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New species of the genus *Xanthocalanus* (Copepoda, Calanoida,
Phaennidae) from the Laptev Sea

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Abstract

Sampling of the near-bottom calanoid copepods was performed on board of the research vessel *Polarstern* in 1993 in the Laptev Sea (Siberian Arctic). Three new species of *Xanthocalanus* were identified as such, and are described and figured here: *X. spinodenticulatus* sp. nov., *X. laptevorum* sp. nov. and *X. polarsternae* sp. nov. © 1998 Elsevier Science B.V. All rights reserved.

Keywords: Copepoda; Laptev Sea; Calanoida; Phaennidae; *Xanthocalanus*

1. Introduction

Up to now 58 calanoid copepod species were recorded from the Laptev Sea (Kosobokova et al., 1995; Petryashov et al., 1995; Sirenko et al., 1996) with one species of the genus *Xanthocalanus*, *X. profundus* Sars, 1907 found here. Three new species of the genus *Xanthocalanus* obtained, on board RV *Polarstern* in the Laptev Sea, recently are added to the list of the Laptev Sea calanoids. To date the phaennid genus *Xanthocalanus* includes about 50 species. In this paper I describe three new species of the genus *Xanthocalanus*. However, Bradford (1973) stated that a number of species formally included in this genus do not fit exactly generic definition and should be excluded from this genus (Bradford, 1973;

Bradford et al., 1983). Separate studies should be performed to redefine the genus.

2. Material and methods

The material was collected on board of the RV *Polarstern* in 1993 in the Laptev Sea. The methods, techniques, material and area studied are described in Sirenko et al. (1996). Holotypes and paratypes of the new *Xanthocalanus* species are kept in the Zoological Institute, St. Petersburg.

The following abbreviations are used in the descriptions: Pr = prosome, Ur = urosome; PC = posterior corners of prosome; R = rostrum; Ce = cephalon; Gn = genital segment; Gntb = gnathobase; A1 = antennule; A2 = antenna; Md = mandible;

Mx1 = maxillule, Le = external lobe of limb, Li = internal lobe; Mx2 = maxilla; Mxp = maxilliped; P1–P5 swimming legs; Re = exopod; Ri = endopod

Xanthocalanus spinodenticulatus sp. nov. (Fig. 1)

Xanthocalanus sp. 2: Sirenko et al., 1996, p. 349.

Material examined. Holotype. No. 66831, female, Sta. 050, RV *Polarstern*, 77°41,4'N 125°55,1'E, depth 1992–1993 m, 10.09.1993.

Description of holotype. Total length 2.55 mm. Pr length/Ur length = 3.8. A1 completely missing. Rostral filaments, the shape of posterior corners of prosome and oral parts as shown (Fig. 1). Mx1 Li2 with 5 setae (2 small thin and 3 long), Li3 with 4 setae, basis with 5 setae near the base of Ri, Ri with 8, Re with 10, Le with 9 setae. P1, P5 as figured, of the other swimming legs only P4 are partly saved (Fig. 1).

Male unknown.

Remarks. The new species is distinguished from the other species of the genus by the finely serrated spines on the fourth and fifth Mx2 endites; by the presence of 5 setae at Li2 Mx1 (*X. penicillatus* Tanaka, 1960 has also 5 setae, the majority of the *Xanthocalanus* species have 4 setae), and in the smaller number of setae (4) on the first Mx2 endite (5 setae are typical for other species of *Xanthocalanus*).

Xanthocalanus polarsternae sp. nov. (Figs. 2 and 3)

Xanthocalanus sp. 1: Sirenko et al., 1996, p. 349.

Material examined. Holotype. No. 66828, female, Sta. 048, RV *Polarstern*, 77°07,8'N 126°25'E, depth 556–530 m, 09.09.1993. Paratypes. 21 females and 3 males, No. 66829 (the same locality data); 2 females, No. 66830, Sta. 049, RV *Polarstern*, 77°04,7'N 126°10,7'E, depth 180–360 m, 09.09.1993; 2 females, No. 66834, Sta. 047, RV *Polarstern*, 77°11,7'N 126°19,2'E, depth 1006–1016 m, 09.09.1993

