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XENARCTURUS SPINULOSUS SHEPPARD, 1957 (CRUSTACEA, ISOPODA, VALVIFERA): REDESCRIPTION OF A SPECIMEN FROM THE STRAIT OF MAGELLAN

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ABSTRACT

A redescription of a primitive arcturid species, *Xenarcturus spinulosus*, from the Strait of Magellan is presented with discussion of the systematic position of the monotypical subfamily Xenarcturinae.

INTRODUCTION

Sheppard (1957) has briefly described the species *Xenarcturus spinulosus* from Patagonia, which was part of the R.R.S. "Discovery" (William Scoresby) collections. It is interesting due to its primitive morphology in comparison with other Arcturidae. The genus *Xenarcturus* Sheppard, 1957, is the only genus of the Xenarcturinae. The flattened body, the form of coxal plates on pereonites, the shape of antenna 2 in relation to pereopod 2 and 3, the similarity of all pereopods except pereopod 1 etc are important for its systematic position. Furthermore in comparison with the syntypes not only variations of body form, but also distinct sexual dimorphim are ascertained.

Arguments are proposed that support the systematic position of Xenarcturinae within the family Arcturidae in the sense of Wägele (1989), a redescription of a specimen from a locality in the Strait of Magellan, collected on 07. 04. 1976, is presented.

Material

Female, length: 7.2 mm, from the Magellan Strait, 52°38,5'S, 70°10,5'W; 25 m, clay and slates; 07. April. 1976; grab; leg. V. A. Gallardo (Universidad de Concepcion, Chile), deposited in Zoöl. Mus. Amsterdam.

Syntypes

1 female, 46°00'S, 60°05'W, 150-256 m, 113 BMNH; 2 males, from 50°53'S, 60°00'W to 50°56,3'S, 59°56'W, 119 m, 111-112 BMNH (British Museum Natural History).

