

ABYSSAL PYCNOGONIDA FROM THE WALVIS BASIN, SOUTHERN ATLANTIC

by

Jan H. Stock

Institute of Taxonomic Zoology, University of Amsterdam, P.O. Box 20125,
1000 HC Amsterdam, Netherlands

Résumé

Dix espèces de Pycnogonides (abstraction faite de deux espèces indéterminables) ont été reconnues dans des prélèvements pris entre 3 550 et 5 040 m de profondeur dans le bassin océanique profond de Walvis (ou bassin du Cap), Atlantique Sud. Trois espèces sont nouvelles pour la science : *Nymphon walvisense*, *Pantopipetta lata* et *P. angusta*.

Introduction

The material on which the present study is based, has been obtained during the Campaign "Walvis 1", organized by the Centre Océanologique de Bretagne (C.O.B.), Brest, France, on board of the N/O "Jean Charcot" from December 20, 1978 to January 15, 1979. One of the main objectives of the expedition was to study the fauna on both sides of the Walvis ridge, which separates two biogeographic provinces. The ridge is considered a barrier for Antarctic waters and separates the Angola abyssal plain from the Walvis (or Cape) Basin.

The bottom sediments south of the Walvis ridge appear to consist of clay-like ooze with a low (< 5 percent) CaCO₃ content, whereas north of the ridge foraminiferous mud (70 percent CaCO₃) prevails. The Pycnogonida collected, form in so far a confirmation for the existence of two different faunal provinces, in that they were collected all, without exception, from the southern side of the ridge. However, although the "Walvis 1" campaign did not collect any Pycnogonida from the Angola Basin, other expeditions have obtained several species from the deep-sea north of the Walvis ridge, including several species taken by the "Walvis 1" south of the ridge. Four species are, as far as we know at present, restricted to the deeper waters south of the Walvis ridge (viz., *Anoplodactylus pelagicus*, *Nymphon walvisense*, *Pantopipetta lata* and *P. angusta*). Four others are known from deep waters both north and south of the ridge (*Pallenopsis oscitans*, *Nymphon procerum*, *N. inerme* and *Colossendeis macerrima*). Two further species do not allow proper biogeographic conclusions: one, *Anoplodactylus pygmaeus*, is a shallow

water species, whose presence in a deep-sea sample is possibly accidental, whereas the other, *Colossendeis leptorhynchus*, was until recently confused with *C. macerrima* and may have a wider distribution than we presently assume.

Several other species are known from the Cape Basin (see Stock, 1963), but these have been taken qualitatively and are not considered in this discussion.

Stations on which Pycnogonida were taken by the campaign "Walvis 1"

- Sample 6 (= CP 01), Stat. A: 33°53.6'S 05°06.7'—05°07.2'E, depth 5040-5037m, 24 Dec. 1978.
 Sample 37 (= DS 05), Stat. B: 32°20.8'S 02°34.9'E, depth 4560m, 30 Dec. 1978.
 Sample 38 (= CP 05), Stat. B: 33°22.8'—33°26.2'S 02°36.0'—02°34.6'E, depth 4500m, 30 Dec. 1978.
 Sample 40 (= CP 06), Stat. B: 33°22.5'S 02°35.9'E, depth 4550m, 30 Dec. 1978.
 Sample 42 (= DS 06), Stat. B: 33°24.5'S 02°32.9'E, depth 4585m, 31 Dec. 1978.
 Sample 75 (= CP 13), Stat. E: 32°18.2'S 13°15.9'E, depth 3550m, 12 Jan. 1979.
 Sample 76 (= CP 14), Stat. E: 32°28.9'—32°28.6'S 13°26.2'—13°24.0'E, depth 3675m, 13 Jan. 1979.

Stations A and B are situated on the south side of the Walvis ridge, Station E is in the Walvis Basin, on the continental fringe of South Africa.

The gear used (mentioned in parentheses in the above list) was either CP (5m beam trawl) or DS (Sanders and Hessler epibenthic dredge).

Pycnogonida collected by the "Walvis 1" from the Walvis Basin

The following species are represented in the samples of the campaign "Walvis 1":

- | | |
|-------------------------|---|
| Family Colossendeidae | <i>Colossendeis leptorhynchus</i> Hoek, 1881 (sample 76)
<i>Colossendeis macerrima</i> Wilson, 1881 (sample 75)
<i>Colossendeis</i> spec. (sample 75) |
| Family Nymphonidae | <i>Xymphon inerme</i> Fage, 1956 (samples 42, 75)
<i>Nymphon walvisense</i> n.sp. (samples 6, 38, 40)
<i>Xymphon procerum</i> Hoek, 1881 (sample 40)
<i>Xymphon</i> spec. (aff. <i>residuum</i> Stock, 1971) (sample 37) |
| Family Phoxichilidiidae | <i>Pallenopsis oscitans</i> (Hoek, 1881) (sample 75)
<i>Anoplodactylus pelagicus</i> Flynn, 1928 (sample 75)
<i>Anoplodactylus pygmaeus</i> (Hodge, 1864) (sample 42) |
| Family Austrodecidae | <i>Pantopipetta lata</i> n.sp. (samples 75, 76)
<i>Pantopipetta angusta</i> n.sp. (sample 37). |

TAXONOMIC PART

COLOSSENDEIS LEPTORHYNCHUS Hoek, 1881

C. leptorhynchus; Stock, 1978b: 402, 408, fig. 2, 1.

Material

1 specimen: sample 76.

Remarks

Like Hoek's type of *Nymphon procerum*, the type of *C. leptorhynchus* was collected off Valparaiso, Chile. Both species turned up again in the present collections from the Walvis basin.

COLOSSENDEIS MACERRIMA Wilson, 1881

C. macerrima; Stock, 1978b: 400, fig. 2, m.

Material

1 specimen: sample 75.

Remarks

Distributed world-wide in the deep-sea.

COLOSSENDEIS spec.**Material**

1 specimen: sample 75.

Remarks

The specimen is in fragmentary condition and hence unidentifiable.

NYMPHON INERME Fage, 1956

N. inerme Fage, 1956: 163-164, figs. 8-10; Turpaeva, 1969, table 14; Stock, 1971: 25-26, figs. 2-9; Arnaud, 1974: 170-171.

Material

2 ♀, 1 ♂ ovig. (all fragmentary): sample 75.

1 ♂: sample 42.

Remarks

This species was originally described by Fage from a depth of 4410m in the Kermadec Trench (Pacific Ocean). Stock (1971) found it back in the Northern Atlantic ("Noratlante" St. E 6, between Greenland and Labrador, 3610m; and St. E 8, in the Azores, 3663m).

The present records extend the known range of the species to the Walvis Basin.

NYMPHON WALVISENSE n.sp. Figs. 1-2**Material**

1 ♂ (holotype), 1 ♂, 1 ♀, 1 juv. (paratypes): sample 38.

1 ♂, 1 ♀: sample 40.

1 ♂, 1 juv.: sample 6.

