

Deep-water Pycnogonida from recent cruises to Papua New Guinea and Melanesia, with an appendix of new records from Polynesia and descriptions of five new species

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ABSTRACT

Deep-sea pycnogonid material collected during the N/O *Alis* Campagnes SalomonBOA 3 to the Solomon Islands in 2007, Terasses to New Caledonia in 2008, Tarasoc to the Tuamoto Archipelago and Tarava Seamounts in 2009, Biopapua to Papua New Guinea in 2010, and Exbodi to New Caledonia in 2011, has been analyzed. This includes the first collection of deep-sea pycnogonids from the waters of Papua New Guinea. The material includes 71 specimens from 14 species in seven genera. Most are frequently-recorded species of the genus *Colossendeis*, but there are also four species new to science, *Ascorhynchus quartogibbus* n. sp., *Cilunculus roni* n. sp., *Phoxichilidium alis* n. sp., *Pycnogonum papua* n. sp. A specimen from New Caledonia, identified by Stock in 1997 as *Pycnogonum occa* Loman, 1908, but not figured or described, has been re-examined, and found also to be a distinct species, *Pycnogonum staplesi* n. sp.

KEY WORDS

Pycnogonida,
sea-spiders,
Melanesia,
Polynesia,
Bathypallenopsis,
Bathyzetes,
Pallenopsis,
new species.

RÉSUMÉ

Les pycnogonides d'eaux profondes collectés lors des campagnes récentes en Papouasie-Nouvelle-Guinée et en Mélanésie, avec une liste des signalisations nouvelles pour la Polynésie et la description de cinq nouvelles espèces.

Sont analysés ici les pycnogonides d'eaux profondes collectés pendant les campagnes suivantes du N/O *Alis*, SolomonBOA3 aux îles Salomons en 2007, Terasses en Nouvelle-Calédonie en 2008, Tarasoc à l'archipel des Tuamotu et sur les monts sous marins de Tarava en 2009, Biopapua en Papouasie-Nouvelle-Guinée en 2010, et Exbodi en Nouvelle-Calédonie en 2011. Ce matériel inclut les premières récoltes de pycnogonides de Papouasie-Nouvelle-Guinée. Il comprend 71 spécimens appartenant à 14 espèces et sept

MOTS CLÉS
 Pycnogonida,
 araignées de mer
 Mélanésie,
 Polynésie,
 Nouvelle-Calédonie
Bathypallenopsis,
Bathyzetes,
Pallenopsis,
 espèces nouvelles.

genres. La plupart appartiennent à des espèces du genre *Colossendeis* Jarzynsky, 1870, souvent signalées, mais quatre espèces nouvelles pour la science sont aussi représentées, *Ascorhynchus quartogibbus* n. sp., *Cilunculus roni* n. sp., *Phoxichilidium alis* n. sp. et *Pycnogonum papua* n. sp. Un spécimen originaire de Nouvelle-Calédonie, identifié *Pycnogonum occa* Loman, 1908 par Stock en 1997, mais ni figuré, ni décrit, a été réétudié ; il appartient à une espèce distincte, *Pycnogonum staplesi* n. sp.

INTRODUCTION

The deeper-water Pycnogonida of the Melanesian Island systems has been studied intensively over the last two decades as a result of the extensive material collected by cruises from the Muséum national d'Histoire naturelle, Paris (MNHN). These studies have revealed a high diversity, and a large number of new species most of which are currently endemic to this island system, together with records of the more-widespread panocceanic species of the deep-water genera *Colossendeis* Jarzynsky, 1870 and *Bathypallenopsis* Stock, 1974.

The earlier pycnogonid material has been reported by Stock (1991; 1997) and Bamber (2000; 2004a, b; 2011). Bamber (2004b) summarized the history of pycnogonid recording from this region, which, while concentrated to an extent on New Caledonia, has also covered Vanuatu, the Solomon Islands, the Loyalty Islands, Fiji, Tahiti and the Marquesas; this same paper summarized the known pycnogonid fauna of the Melanesia-Micronesia-Polynesia region.

The present paper analyzes material collected during five N/O *Alis* Campaigns, viz. SalomonBOA 3 to the Solomon Islands in 2007, Terasses to New Caledonia in 2008, Tarasoc to the Tuamoto Archipelago and Tarava Seamounts in 2009, Biopapua to Papua New Guinea in 2010, and Exbodi to New Caledonia in 2011. This includes the first collection of deep-sea pycnogonids from the waters of Papua New Guinea.

The material comprised 14 species in seven genera. Most are frequently-recorded species of the genus *Colossendeis* Jarzynsky, 1870, but there are also four species new to science, one each in the genera *Ascorhynchus* Sars, 1877, *Cilunculus* Loman, 1908, *Phoxichilidium* Milne-Edwards, 1840, and *Pycnogonum* Brünnich, 1764. In the light of the last species, a specimen from New Caledonia, also held in the collections of the MNHN, and identified by Stock (1997) as *Pycnogonum occa* Loman, 1908, but not figured or described, has been re-examined to determine whether it too in fact represents the new species described herein.

As the Tarasoc samples contained only one, widespread species (*Colossendeis macerrima* Wilson, 1881), the data are simply summarized in an Appendix. The remaining material is discussed in more detail below.

This new material is consistent with the previous data for the Pycnogonida of the Melanesian region (see Bamber 2004b), with a range of deep-sea *Colossendeis* and *Bathypallenopsis* species, with the predominant pallenopsid being *Pallenopsis angusta* Stock, 1991, with a further contribution to the high regional diversity of *Cilunculus* and further localized species of *Pycnogonum*. The data from French Polynesian waters extend the known distribution of *Colossendeis macerrima*, and may be considered to show a limited accord with the deep-sea pycnogonid fauna of the rest of Melanesia.

Data on deep-water pycnogonids from elsewhere in the Pacific are insufficient to allow a wider comparison, although there is some colossendeid and pallenopsid species in common with the Albatross records of Hedgpeth (1949).

METHODS

Sampling was either by a Warén Dredge (stations labelled DW) or by a beam trawl (“chalut à perches” – stations labelled CP).

Measurements are axial, measured dorsally for the trunk and proboscis, laterally for oviger and legs. Body length was measured from the anterior margin of the cephalon to the posterior margin of the fourth lateral processes; body width was measured as the width across the second lateral processes.

Higher classification is as in Bamber & El Nagar (2012). All the material is housed at the Muséum national d'Histoire naturelle, Paris (MNHN).

SYSTEMATICS

Class PYCNOGONIDA Latreille, 1810

Family COLOSSENDEIDAE Hoek, 1881

Genus *Colossendeis* Jarzynsky, 1870

Colossendeis colossea Wilson, 1881

Colossendeis colossea – Hedgpeth 1948: 271, 272, fig. 50b (literature). — Bamber 2010: 48, 49, fig. 87; 2011, 61 (literature).

MATERIAL EXAMINED. — One specimen, MNHN-IU-2012-494, Stn. CP3744, Vicinity of the Woodlark Islands, Papua New Guinea, 09°17'S, 152°17'E, 776-856 m, 10.XI.2010, coll. Samadi & Corbari.

REMARKS

A pan-oceanic deep-water species, recorded off New Caledonia, Vanuatu and the Solomon Islands by Stock (1991; 1997) and Bamber (2011).

Colossendeis fijigrypos Bamber, 2004

Colossendeis fijigrypos Bamber, 2004a: 74, 75, figs 1, 2.

MATERIAL EXAMINED. — One specimen, MNHN-IU-2011-3409, Stn. DW3754, Vicinity of Bougainville, Papua New Guinea, 05°02'S, 154°29'E, 615-632 m, 13.XI.2010, coll. Samadi & Corbari.

REMARKS

Previously known only from the type-collection off Fiji at 300-400 m depth.

Colossendeis leptorhynchus Hoek, 1881

Colossendeis leptorhynchus – Stock 1978: 401, 402, fig. 21; 1997: 397 (literature).

MATERIAL EXAMINED. — One specimen, MNHN-IU-2012-493, Stn. CP3744, Vicinity of the Woodlark Islands, Papua New Guinea, 09°17'S, 152°17'E, 776-856 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2008-20498, Stn. CP2785, NW Malaita, Îles Salomon, 08°53'S, 160°42'E, 420-602 m, 14.XI.2007, coll. Richer & Boisselier. Two specimens, MNHN-IU-2008-20524, Stn. CP3741, Vicinity of the Woodlark Islands, Papua New Guinea, 09°14'S, 152°18'E, 694-766 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-906, Stn. CP3667, Open Bay, Papua New Guinea, 04°40'S, 151°34'E, 670-921 m, 23.XI.2010, coll. Samadi & Corbari.

REMARKS

A pan-oceanic deep-water species, mainly recorded in the southern hemisphere, at depths between 531 and 4300 m; recorded by Stock (1997) off New Caledonia and Vanuatu at 751-775 m.

Colossendeis macerrima Wilson, 1881

Colossendeis macerrima – Stock 1978: 400, 401, fig. 2m (synonymy). — Bamber 2010: 52, 53, fig. 89; 2011: 61, 62 (literature).