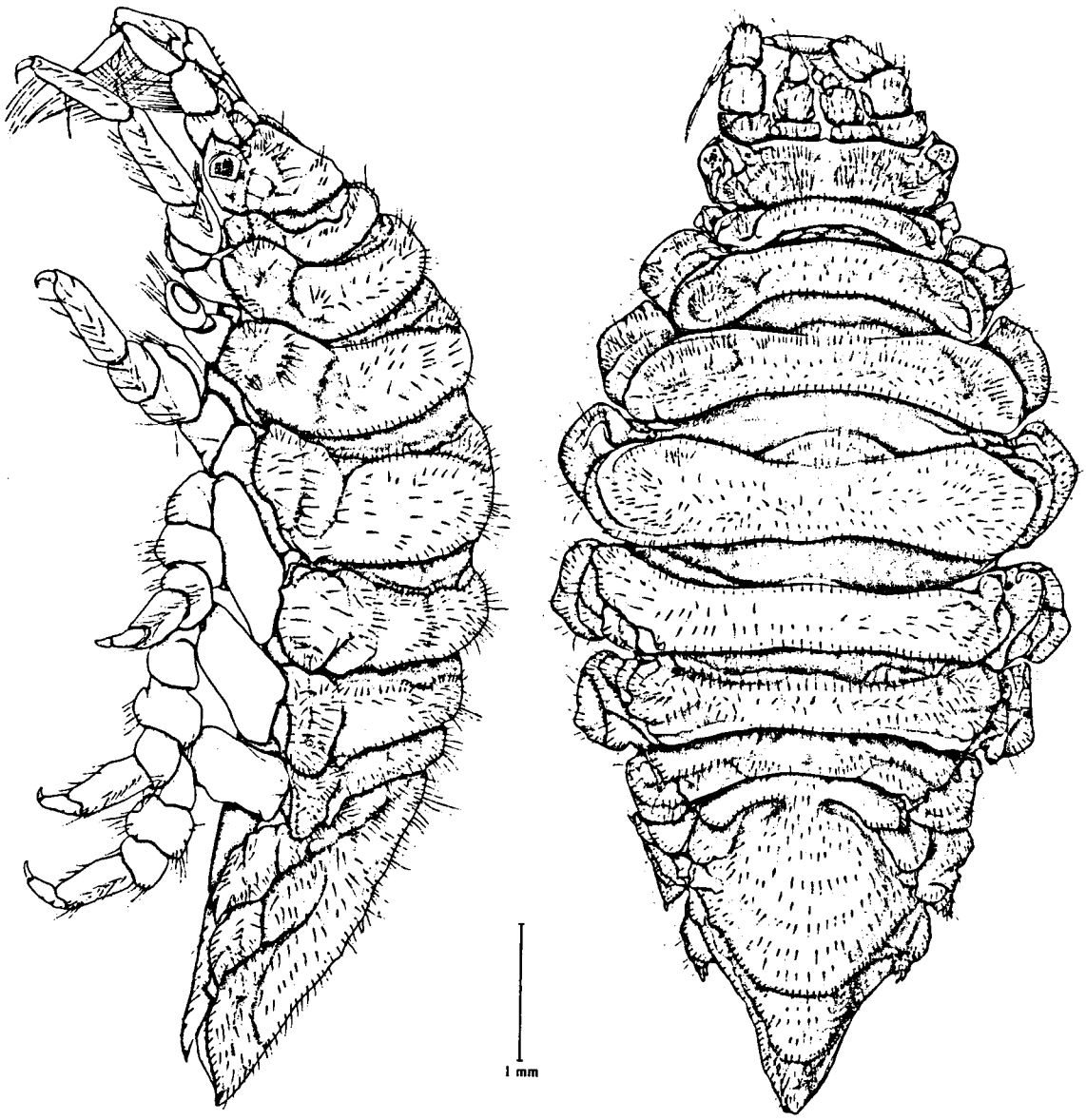

Fig. 1. *Xenarcturus spinulosus* Sheppard, 1957, female, 7.2 mm.

Distribution

Patagonia, 46°00'00"S, 60°05'00"W, 150-256 m; from 50°53'S, 60°00'W to 50°56,3'S, 59°56'W, to 50°59,5'S, 59°52'W, 119 m; from 50°30'S, 58°19'W to 50°27'S, 58°31'W, 141-146 m (Sheppard 1957, present paper); Magellan Strait.

DESCRIPTION

Body (Fig. 1) oval, dorsoventrally flattened, with many short setae on the whole surface of the body, except intersegmental region. Eyes present on lateral margin of cephalothorax. Pereonite 1 as short as pereonite 7, completely fused with head, dorsally discernible by a transversal furrow, laterally marked by a small coxal plate. Pereonites 1-4 increasing in length and breadth, pereonite 4 broadest; coxal plates coalesced with tergites, but marked by furrow, extending lateroventrally over the basis of pereopods 1-4; four pairs of oostegites, last pair surpassing caudally the border between pereonite 7 and pleotelson. Pereonites 5-7 decreasing in length and breadth; coxal plates laterally not extending over insertion of