Description

Blind, no ocular tubercle. Trunk completely segmented. Oviger implantation in front of first lateral processes, strongly swollen. Frontal end of neck swollen at the implantation of the chelifores. Lateral processes unarmed, separated by distances less than their own diameter (in the ♀ paratype), to slightly more than their own diame-

ter (in two males). Abdomen short, not quite reaching the end of coxa 1 of leg 4 (Fig. 1a).

Proboscis straight, cylindrical (Fig. 2b); basal part narrower than middle and distal parts (more or less type B^{'''}). Oral aperture facing dorsally.

Scape almost as long as the proboscis. Chela longer than the scape; palma nearly unarmed; both fingers curved, forming a distinct

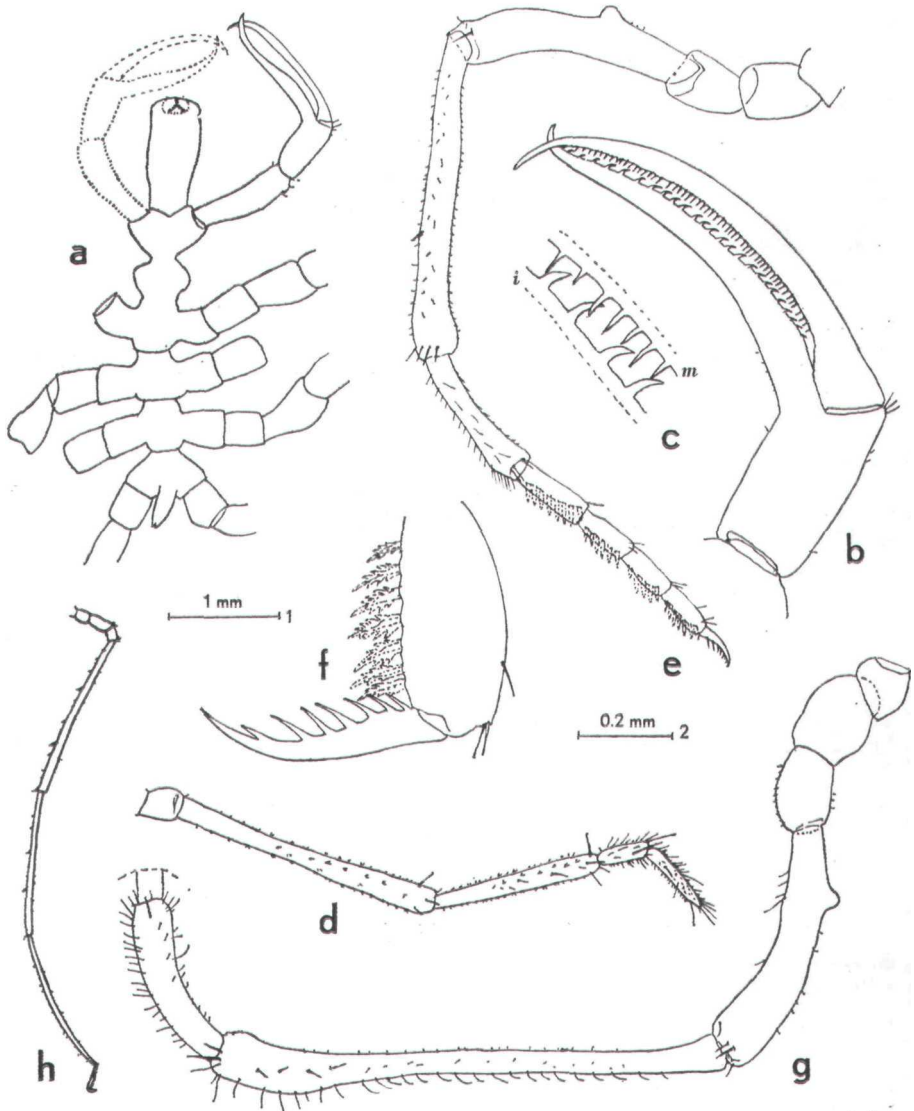


FIG. 1

Nymphon walvisense n.sp.

a: trunk (dorsal), ♀ (actual length **8.2mm**); **b:** chela, ♀ (scale 1); **c:** detail of the teeth on the fingers, ♀ (*i* — immovable linger; *m* — movable finger) (scale 2); **d:** palp, ♀ (scale 1); **e:** oviger, ♀ (scale 1); **f:** distal portion of oviger, ♀ (scale 2); **g:** proximal portion of oviger, ♂ (scale 1); **h:** 3rd leg, ♂ (free-hand sketch).

angle with the palm; movable finger with about 60 small straight, needle-like teeth, immovable finger with 26 to 31 larger, more or less curved teeth (Figs. 1b, 1c).

Palp segment 2 the longest; third segment $\frac{5}{8}$ of second; segment 4 short, only $\frac{3}{10}$ of segment 3; segment 5 longer, about 1.5 X segment 4, slender (Fig. 1d).

Oviger: segment 4 (♀, ♂) with a strong knob in its proximal part; segment 5 club-like, in ♂ much slenderer than in ♀, in ♂ with a row of recurved setae; segment 6 rather elongate. Compound spine formula 9:6:5:7 (♀) or 8:5:5:6 (♂). Oviger claw about as long as segment 10, armed with 5 to 7 long teeth. Compound spines lanceolate, with 3 to 4 lateral denticles (Figs. 1e—g, 2a).

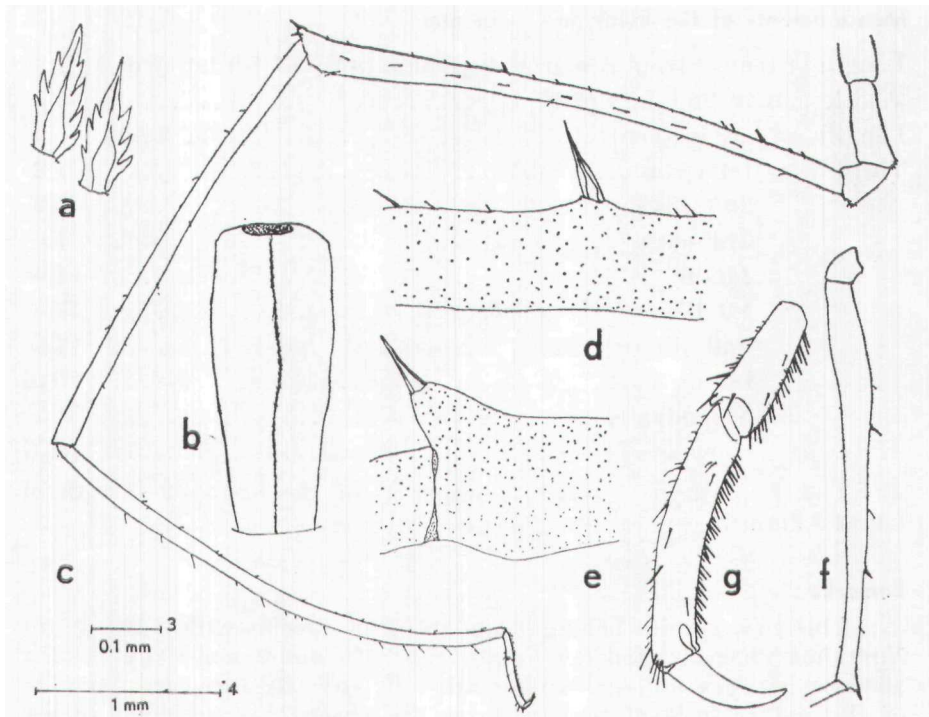


FIG. 2

Nymphon walvisense n.sp.

a: compound spines of oviger segment 10, ♀ (scale 3); b: proboscis, ventral (free-hand sketch); c: 3rd leg, ♂ (actual length 45.5mm); d: spine on dorsal surface of femur, ♂ (scale 4); e: distal end of femur, ♂ (scale 4); f: femur, ♀ (free-hand sketch); g: distal segments of 3rd leg, ♂ (scale 4).

