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SCOLECOCALANUS STOCKI SP. NOV., A NEW CALANOID COPEPOD FROM INDONESIAN WATERS

W. VERVOORT

Rijksmuseum van Natuurlijke Historie, P.O. Box 9517, 2300 RA Leiden, the Netherlands

ABSTRACT

A new species of calanoid copepod, *Scolecocalanus stocki*, occurring in the Bali Sea, off Sepandjang, Indonesia, is described and illustrated and additional remarks on the genus are given.

The genus *Scolecocalanus* was founded by Farran (1936) for the reception of two new species: *Scolecocalanus galeatus* Farran, 1936: 103-104, fig. 14, and *Scolecocalanus lobatus* Farran, 1936: 104, fig. 15, both being recorded from the Great Barrier Reef, Australia. No distinct type of the genus was indicated by Farran, but the first mentioned species, *Scolecocalanus galeatus*, is here designated as the type of the genus. A third species was subsequently described by C. B. Wilson, 1950: 336-337, pl. 35 figs. 528-531, as *Scolecocalanus spinifer* from the Philippine area. Numerous females and males of a new species occur at Snellius Station 172*, 07°15.5'S, 115°51.5'E, Bali Sea off Sepandjang, 0-200 m, 30.10.1930. Originally no males were described by Farran, but in Wilson's material there are two females and a male, so that the generic diagnosis could be extended. Both sexes of *Scolecocalanus* demonstrate the intermediate position of *Scolecocalanus* between the genera *Scottocalanus* G. O. Sars, 1950, and *Macandrewella* A. Scott, 1909 (see also Campaner, 1989). The description of the new species is

presented here, along with additional remarks on the genus. I have great pleasure to dedicate this new species to Prof. Dr. Jan H. Stock in recognition of his great and important contributions in copepodology.

Scolecocalanus stocki sp. nov. (Figs. 1-4)

Material Examined. — Snellius I Expedition Station 172*, 07°15.5'S, 115°51.5'E, Bali Sea off Sepandjang, 0-200 m, 30.01.1930: 56 adult females, 23 adult males, 3 juveniles (copepodites V). One adult female, 4.10 mm long, has been selected as the holotype (RMNH-F 2000), one adult male (RMNH-F 2001), length 4.20 mm as the allotype, and c. 70 adult specimens (RMNH-F 257) as paratypes, also including 4 microslide preparations of mouth parts and legs of both sexes. One specimen of both sexes has also been deposited in the collections of the National Museum of Natural History (Smithsonian Institution), Washington, and those of the Institute of Tax-