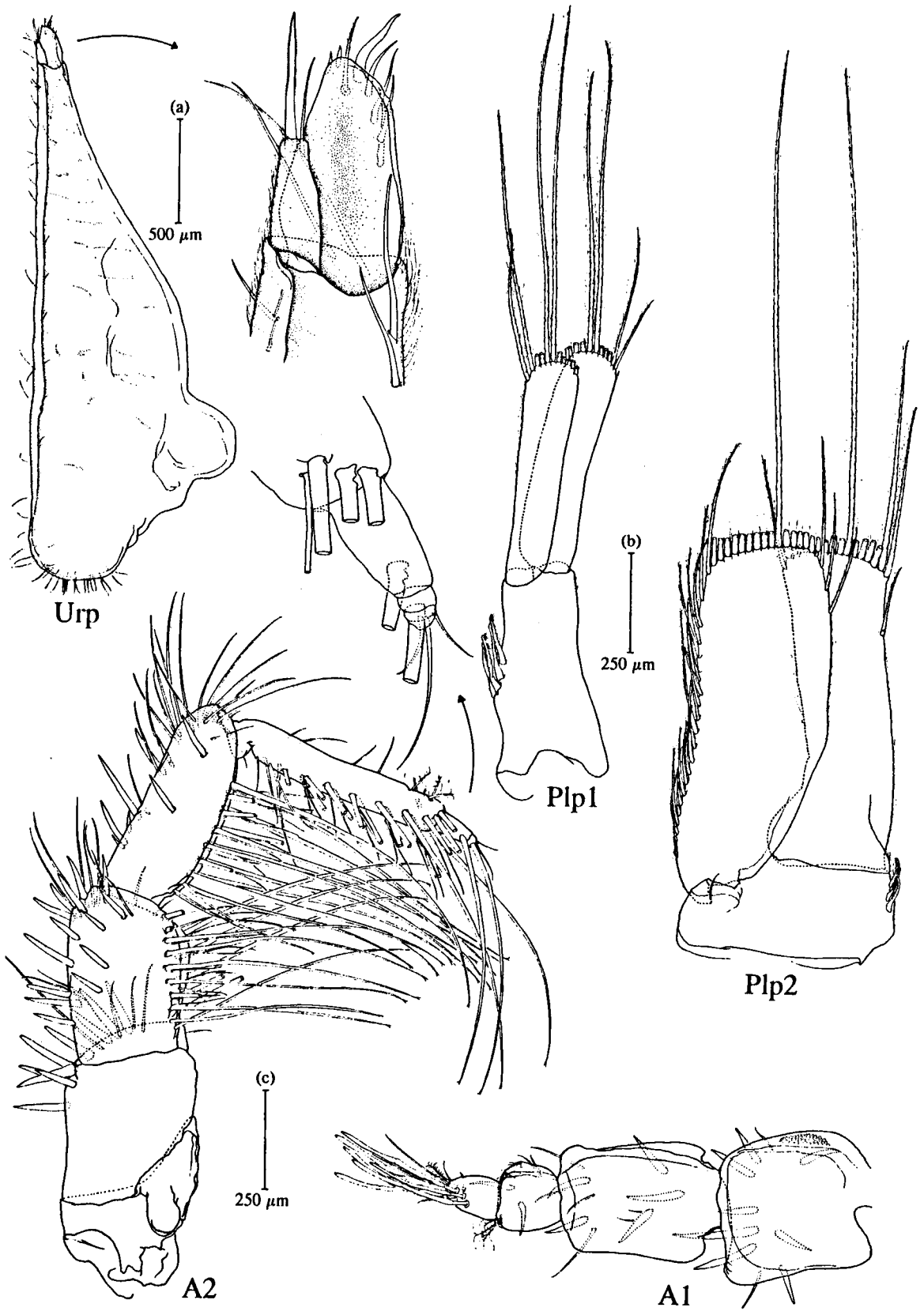

Fig. 2. *Xenarcturus spinulosus* Sheppard, 1957, female, 7.2 mm:(a) for Urp; (b) for Plp1 and Plp2; (c) for A1 and A2.

