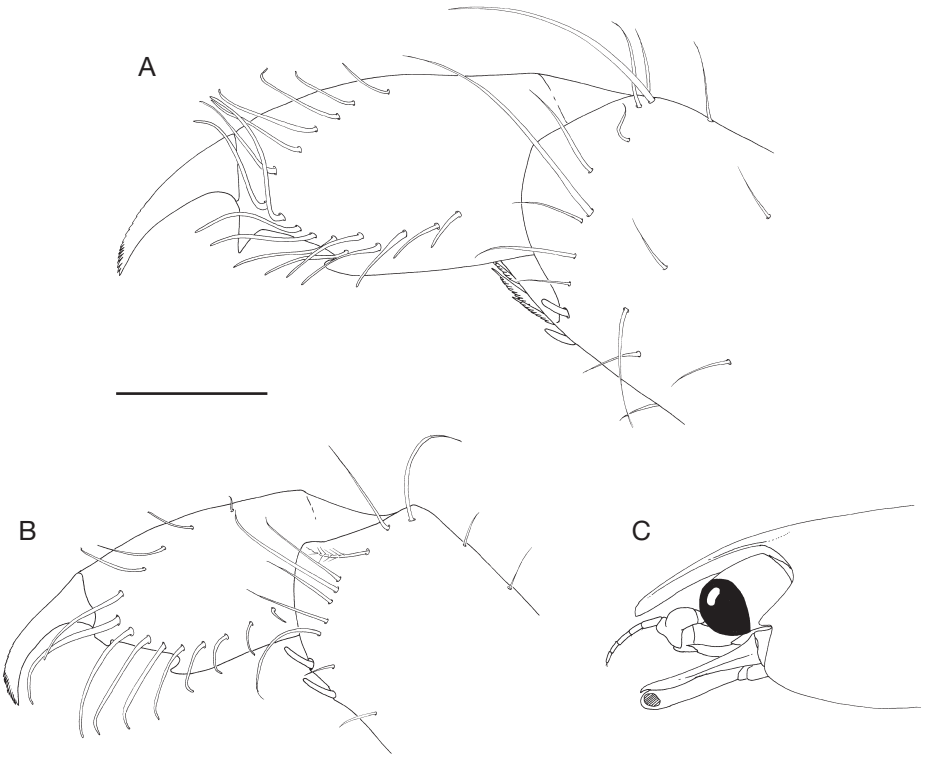

FIG. 6. — **A**, *Odontonia rufopunctata* Fransen, 2002, ovigerous ♀, pocl. 3.1 mm, Papua New Guinea, Louisiades (MNHN-Na 15238), fifth pereiopod, dactylus; **B**, **C**, *Odontonia* sp., juvenile, pocl. 1.9 mm Moçambique, Ibo Island (MNHN-Na 15241); **B**, fifth pereiopod, dactylus; **C**, anterior region, lateral aspect. Scale bar: A, B, 0.15 mm; C, 1 mm.

and *Polycarpa*. *Polycarpa aurata* constitutes a new host record.

Odontonia sp.
(Fig. 6B, C)

MATERIAL EXAMINED. — **Moçambique.** Ibo Island, in *Polycarpa mytiligera* (Savigny, 1816), XI.1995, 1 juvenile (only one ambulatory pereiopod present) pocl. 1.9 mm (MNHN-Na 15241).

REMARKS

The specimen fits the descriptions of *O. rufopunctata* and that of *O. maldivensis* n. sp. except for the following features. It differs from *O. rufopunctata* in: 1) the absence of a ventral, subdistal, rostral tooth; 2) having a much smaller distal accessory tooth on the corpus of the only ambulatory pereiopod present; and 3) having 11 distal scales on the unguis whereas about eight were counted for *O. rufopunctata*. These differences could be intraspecific variation. From *O. maldivensis* n. sp. it differs in: 1) possessing an accessory tooth on the corpus of the dactylus; and 2) having about 11 entire scales on the distal dorsal margin of the unguis instead of about 25 serrated ones. As the specimen is incomplete, a more specific identification has not been possible.

Genus *Pseudopontonia* Bruce, 1992

Pseudopontonia minuta (Baker, 1907)

Pontonia minuta Baker, 1907: 189, pl. 24, figs 9-12 (type locality: South Australia). — Borradaile 1917: 392. — Hale 1927: 57, fig. 51. — Holthuis 1952:

15. — Bruce 1972: 65-75, figs 1-5; 1976a: 92; 1983a: 211. — Chace & Bruce 1993: 62.

Pseudopontonia minuta – Bruce 1992: 1273; 1994: 133, fig. 62. — Li 2000: 280-281. — Davie 2002: 337-338. — Bruce 2002b: 112-114, fig. 2.

MATERIAL EXAMINED. — **Moçambique.** Ibo Island, falaise de Matemo, 20 m, in *Polycarpa nigricans* (Heller, 1878), 18.XI.1995, 1 non-ovigerous ♀ pocl. 4.4 mm; 1 ♂ pocl. 3.4 mm (MNHN-Na 15242).

REMARKS

The species was hitherto only known from South Australia, New South Wales and Queensland. This is the first record of the species from the Indian Ocean. The identity of the host was established by Bruce (2002b), being the Ascidian *Polycarpa flava* Kott, 1985. *Polycarpa nigricans* constitutes a new host record.

Genus *Periclimenaeus* Borradaile, 1915

Periclimenaeus aff. ***colodactylus*** Bruce, 1996 (Fig. 7)

Periclimenaeus colodactylus Bruce, 1996: 222, figs 9, 10 (type locality: New Caledonia, Uatio Islet, 20-25 m); 2002a: 581.

MATERIAL EXAMINED. — **Philippines.** Bohol Sea, Camiguin Island, 9°12.89'N, 124°38.03'E, 7 m, in *Diplosoma versicolor* F. Monniot, 1994 (MNHN A2 DIP.A 147, see Monniot & Monniot 2001: 280-281), 13.IV.1997, 1 specimen pocl. 0.9 mm (R = 2/0) (MNHN-Na 15243).

REMARKS

This is a very small, probably juvenile specimen. It fits the description of *P. colodactylus* by Bruce (1996) differing only in: 1) having two instead of three rostral teeth; and 2) having a more slender dactylus on the third pereiopod with a more prominent proximal tooth on the flexor margin. This could be due to intraspecific variation that might be related to size. It differs from *P. orbitocarinatus* n. sp. in: 1) having no denticulation on the distal cutting edge of the dactylus of the major second pereiopod; 2) the absence of tubercles on the median margin of the merus; and 3) the absence of denticulation in the distal part of the cutting edge of the fixed finger of the minor second cheliped. The specimen is also similar to *P. myora* Bruce, 1998 and *P. zarenkovi* Ďuriš, 1990, from which it differs in not having a denticulated distal cutting edge of the dactylus of the major second pereiopod. Another similar species is *P. nobilii* Bruce, 1974, which was described on the basis of a single female specimen from the Red Sea. The present specimen differs from the Red Sea specimen in: 1) not having numerous long, simple setae on the median margin of the propodus of the minor second cheliped; and 2) not having the proximal part of the propodus of the third pereiopod much broader than the distal part. It shares the slender dactylus of the third pereiopod with this species. Two other specimens of the species recorded by Bruce (1991b: 254, fig. 19) from New Caledonia, were later (Bruce 1998: 397) considered not conspecific with *P. nobilii* from the type locality, as well as a specimen recorded from La Réunion by Bruce (1983b). The two specimens recorded from Papua New Guinea by De Grave (2000: 132) that also differ from the type specimen of *P. nobilii* should be re-examined. Other related species recorded from ascidian hosts are: *P. diplosomatis*, *P. storchi* Bruce, 1989, and *P. orbitocarinatus* n. sp. All these species have been described on the basis of one or a few specimens. It has therefore been impossible to get an impression of the intraspecific variability of characters. The status of some of these species therefore remains doubtful until more material becomes available.

Periclimenaeus colodactylus is only known from New Caledonia. If the present specimen turns out to belong to this species, this would be the first record of the species for the Philippines.

The type specimens of *P. colodactylus* have been recorded from the same host as the present specimen: *Diplosoma versicolor*.

Periclimenaeus diplosomatis Bruce, 1980 (Fig. 8)

Periclimenaeus diplosomatis Bruce, 1980: 39, figs 1-6 (type locality: Heron Island, Capricorn Islands, Queensland, Australia, 23°26.9'S, 151°55'E); 1981: 10; 1983a: 205; 1990: 16, 18; 2002a: 582.

MATERIAL EXAMINED. — **New Caledonia.** Canal Woodin, 27 m, in *Diplosoma inflatum* F. Monniot, 1994, date unknown, 1 ovigerous ♀ pocl. 3.9 mm (MNHN-Na 15244).

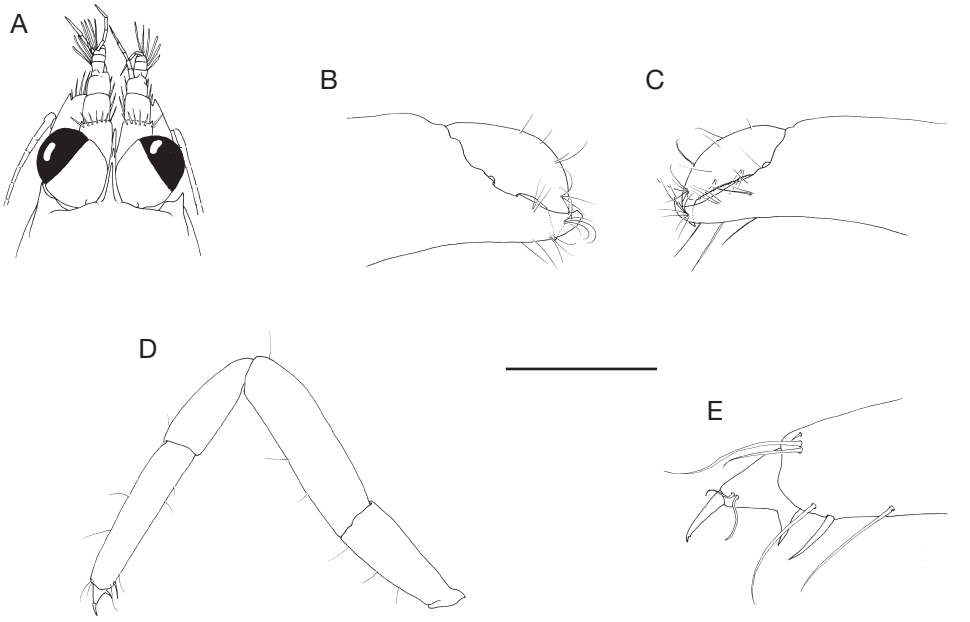

FIG. 7. — *Periclimenaeus* aff. *colodactylus* Bruce, 1996, specimen, pocl. 0.9 mm, Philippines (MNHN-Na 15243): **A**, anterior region, dorsal aspect; **B**, second pereiopod, major chela; **C**, second pereiopod, minor chela; **D**, third pereiopod; **E**, idem, dactylus. Scale bar: A, 1 mm; B-D, 0.6 mm; E, 0.15 mm.

