Poripontonia dux gen. nov., spec. nov., a sponge associated shrimp (Crustacea, Decapoda, Caridea, Palaemonidae, Pontoniinae) from Indonesia

C.H.J.M. Fransen

Fransen, C.H.J.M. *Poripontonia dux* gen. nov., spec. nov., a sponge associated shrimp (Crustacea, Decapoda, Caridea, Palaemonidae, Pontoniinae) from Indonesia.
Zool. Verh. Leiden 345, 31.x.2003: 129-138, figs 1-7.— ISSN 0024-1652/ISBN 90-73239-89-3.
Charles H.J.M. Fransen, Nationaal Natuurhistorisch Museum, Postbus 9517, 2300 RA Leiden, The Netherlands (e-mail: fransen@naturalis.nnm.nl).

Key words: Crustacea; Decapoda; Caridea; Palaemonidae; Pontoniinae; *Poripontonia* new genus; new species; sponge associate; Indonesia.
A new genus and species of sponge associated shrimp from Indonesia is described and depicted. The systematic position of the new genus is discussed.

Introduction

During fieldwork in 2001 on the Island of Bali, Indonesia, a small pontoniine shrimp was collected by Nicole de Voogd. The shrimp was found living in the internal cavities of a sponge. Several pontoniine genera contain species that are associated with sponges (Fransen, 1997). Of these, *Apopontonia* (3 species), *Climeniperaeus* (1 species), *Epipontonia* (3 species), *Nippontonia* (1 species), *Onycocaridella* (3 species), *Onycocaridytes* (1 species), *Onycocaris* (12 species), *Orthopontonia* (1 species), *Paraclimenaeus* (1 species), *Periclimenoides* (1 species), *Thaumastocaris* (1 species), *Typton* (8 species), and *Typtonychus* (4 species) are obligate associates of sponges. The genus *Periclimenaeus* (43 species) comprises 30 species known to be associated to sponges. The genera *Hamiger* (1 species) and *Exopontonia* (1 species) are probably sponge associates although not confirmed (Bruce, 1994). The present species does not key out in any of these genera (nor in any other pontoniine genus) using the keys to pontoniine genera provided by Holthuis (1993: 118) and Bruce (1994: 12).

Systematic part

Poripontonia gen. nov.

Definition.— Moderately sized pontoniine shrimps associated with sponges. Body form cylindrical. Rostrum strongly developed, long and robust with large spaced dorsal and ventral teeth. Hepatic, supra-orbital or para-orbital spines absent. Antennal spine robust. Orbit developed, inferior orbital angle rounded. Abdomen with pleura broadly rounded. Telson with two pairs of submarginal dorsal and three pairs of terminal spines. Eyes normal. Antennula and antenna normal; scaphocerite well developed. Mandible without palp; incisor process normal, not reduced; molar process slender, without rounded lobes. Maxillula and maxilla normal; distal endite of maxilla bilobed. First maxilliped with setiferous palp, basal and coxal endites fused, caridean lobe narrow, feebly bilobed epipod present. Second maxilliped without epipod. Third

maxilliped robust, ischiomerus not fused with basis, arthrobranch absent. Maxillipeds with well developed slender exopods. Fourth thoracic sternite unarmed. First pereiopods normal, fingers subspatulate with distal lateral teeth modified to form interdigitating teeth; fixed finger with lateral subdistal tooth. Second pereiopods relatively small, compressed, similar and equal, with single proximal tooth on cutting edges. Ambulatory pereiopods slender, dactylus simple, long and slender. Uropods with lateral margin of exopod entire, ending in acute tooth with mobile spine.

Type species.— *Poripontonia dux* spec. nov.

Etymology.— From the generic name *Pontonia* and the prefix Pori- from Porifera, in reference of the host group of this genus. Gender: feminine.

Systematic position.— The present genus seems related to *Epipontonia* Bruce, 1977, from which it differs in the absence of a para-orbital spine and in having the ischiomerus of the third maxilliped not fused to the basis. Also the rostrum is remarkably different from species of *Epipontonia* (*E. spongicola* Bruce, 1977, *E. anceps* Bruce, 1983, and *E. hainanensis* Li, 1999). It is much longer than in the other sponge associated genera (except *Thaumastocaris*) and has an unusual dental configuration, which could be an aberration due to damage and subsequent regeneration.

