

# Two New Littoral Anthuridea from Baja California and Redescription of *Mesanthura occidentalis* (Crustacea, Isopoda)

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Two new Isopoda Anthuridea (*Paranthura longitelson* sp.n., *Mesanthura nubifera* sp.n.) from the Pacific coast of Mexico are described. A redescription of the hitherto poorly known species *Mesanthura occidentalis* Menzies & Barnard is presented.

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## Introduction

A collection of Isopoda Anthuridea from the California Academy of Sciences included two specimens from different localities of the Pacific coast of Mexico. One of these animals is a paranthurid with a large tailfan, obviously a new species of the genus *Paranthura* Barnard, 1925, belonging to a group of species which have a tendency to shortened pleonites and to enlarged elements of the tailfan. Until now none of these species has been described thoroughly. The other animal belongs to the genus *Mesanthura* Barnard, 1914 (fam. Anthuridae) and differs from the single hitherto known Californian species *Mesanthura occidentalis* in several respects. To compare these congeneric species a redescription of *M. occidentalis* became necessary, as the original descriptions of Menzies & Barnard (1959) are too brief. Of the new *Mesanthura* only one specimen is available. It is a well preserved mature female which allows a complete description of its morphology. As in many other anthurid species, for the study of sexual dimorphism it is desirable to find and describe the corresponding male.

## Material and methods

The single specimens of the new species described in the present study were collected by Mr D. Chivers in Baja California (see type localities) and are deposited as holotypes in the California Academy of Sciences (San Francisco). A second specimen of *Paranthura longitelson* sp.n., collected by E. Ricketts in the Gulf of California, was discovered by Dr B. Kensley in the collections of the Smithsonian Institution (USNM) (Washington) and sent to the author.

For examinations of morphological details specimens were dissected, the appendages mounted on slides and drawn with the help of a camera lucida.

## Abbreviations used in the text and the figures

A 1 antenna 1  
A 2 antenna 2  
Hy hypopharynx  
Md mandible

Mx maxilla 1  
Mxp maxilliped  
P 1–7 pereopods 1–7  
Plp 1–5 pleopods 1–5

Tel telson  
U Ex exopod of uropod  
U En endopod of uropod  
U Sym sympod of uropod

## *Paranthura longitelson* sp.n. (Figs. 1–4)

**Holotype.** 1 mature male, 16 mm, Calif. Acad. Sci. Cat. No. 025279.  
**Locus typicus.** Baja California, Gulf of California, Pond Island, lagoon at west end of island, leg. D. Chivers.

**Further material.** 1 pre-male (not mature), 14.5 mm, USNM 86344, from T. Buron Island, Gulf of California. Found in "sand of island"; leg. E. Ricketts.

## Description of the holotype

Paranthurid with strikingly large tailfan (Fig. 1a,b). Few scattered dorsolateral chromatophores present, tailfan also pigmented. Cephalon slightly longer than wide, eyes present, rostral point small. Relative length of pereonites: cephalothorax <1>2>3>4>5>6>7. Pleonites not fused but very short, only 4 pleonites visible in dorsal view (first pleonite covered by pereonite 7), together nearly half as long as pereonite 7. Pleon can be telescoped into last pereonite. Suture of pleonite 6 with telson visible in dorsal view, with deep dorsomedial cleft. Tailfan as long as pereonites 4–7 together.

Antenna 1 (Fig. 2d) with 11 flagellar articles. First flagellar article short, with small feather-like bristle, articles 2–5 with distal row of long, slender aesthetascs and single simple setae, sixth article with row of aesthetascs on half of its length indicating fusion of 2 articles, distally few setae and 2 short aesthetascs; articles 7–9 with 2 distal aesthetascs and few setae, last two articles very small, each with 1 aesthetasc, last article with 5 long setae. A 2 with 5 peduncular articles (setation: Fig. 2c), flagellum short, unsegmented, with 9 groups of short setae. Mouthparts of piercing/sucking type. Endite of Md forming acute stiletto; palp 3-segmented, second article longest and with 6 long setae, last article with 16 stout, short setae (Fig. 1f). Mx lancet-like, lateral margin with 13 teeth (Fig. 1d). MxP with reduced endite; palpal articles fused except one tiny distal article, the latter bearing 4 setae (Fig. 1e).