Description. Female. Total length 4.45–4.80 mm. Average ratio Pr length/Ur length 3.8. A1 varies in length: may reach to the last segment of prosome or to the posterior part of genital segment. Re A2 1.5 times longer than Ri. Md palp base as in previous species. Mx1 Li1 with 8 apical and 4 posterior setae, Li2 and Li3 with 3 and 4 setae respectively, basis with 5 setae near the base of Ri, Ri with 8 setae, Re

with 10 setae and Le with 9 setae. Mx2 first–fifth endites with 5, 3, 4, 3, 4 setae respectively; at both the third and fifth endite one of the setae is transformed into a sensory appendage. The Mxp syncoxa and basis as figured; Ri2–5 segments with 4, 4, 3, 3 + 1 and 4 setae respectively. The structure of P1–P5 as figured (Fig. 2).

Male. Total length 3.8–3.9 mm. Pr length/Ur length mean ratio = 3.4. The setation of oral parts reduced in comparison with females: Md palp base with 2 setae; Li1 Mx1 with 3 posterior and 7 terminal setae, Li2, Li3 with 3 setae each, Ri with 6 setae; Mxp syncoxa with 1 seta in proximal group, with only 1 brush-like setae in medial group and 3 setae in the distal group. Mx2 as figured (Fig. 3). In other features oral parts and P1–P4 are as in females. P5 uniramous, 5-segmented, both left and right legs are nearly of the same length (Fig. 3).

Remarks. The new species is very like *X. harpagatus* Bradford and Wells, 1983, in presence of sensory appendages at the third and fifth endites of Mx2, but is distinguished from it by its size, the shape of the posterior corners of prosome and the number of setae on Li2 Mx1 (3 setae contrary to 4 setae in *X. harpagatus*).

Xanthocalanus laptevorum sp. nov. (Fig. 4)

Xanthocalanus sp. 3: Sirenko et al., 1996, p. 349.

Material examined. Holotype. Female. No. 66832, Sta. 050, RV *Polarstern*, 77°41,4'N 125°55,1'E, depth 1992–1993 m, 10.09.1993. Paratype. 1 female, N 66833 (the same locality data).

Description. Total length 2.7 mm. Pr length/Ur length = 4.2. Rostrum filaments tiny, hardly visible. Posterior corners of prosome triangular. A1 of 24 free segments and reaching nearly the posterior end of prosome. A2, Md, Mx1, Mxp as figured. Mx2 with 4, 3, 3, 3, 3 setae at first–fifth endites, 1 seta at the third–fifth endites is transformed into a finely serrated spine. Distal part of the Mx2 with 1 worm-like and 5 brush-like sensory setae. Ri2–Ri5 Mxp with 4, 4, 3, 3 + 1, 4 setae. P1–P5 as shown (Fig. 4), some parts are missing.

Male unknown.

Remarks. The species is attributed to *Xanthocalanus* with some doubt as it shares some features with *Neoscolecithrix* (setation of Re1–Re2 A2;