In relation to the other sponge associated pontoniine genera, the present genus shares the absence of an epipod on the second maxilliped with *Epipontonia* and several species of *Onycocaris* and *Typton*. This character state is also present in several Coelenterate associated monospecific genera: *Anapontonia* (*A. denticauda* Bruce, 1966), *Metapontonia* (*M. fungiacola* Bruce, 1967), *Paratypton* (*P. siebenrocki* Balss, 1914), and sometimes in *Hamodactyloides* (*H. incompletus* (Holthuis, 1958)). The reduction of the epipod in these genera could partly be the result of parallel evolution. The presence of modified interdigitating teeth on the fingers of the first pereiopods is an apomorphic character state shared with *Epipontonia* species and *Periclimenaeus djiboutensis* Bruce, 1970. With *Epipontonia* it also shares the long simple dactyli on the ambulatory pereiopods that are not known from other sponge associated genera.

Poripontonia dux spec. nov.
(figs 1-6)

Material examined.— 1 non-ovigerous female, pocl. 3.4 mm; RMNH D 50401: BAL.17; Tanjung Benoa, Loloan Benoa; 08°45′46′′S 115°14′01′′E; slowly declining reef slope, sandy base; scuba-diving to 25 m depth; 7.iv.2001; in *Neopetrosia* spec. (det. N. de Voogd); collected by N. de Voogd, nr. 88.

Description of female holotype.— A small sized pontoniine shrimp, with subcylindrical body form. Carapace smooth. Rostrum well developed, slightly more than twice as long as antennular peduncle; dorsal margin straight, with 3 large teeth on rostrum proper, no postorbital teeth; proximalmost tooth at level of midlength of first segment of antennular peduncle, second tooth just behind distalmost tooth, distal tooth largest, overreaching distal tip of rostrum; scattered simple setae between and on dorsal teeth. Ventral margin straight, without setae, with one distal ventral tooth overreaching apex of rostrum. The aberrant distal part of the rostrum could be the result of damage followed by partial regeneration. Inferior orbital angle rounded, slightly protruding. Antennal spine strong, acute, marginal. No supra-, para- or infra-orbital nor hepatic spines present. Anterolateral margin straight, anteroventral angle rounded.

Abdomen smooth; sixth segment about 1.2 times longer than fifth, 0.85 times as long as wide, posteroventral angle with small tooth, posterolateral angle rounded, not produced; pleura of first five segments broadly rounded.

Telson 1.7 times longer than sixth abdominal segment, 1.7 times longer than proximal width; lateral margins almost straight; posterior border without median process; two pairs of dorsal spines situated at 0.4 and 0.7 of telson length, both submarginal, length about 0.08 of that of telson; posterior margin with three pairs of spines, lateral spines short, subdistal and marginal; intermediate pair longest, about 3 times length of lateral spines; submedian spines slender, plumose, slightly shorter than intermediate pair.

Eyestalk slightly longer than proximal width, cylindrical, swollen proximally; cornea globular, hemispherical; without discernible accessory pigment spot.

Antennula well developed. Basal segment of antennular peduncle twice as long as proximal width, with acute, strongly produced distolateral tooth almost reaching distal margin of intermediate segment, anterior margin developed, convex; medioventral tooth of moderate size, acute, submarginal, situated at 2/3rd of basal segment; stylocerite short, almost half length of basal segment, with acute tip, lateral margin slightly convex with few short plumose setae. Intermediate segment about as long as broad. Distal segment as long as intermediate segment. Upper flagellum biramous, with 8 proximal segments fused; short free ramus indistinctly one-segmented; longer, slender free ramus of about 8 segments; lower flagellum slightly longer than upper flagellum.

Antenna with basicerite short, laterally armed with small blunt tooth, with antennal gland tubercle medially; ischiocerite and merocerite normal; carpocerite extending to 2/3rds of scaphocerite, 3 times as long as distal width; flagellum slightly longer than postorbital carapace length; scaphocerite with lamina about 3 times longer than wide, anterior margin truncate, lateral margin slightly convex; distolateral tooth robust, 1/8th of length of lamina (incl. distolateral tooth), overreaching distal lamina. Epistome with blunt anterior median carina; labrum broad.

Paragnath with alae rectangular; corpus small, short, with submedian carinae.

Thoracic sternites very narrow, unarmed.