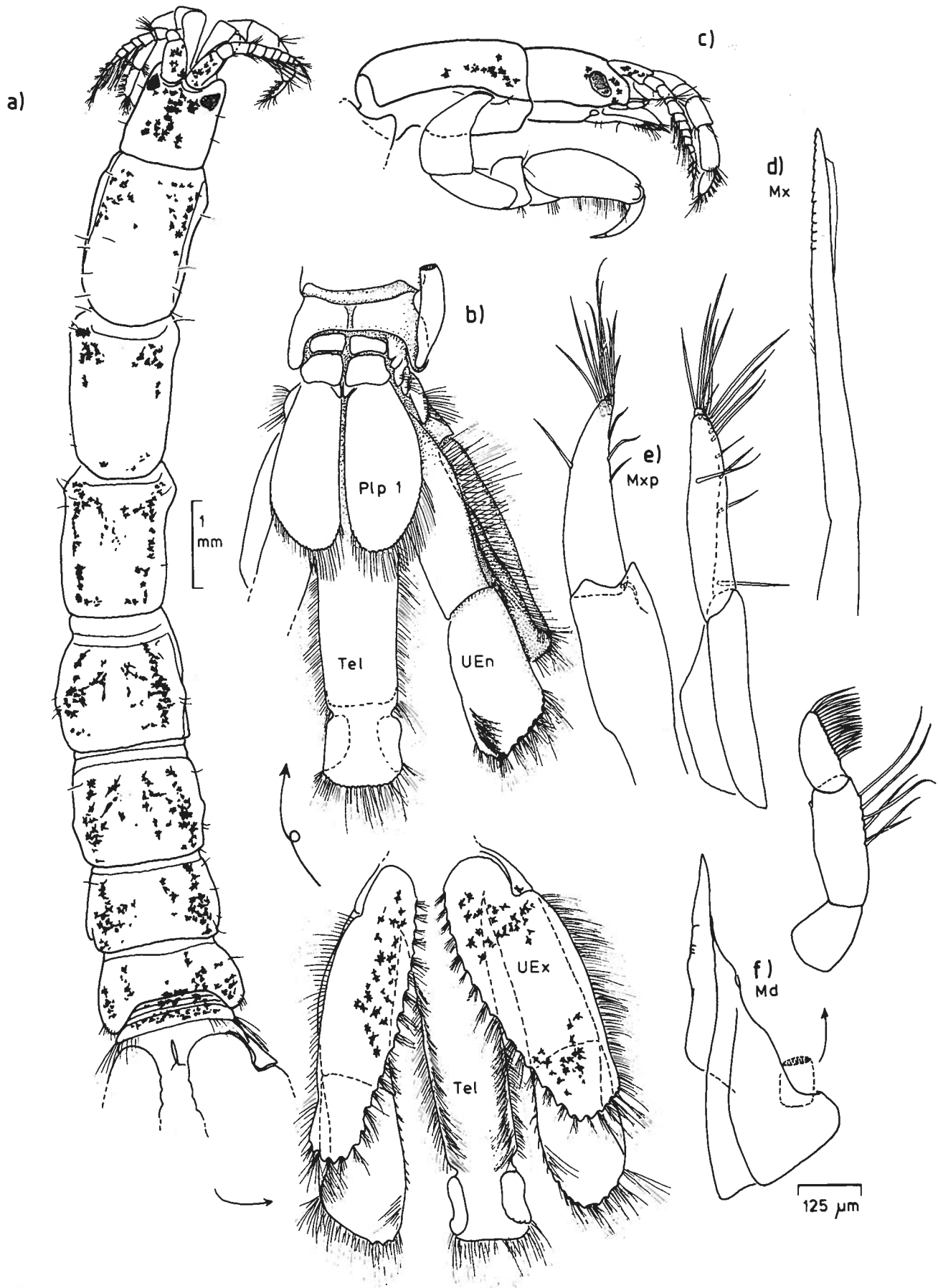


Fig. 1. *Paranthura longitelson* sp.n., male holotype.—a. Total animal shown in dorsal view.—b. Tailfan in ventral view.—c. Cephalon and first pereopod in lateral view.—d–f. Mouthparts.