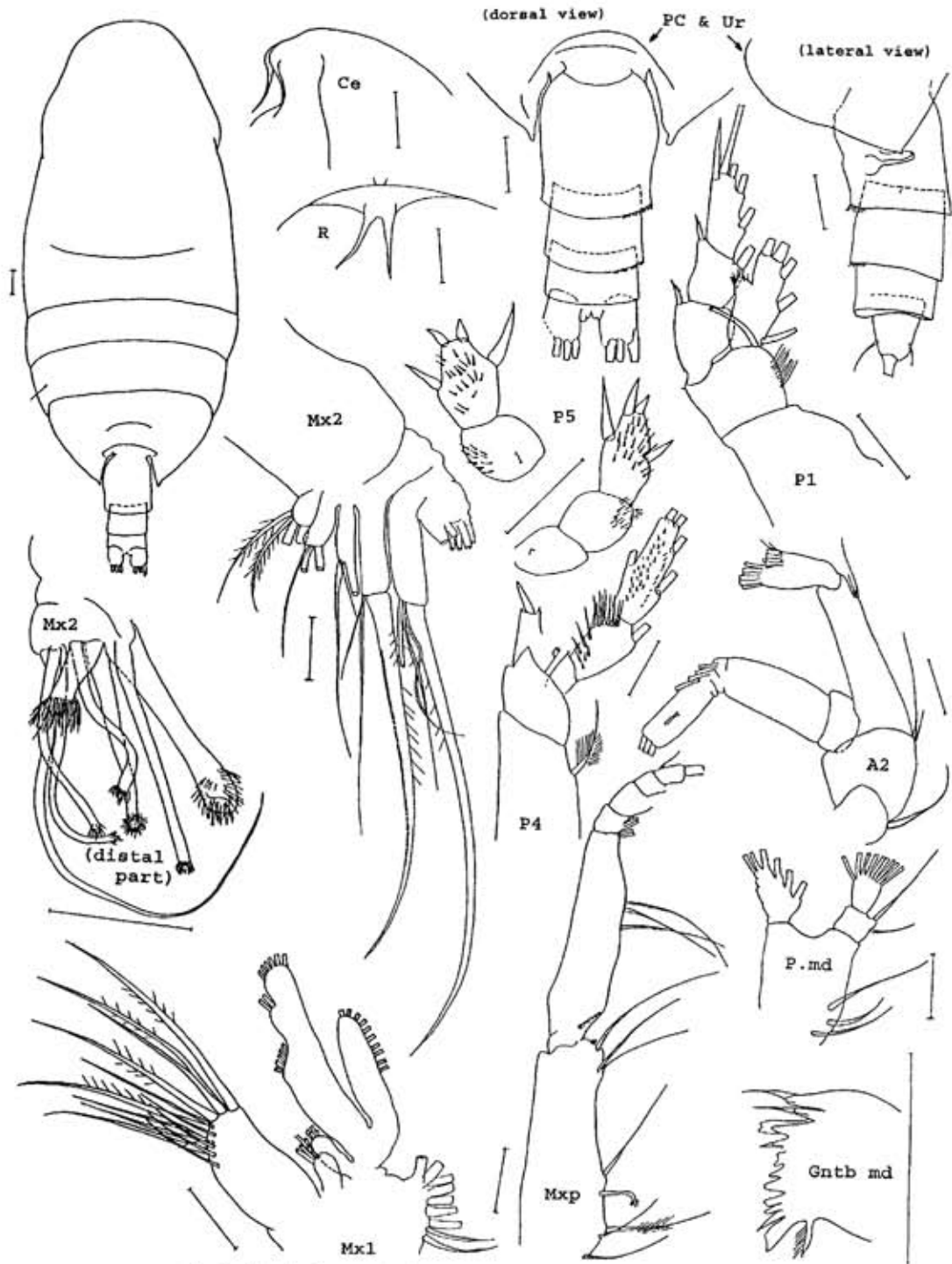


Fig. 1. *Xanthocalanus spinodenticulatus* sp. nov. Female. Scale = 0.1 mm.