DIAGNOSIS. — Rostrum 3/0, proximalmost tooth not flattened, all teeth on rostrum proper, lamina narrow, acute and horizontal distally, without distinct lateral carina, reaching distal margin of second segment of antennular peduncle. Eyestalk robust, slightly broader than long, wider than the hemispherical cornea. Postorbital ridge present but rounded. Antennal spine produced, half length of eyes; inferior orbital angle not developed, angular. Telson with dorsal spines at 0.33 and 0.66 of length. Scaphocerite with lamina not overreaching carpocerite, with long slender distolateral tooth overreaching distal margin of lamina. First pereiopod chela subspatulate. Second pereiopods unequal and dissimilar. Major second chela with dactylus distally concave, denticulate, with about 60 small denticles; fixed finger with distal cutting edge entire; ischium, merus and carpus unarmed mesially. Minor second chela with dactylus denticulate in distal two thirds, with about 60 small denticles, slightly increasing in size distally ending in strongly hooked tip; fixed finger with entire cutting edge. Third pereiopod with propodus slightly longer than carpus, tapering distally, with two laterodistal spines and one subdistal ventral spine; dactylus stout with strongly curved unguis, corpus convex at flexor margin, without distal accessory tooth, with acute forward directed proximal tooth. The exopod of the uropod has a well developed distolateral mobile spine which is distally curved inward and about twice as long as the distolateral tooth.

REMARKS

The specimen agrees with the description of the female holotype (Bruce 1980).

The species is only known from Heron Island, Queensland, Australia. It is now recorded from New Caledonia for the first time.

The type specimens of the species were found in *Diplosoma* ?*rayneri* MacDonald, 1859 (Didemnidae). *Diplosoma inflatum* constitutes a new host record.

Periclimenaeus jeancharcoti Bruce, 1991 (Figs 9; 10)

Periclimenaeus jeancharcoti Bruce, 1991a: 371, figs 50-55 (type locality: off New Caledonia, 21°31'S, 166°21'E, 375-450 m); 2002a: 582.

MATERIAL EXAMINED. — **Papua New Guinea.** 10°00.21'S,

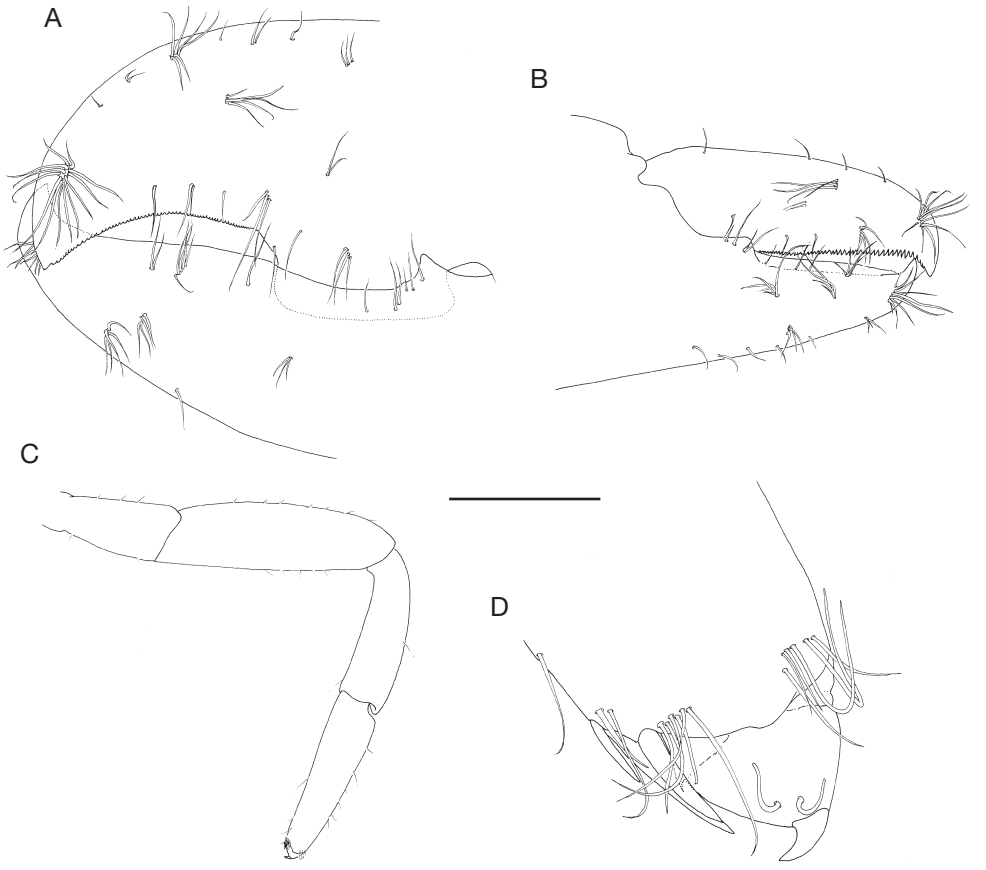

FIG. 8. — *Periclimenaeus diplosomatis* Bruce, 1980, ovigerous ♀, pocl. 3.9 mm, New Caledonia (MNHN-Na 15244): **A**, second pereiopod, major chela; **B**, second pereiopod, minor chela; **C**, third pereiopod; **D**, idem, dactylus. Scale bar: A, B, 0.6 mm; C, 1.5 mm; D, 0.15 mm.

150°50.04'E, 37 m, in *Leptoclinides* sp. "cavité cloacale", 18.I.2002, 1 ovigerous ♀ pocl. 2.1 mm (R = 7/0) (MNHN-Na 15250).
10°06.33'S, 150°57.68'E, 21 m, in *Leptoclinides* sp., 20.I.2002, coll. CRRF, 1 juvenile specimen pocl. 0.8 mm (R = 5/0); 1 non-ovigerous ♀ pocl. 1.8 mm (R = 5/0) (MNHN-Na 15246).
9°57.82'S, 150°50.73'E, 10 m, in *Leptoclinides* sp., 19.I.2002, coll. CRRF, 1 ♂ pocl. 1.6 mm (R = 6/0), 1 non-ovigerous ♀ pocl. 2.0 mm (R = 6/0) (MNHN-Na 15249).
9°07.50'S, 149°23.54'E, 15 m, in *Leptoclinides uniorbis* Monniot & Monniot, 1996, 22.I.2002, coll. CRRF, 1 ovigerous ♀ pocl. 1.9 mm (R = 5/0) (MNHN-Na 15251).
Baluan, 2°32.27'S, 147°17.97'E, 24 m, in *Didemnum* sp., 22.VI.2003, coll. CRRF, 1 non-ovigerous ♀ pocl. 1.6 mm (MNHN-Na 15248).
Mindanao, Davao, SW of Samal Island, W side of Talikud Island, 6°56.11'N, 125°40.46'E, 3 m, in *Leptoclinides subviridis* (Sluiter, 1909) (MNHN A2 LEP 82, see Monniot & Monniot 2001: 288), 31.III.1996, 1 ovigerous ♀ pocl. 3.6 mm (MNHN-Na 15247).
Bohol Sea, Balicasag, 9°53.39'N, 123°45.45'E, 10 m, in *Didemnum granulatum* Tokioka, 1954 (MNHN A2 DID. C 422, see Monniot & Monniot 2001: 267), IV.1997, coll. CRRF, 1 ovigerous ♀ pocl. 1.2 mm (R = 3/0), with large lateral bopyrid (MNHN-Na 15252).

MATERIAL EXAMINED FOR COMPARISON. — *Periclimenaeus minutus* Holthuis, 1952, *Siboga* Expedition, stn 240, Indonesia, Banda anchorage, trawl, dredge and reef exploration, 9-36 m, bottom black sand and coral, *Lithothamnion* bank in 18-36 m, 22.XI-1.XII.1899,