P 1–3 subchelate. Propodus of P 1 stout, palm convex without projections or teeth, with comb-like row of short setae on medial surface (Fig. 2a,b). P 2 with dense group of setae on caudal margin of merus and carpus; palm of propodus with 9 sensory spines and several setae (Fig. 3a,b); P 3 similar to P 2. P 4–7 with rectangular carpi,

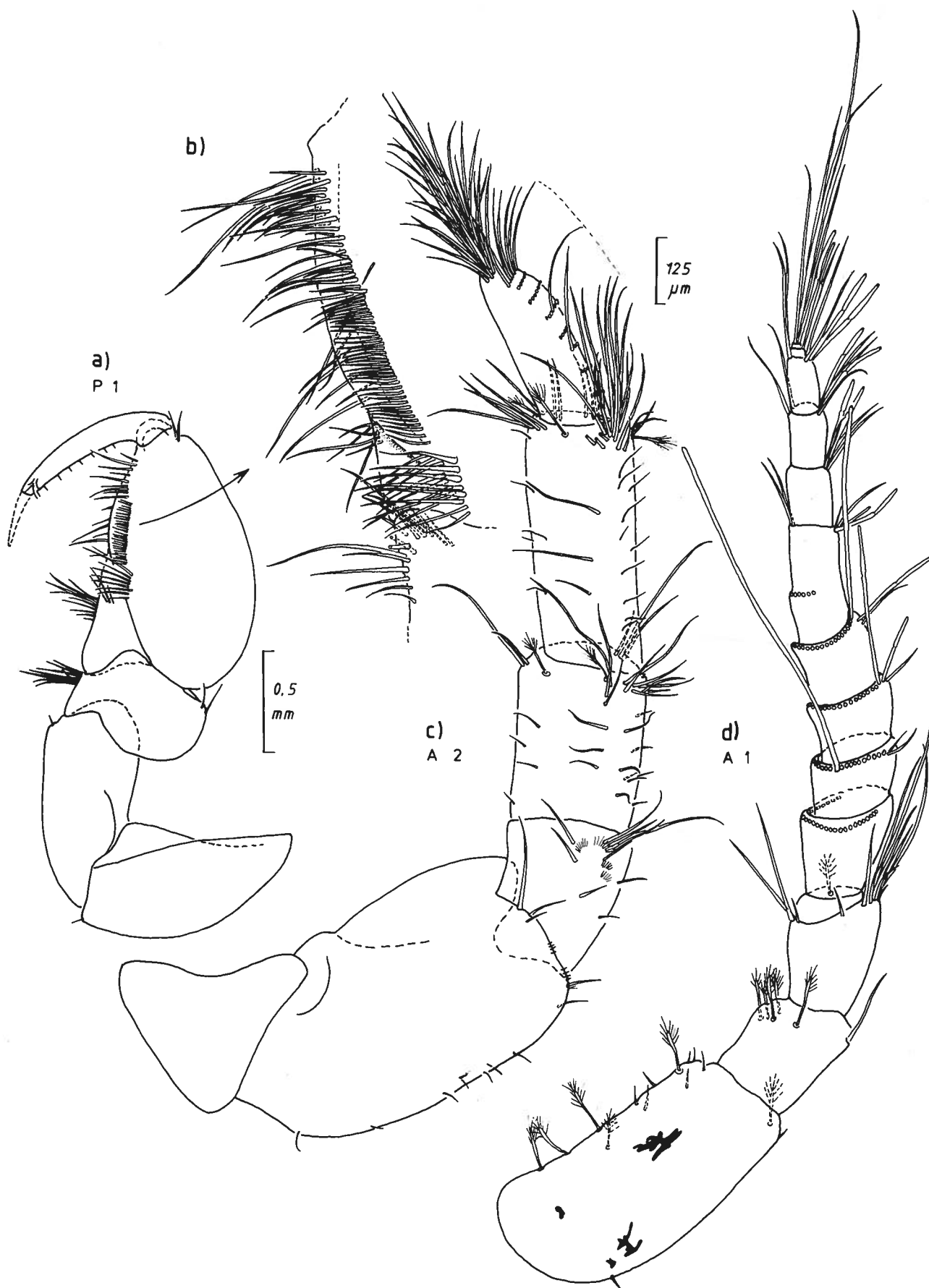


Fig. 2. *Paranthura longitelson* sp.n., Male holotype.—a–b P 1 with enlarged details of propodal palm (b).—c–d. Antennae. Most aesthetascs of A 1 and setae on flagellum of A 2 omitted.

length increasing caudally, setation as in Fig. 3c–e. Propodus of P 4 and P 7 with 4 sensory spines, of P 5 and P 6 with 5 spines, carpus of P 4 and P 6 with 5 spines, of P 5

with 6 spines, carpus of P 7 with 4 spines.