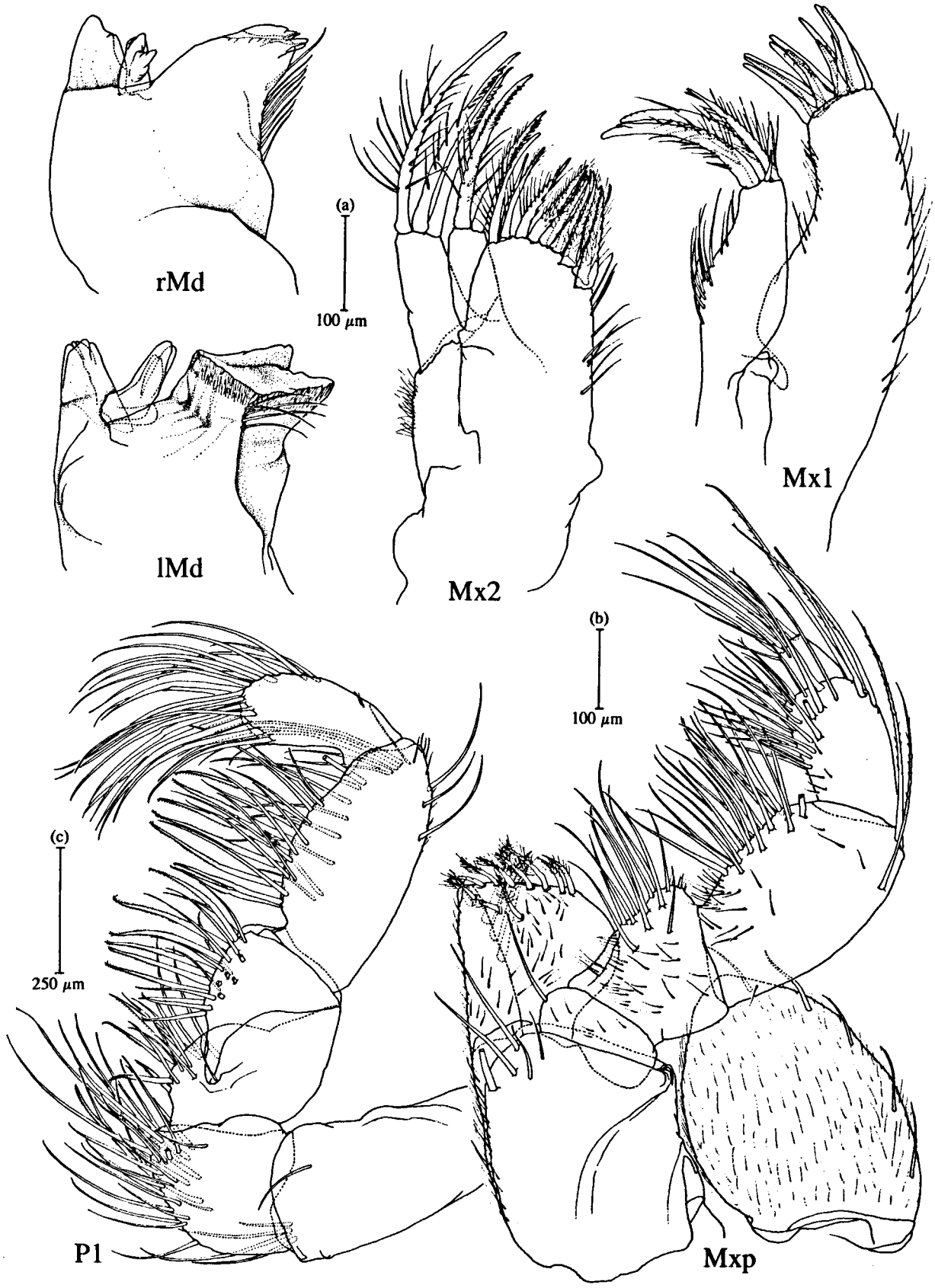

Fig. 3. *Xenarcturus spinulosus* Sheppard, 1957, female, 7.2 mm;(a) for rMd, lMd, Mx1 and Mx2; (b) for P1; (c) for Mxp.

pereopods, marked by an incomplete suture. Pereonite 6 and 7 with distinctly smaller intersegmental area. All pleonites fused, two pairs of lateral projections and shallow grooves indicating pleonites 1 and 2; at the end of those lateral projections small claw-like spines. Last half of pleotelson dorsally with shallow transversal groove; tapering abruptly, forming protruding point.

Antennule (Fig. 2) with 3 subequal peduncular articles, surpassing the midst of fourth peduncular article of antenna, dorsally with many short strong spines; first article somewhat broader than second, second somewhat longer than first, third as long as and somewhat broader than second flagellar article; first flagellar segment very short, ring-shaped, difficult to detect; dorsomedially with 3 feather-like bristles; second flagellar segment distally with 6 aesthetascs in 3 groups on ventral side, on dorsal side with 3 simple long setae and a feather-like bristle, dorsally 3 simple short setae.

