

# A new bathypelagic copepod *Pseudoamallothrix paralaminata* sp. n. from the Arctic Basin and arguments for the transfer of *Xanthocalanus soaresmoreirai* Bjornberg, 1975 to the genus *Pseudoamallothrix* (Calanoida: Scolecitrichidae)

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*Pseudoamallothrix paralaminata* sp. n. is described from the Arctic Basin. The new species is very close to *P. laminata* (Farran, 1926) and *P. profunda* (Brodsky, 1950), but clearly differs from these in several characters of male and female. *Xanthocalanus soaresmoreirai* Bjornberg, 1975 described from male has a number of morphological features never observed in *Xanthocalanus* (fam. Phaennidae) but typical of the genus *Pseudoamallothrix* (fam. Scolecitrichidae); in some characters, this species is close to *P. ovata* (Farran, 1905). *X. soaresmoreirai* is transferred to the genus *Pseudoamallothrix* (**comb. n.**). A transformation of setae on apical and subapical segments of the male maxilliped as a synapomorphic character for the family Scolecitrichidae is recorded for the first time.

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## Introduction

The genus *Pseudoamallothrix* was erected by Vyshkvartzeva (2000) for 13 species previously included in several genera of the family Scolecitrichidae: *Scolecithrix*, *Scolecithricella*, *Amallothrix* and *Amalophora*. The last genus is not valid because *A. typica* T. Scott, 1894, the type species of the subgenus *Amalophora* T. Scott, 1894 considered later as a genus (Sars, 1902), is based on a male which actually belongs to the genus *Xanthocalanus* Giesbrecht, 1892 (Giesbrecht & Schmeil, 1898; Bradford et al., 1983; Roe, 1975). All the other species originally described in *Amalophora* were further included in *Xanthocalanus* (Phaennidae) or in new or re-diagnosed genera of the family Scolecitrichidae (Roe, 1975; Bradford et al., 1983; Park, 1983b; Razouls, 1995; Vyshkvartzeva, 2000).

Ten species, material of which is kept in the collection of the Zoological Institute, have been transferred to the genus *Pseudoamallothrix* (Vyshkvartzeva, 2000). One species of this genus was recorded from the Arctic Basin under the name *Scolecithricella laminata* (Farran, 1926), from specimens collected by K.N. Kosobokova during the R/V "Polarstern" cruise (Mar-

khaseva, 1998); in addition, the collection of Zoological Institute, St.Petersburg, included specimens collected from the drifting station "North Pole-4" and identified by K.A. Brodsky as *Amallothrix profunda* Brodsky, 1950. A detailed comparison of the specimens, females and males, from the central Arctic Basin with both *P. laminata* from the Atlantic Ocean (Farran, 1926; Grice & Hulsemann, 1965; Roe, 1975) and *P. profunda* from the North Pacific, redescribed by Vyshkvartzeva (2000), has shown that the specimens from the Arctic Basin belong to a species distinctly differing from both *P. laminata* and *P. profunda*.

## Methods

The examined specimens were preserved in 4% formaldehyde. The techniques of measurements, preparation of slides and drawings are described by Vyshkvartzeva (2000).

The abbreviations used in this paper are as follows: A1 – antennule, A2 – antenna, Ce – cephalosome, Md – mandible, Mxp – maxilliped (Li1-Li4 – 1st-4th endites of syncoxa), Mx1 – maxillule (Li1 – gnathobase of praecoxxa, Li2 – endite of coxa, Li3 and Li4 – endites of basis, Le1 – epipodite of coxa), Mx2 – maxilla (Li1 and Li2 –

praecoxal endites; Li3 and Li4 – coxal endites; Li5 – basal endite), P1-P4 – 1st-4th pairs of swimming legs, P5 – 5th pair of legs, Re1-Re7 – 1st-7th segments of exopod, Ri1-Ri3 – 1st-3rd segments of endopod, Smp1-Smp5 – somites bearing 1st-5th swimming legs, Ur – urosome, Ur1-Ur5 – 1st-5th urosomal somites.

### Taxonomic account

#### *Pseudoamallothrix paralaminata* sp. n. (Figs 1-40)

*Holotype*. ♀ (total length 3.2 mm), ZIN 1/58635, central part of Arctic Basin, 81°46'8" N 178°5' W, collected from drifting station SP-4, St. 4, haul 7, 1750-900 m, 14.VI.1955.

*Paratypes*. 1 ♀ (3.0 mm), 2 ♂ (3.0 and 3.2 mm), ZIN 2/58635, same haul; 1 ♀ (3.08 mm), central part of Arctic Basin, 85°43' N 179°12' E, collected from drifting station SP-4, St. 16, haul 3, 2319-950 m; 3 ♀ (2.85-3.1 mm); 1 ♂ (3.0 mm), ZIN 90747, Makarov Basin, 81°12' N 150°14' E, net tows taken during R/V "Polarstern" cruise, ARK X1/1, St. 057, 2500-1500 m vertical haul, 28.VIII.1995; 1 ♂ (3.12 mm), northern part of Laptev Sea, R/V "Polarstern", St. 76, NN 1', 1900-1000 m, 17.VIII.1996.