Plp 1 operculiform, not larger than in other species of the genus (Figs. 1b, 3f); exopod with 39 swimming setae,

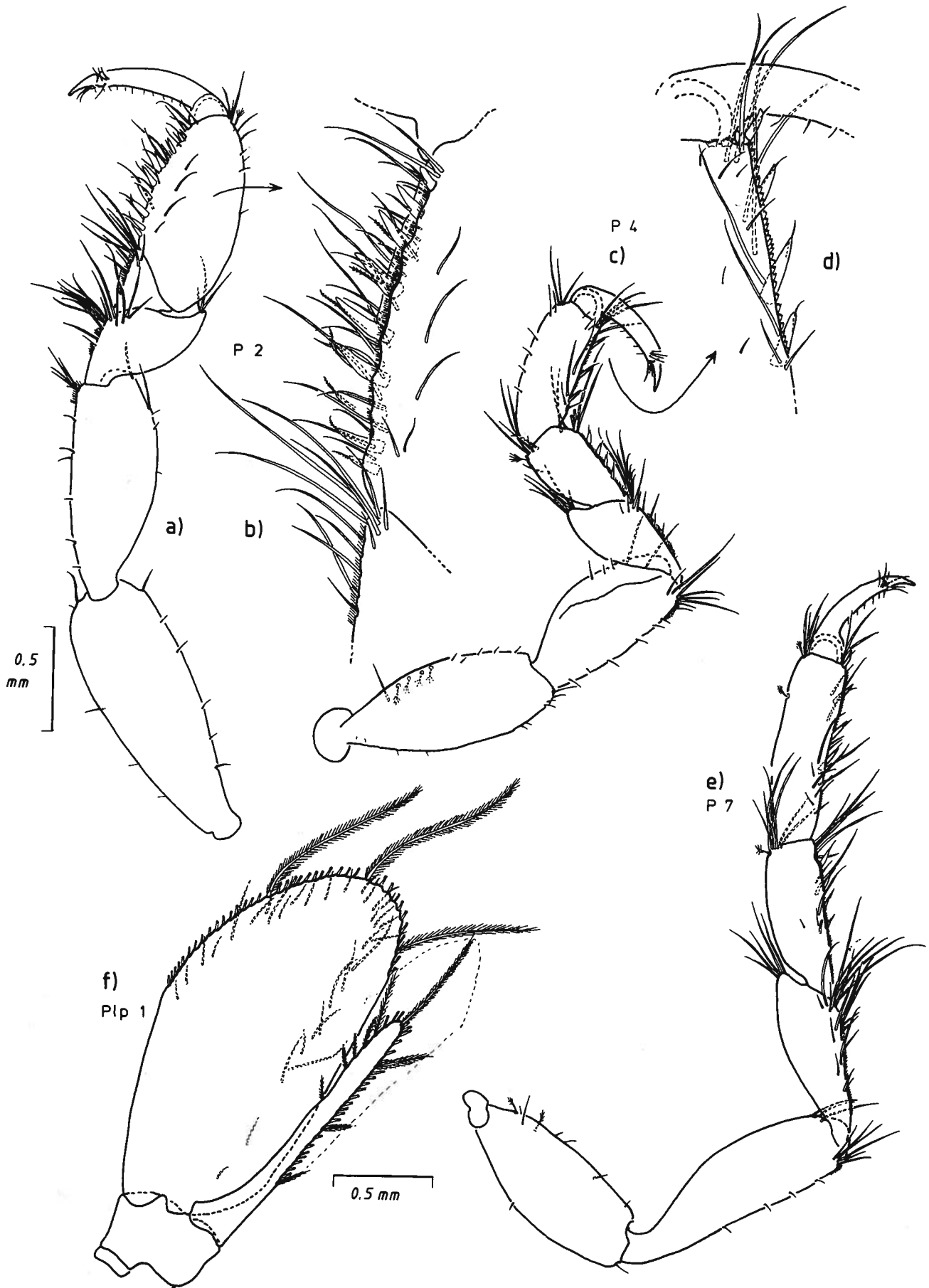


Fig. 3. *Paranthura longitelson* sp. n., male holotype. —a–e. Pereopods with details of propodal palm (b, d). —f. Plp 1. Most swimming setae omitted.

endopod narrow, shorter than exopod, 33 swimming setae concentrated along medial margin. Plp 2 with 14 swimming setae on each branch; appendix masculina of

endopod reaching beyond this branch, with distal rounded hook (Fig. 4a,b).