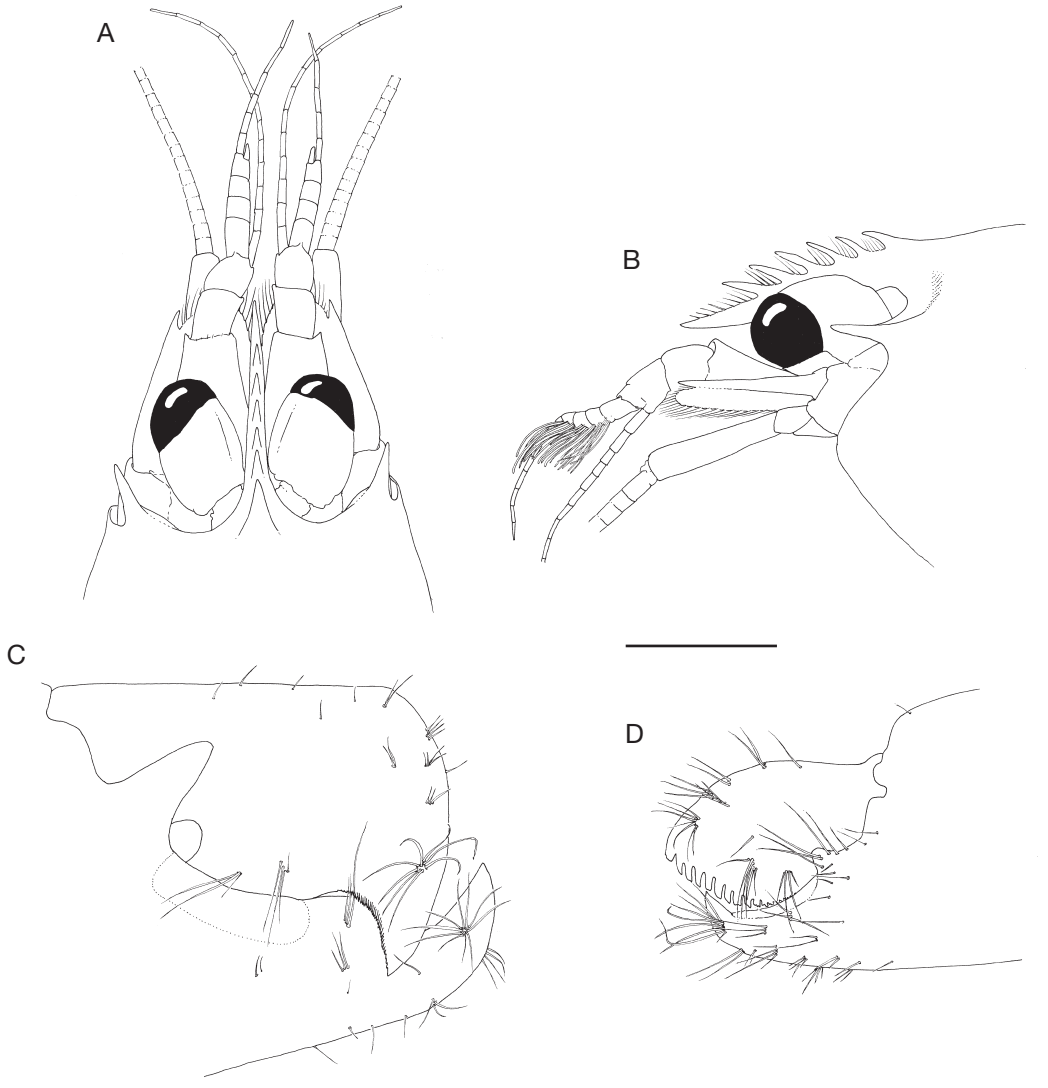

FIG. 9. — *Periclimenaeus jeancharcoti* Bruce, 1991, ovigerous ♀, pocl. 3.6 mm, Philippines (MNHN-Na 15247): **A**, anterior region, dorsal aspect; **B**, idem, lateral aspect; **C**, second pereiopod, major chela; **D**, second pereiopod, minor chela. Scale bar: A, B, 1 mm; C, D, 0.6 mm.

syntypes, 1 ♂ pocl. 2.0 mm; 1 ovigerous ♀ pocl. 1.8 mm (ZMA).

DIAGNOSIS. — Rostrum 5-7/0, proximalmost tooth not flattened but slightly more robust than distal ones, all teeth on rostrum proper, rostrum narrow, acute and horizontal distally, without distinct lateral carina, reaching distal margin of second segment of antennular peduncle. Eyestalk robust, slightly longer than broad, wider than the hemispherical cornea, obliquely placed on eyestalk; eyestalk dorsomesially with excavation in which rostrum fits. Postorbital ridge present but shallow. Antennal spine produced, almost reaching cornea; inferior orbital angle not developed, rounded. Telson with dorsal spines at 0.20-0.25 and 0.5-0.6 of length. Scaphocerite with lamina not overreaching carpocerite, with long slender distolateral tooth not overreaching distal margin of lamina. First pereiopod chela subspatulate. Second pereiopods

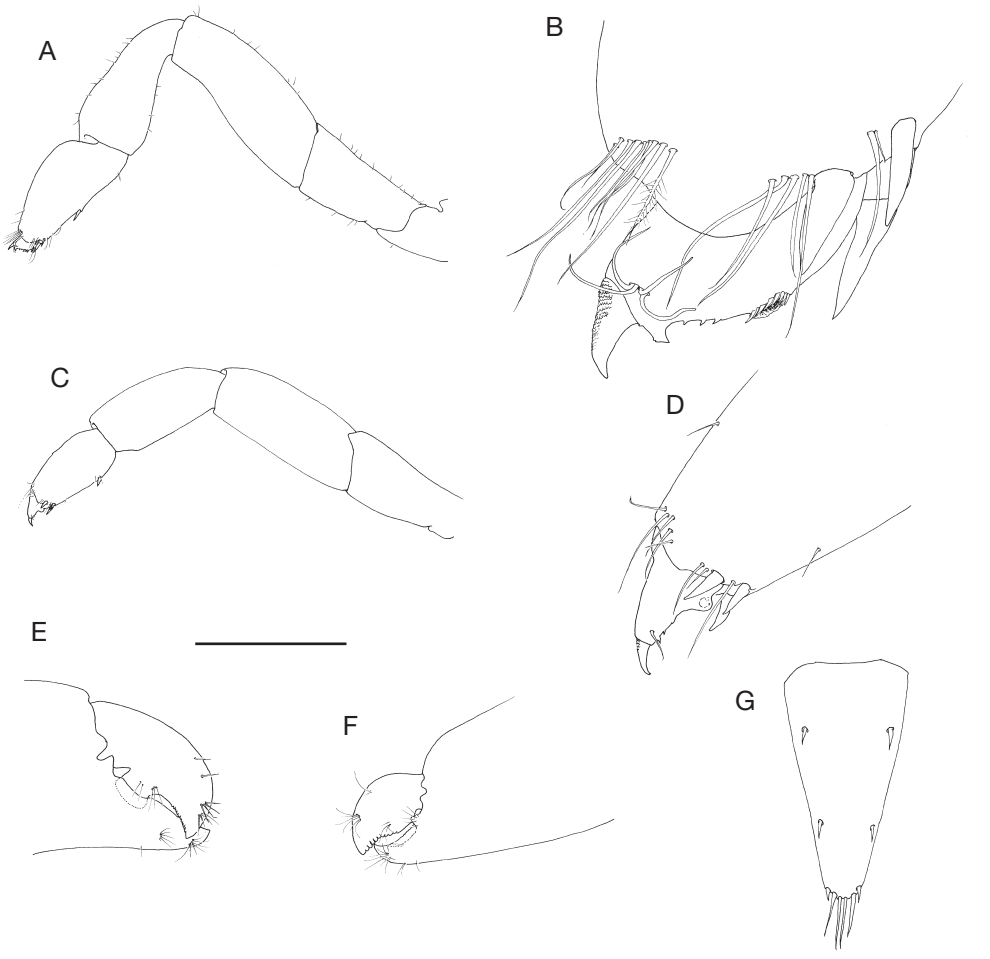

FIG. 10. — *Periclimenaeus jeancharcoti* Bruce, 1991: **A**, **B**, ovigerous ♀, pocl. 3.6 mm, Philippines (MNHN-Na 15247); **C**-**G**, ovigerous ♀, pocl. 1.2 mm, Philippines (MNHN-Na 15252); **A**, **C**, third pereiopod; **B**, **D**, idem, dactylus; **E**, second pereiopod, major chela; **F**, second pereiopod, minor chela; **G**, telson. Scale bar: A, C, E-G, 0.6 mm; B, D, 0.15 mm.

unequal and dissimilar. Major second chela with dactylus distally concave, denticulate, with about 25-30 denticles; fixed finger with distal cutting edge entire; ischium, and merus mesially armed with two rows of acute teeth. Minor second chela with strongly compressed dactylus with convex, sometimes sinuous – proximally convex and distally concave – denticulate cutting edge with about 20 rather large teeth increasing in size distally; fixed finger with entire cutting edge. Third pereiopod with propodus slightly shorter than carpus, propodus proximally broad, tapering distally, with two laterodistal spines one subdistal ventral spine and usually one spine at one third of ventral margin (sometimes three spines on ventral margin); dactylus stout with strongly curved unguis with transversal rows of scales at the dorsal surface proximally, corpus convex at flexor margin, with small distal accessory tooth, with patch of acute forward directed spines in centre of flexor margin, with few acute teeth distally from patch. The exopod of the uropod with well developed distolateral, mobile, distally straight, spine, not curved inward, and about twice as long as distolateral tooth.

REMARKS

With the description of *P. jeancharcoti*, Bruce (1991a: 378) discussed the systematic position of this species in relation to *P. minutus* Holthuis, 1952. The characters in which *P. minutus* differs from *P. jeancharcoti* are noted by Bruce: "The ambulatory dactyl is simply

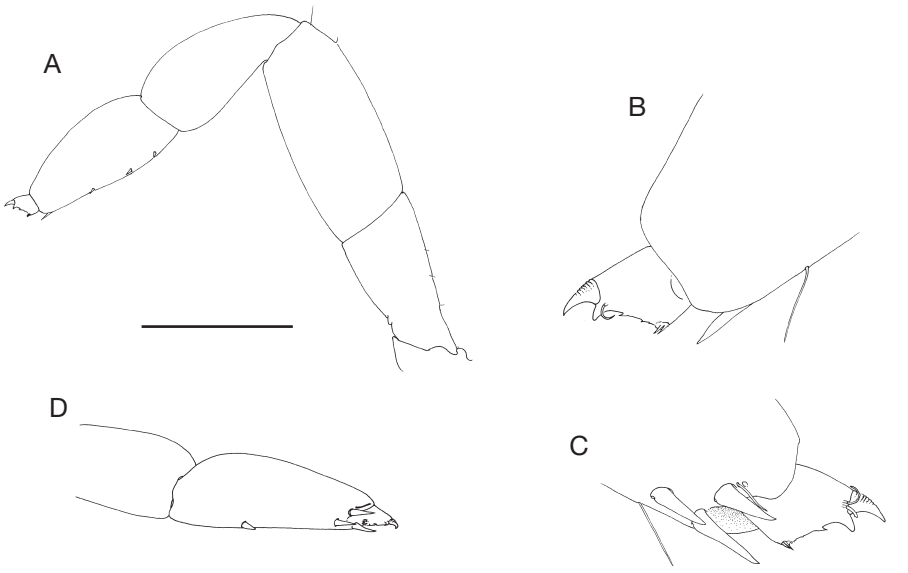

FIG. 11. — *Periclimenaeus minutus* Holthuis, 1952: **A**-**C**, ovigerous ♀ syntype, pocl. 1.8 mm; **D**, ♂ syntype, pocl. 2.0 mm; **A**, third pereiopod; **B**, **C**, idem, dactylus; **D**, idem, propodus and dactylus. Scale bar: A, D, 0.6 mm; B, C, 0.15 mm.

biunguiculate and the propod bears 3-4 small spines along its ventral border". In the original description of *P. minutus*, these three to four small spines are figured by Holthuis (1952: 135, fig. 58e) and described as: "The dactylus is about 1/5 of the length of the propodus, it is biunguiculate. The propodus is slightly less than thrice as long as broad, it is broadest at base and has the posterior margin provided with some spinules". The two syntypes of *P. minutus* have now been re-examined. The third pereiopod figured by Holthuis was found detached. As the male syntype is intact, this appendage must belong to the ovigerous female. Close examination of the dactylus (Fig. 11B, C) revealed the characteristic features described by Bruce for *P. jeancharcoti*. Apart from the subdistal ventral spine, three more spines are present on the ventral margin (Fig. 11A). Both third pereiopods of the male however, possess only one ventral propodal spine (Fig. 11D) like in the holotype of *P. jeancharcoti*. All specimens from Papua New Guinea and the Philippines have only one spine at one third of the ventral propodal margin. Although there seem to be no features to distinguish between *P. minutus* and *P. jeancharcoti*, I refrain from synonymizing the species here as the species are recorded from completely different host groups. *Periclimenaeus minutus* is recorded from a sponge host by Holthuis (1952) and by Bruce (1976b: 473; 1978: 121) while specimens of *P. jeancharcoti* are recorded from compound ascidians. A thorough comparison between specimens from both host groups could reveal if they belong to separate species or not.