Antenna (Fig. 2) with 5 peduncular and 3 flagellar articles. First peduncular article dorsally very short, ventrally surpassing the center of second peduncular article, dorsally without short spines; second as long as third, distally on dorsolateral side with many short spines, without filter-setae; third dorsally with many short spines and distally with some short simple setae; third to fifth articles ventrally with two longitudinal rows of groups of long filter-setae of similar shape as setae of pereopods 2 and 3, the outermost setae a little longer than the medial ones; fourth dorsally with some short spines and distally with simple setae (about half so long as other ventral filter-setae); fifth longest, without short spines, dorsally on distal margin with 5 feather-like bristles. Flagellum very short; first flagellar article longest, distolaterally with a long seta; second and third very small; second distolaterally with a long seta and 3 simple short setae; third without setae.

Mandibles (Fig. 3) asymmetrical, without palp. Pars incisiva of right mandible somewhat shorter and thicker than left, with 3 blunt teeth; right lacinia mobilis a little smaller than pars incisiva, with 3 teeth; pars molaris apically narrower, small, slightly concave grinding surface with indented margin; a row of long setae on proximal side, directed caudally. Pars incisiva of left mandible with 5 teeth; left lacinia mobilis longer than right one, with 2 small and 2 large teeth; pars molaris stout angular, broad and slightly concave grinding surface with indented margin, which is less marked than on right mandible (Fig. 3).

Medial endite of maxillula (Fig. 3) bearing 3 strong apically setulated and medially directed bristles, the lateral one somewhat smaller, beside it ventrally a small seta; lateral endite larger, with 11 strong, sparsely indented and medially curved spines.

Maxilla of 3 endites (Fig. 3); medial endite broader, apically with 12 setulated setae in two rows; 6 setae of dorsal row thick and spine-like, the other thin and sparsely setulated; middle endite apically with 2 and lateral endite with 3 setulated long setae, which usually are finely serrated on distal third, lateral setae are always longer than medial ones and all setae are curved medially.

On mediodorsal and apical margin of endite of maxilliped (Fig. 3) with 15 short, spine-like and densely setulated setae, of which mediodorsal ones are longer than distal ones; no coupling hook. Epipod oval, surpassing first palpal article; distolateral margin with some short setae, medial margin with fine hair-like setae as on whole surface of epipod. Palp of 5 articles, with dense brushes of setae bearing fine setules, at tip split in two; third article longest and broadest, last smallest.

Pereopod 1 (Fig. 1 & 3) small. All articles, except basis, densely setose on medioventral margin with two types of setae; one long, thin and apically split type, which is mostly located on dactylus, ischium and basis; the other generally shorter, broader and distally on two sides finely serated; dactylus comparatively large, distally broadend, without claw; propodus long-oval, on the medial side of propodus a row of few densely setulated bristles, the more distal ones smaller; carpus triangular; merus trapezoidal; ischium medioventrally with many setae; basis longer than ischium and merus together, distally with some simple setae; all articles more of less of similar thickness.

Pereopods 2-3 (Fig. 4) rather similar, all articles except dactylus medioventrally with two longitudinal rows of groups of long setae (filter-setae), between these rows a row of single short setae; dactylus of