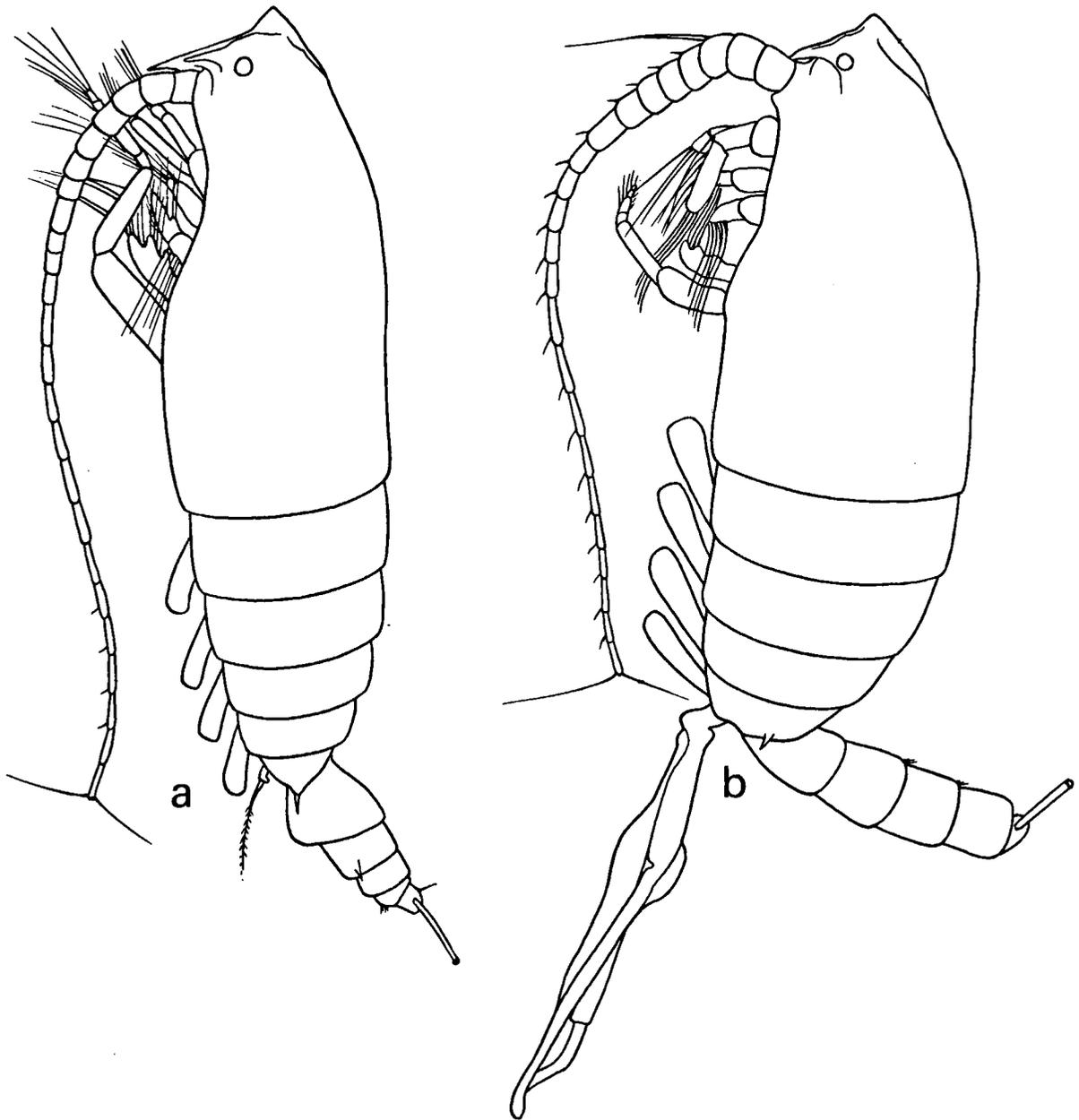


Fig. 1. *Scolecocalanus stocki* sp. nov., Snellius Expedition, Sta. 172*. a, adult female, lateral view from left side; b, adult male, lateral view from left side. a, b, $\times 30$.

onomic Zoology (Zoological Museum) of the University of Amsterdam.

Description. — *Adult female* (fig. 1a), total length 3.75-4.25 mm. Proportional lengths of cephalothorax and urosome are as 64 to 18, the length of the urosome being contained 3.55 times in that of the anterior part of the body.

Head and 1st thoracic somite completely fused, 4th and 5th somites of thorax partly fused, line of fusion distinct in dorsal region. General outline of body much resembling outline drawing of *S. galeatus* given by Farren (1936, fig. 14a), the head being provided with a high, triangular crest (fig. 2b), directed forward and