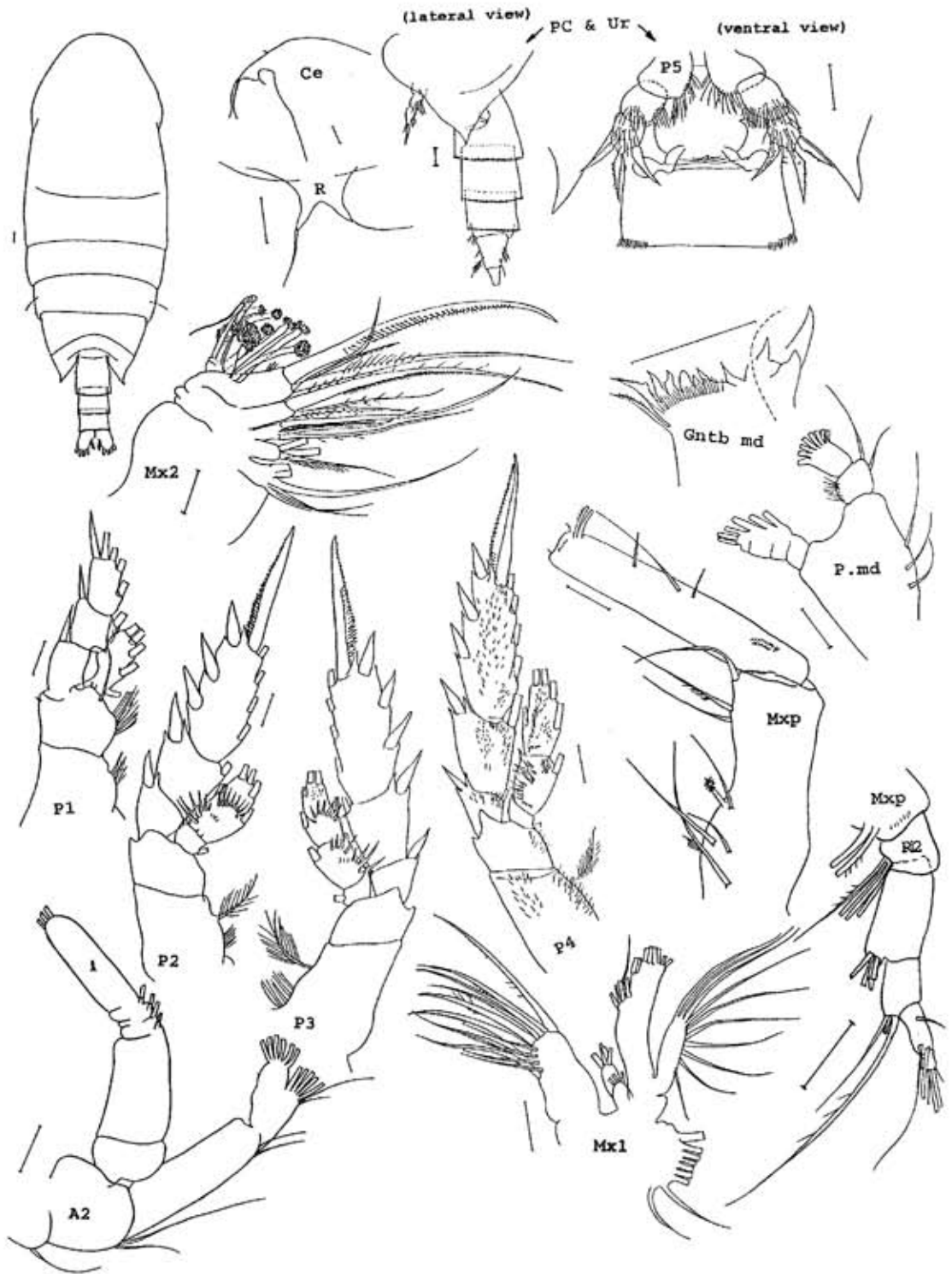


Fig. 2. *Xanthocalanus polarsternae* sp. nov. Female. Scale = 0.1 mm.