The small ovigerous female specimen from *Didemnum granulatum* has only three dorsal rostral spines. As this is the only marked difference with the other specimens and the type material, the specimen is here regarded conspecific.

Except for the holotype of *P. jeancharcoti*, which was found in deep water (375-450 m), the specimens from Papua New Guinea and the Philippines were found in shallow water.

Periclimenaeus aff. ***jeancharcoti*** Bruce, 1991 (Fig. 12)

MATERIAL EXAMINED. — **Palau Islands.** Babeldaob, Ibobang, 7°30.58'N, 134°29.66'E, 10 m, in *Leptoclinides madara* Tokioka, 1953 (MNHN A2 LEP 73, see Monniot & Monniot 2001: 287), 11.VI.1996, coll. CRRF, 1 juvenile specimen pocl. 1.3 mm (R = 7/0) (MNHN-Na 15245).

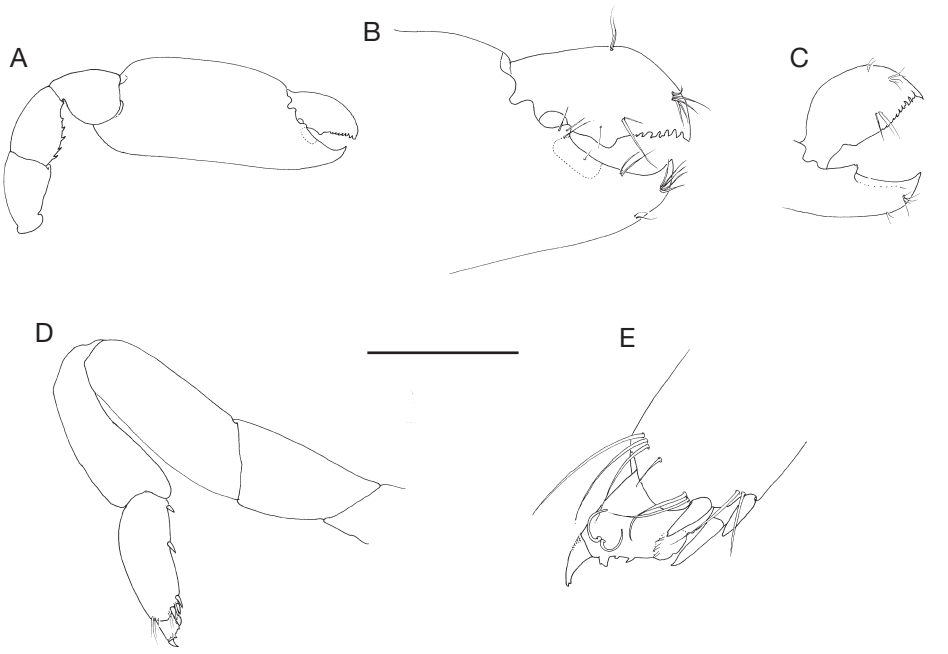

Fig. 12. — *Periclimenaeus* aff. *jeancharcoti* Bruce, 1991, specimen, pocl. 1.3 mm, Palau Islands (MNHN-Na 15245): **A**, major second pereiopod; **B**, idem, chela; **C**, second pereiopod, chela minor; **D**, third pereiopod; **E**, idem, dactylus. Scale bar: A, 1.5 mm; B-D, 0.6 mm; E, 0.15 mm.

Remarks

This specimen agrees with the description of *P. jeancharcoti* as provided by Bruce (1991a) except for features on the chela of the major second pereiopod. The dactylus of the chela has about seven large teeth as in the minor second pereiopod instead of the 25-30 small denticles in the distal part of the cutting edge. This could be an abberation, but might well be a specific character. The propodus of the third pereiopod has two spines in the proximal part of the ventral margin. As only this small specimen is available and not much is known about the infraspecific variation of *P. jeancharcoti*, I hesitate to describe it as a new species.

Periclimenaeus orbitocarinatus n. sp.
(Figs 13-15)

Type material. — **Loyalty Islands.** MUSORSTOM 6, stn DW 431, 20°22.25'S, 166°10.00'E, 21 m, in *Lissoclinum verrilli* (Van Name, 1902), 18.II.1989, coll. B. Richer de Forges, 1 ovigerous ♀ holotype pocl. 2.3 mm (minor P2 missing, telson broken) (MNHN-Na 15253).
Madagascar. MUA 76, in *Didemnum* sp., coll. P. Laboute, 1 ovigerous ♀ paratype pocl. 2.1 mm (RMNH D 51002).
Indonesia. Manado, 15 m, in *Didemnum* sp., 2 juvenile paratype specimens pocl. 1.1 mm (R = 2/0) and 1.4 mm (R = 2/0) (damaged, most pereiopods detached) (MNHN-Na 15254).

Etymology. — From the Latin "orbita" referring to the orbit of the eye, combined with the Latin "carina" meaning "ridge".

Description of female holotype

Body subcylindrical, slightly laterally compressed. Carapace smooth. Rostrum well developed, slender, acute, compressed, reaching to about distal margin of second segment of antennular peduncle, horizontal, straight, dorsal carina with four slender, acute teeth, subequal, oblique, proximalmost tooth more robust and less erect, tip of rostrum slender and acute, slightly upturned; lateral carina not developed; ventral lamina not developed. Postorbital ridge strongly developed as protruding carina in adult

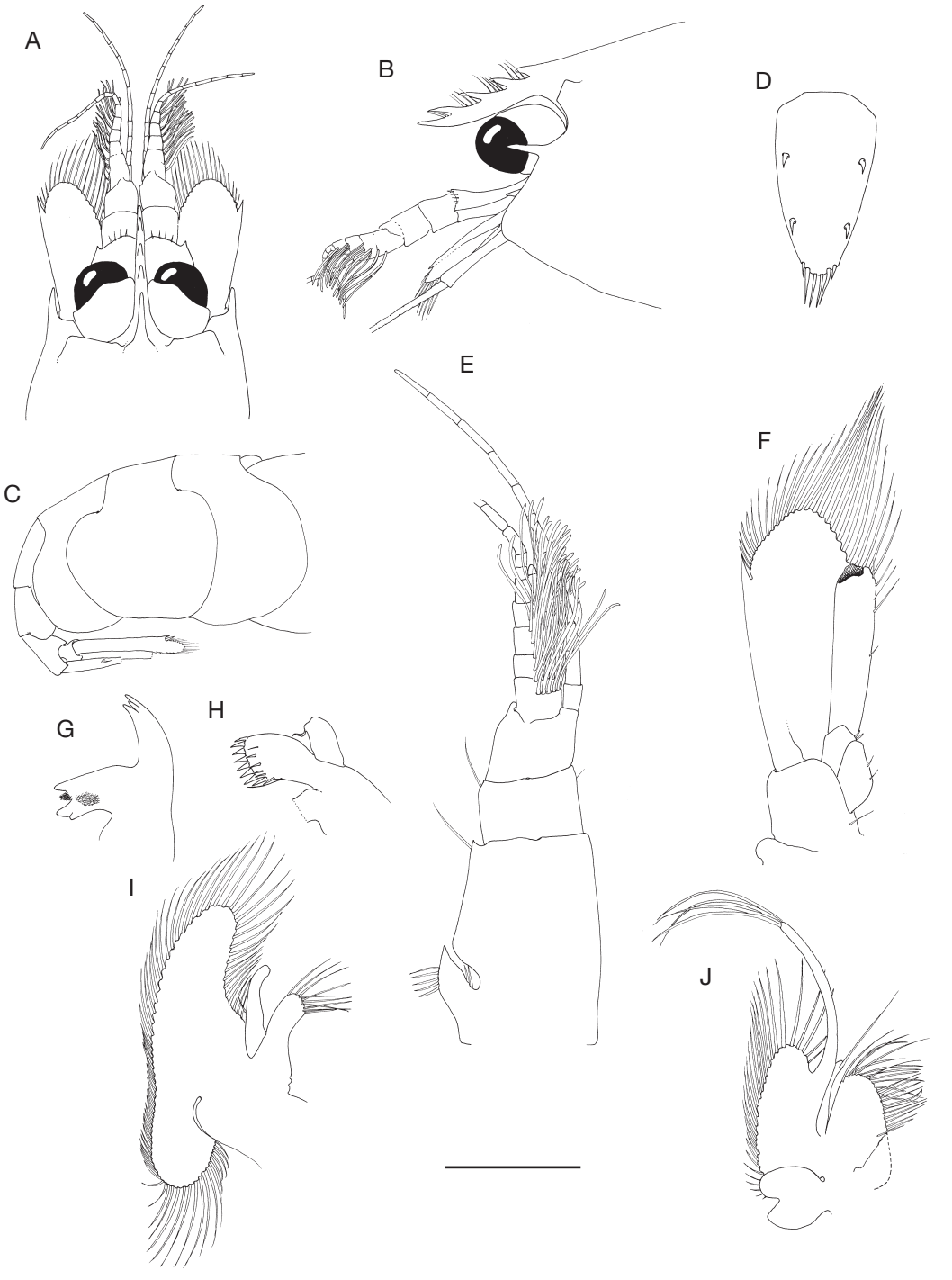

FIG. 13. — *Periclimenaeus orbitocarinatus* n. sp., ovigerous ♀ holotype, pocl. 2.3 mm, Loyalty Islands (MNHN-Na 15253): **A**, anterior region, dorsal aspect; **B**, idem, lateral aspect; **C**, abdomen, lateral aspect; **D**, telson; **E**, antennula; **F**, antenna; **G**, mandible; **H**, maxillula; **I**, maxilla; **J**, first maxilliped. Scale bar: A, B, D, 1 mm; C, 2 mm; E-J, 0.6 mm.

specimens. Antennal spine pronounced reaching cornea; inferior orbital angle slightly developed, rounded; anterior margin of carapace strongly produced, overreaching antennal spine.