The holotype and most of the paratypes of the new species are kept at the Zoological Institute, St. Petersburg.

*Description. Female*. Body length 2.85-3.20 mm, prosome length 2.38-2.50 mm, urosome length 0.6-0.75 mm. Prosome elliptical in lateral (Fig. 1) and dorsal views; forehead (Fig. 2) in shape of a low triangle with rounded tip. Rostrum (Fig. 3) with two strong rami each continued by a thick, aesthetasc-like filament about 1.5-2.0 times as long as ramus. Ce and Smp1, as well as Smp4 and Smp5, separated by a thin line; distal corners of Smp5 not produced, broadly rounded, with a shallow indentation (Fig. 4).

Urosome consisting of four somites, short, 0.24-0.27 times as long as prosome. Genital somite dorsally slightly swollen in midlength (Fig. 4), laterally slightly wider than long (its length-width ratio about 100 : 113), with rounded genital projection in anterior two-thirds of somite length and concave ventral margin in posterior third (Fig. 5); in some specimens with open operculum, genital swelling rather inconspicuous (Fig. 6). Spermatheca with elongate-oval curved vesicle directed obliquely anterodorsally. Ur2 and Ur3 subequal, each 1.1 times as long as Ur1, slightly longer than wide (Figs 5, 6). Length-width ratio of Ur2 about 100 : 94, that of Ur3 about 100 : 97.

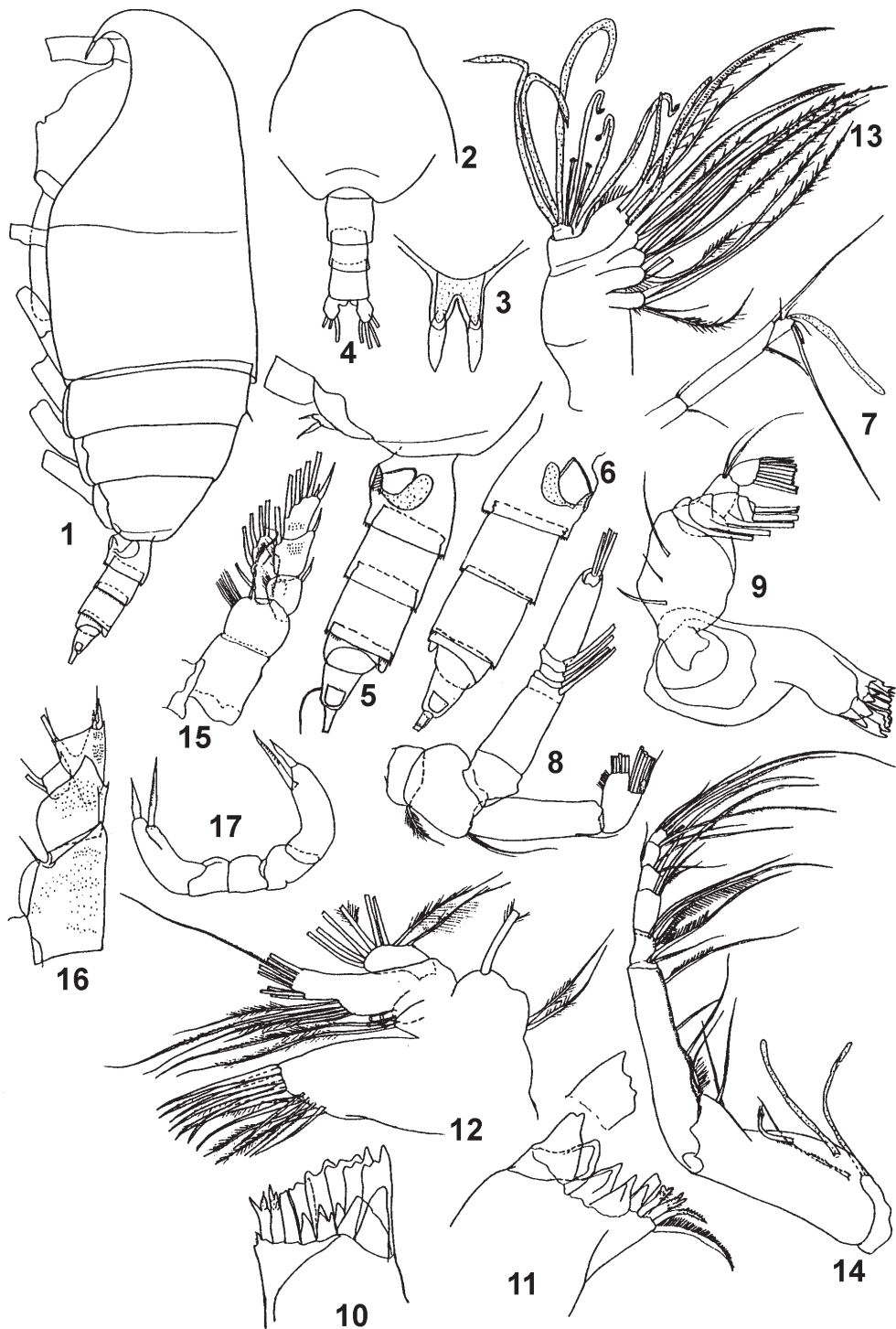
A1 with 24 free segments, reaching to Ur4. Segments 8 and 9 (ancestral segments 10 and 11) fused; segment 24 (Fig. 7) with one long, four short setae and one long aesthetasc. In A2 (Fig. 8), exopod 1.5 times as long as endopod, Re1 with rounded swelling on inner margin, Re2 and