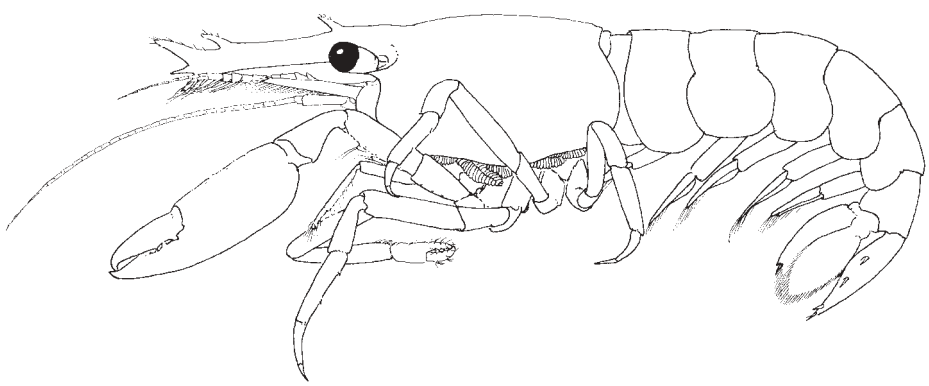

Fig. 1. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401, lateral aspect.

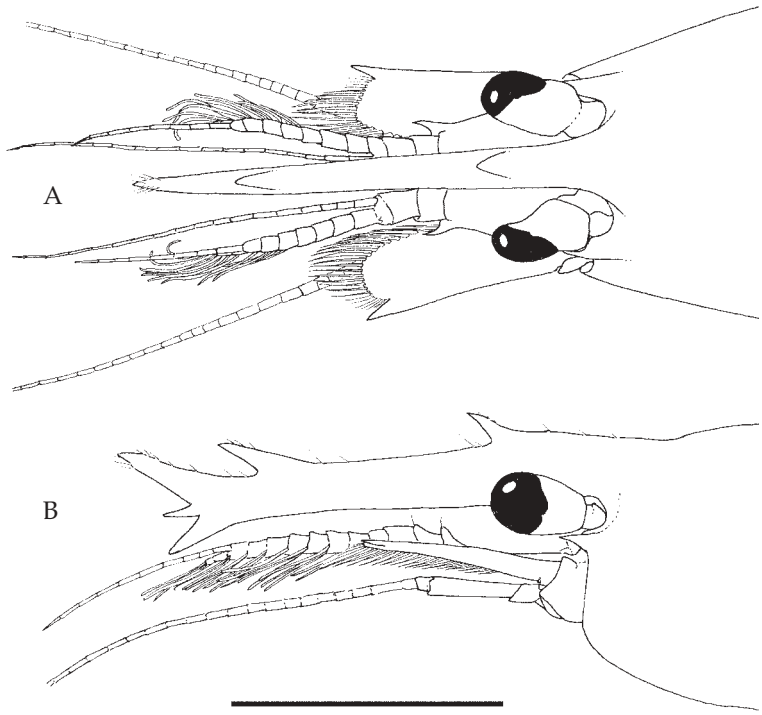

Fig. 2. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, anterior appendages, dorsal view; B, idem, lateral view. Scale: 2 mm.

Mandible without palp; with 6 small distal teeth on slender incisor process of left mandible, without denticles along ventromedial margin; molar process slender, with distal ring of small very acute teeth.

Maxillula with upper lacinia moderately broad, with several rows of setulose spines and setae along medial margin; lower lacinia short and slender, with setulose setae distoventrally; palp bilobed, larger lobe with two medial tubercles with single, short, recurved, simple setae.

Maxilla with basal endite robust, well developed, bilobed; distal lobe broad rectangular, with many setulose, long setae along medial margin, row of few plumose setae along distolateral margin; proximal lobe smaller than distal lobe, with many setulose, long setae along medial margin. Coxal endite with medial margin not produced, without setae. Scaphognathite rather narrow. Palp simple, short, tapering to blunt point distally, not extending beyond distal lobe of basal endite, with few plumose setae along proximal lateral margin.

First maxilliped with coxal and basal endite completely fused, broad, fringed with many finely serrulate setae along entire median margin; exopod well developed, flagellum broad, laminar, with 6 long plumose setae distally; caridean lobe rather small; epipod well developed, bilobed; palp simple, short, as long as distal margin of basal endite, with 2 plumose setae ventrally.