Abdomen smooth, glabrous; first segment not anterodorsally produced; pleura broadly rounded, first three enlarged, fourth slightly produced, fifth small, feebly produced; fifth segment subequal to sixth segment length, sixth segment about as long as deep, depressed, posteroventral angle large, acute, posterolateral angle small, blunt, posterior dorsal margin unarmed. Telson broken.

Eyestalk robust, slightly longer than broad, wider than the hemispherical cornea, obliquely placed on eyestalk; eyestalk dorsomesially with excavation in which rostrum fits.

Antennula with peduncle and flagellum of moderate size. Basal segment 1.5 times longer than proximal width, with small acute distolateral tooth, anterior margin reduced; medioventral tooth absent; stylocerite short, reaching halfway basal segment, with acute tip, lateral margin with few plumose setae. Intermediate segment short, broader than long. Distal segment about as long as broad. Upper flagellum short, biramous, with five segments fused; short free ramus one-segmented; long free ramus with about 10 segments. Lower flagellum slender, about as long as upper flagellum.

Antenna with basicerite short, laterally unarmed, with antennal gland tubercle medially; ischiocerite and merocerite normal; carpocerite not overreaching scaphocerite, rather slender, about 4.4 times longer than distal width; flagellum slender, shorter than carapace; scaphocerite with small distolateral tooth, about 0.1 times as long as lamina, tooth not overreaching rounded distal margin of lamina, lamina slightly more than twice as long as maximum width.

Mandible with incisor process with three terminal teeth; molar process with three blunt teeth and two patches of setal brushes.

Maxillula with upper lacinia rectangular with about nine distal spines, with few simple setae in distal part; lower lacinia slender, triangular, with few simple distal setae; palp feebly bilobed, distal lobe obsolete, lower lobe rounded with small ventral tubercle with one simple curled seta.

Maxilla with basal endite developed, distal and proximal lobes fused, with about 10 long simple setae; coxal endite obsolete, median margin convex, without setae; scaphognathite large, posterior lobe with long plumose setae; palp simple, with one plumose seta on lateral margin.

First maxilliped with coxal and basal endites fused, broad, fringed with rows of long simple and serrulate setae; exopod well developed, flagellum with four long distal plumose setae; caridean lobe rather small, narrow; epipod bilobed; palp simple with one subdistal long plumose seta.

Second maxilliped with normal endopod; dactylar segment almost three times longer than broad, fringed with short, coarsely serrulate and longer curled, finely serrulate setae medially; propodal segment with row of long simple setae and long, slightly expanded distomedian margin; carpal segment short, broader than long, unarmed; meral segment without setae; ischial and basal segments fused, medially strongly excavate, without long plumose setae, with few short simple setae basally; exopod long, with four distal long plumose setae; coxal segment slightly produced medially, with two simple setae; epipod (lost in dissection) simple.

Third maxilliped with endopod rather short, reaching with ultimate segment to tip of rostrum; ischiomerus not broadened, about twice as long as broad, not tapered distally, median margin with long simple setae; basal segment with few simple setae; exopod reaching to half of penultimate segment, with one subdistal and four distal plumose setae; coxal segment with large lateral plate without setae; penultimate segment as long as ischiomerus, flattened, with rows of long simple setae; ultimate segment two thirds of penultimate segment length, also with rows of long simple setae.

First pereiopod slender, exceeding rostrum with chela, carpus and distal fourth of merus; chela subspatulate about four times longer than maximum width, subcylindrical; palm medially excavate; fingers slightly shorter than palm, with rows of serrulate setae in distal half; tip of dactylus with two blunt hooks; tip of fixed finger with three blunt hooks, middle hook largest; carpus 1.2 times length of chela, almost five times longer than distal width; merus slightly longer than carpus, slender, 5.2 times longer

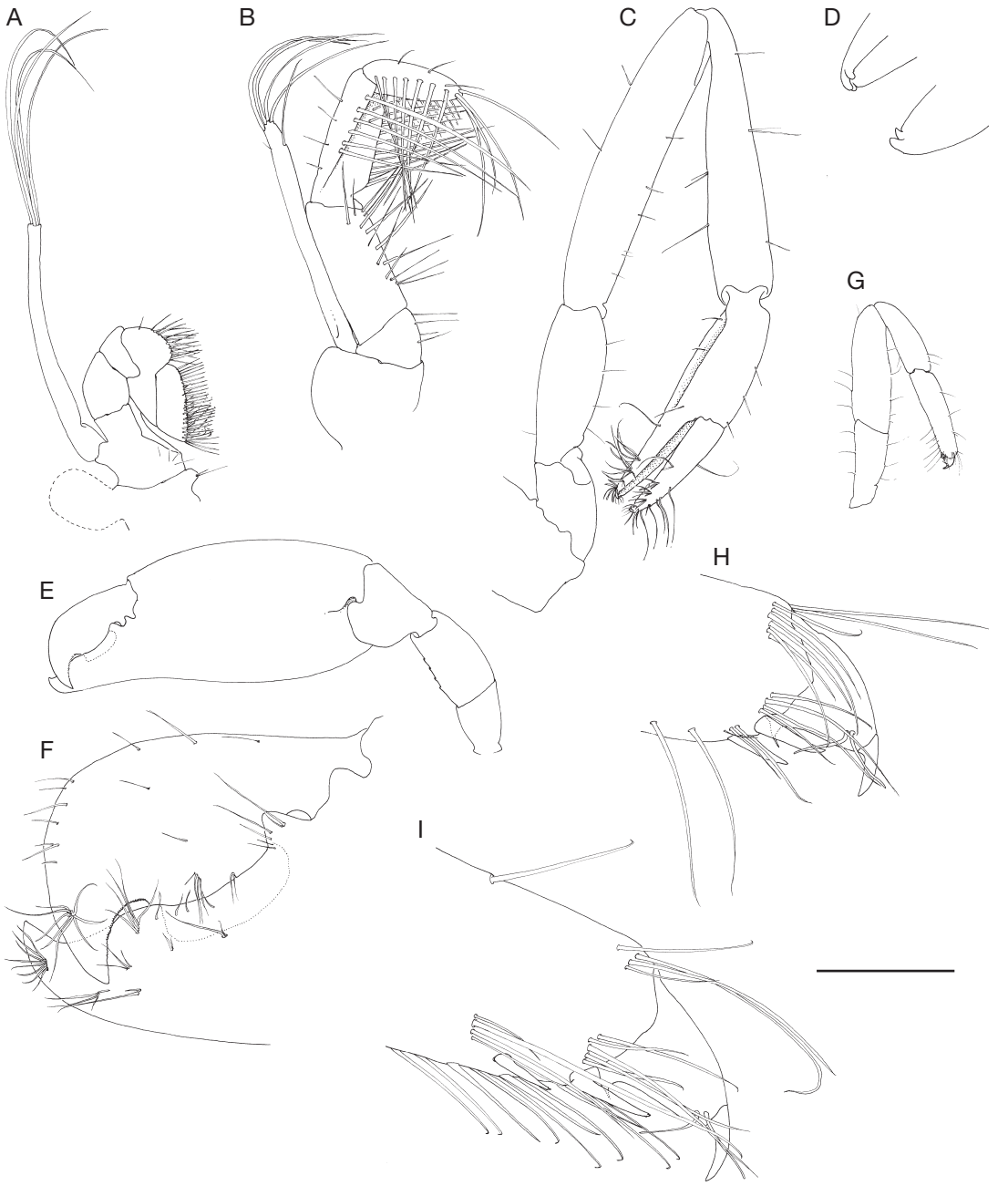

FIG. 14. — *Periclimenaeus orbitocarinatus* n. sp., ovigerous ♀ holotype, pocl. 2.3 mm, Loyalty Islands (MNHN-Na 15253): **A**, second maxilliped; **B**, third maxilliped; **C**, first pereiopod; **D**, idem, detail of tip of fingers of chela; **E**, major second pereiopod; **F**, idem, chela; **G**, third pereiopod; **H**, idem, dactylus; **I**, fifth pereiopod, dactylus. Scale bar: A-C, F, H, I, 0.6 mm; D, 0.15 mm; E, 2 mm; G, 1.5 mm.

than central width; ischium slightly broader than merus, half as long as merus, with few simple setae along median margin; basis half as long as ischium, unarmed; coxa without special features.

Major second chela very large, about twice postorbital carapace length; palm twice as long as fingers, proximally somewhat swollen; dactylus with large molar process in centre, distal cutting edge concave, denticulate, with about 50 small acute denticles; fixed finger with central fossa to receive molar process of dactylus, distal cutting edge entire, tip hooked; both fingers with groups of short simple setae in distal part; carpus small, triangular, about 1.2 times longer than distal width, 0.3 of palm length, unarmed, strongly tapered proximally; merus as long as carpus, 1.7 times longer than central width, median margin with about five blunt tubercles; ischium 0.6 of merus length, unarmed, tapered proximally.

Minor second chela not present.

Third ambulatory pereiopod stout, with short dactylus, strongly compressed, about 0.15 of propodus length, unguis distinct, conical, ventrally curved, about 0.4 of corpus length; corpus without distal accessory tooth, with acute proximal tooth perpendicular to straight corpus margin; propodus four times as long as proximal width, slightly tapered distally, with two laterodistal spines only, with sparse rather long simple setae; carpus 0.9 times as long as propodus, slightly expanded distally; merus 1.6 times longer than carpus, broad, 3.0 times longer than maximum width, unarmed; ischium half as long as merus, tapered proximally; basis and coxa without species features. Fourth and fifth pereiopods similar. Fifth pereiopod with distoventral part of propodus setulose, with one subdistal spine and two laterodistal spines.

The exopod of the uropod with well developed distolateral mobile spine which is distally straight, not curved inward, and about twice as long as distolateral tooth; endopod about as long as exopod.

Number of eggs *c.* 50. Embryo at point of hatching about 0.6 mm long.

Description of female paratype from Madagascar

As holotype except for less pronounced postorbital ridge. Telson almost twice as long as sixth abdominal segment, almost twice as long as anterior width, lateral margins straight, convergent, posterior margin rounded, about 0.26 of anterior margin width, with two pairs of small dorsal spines, about 0.09 of telson length, anterior pair submarginal at 0.36 of telson length, posterior pair also submarginal, at 0.72 of telson length; posterior margin rounded, without median point, with three pairs of posterior spines, lateral spines about as long as dorsal spines, intermediate spines twice as long as lateral spines, robust, submedian spines as long as intermediate spines but more slender, proximally setulose.

Minor second chela much smaller than major chela; with compressed dactylus with almost straight denticulate cutting edge with about 25 moderately large teeth increasing in size distally, a proximal excavation for receiving proximal blunt tooth of fixed finger; fixed finger with cutting edge distally with shallow blunt denticles, with proximal blunt triangular tooth; merus with very indistinct median tubercles.

