

# Studies on Antarctic Crustacea Isopoda

## 1. Anthuridea from the Weddell Sea

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**Summary.** The following Isopoda Anthuridea were collected in the Weddell Sea during the expedition of *RV Polarstern* in the season 1982/83: *Eisothistos antarcticus* Vanhöffen, *Accalathura gigantissima* Kussakin, *Paranthura antarctica* Kussakin and *Leptanthura glacialis* Hodgson. Redescriptions of these species are presented together with a list of the Anthuridea hitherto recorded south of the Antarctic Convergence.

**Zusammenfassung.** Während der Expedition von *FS Polarstern* wurden in der Saison 1982/83 die folgenden Isopoda Anthuridea in der Weddellsee gesammelt: *Eisothistos antarcticus* Vanhöffen, *Accalathura gigantissima* Kussakin, *Paranthura antarctica* Kussakin und *Leptanthura glacialis* Hodgson. Nachbeschreibungen aller Arten und eine Zusammenstellung aller bisher südlich der

Antarktischen Konvergenz gefundenen Anthuridea werden vorgestellt.

### Introduction

During the first expedition of *Polarstern* (season 1982/83) a large number of isopods was collected in the Weddell Sea. We expect to expand this collection during future expeditions, but believe that most of the larger and more abundant species are already represented.

In the following paper the morphology of the Anthuridea is described. These descriptions will serve as a basis for future studies of functional morphology, taxonomy and zoogeography. The species of Anthuridea found south of the Antarctic Convergence (50–60°S) are presented in Table 1.

**Table 1.** List of Antarctic Isopoda Anthuridea

Name	Distribution		Author(s)
Family Hyssuridae			
<i>Eisothistos antarcticus</i> Vanhöffen	66°2'9"S	89°38'5"E	Vanhöffen 1914
	67°S	142°36'E	Hale 1937
	76°45'S	31°59'W	present study
	77°5'S	164°17'E	Tattersall 1920
Family Anthuridae			
<i>Malacanthura antarctica</i> Kensley	74°S–76°49'S	Weddell Sea: 54–58°W	Kensley 1982
Family Paranthuridae			
<i>Accalathura gigantissima</i> Kussakin	64°32'S–75°39'S	circumantarctic	Poore 1981 and present paper
<i>Austranthura elegans</i> Kussakin	53°7'5"S	71°46'11"E	Kussakin 1967
<i>Leptanthura antarctica</i> Kussakin	65°29'S	91°21'E	Kussakin 1967
<i>Leptanthura glacialis</i> Hodgson	7°9'S(?)–76°45'S	circumantarctic, Argentina Basin	among others: Hodgson 1910; Kussakin 1967; Kensley 1982; present paper
<i>Paranthura antarctica</i> Kussakin	69°55'S	12°50'E	Kussakin 1967
	70°30'S	8°7'E	present paper

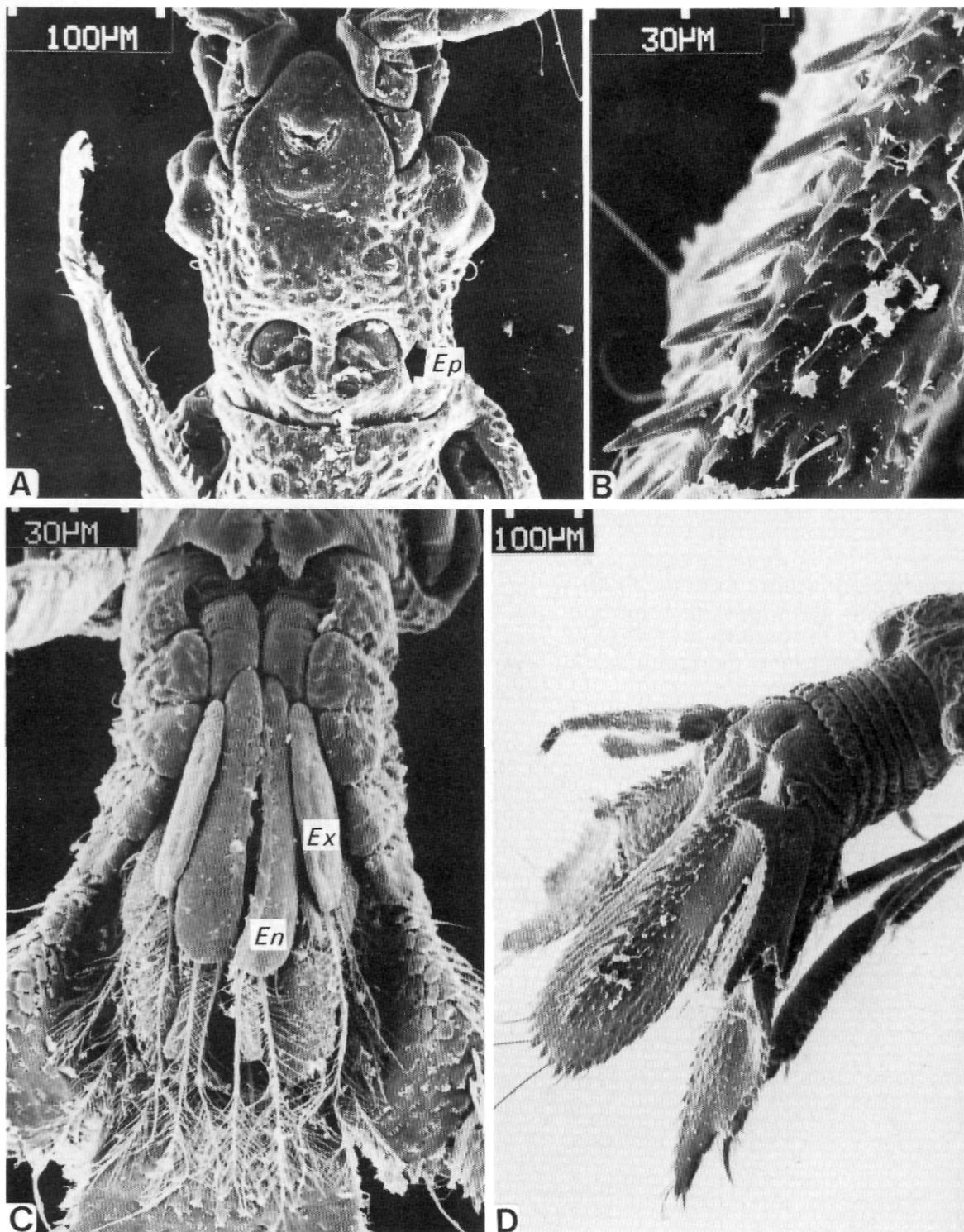


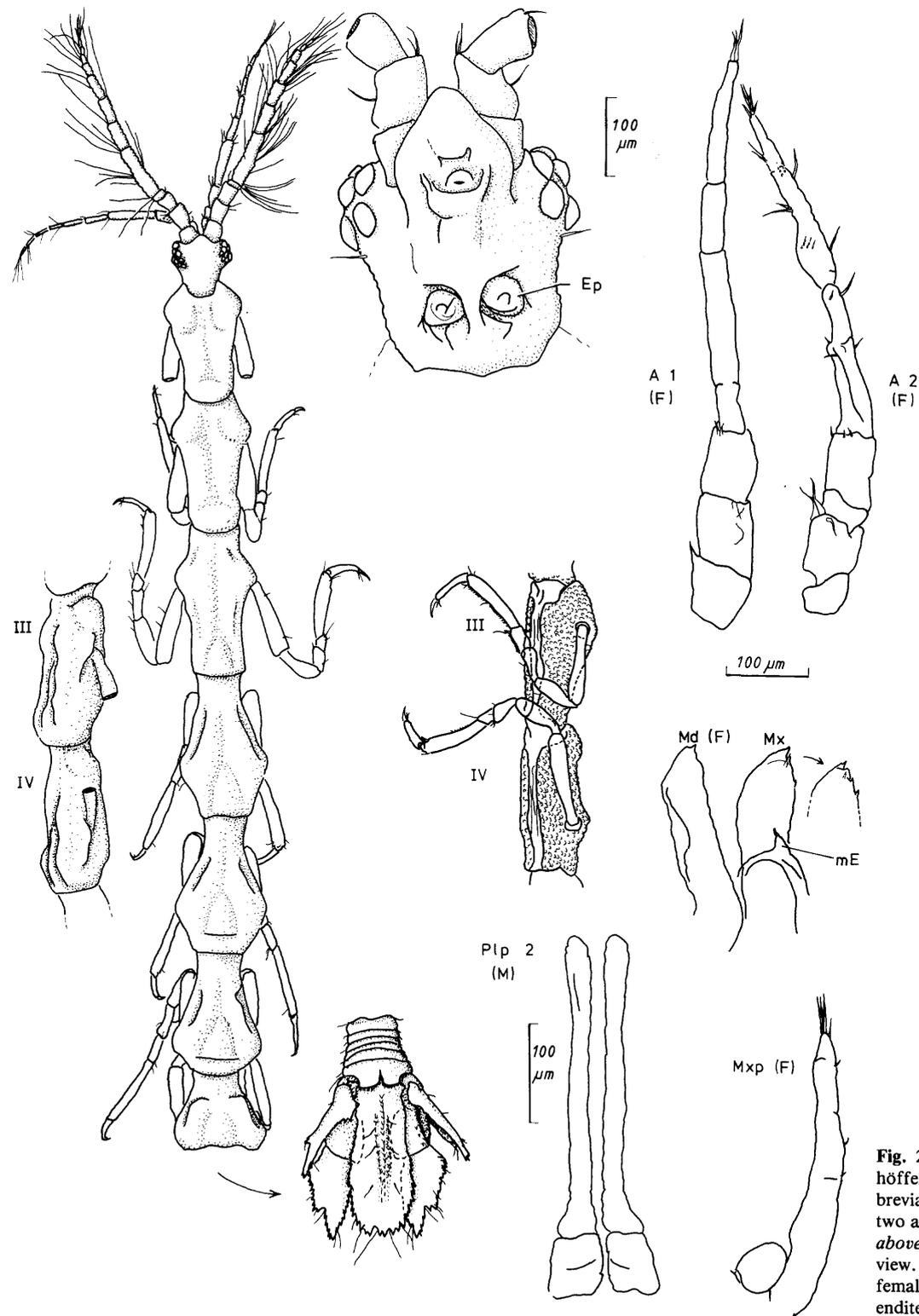
Fig. 1 A–D. Male *Eisothisτος antarcticus* Vanhöffen, SEM-pictures. A Cephalothorax in ventral view. Note complete reduction of mouthparts; *Ep* = epipodite of Mxp. B Detail of dorsal surface of telson: keel with acute spines. C Pleon and tail fan in ventral view. Note structure of Plp 1: endopod (*En*) larger than exopod (*Ex*), incompletely covering remaining pleopods. D Tail fan in dorsolateral view

*Abbreviations used in text and figures:*

A 1,2 = antenna 1,2; Md = mandible; MdP = mandibular palp; Mx = maxilla 1; Mxp = maxilliped; P 1–7 = pereopods 1–7; Plp 1–5 = pleopods 1–5; Tel = telson; UEn = endopod of uropod (in figures together with sympod); UEx = exopod of uropod

### Materials and Methods

Samples of benthos were collected by means of an Agassiztrawl with an aperture of  $3 \times 1$  m and a mesh of 3 cm (Drescher et al. 1983). Larger specimens were decanted through a 1 mm-sieve, sorted out with a dis-



**Fig. 2.** *Eisothistos antarcticus* Vanhöffen. For symbols see list of abbreviations. Dorsum of male, with two aspects of pereonites III and IV; above: male cephalothorax in ventral view. *Ep* = epipodite of *Mxp*, (*F*) = female, (*M*) = male, *mE* = medial endite of *Mx*

secting microscope, fixed in formalin (4%) and preserved in alcohol (70%).