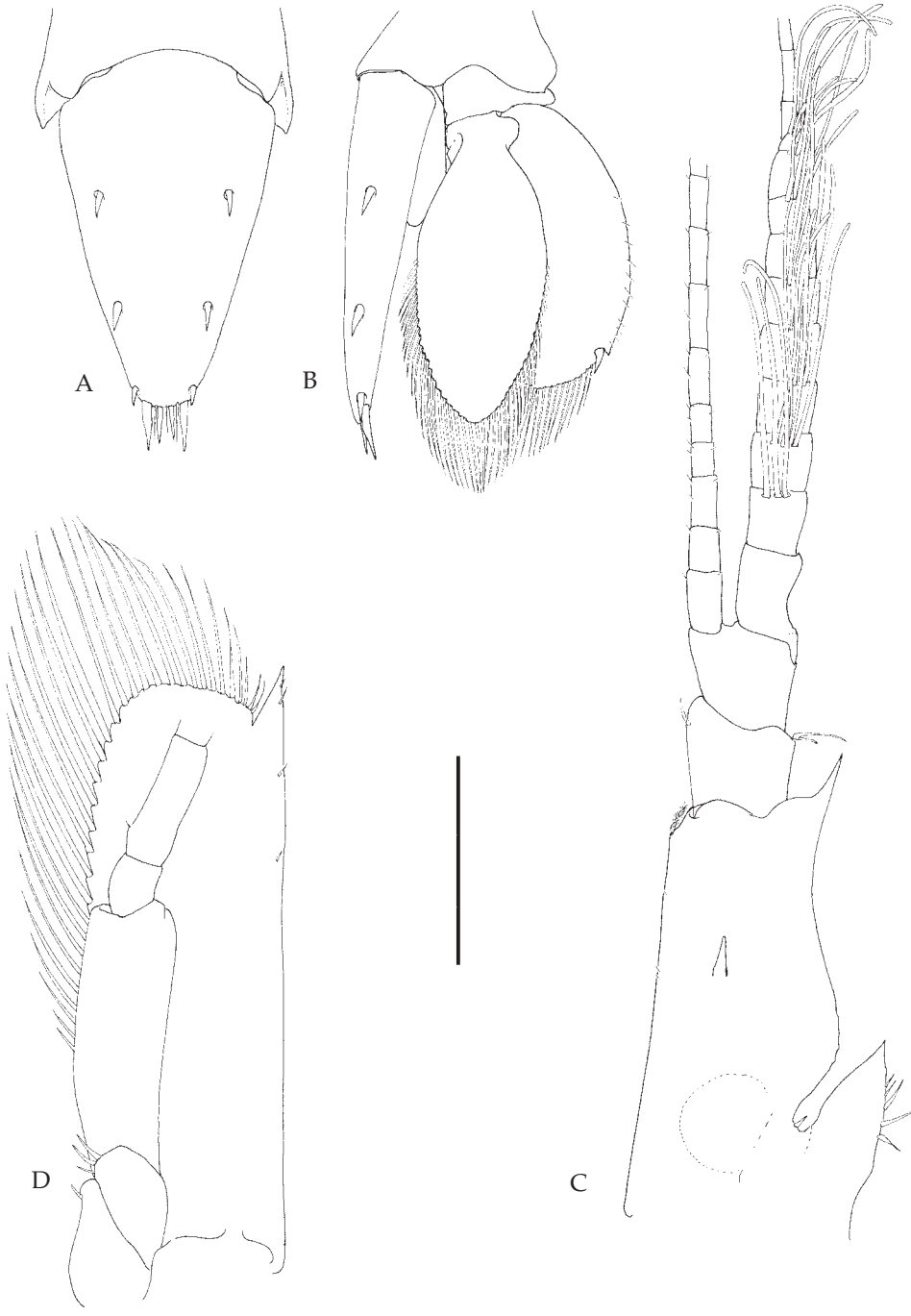

Fig. 3. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, telson dorsal view; B, telson and uropods, lateral view; C, Antennula, ventral view; D, antenna, ventral view. Scale: A, B = 1 mm; C, D = 0.6 mm.