Coloration

Not known.

Host

Found in association with *Diplosoma* sp., and in *Lissoclinum verrilli*.

Remarks

Similar to *P. myora*. In *P. myora*, the postorbital ridge is not developed as in the present specimens (Bruce 1998). The cutting edge of the fixed finger of the minor second chela is entire in *P. myora* while denticulate in the present species. Despite the large geographical distance between the specimen from Madagscar and the specimen from the Loyalty Islands, the differences are minor. In the specimen from the Loyalty Islands the postorbital ridge is more pronounced than in the specimen from Madagascar, no other differences have been found. The specimens from Manado are juveniles. The differences between these specimens and the adults from the Loyalty Islands and Madagascar could be related to size. The postorbital ridge is clearly present in the juveniles but not as pronounced as in the adults. The rostrum has only two dorsal

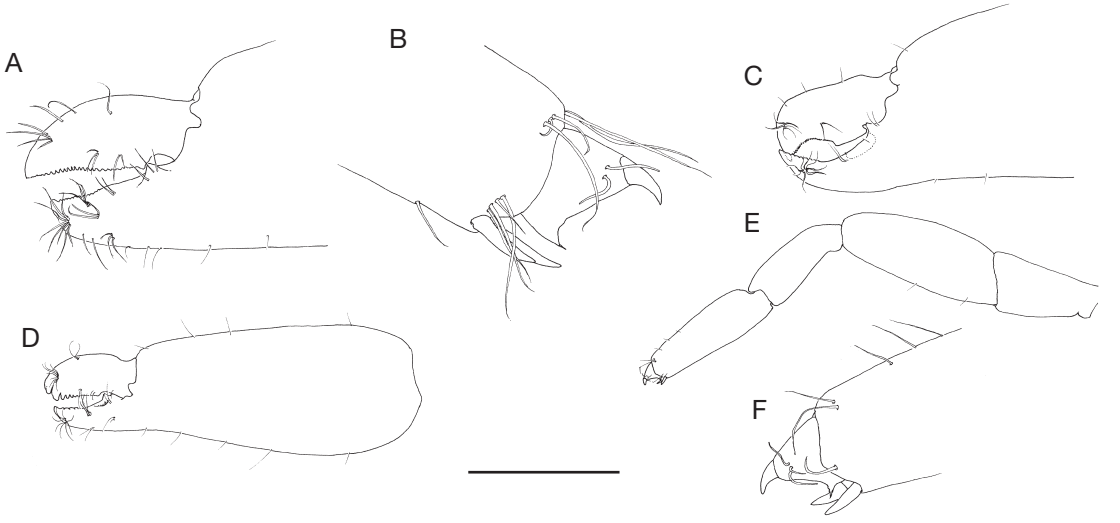

FIG. 15. — *Periclimenaeus orbitocarinatus* n. sp.: **A**, **B**, ovigerous ♀ paratype, pocl. 2.1 mm, Madagascar (RMNH D 51002); **C**-**F**, juvenile paratype specimen, pocl. 1.4 mm, Indonesia, Manado (MNHN-Na 15254); **A**, **D**, second pereiopod, minor chela; **C**, idem, major chela; **E**, third pereiopod; **B**, **F**, idem, dactylus. Scale bar: A, C-E, 0.6 mm; B, F, 0.15 mm.

teeth in the juveniles while four in the adults. The number of denticles on the dactylus of the major second chela is about 15 while around 50 in adults. The number of teeth on the dactylus of the minor chela is seven while about 25 in the adults.

Periclimenaeus pachydentatus Bruce, 1969 (Fig. 16)

Periclimenaeus pachydentatus Bruce, 1969: 162 (type locality: Great Barrier Reef, Australia, 14°12'N, 142°48'E, 35); 1974: 1583; 1981: 12; 1983a: 205; 1986: 166, figure on frontispiece; 1990: 16, 18; 1993: 834, fig. 3; 2002a: 581.

MATERIAL EXAMINED. — **Papua New Guinea.** Milne Bay Province, East Cape, Boia Boia, Waga Island, 10°12.26'S, 150°44.75'E, 18 m, in *Hypodistoma deerratum* (Sluiter, 1885) (MNHN A3 HYP.B 3, see Monniot & Monniot 2001: 249), 27.V.1998, 1 ♂ pocl. 3.2 mm (MNHN-Na 15255).

DIAGNOSIS. — Rostrum with six slender, acute, upright teeth, proximalmost tooth broad, flattened, at level of orbit, other teeth on rostrum proper, lamina narrow, distally curved upward, without distinct lateral carina, reaching distal margin of distal segment of antennular peduncle. Antennal spine strongly produced, reaching halfway cornea; supraorbital tubercles present; no postorbital ridge; inferior orbital angle developed, protruding; anterior margin of carapace straight, not produced. Telson with dorsal spines at 0.20 and 0.56 of length, about 0.14 times as long as telson length. Exopod of uropod with distolateral mobile spine twice as long as distolateral tooth. Eyestalk robust, slightly longer than broad; hemispherical cornea as wide as eyestalk. Scaphocerite with lamina overreaching carpocerite, with short distolateral tooth not overreaching distal margin of lamina. First pereiopod long and slender, overreaching rostrum with chela, carpus, and distal third of merus; chela spatulate. Major second pereiopod missing. Minor second chela with cutting edge of dactylus distally concave, denticulate; fixed finger with distal cutting edge entire; carpus unarmed; merus and ischium with ventromesial tubercles. Third pereiopod with propodus longer than carpus, slightly tapering distally, with two laterodistal spines and one subdistal spine and four spines along ventral margin; dactylus stout with small, strongly curved unguis, corpus straight at flexor margin, with hooked distal accessory tooth as long as unguis, with row of small acute denticles along flexor margin. The exopod of the uropod has a well developed distolateral mobile spine which is distally curved outward and about twice as long as the distolateral tooth.

DISTRIBUTION. — Previously recorded from the Great Barrier Reef, northern Australia, now recorded from Papua New Guinea for the first time.

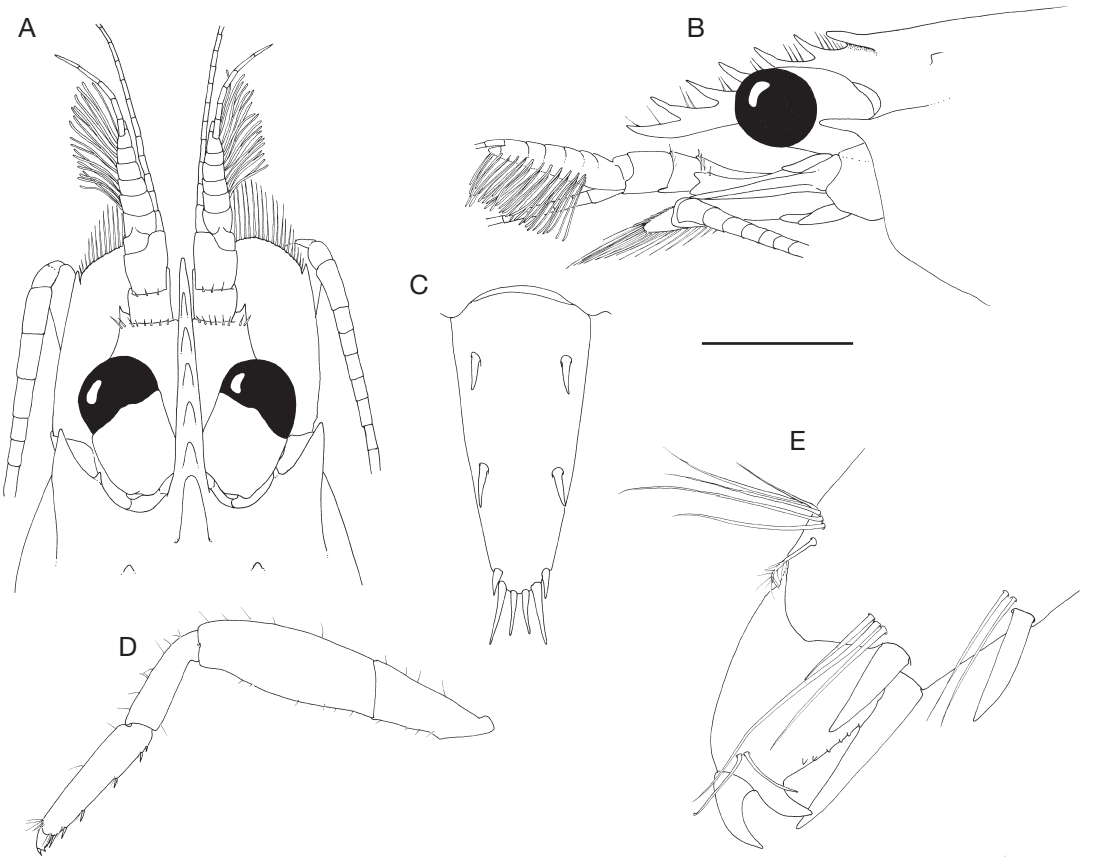

Fig. 16. — *Periclimenaeus pachydentatus* Bruce, 1969, ♂ pocl. 3.2 mm, Papua New Guinea (MNHN-Na 15255): **A**, anterior appendages, dorsal aspect; **B**, idem, lateral aspect; **C**, telson; **D**, third pereiopod; **E**, third pereiopod, dactylus. Scale bar: A-C, 1 mm; D, 1.5 mm; E, 0.15 mm.

Host

The compound ascidian *Hypodistoma deerratum*, from which is was previously recorded by Bruce (1981: 12).

Remarks

Similar to *P. spongicola* Holthuis, 1952 (types: RMNH D 4751) in having a flattened proximal rostral dorsal tooth; the strongly developed antennal spines, the place and length of the dorsal spines on the telson; and in the features on the dactylus of the third pereiopod. *Periclimenaeus spongicola* differs from *P. pachydentatus* in: 1) the less broad and flattened proximal rostral tooth; 2) the absence of supraorbital tubercles but presence of a ridge there; 3) the larger distolateral tooth on the scaphocerite; 4) the serrate distal cutting edge of the dactylus of the major second chela; 5) the shorter and compacter propodus of the third pereiopod; and 6) and the presence of only one ventral tooth on the propodus of the third pereiopod.

Periclimenaeus aff. ***spongicola*** Holthuis, 1952 (Fig. 17)

Periclimenaeus spongicola Holthuis, 1952: 14, 137, figs 60-62. — Bruce 1979: 235.