The SEM-pictures were taken with a Cambridge Stereoscan 180. Drawings were prepared with the help of a camera lucida.

#### Systematics

Family Hyssuridae Wägele

*Eisothistos antarcticus* Vanhöffen 1914 (Figs. 1–6)

The following redescription is based on only a few specimens, most of them males. Breeding females and juveniles are lacking in the collection, probably because of the special mode of life (see below). Nevertheless, the present material is sufficient for a characterization of this hitherto poorly known species.

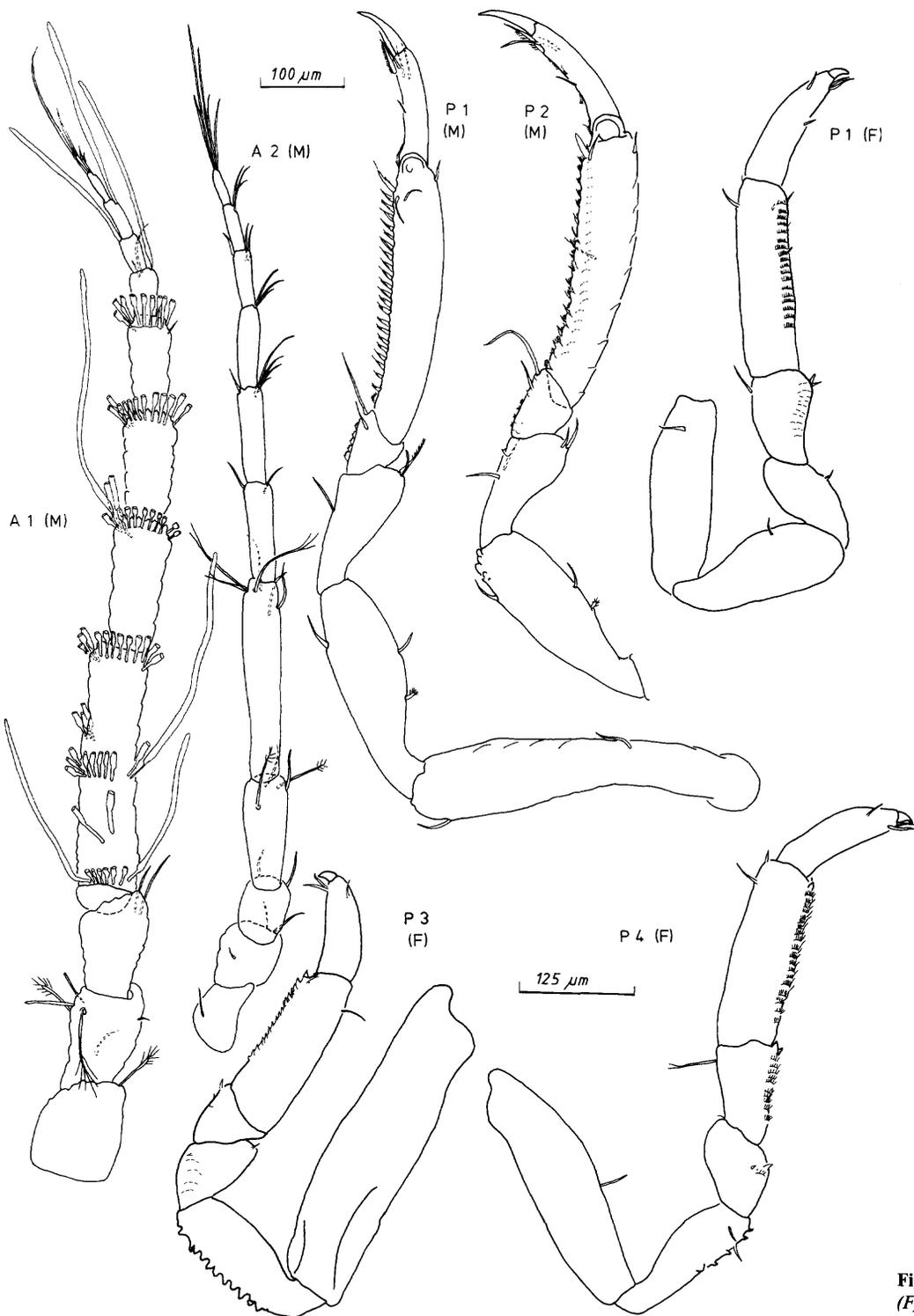


Fig. 3. *E. antarcticus* Vanhöffen. (F) = female, (M) = male

**Material:** 3 males, 4–5.5 mm; 1 female, 4.5 mm.

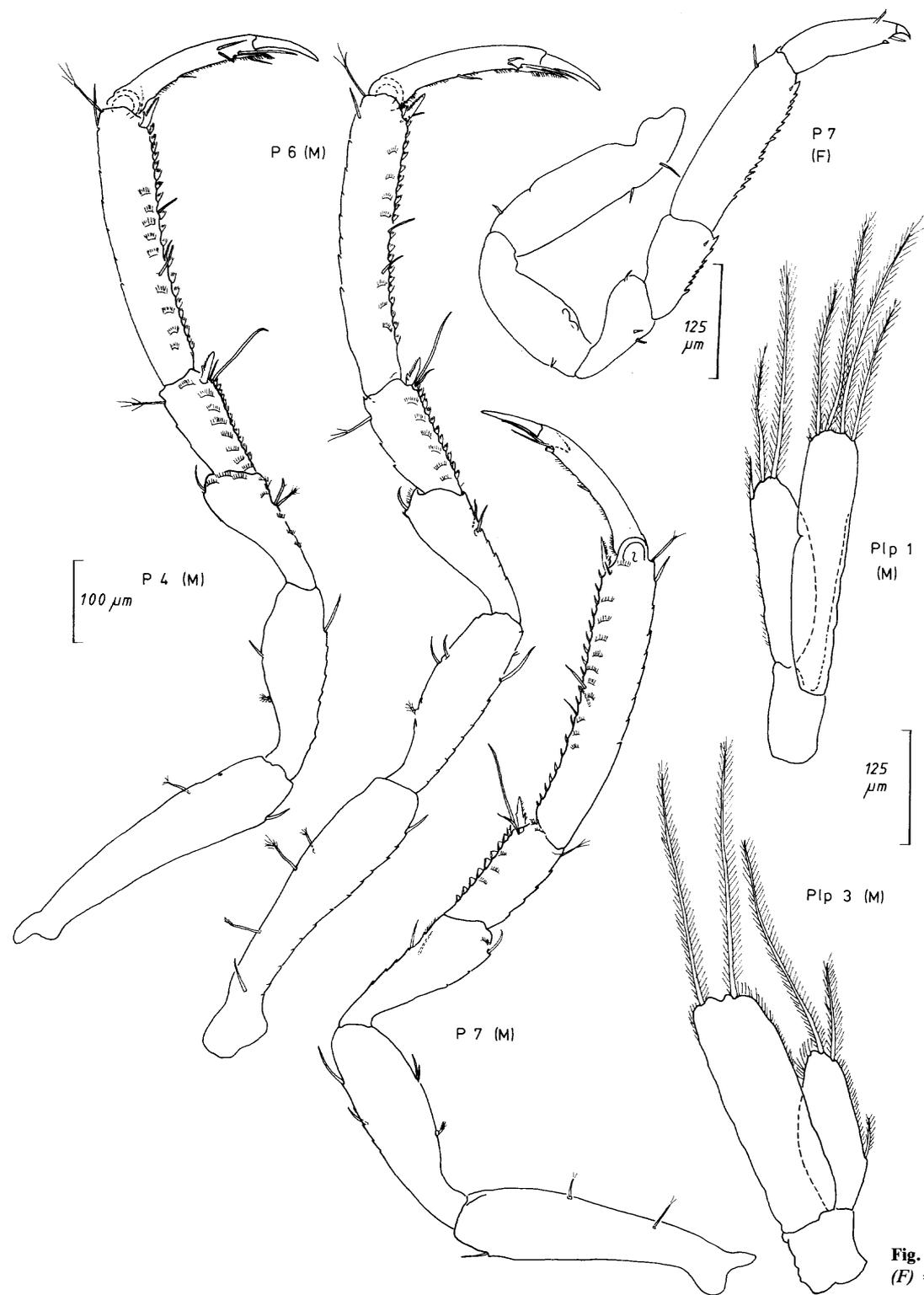
**Locality:** 76°45.6'S 31°59.8'W, depth 257 m.

**Type Material:** 1 female 4.2 mm (lectotype), 1 manca 1.2 mm; slides Nos. 520, 522–524 (Humboldt-Museum, Berlin, GDR); from the "Gauss"-station at 66°2'9"S 89°38'5"E, depth 385 m (Vanhöffen 1914).

**Distribution:** Also known from 77°5'S 164°17'E, depth 252 m (Tattersall 1920); 67°S 142°36'E, depth 46 m (Hale 1937).

#### *Description of the Male (5.5 mm)*

Body long and slender, pereonites broadened in the coxal region, surface covered with cuticular scales (Figs. 1 and 2). Cephalothorax shorter than pereonites, with large eyes composed of few ommatidia protruding laterally (Fig. 2). Relative length of pereonites: 1 < 2 < 3 = 4 = 5 > 6 > 7. Pleonites 1–5 not fused (Figs. 1D and 2), together shorter than pereonite 7. Pleonite 6 fused with telson, dorsal suture forming transversal step with dorsomedial cleft.



**Fig. 4.** *E. antarcticus* Vanhöffen. (F) = female, (M) = male

A1 with nine flagellar articles; first article very short; second article originating from fusion of two or three articles, bearing long aesthetascs arranged in three rings (Fig. 3); articles 3–5 with distal aesthetascs, articles 6–8 small, each with 1 aesthetasc; last (ninth) article with 4 setae.

A 2 consisting of very slender articles, flagellum with six scarcely setose articles; the longest is the last peduncular (fifth) article; last flagellar article with five simple setae. Mouthparts completely reduced (Figs. 1A and 2), only the maxillipedal epipods remain. Pereopods not

subchelate, with few setae. Basis and propodus of P 1 very long and slender, carpus short, of trapezoidal outline. Palm of propodus with 21 sensory spines (Fig. 3). Basis of P 2 shorter than in P 1, propodal palm with cuticular scales and only one distal spine. P 3 similar to P 2 (Fig. 3). P 4–7 similar, with rather long propodi that bear distally on the palm one spine and medially two to three simple setae; carpi rectangular, anterodistally one spine and two setae, posterodistally one plumose seta (Fig. 4).