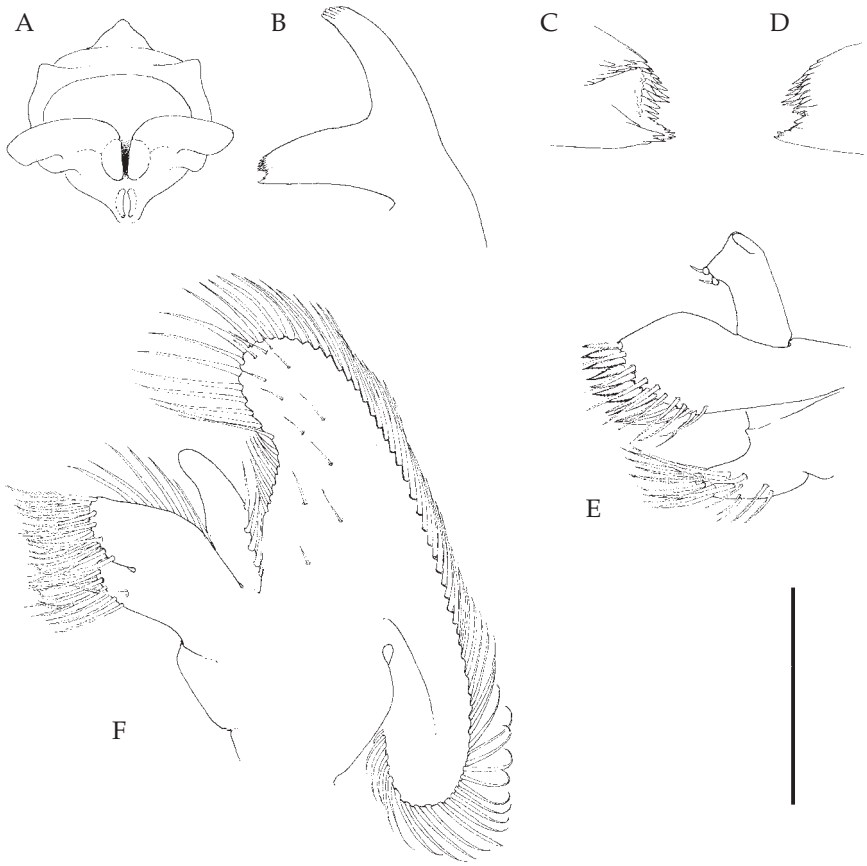

Fig. 4. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, paragnath; B, left mandible, ventral aspect; C, idem, molar process, dorsal view distal part; D, idem, ventral view distal part; E, left maxillula, ventral view; F, maxilla, ventral view. Scale: A = 1 mm; B, E, F = 0.6 mm; C, D = 0.15 mm.

Second maxilliped with well-developed endopod. Dactylar segment narrow, about 3.4 times longer than broad, densely fringed with coarsely serrulate spiniform, and long curled finely serrulate setae medially. Propodal segment with row of long spines and simple and finely serrulate setae along rounded distomedial margin; distomedial margin not produced; ventrolateral margin without setae. Carpal segment short, triangular, unarmed, with well-developed rounded medial lobe. Merus normal. Basal and ischial segment fused, medially excavate; exopod normal, with long plumose setae in distal part. Coxa medially produced, rounded, without setae; no epipod.

Third maxilliped extending anteriorly to level of distal margin of scaphocerite. Ischiomerus not fused with basis, about 3.7 times longer than broad, with row of few simple setae along median margin, ventral surface with few setae distally, lateral margin with row of few short simple setae distally. Basal segment medially straight, not convex, without setae; exopod well developed, as long as ischiomeral segment, flat-

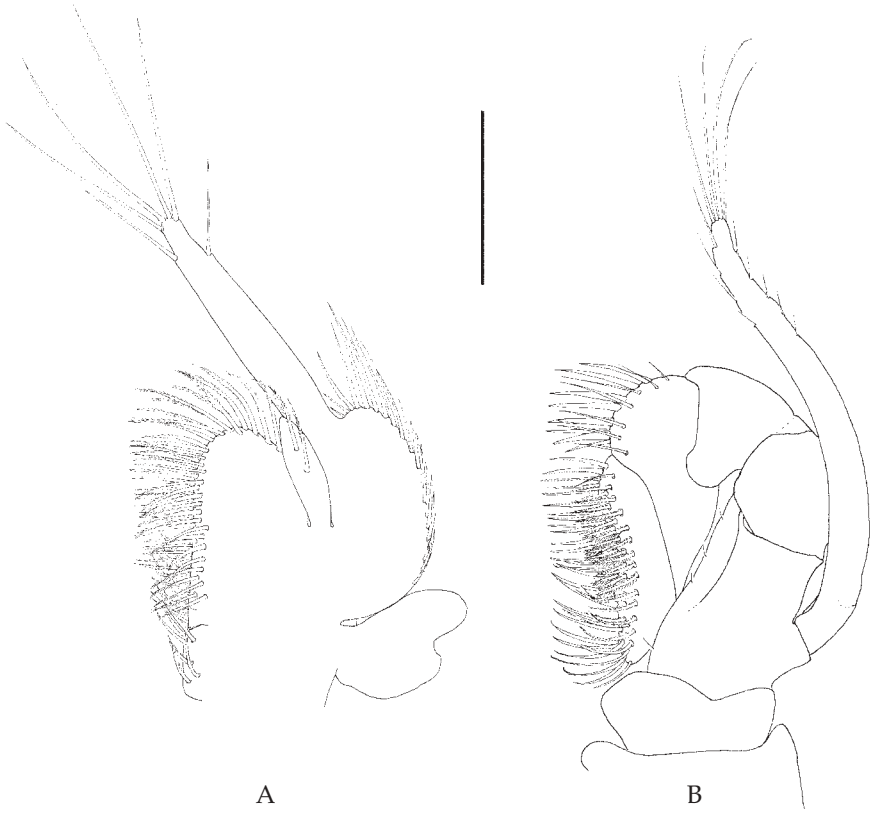

Fig. 5. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, left first maxilliped, ventral view; B, left second maxilliped, ventral view. Scale = 0.6 mm.