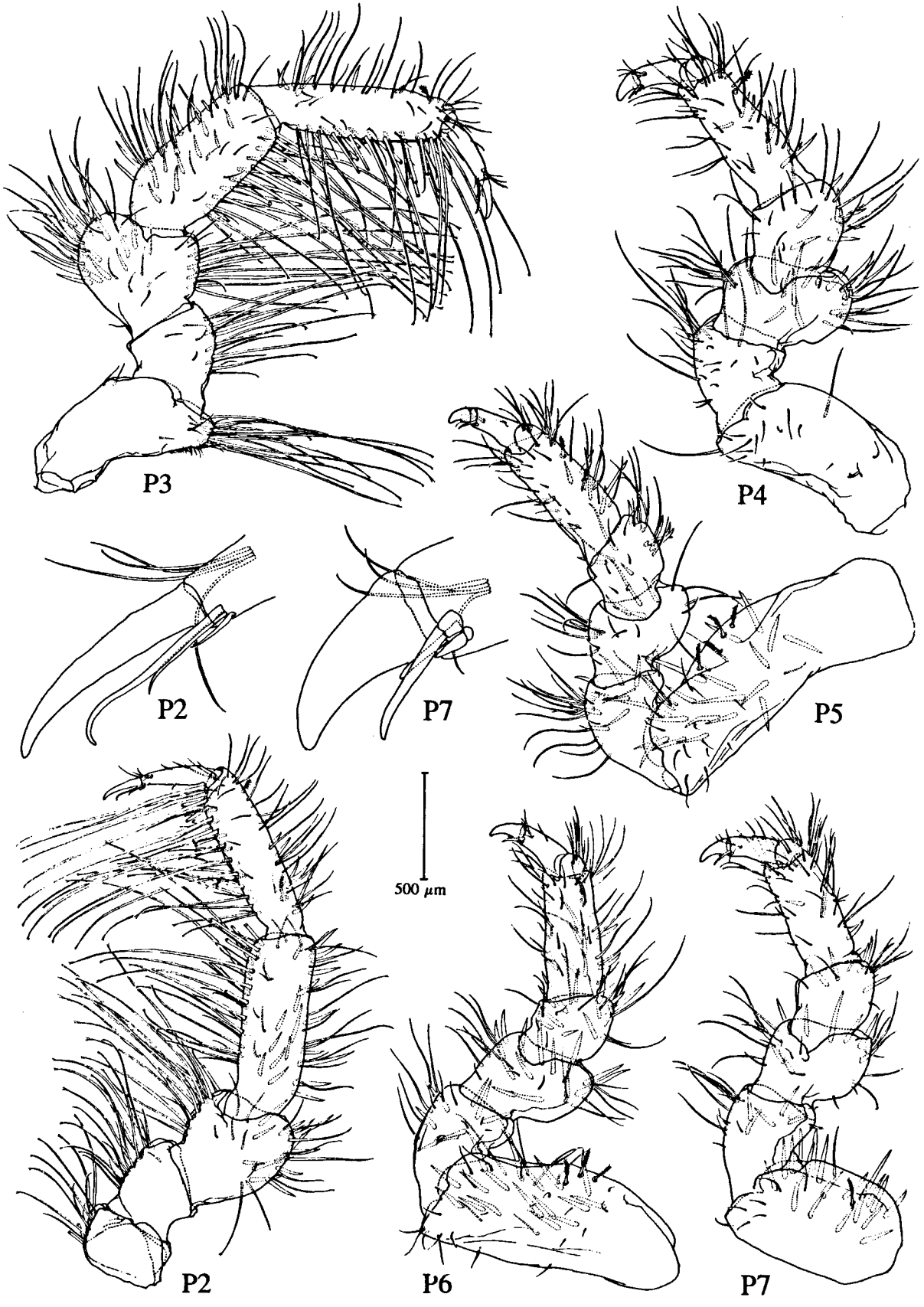

Fig. 4. *Xenarcturus spinulosus* Sheppard, 1957, female, 7.2 mm;P2-7

pereopods 2-3 small, with an apical, spine-like and a small subapical seta-like claw, between them a long and a short seta; propodus and carpus of pereopod 2 of similar length, carpus of pereopod 3 shorter and thicker than propodus, both articles dorsally with a little short seta; merus trapezoidal, dorsally on distal margin with simple setae; propodus, carpus and merus dorsomedially with many short spines; small ischium without dorsal setae; basis a little shorter than ischium and merus together, ventrodistally with a tuft of long setae (filter-setae).