Legs long, slender, thin (Figs. 1h, 2c). Coxa 2 not very elongate, especially not on the anterior legs and especially not in female. Femur hardly curved; basal third slightly swollen in female (Fig. 2f); distally produced into a modest spiniferous spur (Fig. 2e); on the dorsal margin of the femur (♀, ♂) 2 or 3 slight swellings, each armed with a hollow spine, are found. Cement gland apertures not raised; the glands discharge through a number of narrow ducts in the exoskeleton; the ducts are agglomerated into 7 groups, separated by

stretches without ducts and are found in the proximal third of the ventral margin of the male femur; each group cement gland apertures consists of 5 to 16 ducts; the distal two-thirds of the femur is devoid of cement gland apertures. The first tibia is shorter than the femur. The second tibia is curved, slightly longer than tibia 1, sparingly setose. Tarsus about half as long as propodus. Propodus without heel, very slightly curved. Tarsal and propodal sole armed with numerous small, straight spinules, often occurring in pairs. Claw short (less than half the propodus), rather strong, curved; no auxiliary claws. Female genital openings large, on the ventral surface of coxa 2 of all legs; male genital pores small, on the ventrodistal end of coxa 2 of legs 3 and 4.

Measurements of **the** holotype (δ) in mm

Length of trunk (frontal margin cephalon to tip of 4th lat. proc.)	7.8
Width across 2nd lat. proc.	3.5
Length proboscis (ventral)	3.9
Third leg: 1st coxa	1.2
2nd coxa	2.2
3rd coxa	1.0
femur	14.0
1st tibia	12.0
2nd tibia	12.5
tarsus	0.67
propodus	1.2
claw	0.57

The 9 paratype is slightly larger than the holotype (length of trunk 8.2mm).

Remarks

This new species belongs to a group of species within the genus *Nymphon* characterized (as Fage, 1956: 165 emphasized) by (a) the absence of eyes and an ocular tubercle, (b) the forward position of the oviger implantation, and (c) the absence of auxiliary claws. A key to the members of this group has been provided by Stock, 1972: 259. After 1972, only one more species of this group has been described, viz. *Nymphon stocki* Turpaeva, 1974: 282 (1). By the presence of a femoral spur as well as by the high number (abt. 60) of teeth on the movable finger of the chela, the present material from the S. side of the Walvis ridge comes closest to *N. hamatum* Hoek, 1881, a deep-sea species recorded from two "Challenger" stations off the Crozet Islands in the southern Indian Ocean.

According to Hoek's description, and to the additional notes on Hoek's type-specimens by Gordon, 1932, the following differences are noticeable: (a) *N. hamatum*, the cement glands form raised

(1) Unfortunately this name is preoccupied (Utinomi, 1955: 10). After its type-locality, the Scotia Sea, I propose to rename Turpaeva's species *Nymphon scotiae* n.nov.

papillae, 12 to 13 on the proximal half of the male femur (in *N. walvisense*, 5 to 16 ducts form non-raised agglomerations, of which 7 are found in the proximal third of the male femur), (b) the number of teeth on the immovable finger of *N. hamatum* is about equal (viz. 50-55) to that on the movable finger (viz. 60-65); in *N. walvisense* those numbers are about 60 and 26-30, respectively; (c) the palm of