tened, broad, with short setae in distal half and 4 long plumose setae at tip. Coxa without medial process, with rounded lateral plate, without setae, without arthrobranch. Penultimate segment about 5.6 times longer than broad, about 0.8 of ischiomeral length, with long, finely serrulate setae ventromedially. Ultimate segment half as long as penultimate segment, tapering distally, with long coarsely serrulate setae medially and distally.

First pereiopods slender, exceeding antennular peduncle with carpus and chela. Chela about 2.9 times longer than deep, subcylindrical; fingers about as long as palm, with cutting edges entire, with groups of many serrulate setae, with tip acute, hooked. Carpus about 1.6 times longer than chela, 4.7 times longer than distal width, somewhat tapering proximally, unarmed, with few simple setae; cleaning organ well developed on carpal-propodal joint. Merus as long as carpus, five times longer than central width, unarmed, with few simple setae. Ischium 0.35 times merus length, slightly expanded medially, with few simple setae. Basis as long as ischium; coxa without special features.

Second pereiopods equal, similar, extending beyond antennular peduncle with

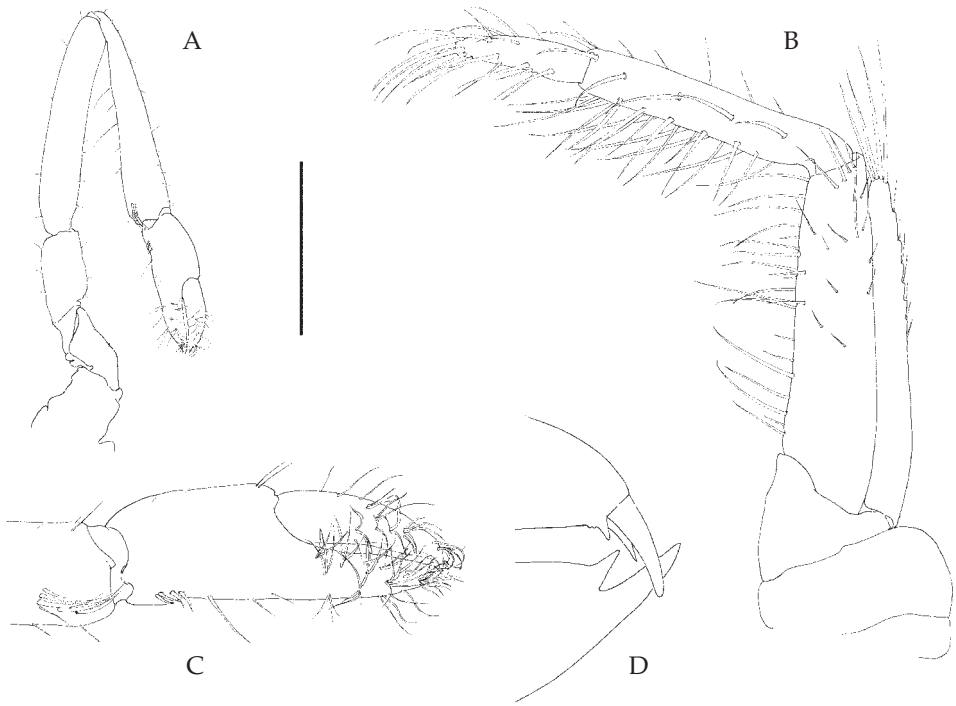

Fig. 6. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, left third maxilliped, ventral view; B, first pereiopod; C, idem, detail chela; D, idem, detail distal part fingers, setae omitted. Scale: A, C = 0.6 mm; B = 1.5 mm; D = 0.15 mm.

chela. Chela compressed; palm with small denticle dorsally, with row of simple setae along ventral margin; fingers 0.65 of palm length, triangular, tips hooked, acute, simple; dactylus with blunt tooth proximally and shallow acute tooth at 0.35 of length, distal part of cutting edge entire, straight; fixed finger with oblong fossa for reception of dactylar tooth when fingers closed, distal part of cutting edge straight, entire. Carpus short and stout, about 0.53 of palm length, expanding distally, 1.7 times longer than distal width, unarmed. Merus 1.3 times longer than carpus, 3.0 times longer than central width, with row of acute denticles along ventral margin. Ischium 0.83 times merus length, with few acute denticles along ventral margin. Basis and coxa short, without special features.