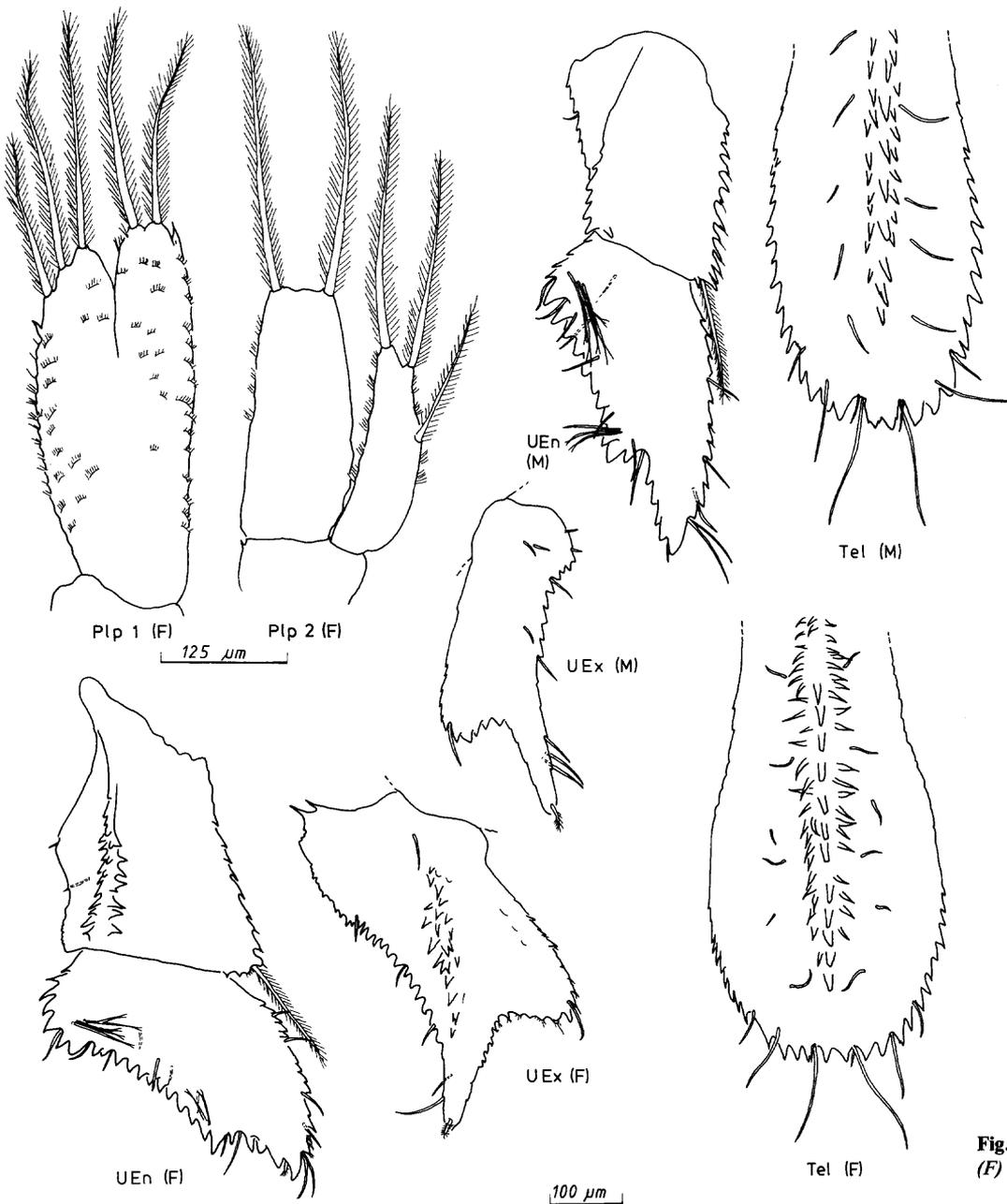


Fig. 5. *E. antarcticus* Vanhöffen. (F) = female, (M) = male

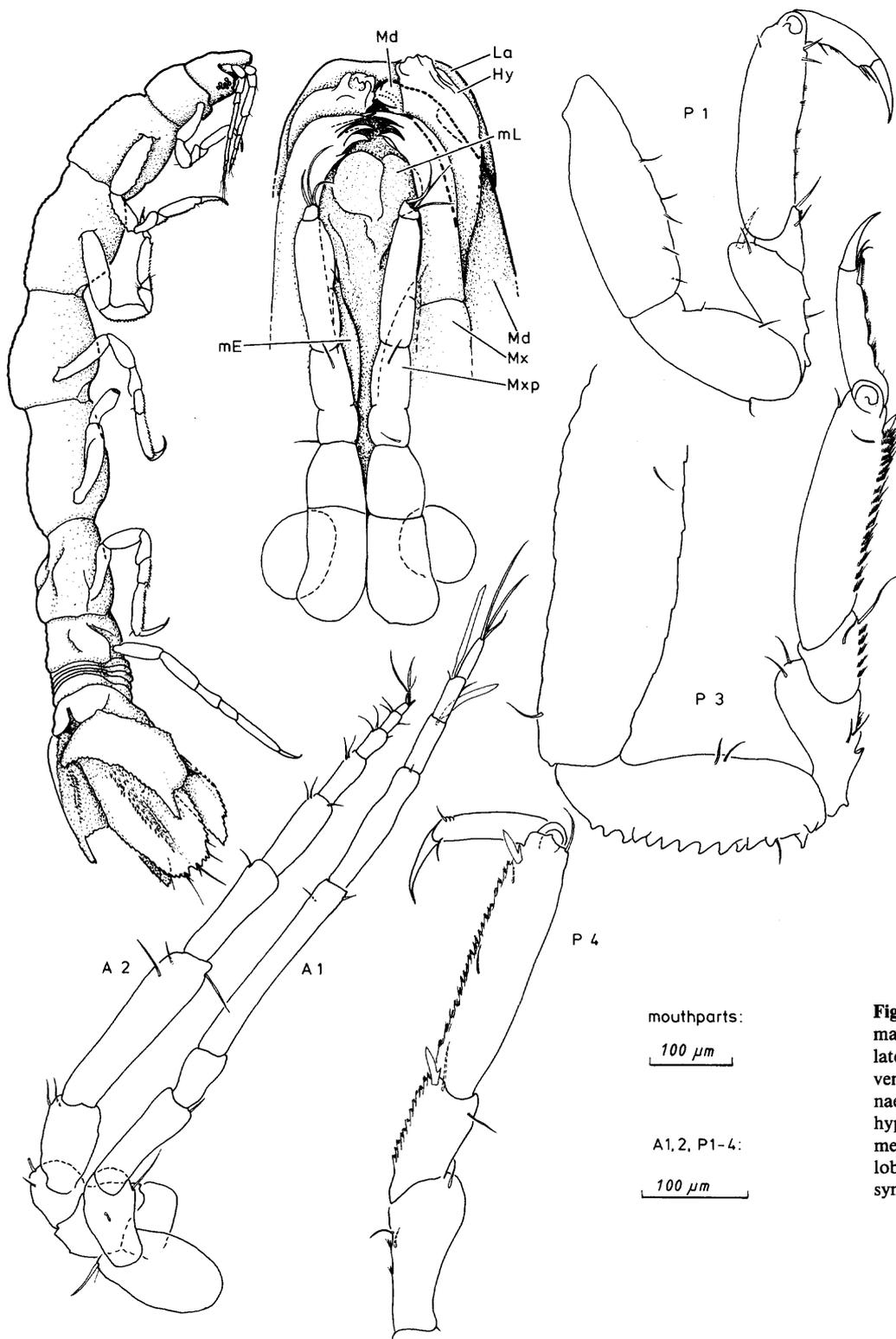
Plp 1 not operculiform, endopod longer than exopod, distal margin with three swimming setae, exopod with four swimming setae (Figs. 1A and 4). Plp 2 with only one branch, seemingly the appendix masculina of the endopod (Fig. 2). Plp 3 similar to Plp 1 but broader, exopod with two, endopod with three swimming setae. Tail-fan not so enlarged as in several other species of the genus. UEn longer than sympodite, scarcely surpassing telson (Fig. 1D), margin deeply serrated (outline: Fig. 5 UEn(M)). UEx with prolonged distal lobe, setation sparse (Fig. 5). Tel tongue-like, margin deeply serrated, distally one short and three long pairs of setae; dorsally with longitudinal keel of spines (Fig. 1D and 5) and few simple setae. Statocysts not present.

#### Description of the Female (4.5 mm)

This specimen is a mature, virgin female that had molted recently; the thin cuticle is damaged and did not allow a description of the pereonites. The specimen is not wearing the breeding dress (long setae on

some of the somites and on pereopods, worm-like elongated body) and still has the length of the immature adult. The worm-like breeding stage (see *E. macrurus*: Wägele 1979) still has to be discovered.

Body broader than in male. Antennae atrophic, segmentation obscure, setae very short (Fig. 2: A1, 2 (F)). Mouthparts atrophic, but not completely reduced. Md without palp, endite without differentiations. Lateral endite of Mx with tiny apical teeth; Mxp very slender, articles fused, apex with four short setae (Fig. 2). Articles of pereopods shorter and relatively broader than in male, carpus of P 1 larger than in male; basipod partly with small tubercles (P 1, P 3, P 4: Fig. 3; P 7: Fig. 4). Plp 1 operculiform, exo- and endopod fused; exopod with three, endopod with two swimming setae. Plp 2 two-branched, exopod smaller than endopod, with three distal swimming setae, endopod with two setae. UEn broader than in male, medial margin much shorter; UEx with shorter distal lobe. Tel widening distally, apex broadly rounded, marginal indentations smaller than in male. Statocysts are lacking.



**Fig. 6.** *E. antarcticus* Vanhöffen. Immature female (lectotype) in dorso-lateral view. Above mouthparts in ventral view. Several setae on antennae and pereopods are lost. *Hy* = hypopharynx, *La* = labrum, *mE* = medial endite of *Mx*, *mL* = medial lobe of hypopharynx. For other symbols see list of abbreviations

#### Description of the Lectotype (Fig. 6)

From Vanhöffen's type material the best preserved specimen was chosen as a lectotype. It is a non-breeding female of 4.2 mm length that differs from the foregoing specimen in the complete (not atrophic) state of mouthparts, antennae and pereopods. It is the feeding stage, that in the mediterranean species *E. macrurus* and *E. pumilus* use to assault serpulid worms (Wägele 1981). The strong cuticular teeth and scales on the pereopods are probably needed for the predatory actions.