Re3 partly fused, Re1-Re7 setation as follows: 0, 0, 1, 1, 1, 1, 3 terminal setae. Mandibular coxa and basis subequal (Fig. 9); cutting edge of coxal plate (Figs 10, 11) having four strong cockscomb-like teeth with multicusped crowns, one small tooth with a crown, three narrow dorsal spinulose teeth and dorsal strongly setose seta being twice as long as most dorsal tooth. Md (Fig. 9) with following characters: basis with two long inner setae and one shorter seta between them, two-segmented endopod almost as long as five-segmented exopod, Ri1 with two inner setae, Ri2 with nine apical setae, exopod with six long plumose setae.

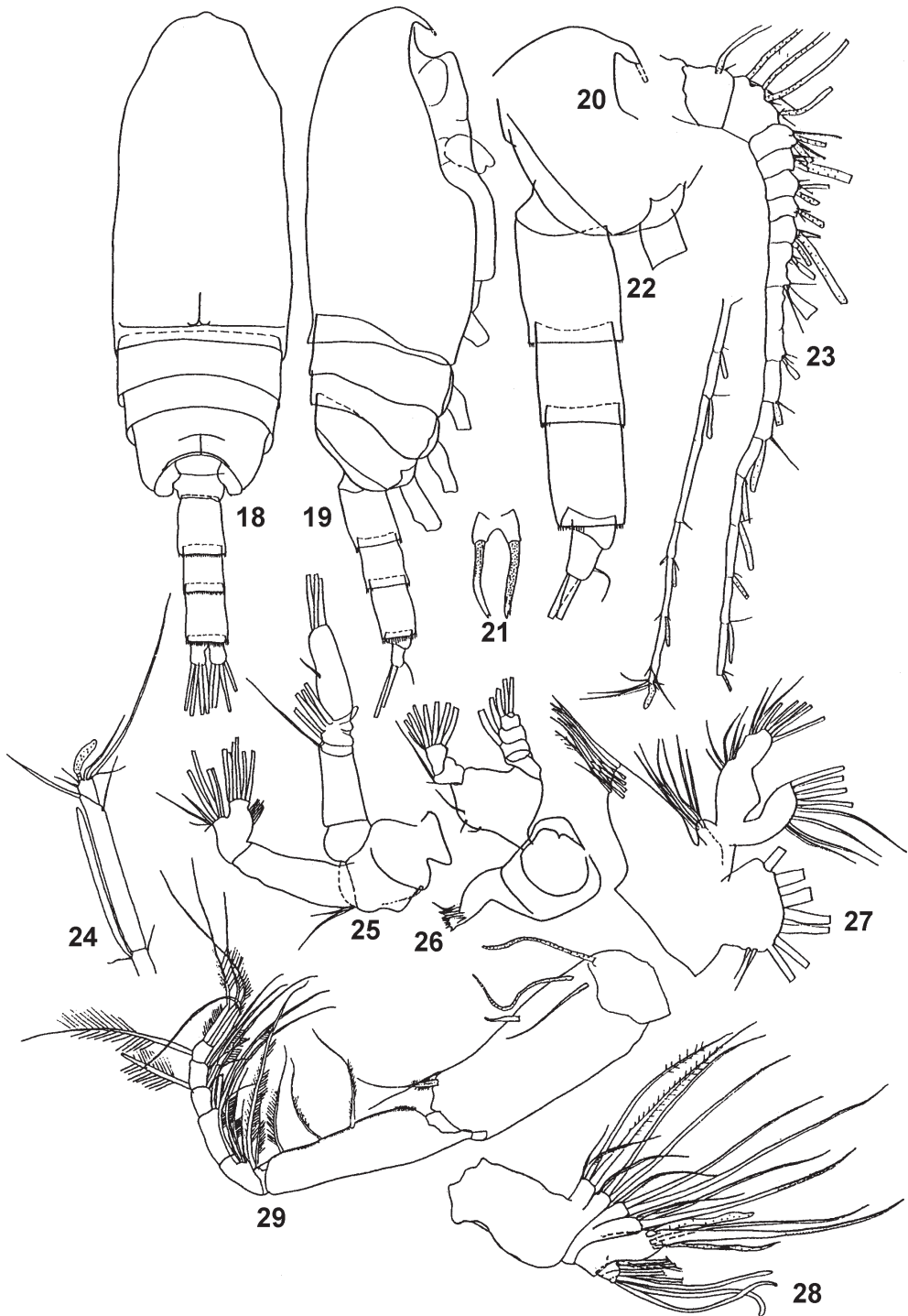
Mx1 (Fig. 12) with features listed below. Li1 with 14 closely spaced setae: nine strong and long marginal, one short anterior and four thin spinulose posterior setae. Marginal setae of Li1 arranged in two groups: proximal of two setae and distal of seven ones. Proximal marginal setae thinner and slightly shorter than distal ones, but more spinulose, armed with long rigid spinules. Seven distal setae strong, claw-like, arranged in two rows: anterior row of three long setae armed with long, slender as well as short spinules and posterior row of four slightly thinner and shorter setae supplied with short spinules. Li2-Li4 of Mx1 with 2, 4 and 5-6 long plumose setae, respectively; endopod fused with basis, bearing three inner plumose and five apical setae (four of the latter with short spinules, whereas 5th seta plumose); Le1 with seven long, strongly plumose and two short setae; exopod with eight long and strongly plumose setae.