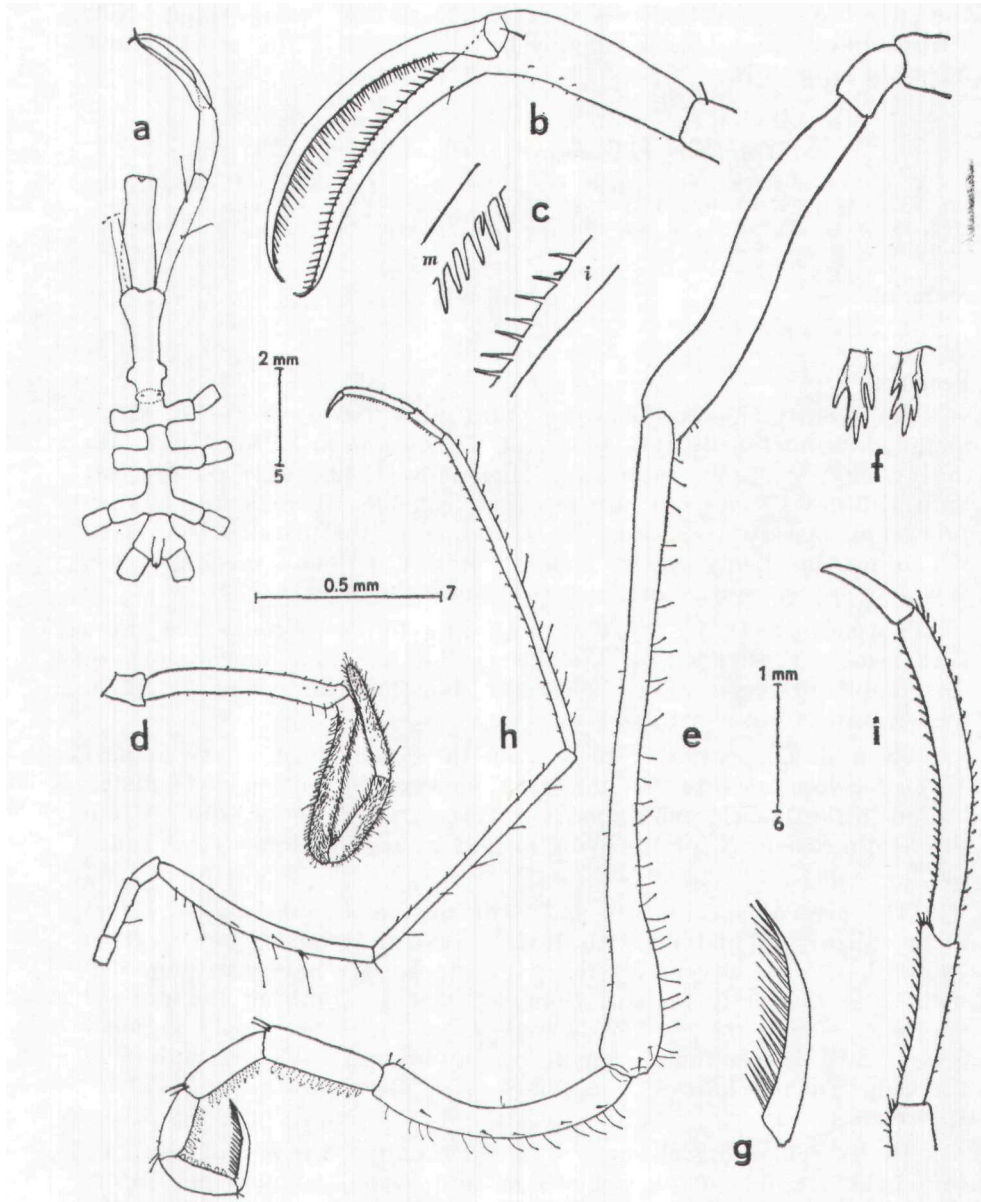


FIG. 3

Nymphon procenim Hoek, 1881, ♂

a: trunk, dorsal (scale 5); b: chela (scale 6); c: detail of the teeth of the chela (*i* = immovable finger; *m* = movable finger) (scale 7); d: palp (scale 6); e: oviger (scale 41); f: compound oviger spines (free-hand sketch); g: terminal oviger claw (scale 2); h: second leg (scale 5); i: distal segments of second leg (scale 4).

the chela is shorter in relation to the fingers in *N. walvisense*; (d) the female femur is distended in its proximal two-thirds in *N. hamatum*, in its proximal one-third in *N. walvisense*.

Derivatio nominis

The ridge in the Southern Atlantic separating the biogeographical provinces of the abyssal of the Angola (or Southeastern Atlantic) and the Cape Basins, is called in several languages the Walvis ridge. Notwithstanding the barbaric (namely Dutch) origin of the word, I have dared to latinize it.

***NYMPHON PROCERUM* Hoek, 1881. Fig. 3**

N. procerum Hoek, 1881: 39-40, pl. II figs. 9-12; Gordon, 1932: 112-113, fig. 9a; Fage, 1951: 95-97, figs. 1-2; Fage, 1953: 1; Fage, 1954: 52, fig. 2; Turpaeva, 1969, table 14; Turpaeva, 1971: 276-277, fig. 2; Turpaeva, 1973: 178; Turpaeva, 1974: 281.

Material

1 ♂ : sample 40.

Remarks

Apparently, Losina-Losinsky, 1961 and Turpaeva (1971, 1973) included *N. noctum* Hilton, 1942 and *N. profundum* Hilton, 1942 into the synonymy of *N. procerum*. Hedgpeth (1949), who redescribed both Hilton's species did not, however, consider them identical with *procerum*, mainly because of the armature of the distal oviger claw, which has numerous (ca. 18) close-set spines in Hoek's species, versus 6 widely spaced spines in the two Hiltonian species.

Turpaeva's (1971: 276-277) reasoning to synonymize the three taxa remains restricted to the observation that the morphology of the compound oviger spines is variable, but the armature of the distal oviger claw is not considered.

Even if Turpaeva's records from the North Pacific are in part *N. profundum/noctum*, *N. procerum* appears to have a wide distribution in the Pacific (off Valparaiso, type-locality) and Atlantic (from the Scotia Sea to N. of the Azores) and a large bathymetrical range (2425-6135m).

The present specimen, a male with only one complete leg, agrees in practically all details with Hoek's type-material, as re-described by Gordon, 1932, except for the palp. In Hoek's holotype, palp segment 5 is distinctly shorter than segment 4. Both in the present specimen, and in Fage's (1951) male from the Azores, palp segment 5 is slightly longer than segment 4. Moreover, Hoek's description of the palp ("nearly hairless") is not very appropriate for the "Walvis" specimen.

In its remaining characters (slender palm; number of teeth on the chela, viz. 32 on the immovable, and 51 on the movable finger; shape of the oviger spines; armature, with 18 slender, close-set, needle-like teeth, of the terminal oviger claw; relative length of the leg segments; general body shape; rudimentary condition of the ocular tubercle; forward position of the implantation of the oviger) the "Walvis" specimen agrees very well with *N. procerum*.

NYMPHON spec.

Material

1 post-larval juvenile: sample 37.

Remarks

The ovigers and P4 are still unsegmented in this juvenile. In general, this specimen resembles *N. residuum* Stock, 1971 (collected by the "Galathea" in the deep-sea off Kenya), but the teeth on the immovable finger are longer.

PALLENOPSIS (BATHYPALLENOPSIS) OSCITANS (Hoek, 1881). Fig. 4

Phoxichilidium oscitans Hoek, 1881: 89-90, pl. XIII figs. 1-5. (nec *P. oscitans* of Hedgpeth, 1948; Barnard, 1954; Arnaud, 1974).

Material

3 ♂ 3 ♀ sample 75.

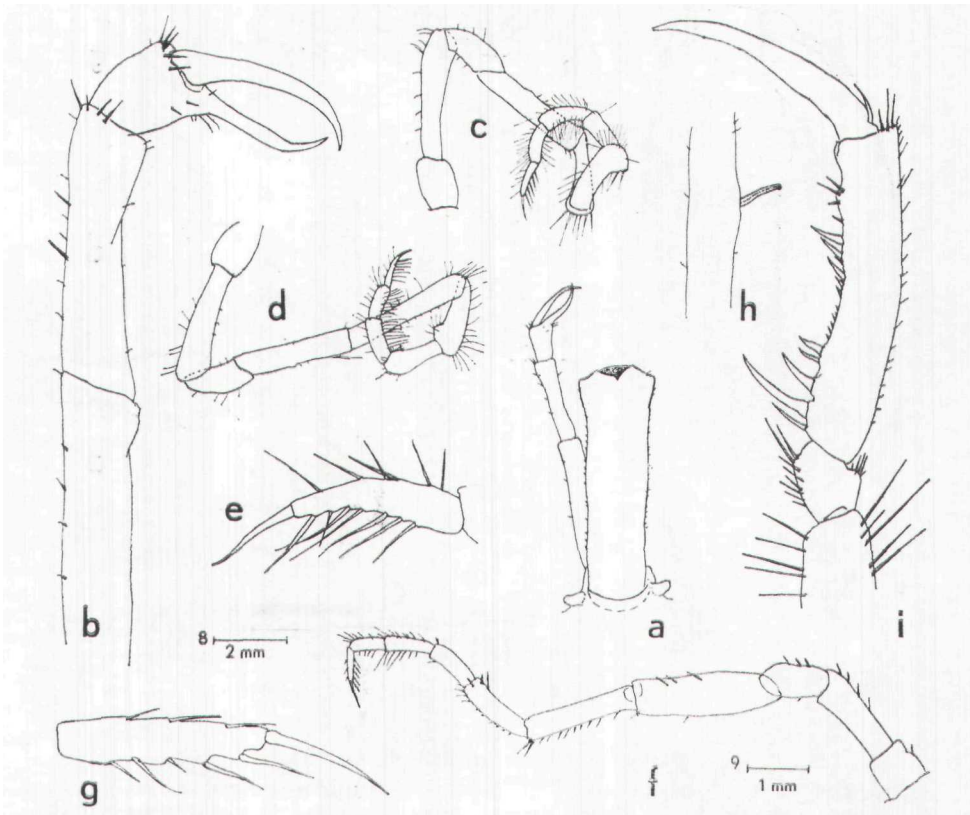


FIG. 4

***Pallenopsis oscitans* (Hoek, 1881)**

a: proboscis and chelifore, ♂, ventral (free-hand sketch); b: chelifore, ♀ (free-hand sketch); c: oviger, ♂, in situ (scale 8); d: same, flattened under cover glass (scale 8); e: 10th oviger segment, ♂ (scale 4); f: oviger, ♀ (scale 9); g: 10th oviger segment, ♀ (scale 7); h: cement gland duct, ♂ (free-hand sketch); i: distal segments of leg (scale 10).