Tail fan as in foregoing specimen, larger than in male. A 1 with six flagellar articles, second article remarkably long (about eight times longer than wide), articles four and five each with one aesthetasc, last article with three setae. A 2 with six flagellar articles. Mouthparts projecting frontally beyond insertion of antennae. Md without palp, endite long, medially curved, pars molaris reduced, lamina dentata with few (three?) teeth, pars incisiva strongly chitinized. Apex of Mx embedded between the distal lobes of Hy, with six acute apical teeth. Medial endite of Mx short, with two apical setae. Mxp with five articles, third

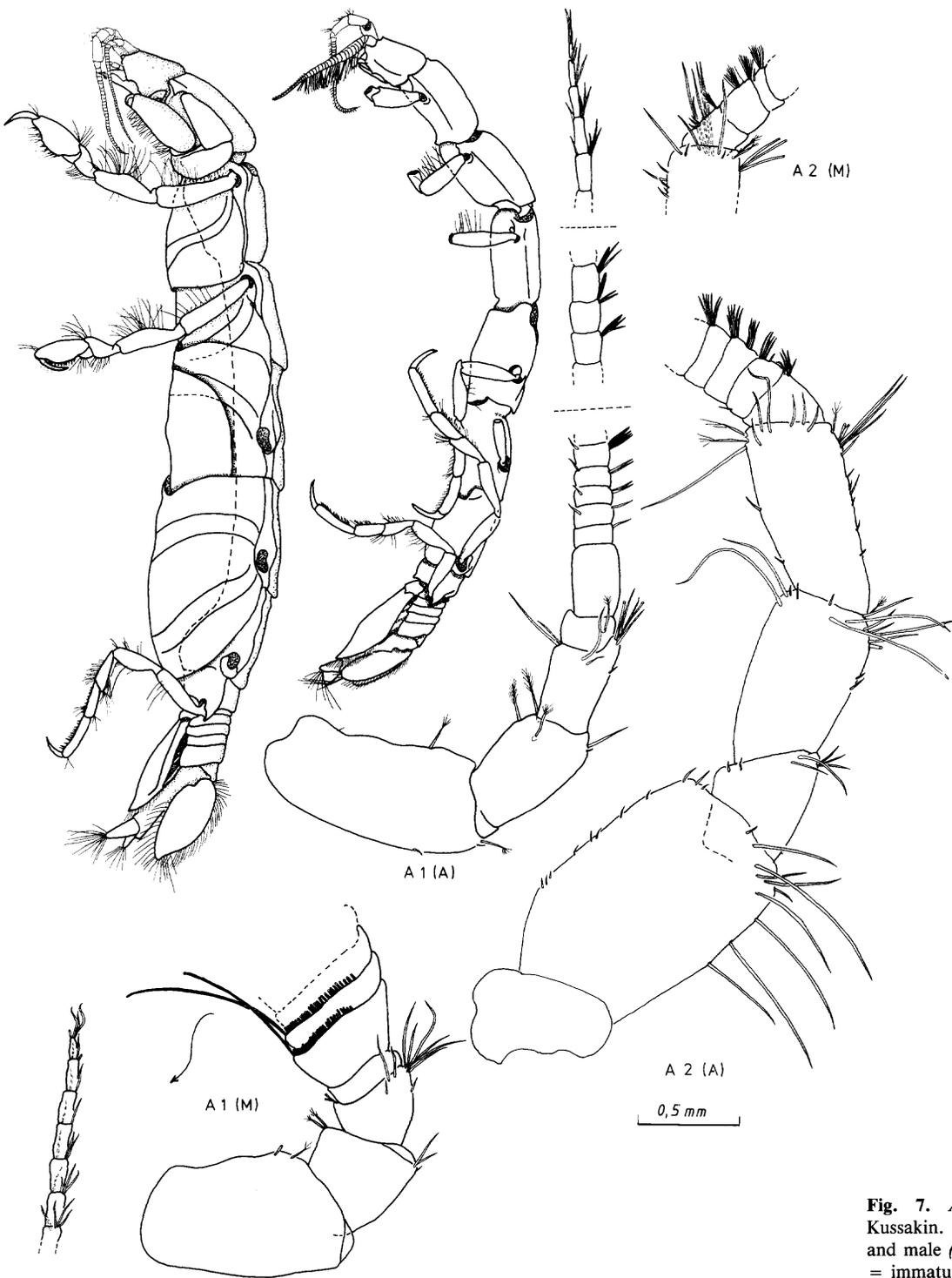


Fig. 7. *Accalathura gigantissima* Kussakin. Ovigerous female (left) and male (right) in lateral view. (A) = immature adult, (M) = male

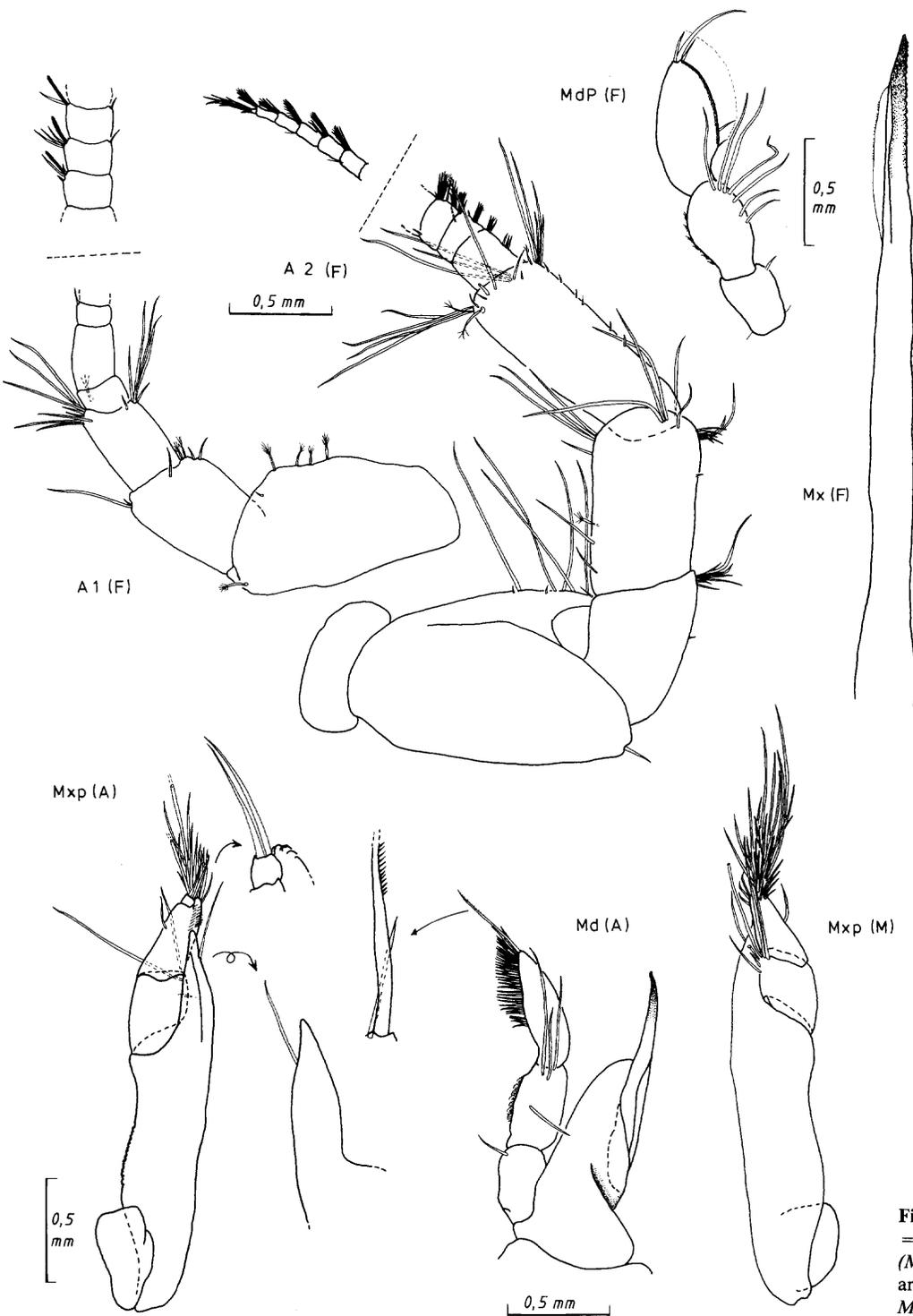
article with indication of a suture, last article bearing three setae. Pereopods not subchelate, carpus of P 1–3 triangular, carpus of P 4–7 long trapezoidal. Merus of P 1 and merus and ischium of P 2,3 with strong cuticular teeth on caudal margin. Cuticular scales scattered all over the body.

#### Comparison with Other Species

The present material from the Weddell Sea is similar to the Gauss-specimens described by Vanhöffen (1914). The drawings of Vanhöffen and those of Hale (1937) are not precise enough for a clear identification,

but the study of the lectotype revealed that the structure of the tail fan is the same.

Mature males of this genus are only known from *E. crateris* Kensley 1976 and *E. macrurus* Wägele 1979. Of *E. pumilus* only a pre-male stage has been described (Wägele 1979), the "male" of *E. vermiformis* Haswell 1884 probably is a breeding worm-like female. The complete reduction of the male mouthparts is also typical for *E. macrurus*, the mouthparts of *E. crateris* have not been described. The remarkable sexual dimorphism of Plp 1 and Plp 2 has not been noted before, the male pleopods of *E. macrurus* are not known (damaged specimen), in



**Fig. 8.** *A. gigantissima* Kussakin. (A) = immature adult, (F) = female, (M) = male. Only part of flagellar articles of antennae shown; setae of MdP partly cut off

*E. crateris* the male Plp 2 is two-branched as in other anthurids. Long propodi are also known from the male of *E. macrurus*, the pereopods of *E. crateris* are broader. A typical feature of *E. antarcticus* is the outline of the tail fan. Many species have a broader or distally truncate telson (*E. bataviae*, *E. crateris*, *E. macrurus*, *E. vermiformis*); dorsal spines are lacking on the telson of most of the other species, in *E. pumilus* the tail fan is shorter than the pleon. *E. atlanticus* Vanhöffen 1914 badly needs redescription.

#### Remarks

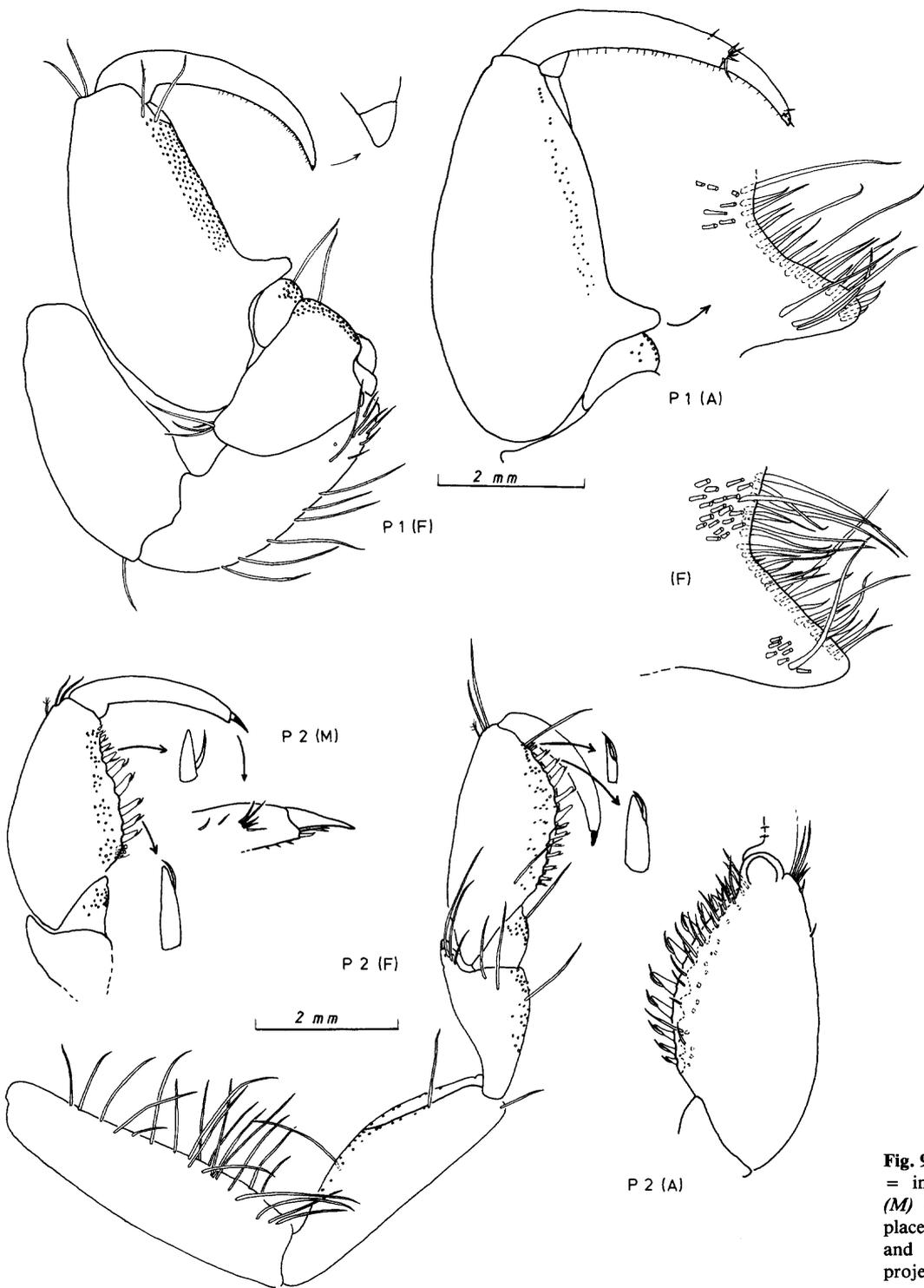
*E. antarcticus* clearly has the sexual dimorphism which is typical for this genus, the special pleopods of the male and the different degree of

reduction of the mouthparts in both sexes are conspicuous. It is to be expected that the biology of *E. antarcticus* is essentially similar to that of *E. macrurus* or *E. pumilus* (Wägele 1981), i.e. the immature specimens as well as the breeding females will be found in tubes of serpulid worms. This explains why these stages are lacking in the present material.