MATERIAL EXAMINED. — One specimen, MNHN-IU-2008-20490, Stn. CP2817, S Malaita, Îles Salomon, 09°55'S, 161°33'E, 1136-1750 m, 18.XI.2007, coll. Richer & Boisselier. Two specimens, MNHN-IU-2008-20494 and 20495, Stn. CP2783, New Georgia Sound, Îles Salomon, 08°53'S, 159°23'E, 1501-1545 m, 13.XI.2007, coll. Richer & Boisselier. Five specimens, MNHN-IU-2008-20500, 20501, 20503, 20504 and 20505, Stn. CP2835, E San Cristobal, Îles Salomon, 10°41'S, 162°20'E, 735-862 m, 21.XI.2007, coll. Richer & Boisselier. One specimen, MNHN-IU-2008-20519, Stn. CP3739, Vicinity of the Woodlark Islands, Papua New Guinea, 09°09'S, 152°15'E, 503-546 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2008-20520, Stn. CP3724, Vitiaz Strait, Papua New Guinea, 05°59'S, 147°39'E, 860-880 m,

07.XI.2010, coll. Samadi & Corbari. Two specimens, MNHN-IU-2008-20521, Stn. CP3740, Vicinity of the Woodlark Islands, Papua New Guinea, 09°12'S, 152°16'E, 556-645 m, 10.XI.2010, coll. Samadi & Corbari. Two specimens, MNHN-IU-2008-20522 and 20523, Stn. CP3744, Vicinity of the Woodlark Islands, Papua New Guinea, 09°17'S, 152°17'E, 776-856 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2012-496, Stn. CP2817, S Malaita, Îles Salomon, 09°55'S, 161°33'E, 1136-1750 m, 18.XI.2007, coll. Richer & Boisselier. One specimen, MNHN-IU-2011-1148, Stn. CP3666, Open Bay, Papua New Guinea, 04°40'S, 151°33'E, 760-866 m, 23.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-1339, Stn. CP3677, Kimbe Bay, Papua New Guinea, 05°20'S, 150°44'E, 760-800 m, 25.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-1642, Stn. CP3739, Vicinity of the Woodlark Islands, Papua New Guinea, 09°09'S, 152°15'E, 503-546 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-1906, Stn. CP3667, Open Bay, Papua New Guinea, 04°40'S, 151°34'E, 670-921 m, 23.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-2012, Stn. CP3741, Vicinity of the Woodlark Islands, Papua New Guinea, 09°14'S, 152°18'E, 694-766 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-2438, Stn. CP3743, Vicinity of the Woodlark Islands, Papua New Guinea, 09°11'S, 152°16'E, 540-585 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-2539, Stn. CP3740, Vicinity of the Woodlark Islands, Papua New Guinea, 09°12'S, 152°16'E, 556-645 m, 10.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-2666, Stn. CP3674, N of Rabaul, Papua New Guinea, 04°02'S, 151°50'E, 788-805 m, 24.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-3095, Stn. CP3762, Vicinity of the Feni Islands, Papua New Guinea, 03°57'S, 153°49'E, 995-1050 m, 14.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-3237, Stn. CP3686, Seamounts south of Manus island, Papua New Guinea, 03°16'S, 147°18'E, 964-1025 m, 28.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-3534, Stn. CP3676, Kimbe Bay, Papua New Guinea, 05°21'S, 150°46'E, 704-720 m, 26.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-3811, Stn. CP3724, Vitiaz Strait, Papua New Guinea, 06°03'S, 147°36'E, 860-880 m, 07.XI.2010, coll. Samadi & Corbari.

REMARKS

A panocceanic deep-water species, which has been frequently recorded in Melanesia (see Bamber 2004b).

Colossendeis pipetta Stock, 1991

Colossendeis pipetta Stock, 1991: 164-166, fig. 28. — Bamber 2011: 62 (literature).

MATERIAL EXAMINED. — One specimen, MNHN-IU-2011-4718, Stn. DW3125, Île des Pins, New Caledonia, 22°55'S, 167°17'E, 480-500 m, 30.XI.2008. One specimen, MNHN-IU-2008-20517, Stn. DW3719, Vitiaz Strait, Papua New Guinea, 06°03'S, 147°36'E, 410 m, 07.XI.2010, coll. Samadi & Corbari. One specimen, MNHN-IU-2011-1709, Stn. DW3719, Vitiaz Strait, Papua New Guinea, 06°03'S, 147°36'E, 410 m, 07.XI.2010, coll. Samadi & Corbari. Four specimens, MNHN-IU-2008-20506 to 20509, Stn. CP3898, S Durand Bank, New Caledonia, 22°18'S, 168°42'E, 340-346 m, 20.XI.2011. One specimen, MNHN-IU-2008-20511, Stn. DW3900, S Durand Bank, New Caledonia, 22°17'S, 168°41'E, 355-357 m, 20.XI.2011. One specimen, MNHN-IU-2008-20512, Stn. CP3917, Astrolabe Reefs, East seamount, New Caledonia, 19°52'S, 165°55'E, 753-951 m, 24.XI.2011. One specimen, MNHN-IU-2008-20513, Stn. DW3896, S Durand Bank, New Caledonia, 22°19'S, 168°41'E, 340-343 m, 20.XI.2011.

REMARKS

A species currently endemic to the Melanesian region, having been recorded from numerous samples around New Caledonia, the Loyalty and Chesterfield Islands, and Fiji (Stock 1991, 1997; Bamber 2004a, b; 2011).

Colossendeis sinuosa Stock, 1997

Colossendeis sinuosa Stock, 1997: 398, 399, fig. 4. — Bamber 2011: 63 (literature).

MATERIAL EXAMINED. — One specimen, MNHN-IU-2011-2368, Stn. CP3755, Vicinity of Bougainville, Papua New Guinea, 05°04'S, 154°29'E, 662 m, 13.XI.2010, coll. Samadi & Corbari.

REMARKS

A species recorded previously only from New Caledonia, from depths between 420 and 1150 m (Stock 1997; Bamber 2004b; 2011).

Colossendeis sp. indet.

MATERIAL EXAMINED. — One fragmented specimen, MNHN-IU-2011-2666, Stn. CP3674, N of Rabaul,

Papua New Guinea, 04°02'S, 151°50'E, 788-805 m, 24.XI.2010, coll. Samadi & Corbari.

REMARKS

This specimen is too badly damaged to identify to species.

Family ASCORHYNCHIDAE Hoek, 1881
Genus *Ascorhynchus* Sars, 1877

Ascorhynchus quartogibbus n. sp.
(Fig. 1)

HOLOTYPE. — 1 ♂, MNHN-IU-2008-20493; Stn. CP2783, New Georgia Sound, Solomon Islands, 08°53'S, 159°23'E, 1501-1545 m, 13.XI.2007, coll. Richer & Boisselier.

PARATYPES. — 2 ♂♂, MNHN-IU-2008-20491 and 20644; Stn. CP2817, S Malaita, Solomon Islands, 09°55'S, 161°33'E, 1136-1750 m, 18.XI.2007, coll. Richer & Boisselier. — 1 ♂, MNHN-IU-2011-3331; Stn. CP3731, Vicinity of Mambare Bay, Papua New Guinea, 07°50'S, 148°04'E, 895-1150 m, 08.XI.2010, coll. Samadi & Corbari.

ETYMOLOGY. — From the Latin *quartus* – fourth, and *gibber* – a hump on the back, this species being characterized by having a mid-dorsal tubercle on the fourth trunk-segment.

DESCRIPTION OF MALE HOLOTYPE

“Giant” *Ascorhynchus*, body length 16.5 mm (Fig. 1A, B).

Trunk glabrous, completely segmented, posterior margins of trunk segments flared. Cephalon 43% of total length, raised anteriorly (but without tubercles) at attachment of chelifores; low boss-like tubercle at anterior of cephalon above attachment of palps; tall, spired ocular tubercle above attachment of ovigers, without eyes. Second and third trunk segments with pointed mid-dorsal tubercle at posterior margin. Fourth trunk segment with low but conspicuous mid-dorsal tubercle at mid-length. Lateral processes longer than trunk diameter, separated by more than their own diameter, without tubercles. Oviger implantation well anterior of first lateral processes. Abdomen articulated at base, slender, clavate, setose dorsodistally, its tip exceeding half the length of second coxa of fourth leg. Proboscis

bulbous with proximal and less-pronounced distal constrictions, just longer than half length of trunk.

Chelifore scape of two articles, proximal article 0.8 times as long as distal article; chela atrophied, with short, stubby fingers (Fig. 1C).

Palp (Fig. 1D) of 10 articles; article 3 longest, 2.7 times as long as article 4; article 6 very short, article 7 twice as long as article 6; article 8 elongate, 1.5 times as long as subequal articles 9 and 10; distal five articles each with dense row of ventral setae.

Oviger (Fig. 1E, F) proximal three articles glabrous; articles 4 to 6 with ventral and dorsal fine setae; article 4 just longer than article 5, article 6 half as long as article 4; articles 7 to 10 with compound spines in two or three rows, main row comprising 12, 8, 7 and 8 spines respectively; terminal claw curved, simple, 0.4 times as long as article 10.

Third leg (Fig. 1G) glabrous, first coxa shorter than lateral process, second coxa 2.6 times as long as first coxa; third coxa less than half length of second coxa; femur longest article, 2.2 times as long as second coxa, with row of cement-gland pores; first tibia 0.8 times as long as femur, also with row of cement-gland pores; second tibia 0.65 times as long as first tibia, tarsus about one quarter length of second tibia, and 0.8 times as long as propodus; main claw one-third length of propodus; no auxiliary claws.

Cement gland pores on holotype: 20 on femur, 14 on tibia; one on paratypes: MNHN-IU-2008-20644 (18.5 mm body-length) – 26 and 16; MNHN-IU-2008-20491 (18.2 mm body-length) – 24 and 13; MNHN-IU-2011-3331 (20.6 mm body-length) – 20 and 14.

Female unknown.

Measurements of holotype (mm): trunk length 16.5; width across second lateral processes 8.6; proboscis length 8.75; abdomen length 3.6. Chelifore scape article-1 1.5; scape article-2 1.9.

Palp article 3 (Pa3) 4.5; Pa4 1.65; Pa5 3.2; Pa6 0.5; Pa7 1.0; Pa8 2.7; Pa9 1.7; Pa10 1.6.

Oviger article 1 (O1) 0.5; O2 2.0; O3 1.65; O4 6.0; O5 5.4; O6 2.9; O7 1.9; O8 1.1; O9 1.1; O10 0.9.

Third leg: coxa-1 2.7, coxa-2 7.0, coxa-3 3.0, femur 15.3, tibia-1 12.3, tibia-2 8.0, tarsus 2.1, propodus 2.7, claw 0.9.

REMARKS

Child (1987) defined a group of “giant” species of *Ascorhynchus*, being those species having a trunk length of 13 mm or more, and with median dorsal tubercles, long abdomina, two-segmented chelifore scapes, numerous cement-gland pores on multiple leg segments, and a tarsus almost or as long as the propodus. Other species generally have a trunk-length of 7 mm or less, although *A. colei* Hedgpeth, 1943 (vide Hedgpeth, 1948) can be up to 10 mm long.