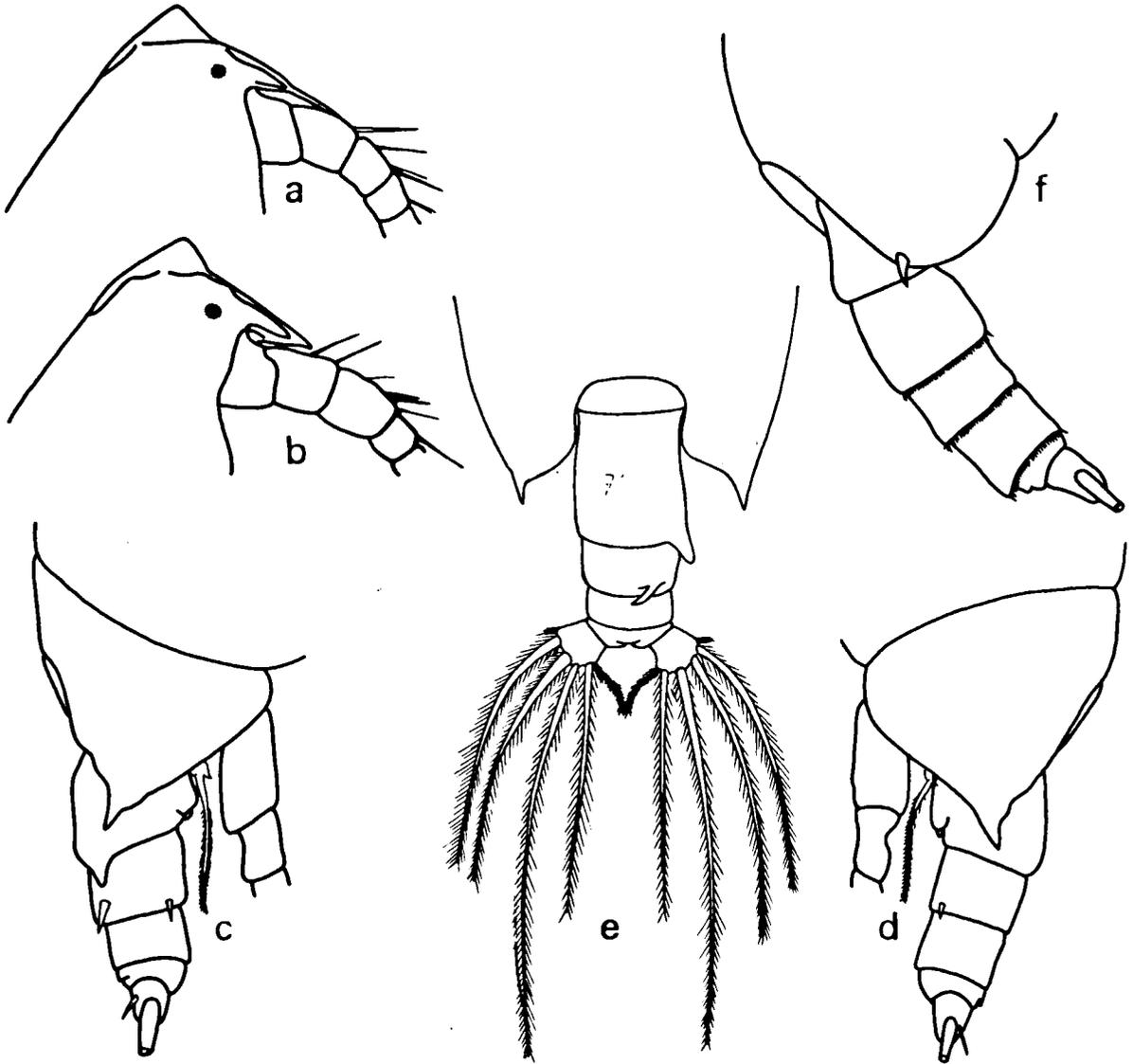


Fig. 2. *Scolecocalanus stocki* sp. nov., Snellius Expedition, Sta. 172*. a, adult male, head, lateral view from right side; b, adult female, head, lateral view from right side; c, adult female, posterior part cephalothorax and urosome, lateral view from right side; d, idem, from left side; e, idem, dorsal view; f, adult male, posterior part cephalothorax and urosome, lateral view from right side. a-f, $\times 30$.

with a strong, bifurcated rostrum. Shape of rostrum in agreement with that of *S. lobatus* (cf. Farran, 1936, fig. 15e); incision not particularly deep, each ramus with a small, acutely pointed rostral spine, shorter than depth of incision; rostrum pointing downwards and slightly backwards. "Eyes" distinct, anterior surface of rostrum (lenticular plate) slightly thickened.

Lateral thoracic margins produced, slightly

asymmetric, on each side with triangular flap (fig. 2e), terminating in acutely pointed, strong tooth, pointing slightly downwards in some specimens, but generally directed straight backwards, a bit more produced on the right (fig. 2d) than on the left side (fig. 2c). Basis of spine slightly swollen.

Urosome 4-segmented, proportional lengths of these somites, including the furca:

1 + 2	3	4	5	furca	
45	22	13	5	15	= 100.