Material examined. — **Caroline Islands, Federated states of Micronesia.** Chuuk Lagoon, Nemoton Bay,

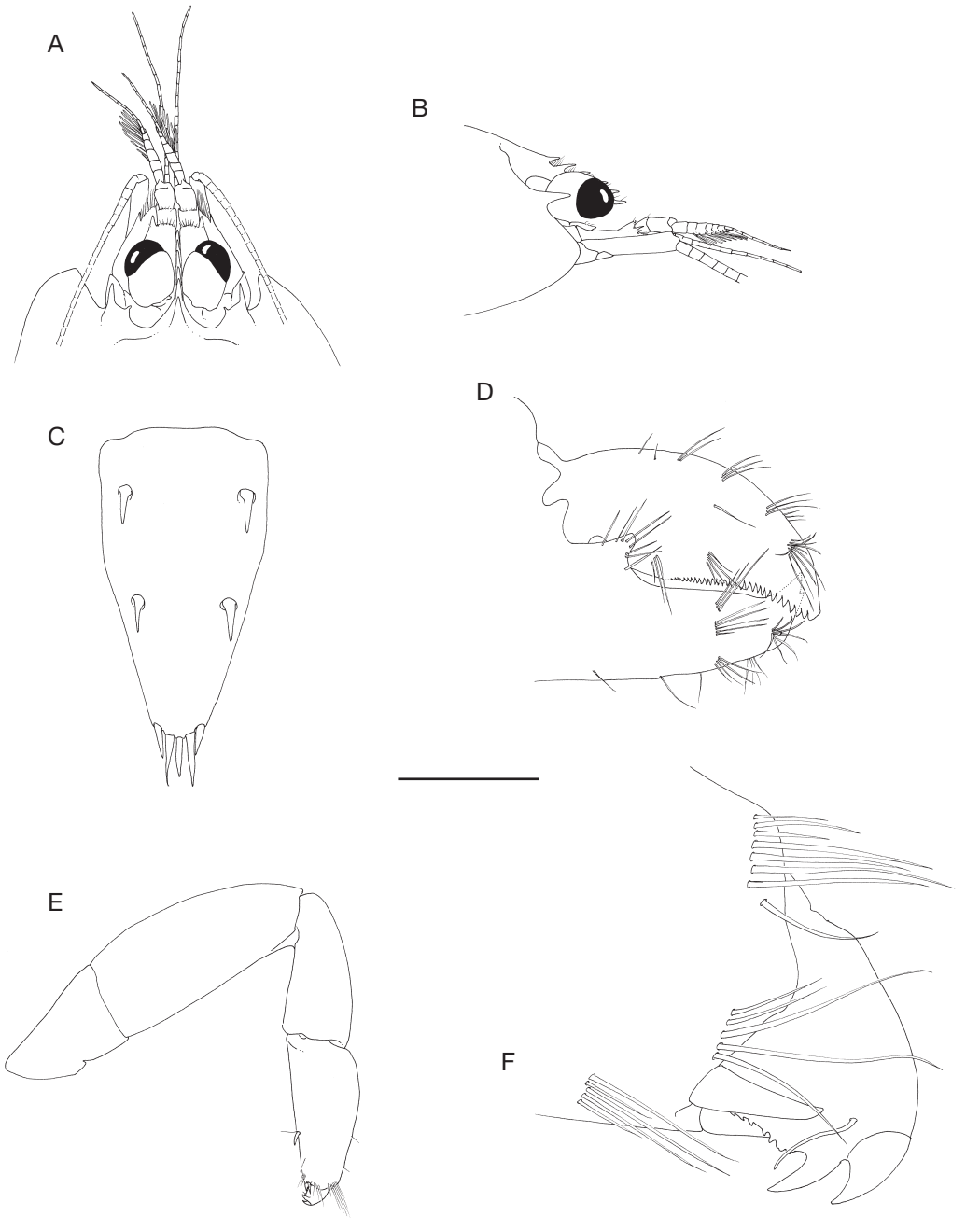

FIG. 17. — *Periclimenaeus* aff. *spongicola* Holthuis, 1952, ovigerous ♀, pocl. 4.1 mm, Papua New Guinea, Motupore (MNHN-Na 15257); **A**, anterior region, dorsal aspect; **B**, idem, lateral aspect; **C**, telson; **D**, second pereiopod, minor chela; **E**, third pereiopod; **F**, idem, dactylus. Scale bar: A, B, 2 mm; C, 1 mm; D, 0.6 mm; E, 1.5 mm; F, 0.15 mm.

Polle Reef, 7°21.54'N, 151°35.63'E, 10 m, in *Exostoma ianthinum* (Sluiter, 1909) (MNHN A3 Exo 8, see Monniot & Monniot 2001: 249), 9.VIII.1993, 1 ovigerous ♀ pocl. 4.3 mm (R = 5/0, second pereiopods missing) (MNHN-Na 15256).
Papua New Guinea. Port Moresby, Bootless Inlet, south Motupore Island, 9°31.81'S, 147°17.05'E, 3 m, in *Exostoma ianthinum* (Sluiter, 1909) (MNHN A3 Exo 7, see Monniot & Monniot 1996: 197), IV.1993, 1 ovigerous ♀ pocl. 4.1 mm (R = 5/0, major second pereiopod missing) (MNHN-Na 15257).

MATERIAL EXAMINED FOR COMPARISON. — **Indonesia.** Java Sea, *Gier* Expedition G. 12 E. 5, 4°41'S, 113°2'E, in sponge, 8.X.1908, 1 ovigerous ♀ holotype pocl. 2.5 mm (R = 6/0) (RMNH D 4751).

DIAGNOSIS. — Rostrum with five slender, acute, upright teeth, proximalmost tooth slightly broader, situated just in front of orbit, lamina narrow, distally curved upward, without distinct lateral carina, reaching distal margin of basal segment of antennular peduncle. Antennal spine strongly produced, almost reaching cornea; postorbital ridge distinct; inferior orbital angle developed, protruding; anterior margin of carapace produced, reaching beyond antennal spine. Telson with dorsal spines at 0.18 and 0.55 of length, about 0.14 times as long as telson length. Exopod of uropod with large distolateral mobile spine, three times as long as distolateral tooth. Eyestalk robust, slightly longer than broad, proximally swollen; hemispherical cornea as wide as eyestalk. Scaphocerite with lamina overreached by carpocerite, with moderate distolateral tooth not overreaching distal margin of lamina. First pereiopod long and slender, overreaching rostrum with chela, carpus, and distal two thirds of merus; chela spatulate. Second pereiopods missing in specimen from Caroline Islands. Major second pereiopod missing in specimen from Papua New Guinea. Minor second pereiopod dactylus with slightly concave distal cutting edge with many denticles, with small molar process proximally, dorsal margin dactylus semicircular; fixed finger with distal cutting edge entire; palm with minute tubercles; carpus unarmed; merus and ischium with indistinct ventromesial tubercles. Third pereiopod with dactylus with hooked unguis and larger recurved accessory tooth; with four to eight small teeth on straight flexor margin of corpus; propodus as long as carpus, triangular, tapered distally, with one spine at two thirds of ventral margin, with two distolateral spines.

REMARKS

The present specimens are differing from the holotype (Fig. 18) of *P. spongicola* in having: 1) the inferior orbital angle strongly produced while rounded in the holotype of *P. spongicola*; 2) the distolateral tooth of the basal antennular segment produced, reaching beyond the distal half of the second antennular segment while this tooth is small in the holotype of *P. spongicola*; and 3) the accessory tooth of the dactylus of the third pereiopod as large as the unguis while it is smaller than the unguis in *P. spongicola*. These differences are minor but could turn out to be species specific. *Periclimenaeus spongicola* has been found in an unidentified sponge (Holthuis 1952) and in the sponge *Mycale philippensis* (Dendy, 1896) (cf. Bruce 1979). As the present specimens are found in compound ascidians and differ from *P. spongicola* in several features, they probably represent a new species. Because of the absence of the major second pereiopod however, I refrain from describing them as new here.

DISCUSSION

Bruce (2002a: 577) noted sexual dimorphism in *P. tridentatus*. The males have the distal cutting edge of the major second cheliped dactylus entire while that of the females is denticulate. This could be the case in related species of which only one sex is known until now. This could have taxonomic consequences as the character has been used to discriminate between several species.

Most species in the genus *Periclimenaeus* that have the dactylus of the minor second pereiopod denticulate or serrate, are associated with ascidians. *Periclimenaeus spongicola* and *P. tridentatus* have been recorded from both sponges and ascidians. The only ascidian associated species of *Periclimenaeus* without a denticulate distal cutting edge in the dactylus of the minor second pereiopod is *P. serrula* Bruce & Coombes, 1995. Of some species the host is unknown. The denticulate cutting edge of the dactylus of the minor second pereiopod might well be an apomorphic character state (opposed to an entire cutting edge being the plesiomorphic state), and would almost completely separate the ascidian-associated species from the sponge-associated species. A comprehensive phylogenetic analysis of all species within *Periclimenaeus* combined with species from sister genera could evaluate this hypothesis.

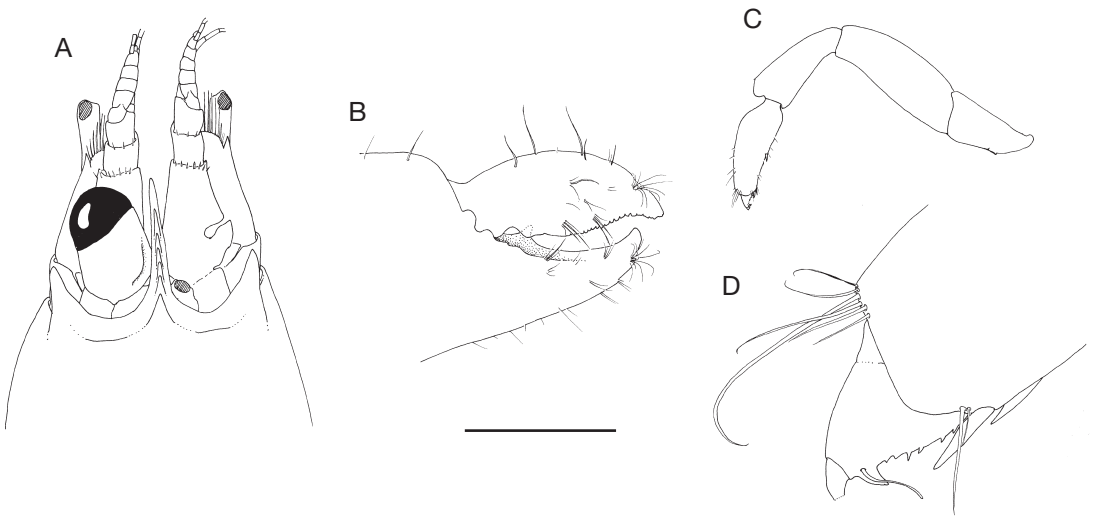

FIG. 18. — *Periclimenaeus spongicola* Holthuis, 1952, ovigerous ♀ holotype, pocl. 2.5 mm, Java Sea (RMNH D 4751): **A**, anterior region, dorsal aspect; **B**, second pereiopod, minor chela; **C**, third pereiopod; **D**, idem, dactylus. Scale bar: A, 1 mm; B, 0.6 mm; C, 1.5 mm; D, 0.15 mm.