Ambulatory pereiopods similar. Dactylus of third pereiopod long, slender, curved, 4.0 times longer than proximal width, without accessory tooth, denticles nor setae on corpus; unguis acute, 0.37 of corpus length. Propodus 1.25 times longer than dactylus, 4.3 times longer than proximal width, with 2 short spines along flexor margin, with one small ventrodistal spine, with few short setae distally. Carpus about 0.8 propodus length, 3.2 times longer than distal width, unarmed. Merus 1.6 times longer than carpus, 4.1 times longer than central width, unarmed. Ischium 0.65 times as long as merus, as wide as merus, with few simple setae. Basis and coxa short, without special features. Fourth and fifth pereiopods similar, fourth shorter than third, fifth shorter than fourth. Fifth lacking spines on flexor margin of propodus.

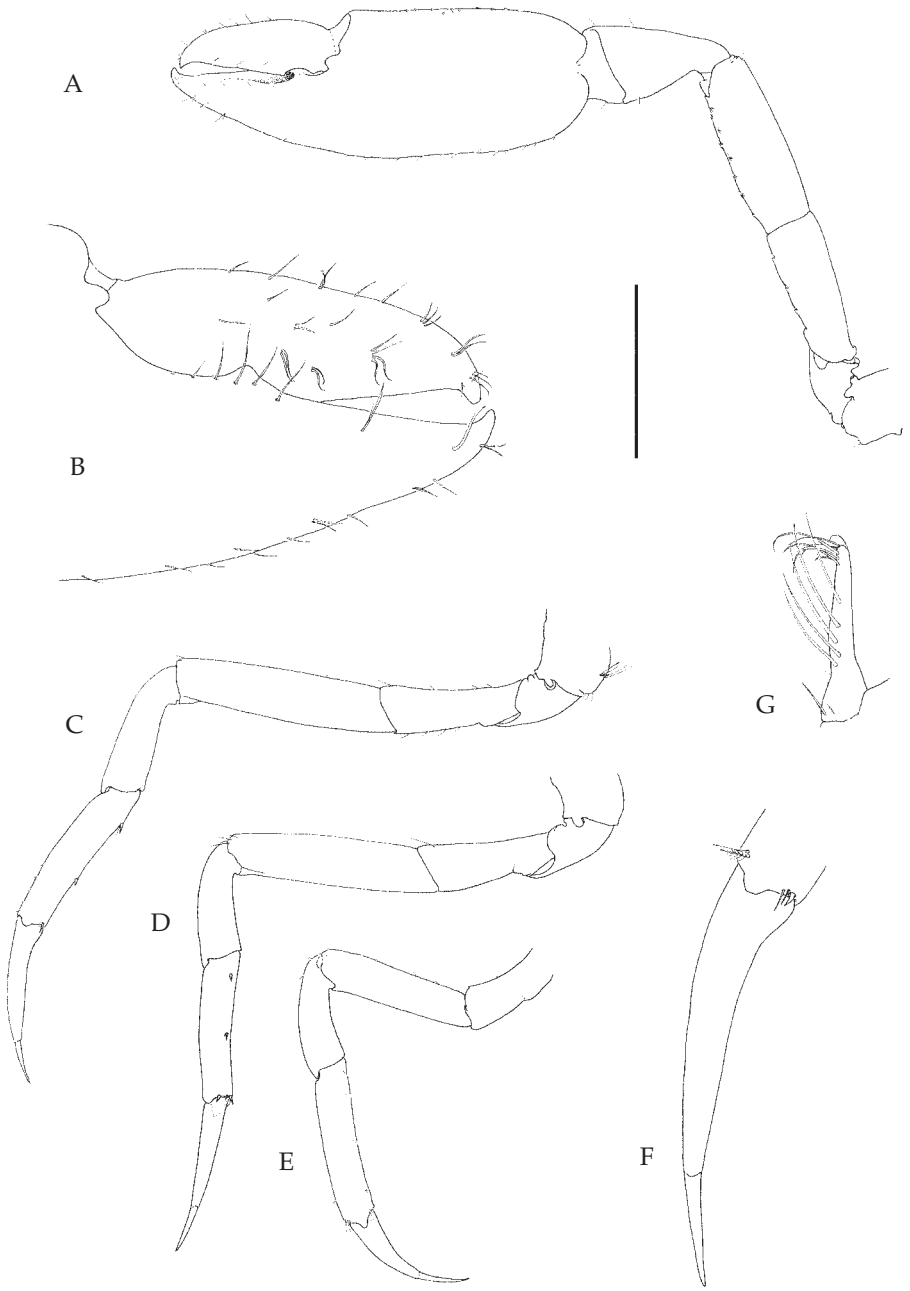

Fig. 7. *Poripontonia dux* spec. nov.: female holotype, pocl. 3.4 mm, RMNH D 50401. A, left second pereiopod; B, idem, detail fingers; C, third pereiopod; D, fourth pereiopod; E, fifth pereiopod; F, idem, dactylus; G, first pleopod, endopod. Scale: A, C-E = 1.5 mm; B, F, G = 0.6 mm.

Female endopod of first pleopod slender, with several long curved simple setae distally, with row of long plumose setae laterally.

Uropods with short unarmed protopodite. Exopod broad, lateral margin rounded, with distinct acute distolateral tooth and strong distolateral spine; distal lamina rounded. Endopod more slender than exopod, as long as telson.

Size.— Postorbital carapace length 3.4 mm.

Colouration.— Not known.

Host.— Sponge: *Neopetrosia*, Petrosiidae, Petrosina, Petrosida, class Demospongiae.

Etymology.— The epitheton *dux* is latin for "duke" which is "hertog" or "hartog" in Dutch. This species is named in honour of my friend and colleague J.C. den Hartog with whom I had the privilege to work for many years in the museum and during fieldtrips, and who shared his extensive knowledge on all aspects of nature and especially his warm personality with me.

Acknowledgements