Of the previous eight recorded “giant” species of *Ascorhynchus* (see below), none has a median dorsal tubercle on the fourth trunk segment, unlike the present species. Six of those species have eyes, unlike *A. quartogibbus* n. sp., the other two being *A. levissimus* Loman, 1908, from the Flores Sea, Indonesia, and *A. glaber* Hoek, 1881, from the Indian Ocean off Africa. *A. levissimus* differs from *A. quartogibbus* n. sp. in having the tarsus of the walking legs as long as the propodus (shorter

in *A. quartogibbus* n. sp.), the ocular tubercle a low dome (tall and pointed in *A. quartogibbus* n. sp.), palp article 8 (Pa8) twice as long as Pa9 (1.6 times as long in *A. quartogibbus* n. sp.), and Pa3 5.6 times as long as Pa4 (2.7 times in *A. quartogibbus* n. sp.). *A. glaber* (a smaller animal, body length <14 mm) differs from *A. quartogibbus* n. sp. in its conspicuously short third palp article, only 1.5 times as long as Pa4, and in the chelate and functional chelae in the adult.

Ascorhynchus quartogibbus n. sp. was collected off the Solomon Islands and Papua New Guinea at depths from 895 to 1750 m.

Child (1987) produced an identification key to six of the giant *Ascorhynchus* species known at the time, not including *A. levissimus* or *A. orthorhynchus* Hoek, 1881. Below is an identification key to the nine species now known. Note: *A. agassizi* Schimkewitsch, 1893 and *A. pararmatus* Stock, 1975 key out twice, as their dorsodistal lateral-process-tubercles are low swellings which may not be noticed.

IDENTIFICATION KEY TO GIANT *ASCORHYNCHUS* SPECIES

- 1 Lateral processes smooth, without any dorsodistal tubercle 2
- Lateral processes with dorsodistal tubercles; eyes present 7
- 2 Claws on first walking legs not conspicuously shorter than those on other legs; eyes present; proximal scape article clearly shorter than distal scape article
..... *A. agassizi* Schimkewitsch, 1893
- Claws on first walking legs conspicuously shorter than those on other legs; eyes present or absent; scape article proportions various 3
- 3 Mid-dorsal tubercle present on trunk segment 4; eyes absent
..... *A. quartogibbus* n. sp.
- No mid-dorsal tubercle on trunk segment 4; eyes absent or present 4
- 4 Palp article 3 only 1.5 times as long as article 4; tarsus clearly shorter than propodus; proximal scape article about as long as distal scape article; eyes absent; chelifores chelate
..... *A. glaber* Hoek, 1881
- Palp article 3 more than four times as long as article 4 5
- 5 Palp article 3 about 4.5 times as long as article 4; tarsus clearly shorter than propodus; proximal scape article shorter than distal scape article; eyes present; chelae atrophied
..... *A. pararmatus* Stock, 1975
- Palp article 3 over 5 times as long as article 4; tarsus about as long as propodus; eyes present or absent; chelae various 6

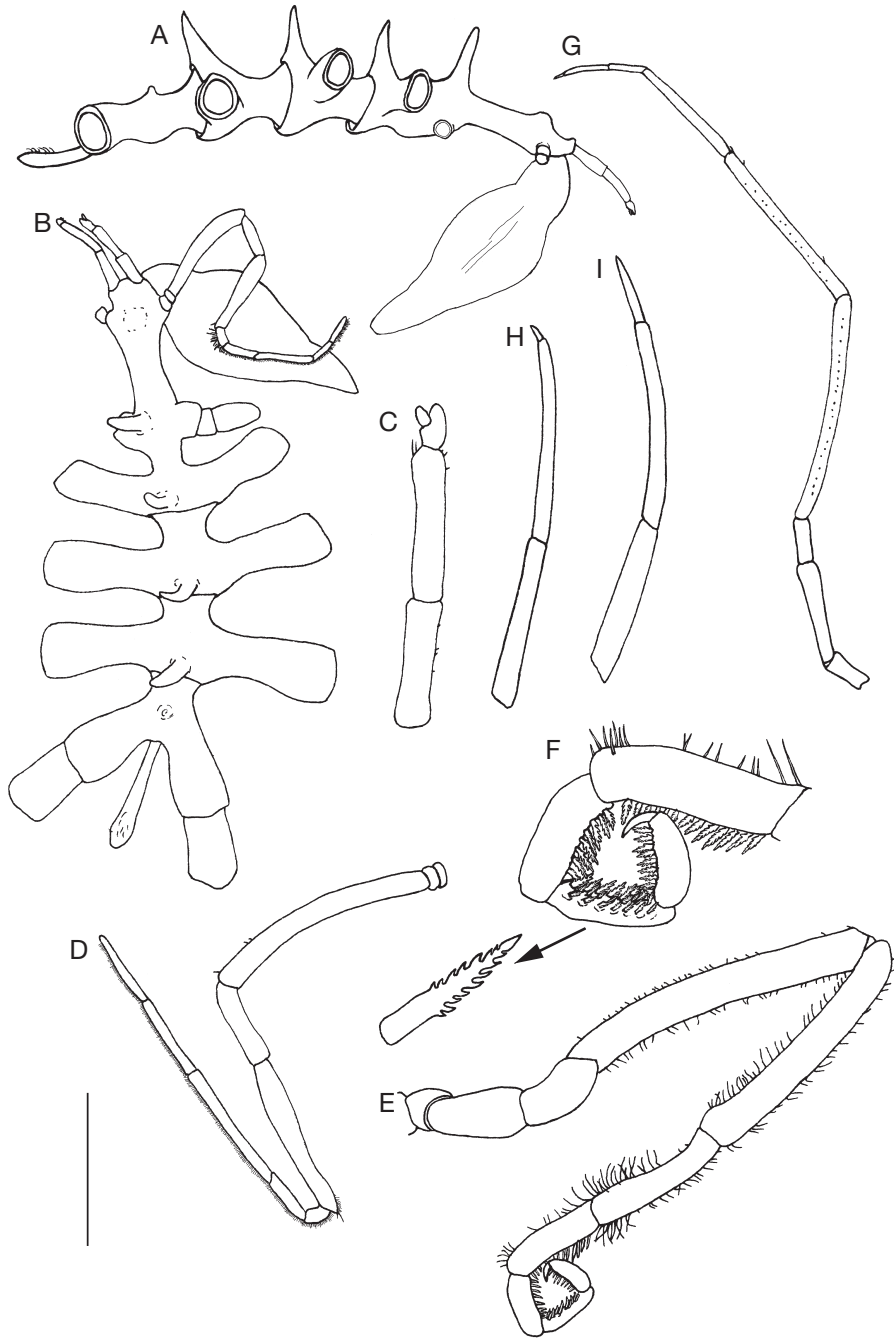


FIG. 1. — *Ascorhynchus quartogibbus* n. sp., male: **A, D–I**, holotype (MNHN-IU-2008-20493); **B, C**, paratype (MNHN-IU-2008-20644). **A**, habitus, lateral; **B**, habitus, dorsal; **C**, left chelifore; **D**, palp; **E**, oviger; **F**, oviger strigilis, with detail of compound spine; **G**, third leg; **H**, distal articles of first leg; **I**, distal articles of third leg. Scale bar: A, B, 5 mm; C, H, I, 2 mm; D, E, 0.3 mm; F, 0.14 mm; G, 10 mm.

- 6 Proximal scape article longer than distal scape article; eyes present; palp article 8 only 1.3 times as long as article 9; chelae atrophied *A. japonicus* Ives, 1892
- Proximal scape article clearly shorter than distal scape article; eyes absent; palp article 8 twice as long as article 9; chelifores chelate *A. levissimus* Loman, 1908

- 7 Proximal scape article longer than distal scape article; palp article 7 twice as long as article 10 (distal article); chelifores chelate *A. orthorhynchus* Hoek, 1881
- Proximal scape article shorter than or equal to distal scape article; palp article 7 about as long as article 10 (distal article); chelae atrophied 8

- 8 Claws on first walking legs not conspicuously shorter than those on other legs; palp article 3 no more than 3 times as long as article 4 *A. agassizi* Schimkewitsch, 1893
- Claws on first walking legs conspicuously shorter than those on other legs; palp article 3 at least 3.5 times as long as article 4 9

- 9 Palp article 3 about 3.5 times as long as article 4; tarsus as long as propodus; ocular tubercle not pointed distally *A. cooki* Child, 1987
- Palp article 3 about 4.5 times as long as article 4; tarsus shorter than propodus; ocular tubercle various 10

- 10 Proximal scape article shorter than distal scape article; ocular tubercle not pointed distally; tarsus 0.5 to 0.6 times as long as propodus; lateral process tubercles low and rounded ...
..... *A. pararmatus* Stock, 1975
- Proximal scape article about as long as distal scape article; ocular tubercle pointed distally; tarsus 0.8 to 0.9 times as long as propodus; lateral process tubercles conspicuous and pointed *A. armatus* (Wilson, 1881)

Genus *Bathyzetes* Stock, 1955

Family AMMOTHEIDAE Dohrn, 1881

Genus *Cilunculus* Loman, 1908

Bathyzetes umbrella Bamber, 2004

Cilunculus roni n. sp.

(Figs 2; 3)

Bathyzetes umbrella Bamber, 2004b: 4-8, figs 2, 3.

MATERIAL EXAMINED. — 1 ♀, MNHN-IU-2008-20492, 1 ♂, 1 ♀, MNHN-IU-2012-495; Stn. CP2817, S Malaita, Solomon Islands, 09°55'S, 161°33'E, 1136-1750 m, 18.XI.2007, coll. Richer & Boisselier.

HOLOTYPE. — 1 ♂, MNHN-IU-2011-2583, Stn. DW3696, NE Manus Island, Papua New Guinea, 01°54'S, 147°12'E, 326-355 m, 30.XI.2010, coll. Samadi & Corbari.

ETYMOLOGY. — Named after Roni Robbins of Artoo, in gratitude for unparalleled collaboration (noun in apposition).

REMARKS

This species was known previously only from the type-collection (Bamber 2004b), also from the Solomon Islands, slightly north-east of the present record, at 1036-1138 m depth. The cement-gland pore on the type-males was not clear; on the present male, it is evident as an elongate pore proximal on the dorsal surface of the femur.