Exopod of Urp long-oval, longer than sympod, medial

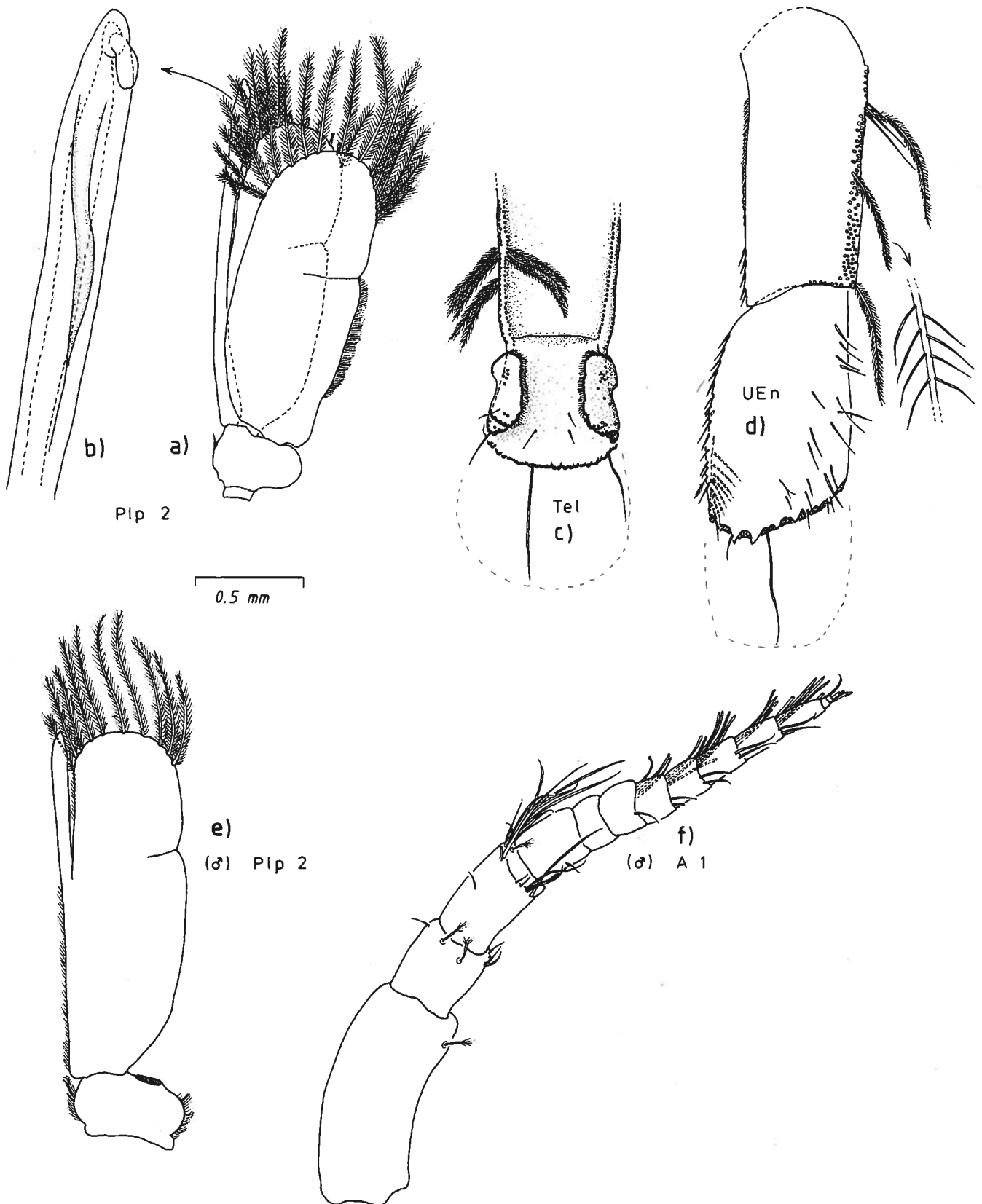


Fig. 4. *Paranthura longitelson* sp. n.—a-d. Male holotype.—b. Enlarged apex of appendix masculina.—c. Detail of distal part of Tel.—d. UEn; most plumose setae of sympod and distal simple setae of endopod cut off.—e-f. Pre-male (♂).—e. Endopod of Plp 2 with developing appendix masculina.—f. A 1; several setae are lost.

and distal margin serrate, with tufts of small setae in each dent (Fig. 1a); setae of lateral margin plumose. Endopod of Urp dorsally concave, wider and shorter than sympod, rectangular, distal margin with 9 tufts of long setae inserting in indentations; medial margin with row of short setae and distally some longer setae on ventral surface. Sympod

with great number of plumose setae on lateral margin (Fig. 4d). Telson long, rectangular, with distolateral margins folded over dorsum (Fig. 4). No statocyst present.