Thanks are due to N.J. de Voogd who kindly provided me with the specimen and the identification of the host sponge, and to Dr L.B. Holthuis for critically reading the manuscript. Collecting was carried out during the "Lombok Strait" Expedition by the Nationaal Natuurhistorisch Museum, Leiden (NNM), the Center of Oceanological Research and Development (PPPO) of LIPI in Jakarta, and the World Wildlife Foundation (WWF) Wallacea project at Denpasar, with chief-scientist Dr B.W. Hoeksema and counterpart Ir M.I. Yosephine Tuti H (PPPO-LIPI). These organisations and scientists are gratefully acknowledged for their efforts.

References

Bruce, A.J., 1970. Further preliminary descriptions of new species of the genus *Periclimenaeus* Borradaile, 1915 (Crustacea, Decapoda Natantia, Pontoniinae).— Zoologische Mededelingen Leiden 44 (21): 305-315.

Bruce, A.J., 1977. Notes on some Indo-Pacific Pontoniinae, XXIX: *Epipontonia spongicola* gen. nov., sp. nov., from Wasin Island, Kenya.— Crustaceana 32 (3): 304-315, figs. 1-5.

Bruce, A.J., 1983. *Epipontonia anceps* n. sp., a sponge-associated pontoniine shrimp from Heron Island, Queensland (Crustacea: Decapoda: Palaemonidae).— Records of the Australian Museum 35: 19-28, figs. 1-10.

Bruce, A.J., 1994. A synopsis of the Indo-West Pacific genera of the Pontoniinae (Crustacea: Decapoda: Palaemonidae).— Theses Zoologicae 25: 1-172, figs. 1-70.

Fransen, C.H.J.M., 1997. Indonesian pontoniine shrimps. In: T. Tomascik, A.J. Mah, A. Nontji & M. Kasim Moosa (eds), The ecology of the Indonesian Seas, Part II, Box 21.3: 1064-1075, figs. 21.6, 21.9-11.

Holthuis, L.B., 1993. The recent genera of the caridean and stenopodidean shrimps (Crustacea, Decapoda), with an appendix on the order Amphionidacea: 1-328, figs. 1-321.— Nationaal Natuurhistorisch Museum, Leiden.

Li, X., 1999. *Epipontonia hainanensis*, a new species of Pontoniinae (Decapoda, Palaemonidae) from Hainan Island, South China Sea. In: Schram, F.R. & J.C. von Vaupel Klein (eds), Crustaceans and the biodiversity crisis: proceedings of the Fourth International Crustacean Congress, Amsterdam, the Netherlands, July 20-24, 1998: 357-362, figs. 1-3.— Brill, Leiden, Boston, Köln.