

A key to the genera of Scolecitrichidae, with description of a new genus and redescription of two species (Crustacea, Calanoida)

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The composition of the family is discussed and a key to the genera is given. A new genus, *Falsilandrumius*, is described for *Scaphocalanus bogorovi* Brodsky; *S. angulifrons* Sars and *Scolecithricella lobata* Sars possibly belong to this new genus. *Scolecithrichopsis tenuipes* (T. Scott) and *Parascaphocalanus zenkevitchi* Brodsky are redescribed.

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Introduction

Ferrari & Markhaseva (1996) placed 18 genera in Scolecitrichidae, among them the genus *Pseudophaenna* Sars, 1902 previously referred to Phaennidae. In my opinion, the systematic position of this genus needs further examination, and I do not include it in Scolecitrichidae. The key character separating Scolecitrichidae from Phaennidae, the structure of the sensory setae of Mx2 endopod, was incompletely described by Sars, but as he distinguished the structure of these setae in Phaennidae and Scolecitrichidae, it may be assumed that they are similar to those of Phaennidae. Bradford (1973) placed the genus outside both the Phaennidae and Scolecitrichidae because of the absence of conspicuous spines on the posterior surface of non-expanded P2-P4 endopods. More recently, Bradford et al. (1983) tentatively placed the genus in Tharybidae. In fact, *Pseudophaenna* shares the short endopod of A2 (scarcely as long as half of A2 exopod) with tharybids and phaennids, the absence of conspicuous spines on posterior surface of non-expanded P2-P4 endopods with most tharybids, the very small, narrow exopod of Mx1 bearing 2 setae with *Undinella* Sars, 1900, the fusiformly dilated basis of Mxp with *Tharybis* Sars, 1903, and the single, cone-shaped rostrum with *Rythabis* Schulz, 1995 (Tharybidae), but the shape of female P5 is atypical of both families. The uniramous male P5, of simple

structure with subcylindrical segments, is typical of Phaennidae, noted also in some scolecitrichids, but atypical of tharybids, and seems to be close to the male P5 of ancestral form for all so called Bradfordian families. As parallelisms seem to be very frequent in the evolution of Bradfordian families (Ferrari & Markhaseva, 1996; Vyshkvartzeva, 2000), only reexamination of sensory setae of Mx2 can give the ultimate answer to the family position of this deviating genus combining the characteristic features of different taxa.

Now, with inclusion of *Xantharus* Andronov, 1981 and *Neoscolecithrix* Canu, 1896 (part, only 3 species) in Scolecitrichidae and with description of the genera *Scolecithrichopsis* Vyshkvartzeva, 2000, *Pseudoamallothrix* Vyshkvartzeva, 2000 (Vyshkvartzeva, 2000) and *Falsilandrumius* gen. n., the family Scolecitrichidae contains 21 genera and is one of the largest among free-living Calanoida. A key to these genera is given below. The paper includes also a description of *Falsilandrumius* gen. n. and redescrptions of two species.

Material and methods

This study is based on the collection of Zoological Institute, St.Petersburg, and material obtained from the following institutions: Atlantic Research Institute of Fisheries and Oceanography, Kaliningrad; Institute of Oceanology, Moscow; State Oceanography Institute, Mos-

cow. Specimens for examination were selected from plankton samples preserved in 4% formaldehyde. They are now kept at the Zoological Institute, St. Petersburg.

The techniques of measurements and preparation of drawings are described by Vyshkvaritzeva (2000).

The following abbreviations are used in the descriptions: Pr – prosome; Ur – urosome; SmP1-SmP5 – somites bearing 1st-5th swimming legs; Ur1-Ur5 – 1st-5th urosomal somites; A1 – antennule; A2 – antenna; Md – mandible; Mx1 – maxillule (Li1 – precoxal arthrite, or gnathobase; Li2 – coxal endite; Li3 and Li4 – basal endites; Le1 – coxal epipodite); Mx2 – maxilla (Li1 and Li2 – precoxal endites; Li3 and Li4 – coxal endites; Li5 – basal endite); Mxp – maxilliped; P1-P4 – swimming legs of 1st-4th pairs; P5 – 5th pair of legs; Re1-Re7 – 1st-7th segments of exopod; Ri1-Ri3 – 1st-3rd segments of endopod.

Family SCOLECITRICHIDAE

Small, medium-sized and large calanoids; body length from 1 to 8.1 mm. Head with or without crest. Head and SmP1 as also SmP4 and SmP5 separate or partly or completely fused. Rostrum of two filaments or as simple or bifurcate plate with or without filaments. Urosome as long as 1/3-1/5 of prosome; caudal rami slightly longer than wide. Genital somite may project ventrally.

A1 of 20-24 segments, fewer in male; sometimes segmentation slightly asymmetrical: right A1 has one articulated segment less than left A2. A2 rami subequal or one ramus (2-segmented endopod or 6-segmented exopod) as long as 3/5-4/5 of the other ramus, except for *Grievella*, in which endopod half as long as exopod; Re1-Re6 usually with 0, 1-2, 1, 1, 1, 0-1 + 3 setae respectively, except *Grievella* (Re2 with 3 setae), *Neoscolecithrix* (Re1 with 2 and Re2 with 3 setae) and *Puchinia* (exopod 7-segmented, with 2, 2, 1, 1, 1, 1, 3 setae respectively). Md gnathobase not enlarged; cutting edge bearing 8 teeth; 2-4 ventral teeth with manycuspid siliceous crowns; central and dorsal teeth shorter and narrower; dorsal seta slender. Mx1 gnathobase (Li1) not enlarged, bearing 9-10 marginal (7 in *Heteramalla*) and 1-4 posterior setae; Li2-Li4 with 0-5 (usually 2), 3-4, 3-5 setae respectively; endopod 1-3-segmented, usually indistinctly 2-segmented with 2-3 + 4-8 setae (6-11 setae in total); exopod of Mx1 with 5-11 (usually 6-9) setae; there is a trend to reduction of number of setae, but

exopod lobe well developed. Li1 of Mx2 with 3, sometimes 4-5 setae; setae of Li1-Li4 whip-like, two setae on each lobe more than 1.5 times as long as Mx2 body, sometimes one of the 3 sclerotized setae of Li2-Li4 transformed (independently in some species of several genera) into worm-like one; one of fore setae of Li5 usually thickened, one or two sometimes worm-like (independent transformation in some species of several genera). Endopodal complex always with 3 long worm-like and 5 brush-like sensory setae (this state is a synapomorphy of Scolecitrichidae; the ancestral state for Bradfordian families is 9 sclerotized setae: 7 on endopod and 2 on Li6). A short rudimentary ninth seta is retained in *Xantharus*; in *Grievella*, *Landrumius* and *Falsilandrumius*, one, ninth seta independently transformed into sixth brush-like seta, which is shorter or thinner than 5 others. An exception forms also *Racovitzanus* with 4-5 long worm-like and 4-3 shorter brush-like setae (Tanaka, 1961; Park, 1983), but the character of setae in this genus needs re-examination as brush-like and worm-like setae may be sometimes confused (e. g. in *Pseudoamallothrix* and *Falsilandrumius*).

Syncoxa of Mxp usually with 1, 2, 1-3, 3 setae on Li1-Li4; seta of Li1 and one seta of Li2 worm-like in some species or in some genera; medial endite (Li3) with 3 sclerotized setae (plesiomorphic state for all Bradfordian families) in *Archescocleithrix* and *Grievella*, with 1 brush-like and 2 sclerotized setae in 5 genera, with 1 brush-like, 1 worm-like and 1 sclerotized seta in *Puchinia*, with 1 worm-like and 1 sclerotized seta in *Heteramalla*, and with 1 brush-like seta in all other genera (transformations of setae were more or less independent within the family). Basipod of Mxp usually as long as syncoxa, with two submedial and one more distal seta (basipod in *Puchinia* longer, in *Racovitzanus* and *Grievella* shorter than syncoxa, in all these genera with 3 medial setae); endopod with 2, 4, 3-4, 2-3, 2-3 + 1, 3-4 setae respectively.

Segmentation and setation of P1-P4 typical of superfamily Clausocalanoidea: endopod of P1 1-segmented, of P2 2-segmented, of P3-P4 3-segmented; exopods of P1-P4 3-segmented; rarely (*Heteramalla*, *Racovitzanus*, *Mixtocalanus*, *Parascaphocalanus*, *Landrumius*, *Falsilandrumius*), there is a trend to fusion of segments of exopod of P1 and/or loss of one or rarely two proximal outer spines of exopod or inner seta of basis of P1; segments of P3 endopod fused in *Heteramalla*. 1-segmented endopod of P1 usually with outer spinose lobe (sometimes lost), posterior surface sometimes

with spinules distally. Both rami or rarely only endopod of P2-P4 with conspicuous spines and spinules on posterior and sometimes anterior surfaces (but in *Grievella* both rami without armament); endopods of P2-P4 usually broadened.

Female P5 1-3-segmented; distal segment bearing 1-4 articulated spines and setae (in *Xantharus* and *Neoscolecithrix*, also non-articulated spine-like processes); inner seta usually longer than segment; sometimes P5 lost (*Scolecithrix*, some *Scolecithricella*, *Scaphocalanus*, *Racovitzanus*, *Heteramalla*?). Male mouthparts as in female, or slightly or strongly reduced. Male P5 usually asymmetrical, biramous; right basipod usually strongly swollen; right endopod 1-segmented, tapering, sometimes with a trend to reduction (*Scolecithrix*, *Scolecithricella*); exopod 2-3-segmented, proximal segment may be with processes, terminal one may be variously modified; left coxopod and basipod subcylindrical; left 3-segmented exopod shorter or longer than endopod. Sometimes both legs of simple structure with subcylindrical segments: biramous in *Xantharus*, uniramous in *Scolecitrichopsis* and some *Pseudoamallothrix*; right leg biramous, endopod 1-segmented and seta-like in *Neoscolecithrix* (part, 3 species).

Key to the Scolecitrichidae genera

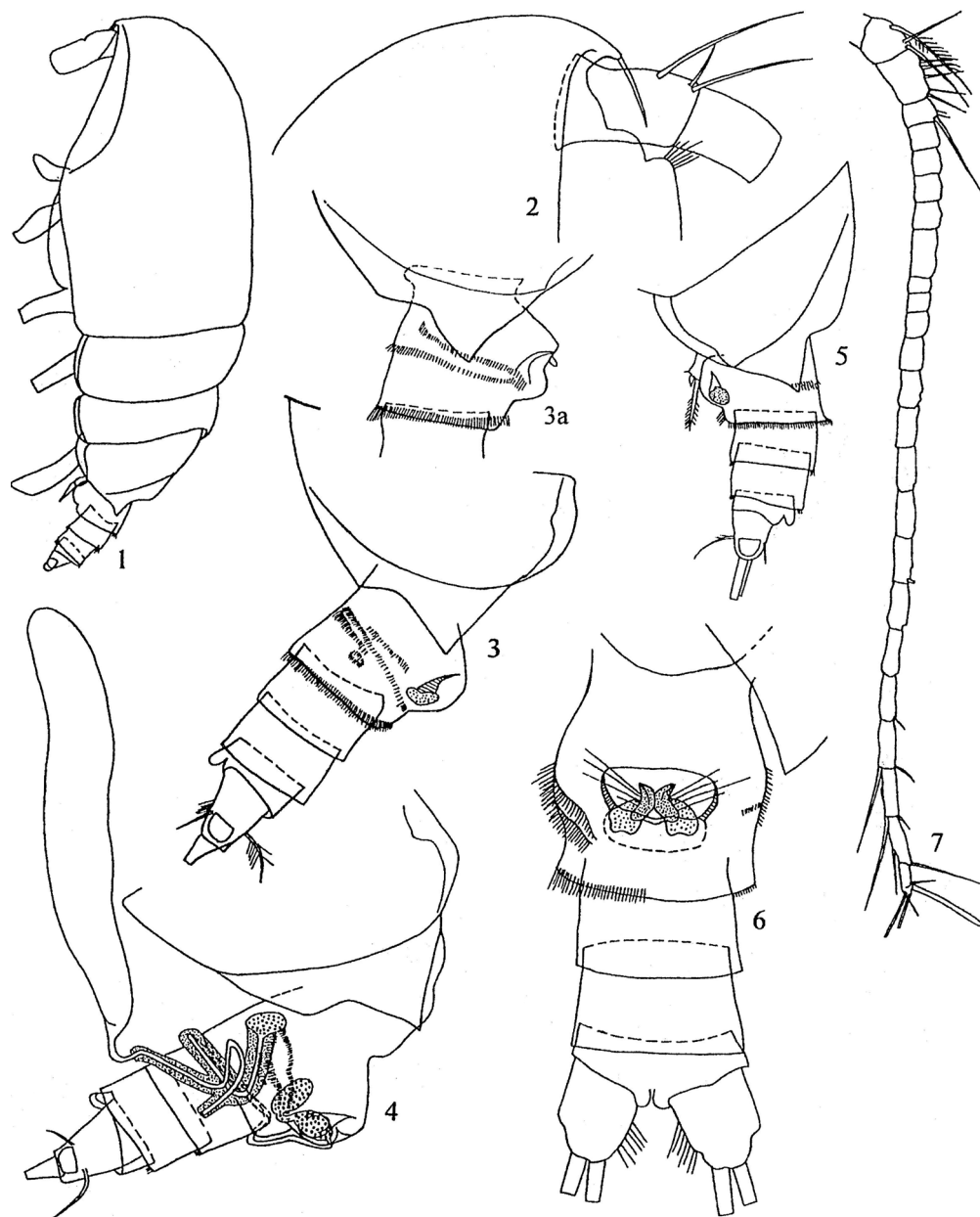
(Note. The very recently described genus *Grievella* is not included in the key).