Remarks

Hoek's *P. oscitans* was described in the same year, 1881, as Wilson's *P. longirostris*, the latter having priority. There can be no doubt that these two taxa are closely related, characterized as they

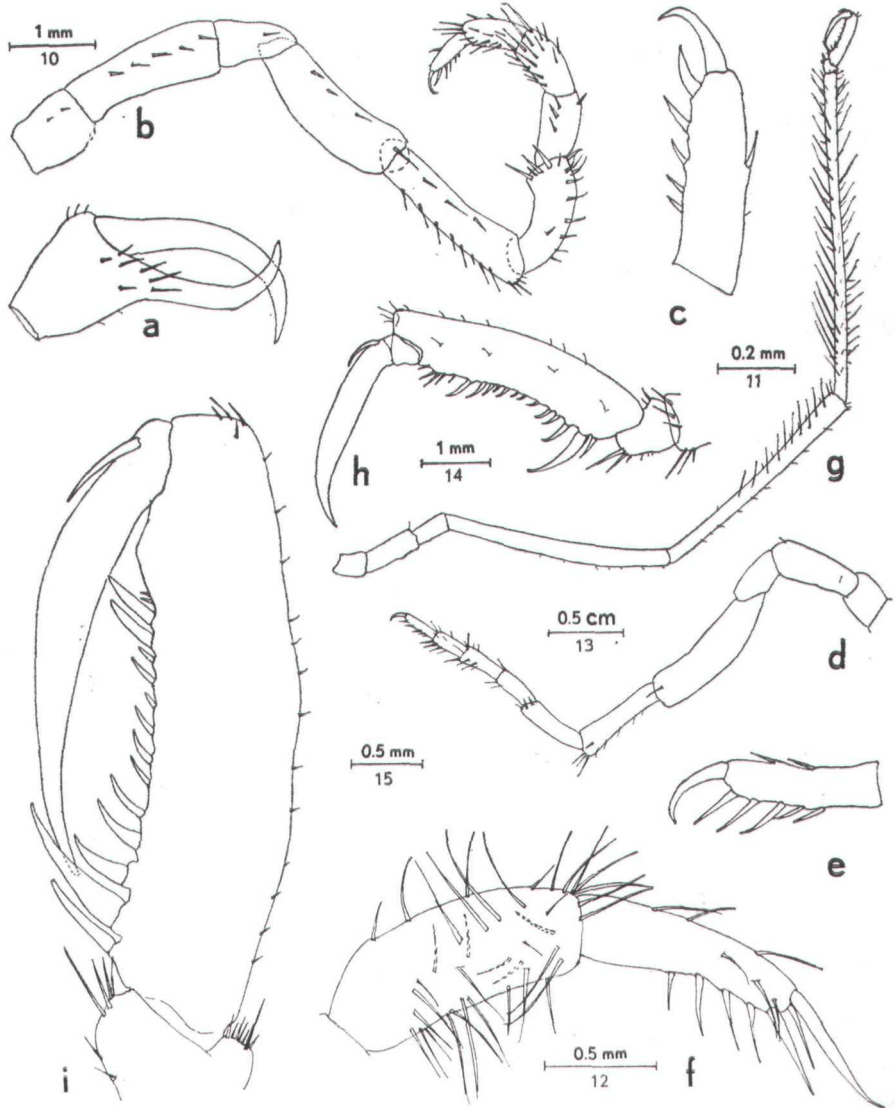


FIG. 5

Pallenopsis longirostris Wilson, 1881

a: chela, ♀ (scale 1); b: oviger, ♀ (scale 10); c: distal part of same (scale 11); d: oviger, ♀ (scale 9); e: distal part of same (scale 7); f: distal segments of oviger, ♂ (scale 12); g: 2nd leg, ♀ (scale 13); h: distal segments of 4th leg, ♂ (scale 14); i: distal segments of 3rd leg, ♂ (scale 15).

[a, b, e, g, h: from "Iselin" St. 168, Bahamas, 24°26.5'—24°28.6'N ; 77°23.3'—77°24.7'W, 1570m;

d, e: from "Gilliss" St. 97, Norfolk Canyon, 37°00'18"—36°59'54"N ; 74°15'00"—74°24'30"W, 1400-1460m;

f, i: from "Albatross" St. 2554, off New York, 39°48'30"N 70°40'30"W, 445 fms.]

are by long setae on the tibiae (Fig. 5g) and a distally markedly widened proboscis (Fig. 4a). Although Hoek (1881: 147) did not regard his species identical with Wilson's, Hedgpeth (1948: 210) considers them synonymous (and comprises also *P. plumipes* Meinert, 1898, into the synonymy).

The only differences between *P. oscitans* and *P. longirostris* that I have been able to find after re-examination of North Atlantic samples of the latter, are found in the distal part of the ovigers of both sexes. The ♀ of *P. oscitans* has a straight, slender (spine-like) element in terminal position on oviger segment 10, versus a strongly curved, claw-like element in *P. longirostris* (Figs. 4g and 5e); the ventral elements on this segment are very long, almost setiform, in *P. oscitans*, spiniform and much shorter in *P. longirostris*. The 10th oviger segment of the ♂ of *P. oscitans* is strongly tapering in shape and ventrally armed with long, setiform elements (much longer than the diameter of the segment), whereas this segment of *P. longirostris* is more or less sausage-shaped and ventrally armed with setiform elements not longer than the segment's diameter (Figs. 4e and 5f). *Pallenopsis plumipes* appears to be closer to *P. longirostris* than to *P. oscitans*, as far as one can judge from Meinert's (1898) figures.

Materials identified by various authors as *P. oscitans*/*P. longirostris* have a proboscis of the "normal" B" type, i.e. it is equally wide in the middle and at the tip. Such specimens belong to the *P. mollissima* group and not to the *P. longirostris* group. Examples of specimens with such a proboscis are Barnard's (1954) female specimen collected off Cape Point, South Africa, in 900-1000 fm; Arnaud's (1974) material from the Azores (37°21'N 25°28'W, in 2090m) (I re-examined 1 ♂, ZMA Pa. 2022); a male from Gilliss Cruise 74-04, Stat. 83 (36°40'42"—36°41'00"N 74°30'30"—74°29'00"W, 1500-1350m, USNM 151496); and several samples from the Albatross Expeditions listed by Hedgpeth, 1948, viz. from Stats. 2470, 2628, 2699, and 2734, all in the Northern Atlantic.