Genital somite asymmetric, with backwardly directed lobe on right latero-dorsal margin (fig. 2c). Genital swelling slight, genital operculum distinct, visible on each side; behind operculum a small, transparent tubercle. Third somite of urosome with 3 distinct spines: a large curved spine on dorsal surface near right distal corner, pointing obliquely backwards and a small acute spine on each latero-ventral corner, pointing backwards (fig. 2c, d, e). Anal operculum on last (anal) somite distinct.

Rami of furca about as long as wide, each with four strong, marginal setae and a small, curved appendicular seta (fig. 2e). All marginal setae densely plumose, the second internal on each side nearly 1.5 times as long as remaining setae; appendicular seta with short hairs. External margin of each ramus with a patch of hairs near base of external marginal seta. In this patch of hairs the dorsal (external) seta is hidden.

Antennules reaching distal margin of third urosomal somite; the various segments have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14
42	50	23	25	27	29	28	57	27	29	40	55	55
15	16	17	18	19	20	21	22	23	24	25		
55	54	53	53	52	50	46	45	46	46	13	= 1.000.	

On the right side there is complete fusion between segments 8-9, 10-12 and 20-21; the segmentation between 8-9 and 10-12, between 10-12 and 13, and between 14 and 15 being incomplete. On the left side the same condition prevails, with the exception of segments 20 and 21, that are separate.

Antenna with endopodite half as long as exopodite; 1st basal segment with strong terminal seta and a patch of hairs ventrally near its base. Second basal segment with 2 strong setae. First segment of endopodite with internal, almost distally placed, strong seta. Terminal segment of endopodite with 6 setae (5 and 1 appendicular) on the proximal and 8 setae on the terminal lobe. Exopodite of the usual struc-

ture, 1st and 2nd segments separate and without setae, 3rd to 6th segments each with strong seta and terminal (7th) segment with 3 setae.

Mandibula largely as in *Scottocalanus*; gnathobasis not studied in detail. Palp with 1st basal segment shaped as annular sclerite, attaching palp to gnathobasis; no setae present. Second segment of basipodite large, globular, with 2 unequal setae at the outer margin. Endopodite composed of 2 segments; first segment conical, well articulating with 2nd segment of basipodite, armed with single plumose seta and appendicular seta. Endopodite segment 2 as long as first, with a total of 8 plumose setae, one appendicular seta and a row of hairlike spinules near the apex. Exopodite short, articulation between 6 segments distinct; each segment with large, plumose seta.

Maxillula (fig. 3a) as figured by Farran for *Scolecocalanus galeatus*; 1st inner lobe of first segment of basipodite bearing 11 spiniform setae, 3 of which occur on the posterior side. Second inner lobe of this segment with 2 apical plumose setae. First outer lobe of this segment with 9 plumose setae. Second outer lobe absent. Second segment of basipodite with total of 5 setae, one of which is appendicular; endite of this segment of moderate size, bearing 3 setae. Exopodite of 2nd segment of basipodite of considerable size, bearing 8 strong, plumose setae; endopodite with a total of 6 setae and an appendicular sea, without articulation and apparently fused with basipodite.

Maxilla (fig. 3b) with first segment of basipodite conical and smooth, without appendages. There are 4 distinct endites, each with 3 setae, one of which is spiniform, increasing in size distally, one is normal and one appendicular. Second segment of basipodite with large (5th) endite bearing a strong, curved spine-shaped seta, coalescent with the endite, and one spinulose seta. Distal border of 5th endite with row of spiniform hairs. Structure of endopodite obscure in dissections, but apparently 2 free segments are present, bearing a complement of 6 (sensory), weakly sclerotized setae.