- 1(14). Syncoxa of Mxp in medial endite (Li3) with 3, sometimes with 2 (*Heteramalla*) setae, 1-2 of them transformed in sensory setae.
- 2(5). Endopod of Mx2 with 1-2 brush-like setae greatly enlarged compared with 3 others.
- 3(4). Posterolateral corners of SmP5 produced distally into sharp spine-like process extending beyond middle of genital somite. Rostrum as short, large plate with two short rami without filaments. P5 rudimentary, 1-segmented, attached to short basal coupler. Male unknown **Puchinia** Vyshkvartzeva, 1989 (1 species)
- 4(3). Posterolateral corners of SmP5 not produced, narrowly rounded. Rostrum cylindrical, robust, distally divided into 2 short, pointed rami, without filaments. P5 3-segmented, rudimentary; distal segment small, pointed apically. Male unknown **Heteramalla** Sars, 1907 (1 species)
- 5(2). Endopod of Mx2 with all 5 (rarely 4) brush-like sensory setae uniform, not enlarged, or two brush-like setae shorter than 3 others.
- 6(7). Posterolateral corners of SmP5 produced distally into 2 sharp spine-like processes separated by wide gap. Re1 of A2 with 2 setae; Re2 with 3 setae. Male mouthparts as in female. Male P5 of simple structure, with subcylindrical segments; left and right legs of subequal length; left leg uniramous, right leg biramous; endopod small, seta-like **Neoscolecithrix** Canu, 1896 (part; 3 species, ♂ 2)
- 7(6). Posterolateral corners of SmP5 of different shape, without two spine-like processes. Re1 of A2 without setae, Re2 with 0-1 seta.
- 8(9). Li1 of Mx2 with 3 setae. Female P5 2-segmented; distal segment with 2 (apical and subapical) spines. Male mouthparts reduced compared to those of female. Male P5 biramous; right Re1 without mediolateral process; right endopod long; left endopod longer than exopod **Archescocleithrix** Vyshkvartzeva (1 species, ♀, ♂)
- 9(8). Li1 of Mx2 with 4-5 setae. Female P5 3-segmented.
- 10(11). Basis of P1 with distal inner seta. Ri of P1 with spinous outer lobe. Distal segment of female P5 with 2 apical spine-like processes and 0-1 subapical inner spine. Male mouthparts as in female. Male P5 slightly asymmetrical, biramous; endopods short; exopods 3-segmented, of simple structure; distal segments tapering into sharp points **Xantharus** Andronov, 1981 (2 species, ♂ 1)
- 11(10). Basis of P1 without distal inner seta. Ri of P1 without spinous outer lobe. Distal segment of P5 with 4 setae.
- 12(13). Rostrum simple, strong, with bifurcated tip, without filaments. Outer distal corners of terminal endopodal segments of P2-P4 not produced, rounded. Male unknown **Landrumius** Park, 1983 (4 species)
- 13(12). Rostrum with 2 long, smoothly tapering filaments. Outer distal corners of terminal endopodal segments of P2-P4 produced in a spine-like process. Male mouthparts as in female. Male P5 biramous, of *Scaphocalanus* type, but right endopod longer, reaching the middle of its Re2; Re1 with angular mediolateral process; left endopod longer than its 3-segmented exopod **Falsilandrumius** gen. n. (1 to 3 species, ♂ 1)
- 14(1). Syncoxa of Mxp in medial endite with 1 brush-like sensory seta.
- 15(18). Endopod of Mx2 with 1-2 brush-like setae greatly enlarged compared with 3 others.
- 16(17). Female with 1, male with 2 greatly enlarged brush-like sensory setae. Exopod of A2 slightly longer than endopod. Endopod of P1 with small, spinous outer lobe. Female P5 indistinctly 3-segmented; distal segment usually with 2-3 spines (apical and inner subapical). Male P5 of *Scaphocalanus* type, but mediolateral corner of right Re1 not produced, terminal segment with a peculiar claw-like formation **Scopalatum** Roe, 1975 (5 species, ♂ 1)
- 17(16). Female endopod of Mx2 with 2 enlarged and shorter than 3 others brush-like sensory setae. Endopod of A2 slightly longer and stronger than exopod. Endopod of P1 without outer lobe. Female P5 3-segmented; distal segment sometimes asymmetrical, with 0-2 (apical and subapical) spines. Male mouthparts with reduced masticatory parts. Male P5 biramous; right exopod of simple structure, mediolateral corner of Re1 not produced, right endopod sausage-like with apical slender spine; left endopod slightly shorter than its 3-segmented

- exopod
- **Mixtocalanus** Brodsky, 1950 (3 species, ♂ 2)
18(15). Female endopod of Mx2 without enlarged brush-like setae.
- 19(24). Head with lens-like organ or eye spots.
- 20(23). Head with lens-like organ. Posterolateral corners of SmpP5 and genital segment usually asymmetrical, sometimes one of them symmetrical. Rostrum long, strong, deeply (about till 1/3 length) bifurcate terminally, with filaments or tapering process.
- 21(22). Forehead with crest. Re2-Re3 of P4 with a longitudinal row of spinules on anterior surface. Female P5 present only on left side and consists of short basal segment bearing a long curved spine. Male mouthparts as in female. Male P5 biramous; right basis swollen, endopod long, reaches almost tip of exopod, Re1 with processes; left leg endopod slightly shorter than 2-segmented exopod
- **Scolecocalanus** Farran, 1936 (5 species, ♂ 1*)
- 22(21). Forehead without crest. Re2-Re3 of P4 without a longitudinal row of spinules on anterior surface. Female P5 absent or small, 1-segmented, with short basal portion. Male mouthparts as in female. Male P5 biramous, right basis swollen, endopod long, reaches beyond the middle of the distal segment of exopod, the latter usually forked, of complex shape; left leg endopod well developed, usually as long as 2-segmented exopod, distal part of the last segment of exopod of complex shape
- ... **Macandrewella** A. Scott, 1909 (8 species, ♂ 7)
- 23(20). Head usually with eye spots. Posterolateral corners of SmpP5 and genital segment usually symmetrical. Rostrum large, platelike, terminally divided into 2 short rami, each with conical process of varying size. Female P5 2-segmented, distal segment with convex inner side and dilated distal margin bearing long, serrated subapical outer spine and inner apical lobe tipped with small spine. Male mouthparts as in female, but a little smaller. Male P5 biramous, right basis swollen, right exopod 2-segmented, proximal segment with mediobasal process, distal segment with spine, endopod one-segmented, reaching the middle of distal exopodal segment or shorter; left endopod small; terminal part of distal segment of exopod of complex structure
- ... **Scottocalanus** Sars, 1905 (12 species, ♂ 11**)
- 24(19). Head usually without lens-like organ or eye spots.
- 25(26). Posterolateral corners of SmpP5 strongly asymmetrical, left corner more produced distally than right. Rostrum strong, with 2 triangular pointed processes and 2 thick filaments inserted subterminally into processes. P5 3-segmented, segments subequal, distal one with 1 outer and 2 long, strong, serrated apical spines, 2 and 3 times as long as segment respectively. Male unknown
- **Undinothrix** Tanaka, 1961 (1 species)
26(25). Posterolateral corners of SmpP5 usually symmetrical. Rostrum and P5 of different structure.
- 27(28). Ur4 usually 1.4 times as long as Ur3. Rostrum strong, long, cylindrical, without or with small filaments. Female P5 2-segmented or absent. Distal segment of P5 with short apical spine or without apical spine, always with very long inner seta 2-4 times as long as distal segment. Masticatory parts of mouthparts strongly reduced in male. Male P5 as long as urosome, both legs biramous, of about equal length, but asymmetrical in structure, of *Scaphocalanus* type. Both endopods 1-segmented, long, smoothly tapering, left one longer than exopod
- ... **Racovitzanus** Giesbrecht, 1902 (4 species, ♂ 3)
- 28(27). Ur4 not longer, usually shorter than Ur3. Structure of male and female rostrum and P5 not as above.
- 29(32). Posterior margin of A1 with transparent stripe.
- 30(31). Rostrum very small, rudimentary, blunt, without filaments. Endopod and exopod of Md of subequal length. Li1 of Mx1 with 14 (4 posterior) setae. Female P5 3-segmented, medial and distal segments each about as long as wide, distal segment with 2 strong apical spines. Male mouthparts not reduced. Male P5 1.4 times as long as Ur, biramous, of *Scaphocalanus* type, but inner margin of right Re1 with projections in 1/3 and 2/3 its length, but without distal projection, distal segment in the shape of new moon
- . **Parascaphocalanus** Brodsky, 1955 (1 species, ♀, ♂)
- 31(30). Rostrum usually of two long, smoothly tapering filaments. Endopod of Md half as long as exopod. Li1 of Mx1 with 13 (3 posterior) setae. Female P5 usually 2-segmented, sometimes 3-segmented or absent; distal segment fusiform, usually with 3 spines: strong and long inner, shorter 1-2 apical and small outer, the latter sometimes absent. Masticatory parts of mouthparts strongly reduced in male. Male P5 usually shorter than urosome, asymmetrical, right basis swollen, left one long, rectangular. Right endopod long, tapering, exopod 2-segmented, first segment with mediobasal projection, distal segment with long flexible spine. Left 1-segmented endopod longer than 3-segmented exopod, distal segment of exopod the shortest, with setules and spinules
- Scaphocalanus** Sars, 1900 (about 30 species, ♂ 15)
- 32(29). Posterior margin of A1 without transparent stripe.
- 33(36). Female P5 absent or small, 1-segmented.
- 34(35). Body robust, ovoid. SmpP4 and SmpP5 distinctly separate. Urosome short, about as long as 1/5 of

* *Scottocalanus infrequens* Tanaka, 1969 originally described from a single, 4.67 mm long female collected in North Pacific (male unknown) actually fits well *Scolecocalanus*, and I place the species in the latter genus (comb. nov.).