Mx2 (Fig. 13) with five endites enlarging from proximal to distal. Li1 of Mx2 with four setae; Li2-Li4 each with a relatively short spinulose posterior seta and two long apical setae; long setae of Li1-Li4 with long sparse perpendicular setules and small spinules; one seta of Li4 strong, claw-like, spinose. Li5 with one claw-like spinose seta (the strongest), one sclerotized seta and two worm-like sensory setae. Endopod of Mx2 with three long worm-like and five brush-like sensory setae; three of these latter distinctly longer than two others, having a worm-like stem and small apical brushes; all five brushes almost equal in size.

Mxp (Fig. 14) long and slender, seven-segmented. Syncoxa of Mxp with a worm-like sensory seta on Li1, sclerotized seta and worm-like sensory seta on Li2, short brush-like seta on Li3, and three setae on Li4. Basis with three widely-spaced setae, bunch of thin hair-like setules proximally and a row of minute spinules along inner margin up to the distal part of segment. Ri1-Ri6 with 2, 4, 4, 3, 3+1, and 4 setae, respectively. Outer setae of Ri5 and Ri6 directed distally, slender, as long as one-third and half of endopod, respectively.



**Figs 1-17.** *Pseudoamallothrix paralaminata* sp. n., female. 1, left lateral view; 2, forehead, dorsal view; 3, rostrum; 4, Smp5 and Ur, dorsally; 5, Smp5 and Ur, left lateral view; 6, Smp5 and Ur, right lateral view; 7, segments 24 and 25 of A1; 8, A2; 9, Md; 10, 11, gnathobase of Md; 12, Mx1; 13, Mx2; 14, Mxp; 15, P1; 16, coxa and basis of P4; 17, P5.



**Figs 18-29.** *Pseudoamallothrix paralaminata* sp. n., male. 18, habitus, dorsal view; 19, habitus, right lateral view; 20, forehead, lateral view; 21, rostrum; 22, Smp5 and Ur, right lateral view; 23, A1; 24, segments 24 and 25 of A1; 25, A2; 26, Md; 27, Mx1; 28, Mx2; 29, Mxp.

P1 (Fig. 15) and P2-P4 as in male (see below), but inner lamellate transparent lobe on coxopod of P4 (Fig. 16) developed better. Apical spine of P2-P4 with 50-54, 46-48 and 48 narrow teeth along outer edge, respectively. Ratio of length of Re3 to length of its apical spine 100 : 118 in P2, 1 : 1 in P3, 100 : 89 in P4.

P5 (Fig. 17) symmetrical, two-segmented; distal segment curved medially, with two rather strong spines: subapical inner spine (slightly shorter than segment) and apical spine (half as long as inner spine).

*Male.* Body length 3.0-3.2 mm. Body (Figs 18, 19) slenderer than in female. Forehead, viewed laterally (Fig. 20), as a low triangle, viewed dorsally, almost truncate and with a median rounded projection. Rostral filaments (Fig. 21) thinner than those in female, with bifurcated tips. Ce and SmP1 fused; SmP4 and SmP5 separated; distal edge of SmP5 broadly rounded (Fig. 22). Urosome (Fig. 22) 0.35-0.45 times as long as prosome (depending of how much Ur2-Ur5 are telescoped into preceding somite). Ur2 the largest, its length-width ratio in lateral view about 100 : 75. Ur3 about 0.73 times as long as Ur2; its length-width ratio 100 : 90. Ur4 about 0.91 times as long as Ur2; length-width ratio of Ur4 about 100 : 63. Ur5 and caudal rami short.