Family Paranthuridae Menzies and Glynn

*Accalathura gigantissima* Kussakin 1967 (Figs. 7–11)

Besides *Calathura brachiata*, this is the largest species of the suborder Anthuridea. Despite the vast distribution and eminent size, the morphology of *A. gigantissima* is incompletely known. In the following only adult specimens will be compared.



**Fig. 9.** *A. gigantissima* Kussakin. (A) = immature adult, (F) = female, (M) = male. Of several setae only place of insertion is shown. P 1 (A) and (F) showing details of basal projection of propodal palm

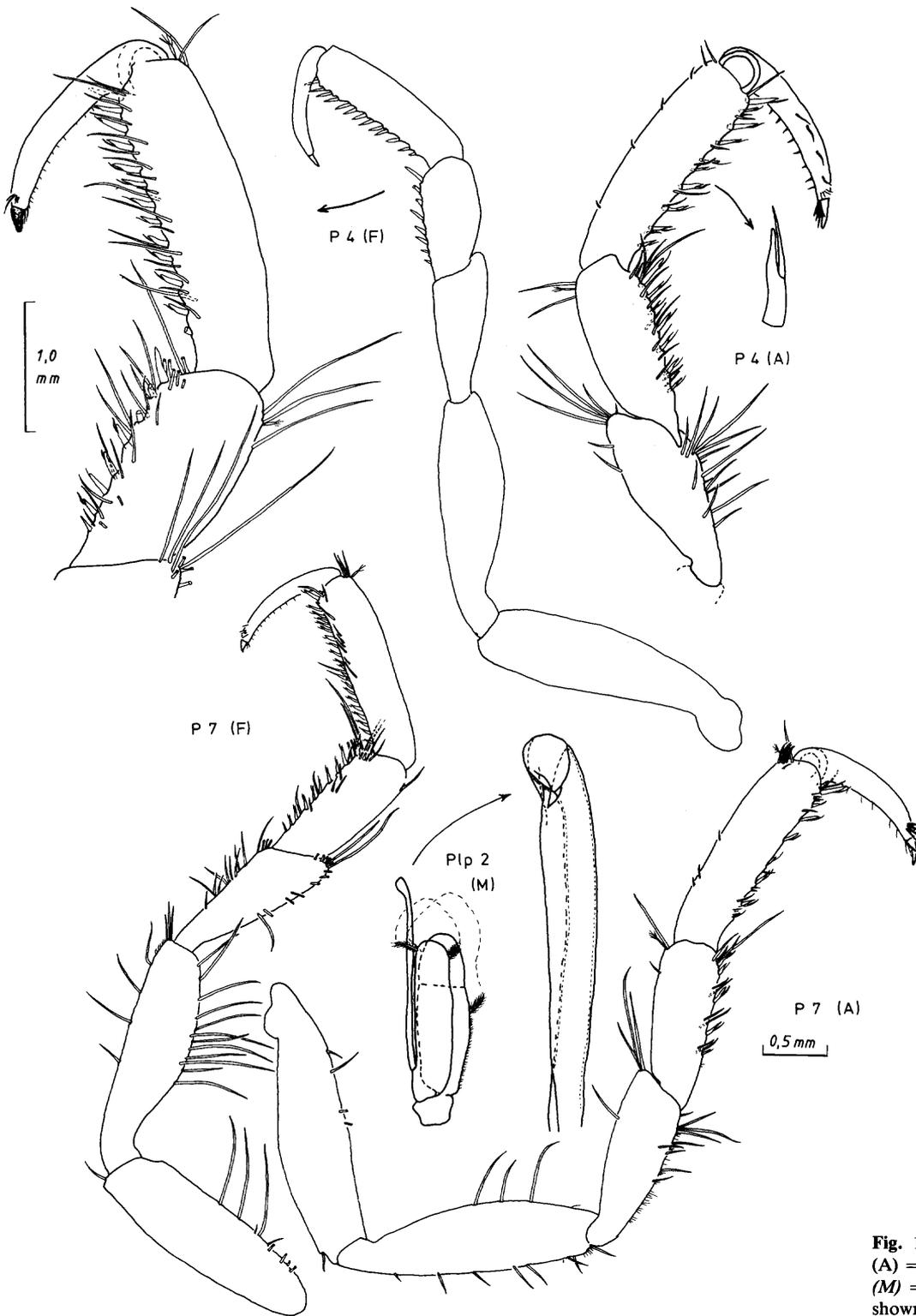
**Material and Localities:** All samples were collected in the Weddell Sea; length measured without antennae. Immature adults 27 mm, 52 mm, male 43 mm, female 47 mm, 70°26.9'S 8°39.8'W, depth 346 m; immature adults 49 mm, 51 mm, 52 mm, females 45 mm, 46 mm, 70°30'S 7°54'W, depth 249 m; immature adult 24 mm, 70°29.8'S 8°7.4'W, depth 257 m; immature adult 44 mm, 71°27.9'S 13°12.8'W, depth 239 m; immature adults 37 mm, 47 mm, female 39 mm, 72°25.4'S 16°26.6'W, depth 220 m; female 43 mm, 72°54.8'S 19°39.9'W, depth 429 m; immature adult 41 mm, female 47 mm, 72°9.9'S 15°8.6'W, depth 227 m; immature adults 37 mm, 40 mm, 75°38.9'S 27°20.9'W, depth 289 m.

**Distribution:** also known from off Lars-Christensen Coast, off George V Land, off Adelie Land, off Shackleton Ice Shelf, off Mawson Coast; depth 123–655 m (Poore 1981).

**Description of the Oviparous Female (47 mm)**

Cuticle thick, cream-coloured; lateral white eye-spots shining through cuticle of cephalothorax in living specimens. Pleonites 1–5 free, pleonite 6 fused with telson. Oostegites on pereonites 2, 3, 4, 5.

Flagellum of A 1 with 37 articles; first article short, with one plumose bristle; articles 4–18 and 20–30 each with one aesthetasc and

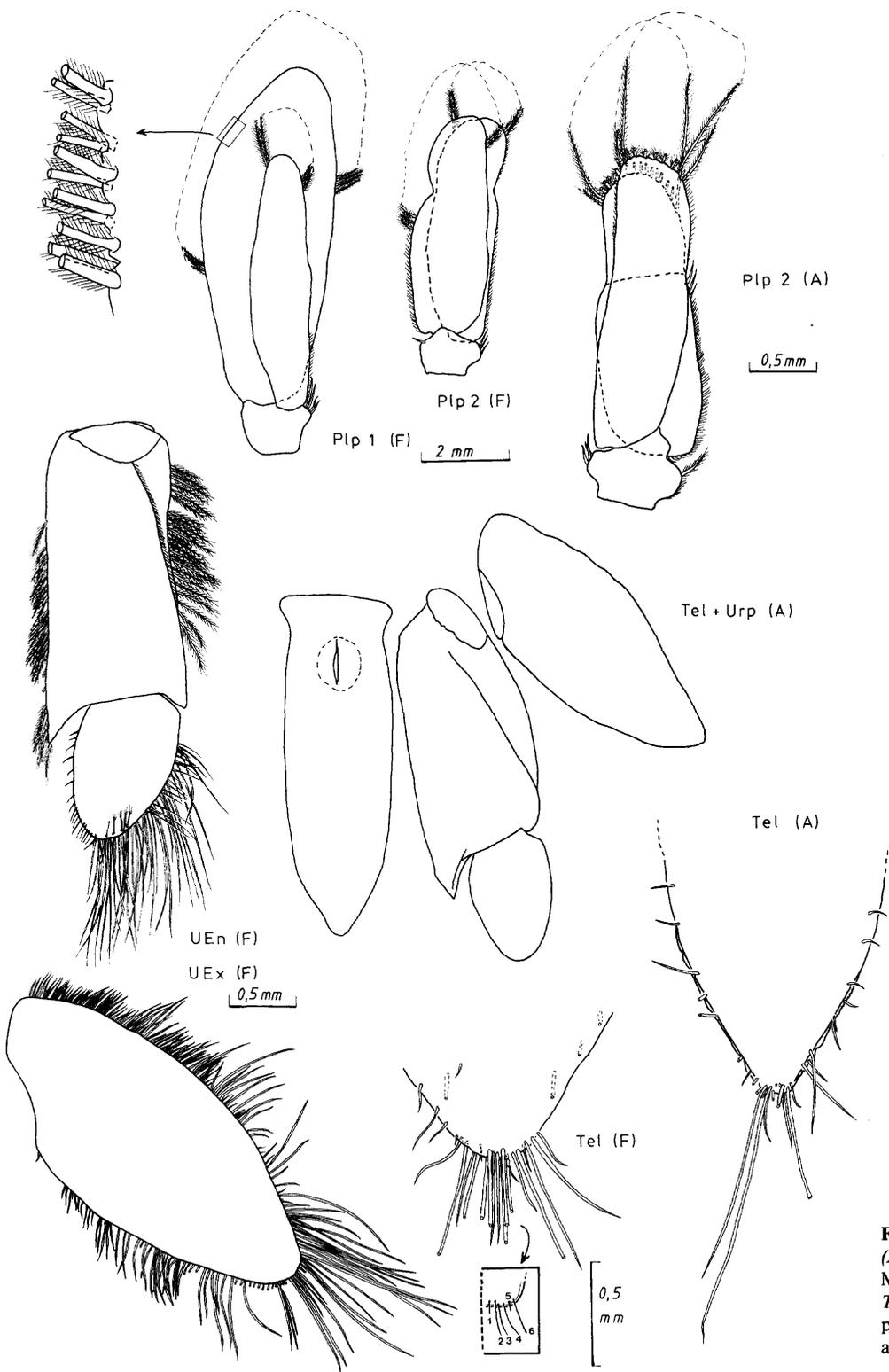


**Fig. 10.** *A. gigantissima* Kussakin. (A) = immature adult, (F) = female, (M) = male. Most setae of *Plp 2* not shown

few setae (detail in Fig. 8); two aesthetascs on articles 7, 18; last article with four setae. A 2 with several long setae on peduncular articles 2, 4 and 5 (Fig. 8), flagellum with 38 articles; flagellar articles with distal bunches of short setae, about 15 setae on central articles, distal articles with 9–11 setae, last article with six setae. Md without pars molaris, pars incisiva spiniform, with darkened apex; palp 3-jointed, second article with row of seven long setae, last article extended, lateral margin with row of 61 short setae and distally one longer seta. Mx stiletto-like

(Fig. 8). Mxp with slender basipod and acute endite that reaches beyond the center of the second palpal article; palp with two large articles; first article with six, second with about 25 apical setae and on its ventral side a further, tiny third article with two setae (as in Fig. 8, Mxp(A)).