** *Scottocalanus longispinus* A. Scott, 1909 was originally described from a single, 4.75 mm long female collected in the Malay Archipelago. Farran (1936) presented a brief description of both the female (4.32 mm long) and male (4.1 mm long) from the Great Barrier Reef, but the male seems to be misidentified and belonging to *Scolecocalanus*, possibly to *S. spinifer* Wilson, 1950 originally described from female and male (4.25 mm long) obtained in China Sea off Hong Kong, 20°19'30"N, 121°51'15"E.



Figs 1-7. *Scolecitrichopsis tenuipes*, female. 1, habitus, left lateral view; 2, forehead, right lateral view; 3, Smp5 and Ur, right side; 3a, Smp5 and Ur1, right side; 4, Smp5 and Ur, right side, with a spermatophore; 5, Smp5 and Ur, left side; 6, Ur, ventral view; 7, right A1.



Figs 8-16. *Scolecitrichopsis tenuipes*, female. 8, Smp4-P5 and Ur, dorsal view; 9, forehead, dorsal; 10, A2; 11, Mx1; 12, Mx2; 13, Mxp; 14, P2; 15, P4; 16, P5.

- prosoma. Genital segment with highly conspicuous swelling and large operculum expanding posteriorly beyond the posterior margin of the genital segment. Lil of Mx1 with 11 (1 posterior) setae. Coxopod of P4 without inner seta. Female P5 absent or small and asymmetrical. Male mouthparts only very slightly reduced compared with female. Male P5 longer than urosome. Right male P5 uniramous, left biramous, with club-like endopod shorter than its exopod. *Scolecithrix* Brady, 1883 (2 species, ♂ 2)
- 35(34). Body narrowly elliptical. SmP4 and SmP5 usually completely fused. Urosome about as long as 1/4 of prosoma. Genital segment without ventral genital prominence; operculum small. Lil of Mx1 with 12 (2 posterior) setae. Coxopod of P4 with inner seta. Female P5 absent or small, 1-segmented, flattened, attached to short coupler. Male mouthparts slightly reduced compared with female. Male P5 longer than urosome, biramous; right endopod usually short, rudimentary; left endopod about half as long as exopod, finger-like
- *Scolecithricella* Sars, 1902 (11 species, ♂ 9)
- 36(33). Female P5 3- or 2-segmented.
- 37(38). Rostrum as short plate with 2 thin filaments of moderate length. Outer distal corner of Ri1 P2 not produced, rounded. All segments of P4 with numerous spines and spinules on posterior surface. Female P5 3-segmented, with short distal segment bearing 3 spines or 2-segmented with distal segment elongate, flat, with outer distal spine-like process and inner seta. Male P5 uniramous, asymmetrical, of simple structure with subcylindrical segments; left, longer leg usually much longer than urosome *Scolecitrichopsis* Vyshkvartzeva, 2000 (6 species, ♂ 4)
- 38(37). Rostrum with 2 strong rami continuing into filaments. Segments of P4 with few spines and spinules on posterior surface. Female P5 usually 2-segmented. Male P5 usually biramous; if uniramous (*Pseudamallothrix ovata*, *P. cenotelis*), combination of key features differs from that of *Scolecitrichopsis*.
- 39(40). Rostrum with short, strong rami, continuing into 2 thick aesthetasc-like filaments longer than rami. Coxa of P2-P3 usually with projection on inner margin. Coxa of P4 with oval projection on inner margin. Female P5 with 2 spines (apical and subapical) on distal subcylindrical segment; in *P. ovata* and *P. cenotelis*, distal part of distal segment flat, expanded into roughly circular plate. Male P5 usually biramous; endopod of left leg at least as long as its exopod, usually longer; right Re1 without or with short mediobasal projection; in *P. ovata* (and *P. cenotelis*?), P5 uniramous; left leg longer than right and about as long as urosome *Pseudo-amallothrix* Vyshkvartzeva, 2000 (13 species, ♂ 8)
- 40(39). Rostrum with long, strong rami tapering into filaments not longer than rami. Coxa of P2-P3 without projection on inner margin. Coxa of P4 without oval projection on inner margin. Female P5 usually with 3 spines (strong, long inner, medium-sized apical and small outer spine opposite to the inner one) on elongated distal segment. P5 of male biramous; right Re1 usually with well developed mediobasal projection; left endopod about as long as 2/3-3/5 of its exopod.
- *Amallothrix* Sars, 1925 (20 species, ♂ 15)

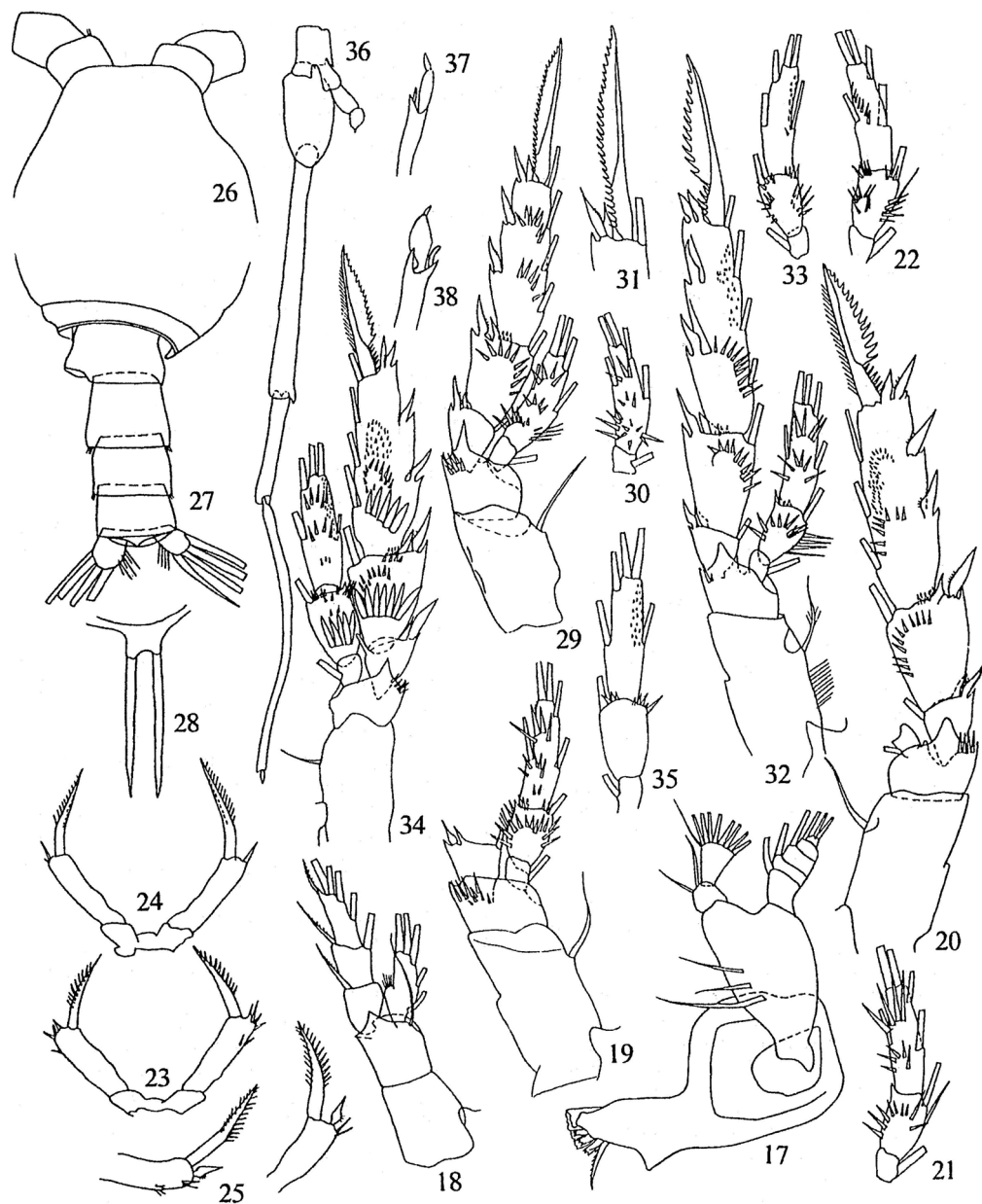
Scolecitrichopsis tenuipes (T. Scott, 1894) (Figs 1-47)

- Scolecithrix tenuipes* T. Scott, 1894: 48, Pl. 5, Figs 10-19; Giesbrecht & Schmeil, 1898: 47; Thompson & A. Scott, 1903: 245; Razouls, 1995: 365-367.
- Scolecithricella tenuipes*: A. Scott, 1909: 92; Sewell, 1948: 516, 517, 523, 546.
- Amallothrix* sp.: Marques, 1959: 212.
- Scolecithricella (Amallothrix) marquesae* Vervoort, 1965: 74, Figs 17a, 17c, 18, 19.
- Amallothrix marquesae*: Vives, 1982: 292.
- Scolecitrichopsis tenuipes*: Vyshkvartzeva, 2000: 221.

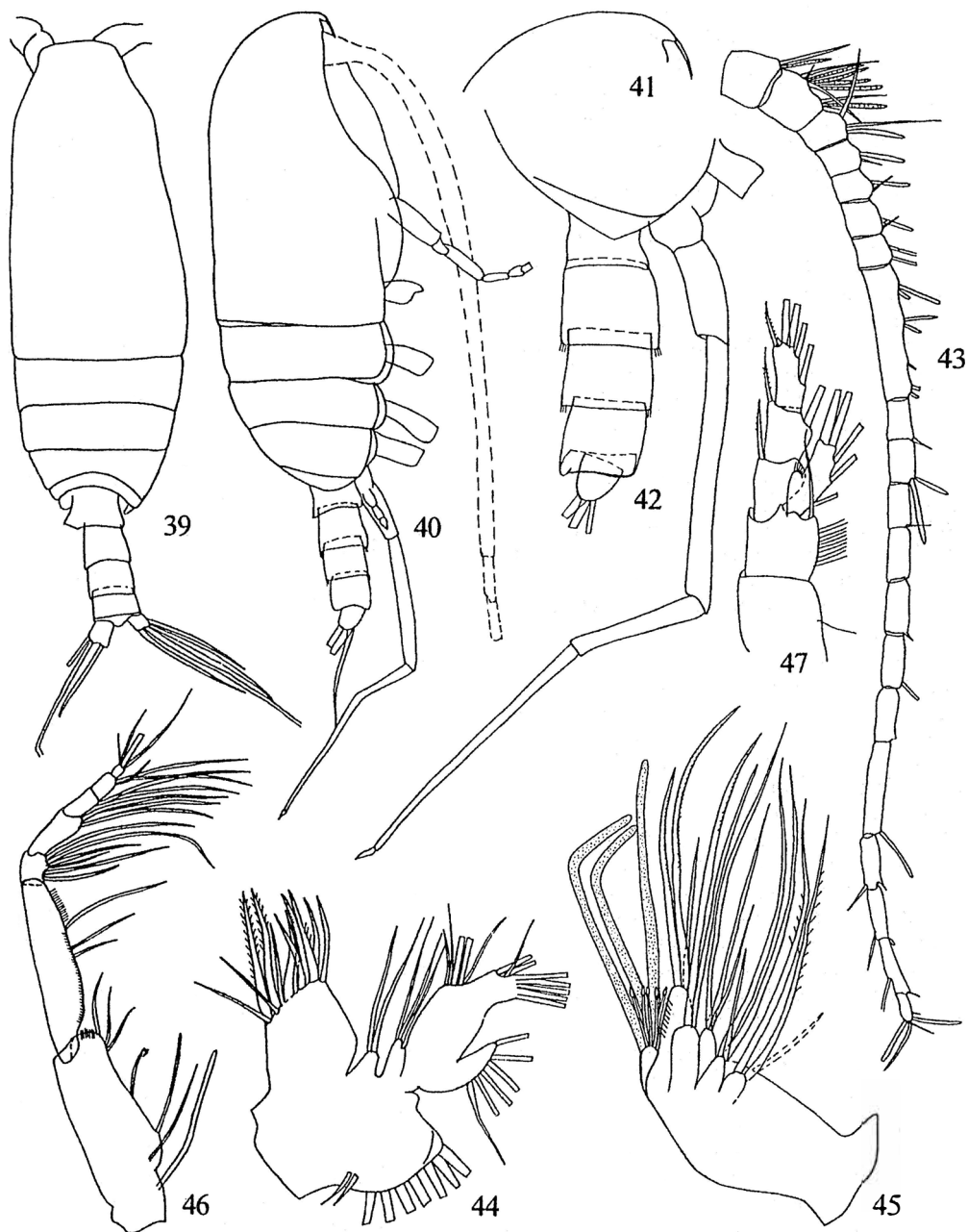
Material. 8 ♀, 3 ♂, Gulf of Guinea, r/v "Zvezda" cruise, 1963, 0-700(?) m; 1 ♀, 1 ♂, 20°S, 12°20'E, SRT-R-9086 vessel cruise, 19.VI.1968, 0-100 m; 1 ♂, 19°30'S, 12°31'E, SRT-R-9086 vessel cruise, 20.VI.1968, 0-100 m; 1 ♀, 1 ♂, 11°30'N, 18°40'W, 27th r/v "Zvezda" cruise, 1.IX.1971, 0-500 m; 7 ♀, 1 ♂, 15°30'N, 17°30'W, 27th r/v "Zvezda" cruise, 12.IX.1971, 200-500 m; 1 ♀, 16°01'N, 19°40'W, 27th r/v "Zvezda" cruise, 8.X.1971, 0-50 m. All specimens collected by Big Judey's net with mouth diameter 37 cm.