A1 reaching the middle of Ur4. Left A1 with 21 free segments (8-9th, 10-12th segments of typical 25-segmented calanoid A1, or, accordingly, 10-11th, 12-14th ancestral segments, completely fused, while 9th and 10th free segments partially fused). Right A1 with 20 segments (17-18th free segments, or 20-21th ancestral ones, also fused). In both right and left A1, free segments 8-15, 17-19 with one aesthetasc, whereas segments 2, 4-7 with two aesthetascs each; terminal segment (Fig. 24) with one long, four short setae and one aesthetasc being shorter than that in female A1. A2 (Fig. 25) different from that of female in armament of exopod: Re1 without rounded swelling and Re1-Re7 with 0, 1, 1, 1, 1, 1, 1+3 terminal setae, respectively.

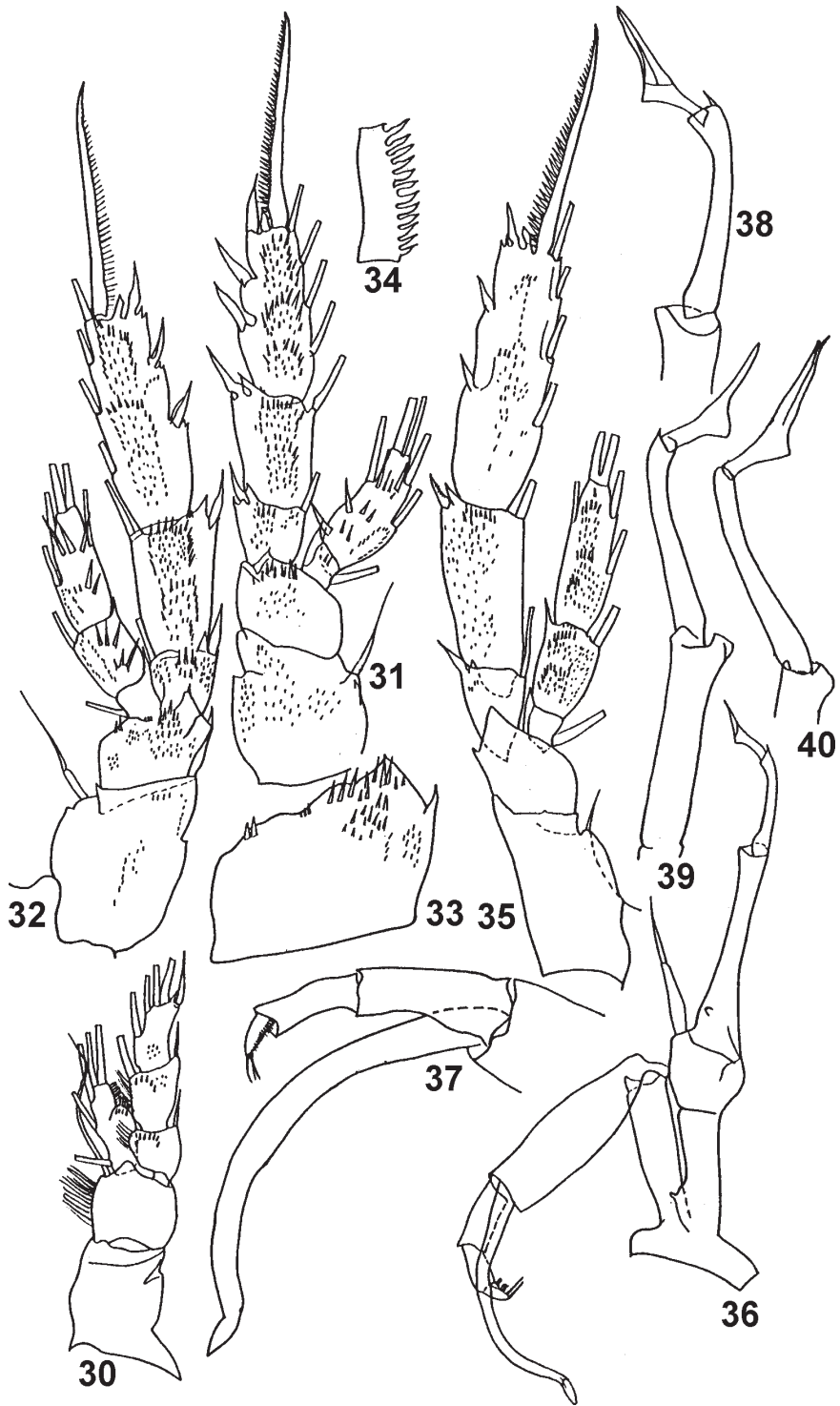
Mouthparts similar to those of female in meristic characters, but coxal plate of Md (Fig. 26), Mx1 (Fig. 27) and Mx2 (Fig. 28) smaller. Md basis broad; inner setae of Md basis and setae of Li1-Li4 of Mx1 shorter than in female. Sensory setae of endopod of Mx2 as in female, but apical brushes not visible. Mxp differing from that of female in armament of Ri5 and Ri6. Outer setae of Ri5-Ri6 of Mxp strongly plumose, directed to basal part of Mxp, distinctly longer and stronger than those in female; in Ri5, outer seta as long as endopod, in Ri6, twice as long as endopod; three apical setae of Ri6 and one seta of Ri5 plumose, longer and stronger than in female, with thickened proximal one-third (Fig. 29).