The present specimens extend the lower depth range to 1750 m. Bamber (2004b) gave a table for distinguishing the four known species of *Bathyzetes*.

DESCRIPTION OF MALE HOLOTYPE

Body (Fig. 2A, B) length 4.25 mm. Trunk completely segmented, posterior margins of trunk segments flared. Cephalon 28% of total length, flared anteriorly into a typical hood; frontal margin extended into two pointed tubercles ("horns"), with pointed mid-dorsal tubercle at posterior margin, lateral processes with posterodistal spine-tipped tubercle; tall, rounded ocular tubercle above attachment of ovigers, with indication of eyes (in preserved

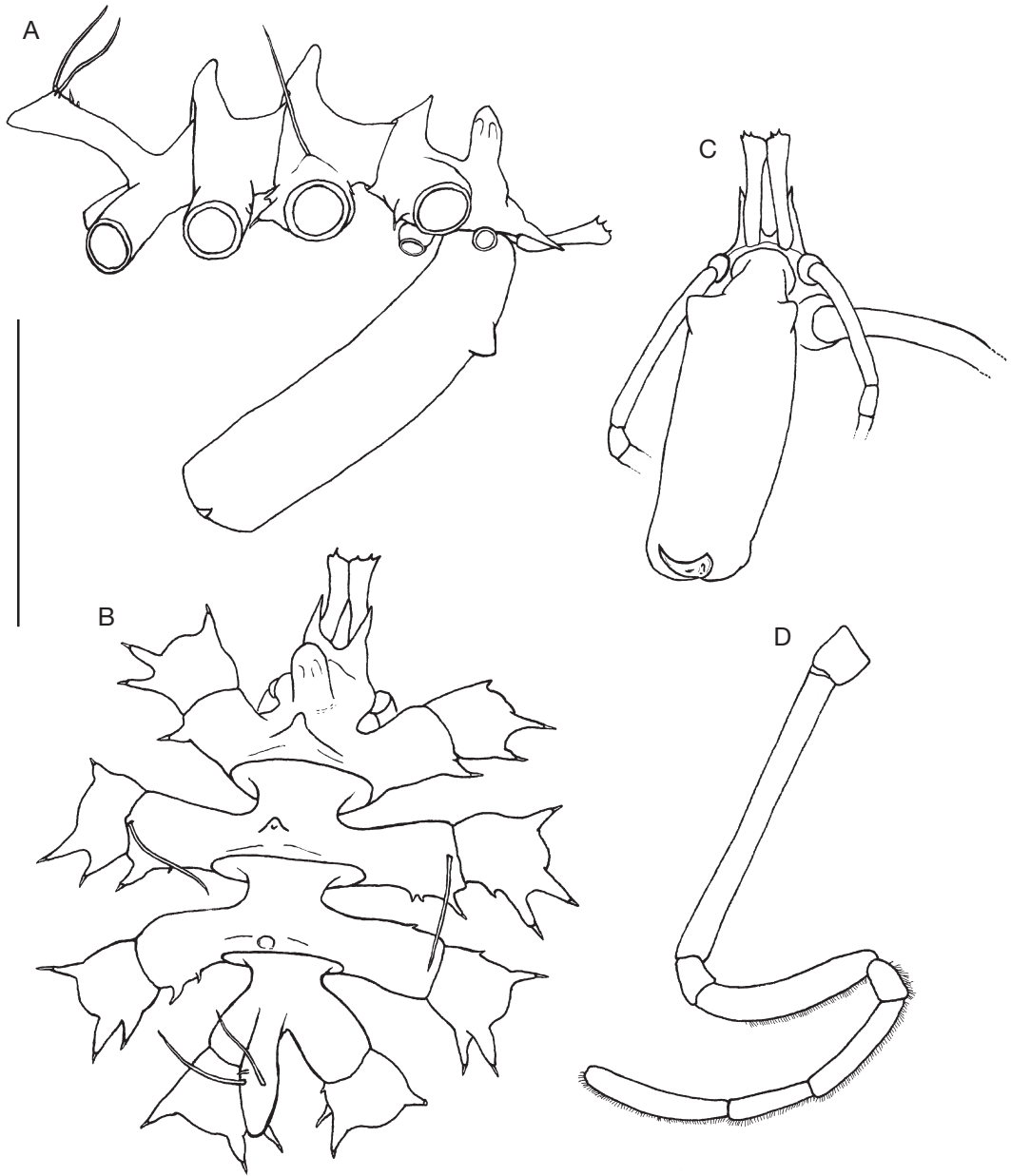


FIG. 2. — *Cilunculus roni* n. sp., male holotype (MNHN-IU-2011-2583): **A**, habitus, lateral; **B**, habitus, dorsal; **C**, cephalon and proboscis, antero-ventral view; **D**, palp. Scale bar: A-C, 3 mm, D, 2 mm.

material). Second trunk segment with mid-dorsal tubercle at posterior margin, lateral processes with posterodistal spine-tipped tubercle and smaller mid-

posterior pointed tubercles, dorsodistally with long, slender seta; third trunk segment with mid-dorsal tubercle at posterior margin, lateral processes with

or without mid-posterior pointed tubercles. Fourth trunk segment without tubercles. Lateral processes separated by about half their own diameter. Ovipiger implantation below first lateral processes. Abdomen not articulated at base, its tip reaching distal margin of second coxa of fourth leg, raised dorso-subdistally and bearing two longer setae and two fine spinules.

Proboscis held ventrally, stout, cylindrical, with two dorsal triangular processes (tubercles) in proximal third, 0.9 times as long as trunk.

Chelifore scape of one article, distally flared; chela totally atrophied.

Palp (Fig. 2D) of eight articles; article 2 longest, almost twice as long as article 4; article 4 with fine setae along distal two-thirds of dorsal margin; article 5 very short, articles 6 to eight elongate, slender; distal four articles each with dense row of ventral setae.

Ovipiger (Fig. 3A, B) proximal article short, glabrous; article 2 longest, with sparse marginal setae; article 3 about 0.2 times as long as article 2, with ventrodistal setae; articles 4 to 7 with denser marginal setae; article 4 half as long as article 2, article 5 0.6 times as long as article 4, article 6 half as long as article 5, article 7 as long as article 6; article 8 with five, article 9 with one and article 10 with two ventral compound spines.

Third leg (Fig. 3C-F), first coxa shorter than lateral process, armed distally with four spine-tipped tubercles; second coxa 1.5 times as long as first coxa, with conspicuous ventrodistal genital spur; third coxa just shorter than first coxa, with setose ventrodistal tubercle; femur 2.9 times as long as second coxa, with tall, conical cement-gland tube distal of mid-length, four tubercles around femur proximal to cement-gland tube, each bearing slender seta (Fig. 3D), distally with array of five seta-bearing tubercles (Fig. 3E); first tibia 1.2 times as long as femur, with two pairs of dorsal seta-bearing tubercles around mid-length and three such tubercles dorsodistally; second tibia 1.1 times as long as first tibia, with sparse dorsal setae; tarsus short, 0.2 times as long as propodus, with raised "hump" dorsally, ventral margin with fine setae and distal spine; propodus one quarter length of second tibia, with dorsal hump at one-third of length and much smaller dorsal swelling

at two thirds of length, ventrally with four robust spines interspersed with setae; main claw stout, 0.4 times as long as propodus; auxiliary claws fine, one third length of main claw.

Cement gland tubes present on all legs, genital spurs on coxa 2 only present on third and fourth legs.

Female unknown.

Measurements of holotype (mm): trunk length 4.25; width across second lateral processes 3.3; proboscis length 4.0; abdomen length 1.42. Chelifore scape length 0.9.

Palp article 2 (Pa2) 2.0; Pa3 0.22; Pa4 1.1; Pa5 0.3; Pa6 0.8; Pa7 0.6; Pa8 1.0.

Ovipiger article 1 (O1) 0.3; O2 2.2; O3 0.5; O4 1.1; O5 0.75; O6 0.35; O7 0.35; O8 0.22; O9 0.2; O10 0.1.

Third leg: coxa-1 0.8, coxa-2 1.2, coxa-3 0.75, femur 3.4, tibia-1 4.1, tibia-2 4.5, tarsus 0.25, propodus 1.1, main claw 0.5, auxiliary claw 0.16.

REMARKS

With a cephalic "hood" within which the anterior appendages arise, few compound spines on the distal ovipiger articles, and its general conformation, the present species is clearly a member of the genus *Cilunculus*. However, *Cilunculus roni* n. sp. is unique in the genus in having an eight-articled palp, with three slender distal articles: nine palp articles, including four short distal articles, is the norm for the genus. Additional unique features are the proximal tubercles on the proboscis, and the single long dorsodistal seta on each second lateral process.

Stock (1997) gave a key to the species of *Cilunculus* then known, in which the present species would key out as *Cilunculus frontosus* Loman, 1908, but that species is without any tubercles on the trunk or on the leg articles. Since then, only four further species have been described, three of these from Melanesia. *Cilunculus ateuchus* Bamber, 2004, from New Caledonia (Bamber 2004a), is distinct from the present species in being glabrous, with naked tubercles on the lateral processes and first coxa, no other tubercles on the leg articles, and no dorsal swelling on the propodus. *Cilunculus cymobostrichos* Bamber, 2004 and *Cilunculus mergus* Bamber, 2004, both from the Solomon Islands (Bamber 2004b),