Description. Female (Figs 1-25). Body length 1.3-1.48 mm (mean: 1.36 mm; n = 9); prosoma length 1.05-1.17 mm; urosome 0.22-0.28 mm. Body elongate ovoid in dorsal and lateral (Fig. 1) view. Rostrum as a short thick plate directed downwards with 2 thin filaments of moderate length. Forehead broadly rounded in lateral (Fig. 2) and dorsal (Fig. 9) view. Cephalosome and SmP1 fused, but in lateral view a thin articulation suture is sometimes visible near the ventral margin. SmP4 and SmP5 partly or completely separate. Ventral parts of posterolateral corners of SmP5 produced distally as large, triangular, slightly asymmetrical lobes; lobe of the right side slightly longer than of the left, exceeding the middle length of the genital somite; dorsal part of SmP5 shorter than ventral, with a distinct emargination (Figs 3-6, 8).

Prosoma 4.2-4.5 times as long as urosome (Figs 3-6, 8). Ur1 about as long as thick and as long as combined length of Ur2-Ur4. Ur2-Ur4 subequal, each much wider or thicker than long. Caudal rami 1.3 times as long as wide, with 4 apical setae; ventral (inner) and outer setae slightly longer than caudal rami. Genital somite in lateral view with a large genital prominence in anterior 2/3 length of somite, broadly rounded when the genital operculum is closed (Fig. 3), or sinuous when the operculum is opened (Fig. 3a); in dorsal view (Fig. 8), with highly swollen lateral sides and a transverse row of spinules in the middle. Left side of Ur1 (Fig. 5) midlength with a short row of spinules; right side with two short rows and a long transverse row (Fig. 3) or two long trans-



Figs 17-38. *Scolecitrichopsis tenuipes* (17-25, female; 26-38 male). 17, Md; 18, P1; 19, P2 without Re2-Re3; 20, P2 without Ri2-Ri3; 21, P2, endopod, dorsal view; 22, P2, endopod, ventral view; 23-25, P5; 26, forehead, dorsal view; 27, SmP5 and Ur, dorsal view; 28, rostrum; 29, P2, posterior surface; 30, P2, endopod of another specimen; 31, P2, apical spine; 32, P3, posterior surface; 33, P3, endopod, anterior surface; 34, P4; 35, P4, endopod, anterior surface; 36, P5; 37, 38, P5, left distal segment and distal part of penultimate segment in different positions.



Figs 39-47. *Scolecitrichopsis tenuipes*, male. 39, habitus, dorsal view; 40, the same, right lateral view; 41, forehead, right lateral view; 42, Smp5 and Ur, right lateral view; 43, right A1; 44, Mx1; 45, Mx2; 46, Mxp; 47, P1.

verse rows (Fig. 3a). Posterior margin of Ur1 with long spinules on the right and the right half of the dorsal side, with short spinules on the left side.

Genital field in ventral view (Fig. 6) with a rectangular transverse operculum; spermathecal vesicles almost pear-shaped, their middle parts contacting with each other; copulatory pores widely set, lateral skeletal plates very narrow; in lateral view, the proximal vesicle directed posteriorly and the distal one, connected with the proximal vesicle by a short tube, anteriorly (Fig. 4). Spermatophore with a long neck making a loop along right side of Ur1-Ur2, attached to genital somite on antero-dorsal part of the right side by oval plate. A very long fertilization tube connecting the attachment plate with the female genital cavity goes at first postero-ventrally, then dorsally and turn round the somite along its posterior margin till the ventral side, where it turns anteriorly to the genital cavity.

A1 (Fig. 7) exceeding caudal rami by 1-2 segments, with 24 free segments; segments 8 and 9 of the typical 25-segmented calanoid antennule (segments 10 and 11 of ancestral calanoid A1) fused. A2 (Fig. 10): endopod about 3/5 as long as exopod; Ri2 with 8+6 setae; Re1 without setae; Re2-Re5 with 1 seta each; Re6 long, with 3 terminal setae. Md (Fig. 17): basipod with 3 inner setae; exopod about as long as endopod; Ri1 with 2, Ri2 with 9 setae. Masticatory margin of Md blade with 5 closely spaced multicuspidate ventral and 3 narrow dorsal teeth and dorsal setose seta. Mx1 (Fig. 11): Li1 with 9 terminal and 2 posterior setae; Li2, Li3 and Li4 with 2, 3 and 5 setae respectively; endopod subdivided from the basipod, with 3 almost completely fused segments bearing 2, 2 and 3 apical setae respectively; exopod with 6 setae. Mx2 (Fig. 12) with 5 inner lobes of increasing size from proximal to distal; Li1-Li5 with 3 setae each; one seta of Li4 stronger than others, denticulated; Li5 with 2 strong, denticulated and 1 shorter seta; distal part of Mx2 endopod with 3 long, worm-like and 5 thin, brush-like sensory setae of about equal size with small apical brushes. Mxp (Fig. 13): syncoxa on inner margin with 2 sclerotized and 1 worm-like setae proximally, 1 brush-like sensory seta in the middle and 3 sclerotized setae distally; basis with 3 medial setae and a row of small spinules along inner margin; Ri1-Ri5 with 2+4, 4, 4, 2+1 and 3 setae respectively.

Segmentation and setation of P1 (Fig. 18), P2 (Fig. 14), P3 (Figs 19-22) and P4 (Fig. 15) typical of scolecitrichids. Outer spine at Re1-Re2 of P1 as long as next segment. Outer spine

at Re1 of P2 shorter than outer spines at Re2 and Re3, as long as 1/3 length of Re2. Coxa of P3 with an indentation of outer margin; inner margin with long inner seta. Basipod of P2 and P3 with spines near distal outer corner; endopod and exopod with spines arranged in arcs on posterior surface, there are some variations in number and arrangement of spines on P3 endopod (Figs 19, 21); anterior surface of Ri2-Ri3 of P3 (Fig. 22) also with long spines, of Ri2 of P4 with some long spines near distal margin. Posterior surface of Re1-Re2 and Ri1-Ri2 of P4 with long and short spines; spines of proximal row on Re2 and Ri2 of P4 lancet-like, transparent. Ri1 of P2-P4 with rounded outer distal corner. Apical spine of P2 0.89 times as long as Re3, with about 25-30 short, separated teeth; of P3 (Fig. 20) 0.73 times as long as Re3, slightly distorted, with 5-7 proximal teeth shorter than 12-13 distal ones, the latter with fused basal parts and separated tips. Apical spine of P4 0.77 times as long as Re3, with 18-22 teeth, 6 proximal ones separated, the other with fused in thin lamella basal parts.

P5 (Figs 16, 23-25) uniramous, symmetrical, usually 2-segmented; basal segments short, distal segment slightly flattened, long, 3.5-4 times as long as wide, distally with a strong, setose inner spine about as long as the segment, a short outer spine and a few spinules on the outer corner; number and arrangement of spinules variable (Figs 16, 23-25).

Male (Figs 26-47). Body length 1.38-1.45 mm; prosome length 1.02-1.12 mm. Rostrum almost as in female (Fig. 28). Body (Figs 39, 40) slightly slenderer than in female. Forehead in dorsal view (Fig. 26) almost truncate, in lateral view (Fig. 41) broadly rounded. Cephalosome with SmP1 fused; SmP4 and SmP5 divided by thin suture. Posterolateral corners of prosome (Fig. 42) slightly angular, with rounded tips.

Prosome 2.8-3.5 times as long as urosome. Urosome (Figs 27, 42) 5-segmented. Ur5 very short and telescoped into preceding somite. Ur2 and Ur3 subequal, as long as wide or thick. Ur4 wider than long. Posterior margin of Ur2-Ur3 with spinules. Caudal rami as long as wide.

A1 (Fig. 43) exceeding body length by 2 segments, slightly asymmetrical; left A1 of 21 free segments, segments 8-12 fused; right A1 of 20 free segments (also segments 20 and 21 of typical of Calanoida 25-segmented A1 fused). A2 endopod 4/5 as long as exopod; Re2-Re6 with one seta each; Re7 with 3 distal setae. Md, Mx1 (Fig. 44) and Mx2 (Fig. 45) almost as in female; Mxp (Fig. 46) differs from

that of female in the number of setae on Ri2-Ri6 (3, 2, 3 and 4 setae respectively). P1 (Fig. 47), P2 (Figs 29-31), P3 (Figs 32, 33) almost as in female. P4 (Figs 34, 35) as in female, except for: posterior surface of coxopod without transverse row of spines near the inner seta, that of basipod with spines near outer distal corner, that of Re3 with a row of lancet-like transparent spines proximally, arc of short spines in the middle and spot of small spinules distally. Length ratio of Re3 to apical spine of P2 100 : 88, of P3 100 : 80, of P4 100 : 73. Apical spine of P4 as that of P3 has 6 shorter, separated proximal teeth and 16-18 longer teeth with fused in thin lamella basal parts.

P5 (Figs 36-38) uniramous, asymmetrical. Right leg very short, 4-segmented, reaching 4/5 length of 2nd segment of left leg. Left leg long and slender, 2.3 times as long as urosome, 6-segmented; segments ratio 17 : 24 : 80 : 36 : 85 : 10. Terminal part of penultimate segment with 2 conical processes and finger-like flexible process near the base of the distal segment, the latter (Figs 37, 38) flat, with short flat spine.

Type locality: T. Scott (1894) described specimens from the Gulf of Guinea, 7°54'N, 17°25'W, 95 m (night collection); 3°0'8"N, 7°43'W, 95 m (day collection); 1°55'5"N, 5°55'5"E, 55 and 660 m (day collection). He did not designate the holotype.

Distribution. The north-east and south-east Atlantic Ocean along western coast of Africa from Mauritania till Angola. Males were collected also in the Red Sea (Thompson & A. Scott, 1903) and in the Indo-Malay Archipelago, 1°4'S, 127°25'E, 0-1500 m (A. Scott, 1909). Sewell (1948) included the species in the list of possible species of the Indian Ocean, but till now it was not recorded in the Indian Ocean (Morjakova, 1971; Madhupratap & Haridas, 1990). The species is predominantly epipelagic and mesopelagic zone inhabitant. It seems to be not frequent in occurrence and low in abundance.

Remarks. Examination of *S. tenuipes* T. Scott males and *Scolecithricella (Amallothrix) marquesae* Vervoort females proved Vives (1982) supposition of their synonymy as they have very similar mouthparts and swimming legs and in our material they were present in the same sample.