Segmentation and setation of P1 (Fig. 30) as in female and typical of the genus; posterior surface of Re1-Re3 with minute spinules. Segmentation and setation of P2 (Fig. 31), P3 (Figs 32, 33, 34) and P4 (Fig. 35) typical of the genus. Bases of P2 and P3 with spinules situated on posterior surface distally, near inner and outer corners; segments of endopod and exopod with numerous differently-sized spinules on posterior surface and minute spinules on anterior surface. Coxopod, basis, Re1 and Ri1 of P4 without spinules; transparent inner coxal projection and inner seta poorly developed. Segments of P4 exopod with sparse, those of Ri2-Ri3 with numerous spinules on dorsal surface; Re2-Re3 with numerous minute spinules on anterior surface. Apical spine of P2-P4 with 41, 42 and 39 long narrow teeth, respectively. Ratio of lengths of Re3 and apical spine of P2 100 : 123, that of P3 100 : 112, and that of P4 100 : 93.

P5 (Figs 36-40) extending slightly beyond the caudal rami, biramous, asymmetrical, subequal in length. In right leg, mediiodistal corner of Re1 very slightly produced, proximal part of Re1 with a tubercle, Re2 slightly curved distally; Re3 triangular, lamella-like, long, about 0.75 times as long as Re2. In left leg, three-segmented exopod about half as long as one-segmented endopod, Re1-Re3 decreasing in size distally; Re3 twice as long as wide, with minute spinules along segment and three long thin distal spinules.

*Comparison.* The new species is very close to *P. laminata* (Farran) and *P. profunda* (Brodsky), as it also has four posterior setae on Li1 of Mx1, three inner setae on mandibular basis, four setae on Li1 of Mx2, two worm-like sensory setae on Li5 of Mx2, and a similar distal triangular, lamella-like Re3 of the right male P5. The female of *P. profunda* differs clearly from those of both *P. laminata* and *P. paralaminata* in the presence of posterior surface spines on the endopod of P1, longer outer spine on Re1 of P2, absence of posterior surface spines on distal inner corner of the bases of P2 and P3, and in stronger and shorter subapical inner spine of P5. The male of *P. profunda* differs from the male of *P. laminata*, as described and figured by Roe (1975: 320, Fig. 9t-v), and from that of *P. paralaminata*, in the presence of posterior surface spines on the endopod of P1 and absence of distal posterior surface spines on the basis of P3.

The female of *P. laminata* clearly differs from that of *P. paralaminata* in the considerably smaller size (1.82-2.4 mm), shorter Ur2 and Ur3 (both are wider than long), in shorter rostral rami (ratio of lengths of rami and filaments about 1 : 3), and in longer and slenderer inner subapical spine and shorter apical spine of P5. The male of *P. laminata* (body length 2.2-2.3 mm) has no



**Figs 30-40.** *Pseudoamallothrix paralaminata* sp. n., male. 30, P1; 31, P2; 32, P3; 33, basis of P3; 34, P3, details of apical spine; 35, P4; 36, P5; 37, right P5, endopod and exopod; 38, 39, distal segment of right P5 in two positions; 40, same, in other specimen.

setae on the basis of the mandibular palp and has nine setae on the exopod of Mx1. Roe (1975) reported for *P. laminata* a different number of setae on the exopod of Mx1 in female (8 setae) and male (9 setae), though females and males in the family Scolecitrichidae are usually characterized by the same number of setae on the exopod of Mx1 (Park, 1980, 1982, 1983a; Vyshkvartzeva, 2000, 2001; etc.).