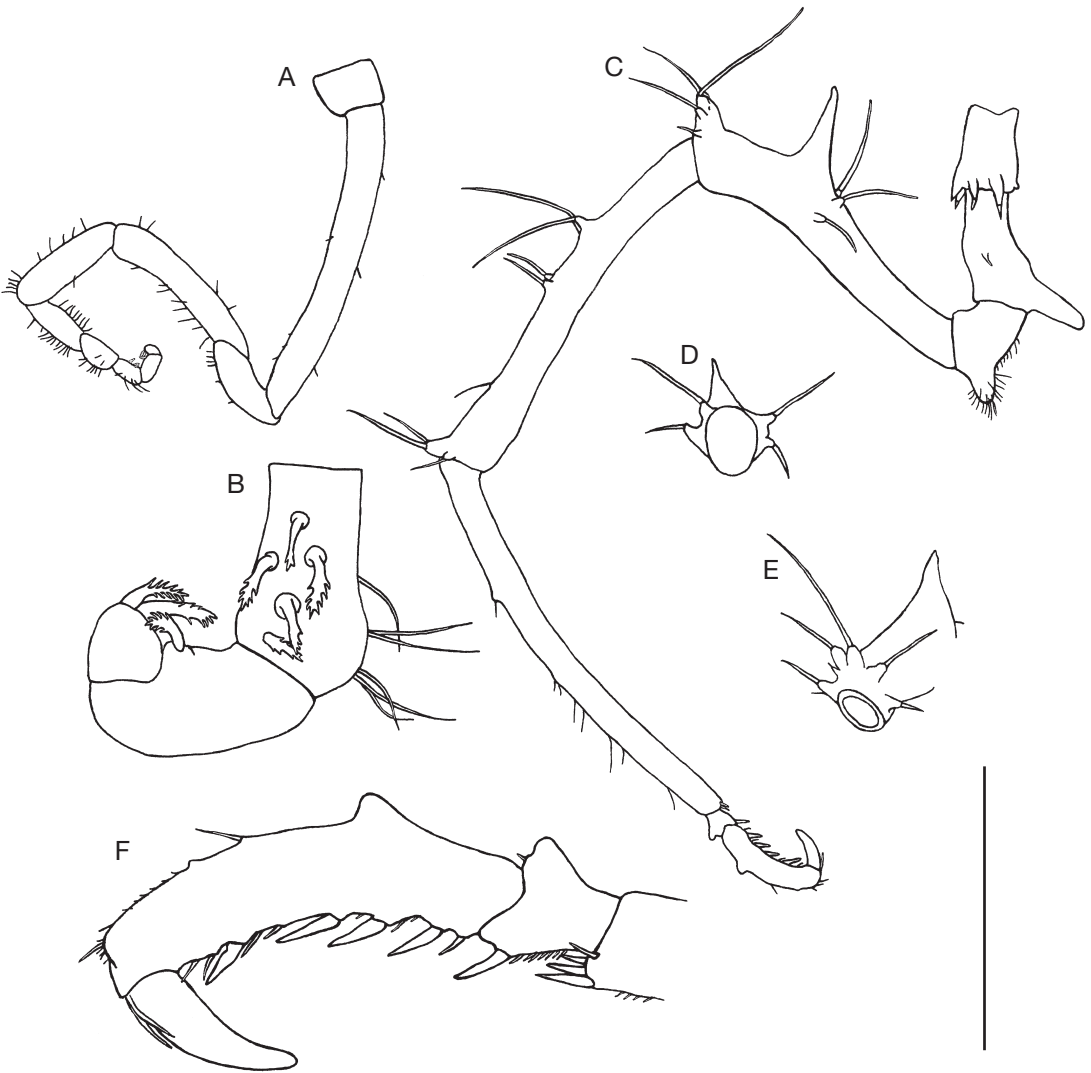


FIG. 3. — *Cilunculus roni* n. sp., male holotype (MNHN-IU-2011-2583) **A**, oviger; **B**, distal three oviger articles; **C**, third leg; **D**, diagrammatic section of femur proximal to cement-gland tube; **E**, distal tip of femur; **F**, distal leg articles. Scale bar: A, 2 mm; B, 0.3 mm; C-E, 3 mm; F, 0.8 mm.

and *Cilunculus misetosus* Turpaeva, 2005 (probably a junior synonym of *Cilunculus europaeus* Stock, 1978), from the North Atlantic (Turpaeva 2005), are all without any tubercles on the trunk midline or on the lateral processes or leg articles, or on the anterior margin of the cephalon, unlike *C. roni* n. sp.

Cilunculus roni n. sp. shares only with *C. scaurus* Stock, 1997 and *C. mergus* Bamber, 2004 the pres-

ence of a dorsal swelling (“hump”) on the propodus of the walking legs, although only *C. roni* n. sp. has a dorsal tubercle on the tarsus as well. *Cilunculus scaurus*, as *C. mergus*, has no dorsal tubercles on the trunk midline, and both have a two-articled chelifore scape, unlike the present species.

The deep waters around Melanesia harbour a remarkable diversity of *Cilunculus* species, ten having

been recorded previously (Bamber 2004b). *Cilunculus roni* n. sp. is the first to have been recorded from around Papua New Guinea.

Family PALLENOPSIDAE Fry, 1978
Genus *Bathypallenopsis* Stock, 1975

Bathypallenopsis richeri (Bamber, 2000)

Pallenopsis (*Bathypallenopsis*) *richeri* Bamber, 2000: 613-615, fig. 1; 2011: 64.

MATERIAL EXAMINED. — 1 ♂, MNHN-IU-2008-20516, Stn. CP3762, Vicinity of the Feni Islands, Papua New Guinea, 03°57'S, 153°49'E, 995-1050 m, 14.XI.2010, coll. Samadi & Corbari.

REMARKS

A Melanesian endemic known previously from Fiji, Vanuatu and the Solomon Islands (see Bamber, 2000: 2011), at depths between 815 and 1191 m.

Bathypallenopsis tydemani (Loman, 1908)

Bathypallenopsis tydemani – Bamber 2010: 188, 189, fig. 218; 2011: 65 (literature and synonymy).

Material examined. — One specimen, MNHN-IU-2008-20496, Stn. CP2822, N San Cristobal, Îles Salomon, 10°21'S, 161°55'E, 653-711 m, 19.XI.2007, coll. Richer & Boisselier. One specimen, MNHN-IU-2008-20497, Stn. CP2858, Kaoka Bay, Îles Salomon, 09°40'S, 160°45'E, 650-725 m, 25.XI.2007, coll. Richer & Boisselier. 1 ♂, MNHN-IU-2008-20502, Stn. CP2835, E San Cristobal, Îles Salomon, 10°41'S, 162°20'E, 735-862 m, 21.XI.2007, coll. Richer & Boisselier.

REMARKS

A widespread deep-sea species, recorded before from Melanesia in the waters of the Solomon Islands and Vanuatu (see Bamber 2011).

Genus *Pallenopsis* Wilson, 1881

Pallenopsis angusta Stock, 1991

Pallenopsis (*Pallenopsis*) *angusta* Stock, 1991: 195, figs 47, 48. — Bamber 2011: 63, 64 (literature).

MATERIAL EXAMINED. — 1 ♀, MNHN-IU-2008-20510, Stn. CP3898, S Durand Bank, New Caledonia, 22°18'S, 168°42'E, 340-346 m, 20.XI.2011. 1 ♀, MNHN-IU-2011-4577, Stn. DW3069, Ride de Norfolk, New Caledonia, 23°18'S, 168°05'E, 300-320 m, 22.XI.2008, coll. Samedi, Lozouet & Castelin.

REMARKS

Pallenopsis angusta is the commonest *Pallenopsis* species of this region, recorded in a large number of samples from Melanesia and Indonesia (see Bamber 2011).

Family PHOXICHILIDIIDAE Sars, 1891
Genus *Phoxichilidium* Milne-Edwards, 1840

Phoxichilidium alis n. sp.
(Fig. 4)

MATERIAL EXAMINED. — 1 ♂, holotype, MNHN-IU-2008-20518, Stn. CP3761, Vicinity of the Feni Islands, Papua New Guinea, 03°59'S, 153°56'E, 760-823 m, 14.XI.2010, coll. Samadi & Corbari.

ETYMOLOGY. — Named after the research vessel responsible for its collection (noun in apposition).

DESCRIPTION OF MALE HOLOTYPE

Body (Fig. 4A) length: 4.35 mm. Trunk completely segmented, glabrous; cephalon 40% of total length; low, rounded ocular tubercle, with indication of eyes (in preserved material). Lateral processes without tubercles, separated by about half their own diameter. Abdomen tip reaching just past distal margin of fourth lateral processes.

Proboscis stout, cylindrical, 0.45 times as long as trunk.

Chelifore scape of one article, overreaching proboscis; chela (Fig. 4B) relatively slender, fingers without any teeth or spines.

Oviger (Fig. 4C) of six articles, proximal article short, glabrous; second article 1.4 times as long as first, with fine ventrodistal seta; third article longest, 2.6 times as long as second article, with slight proximal constriction and sparse marginal setae; fourth to sixth articles curved; fourth article 0.7 times as long as third article, with marginal setae along distal two-thirds of dorsal margin;