There are some differences between the males described by T. Scott and our specimens in the structure of Mx2, Mxp and the ornamentation of swimming legs with surface spines, probably due to better preservation of our specimens or their more detailed examination.

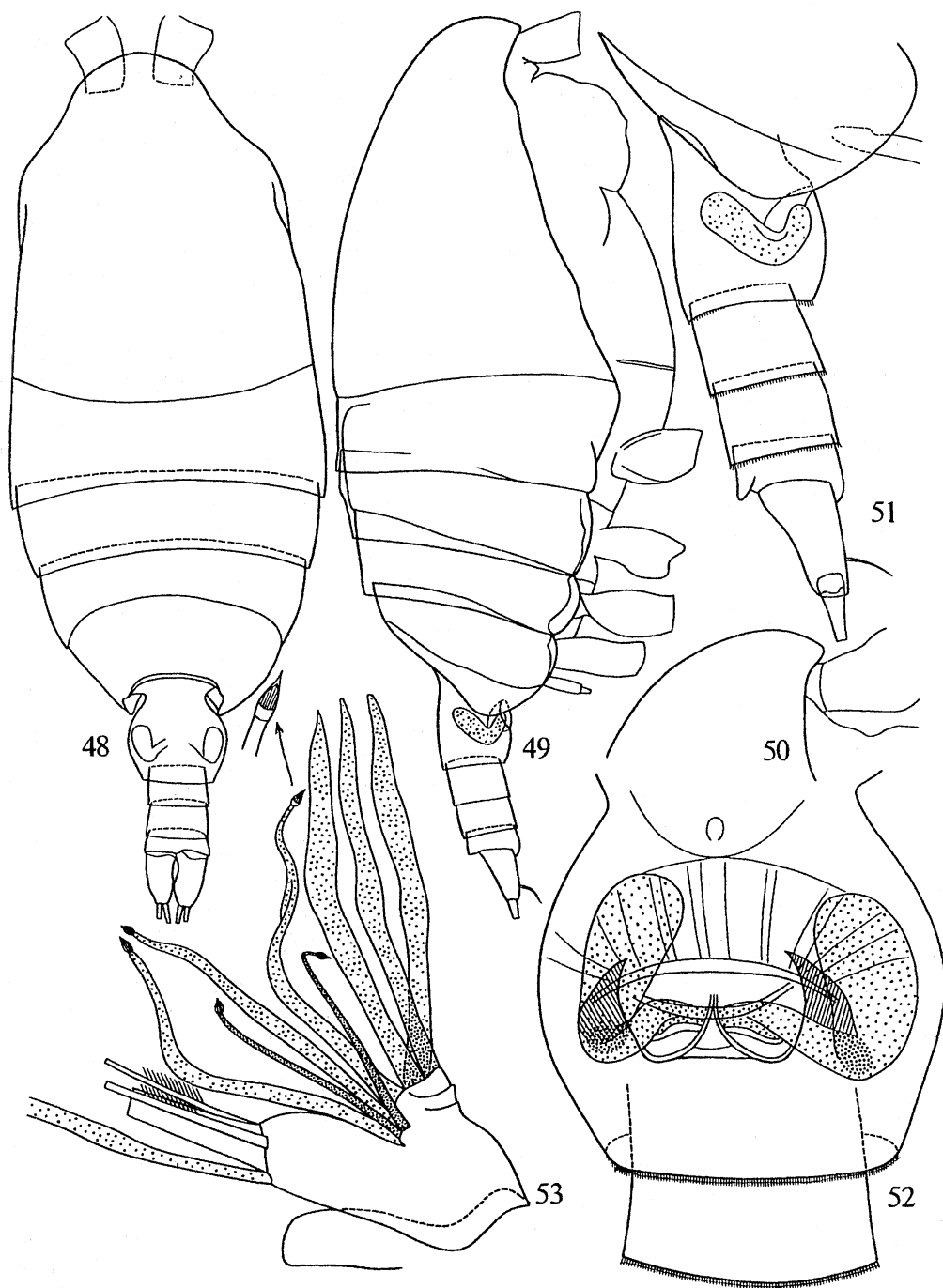
There are some differences between the females described in the present paper and those described by Vervoort (1965). The specimens described by Vervoort, collected on January 31, are smaller (1.152-1.228 mm) than our specimens, collected in June-September (1.3-1.48 mm). Apparently they belong to different generations, or may be size differences depend on the annual differences of food supply. Our specimens have some structural differences from Vervoort's ones: more abundant ornamentation with spinules on the genital segment; Li1, Li3, Li4, endopod and exopod of Mx1 with 11, 3, 5, 2+5, and 6 setae respectively (vs. 7, 2, 3, 2+4, 5 setae noted by Vervoort); endopod of Mx2 with 3 worm-like long and 5 brush-like shorter sensory setae (6 in total, 3 are short as noted by Vervoort); Re1-Re2 of P1 with longer outer spines; basipod of P2 with spines near distal outer corner; Re2 of P2 and also P5 outer distal corner with more spines. But probably the specimens described here are conspecific with Vervoort's ones, some of recorded differences seem to be a result of worse preservation of Vervoort's specimens, some are the result of intraspecific variation (surface ornamentation of P2 and P5).

S. tenuipes is very close to *S. ctenopus*, the type species of *Scolecitrichopsis* (Vyshkvartzeva, 2000), and has the combination of features characteristic for the genus (triangular posterolateral corner of SmP5; rostrum as a short plate with 2 thin filaments of moderate length; Ri1 of P2 with outer distal corner not produced, rounded; presence of long spines on the anterior surface of Ri2 of P3 and dense ornamentation of P4 rami with spines and spinules, including lancet-like spines; male P5 uniramous, asymmetrical, of simple structure, with subcylindrical segments; male mouthparts not reduced, as in female), so the species is assigned to the genus *Scolecitrichopsis* Vyshkvartzeva, 2000 without doubt.

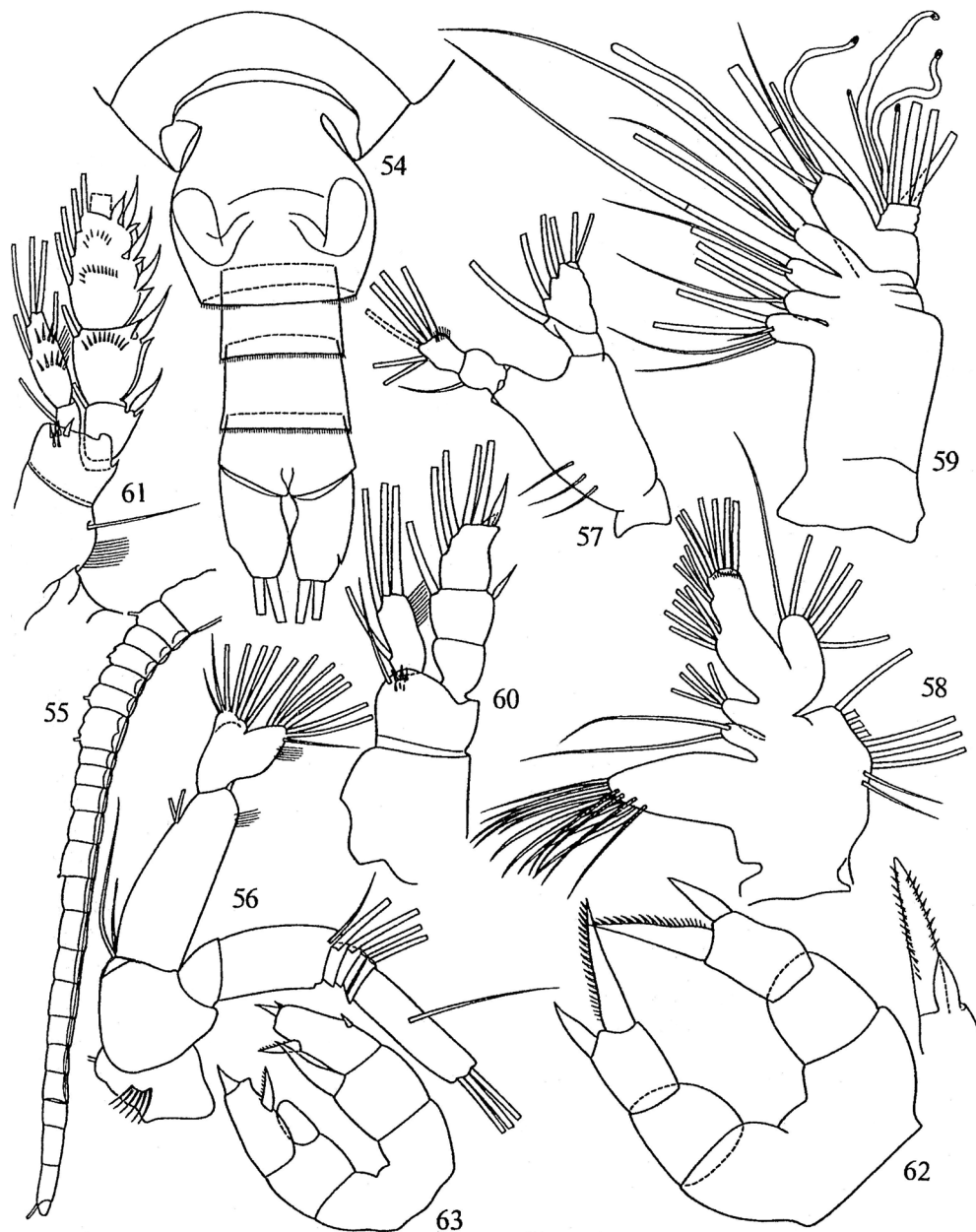
Parascaphocalanus Brodsky, 1955

Brodsky, 1955: 195; Bradford, 1973: 140; Roe, 1975: 321; Razouls, 1982:314; Brodsky et al., 1983: 135; Bradford et al., 1983: 91; Razouls, 1993: 310; 1995: 349.

Definition. Forehead and posterolateral corners of prosome rounded. Rostrum short, rudimentary, blunt, without rostral filaments. Cephalosome and SmP1, and SmP4-SmP5 separated. Genital somite with highly convex (swollen) sides and small genital swelling. Posterior margins of A1 segments with transparent stripe. Endopod and exopod of A2 as well as of



Figs 48-53. *Parascaphocalanus zenkevitchi*, female. 48, habitus, dorsal view; 49, habitus, right lateral view; 50, forehead, right side; 51, SmP5 and Ur, right lateral view; 52, genital somite, ventral view; 53, Mx2, Li5 and endopod.



Figs 54-63. *Parascaphocalanus zenkevitchi*, female. 54, SmP5 and Ur, dorsal view; 55, A1; 56, A2; 57, Md basipod; 58, Mx1; 59, Mx2; 60, P1; 61, P2 without apical spine; 62, P5; 63, P5, variant.

Md of subequal length. Li1 of Mx1 with 14 (4 posterior) setae. Distal part of Mx2 endopod with 3 long worm-like and 5 brush-like sensory setae, 3 of the latter with much longer stems, the brushes subequal in size. Inner distal seta on basipod of P1 straight; Re1 of P1 without outer spine; endopod one-segmented, lacking outer lobe. Female P5 3-segmented, distal segment with 2 strong apical spines. Male P5 biramous; left leg endopod longer than exopod.

Parascaphocalanus zenkevitchi Brodsky, 1955

Parascaphocalanus zenkevitchi Brodsky, 1955: 195, Figs 7, 7a, 8; Bradford et al., 1983: 91.

Syntypes. 52 ♀, 28 ♂, 43°40'N, 149°31'E. 14th r/v "Vitjaz" cruise, St. 2218, depth 8900 m, 8500-6000 m vertical haul, 1.VI.1953.