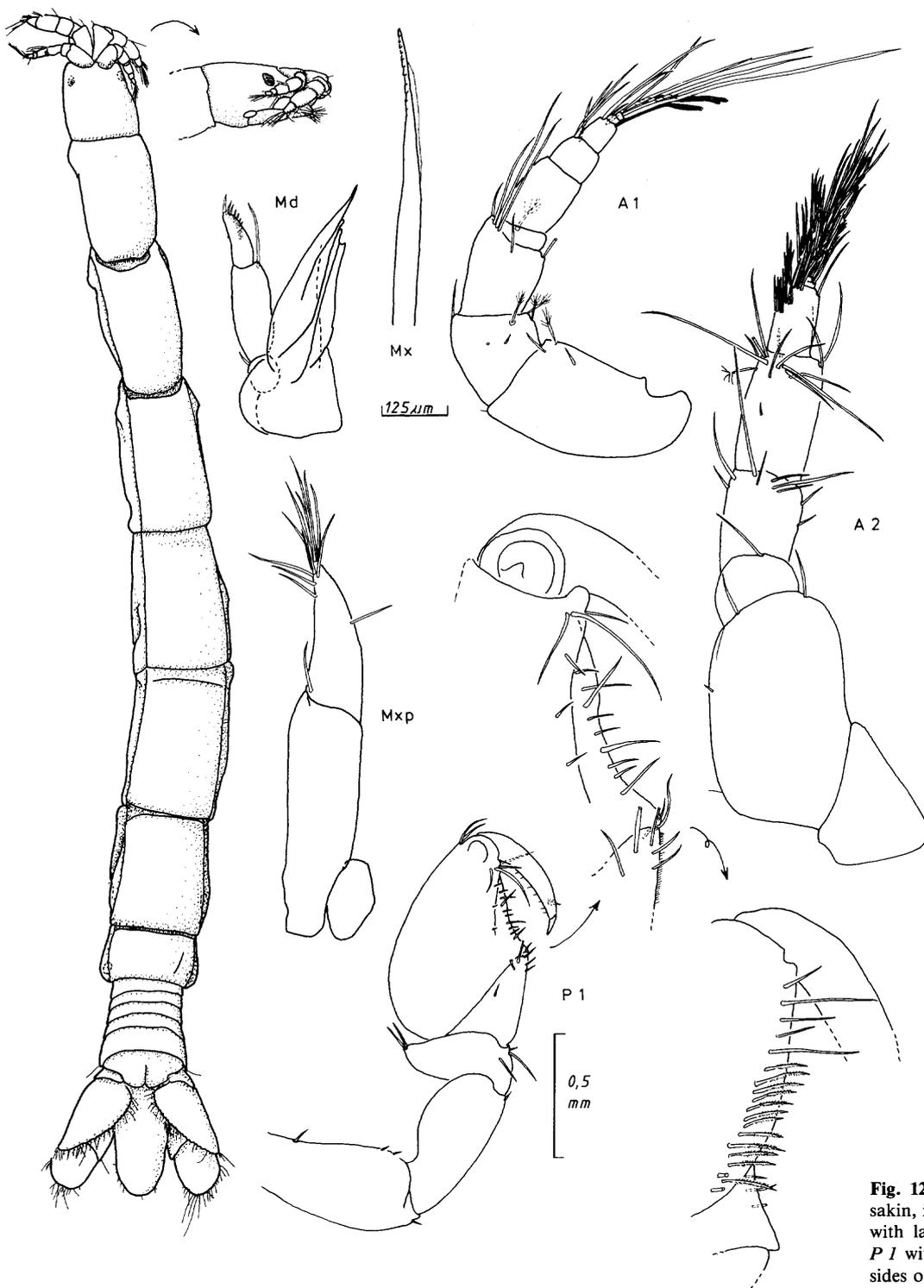
P 1 with stout, subchelate propodus, surface near palm densely setose, palm almost straight, with basal projection (detail in Fig. 9); claw very short, carpus small. Subchela of P 2 smaller, all articles ex-



**Fig. 11.** *A. gigantissima* Kussakin. (A) = immature adult, (F) = female. Most setae of pleopods not shown, *Tel + Urp* = outline of tail fan parts; *Tel (F)* = detail of telsonic apex with scheme of distal setation

cept dactylus bearing long setae (Fig. 9), propodal palm convex, with 14 sensory spines, the two distal ones rather small; carpus triangular, claw short, P 3 similar to P 2. P 4–7 with long, cylindrical articles, carpus nearly as long as merus. Frontal border of carpus and propodus with row of sensory spines besides some smaller simple setae; number of spines on carpus/propodus in P 4: 8/13; P 5: 11/16; P 6: 11/21; P 7: 10/21 (Fig. 10).

Plp 1 with operculiform exopod, fringed with over 250 swimming setae; endopod only half as wide and shorter than exopod, with 21 swimming setae. Exopod of Plp 2 with 61, endopod with 19 swimming setae. Uropods not surpassing telson; sympod clearly broader and twice as long as endopod; endopod oval, with large number of marginal setae. UEx of oval outline (Fig. 11), margin with large number of setae, most of the shorter setae being pinnate. Tel three times



**Fig. 12.** *Paranthura antarctica* Kuskakin, immature adult. Dorsum (left) with lateral view of cephalothorax; *P 1* with details of setation on both sides of propodus

longer than wide, tapering to rounded apex, with several pairs of distal setae (Fig. 11). One large basal telsonic statocyst present.

#### *Description of the Male (43 mm)*

This specimen corresponds on the whole with the foregoing one, the body is more slender. *A 1* with larger number of antennal articles (43), basal articles swollen; articles 2–26 each with apical row of aesthetascs; the more distal articles with few short setae, articles 27, 28, 34, 36

each with one aesthetasc, last article bearing four setae (Fig. 7). *A 2* with 46 flagellar articles, setation similar to female (Fig. 7: *A 2* (M)). Mouthparts and pereopods as in female.

*P 1* damaged. Propodal palm of *P 2/P 3* less convex in comparison with female (Fig. 9), with 13 spines. *P 4–7* similar; number of spines on carpus/propodus: *P 4*: 8/13; *P 5*: 8/12; *P 6*: 9/16; *P 7*: 9–10/13. *Plp 1* as in female; appendix masculina of *Plp 2* long, surpassing both branches, apex rounded (detail Fig. 10); exopod with 51, endopod with 20 swimming setae.

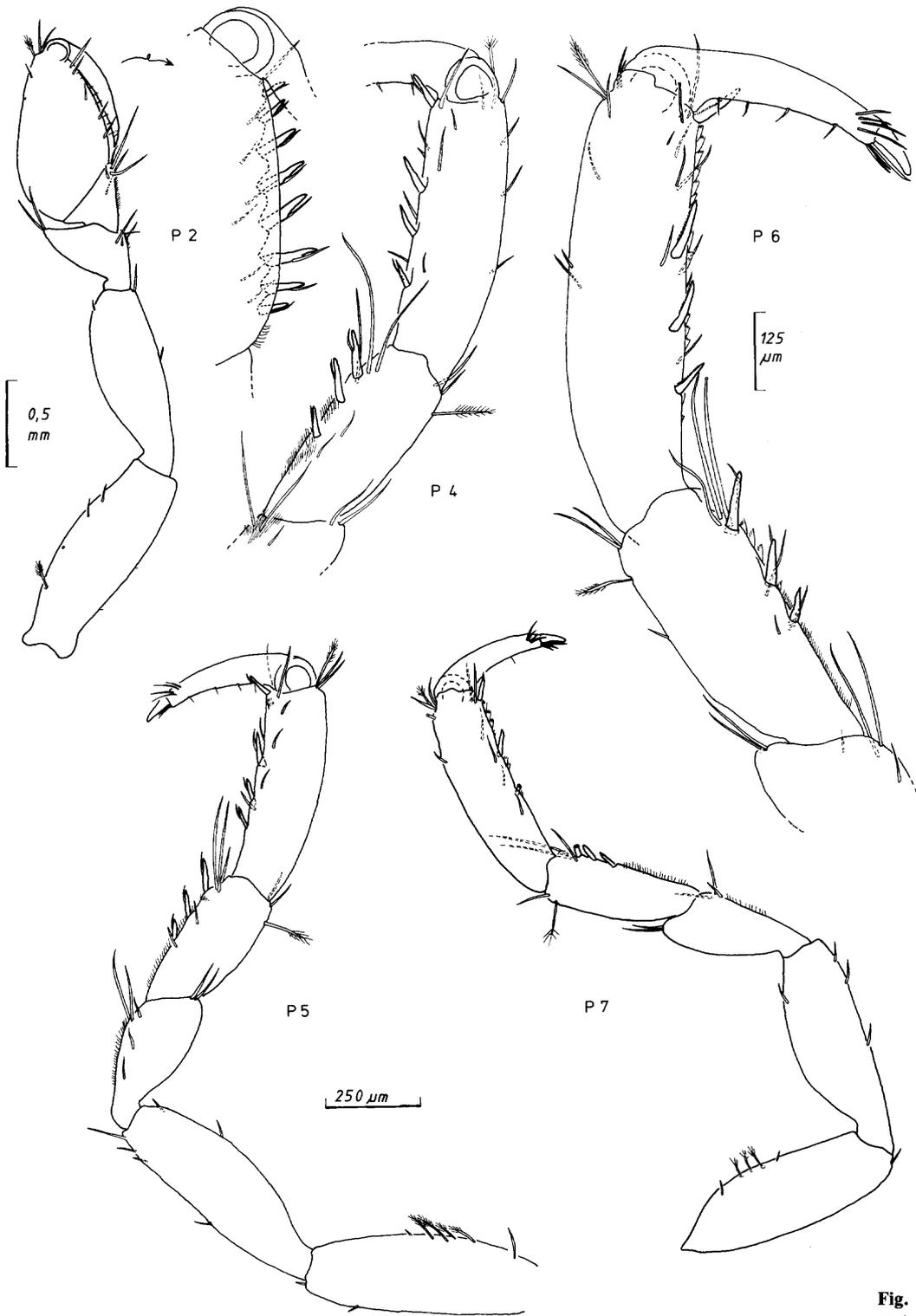


Fig. 13. *P. antarctica* Kussakin, immature adult

*Description of an Immature Adult (27 mm)*

The smaller specimens of course have less spines and setae; the contour of the extremities is similar to the female.

A 1 with 27 flagellar articles; articles 6–20 each with one aesthetasc (Fig. 7: A 1(A)). Flagellum of A 2 with 33 articles. Propodi of P 1–3 somewhat broader than in female, P 2/3 with 11–12 spines on palm. Number of sensory spines on carpus propodus of P 4–7: P 4: 7/10;

P 5: 8/12; P 6: 9/13; P 7: 5/8. Exopod of pleopods with much less setae: exopod of Plp 1 with about 99, endopod with seven swimming setae; exopod of Plp 2 with 19, endopod with 10 swimming setae. Tail fan as in Fig. 11.