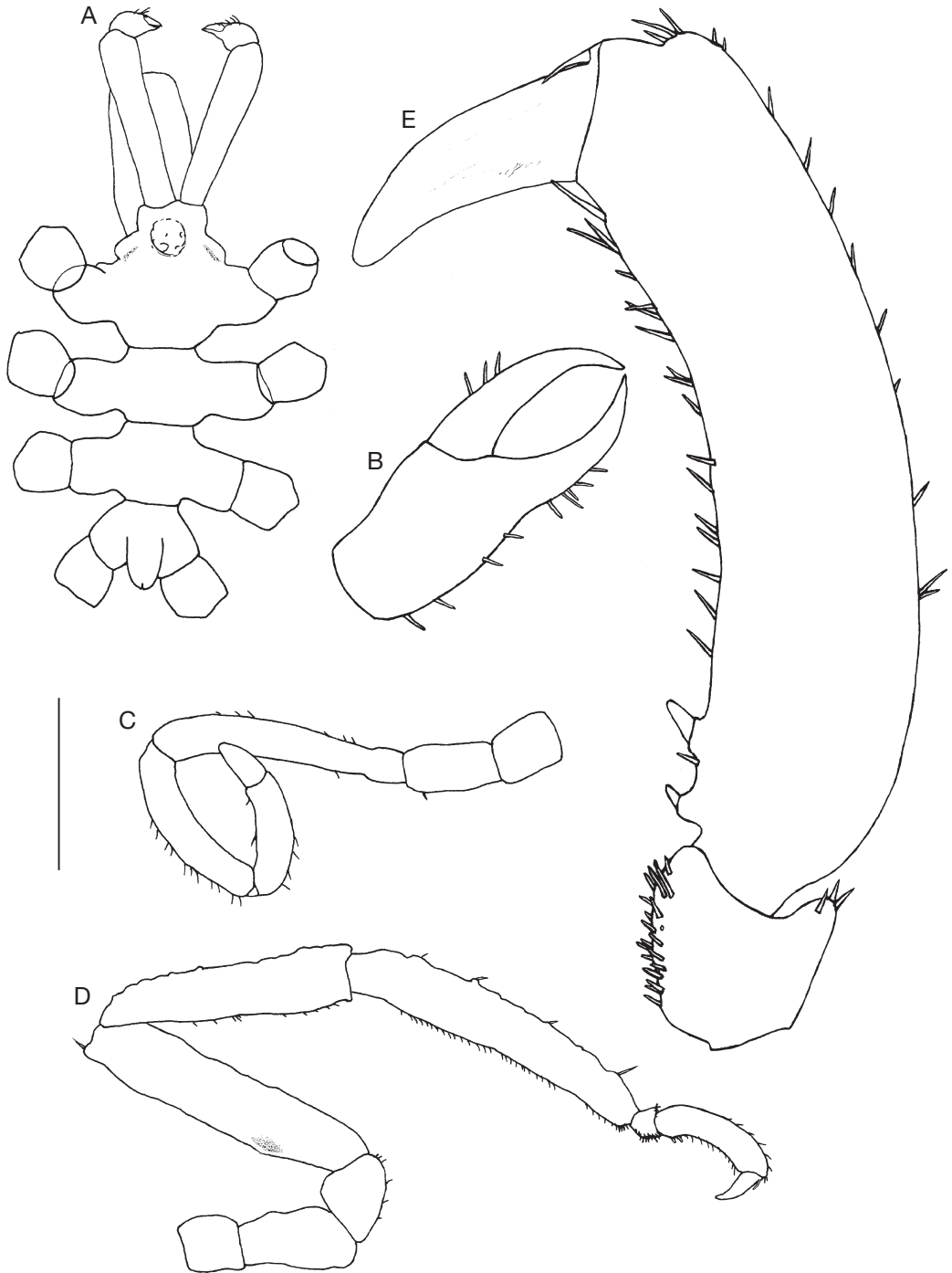


FIG. 4. — *Phoxichilidium alis* n. sp., male holotype (MNHN-IU-2008-20518): **A**, habitus, dorsal; **B**, chela; **C**, oviger; **D**, third leg; **E**, distal article of third leg. Scale bar: A, D, 2 mm; B, 0.5 mm; C, 1 mm; E, 0.3 mm.

fifth article 0.6 times as long as fourth article, with sparse proximally-directed setae; sixth article small, subtriangular, apparently naked.

Third leg (Fig. 4D, E), first coxa about as long as lateral process, without tubercles; second coxa nearly twice as long as first coxa, with slight ventrodistal genital spur; third coxa just longer than first coxa; femur 2.7 times as long as second coxa, with undulating margins and dorsoproximal cement-gland pore, distally with small tubercle bearing seta; first tibia 0.8 times as long as femur, dorsal margin undulating, ventral margin with sparse fine setae; second tibia longest, 1.4 times as long as first tibia, dorsal margin undulating with spinules, ventral margin with dense fine setae; tarsus (Fig. 4E) short, 0.2 times as long as propodus, dorsodistal tubercle and whole ventral margin with short spinules; propodus 0.4 times as long as second tibia, dorsal margin and sole armed with fine spinules, heel with two short, blunt spines; main claw stout, 0.35 times as long as propodus; auxiliary claws fine, mounted dorsally, 0.2 times as long as main claw.

Female unknown.

Measurements of holotype (mm): trunk length 4.35; width across second lateral processes 2.4; proboscis length 2.0; abdomen length 0.65. Chelifore scape length 2.1.

Oviger article 1 (O1) 0.4; O2 0.53; O3 1.4; O4 1.0; O5 0.6; O6 0.3.

Third leg: coxa-1 0.65, coxa-2 1.24, coxa-3 0.76, femur 3.4, tibia-1 2.7, tibia-2 3.7, tarsus 0.24, propodus 1.4, main claw 0.5, auxiliary claw 0.1.

REMARKS

Two species of *Phoxichilidium* have been described previously from Melanesia (New Caledonia), both by Stock (1991), but *Phoxichilidium alis* n. sp. agrees with neither *Phoxichilidium forfex* Stock, 1991 nor *Phoxichilidium tuberculatum* Stock, 1991 because it has no teeth on the chela fingers, the lateral processes are separated by less than their own width, and the third oviger article is substantially larger than the second (three-times as long, compared with subequal in the other two).

Of the ten previously-described *Phoxichilidium* species, only five are without teeth on the chela fingers, and in three of those – *Phoxichilidium femo-*

ratum (Rathke, 1799), *Phoxichilidium quadradentatum* Hilton, 1942 (probably a junior synonym of *P. femoratum*) and *Phoxichilidium ungelatum* Hedgpeth, 1949 – the lateral processes are separated by more than their own width (only half their own width in *P. alis* n. sp.). Of the remaining two species, *Phoxichilidium micropalpidum* Hilton, 1942 has auxiliary claws between 0.35 and 0.5 times as long as the main claw (0.18 times in *P. alis* n. sp.), while *Phoxichilidium tuberungum* Turpaeva, 2006 has no auxiliary claws and a third oviger article 1.5 times as long as the second; both of these species have four pointed heel spines on the propodus of the walking leg (two blunt spines in *P. alis* n. sp.).

Phoxichilidium alis n. sp. is another deep-water species of this conservative genus to have eyes, as are the other two Melanesian species (see above), albeit unpigmented in this preserved material.

Family PYCNOGONIDAE Wilson, 1878

Genus *Pycnogonum* Brünnich, 1764

Pycnogonum papua n. sp.

(Fig. 5)

HOLOTYPE. — 1 ♀, MNHN-IU-2011-2545; Stn. CP3761, Vicinity of the Feni Islands, Papua New Guinea, 03°59'S, 153°56'E, 760-823 m, 14.XI.2010, coll. Samadi & Corbari.

PARATYPE. — 1 ♀, MNHN-IU-2012-492, Stn. CP3762, Vicinity of the Feni Islands, Papua New Guinea, 03°57'S, 153°49'E, 995-1050 m, 14.XI.2010, coll. Samadi & Corbari.

ETYMOLOGY. — The name is derived from the vicinity of its type-locality, Papua New Guinea (noun in apposition).

DESCRIPTION OF FEMALE HOLOTYPE

Relatively large *Pycnogonum*, trunk length 4.5 mm, width 2.6 mm, leg span approximately 14 mm. Cuticle sculptured with subtle reticulation and numerous small pimples, commonly in pairs (as indicated for tibia 1 on Fig. 5 C). Trunk (Fig. 5 A, B) fully segmented, glabrous, but with mid-dorsal tubercles at posterior rim of segments 1 to 3 and centrally on segment 4; lateral processes about 75% as long as segment width, without any dorsodistal

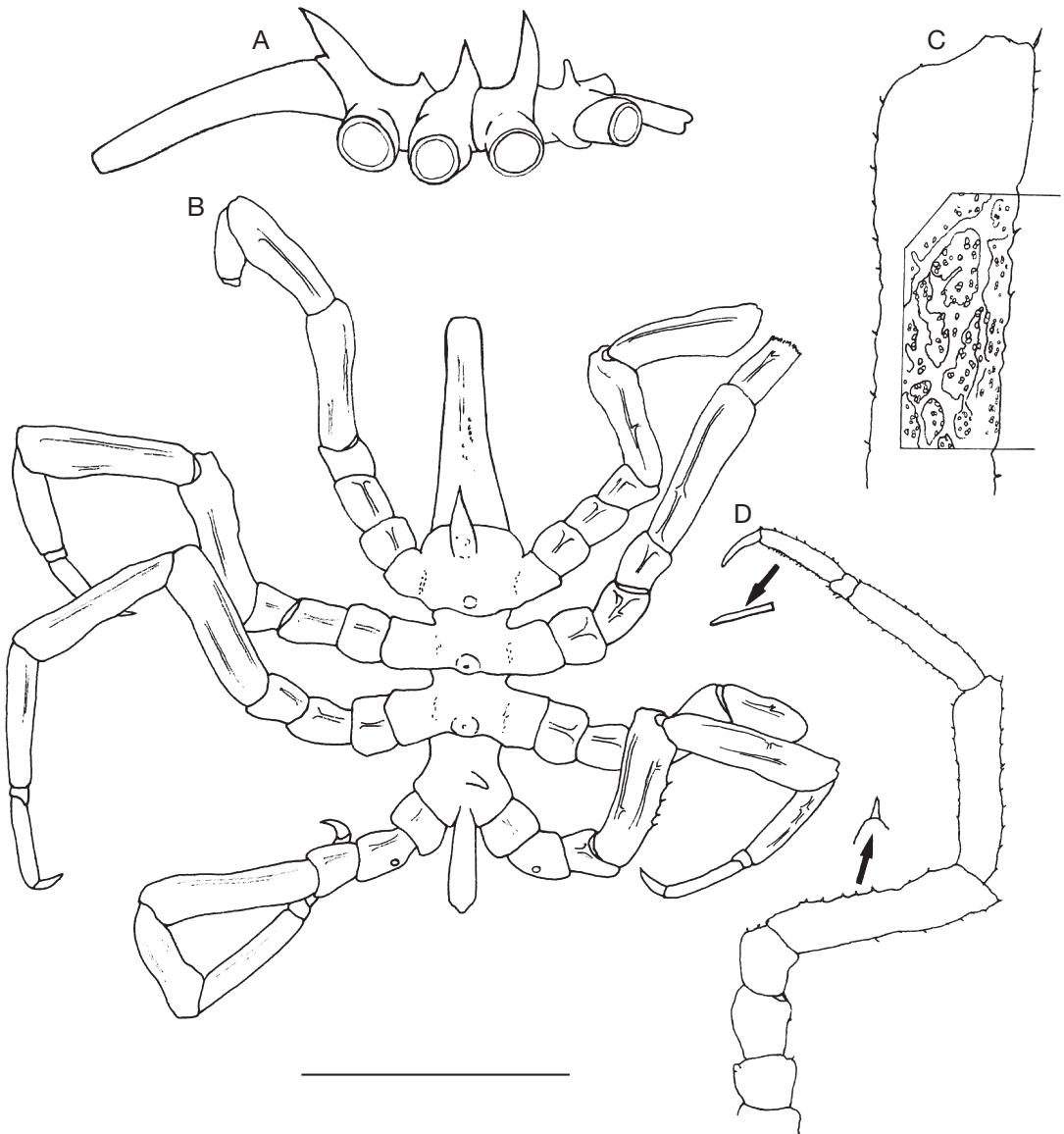


FIG. 5. — *Pycnogonum papua* n. sp., female holotype (MNHN-IU-2011-2545): **A**, habitus, lateral; **B**, habitus, dorsal; **C**, distal half of tibia 1 of third leg, showing detail of cuticular sculpture; **D**, third leg. Scale bar: A, B, D, 4 mm; C, 1.33 mm.

tubercles, separated by about half of their own width. Cephalon 30% of trunk length, ocular tubercle tall, distally pointed, 2.5 times as high as wide, without eyes; mid-dorsal tubercle near posterior margin no higher than wide, about one-fifth as tall as ocular tubercle; second and third trunk segments each two

thirds as long as cephalon and each with a mid-dorsal pointed tubercle at posterior margin, tubercle on second segment about 0.6 times as tall as ocular tubercle, tubercle on third segment as tall as ocular tubercle; fourth trunk segment slightly longer than third, mid-dorsal tubercle in posterior half distally

blunt, about 0.4 times as tall as tubercle on third segment. Abdomen naked, not articulating, held just below horizontal, 0.35 times as long as total trunk length, with rounded postero-dorsal extension.