Additional material (all collected in 39th r/v "Vitjaz" cruise): 37 ♀, 36 ♂, 2 juv., 45°32'N, 152°55'E, St. 5612, haul 74, depth 8300 m, 7700-6400 m vertical haul, 27-28.VI.1966; 6 ♀, 4 ♂, 45°32'N, 152°55'E, St. 5612, haul 77, 7320-6100 vertical haul, 28.VI.1966; 9 ♀, 1 ♂, 45°48'N, 153°33'E, St. 5617, haul 121, depth 8000 m, vertical haul 7130-6120 m, 5-6.VIII.1966; 26 ♀, 1 ♂, 1 CV, 45°11'N, 152°28'E, St. 5626, haul 181, depth 8750 m, vertical haul 7450-6470 m, 24.VIII.1966.

Female. Body length 1.92-2.0 mm; prosome length 1.52; urosome 0.48 mm. Prosome in dorsal and lateral views elliptical (Figs 48, 49). Forehead broadly rounded in dorsal view, narrow and rounded in lateral view (Fig. 50). Cephalosome with prominent shoulders. Rostrum short, blunt, directed ventrad. Posterolateral corners of Smp5 slightly produced, broadly rounded, covering anterior 1/3 of genital somite (Fig. 51).

Urosome (Figs. 51, 52, 54) short, slightly longer than 1/3 length of prosome. Genital somite as long as Ur2-Ur4 combined, in dorsal view slightly wider than long, with strongly swollen, bulging sides, about twice as wide as Ur2-Ur3; in lateral view, as long as thick, with a small, rounded genital swelling.

Spermatheca viewed laterally (Fig. 51) with a wide, elongated distal vesicle slightly dilated distally and lying obliquely dorsoanteriorly. Genital field viewed ventrally (Fig. 52) with rectangular operculum, strong lateral skeletal plates and large vesicles directed anteriorly. Ur2 and Ur3 of subequal size, as long as thick (Figs 51, 54). Ur4 about half as long as Ur3. Posterior margin of Ur1-Ur3 with short, flat, fused spinules. Caudal rami twice as long as wide, with 4 apical strong setae; ventral inner seta small, half as long as caudal rami.

A1 (Fig. 55) with 24 free segments; segments 8 and 9 fused; segment 24 small; poste-

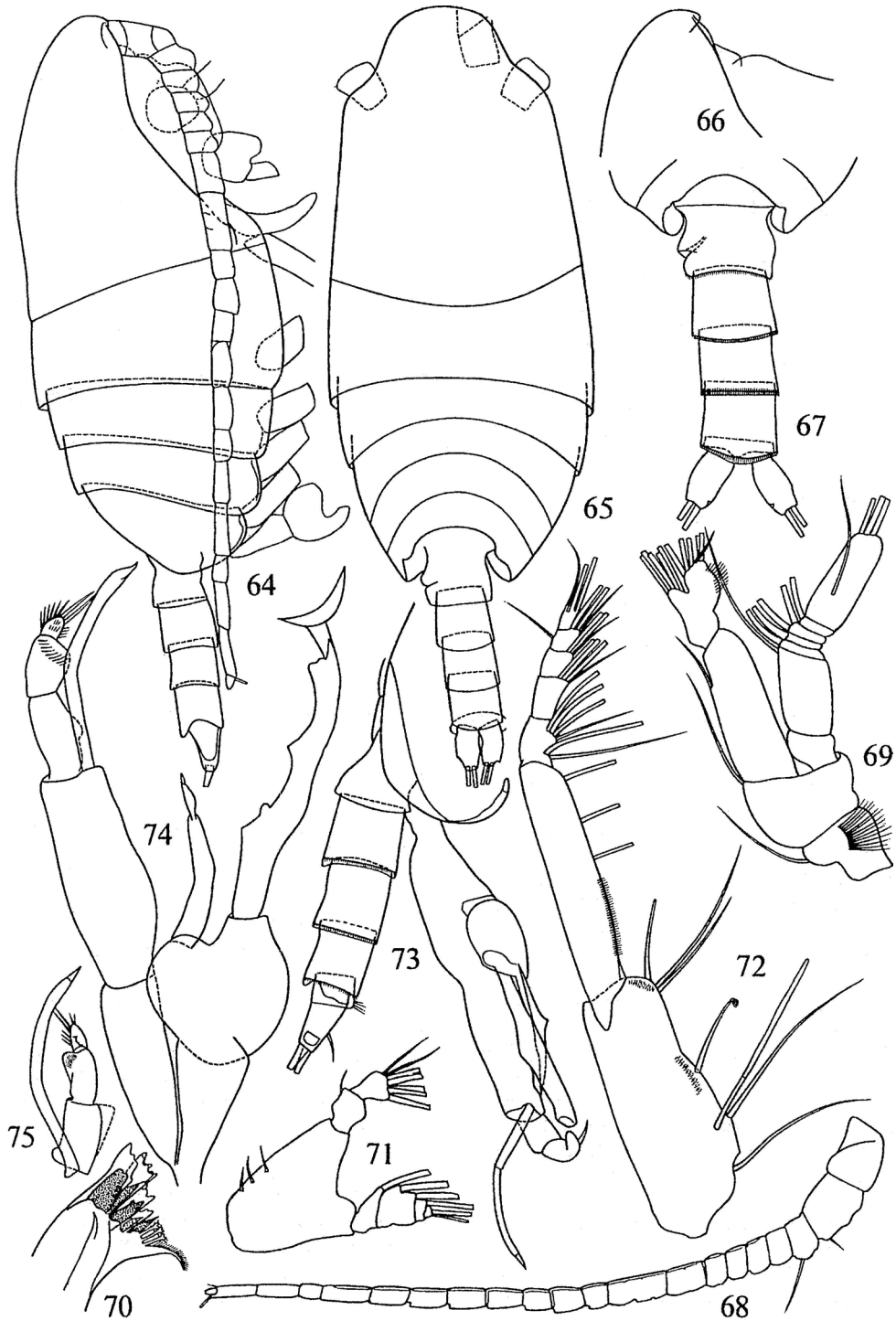
rior edge of segments 2 to 20 with narrow transparent stripe. A1 reaching the middle length of genital somite. A2 (Fig. 56) coxa and basis with 1 and 2 setae respectively; exopod slightly longer than endopod; Re2 with 1 distal seta; Re3-Re6 with 1 seta each; Re7 with 1 medial and 3 terminal setae; endopod 2-segmented, with 2 and 14 setae respectively.

Md basis (Fig. 57) with 3 inner setae; Ri1 with 2 inner setae; Ri2 with 9 terminal setae; endopod nearly as long as exopod. Mx1 (Fig. 58): Li1 with 4 posterior setae; Li2, Li3 and Li4 with 2, 4 and 5 setae respectively; endopod fused with basis, bearing 2-3 inner and 6 terminal setae; exopod with 6, Le1 with 9 setae. Mx2 (Fig. 59): Li1 with 4 setae; Li2-Li4 with 3 setae each; Li5 with 3 sclerotized setae and 1 worm-like sensory seta; distal part of endopod with 3 long worm-like and 5 brush-like sensory setae, 3 of the latter distinctly longer than 2 others, with worm-like stem and small apical brushes, the brushes almost equal in size. Mxp syncoxa with 2 sclerotized and 1 worm-like seta in proximal part, 1 short brush-like seta in the middle and 3 setae distally; basis with 3 setae in distal part and a row of small spinules along inner side reaching the proximal seta. Ri1-Ri5 of Mxp with 2+4, 4, 3, 3+1 and 4 setae respectively.

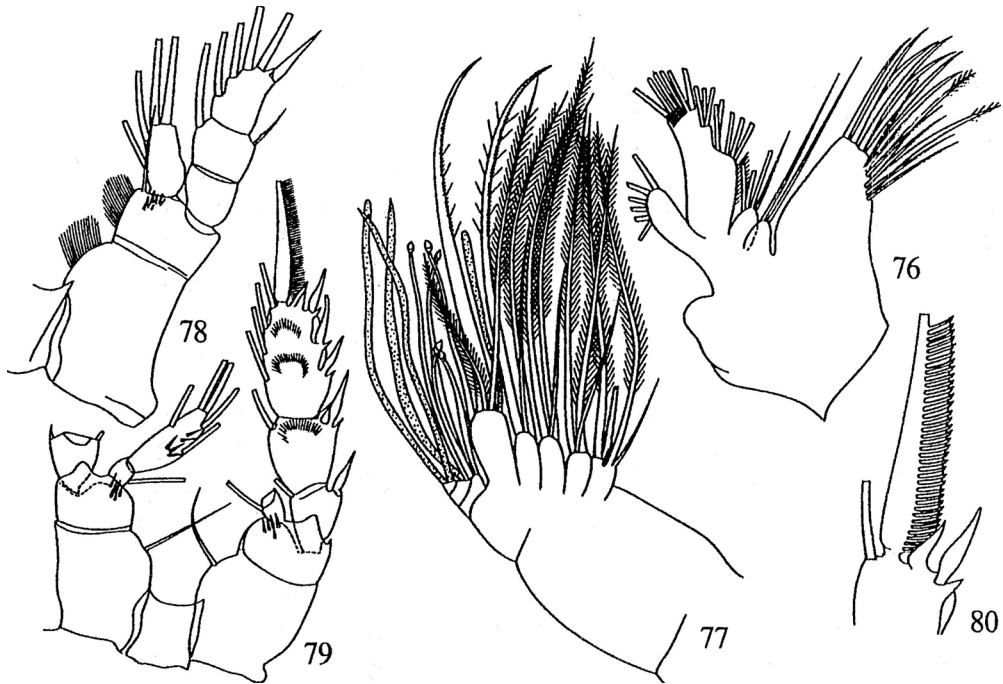
P1 (Fig. 60): basis with a straight inner seta and posterior spines near the base of endopod; Re1 without external spine; external spine of Re2 half as long as Re3. Endopod 1-segmented, with 4 setae and without outer lobe.

P2 (Fig. 61): basis with spines near the base of endopod; Ri1 with rounded outer distal corner; Ri2 with 2 arcs of spines on posterior surface; Re2-Re3 with 1 and 2 arcs of spines on posterior surface respectively; length ratio of Re3 and its serrated apical spine 45 : 63; apical spine with 44 long fused teeth. P3: coxa, basis, Ri1, Re1-Re3 as in P2, but outer spines of Re1-Re3 comparatively shorter; Ri2-Ri3 with 1 and 2 arcs of spines on posterior surface. P4: coxa, basis, Ri1-Ri3 and Re1 (Re2-Re3 broken in all examined specimens) without surface armament.

P5 (Fig. 62, 63) uniramous, usually symmetrical; each leg 3-segmented; distal segment with 2 apical strong spines; inner spine spinous, 2.4 times as long as outer spine and 1.7 times as long as distal segment. In each houl, about 25% of females with a normal genital somite have P5 biramous, slightly asymmetrical, with left basis slightly longer than right, with endopods vestigial, asymmetrical and distal segments (exopods) longer than wide, with



Figs 64-75. *Parascaphocalanus zenkevitchi*, male. 64, habitus, right lateral view; 65, habitus, dorsal view; 66, forehead, lateral view; 67, SmP5 and Ur, dorsal view; 68, left A1; 69, A2; 70, Md coxopod, masticatory margin; 71, Md basipod; 72, Mxp; 73, SmP5, Ur and P5, lateral view; 74, P5; 75, left P5 endopod and exopod.



Figs 76-80. *Parascaphocalanus zenkevitchi*, male. 76, Mx1; 77, Mx2; 78, P1; 79, P2; 80, P2 apical spine.

2-5 short spines. The leg of such a structure (Fig. 63) is very similar to P5 of CV male.

Male. Body length 1.88-2.1 mm; prosome length 1.45-1.5 mm; urosome length 0.5-0.52 mm. Body (Figs 64-65) similar to that of female. Forehead narrowly rounded in lateral view (Fig. 66), broadly rounded in dorsal view. Rostrum as a short rounded plate, directed posteriorly. SmP4 and SmP5 separated; posterolateral margin of SmP5 broadly rounded (Fig. 73).