This appears to be the second record of *P. oscitans*, as far as we can judge from the confused literature. Hoek's original material, a female (and not a male as Hoek presumed) was collected near the Azores (38°25'N 35°80'W) by the "Challenger" in 1675 fathoms.

ANOPLODACTYLUS PELAGICUS Flynn, 1928. Fig. 6

A. pelagicus Flynn, 1928: 25-27, fig. 14; Barnard, 1954: 128, fig. 19; Stock, 1963: 340.

Material

2 ♂ ovig., 3 ♂ : sample 75.
♂ ♀

Remarks

Like the specimen recorded by Stock, 1963, from the same general area, the continental margin of the West coast of South Africa, the present material shows a highly conical ocular tubercle of somewhat variable shape (Fig. 6a). In most specimens, traces of small unpigmented eyes are visible. The distal end of the femur bears a small

spur, in males perhaps slightly more distinct than in females (Fig. 6d). In this respect, one is tempted to compare *A. pelagicus* with *A. pharus* Stock, 1975 (which is distinct, however, in having a propodal lamina) or with *A. oculus* Carpenter, 1905 (which is distinct in having 5 femoral cement gland pores, instead of 1 tubular gland aperture).

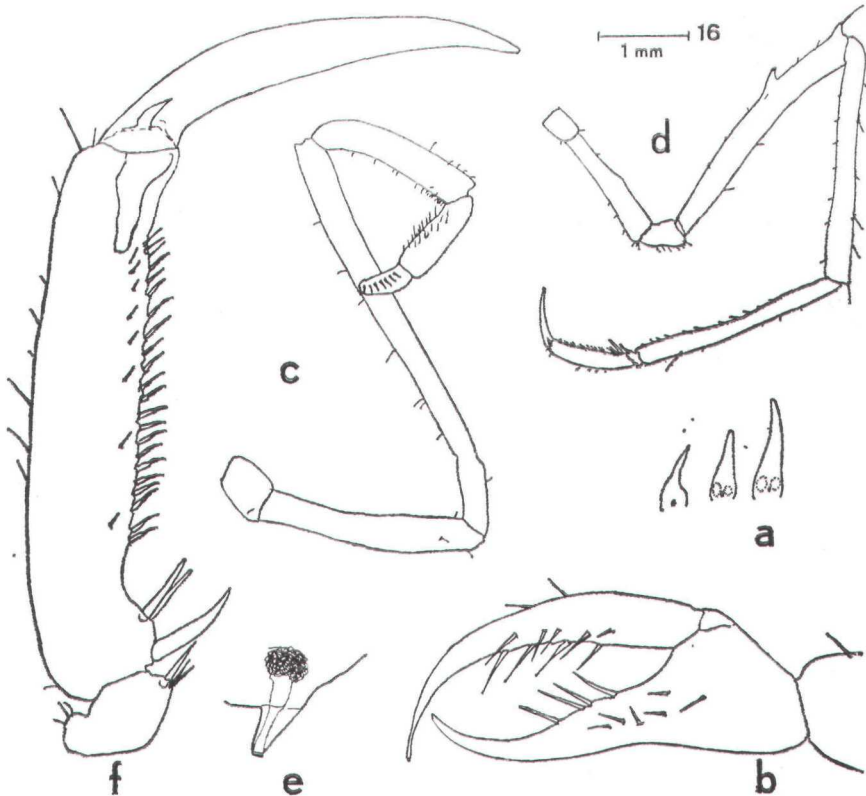


FIG. 6
Anoplodactylus pelagicus Flynn, 1928

a : ocular tubercle of three different specimens, from the left (free-hand sketches);
b : chela, ♂ (scale 2); c : oviger, ♂ (scale 4); d : 3rd leg, ♂ (scale 16); e : cement
gland aperture on 3rd leg, ♂ (scale 2); f : distal segments of 3rd leg, ♂ (scale 2).

ANOPLODACTYLUS PYGMAEUS (Hodge, 1864)

A. pygmaeus Stock, 1954: 77 (refs., syn.).

Material

1 ♂ : sample 42.

Remarks

This record is a bit of a problem: *A. pygmaeus* is a mediolittoral and very shallow water species and its presence in a sample taken at a depth of 4585m does not correspond with the known facts of the ecology of the species. I presume that the specimen got incidentally in the net, possibly from fouling of the ship's hull. At any rate,

the present specimen agrees completely in morphology with littoral material of *A. pygmaeus*; its eyes are well-pigmented (and not absent or unpigmented as one would expect at a depth of 4.5km), and the legs are (in preserved state) banded in white and orange, also an unusual asset for a deepwater form.

THE PANTOPIPETTA LONGITUBERCULATA-COMPLEX

Two closely related, but apparently different, species of the *P. longituberculata-vompiex* are present in the "Walvis" collections. I use the word "*P. longituberculata-complex*" there for those species that lack strong spurs on the lateral processes, have a propodus that is less than 5 times the length of the tarsus, have a long abdomen (the ratio of trunk length divided by abdomen length has a mean around 2), a tall ocular tubercle without eyes, 8-segmented palps, and no auxiliary claws.

Since I have not examined any material of *P. longituberculata* (Turpaeva, 1955) from its terra typica (the Kurile-Kamchatka Trench), I have to depend on the published data (Turpaeva, 1955: 324-327, Fig. 2, and Turpaeva, 1974: 293-294, Figs. 8-9), with the remark that I presume that Turpaeva's specimens (1974) from two stations in the Scotia Sea, specimens characterized by tuberculated lateral processes and a shortish abdomen, belong to some other species, possibly *P. brevicauda* Stock, 1963. Turpaeva's idea (1974: 294, Fig. 9) that the length of the abdomen is correlated with the depth, is not corroborated by later findings (Stock, 1975: 993; Stock, 1978b: 205). Moreover, the structure of the oviger of *P. brevicauda* (with a very elongate 2nd segment, and a long 4th and 10th segment) prevents synonymization of the two species.

Turpaeva's illustrations of the Kurile material [1955, Fig. 2; 1974, Fig. 8 (3-5)] show a species with unarmed lateral processes and some peculiar features in the morphology of the oviger, viz. a third oviger segment that is much longer than the second, and a tenth oviger segment of ovate to rectangular shape, of which the length is shorter than that of oviger segment 9. There is some uncertainty about the slenderness of coxa 2 of *P. longituberculata*: the illustration shows a not very elongate 2nd coxa, but the list of measurements (Turpaeva, 1955: 326) seems to point to a very elongate 2nd coxa. The presence of a number of sickle-shaped spines on palp segment 4 (typical for all other members of the genus) is not shown in Turpaeva's figure 2 (4), but I am not sure this means that such spines are absent.

All South Atlantic specimens examined by me differ from Turpaeva's description and figures in having a low but distinct tubercle on the distal end of the lateral processes, in having oviger segment 3 much shorter than segment 2, and in having a finger- to worm-shaped 10th oviger segment which is longer than segment 9. The 2nd coxae of the Atlantic specimens are very elongate and the 4th palp segment bears several sickle-shaped spines.