First basal segment of maxilliped with 6

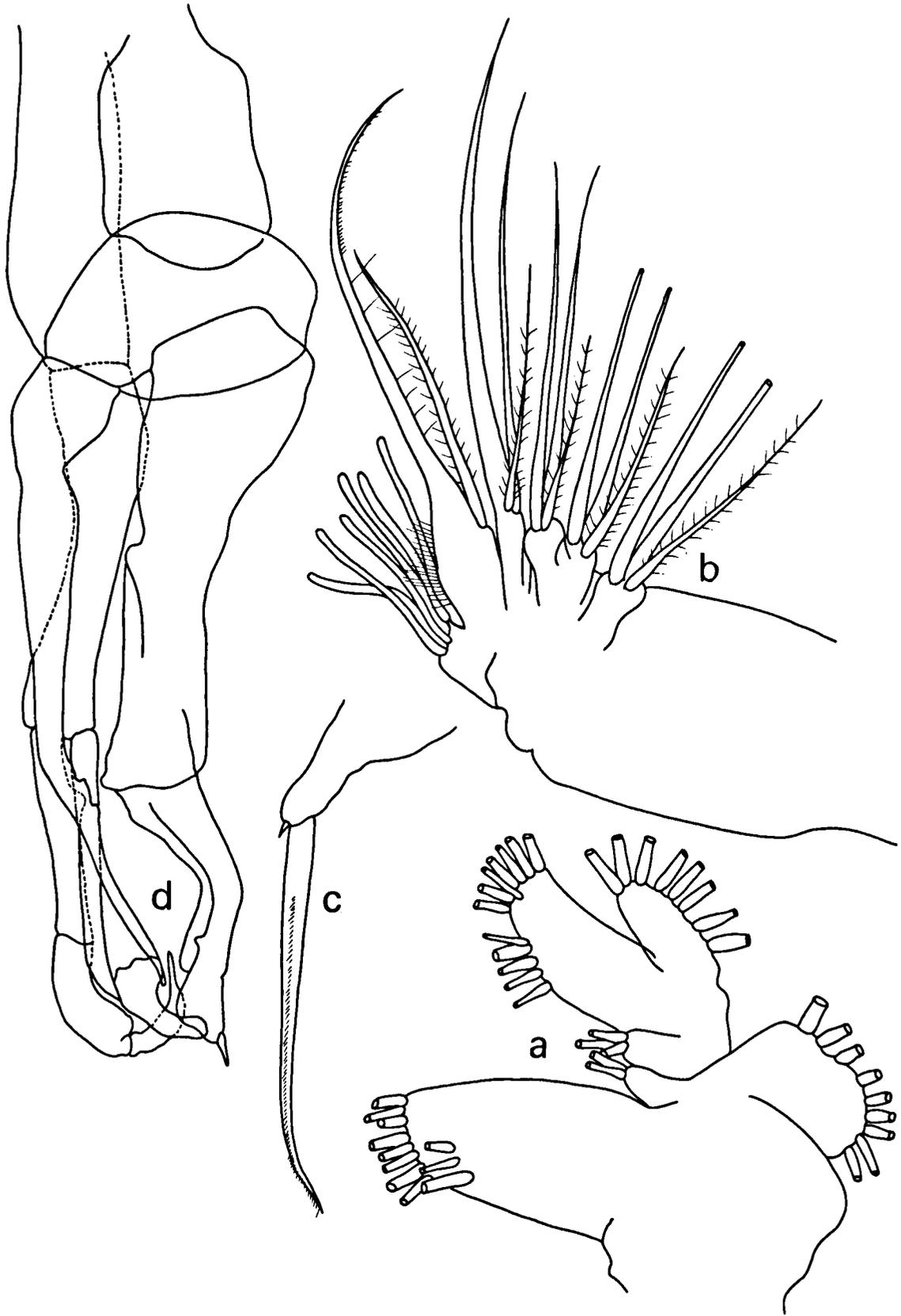


Fig. 3. *Scolococalanus stocki* sp. nov., Snellius Expedition, Sta. 172*. a-c, adult female; a, left maxillule, posterior view; b, left maxilla, anterior view; c, left fifth leg, posterior view; d, adult male, fifth pair of legs, posterior view. a, b, $\times 170$; c, $\times 140$; d, $\times 70$.

setae, 3 of which are terminal, and 1 short, curved sensory appendage on a slight elevation in the middle of that segment. Second basal segment with 5 setae, 2 of which are terminal. First endopodal segment with 4 setae; 2nd endopodal segment, which is twice as long as first, has 2 long apical and 1 short lateral seta. Third segment of endopodite as long as first, with 2 apical setae, the shorter of which stands more or less lateral; fourth segment of endopodite with 3 apical setae, with 1 more or less lateral and 1 short and external. Terminal segment of endopodite with four setae, 2 of which are long while the other two are external and much shorter.