Urosome (Figs 67, 73) about 1/3 length of prosome. Ur2-Ur4 of subequal size, as long as wide or thick. Ur5 very short and almost completely telescoped into preceding somite. Caudal rami symmetrical, twice as long as wide, with 4 apical setae and short inner and outer setae.

A1 (Fig. 68) reaching to Ur4, slightly asymmetrical; right A1 of 21 free segments (segments 8-9, 10-12 and 24-25 of the typical of Calanoida 25-segmented A1 completely fused); left A1 of 20 segments (also segments 20-21 fused), posterior margin of segments 5-17 with a narrow transparent stripe. A2 (Fig. 69), oral parts (Figs 70-72, 76, 77) and P1-P2

(Figs 78-80) as well as P3-P4 similar to those of female.

P5 (Figs 73-75) longer than urosome by 1/4 of its length, biramous; legs subequal in length, asymmetrical. Right leg basis swollen; endopod 2-segmented, reaching the middle length of exopod, the latter 2-segmented (Re1-Re2 completely fused); inner margin of Re1-Re2 with projections; Re3 with apical crescent formation. Left leg basis rectangular, reaching the middle of right Re1-Re2; exopod 3-segmented; Re2 with a distal stretched swelling; Re3 the shortest, with long and short spines; endopod one-segmented, considerably longer than left exopod.

Type locality. North-west Pacific, 43°40'N, 149°31'E, 8500-6000 m.

Distribution. The species was found only in the North-west Pacific in abyssopelagial.

Remarks. Bradford et al. (1983: 91) considered that "it is not at all clear that *Parascaphocalanus zenkevitchi* is in fact a scolecitrichid". As reexamination has shown, the species has the typical of the family Scolecitrichidae composition of Mx2 endopod sensory setae (3 worm-like and 5 brush-like setae). Mxp with 1

brush-like sensory seta in the middle of syncoxa of the species dealt with here is typical of many Scolecitrichidae genera and is not reported in other Bradfordian families. Based on these key characters, the genus is assigned to the family Scolecitrichidae.

Parascaphocalanus is a monotypic genus characterized by a peculiar combination of features (see generic definition), some of which are primitive for Scolecitrichidae: A1 of female with 24 segments; Li1 of Mx1 with 14 (4 posterior) setae; Li3 with 4 setae; male mouthparts not reduced. Some features are derived: basis of P1 with straight medial seta; Re1 of P1 without outer spine, with one-segmented endopod bearing 4 setae and lacking outer lobe; apical formation of male right Re3 of P5 peculiar; rostrum rudimentary; transparent stripes on posterior margins of A1 segments alike to those in A1 of *Scaphocalanus*. All the derived characters of *Parascaphocalanus* are not unique for Scolecitrichidae. Similar P1 transformations are noted sporadically but not all together in some *Scaphocalanus*, *Landrumius*, *Amalothrix*, *Archescolecithrix* and *Mixtocalanus* species; peculiar apical formations of Re3 of male P5 are noted in *Scolecithrix bradyi*, *Scolecithricella vittata*, *Amalothrix lobophora*, in *Scottocalanus* and *Macandrewella* species); the tendency to reduction of rostrum is noted in *Scaphocalanus brevirostris* Park, 1970. Thus, the species under consideration seems to have no features that could prevent its placement in the family Scolecitrichidae.

Falsilandrumius gen. n.

Type species: *Scaphocalanus bogorovi* Brodsky, 1955.

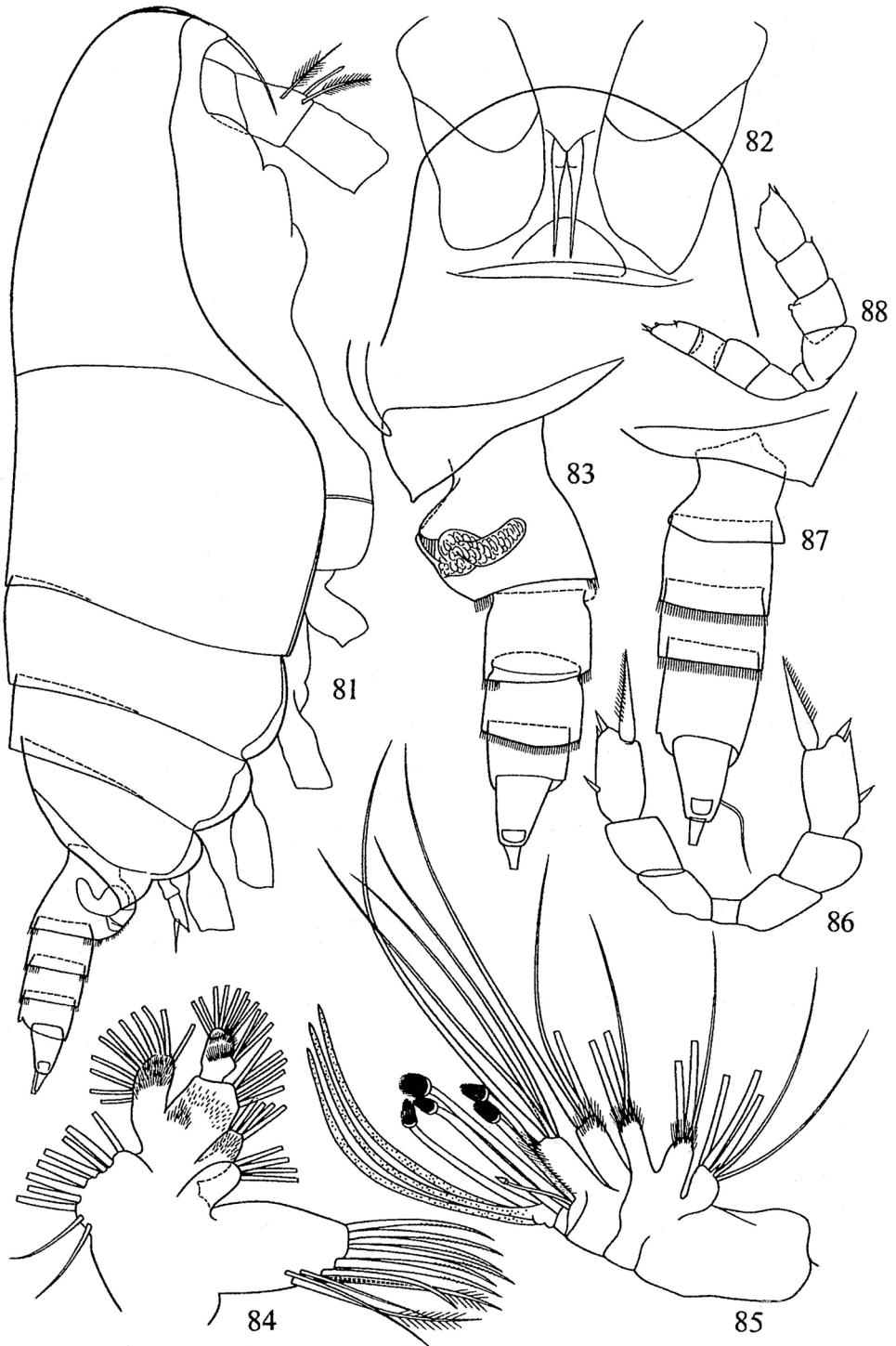
Description. Calanoida of middle and large size, body length 3.68-6.3 mm. Forehead with a low median crest or without crest. Rostrum as a short plate with 2 long filaments. SmP4 and SmP5 separate; posterolateral corners of SmP5 produced distally into triangular lobes with a rounded tip or terminating with a small tooth-like process. Urosome of 4 somites, as long as 1/4-1/5 of prosome. Genital somite (laterally) with a conspicuous genital prominence. Caudal rami as long as wide or slightly longer than wide. A2 endopod as long as exopod or slightly longer. Md basipod with endopod as long as exopod. Mx1 with 2 posterior setae on Li1, 3-4 setae on Li2 and 4 setae on Li3, with 10-11 setae on exopod. Mx2: Li1 with 4(?) - 5 setae; Li2-Li4 with 3 setae each; Li5 with 4 sclerotized setae; endopod with 3 worm-like and 5-6 brush-like sensory setae.

Mxp syncoxa in the middle of inner margin with 3 setae, one sometimes transformed into a brush-like sensory seta. P1-P4 segmentation typical of Clausocalanoidea. P1: basipod without inner distal seta; endopod without setose outer lobe; Re1-Re3 of P1 with long, stout outer spine each, or Re1-Re2 without outer spine. In P2-P4, outer distal corner of all endopodal segments produced as a sharp spine-like process. Outer spine of Re1 of P2 shorter than outer spines of Re2-Re3. Terminal spines of exopods of P2-P4 longer than Re3. Posterior surfaces of P2-P4 protopod and exopod segments usually covered with small denticles; endopod segments with long spinules. P5 3-segmented; distal segment longer than wide and slightly flattened, usually with 4 spines: inner spine the longest, subequal in length to the segment; outer spine situated before the middle of the outer margin.

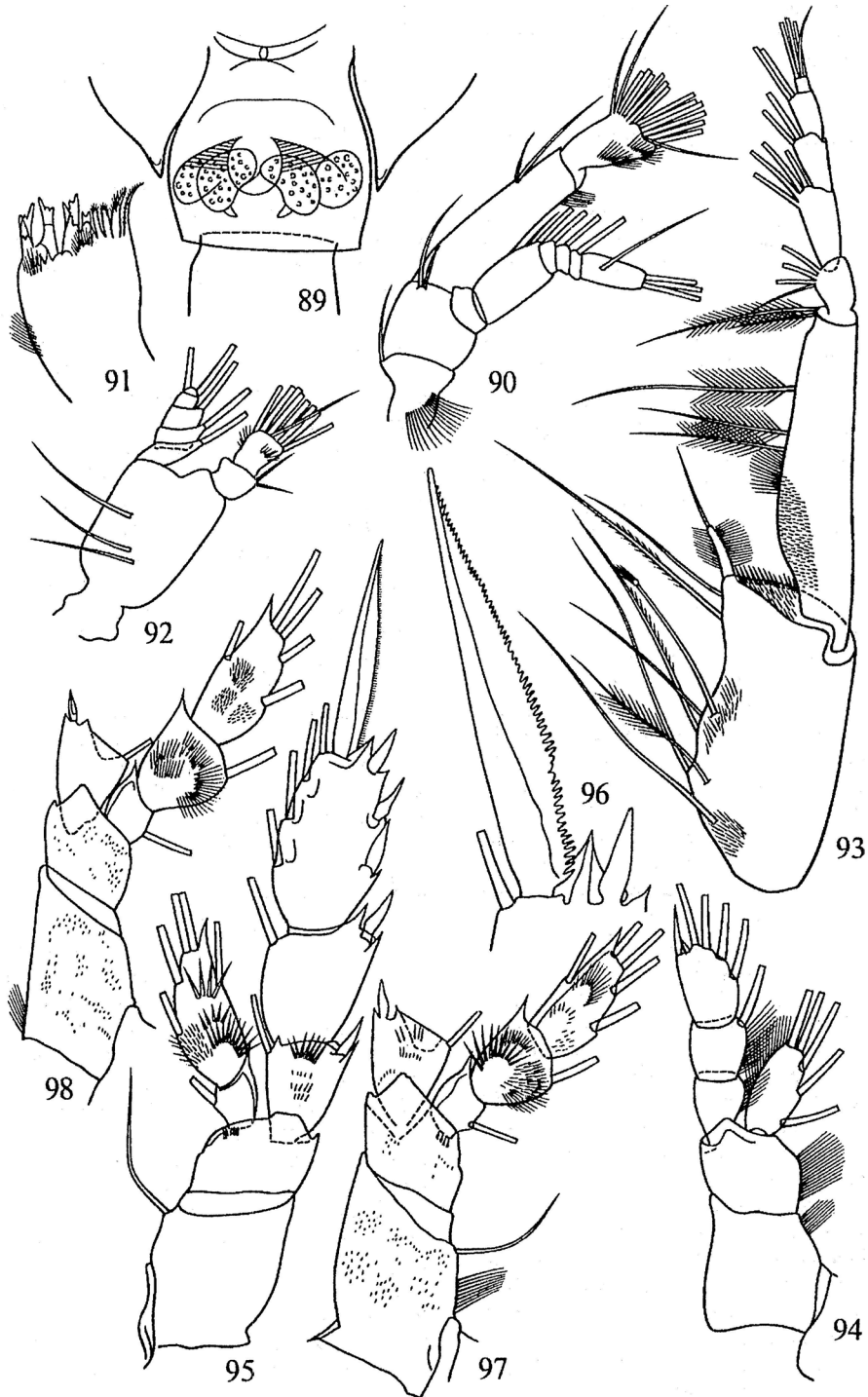
Species included. In addition to the type species, two species are tentatively included in the new genus.