For comparison, a female of *P. laminata* from NE Atlantic (34°53' N 14°59' W) kept in the collection of Zoological Institute was examined. Mx1 of this female has, in contrast to data reported by Roe (1975) (number in parentheses), 9 setae on exopod (8 setae), 3+5 setae on endopod (2+5), 5 setae on Li4 (6), 14 setae on Li1 (13), and 7 long setae on Le1 (5 long and 2 short in female, 6 long and 2 short in male). Therefore, Mx1 of the female of *P. laminata* examined by the author has the armament different from that reported by Roe (1975) and very close to that of *P. paralaminata*, differing only in the number of setae on the exopod of Mx1. It is very difficult to count long, slender, plumose setae of Mx1. Whether the differences in the setation of Mx1 of *P. laminata* listed above are the manifestation of variability in this species or a result of mistake, is unclear. Taking into account that females and males in the family Scolecitrichidae usually have the same number of setae on the exopod of Mx1 and based on the data of Grice & Hulsemann (1965) and my own observations, I accept that *P. laminata* has typically nine setae on the exopod of Mx1, and thus, this feature distinguishes the species from *P. paralaminata*.

***Pseudoamallothrix soaresmoreirai*** (Bjornberg, 1975), comb. n.

= *Xanthocalanus soaresmoreirai* Bjornberg, 1975.

According to the characters of male, this species described by Bjornberg in *Xanthocalanus* (fam. Phaennidae) actually belongs to the genus *Pseudoamallothrix* (fam. Scolecitrichidae). The diagnosis and species composition of the genus *Xanthocalanus* are still not definite. Up to now, 17 species formerly placed in this genus have been transferred to other genera of the families Tharybidae and Scolecitrichidae, and about 50 species are still listed in *Xanthocalanus* s.l. Both sexes are known only for 6 species; 11 species are known from male only. Whether *Thalacalanus* and *Xanthocalanus* are separate genera remains to be determined (Campaner, 1978; Bradford et al., 1983; Park, 1983b; Markhaseva, 1998; Vyshkvartzeva, 2002). Below, the characters of the genus *Xanthocalanus* s.l. are taken for comparison with those of *P. soaresmoreirai*.

*P. soaresmoreirai* (Bjornberg, 1975) has the following features which were never registered in the genus *Xanthocalanus* s.l. (for *Xanthocalanus*, data are given in parentheses): (1) sausage-like rostral filaments (thin, long, tapering filaments); (2) four setae on exopod of Mx1 (usually, 9-10 setae); (3) coxopod of P2 with a notch on outer margin and well-developed projection on inner margin (inner and outer margins of P2 smooth, without projections, as well as those of P3 and P4); (4) outer setae of Ri5 and Ri6 of Mxp strong, much plumose and longer than endopod, directed to the proximal part of Mxp; apical setae of Ri6 and inner seta of Ri5 also transformed, stronger and more plumose than in female; (5) some details of male P5, as discussed below.

Features 1 and 3 of *P. soaresmoreirai* are unique apomorphic features of the genus *Pseudoamallothrix*. Feature 2 is very close to that of *P. ovata* (Farran, 1905) and *P. cenotelis* (Park, 1980), which have five setae on the exopod of Mx1. In the genus *Xanthocalanus*, only one species, *X. echinatus* Sars, 1907, has five setae on the exopod of Mx1; Campaner (1978) and Bradford et al. (1983) suggested that the species should be removed from *Xanthocalanus* and its generic and even family position are not clear. Probably, feature 4 also clearly distinguishes *P. soaresmoreirai* from all species of *Xanthocalanus*.

In *Xanthocalanus* s.l., mouthparts and the endopod of Mxp in male were rarely described or figured [Giesbrecht, 1892: Taf. 12, Figs 20, 21 (*X. agilis*, the type species of the genus *Xanthocalanus*); Sars, 1903: 46, Pl. 31 (*X. fallax*, described as *X. borealis*); A. Scott, 1909: 124, Pl. 3, Fig. 7 (*X. claviger*, as *Amalophora*); Tanaka, 1960: 99, Fig. 89g (*X. pectinatus*); Tanaka, 1960: 107, Fig. 91h (*X. cornifer*, as *Amalophora*); Tanaka, 1960: 111, Fig. 93h (*X. oculata*, as *Amalophora*); Tanaka, 1960: 113, Fig. 94f (*X. irritans*, as *Amalophora*); Grice & Hulsemann, 1970: 192, Figs 162, 163 (*X. rotunda*, as *Amalophora*); Vyshkvartzeva, 2002: 98, Fig. 65 (*X. kurilensis*)].

The published data show that the males of *Xanthocalanus* s.l. have a similar structure of Mxp. At the same time, in the males of some species (*X. claviger*, *X. cornifer*, *X. oculata*, *X. rotunda*) the setae on Li1 of Mx1 are transformed, long, soft-skinned. In other species these setae are reduced. However, in both these groups Mxp is long, slender, seven-segmented, with syncoxal setae varying in degree of reduction, endopodal setae not transformed, outer seta of Ri5 short, not more than one-third of the endopod length, or sometimes missing. Thus, *X. soaresmoreirai* clearly differs from other *Xanthocalanus* s.l. in the outer setae on Ri5 and Ri6 of Mxp, which are strong, much plumose and longer than endopod, but shares the character of

transformed setae with the species of the genus *Pseudoamallothrix*.