Based on the data provided in Turpaeva's papers, I have decided that the South Atlantic specimens are not conspecific with the North Pacific ones. I think that more confusion is created by lumping specimens of apparently different morphology into one species, than by considering them as distinct taxa pending the discovery of more material. By focussing attention to the observed differences, it will be easier for future workers to evaluate significance of these features.

The first specimens of the *P. longituberculata*-complex were recorded from the South Atlantic by Stock (1963: 339) as *Pantopipetta* sp. The male of this sample has been re-examined; it appears to be identical with a couple of specimens in the collections of the "Walvis" Campaign from the continental fringe of South Africa. Another specimen from the South side of the Walvis Ridge belongs apparently to a closely related but different species. Both are described as new in the sequel.

PANTOPIPETTA LATA n.sp. Fig. 7

Pantopipetta sp., Stock, 1963: 339-340, fig. 10 b-c.

Material

1 ♂ (holotype): sample 76.

2 ♂ (paratypes): sample 75.

1 ♂, 1 ♀ (1): SAM Station A 316, 34°42'S 16°54'E, 1725-1780fm (= 3155-3256m) (2), 8 Dec. 1959.

All three stations lay on the continental fringe of the Cape Basin.

Description

Male: Trunk (Fig. 7a) completely segmented, also an intersegmental line at the base of the abdomen. Lateral processes extremely elongate, with a low dorsodistal tubercle. The ratio of width across the 2nd lateral processes divided by trunk length (without abdomen) is about 0.8. The ocular tubercle is highly conical devoid of eyes. The abdomen is long, reaching to about 2/3 of the length of coxa 2 of leg 4. The ratio of length of trunk divided by length of abdomen is about 1.9. The proboscis is annulated, slender, slightly swollen in its basal part; the tubular distal part is gently curved downward (Fig. 7b).

Palp 8-segmented, not fundamentally different from that of the next species, *P. angusta*.

Oviger (Fig. 7c) characterized by a rather slender 2nd segment and a relatively short 4th segment (the ratio length oviger segment 4 divided by segment 2 is 1.5 to 1.6; the ratio segment 6 divided by segment 4 is about 1.2 to 1.3). The compound spine formula is 3:2:2:4. The 10th segment is strongly tapering, finger- to worm-shaped. The distal claw is small, unarmed.

(1) Only the male (in ZMA) re-examined for this purpose. The ♀ is preserved in the South African Museum, Cape Town.

(2) And not "1326-3256m", as Hedgpeth and McCain, 1971: 221, tabulated it.

The legs (Fig. 7d) are thin and slender. Coxa 1 is unarmed. Coxa 2, very elongate. Coxa 3 of all legs bears a very long dorsal spur. The long leg segments, especially femur and tibia 1, bear several long setae. The cement gland duct is ventral, subdistal, chimney-shaped (Fig. 7e). The distoventral margin of tibia 2, the tarsus, and of the propodus bears numerous small spinules, which are not so

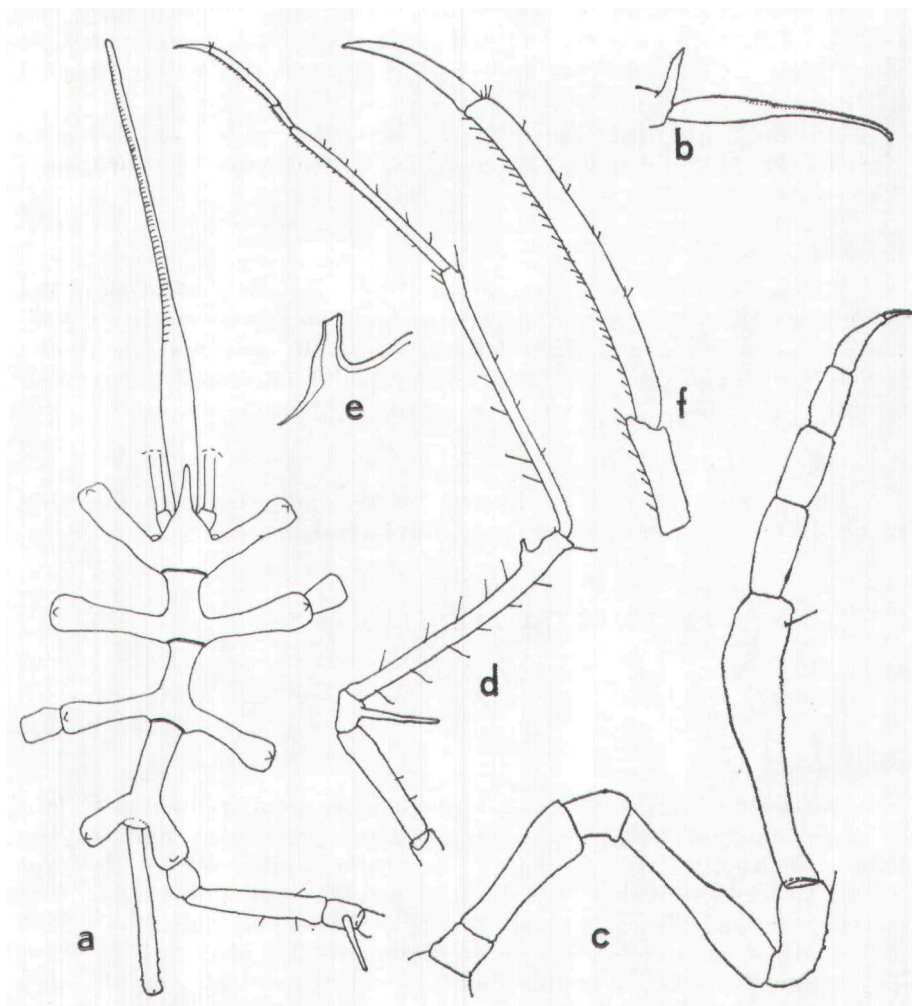


FIG. 7

Pantopipetta lata n.sp., ♂

a: trunk, dorsal (scale 1); b: ocular tubercle and proboscis, from right (free-hand sketch); c: oviger, compound spines omitted (scale 2); d: 3rd leg (scale 1); e: cement gland duct (scale 2); f: distal segments of 3rd (scale 21).

densely packed as in the next species. The propodus is about 3.5 times longer than the tarsus; the claw is about 0.4 times the length of the propodus. No auxiliary claws (Fig. 7f).

Female: Some illustrations of the female can be found in Stock, 1963.

Measurements (in mm)

♂ from CP 13: length proboscis 4.20; length first trunk somite 0.44; length 2nd trunk somite 0.56; length 3rd trunk somite **0.79**; length 4th trunk somite (to base of abdomen) 0.93; total length trunk 2.72; width across 2nd lateral processes 2.18; length abdomen **1.47**.

♂ from A 316: oviger, 1st segment 0.10; 2nd segment 0.28; 3rd segment 0.10; 4th segment 0.44; 5th segment 0.19; 6th segment 0.56; 7th segment 0.21; 8th segment 0.16; 9th segment 0.13; 10th segment 0.15.

♂ from A 316: third leg, **1st** coxa 0.25; 2nd coxa 1.08; 3rd coxa 0.26; femur 2.28; 1st tibia 2.32; 2nd tibia 1.79; tarsus 0.22; propodus 0.76; claw 0.29.