KEY TO THE SPECIES OF *PERICLIMENAEUS* WITH THE CUTTING EDGE OF THE DACTYLUS OF THE MINOR SECOND PEREIOPOD DENTICULATE (*P. SERRULA* ADDED)

Abbreviations: **A**, ascidian host; **EA**, East Atlantic; **EP**, East Pacific; **IWP**, Indo-West Pacific; **S**, sponge host; **U**, host unknown; **WA**, West Atlantic.

1. Distal cutting edge of dactylus of minor second pereiopod denticulate 2
— Distal part of cutting edge dactylus of minor second pereiopod entire, that of major P2 denticulate; R = 4/0 ..... *P. serrula* Bruce & Coombes, 1995, IWP, A

2. Dactylus of ambulatory pereiopods with tooth on proximal border of corpus 3
— Dactylus without tooth in this position 14

3. Corpus with distal accessory spine 4
— Corpus without distal accessory spine 7

4. Rostrum without ventral teeth; dactylus of minor second pereiopod dentate throughout length of cutting edge; dactylus of ambulatory pereiopod very short and stout 5
— Rostrum with one subdistal ventral tooth; dactylus of minor second pereiopod with minute teeth at proximal end of cutting edge only; dactylus of ambulatory pereiopods more slender, with distal accessory tooth of corpus subterminal; R = 5/1 .... *P. manihinei* Bruce, 1976, IWP, U

5. Propodus of P3 without spines on proximal ventral margin 6
— Propodus of P3 with 3 spines on proximal ventral margin; R = 5/0 .... *P. wolffi* Bruce, 1993, IWP, U

6. Dorsal telson spines at 0.34 and 0.68 of telson length, small, about 0.1 of telson length; R = 3/0 ..... *P. tridentatus* (Miers, 1884), IWP, A+S
— Dorsal telson spines at 0.2 and 0.5 of telson length, large, more than 0.2 of telson length ..... *P. ascidiarum* Holthuis, 1951, WA, A

7. Dactylus of third pereiopod with proximal tooth perpendicular to margin 8
— Dactylus of third pereiopod with proximal tooth anteroverted 11

8. Dactylus of major second pereiopod with cutting edge distally denticulate 9
— Dactylus of major second pereiopod with cutting edge entire 10

9. Dorsal telson spines 0.15 times telson length; R = 4/0 ..... *P. atlanticus* (Rathbun, 1902), EA and Ascension Island, U
— Dorsal telson spines less than 0.1 times telson length; R = 3/0 ..... *P. myora* Bruce, 1998, IWP, U

10. Third pereiopod robust with propodus shorter than carpus; corpus of P3 dactylus concave; R = 2/0 ..... *P. nobilii* Bruce, 1974, IWP, A
— Third pereiopod slender with propodus longer than carpus; corpus of P3 dactylus convex; R = 3/0 ..... *P. storchi* Bruce, 1989, IWP, A

11. Dactylus of major second pereiopod with cutting edge denticulate distally 12
— Dactylus of major second pereiopod with cutting edge entire, R = 2-3/0 ..... *P. colodactylus* Bruce, 1996, IWP, A

12. No distinct postorbital carina 13
— Pronounced postorbital carina ..... *P. orbitocarinatus* n. sp., IWP, A

13. Dorsal spines of telson large, more than 0.1 of telson length; R = 3/0 ..... *P. diplosomatis* Bruce, 1980, IWP, A
— Dorsal spines of telson small, less than 0.1 of telson length; R = 5/0 ..... *P. zarenkovi* Ďuriš, 1990, IWP, U

14. Dactylus of ambulatory pereiopods with a distinct accessory tooth distally on corpus 15
— Dactylus of ambulatory pereiopods with corpus distally unarmed; R = 4-5/0 ..... *P. hecate* (Nobili, 1904), IWP, A

15. Proximalmost dorsal rostral tooth not flattened; no supraorbital tubercle or carina; dorsal spines on telson small, less than 0.1 of telson length; major P2 dactylus distally denticulate 16
— Proximalmost dorsal rostral tooth dorsally flattened; supraorbital tubercle present; dorsal spines on telson large, more than 0.2 of telson length; major P2 dactylus distally entire; R = 5/0 ..... *P. pachydentatus* Bruce, 1969, IWP, A

16. Corpus of dactylus of third pereiopod with denticles on flexor margin 17
— Corpus of dactylus of third pereiopod with flexor margin entire; R = 2/0 ..... *P. pacificus* Holthuis, 1951, EP, U

17. Merus of major second pereiopod with median teeth or tubercles; proximal dorsal surface of unguis of third pereiopod with transverse rows of scales; R = 5-7/0 ..... *P. jeancharcoti* Bruce, 1991, IWP, A
— Merus of major second pereiopod without median teeth or tubercles; proximal dorsal surface of unguis of third pereiopod entire; R = 6/0 ..... *P. spongicola* Holthuis, 1952, IWP, A+S

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APPENDIX

Systematic list of ascidian hosts (taxonomy after Monniot & Monniot 2001) and associated shrimps referred to in this study.

Ascidian host	Associated shrimp species
Order APLOUSOBRANCHIA	
Family POLYCITORIDAE Michaelsen, 1904	
Genus *Exostoma* Kott, 1990	
E. ianthinum (Sluiter, 1909)	*Periclimenaeus* aff. *spongicola* Holthuis, 1952
Genus *Hypodistoma* Tokioka, 1967	
H. deeratum (Sluiter, 1895)	*Periclimenaeus pachydentatus* Bruce, 1969
Family DIDEMNIDAE Giard, 1872	
Genus *Didemnum* Savigny, 1816	
Didemnum sp.	*Periclimenaeus jeancharcoti* Bruce, 1991
	Periclimenaeus orbitocarinatus n. sp.
D. granulatum Tokioka, 1954	*Periclimenaeus jeancharcoti* Bruce, 1991
Genus *Diplosoma* Macdonald, 1859	
D. inflatum F. Monniot, 1994	*Periclimenaeus diplosomatis* Bruce, 1980
D. versicolor F. Monniot, 1994	*Periclimenaeus* aff. *colodactylus* Bruce, 1996
Genus *Lissoclinum* Verrill, 1871	
L. verrilli (Van Name, 1902)	*Periclimenaeus orbitocarinatus* n. sp.
Genus *Leptoclinides* Bjerkan, 1905	
Leptoclinides sp.	*Periclimenaeus jeancharcoti* Bruce, 1991
L. madara Tokioka, 1953	*Periclimenaeus* aff. *jeancharcoti* Bruce, 1991
L. subviridis (Sluiter, 1909)	*Periclimenaeus jeancharcoti* Bruce, 1991
L. uniorbis Monniot & Monniot, 1996	*Periclimenaeus jeancharcoti* Bruce, 1991
Order PHLEBOBRANCHIA	
Family DIAZONIDAE Seeliger, 1906	
Genus *Rhopalaea* Philippi, 1843	
Rhopalaea sp.	*Dactylonia ascidicola* (Borradaile, 1898)
Family ASCIDIIDAE Herdman, 1882	
Genus *Ascidia* Linnaeus, 1767	
A. divisa Tokioka, 1953	*Dactylonia ascidicola* (Borradaile, 1898)
A. interrupta Heller, 1878	*Ascidonia miserabilis* (Holthuis, 1951)
A. mentula Müller, 1776	*Ascidonia flavomaculata* (Heller, 1864)
A. ornata Monniot & Monniot, 2001	*Dactylonia ascidicola* (Borradaile, 1898)
A. sydneiensis Stimpson, 1855	*Rostronia stylirostris* (Holthuis, 1951)
Genus *Phallusia* Savigny, 1816	
P. julinea Sluiter, 1919	*Dactylonia ascidicola* (Borradaile, 1898)
Family PLURELLIDAE Kott, 1973	
Genus *Plurella* Kott, 1973	
P. colini Monniot & Monniot, 2004	*Dactylonia holthuisi* Fransen, 2002
P. monogyna Monniot & Monniot, 2000	*Dactylonia holthuisi* Fransen, 2002
Plurella sp.	*Dactylonia holthuisi* Fransen, 2002
Order STOLIDOBRANCHIA	
Family STYELIDAE Sluiter, 1895	
Genus *Polycarpa* Heller, 1877	
P. arnoldi (Michaelsen, 1914)	*Dactylonia anachoreta* (Kemp, 1922)
P. aurata (Quoy & Gaimard, 1834)	*Odontonia katoi* (Kubo, 1940)
	Odontonia sibogae (Bruce, 1972)
P. captiosa (Sluiter, 1885)	*Odontonia katoi* (Kubo, 1940)
P. camptos Monniot & Monniot, 2001	*Odontonia rufopunctata* Fransen, 2002
P. cryptocarpa (Sluiter, 1885)	*Odontonia katoi* (Kubo, 1940)
	Odontonia maldivensis n. sp.
P. mytiligera (Savigny, 1816)	*Odontonia* sp.
P. nigricans (Heller, 1878)	*Odontonia katoi* (Kubo, 1940)
	Pseudopontonia minuta (Baker, 1907)
P. pigmentata (Herdman, 1906)	*Odontonia rufopunctata* Fransen, 2002

Ascidian host	Associated shrimp species
Polycarpa sp.	*Odontonia katoi* (Kubo, 1940)
	Odontonia maldivensis n. sp.
Family PYURIDAE Hartmeyer, 1908	
Genus *Herdmania* Lahille, 1888	
Herdmania sp.	*Ascidonia quasipusilla* (Chace, 1972)
Genus *Pyura* Molina, 1782	
P. albanyensis Michaelsen, 1927	*Odontonia katoi* (Kubo, 1940)
P. gangelion (Savigny, 1816)	*Odontonia katoi* (Kubo, 1940)
Genus *Microcosmus* Heller, 1877	
M. exasperatus Heller, 1878	*Ascidonia quasipusilla* (Chace, 1972)