Feature 5 of *P. soaresmoreirai* is as follows: P5 in male is uniramous, with simple, sub-cylindrical, strongly asymmetrical segments; such structure of P5 is very close to that in *Xanthocalanus* species having a rudimentary right leg, which is subequal to the proximal segment of the left, five-segmented P5 (some other species of *Xanthocalanus* have subequal right and left P5, the former being styliform). Probably, Bjornberg (1975) included *X. soaresmoreirai* in the genus *Xanthocalanus* mainly on the basis of the structure of male P5. However, in *Xanthocalanus* the right leg is usually four- or five-segmented with very small apical segment; in *P. soaresmoreirai* the right leg (probably, erroneously referred to as the left one by Bjornberg) is three-segmented. Relative length and shape of segments of P5 in *P. soaresmoreirai* are much closer to those in *P. ovata* (see Tanaka, 1962: Fig. 137o; Minoda, 1971: 31, pl. 2, Fig. 8), with which the species under discussion shares the above features 2, 3 and 4, the structure of male P5 and rudimentary mouthparts.

Summarizing: although in *P. soaresmoreirai* the rudimentary Mx2 is described insufficiently, coxopods of P3 and P4 are missing, and the mandibular endopod is erroneously described as four-segmented (always two-segmented in the superfamily Clausocalanoidea!), there is no question the species under consideration should be transferred to the genus *Pseudoamallothrix* (Scolecitrichidae).

## Discussion

Strong dissimilarity of the maxilliped in male and female is observed not only in the two species considered above, but also in other species of the genus *Pseudoamallothrix*. The male is known for 9 species of the genus *Pseudoamallothrix*: *P. emarginata*, *P. indica*, *P. inornata*, *P. longispina*, *P. ovata*, *P. obtusifrons*, *P. paralaminata*, *P. profunda*, and *P. soaresmoreirai*. The maxilliped of male is known for 6 species: *P. inornata*, *P. longispina*, *P. ovata*, *P. paralaminata*, *P. profunda*, and *P. soaresmoreirai* (Minoda, 1971; Schulz, 1991; Bjornberg, 1975; personal observations). In all these species, outer setae of Ri5 and Ri6 of the maxilliped are developed in male better than in female. In *P. ovata*, outer setae of Ri5 and Ri6 in male are 0.5 and 0.8 times as long as endopod, respectively. In five other species, they are 0.96-1.15 and 1.23-1.33 times as long as endopod, respectively. At the same time, in female the outer setae are not longer than half-length of the endopod of maxilliped, varying from 18 to 42% of the endopod length in 10 species examined by the author (Vyshkvartzeva,

2000). Moreover, outer setae of the maxilliped in male are strongly plumose, armed with longer and more rigid setules and tend to be directed proximally; apical setae of Ri6 and 1-2 setae of Ri5 are also developed much better. A better development of outer and distal setae of the maxilliped in male is probably not related to feeding. In *P. ovata* and *P. soaresmoreirai*, males apparently do not feed, as the setae of proximal segments of the mouthparts, participating in feeding, are reduced. In the other known males of this genus, mouthparts are slightly reduced and probably participate in the feeding.

Other genera of the family Scolecitrichidae (see Vyshkvartzeva, 2001) usually also have sexual dimorphism in structure of the maxilliped, similar to that reported for species of the genus *Pseudoamallothrix*. In the family Scolecitrichidae, the maxilliped of male is more or less shortened as compared with that of female, setae of syncoxa are slenderer than in female or reduced, but setae of Ri5 and Ri6 are developed better and more plumose, bearing long rigid setules (regardless the degree of reduction of syncoxal setae) and tend to be directed externally or proximally, to the base of maxilliped (not distally as in female). The outer seta of Ri5 in males of the family Scolecitrichidae is about 0.5-1.5 times as long as the endopod (in females, about 0.33-0.5 times), that of Ri6, about 0.6-2.0 times as long as endopod (in females, about half as long). Three apical setae of Ri6 and one seta of Ri5 are usually transformed in a similar way.

A trend to the sexual dimorphism of outer setae on terminal segments of the maxilliped seems to be a characteristic synapomorphic feature of Scolecitrichidae, which clearly distinguishes this family from the other bradfordian families, Phaennidae, Tharybidae and Diaixidae (in Parkiidae, only female is known), in which both the female and male have a similar structure of outer setae on distal segments of the maxilliped, or the outer setae of Ri5 in male are missing or reduced as compared with those in female (Sars, 1903; Tanaka, 1960; Andronov, 1974, 1979, 2002; Bradford et al., 1983; Park, 1983b; Othman & Greenwood, 1994). The maxilliped structure similar in both sexes is a primitive, ancestral state for bradfordian families; it may be found in some species of the family Scolecitrichidae as well.

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