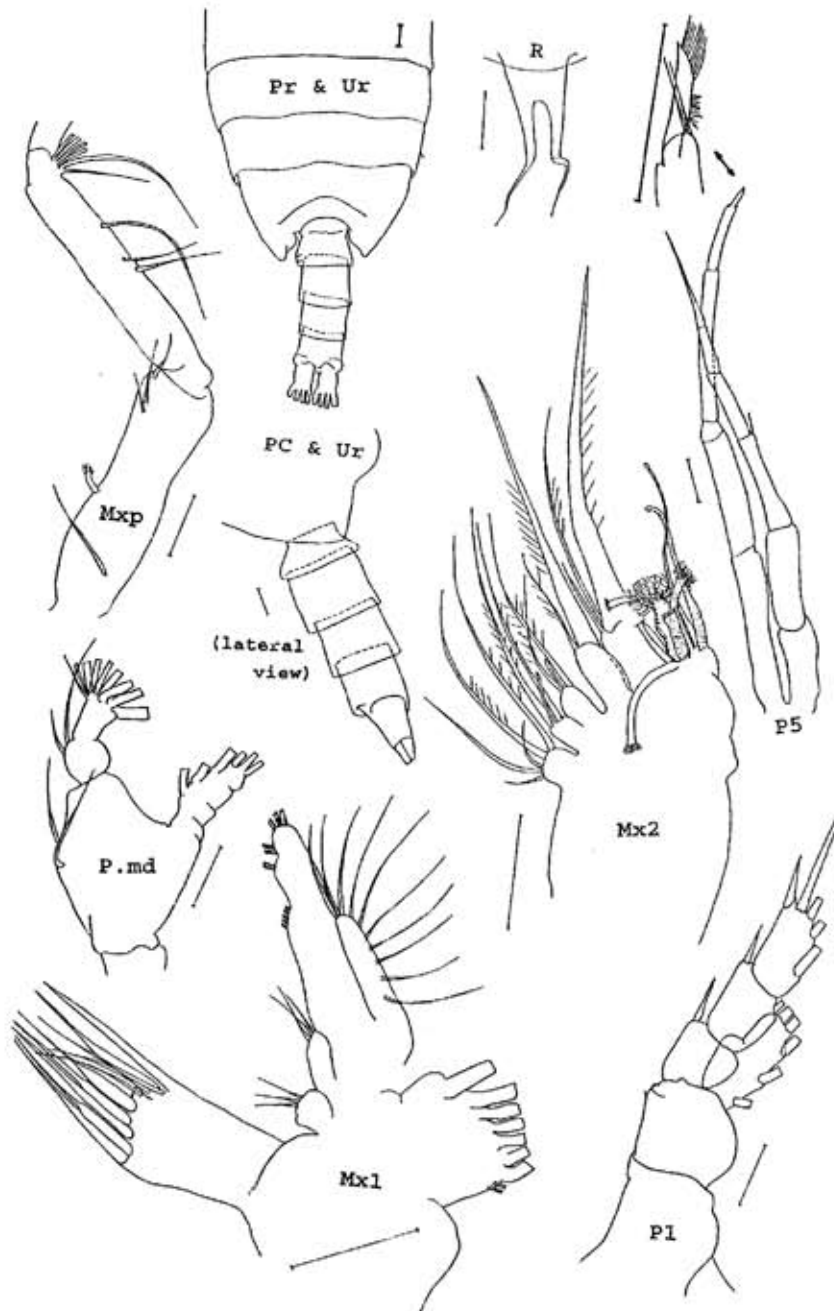


Fig. 3. *Xanthocalanus polarsternae* sp. nov. Male. Scale = 0.1 mm.

composition of setae at the syncoxa of Mxp). The coarse serration of spines on fourth and fifth Mx2 endites, typical of *Xanthocalanus* is poorly pronounced. However the setal composition of the distal

part of Mx2 is similar to the phaennid type (single worm-like appendage), but the number of brush-like appendages is less (5) than in phaennids and *Xanthocalanus*. Also the number of setae (4) at the first