Pereopods 4-7 (Fig. 4) rather similar in shape and somewhat shorter than pereopods 2-3; dactylus with a larger apical and a very short subapical spine-like claw, between them 2 simple small setae; except basis articles of pereopods 4-7 of comparable size, basis of pereopod 5 longest and that of pereopod 7 shortest; the difference of entire length of appandages is due to the varying size of the basis; all articles except dactylus dorsomedially with many short spines; propodus, carpus and merus, dorsally and ventrally with relatively short setae, ischium only ventrally; basis of pereopods 5-7 dorsally with feather-like bristles.

Protopod of female pleopod 1 (Fig. 2) twice as long as and half as broad as that of pleopod 2, medially with 4 coupling hooks; exopod a little longer than endopod; both rami only apically with long swimming setae. Protopod of pleopod 2 medially also with 4 coupling hooks; exopod margin with long swimming setae, on endopod only apically.

Uropod (Fig. 2) biramous; sympod with 2 long setae on distolateral margin surface with some long setae, directed medially; medially a row of short setae; lateral ramus apically with a feather-like bristle on ventral side, on which laterally 5 setae; medial ramus small, with a large strong, distally on both sides finely serrated seta and a slender simple seta, surpassing lateral ramus.

DISCUSSION

The specimen from the Magellan Strait partially agrees with the original description of Sheppard (1957). On the specimen of *Xenarcturus spinulosus* from the Magellan Strait the following differences were noted, which Sheppard (1957) has not mentioned in her description. Coxal plates on pereonites 5-7 are not laterally extended, but marked by an incomplete suture, while those on the anterior pereonites are fused completely with tergites, without a deep suture (a shallow groove is visible). The antennule has two flagellar articles. The antenna is somewhat longer than the antennule, with regularly arranged long filter-setae on the ventral side of third, fourth and fifth segments; flagella with three short articles, first and second each tipped with a long seta. The marsupium surpasses the border between pereonite 7 and pleon, the anterior part of the ventral pleotelson is covered by the fourth pair of oostegites. All appendages, except mouthparts and pereopod 1, have many short spines on the surface.

Most arcturids present a sexual difference of body form: the male is usually narrower than the female. In the species, *Xenarcturus spinulosus*, there are two distinct morphological sexual differences: females and immature specimens have a fine and dense spinulation on tergites, while the body surface of the male is smooth. Furthermore the two pairs of lateral projections of the pleotelson of the male are elongated, ending in an acute point. Besides the syntypes originally studied by Sheppard show morphological variations within one population: of the two males, which were caught in the same locality, one is long and narrow, the other short and wide.

The flattened form of the body of *Xenarcturus,* also seen in *Pseudidothea* and *Holidotea,* must be considered a plesiomorphic feature (Wägele, 1989). Wägele (1989) proposed that the reduction of claws of pereopod 1 and the distal swollen end of the dactylus of *Xenarcturus* could be an autapomorphy. With that autapomorphy monophyly of the Xenarcturinae should be ascertained. The antenna has filter setae similar to those of pereopods 2 and 3 (see text). That character already appears at the basis of the family Arcturidae and was accepted as a synapomorphy for the Pseudidotheinae, Xenarcturinae and Arcturinae (Wägele, 1989). What is remarkable, is that in *Xenarcturus spinulosus* the filter-setae of the antenna are especially long, in comparison with other genera of Pseudidotheinae and Arcturinae. As Brusca (1984) and Wägele (1989) thought, the Xenarcturinae Sheppard, 1957 and Arcturinae Sars,

1819 could be distinguished from the other less derived arcturids by the presence of regular and densely arranged filter setae on merus, carpus and propodus of pereopods 2 and 3, and thus fall in a relation of adelphotaxa.

In Arcturinae, filter setae appear also on pereopod 4. Interestingly in *Xenarcturus* the pereopod 4 is directed frontally, though it has a similar shape as pereopods 5-7. As yet there exist no observations of living *Xenarcturus* specimens. Such an observation should help us to understand the function of morphology of the appendages and to describe evolution of arcturids.

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