Proboscis naked, tapering, slightly downcurved (Fig. 5 A), 0.8 times as long as cephalon, without tubercles; oral glands (*sensu* Staples 2002) not seen.

Third leg (Fig. 5 D) with few dorsal and ventral (but not lateral) slender spines on margins of all articles (sparse on coxae), not bifurcating (detail from propodus, Fig. 5 D). Coxa-1 with small ventrodistal tubercle and one dorsodistal spine; coxa-2 slightly longer than coxa-1, coxa-3 about as long as coxa-1; femur longest article, 3.6 times as long as wide, with two small rounded dorsodistal tubercles but no spur, ventral margin with slight raised tubercles in proximal half, each bearing stout spine (detail, Fig. 5 D); tibia-1 0.9 times as long as femur, four times as long as wide; tibia-2 0.8 times as long as femur, 4.7 times as long as wide; tarsus short, one-quarter as long as propodus, longer ventrally than dorsally, with slender ventral spines; propodus slender, 3.9 times as long as wide; main claw 0.6 times as long as propodus; auxiliary claws absent. Gonopores distinct on postero-dorsal margin of coxa 2 of fourth legs. Coxal glands (*sensu* Staples 2002) not seen.

Measurements of holotype (mm): trunk length 4.5; width across second lateral processes 2.6; proboscis length 3.74; abdomen length 1.57; third leg, coxa-1 0.78, coxa-2 0.96, coxa-3 0.87, femur 3.04, tibia-1 2.78, tibia-2 2.35, tarsus 0.30, propodus 1.35, claw 0.78.

REMARKS

The present species, with its conspicuous dorsal trunk tubercles, lack of auxiliary claws and tapering proboscis, keys out in Stock's (1966) key to the genus to either *Pycnogonum tenue* Slater, 1879 (not Kishida, 1927 as given by Stock, 1996) or *Pycnogonum occa* Loman, 1908. Unlike *Pycnogonum papua* n. sp., *Pycnogonum tenue* has blunt trunk tubercles, a domed ocular tubercle, a dense brush of spinules ventrally on the propodus and more compact longer leg-articles (e.g., tibia-1 about twice as long as wide) (see Nakamura 1987), while *P. occa* has distinct dorsodistal tubercles on each lateral process, as well

as a larger posterior tubercle on the cephalon and a proportionately shorter proboscis (see Loman 1908; Staples 2002, including comprehensive discussion of this species).

Twenty-eight species of *Pycnogonum* have been described since Stock (1966) (Bamber & El Nagar 2012), six of which have auxiliary claws (see Bamber 1997). Of the remainder, the only species with a tapering proboscis, a pointed ocular tubercle and pointed mid-trunk tubercles is *Pycnogonum moniliferum* Stock, 1991 (*q.v.*; see also Bamber 2004a), but, unlike *P. papua* n. sp., that species has no dorsal tubercle on the fourth trunk segment and far-more compact and nodulose longer leg-articles (e.g., tibia-1 twice as long as wide).

Pycnogonum papua n. sp. was taken off Papua New Guinea in a depth range of 760-1050 m.

Pycnogonum staplesi n. sp.

Pycnogonum occa Stock, 1997: 407. Non *Pycnogonum occa* Loman, 1908: fig. 6.

MATERIAL EXAMINED. — 1 "♀", holotype MNHN-Py 922, New Caledonia, Stn DW923, 18°51.51'S, 163°24.17'E, 502-470 m depth, 06.VIII.1994.

ETYMOLOGY. — Named after David Staples, in recognition of his comprehensive work on the morphology of *Pycnogonum* species, *inter alia*.

DESCRIPTION OF HOLOTYPE

Trunk length 2.9 mm, width 2.1 mm, leg span approximately 12 mm. Cuticle sculptured throughout with small warts. Trunk (Fig. 6A, B) fully segmented, glabrous; lateral processes about 85% as long as segment width, separated by about half of their own width, each bearing fleshy dorsodistal tubercle about 1.5 times as tall as lateral-process width. Cephalon 32% of trunk length, ocular tubercle tall, distally rounded, 1.7 times as high as wide, without eyes; mid-dorsal tubercle near posterior margin similar to lateral process tubercles, tapering, just taller than ocular tubercle; second and third trunk segments each two thirds as long as cephalon and each (?) with a slender, fleshy mid-dorsal tapering tubercle at posterior margin, tubercle on second segment broken, tubercle on third segment as tall mid-dorsal

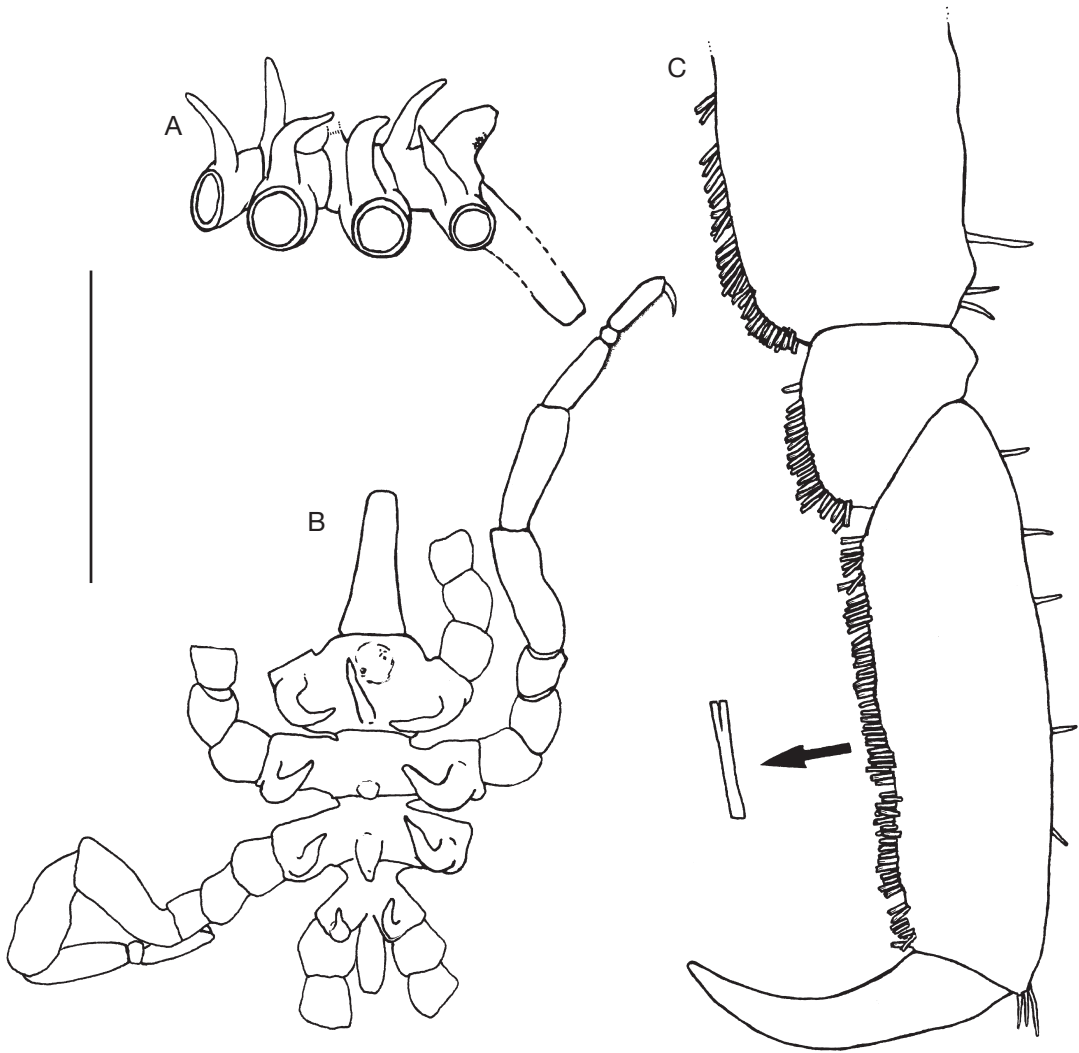


FIG. 6. – *Pycnogonum staplesi* n. sp., holotype (Py 922): **A**, habitus, lateral (note, mid-dorsal tubercle on trunk segment 2 broken); **B**, habitus, dorsal; **C**, distal articles of third leg, with detail of split spinule. Scale bar: A, B, 3 mm; C, 0.4 mm.

cephalon tubercle; fourth trunk segment slightly shorter than third, without mid-dorsal tubercle. Abdomen naked, not articulating, held horizontally, 0.27 times as long as total trunk length, distally blunt.

Proboscis naked, tapering, half as long as cephalon, without tubercles; oral glands (*sensu* Staples 2002) not seen.