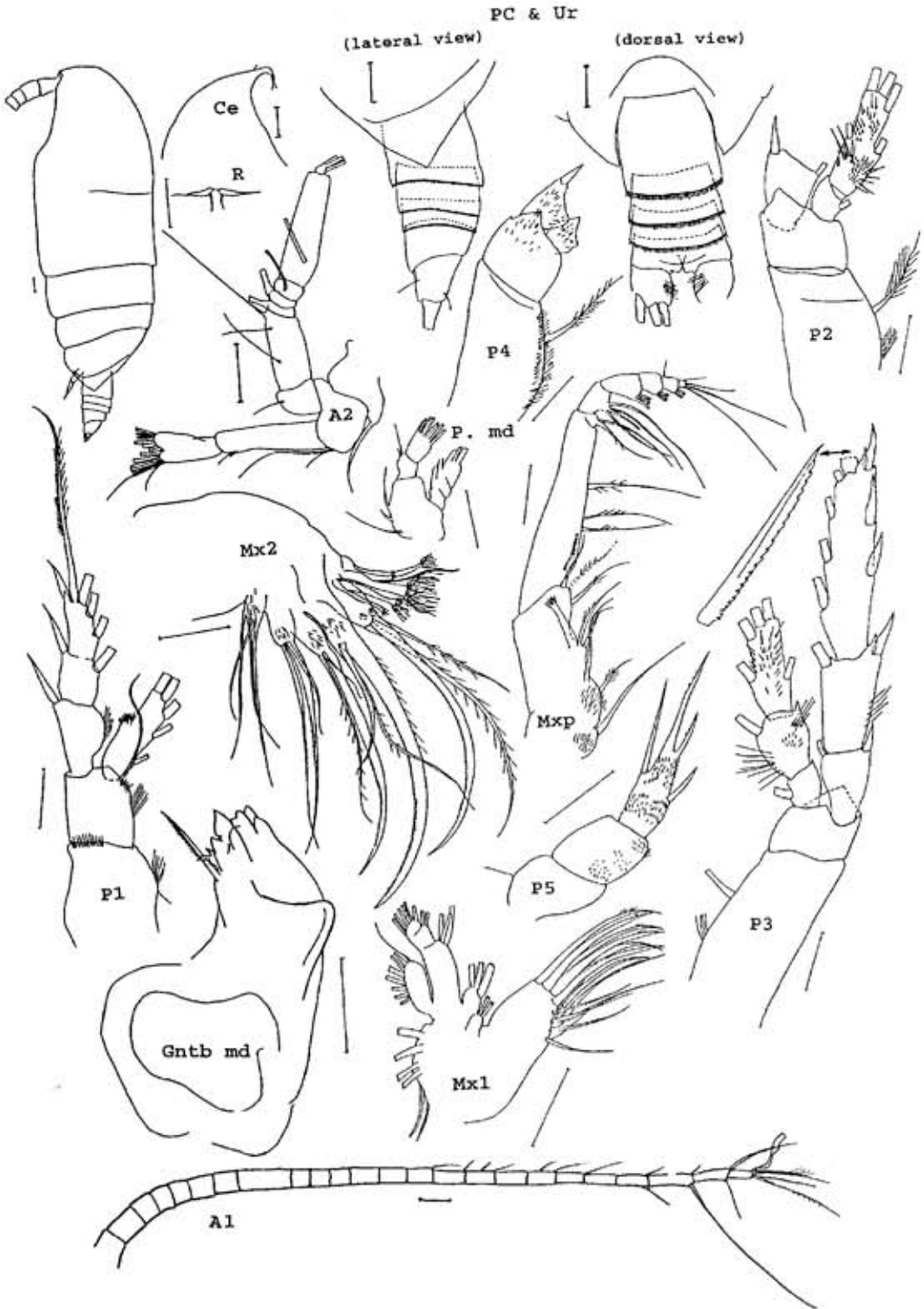


Fig. 4. *Xanthocalanus laptevorum* sp. nov. Female. Scale = 0.1 mm.

Mx2 endite is less than typical of *Xanthocalanus* (5). Nevertheless, for the moment the species is tentatively placed in *Xanthocalanus*.

3. Discussion

The phaennid genus *Xanthocalanus* includes about 50 species. It was noted recently that some species of the genus do not fit well the generic definition and should be placed in the different than Phaennidae families: some tentatively were placed in Tharybidae (*Xanthocalanus hispidus* Grice and Hulsemann, 1967/? *Xanthocalanus paululus* Park, 1970/, *Xanthocalanus macrocephalon* Grice and Hulsemann, 1970 and *Xanthocalanus paraincertus* Grice and Hulsemann, 1965) others in Scolecitrichidae (Bradford, 1973; Bradford et al., 1983). Janet Bradford-Grieve defined a group of species related to *Scolecithrix ctenopus* of the family Scolecitrichidae (Bradford, 1973) where she placed together with other species: *Xanthocalanus elongatus* Grice and Hulsemann, 1970, *Xanthocalanus alvinae* Grice and Hulsemann, 1970, *Xanthocalanus distinctus* Grice and Hulsemann, 1970, and *Xanthocalanus difficilis* Grice and Hulsemann, 1965, referring that Mx2 of these species is of scolecitrichid type (Bradford, 1973, p. 139). My original study of *Xanthocalanus polaris* Brodsky, 1950 from the Laptev Sea showed that this species is very like species included by Bradford-Grieve (Bradford, 1973; Bradford et al., 1983) in the *Scolecithrix*

ctenopus group and should be added to it. Despite the fact that the taxonomic position of the above mentioned species was improved (Bradford, 1973; Bradford et al., 1983) their generic name was not changed and according to the Code of Zoological Nomenclature they should be still assigned to the genus *Xanthocalanus*.

Three new species of *Xanthocalanus* that are described here (*X. laptevorum* sp. nov., *X. polars-ternae* sp. nov. and *X. spinodenticulatus* sp. nov.) have the setal composition of the distal part of Mx2 typical of Phaennidae and fit the existing definition of the genus (Bradford, 1973; Bradford et al., 1983).

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