Legs resembling those found in *Scottocalanus*. First pair with 3-segmented exopodite and unsegmented endopodite (fig. 4a). Internal border of 2nd basal segment haired. First segment of exopodite with large, haired swelling at internal margin. First and 2nd segments of exopodite with identical spine at external margin; terminal segment of exopodite with slightly stronger spine at end of external margin and strong terminal spine with lamelliform row of small teeth along external margin.

Endopodite of 2nd pair of legs 2-segmented; exopodite 3-segmented (fig. 4b). Second segment of endopodite with 2 rows of spinules on anterior aspect, one row of four strong spinules placed along a distinct carina on the segment and a second row of 2 slightly smaller spinules. Posterior aspect of this segment with 1 spine. Second segment of exopodite with row of spinules along distal margin of anterior surface, curving upwards along internal border and consisting of 15 spines. Third segment of exopodite with 2 patches of spines on anterior surface, one in middle of segment and consisting of 6 strong and 6 smaller spinules, and a basal patch, consisting of 11 small spinules. Terminal spine of 3rd segment of exopodite with c. 35 strong teeth along external border and a lamelliform row of hairs along internal border.

Endo- and exopodite of 3rd pair of legs 3-segmented (fig. 4c); 2nd segment of endopodite with 3 strong spines; third segment of

endopodite with 3 strong spines and 1 smaller spine. Armature of exopodite almost as in 2nd pair, spinules on anterior surface of third segment dispersed and small. Terminal spine of exopodite as in second pair.

Endo- and exopodite of 4th pair of legs also 3-segmented (fig. 4d); spines on anterior aspect arranged in longitudinal row on endo- and exopodite. Second segment of endopodite with 2, 3rd with 3 strong spines. Second segment of exopodite with row of c. 7 spinules, increasing in length distally, inserting on distinct elevation of integumentum under each spine; distal spine strong. Third segment of exopodite with 3 rows of spinules, arranged in a single longitudinal row. First row composed of 27 strong spinules, increasing in length distally; second row with 10 spinules also increasing in size towards base of segment and generally as strong as those of first row. Spines of 3rd row number 20 and are of smaller but equal size. Terminal spine on third segment of exopodite as in second and third pairs.

Fifth legs only present on left side (fig. 3c), intermediate between shape described by Farran (1936) for *Scolecocalanus* and that in *Scottocalanus*. Free segment much shorter than that observed in *Scottocalanus*, but with a small additional spine as usually observed in that genus. Terminal spine strong, six times as long as free segment, much stronger than usually found in *Scottocalanus*, with one longitudinal row of hairlike spinules.

Adult male (fig. 1b), total length 3.95-4.25 mm. Proportional lengths of cephalothorax and urosome are as 60 to 22, length of abdomen being thus contained 2.73 times in that of cephalothorax. General appearance of male much resembling that of adult female. Head and 1st thoracic somite as well as 4th and 5th thoracic somites completely fused. Head as in female (fig. 2a), creast slightly lower, rostral base slenderer, appendicular spines long, almost same length as rostrum, hidden between basal parts of antennules; incision, as in female, shallow. "Eyes" distinct; anterior surface of rostrum (lenticular plate) thickened, resembling condition observed in female.