Remarks

This species is mainly characterized by the great elongation of the lateral processes (width/length ratio of trunk 0.8), the relatively long 2nd oviger segment and the relatively short 4th oviger segment, the loosely set spinules on the tarsal and propodal soles, and the relative length of the claw.

Derivatio nominis

The specific name, *lata*, means "wide" and alludes to the wide trunk due to the great elongation of the lateral processes.

PANTOPIPETTA ANGUSTA n.sp. Fig. 8

Material

1 ♂ (holotype): sample **37**.

Description

Male: trunk (Fig. 8a) looking much more slender than in *P. lata* because the lateral processes are (at about the same length of the trunk) distinctly less elongate. The ratio width across the 2nd lateral processes divided by length of the trunk is about 0.63. The lateral processes bear low but distinct dorsodistal tubercles. The abdomen is long and reaches to approximately 2/3 of coxa **2** of leg **4**. The proboscis (Fig. 8c) in the single specimen available consists of a slightly swollen basal part and a sigmoid, partly upcurved, tubular distal part. Whether this is **an** artefact due to conservation on the natural position, is unknown.

The palp (Fig. 8d) is 8-segmented. Segment **2** is slightly longer than segment **4**; the latter bears 4 medial curved spines and 1 distal sickle-shaped spine. Segment **5** is rather elongate, segment **6** is shorter than segment **7**, segment **8** slightly longer than segment **7**.

The oviger (Fig. 8e) is characterized by a short 2nd segment. On the other hand, segment **4** is long, almost as long as segment **6**. The ratio length oviger segment **4** divided by segment **2** is about 2.8; the ratio segment **6** divided by segment **4** is only slightly more than **1**. The compound spine formula is 3:2:2:4. The compound spines

(Fig. 8f) are broadly triangular, marginally with some 6 fine teeth. Oviger segment 10 and terminal claw similar to those of *P. lata*.

Legs (Fig. 8g) similar to those of *P. lata*. Setae on tibia 1 less long and less numerous. Spinules on ventral margin of tibia 2 and

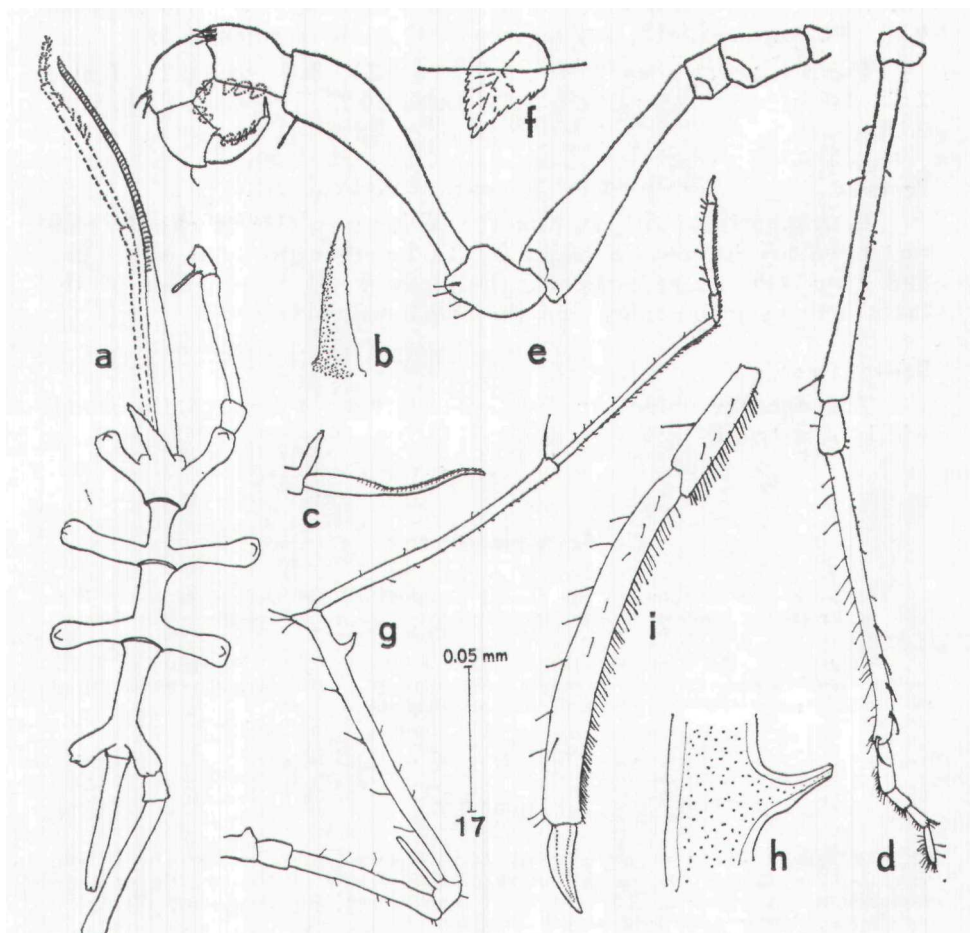


FIG. 8

Pantopipetta angusta n. sp., ♂

a: trunk, dorsal (scale 1); b: ocular tubercle, from the left (free-hand sketch); c: ocular tubercle and proboscis, from the right (scale 8); d: palp (scale 4); e: oviger (scale 2); f: first compound spine of oviger segment 7 (scale 17); g: 3rd leg (scale 1); h: cement gland duct (scale 2); i: distal segments of first leg (scale 2).

on tarsal and propodal soles very numerous, densely packed, especially on the distal end of the propodus (Fig. 8i). Claw short, only 25 percent of the length of the propodus.

In its remaining characters, *P. angusta* resembles *P. lata*.

Female: unknown.

Measurements of the holotype (in mm)

Length proboscis 3.73; length 1st trunk somite 0.48; length 2nd

trunk somite 0.61; length 3rd trunk somite 0.74; length 4th trunk somite (to base of abdomen) 0.94; total length trunk 2.76; width across 2nd lateral processes 0.48; length abdomen 1.41.

Oviger: 1st segment 0.09; 2nd segment 0.19; 3rd segment 0.09; 4th segment 0.51; 5th segment 0.16; 6th segment 0.52; 7th segment 0.18; 8th segment 0.13; 9th segment 0.11; 10th segment 0.14.

Third leg: 1st coxa 0.30; 2nd coxa 1.28; 3rd coxa 0.25; femur 2.53; 1st tibia 2.38; 2nd tibia 1.80; tarsus 0.25; propodus 0.71; claw 0.18.

Remarks

In comparison with *P. lata* the present species is chiefly characterized by the narrow trunk (width/length ratio 0.63), short 2nd and long 4th oviger segment, the densely set spinulation of the tarsal and propodal soles, and the short distal claw.

Derivatio nominis

The specific name, *angusta*, (= narrow) refers to the small width of a trunk.

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Summary

Ten species of Pycnogonida (plus two unidentifiable species) have been recognized in samples taken in depths of 3550-5040m in the Walvis or Cape Basin, Southern Atlantic. Three of these species are new to science: *Nymphon walvisense*, *Pantopipetta lata*, and *P. angusta*.

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