Third leg with sparse dorsal and ventral slender simple spinules on margins of all coxae, femur

and tibia 1, dorsally on tibia 2 and propodus (e.g., Fig. 6C); ventral margins of tibia 2, tarsus and propodus with dense row of distally squared, split spinules (Fig. 6C). Coxa-1 without tubercle; coxa-2 1.3 times as long as coxa-1, coxa-3 just shorter than coxa-2; femur 2.3 times as long as coxa-2, 3.2 times as long as wide, with rounded dorsodistal spur; tibia-1 as long as femur, 2.5 times as long as wide; tibia-2 0.7 times as long as femur, 2.7 times

as long as wide; tarsus short, one-quarter as long as propodus, longer ventrally than dorsally; propodus slender, 3.1 times as long as wide, with dorsodistal tuft of three spinules; main claw half as long as propodus; auxiliary claws absent. Gonopores and coxal glands (*sensu* Staples 2002) not seen.

Measurements of holotype (mm): trunk length 2.91; width across second lateral processes 2.1; proboscis length 1.56; abdomen length 0.8; third leg, coxa-1 0.43, coxa-2 0.57, coxa-3 0.55, femur 1.31, tibia-1 1.31, tibia-2 0.93, tarsus 0.17, propodus 0.68, claw 0.37.

REMARKS

Stock (1997) recorded this specimen, which he attributed to *Pycnogonum occa* Loman, 1908, from New Caledonia. Staples (2002), in his analysis of species of *Pycnogonum* from Australia, discussed the difficulty in interpreting the various records of *P. occa* in the literature, and in particular noted that Stock (1997) did not comment on the morphology of his specimen, so no comparison with this specimen could be made. Considering the possibility that this New Caledonia specimen might have been actually of the previous species, Stock's specimen has been re-examined, and determined to be a distinct species.

With its lateral-process tubercles, lack of a mid-dorsal tubercle on the fourth trunk segment, blunt ocular tubercle and peculiar spinulation of the propodus, tarsus and tibia-2, this specimen is not *Pycnogonum papua*.

Neither is it *Pycnogonum occa*: in comparison with Loman's (1908) figures and description, the lateral processes are not sufficiently separated, the ocular tubercle is not spired, the lateral-process tubercles are comparatively enormous, there is no mid-dorsal tubercle on the fourth trunk segment, and, in particular, there is an array of distally squared, split spinules along the propodal sole, the ventral margin of the tarsus and the ventral margin of the distal third of tibia-2 (Fig. 6C). While some other species of *Pycnogonum* have split spines on the legs (e.g., *P. clarki* Staples, 2002; *P. coninsulum* Bamber, 2008), those spinules are distally pointed, not truncate. Loman (1908: pl. XII, fig. 174) clearly shows sparse and simple ventral spinulation on these articles, consistent with the morphology of

Staples' (2002) specimen. In fact, the density of this spinulation is more in agreement with the "*P. occa*" specimen of Stock (1968: 61-62, fig. 22c-e) from the Kermadec Trench, although that specimen does have a tubercle on the fourth trunk segment, and also peculiar tubercles along the frontal margin of the cephalon (the latter precluding it from being *P. occa*; see also Child 1988: 27; Staples 2002: 547).

Stock (1997) called the present specimen a female, but I can find no gonopores to confirm or deny this.

Acknowledgements

I am grateful to Laure Corbari of the Muséum national d'Histoire naturelle, Paris, for the opportunity to analyze the material herein, and for the loan of Stock's "*Pycnogonum occa*" specimen, and to Miranda Lowe of the Natural History Museum, London, for her attempts to locate Hoek's type-material of *Colossendeis leptorhynchus*. I also thank Franz Krapp, Annemarie Ohler and an anonymous reviewer for their constructive comments on this paper.

REFERENCES

- BAMBER R. N. 1997. — Pycnogonids (Arthropoda: Pycnogonida) from the Cape d'Aguilar Marine Reserve, Hong Kong, in Morton B. (ed), *Proceedings of the Eighth International Marine Biological Workshop: the Marine Flora and Fauna of Hong Kong and southern China, Hong Kong, 1995*. Hong Kong University Press, Hong Kong: 143-157.
- BAMBER R. N. 2000. — Pycnogonida: Pycnogonids from French cruises to New Caledonia, Fiji, Tahiti and the Marquesas. New records and new species, in CROSNIER A. (ed.) *Résultats des campagnes MUSORSTOM*, Vol. 21. Mémoires du Muséum national d'Histoire naturelle, Paris, 184: 611-625.
- BAMBER R. N. 2004a. — Pycnogonids (Arthropoda: Pycnogonida) from New Caledonia, Fiji and Tonga: new records and new species, in MARSHALL B. & RICHER DE FORGES B. (eds), *Tropical Deep-Sea Benthos*, Vol. 23. Mémoires du Muséum national d'Histoire naturelle, Paris, 191: 73-83.
- BAMBER R. N. 2004b. — Pycnogonids (Arthropoda: Pycnogonida) from French cruises to Melanesia. *Zootaxa* 551: 1-27.
- BAMBER R. N. 2010. — *Sea-Spiders (Pycnogonida) of the Northeast Atlantic. Keys and notes to the identification of species*. The Linnean Society of London & The Field

- Studies Council, The Dorset Press, 250 p.
- BAMBER R. N. 2011. — The male of *Ascorhynchus constrictus* Stock, 1997 (Arthropoda: Pycnogonida) with further new records of deep-sea pycnogonids from New Caledonia, the Solomon Islands and Vanuatu. *Zootaxa* 2787: 55-67.
- BAMBER R. N. & EL NAGAR A. (eds) 2012. — *PycnoBase: World Pycnogonida Database*. Available online at <http://www.marinespecies.org/pycnobase/> (accessed on 30 June 2012).
- CHILD C. A. 1987. — New and little known Pycnogonida from Antarctic and Subantarctic Waters. *Proceedings of the Biological Society of Washington* 100 (4): 902-916.
- CHILD C. A. 1988. — Pycnogonida of the Western Pacific Islands, III: Recent Smithsonian-Philippine Expeditions. *Smithsonian Contributions to Zoology*, 468: i-iv + 32 p.
- HEDGPETH J. W. 1948. — The Pycnogonida of the western North Atlantic and the Caribbean. *Proceedings of the United States National Museum* 97 (3216): 157-342; 3 charts.
- HEDGPETH J. W. 1949. — Report on the Pycnogonida collected by the *Albatross* in Japanese waters in 1900 and 1906. *Proceedings of the United States National Museum* 98 (3231): 233-321.
- LOMAN J. C. C. 1908. — Die Pantopoden der Siboga-Expedition. *Siboga Expeditie Monographie* 40: 1-88; pls I-XV.
- NAKAMURA K. 1987. — *The Sea Spiders of Sagami Bay*. Biological Laboratory, Imperial Household: 1-43 [in English], plates 1-40: 1-35 [in Japanese], 2 maps.
- STAPLES D. 2002. — *Pycnogonum* (Pycnogonida: Pycnogonidae) from Australia with descriptions of two new species. *Memoirs of the Museum of Victoria* 59: 541-553.
- STOCK J. H. 1966. — 4. Pycnogonida. Campagne de la *Calypso* au large des côtes atlantiques de l'Amérique du sud (1961-62). *Résultats Scientifiques de la Campagne de la Calypso*, 7, in *Annales de l'Institut Océanographique, Monaco* 44: 385-406.
- STOCK J. H. 1968. — Pycnogonida collected by the *Galathea* and *Anton Bruun* in the Indian and Pacific Oceans. *Vikenskabelige Meddelelser fra Dansk Naturhistorisk Forening i København* 131: 7-65; 1-22.
- STOCK J. H. 1978. — Abyssal Pycnogonida from the North-eastern Atlantic Basin, Part II. *Cahiers de Biologie Marine* 19: 397-413
- STOCK J. H. 1991. — Deep-water Pycnogonida from the surroundings of New Caledonia. In: CROSNIER A. (ed.), *Résultats des Campagnes MUSORSTOM*, Vol. 8 Mémoires du Muséum national d'Histoire naturelle, Paris (A) 151: 125-212.
- STOCK J. H. 1997. — Pycnogonids collected in recent years around New Caledonia and Vanuatu. In: CROSNIER A. (ed.), *Résultats des Campagnes MUSORSTOM*, Vol. 18 Mémoires du Muséum national d'Histoire naturelle, Paris 176: 389-409.
- TURPAEVA E. P. 2005. — Bathyal pycnogonids (Pycnogonida) from the northern Atlantic Ocean and the southern Norwegian Sea. *Zoologicheskii Zhurnal* 84 (5): 541-554.

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APPENDIX

New records from Polynesia: the Tuamoto Archipelago and Tarava Seamounts

The MNHN Cruise Tarasoc N.O. *Alis* in September–October 2009 sampled off the Tuamoto Archipelago and Tarava Seamounts in French Polynesia. Pycnogonids were collected at stations ranging from 490–737 m depth, all of the single species *Colossendeis macerrima*. These appear to be the first deep-water pycnogonid records from these waters, and are tabulated below.

Tuamoto Archipelago

One specimen (MNHN-IU-2011-4029), Stn. DW3355, SW Kaukura, 15°57'S 147°08'W, 530-710 m, 01.X.2009.

One specimen (MNHN-IU-2011-3664), Stn. DW3356, SW Kaukura, 15°57'S 147°08'W, 490 m, 01.X.2009.

Two specimens (MNHN-IU-2011-3940 and MNHN-IU-2008-20499), Stn. CP3376, Kaukura, 15°41'S 146°54'W, 646-737 m, 4.X.2009

Tarava Seamounts

One specimen (MNHN-IU-2011-3939), Stn. CP3306, Mont Punu Taipu, 19°17'S 150°59'W, 23.IX.2009 (depth not recorded).

One specimen (MNHN-IU-2011-3954), Stn. DW3310, Mont Ari'i Moana, 19°13'S 151°37'W, 613-698 m, 24.IX.2009.

One specimen (MNHN-IU-2011-3646), Stn. DW3321, Mont Ari'i Moana, 19°13'S 151°32'W, 540-572 m, 25.IX.2009.

One specimen (MNHN-IU-2011-4321), Stn. DW2325, Mont Ari'i Moana, 19°17'S 151°33'W, 595-628 m, 25.IX.2009.