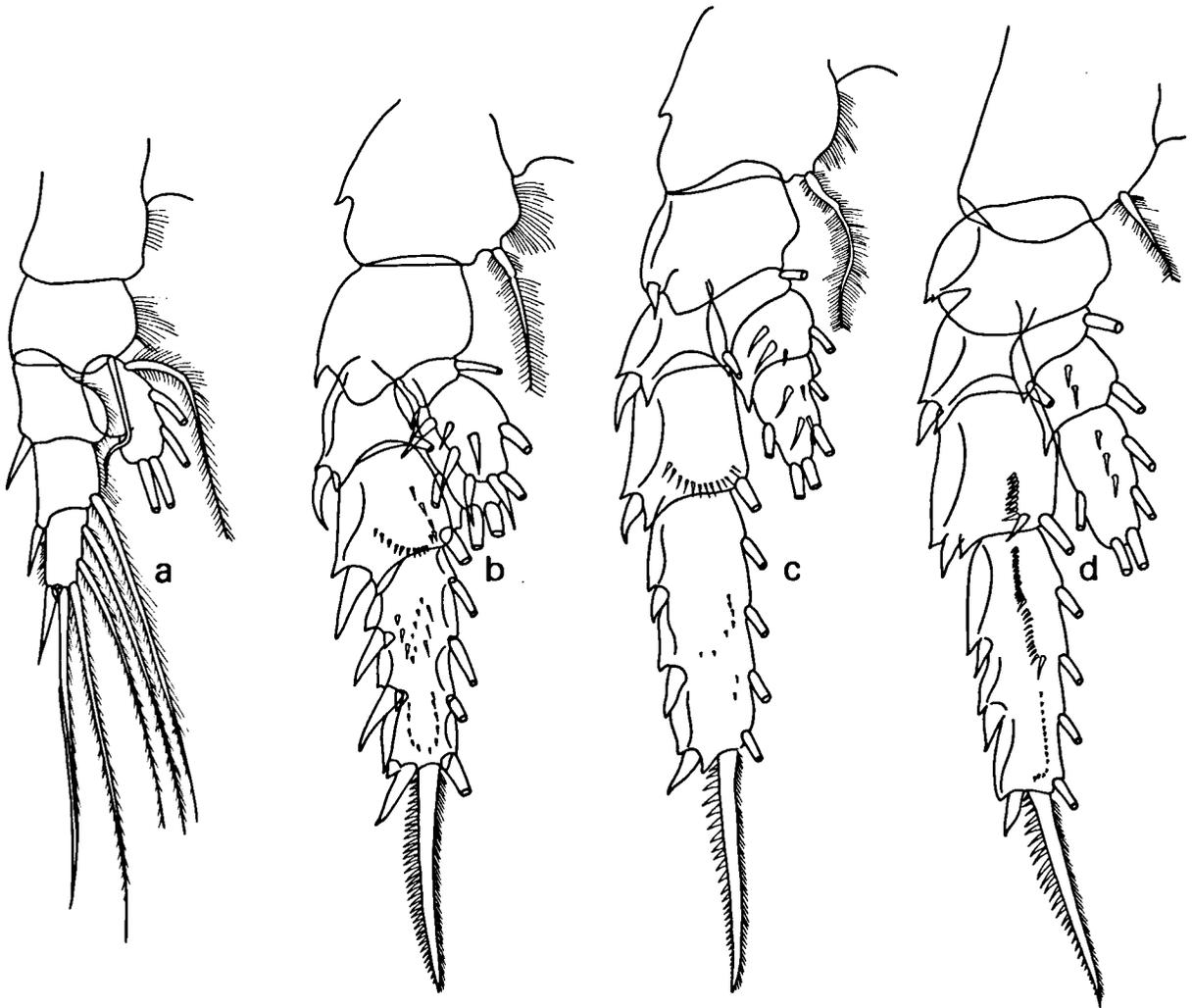


Fig. 4. *Scolecocalanus stocki* sp. nov., Snellius Expedition, Sta. 172*, adult female. a, right first leg, anterior view; b, left second leg, anterior view; c, left third leg, anterior view; d, left fourth leg, anterior view. a-d, $\times 85$.

Lateral thoracic margins rounded, with on each side backwardly directed, curved spine (fig. 2f).

Urosome 5-segmented, proportional lengths of urosomal somites and furca:

1	2	3	4	5	furca	
17	29	18	19	8	9	= 100.

First urosomal somite slightly asymmetric, with genital opening on left side, covered by circular plate, in dorsal aspect visible as a slight eminence on left side. Distal border of 2nd to 4th abdominal segments each with row of leaf-like spinules, largest on dorsal portion of each

segment, particularly in abdominal segment four. Furcal rami as in female; internal seta small, 2nd internal seta on each side only slightly enlarged.

Antennula slightly shorter than that of female, reaching distal border of 2nd urosomal somite. The various segments have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10-12	13	14	15
47	57	29	22	29	27	28	65	86	45	46	55

16	17	18	19	20-21	22	23	24	25
61	61	57	53	82	45	51	41	12 = 1.000.