*Remarks*

The genus *Accalathura* has, as shown above in *A. gigantissima*, three palpal articles on the Mxp, a number also present in the northern gigan-

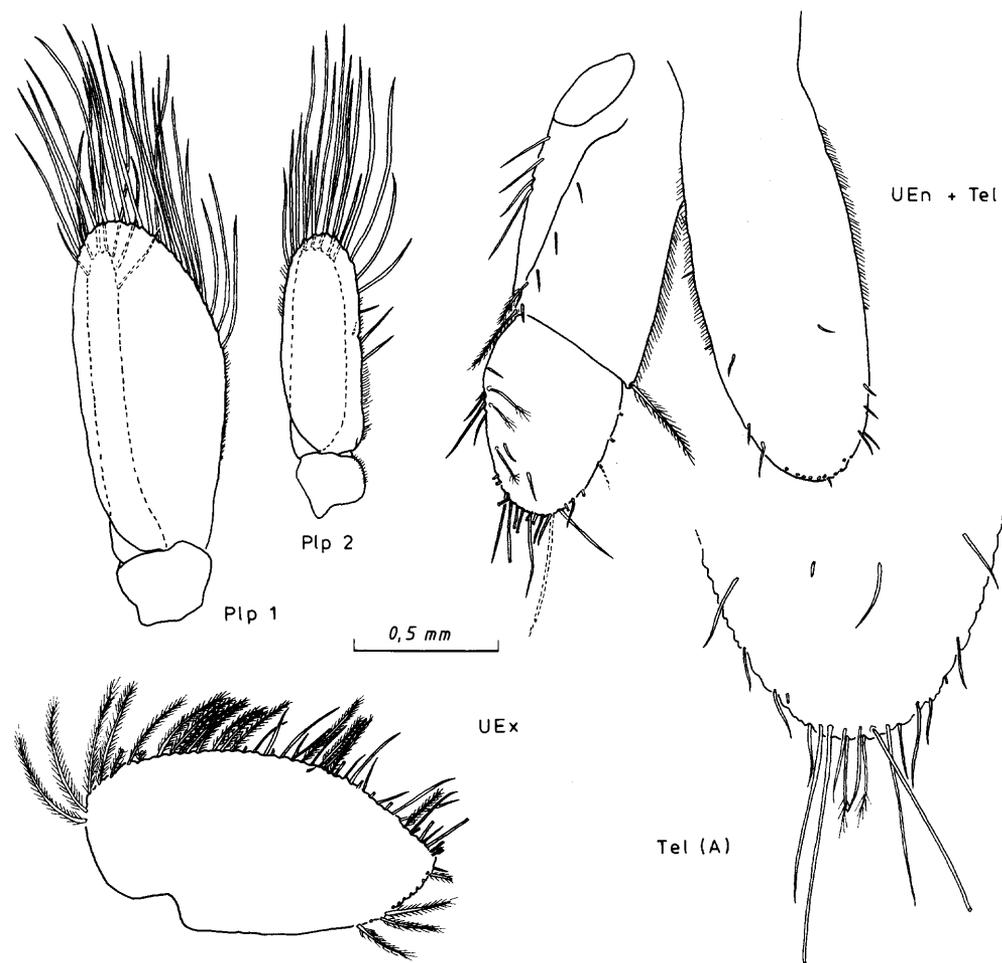


Fig. 14. *P. antarctica* Kussakin, immature adult. Swimming setae of pleopods shown as simple setae

tic paranthurid, *Calathura*. But these articles are not identical. The short first article of *Calathura* (Sars 1896) is not present in *Accalathura*, while the tiny third article of *A. gigantissima* is reduced in the former genus. The common ancestor of these genera must have had at least four palpal articles (see hypothetical form in Fig. 42, Wägele 1981) or five (as in *Curassanthura* Kensley).

Further differences between *Calathura* and *Accalathura* can be found in the form of pereopods (carpi of P 4–7) and the reduction of the statocyst in *Calathura*.

The differences between the two large, southern species of *Accalathura*, *A. gigas* (Australia) and *A. gigantissima* (Antarctica) have been described by Poore (1981).

To obtain a complete picture of the distribution, we need far more samples. *A. gigantissima* has been found on the shelf of East Antarctica, never south of 66°55'S. The area of distribution can now be extended nearly 10 degrees farther south and into the West Antarctic area. It is not possible to find morphological differences between the animals from the Weddell Sea and populations of East Antarctica, the earlier descriptions are not accurate enough. A circumantarctic distribution of genotypically fairly homogeneous populations is to be expected.

#### *Paranthura anatarctica* Kussakin 1967 (Figs. 12–14)

This species seems to be one of the less frequent Antarctic anthurids. It has not been collected again since the first description by Kussakin (1967).

**Material:** 3 immature adults 8–11 mm, 1 manca 6.5 mm.

**Locality:** Atka Bay, 70°29.6'S 8°7.4'W, depth 257 m.

**Distribution:** also known from 69°55'S 12°50'E, depth 230–260 m (Kussakin 1967).

#### Description of an Immature Adult (11 mm)

Body without pigments. Cephalothorax somewhat longer than wide, small lateral eyes present. Relative length of pereonites:  $c < 1 < 2 = 3 = 4 < 5 > 6 > 7$ . Pleonites 1–5 free, pleonite 6 fused with telson, dorsal suture forming a transversal step with dorsomedian cleft.

A 1 with six flagellar articles; first article short with one feather-like bristle; the two distal articles very small; articles 4–6 each with one aesthetasc and few long setae. A 2 with one large and two very short flagellar articles, with distal bunches of setae (Fig. 12). Endite of Md with pointed, acute pars incisiva, pars molaris reduced; palp not surpassing endite, last article with row of 10 setae. Mx as in Fig. 12. Mxp with reduced endite; palp of one article, with apical suture of a tiny article, all in all with 11 setae. P 1 with stout, subchelate propodus, palm concave, basal projection not conspicuous; setation as in Fig. 12. P 2, 3 subchelate, smaller than P 1, with oval propodus and triangular carpus; palm bearing seven setae and eight slender sensory spines (Fig. 13). P 4–7 with slender, cylindrical articles; carpus somewhat longer than merus; carpus with three, propodus with four spines (three in P 7; Fig. 13). Exopod of Plp 1 operculiform, with 20 swimming setae; endopod shorter, with only a quarter of the exopod's width, with seven setae. Exopod of Plp 2 with 13, endopod with five swimming setae. Uropods scarcely surpassing telson. Sympod not much wider, but 1.5 times longer than endopod; exopod oval, fringed with feather-like setae and few short, simple setae. Tel tongue-like, rounded apex with seven to eight pairs of setae (Fig. 14). Statocyst not present.

#### Remarks

The material discussed by Kussakin (1967) was collected in East Antarctica and was described rather briefly, but the shape of A 1, P 1, and tail fan agree well with the present specimens.

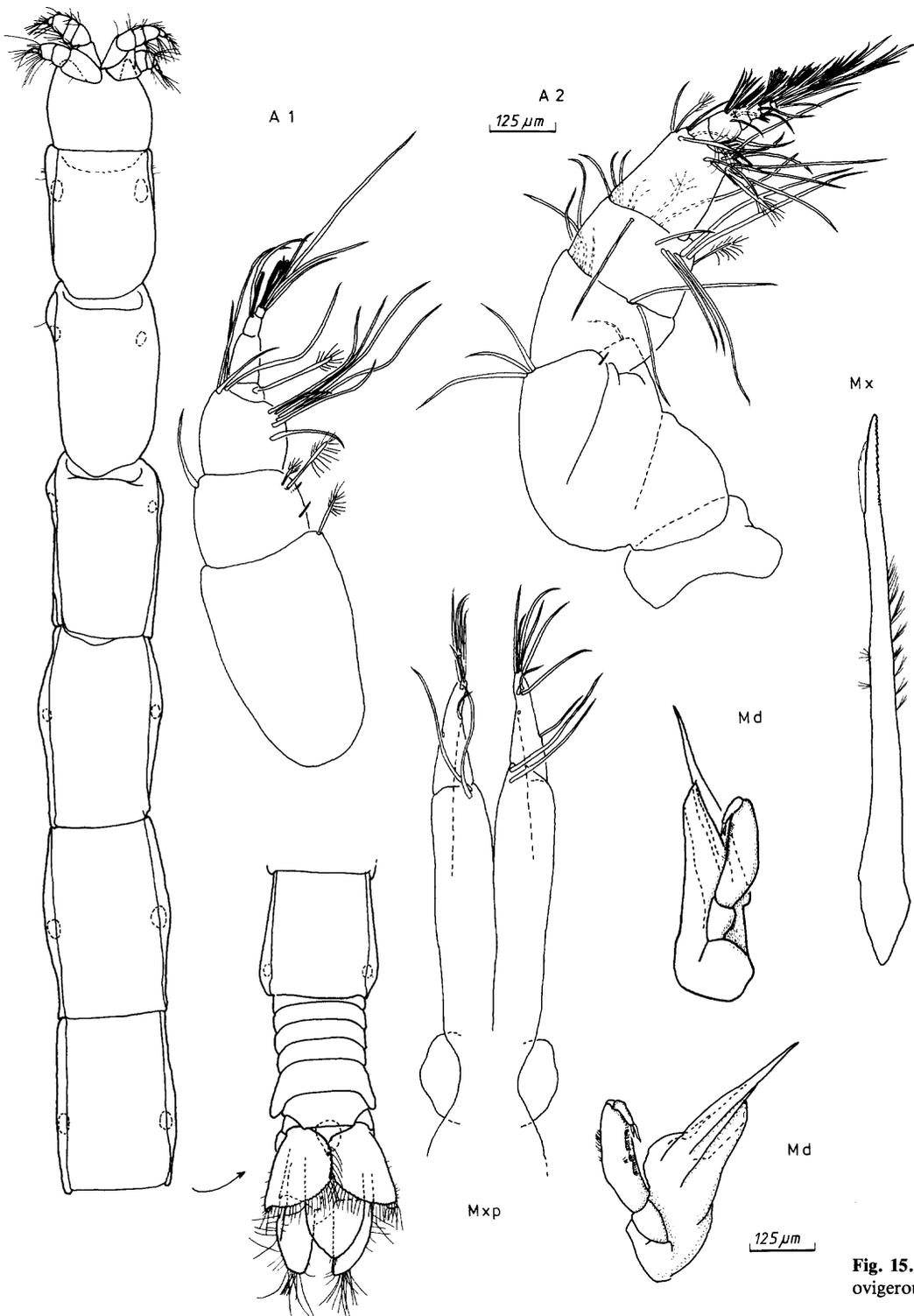


Fig. 15. *Leptanthura glacialis* Hodgson, ovigerous female

*Leptanthura glacialis* Hodgson 1910 (Figs. 15–17)

**Material and Localities:** All samples were collected in the Weddell Sea and the Bransfield Strait. Immature adult 7 mm, 62°13.4'S 55°58.2'W, depth 130 m; immature adults 7.5 mm, 8 mm, 70°29.8'S 8°7.4'W, depth 257 m; 3 immature adults 7.5–9 mm, 70°34.8'S 8°5'W, depth 124 m; immature adults 11 mm, 12.5 mm, 71°27.9'S 13°12.8'W, depth 239 m, immature adult 8.5 mm, 72°25.4'S 16°26.6'W, depth 220 m; manca stage 3.5 mm, seven immature adults 11–17.5 mm, 74°3.9'S 23°56.4'W; manca stage 4.5 mm, seven immature adults 9.5–15.5

mm, 75°38.9'S 27°20.8', depth 289 m; immature adults 11 mm, 12.5 mm, 76°45.6'S 31°59.8'W, depth 257 m.