Scaphocalanus angulifrons Sars, 1920 differs greatly from other species of the genus *Scaphocalanus* Sars, 1900 in most of the key characters, except structure of rostrum, and, as Bradford (1973) noted, cannot be referred to this genus. Bradford (1973) tentatively placed this species in *Lophothrix* Giesbrecht, 1895. But Sars (1924-1925) redescription of *S. angulifrons* (*angustifrons* in Sars, 1924, lapsus calami) agrees well with the definition of the new genus *Falsilandrumius* in the structure of rostrum, Md, and P5, armament of Mxp syncoxa, basis and endopod of P1, and P2-P4. But description of the male and re-examination of Mx1 and Mx2 in the female are necessary for final decision.

Also *Scolecithricella lobata* Sars, 1920 (*Scolecithrix lobata*: Sars, 1924; *Amalothrix lobata*: Sars, 1925) probably belongs to *Falsilandrumius*, as the species agrees with this genus in the shape of the posterolateral corner of SmP5 and rostrum, structure of P1 (basipod without inner distal seta; endopod without setose outer lobe), structure of P2 (outer distal corner of Ri1-Ri2 produced as a spine-like process) and armament of its segments (posterior surface of Re1 with spinules, of Re2-Re3 without spinules; Ri2 with numerous long spinules, while in *Amalothrix* and *Scolecithricella* endopod and exopod of P2 with a few spinules), and in the shape and armament of P5 (3-segmented; distal segment longer than wide and slightly flattened, with 4 spines, inner spine the longest, subequal in length to the segment, outer spine situated



Figs 81-88. *Falsilandrumius bogorovi* (81-86, female; 87-88, male CV). 81, habitus, right lateral view; 82, forehead ventrally and rostrum; 83, SmP5 and Ur, left lateral view; 84, Mx1; 85, Mx2; 86, P5; 87, Smp5 and Ur, right lateral view; 88, P5.



Figs 89-98. *Falsilandrumius bogorovi*, female. 89, genital somite, ventrally; 90, A2; 91, Md coxopod, masticatory margin; 92, Md basipod; 93, Mxp; 94, P1; 95, P2; 96, apical spine of Re3P2; 97, P3 (Re2 and Re3 missing); 98, P4 (Re2 and Re3 missing).

closer to the segment base, not opposite the inner spine, as is typical of *Amallothrix*). But the generic position can be confirmed only after description of mouthparts and the male.

Falsilandrumius bogorovi (Brodsky, 1955), comb. n.

Scaphocalanus bogorovi Brodsky, 1955: 193, Figs 6, 6a; Grice & Hulsemann, 1965: 239, Figs 13n-o, 14a-f; Roe, 1975: 325; Park, 1982: 76; Bradford et al., 1983: 93, 103.

Holotype. ♀, ZIN RAS collection No. 40872, Pacific Ocean, 43°40'N, 149°31'E, 6000-8500 m, depth 8900 m, 14th r/v "Vitjaz" cruise, St. 2218, I.VII. 1953.

Additional material (all collected in 39th r/v "Vitjaz" cruise, except the last specimen): 2 ♀, 1 CV, 23-24.VIII.1966, St. 5626, haul 184, 45°11'N, 152°28'E, 5400-6600 m; 2 ♀, 27-28.VII.1966, St. 5612, 45°31'05"N, 152°55'05"E, 6100-7320 m, depth 8300 m; 2 ♀, 27-28.VII.1966, St. 5612, 4000-5500 m; 1 ♀, 5-6.VIII.1966, St. 5617, 3141-6610 m, all catches made by BR 113 (modified Judey's net with mouth square 1.0 sq. m); 1 ♀ taken in r/v "Akademik Korolev" cruise, St. 162, Central Pacific Ocean.

Female (Figs 81-98). Body length 3.68-4.37 mm (mean 3.91 mm; n = 9). Body elongate ovoid in dorsal and lateral view (Fig. 81). Rostrum as a short thick plate with 2 long filaments (Fig. 82). Forehead broadly rounded, without crest in lateral and dorsal view. Cephalosome and SmP1 separated. SmP4 and SmP5 separated. Posterolateral corners of SmP5 produced distally as a large triangular lobe terminating with a small tooth-like process reaching about middle of genital somite; dorsal part of SmP5 much shorter than ventral, with a distinct emargination (Fig. 83).

Prosoma 4.5 times as long as urosome (Fig. 83). Ur1 about as long as Ur2 and Ur3 combined. Ur1 as long as thick; Ur2-Ur3 slightly wider or thicker than long; Ur4 much thicker than long. Posterior margins of Ur1-Ur3 with long spinules. Caudal rami 1.3 times as long as wide, with 4 apical setae; ventral (inner) and outer setae slightly shorter than caudal rami. Genital somite in lateral view with a large genital prominence (Fig. 83), in dorsal view (Fig. 89) with convex sides. Spermatheca laterally as a large elongate vesicle, ventrally (Fig. 89) as two ovoid vesicles; operculum small and ovoid; lateral skeleton plate large.

A1 in all examined specimens broken after segment 15, segments 8 and 9 fused. A2 (Fig. 90): exopod about 3/5 the length of endopod; Ri2 with 8+7 setae; Re2 with 2 setae; Re3-Re5 with 1 seta each; Re6 with 1 middle and 3 terminal setae. Md (Figs 91, 92): basipod with 3

inner setae; exopod about as long as endopod; Ri1 with 2, Ri2 with 9 setae. Masticatory margin of Md gnathobase with 4 multicuspidate ventral and 3 narrow dorsal teeth and dorsal setose seta.

Mx1 (Fig. 84): Li1 with 9 distal, 2 posterior and 1 anterior setae; Li2, Li3 and Li4 with 4, 4 and 5 setae respectively; endopod separated from the basis, with completely fused first and second segments and separated third segment with 3+3 inner and 5 apical setae respectively; exopod with 11 and Le1 with 9 setae. Mx2 (Fig. 85) with 5 subequal inner lobes; Li1 with 5, Li2-Li4 with 3 setae each; Li5 with 4 setae; distal part of Mx2 endopod with 3 long, worm-like and 6 brush-like sensory setae, of the latter 3 setae long, 2 a little shorter, all 5 with well developed brushes of about equal size, the 6th seta short and thin, with a small brush. Mxp (Fig. 93): syncoxa on the inner margin with 3 sclerotized setae and spot of spinules proximally, 1 brush-like sensory seta, 2 sclerotized setae and a row of spinules in the middle and 3 sclerotized setae and a spot of spinules distally. Basis with 3 medial setae, a spot of small spinules and a row of hairs proximally, Ri1-Ri5 with 2+4, 4, 2, 2 and 4 setae respectively.

Segmentation of P1-P4 typical of scolecitrichids. P1 (Fig. 94): basis without an inner seta; endopod without outer spinous lobe; Re1-Re2 without outer spine. P2 (Figs 95, 96) and P3 (Fig. 97): basis with spinules near the base of endopod. In P2, Re1 with, Re2-Re3 without long spines on posterior surface; outer spine of Re1 short, about equal to that of Re2; Ri2 with 3 arcs of long spinules and a spot of small spinules; terminal spine of Re3 (Fig. 96) 1.2 times as long as the segment, finely serrated. Ri2-Ri3 of P3 with numerous long and small spinules. P4 (Fig. 98): Ri2-Ri3 with spinules. Distal outer corner of all endopodal segments of P2-P4 produced in spine-like process.

P5 (Fig. 86) uniramous, symmetrical, 3-segmented; distal segment the longest, twice as long as wide, slightly flattened, with a strong inner, subterminal setose spine about as long as the segment, a short outer spine situated about in the middle of outer margin and 2 short terminal spines.

Male, CV. Body length 3.42 mm. Body as in female, but urosome (Fig. 87) slender, Ur4 the longest, Ur2 and Ur4 slightly longer than wide, Ur1 and Ur3 wider than long. Mouthparts and P1-P4 nearly as in female. P5 slightly asymmetrical; both legs 4-segmented, but the right leg a little stouter, with minute knob-like rudiment of endopod on second segment, third segment with distal outer setule, fourth with 2

(apical and subapical) setules and with obliquely cut apical margin. Distal segment of left leg with 4 small setules (Fig. 88).

Type locality. The Pacific Ocean, 43°40'N, 149°31'E, 6000-8500 m.

Distribution. North-west and central Pacific, north-east Atlantic.

Remarks. Roe (1975) and Park (1982) noted that the species under consideration is a very atypical *Scaphocalanus* and should be excluded from the genus. Our re-examination has shown that the species differs quite clearly from *Scaphocalanus* in the absence of transparent stripe on posterior margins of A1 segments; Md endopod and exopod of subequal length; presence of 5 (not 3) setae on L11 of Mx2, of 6 (not 5) brush-like sensory setae on Mx2 endopod and of 3 setae on Mxp syncoxa (1 transformed into brush-like seta) in the middle of inner margin (instead of only 1 brush-like seta). All mentioned features show greater affinity to the genus *Landrumius* Park, 1983. Some features however clearly distinguish the species from *Landrumius*: rostrum with 2 long filaments (large, single in Park's definition of *Landrumius*); Mx1 with 2 (4 in Park's definition) posterior setae; outer distal corner of distal segment of endopod of P2-P4 projected into a large, spine-like process (not projected, rounded); spiniform process of exopodal segments at bases of outer spines of P2-P4 not pointing outward (vs. conspicuous and pointing outward). Features mentioned above distinguish well the new genus from *Landrumius* Park. But as the new genus has a number of similarities with *Landrumius* which distinguish them from other Scolecitrichidae genera, it is named as false (Latin falsus) *Landrumius*.

The genus presently includes *F. bogorovi* (Brodsky, 1955), **comb. n.** I place tentatively in this genus also *F. angulifrons* (Sars, 1920), **comb. n.** (from *Scaphocalanus*) and *F. lobata* (Sars, 1920), **comb. n.** (from *Scolecithricella*).

The following features distinguish *F. angulifrons* (Sars), as redescribed by Sars (1924-1925), from *F. bogorovi*: the species is larger; forehead with a triangular crest; Re1-Re2 of P1 with an outer spine each; endopod of P1 with transverse row of spinules on posterior(?) surface.

The adult male is known only for *F. angulifrons* (see Wilson, 1950), its structure, as that of females, differs from typical of *Scaphocalanus*. Forehead with a crest. Posterolateral corners of SmP5 rounded. Ur 5-segmented, as long as 2/5 of the prosome, anal somite the shortest, caudal rami slightly longer than anal somite, with 5 setae. Mouthparts as in female.

Endopods of P2-P3 with rows of spines (being on ventral surface according to Wilson, 1950, but rather situated on posterior surface, as in female). P5 biramous. The endopod of right P5 one-segmented, laminate, longer than Re1 of right exopod, the latter with distal inner corner produced as an angular process; Re2 sickle-like, with a spine. Endopod of left leg slightly longer than 3-segmented exopod.

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