On the left side segments 8-9, 10-12 and 20-21

are fused, though between 8-9 and 10-12 the fusion is incomplete; on the right side segments 20-21 are nearly completely separate.

Antennae and oral parts, with exception of the maxillipeds, are not reduced and have the same structure as in the female. Both segments of endopodite of maxilliped of reduced length, though with same number of setae as also observed in female.

First to fourth pairs of legs much resembling those of female; segmentation between 2nd and 3rd segments of exopodite of 1st pair of legs incomplete. Spinulation of legs of 2nd and 3rd pairs as in female, 4th pair entirely bare.

Fifth pair of legs (fig. 3d) biramose on each side, intermediate in shape between structure observed in *Scottocalanus* and that described in *Scolecocalanus* by Wilson (1950). Basipodite of right leg short, first segment short and cylindrical, second segment globular, with long and styliform endopodite attached laterally. This endopodite has about same shape as corresponding appendage in male *Macandrewella asymmetrica* (cf. Farran, 1936, fig. 16f), being shorter than right exopodite. This right exopodite 3-segmented, each segment of characteristic shape and with a number of slits and tubercles; 2nd segment with terminal spinelike projection at external margin. Basipodite of left leg long and cylindrical, left endopodite 1-segmented, styliform, smooth.

Left exopodite 3-segmented; distal portion of 1st segment of exopodite with some tubercles and a slit; jointing between 1st and 2nd segments of exopodite indistinct. Third segment of exopodite small and claw-shaped. Endopodite of left leg reaching middle of 2nd segment of exopodite of left side. Right and left exopodite of nearly same length.

Remarks. — The present new species shows resemblance with *Scolecocalanus spinifer* as described and figured by C. B. Wilson (1950: 336-337, pl. 35 figs. 528-531), so much so that I thought it advisable to obtain more information concerning Wilson's species. I found Dr Frank Ferrari, SOSC/MSC, National Museum of Natural History, Washington, willing to compare my drawings with Wilson's material and to make some sketches. The type lot of *Scolecocalanus spinifer* consists of a female and a male, USNM no. 74155, of which the cephalothoraxes are cracked, probably as a result of alcohol dehydration. There is also a female specimen under USNM no. 143831 (vial no. 73712) of which the appendages of the right side are missing; this is probably the specimen used by Wilson for description and drawings. The appendages (with the exception of the fifth feet of both sexes) are not described in detail nor figured. From the sketches and notes that Dr Ferrari sent me the following differences are apparent:

	<i>S. spinifer</i>	<i>S. stocki</i>
Female:		
left caudo-lateral corner of 4+5th thoracic somites:	rounded (according to information supplied by Dr F. Ferrari)	pointed
left fifth foot:	terminal spine short, reaching distal border of genital complex	terminal spine long, reaching distal border of 3rd urosomite
genital complex:	tubercle on right disto-lateral corner pointed, visible from left side	tubercle on right disto-lateral corner rounded, invisible from left side
fourth urosomite:	with small tubercle on upper part of left side and small, triangular spine on upper part of right side	smooth on both sides
furcal rami:	with cluster of small spinules on lateral surfaces	without any spinules on lateral surfaces

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REFERENCES

- BOSCHMA, H., 1936. Biological Data. Snellius Exped., 6: 1-29, chart.
- CAMPANER, A. F., 1989. Supplementary description of *Macandrewella chelipes* (Giesbrecht, 1896) from the Gulf of Elat (Copepoda: Scolecithricidae), and comments on its relationship with *Scottocalanus* Sars and *Scolecocalanus* Farren. Israel J. Zool., 35: 229-235.
- FARRAN, G. P., 1936. Copepoda. Scient. Rep. Gt Barrier Reef Exped., 5 (1): 73-142.
- WILSON, C. B., 1950. Copepods gathered by the United States Fisheries steamer "Albatros" from 1887 to 1909, chiefly in the Pacific Ocean. In: Contributions to the biology of the Philippine Archipelago and adjacent regions. Bull. U.S. Natn. Mus., 100 (14) (4): i-ix, 141-441, pls. 2-36.

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