**Distribution:** Ross Sea, off Queen Maud Land, Bellinghausen Sea, Weddell Sea, Drake Passage, Argentina Basin (Hodgson 1910; Tattersall 1920; Monod 1926; Kussakin 1967; Schultz 1978; Kensley 1982).

**Description of a Female (14.5 mm) from the Weddell Sea (Figs. 15–17)**

Blind species without chromatophores. Cephalothorax a little broader

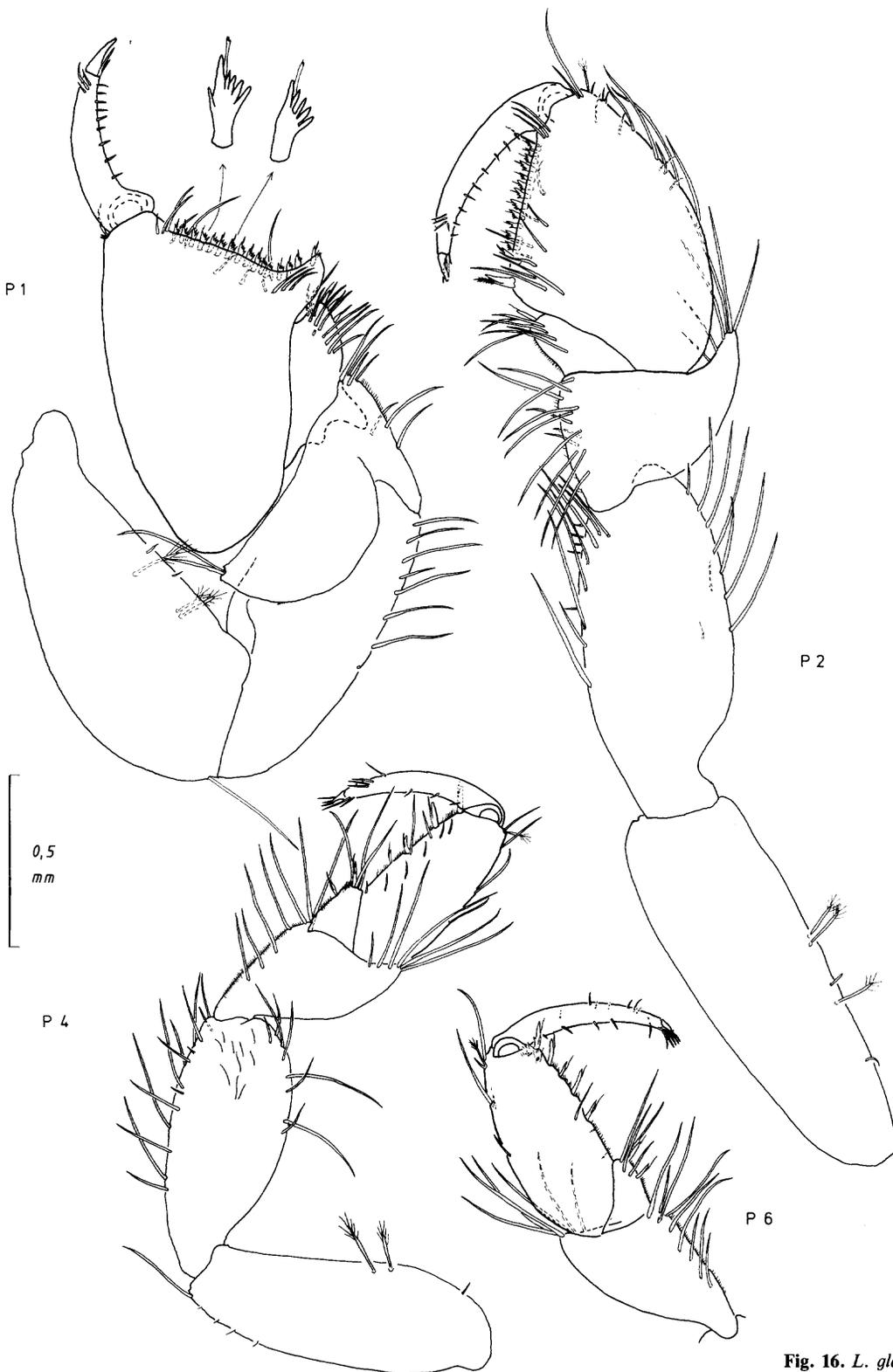


Fig. 16. *L. glacialis* Hodgson, ovigerous female

than long. Relative length of pereonites:  $1 < 2 = 3 < 4 = 5 > 6 > 7$ . Pleonites 1–5 not fused, together shorter than pereonite 7.

A 1 with small, 4-jointed flagellum; first article short, with one plumose bristle; third article with one aesthetasc and one seta, last article with two aesthetascs and five setae.

Flagellum of A 2 with six short articles that bear distal tufts of setae (Fig. 15). Md with acute pars incisiva, last palpal article bent and short, with two apical setae. Mx stiletto-like (Fig. 15). Mxp without endite,

basipods basally fused, with two anteromedial setae; the single palpal article short, bearing eight to nine setae.

Propodus of P 1 stout, subchelate; palm straight, with basal projection and 16 hand-like sensory spines; carpus short (Fig. 16). P 2, 3 with somewhat smaller subchelate propodi, palm straight, without basal projection, with 14 (P 2) or 10 (P 3) hand-like sensory spines (Fig. 16). P 4–7 with short, triangular carpus and oval propodus; propodal palm with four (P 4, 5) or five (P 6, 7) slender sensory spines; P 7 more

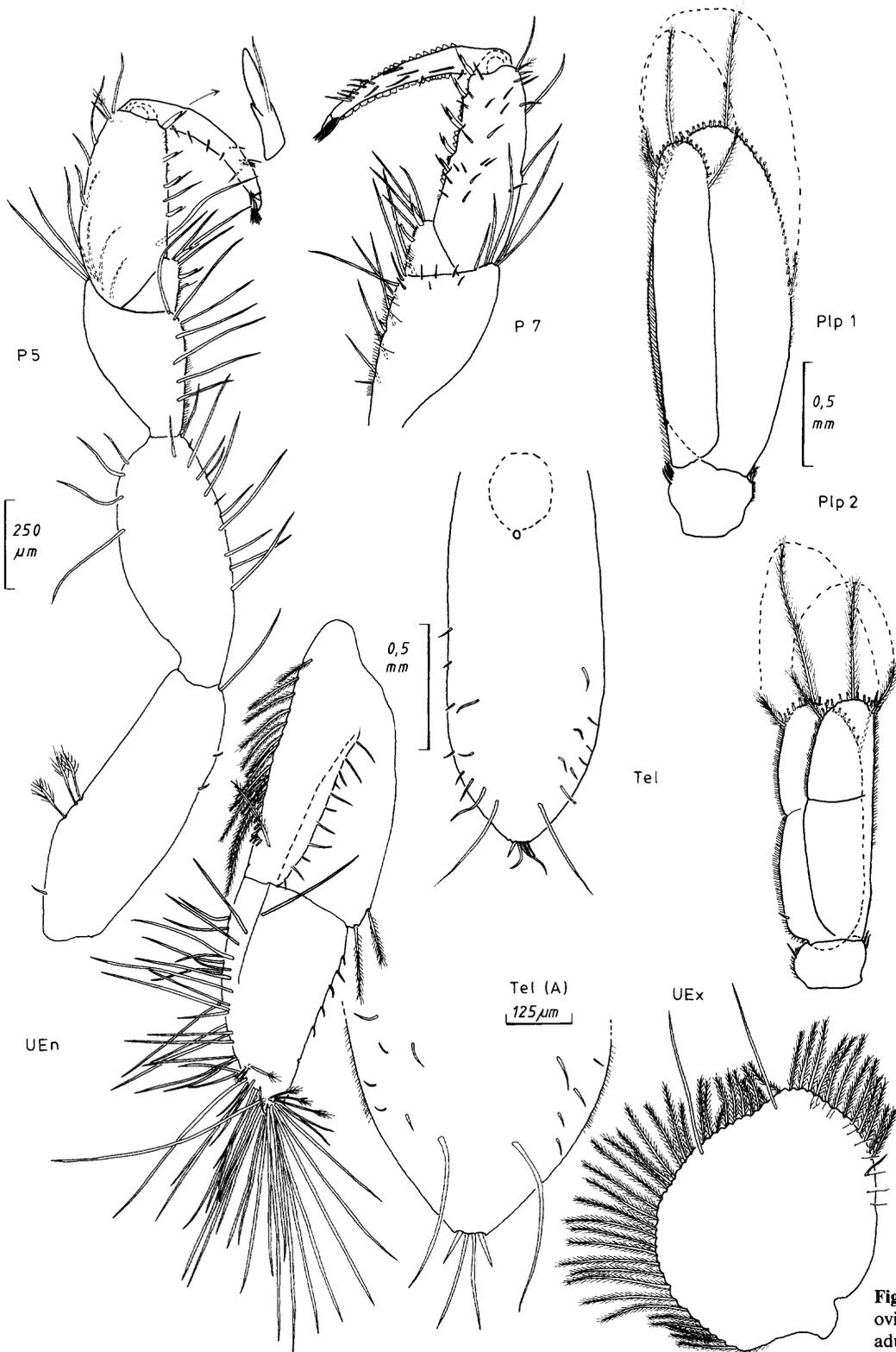


Fig. 17. *L. glacialis* Hodgson, ovigerous female. (A) = immature adult. Most setae of pleopods cut off

slender than the other pereopods. Exopod of Plp 1 operculiform, two times wider than endopod, fringed with 39 swimming setae; endopod with 17 setae. Exopod of Plp 2 with 16, endopod with 12 swimming setae. UEn surpassing telson; sympodite longer than endopodite, setation as in Fig. 17. UEx of nearly circular shape, margin with a row of feather-like setae and two long simple setae (Fig. 17). Tel tongue-like, tapering to a blunt apex with two pairs of short setae. One basal telsonic statocyst present.

#### Remarks

As in the foregoing species a similarity with the hitherto published drawings of this species is obvious, though a comparison of details (A 1, 2, P 2–7, tail fan) is not possible (Hodgson 1910; Monod 1926; Kussakin 1967; Kensley 1982). *L. glacialis* seems to be, besides *A. gigantissima*, the most common anthurid of the Antarctic shelf. *L. antarctica* Kussakin 1967, a species with broadened telsonic apex, is only known from the type locality (Davis Sea).

## Discussion

Only seven of the about 310 known species of Anthuridea live in the Antarctic, and only few antarctic localities are mentioned in literature. Thus it would be premature to try an analysis of the zoogeography of antarctic anthurids. We only know that a tendency to a circumpolar distribution exists and that all antarctic species (exception: *L. glacialis*) are endemic. We know nothing about their ecology and biology. Observations in the field and of specimens kept in aquaria are necessary to obtain data on these important subjects.

Anthurids are isopods that prefer the upper littoral (0 to 100 m depth) of the warmer seas, where most species actually live (Wägele 1981). The antarctic species belong to specialized genera, as the serpulid-dependent *Eisothistos* or the blind, deep-water-adapted *Leptanthura*. Five of the seven species belong to the family Paranthuridae, *Austranthura elegans* (only known from the type locality at 53°S 91°E) being the more primitive species, where the mouthparts do not form a perfect stinging cone.

Judging from the structure of the mouthparts, the paranthurids seem to live the same way as the only hitherto studied, mediterranean species of Paranthura (Wägele 1981), i.e. sucking on small crustaceans as amphipods and tanaids.

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