#### Description of the pre-male

This is the stage just before the last molt by which the

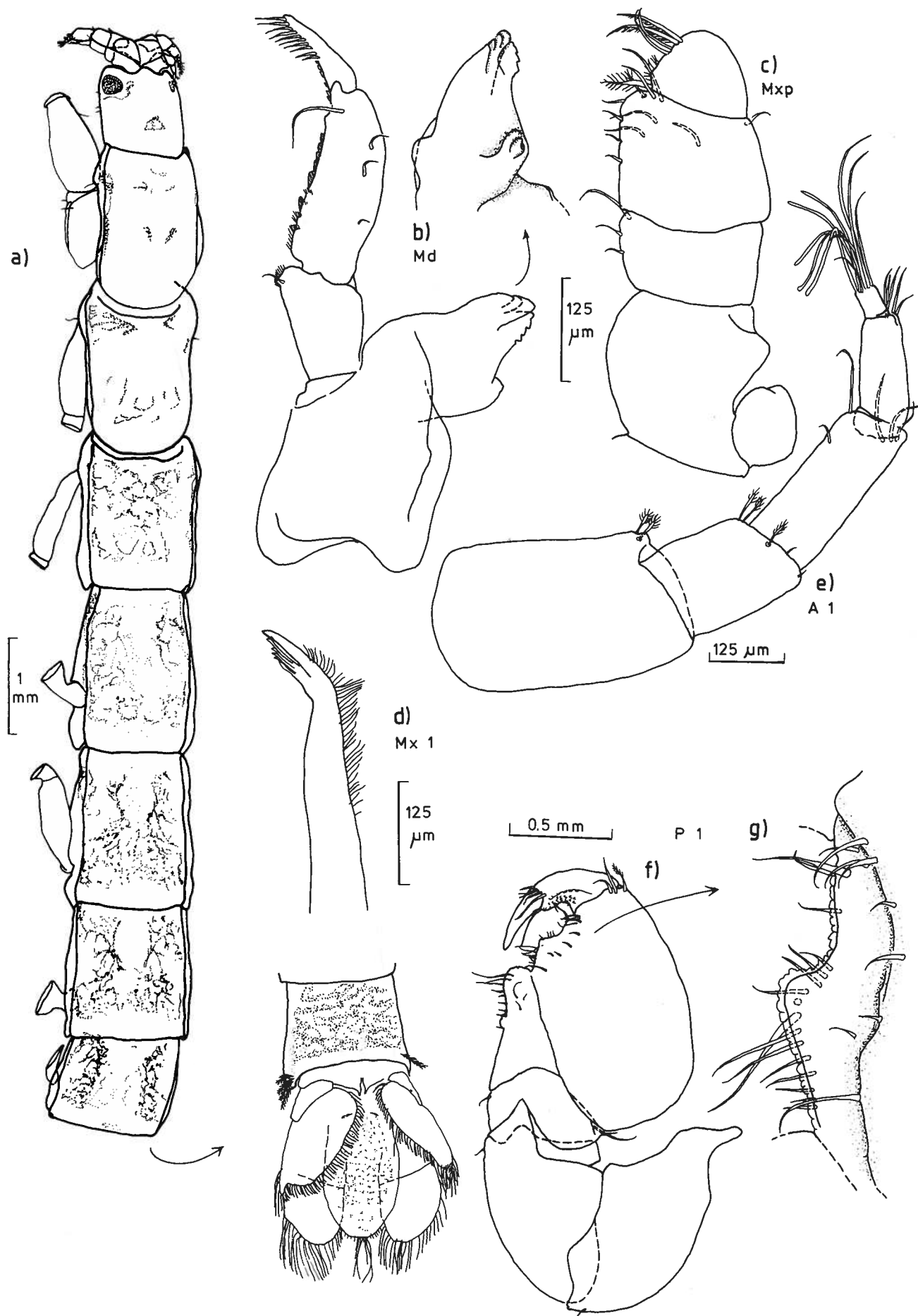


Fig. 5. *Mesanthura nubifera* sp. n., female holotype.—a. Total animal in dorsal view.—b–d. Mouthparts.—e. A 1.—f–g. P 1 with enlarged propodal palm (g).

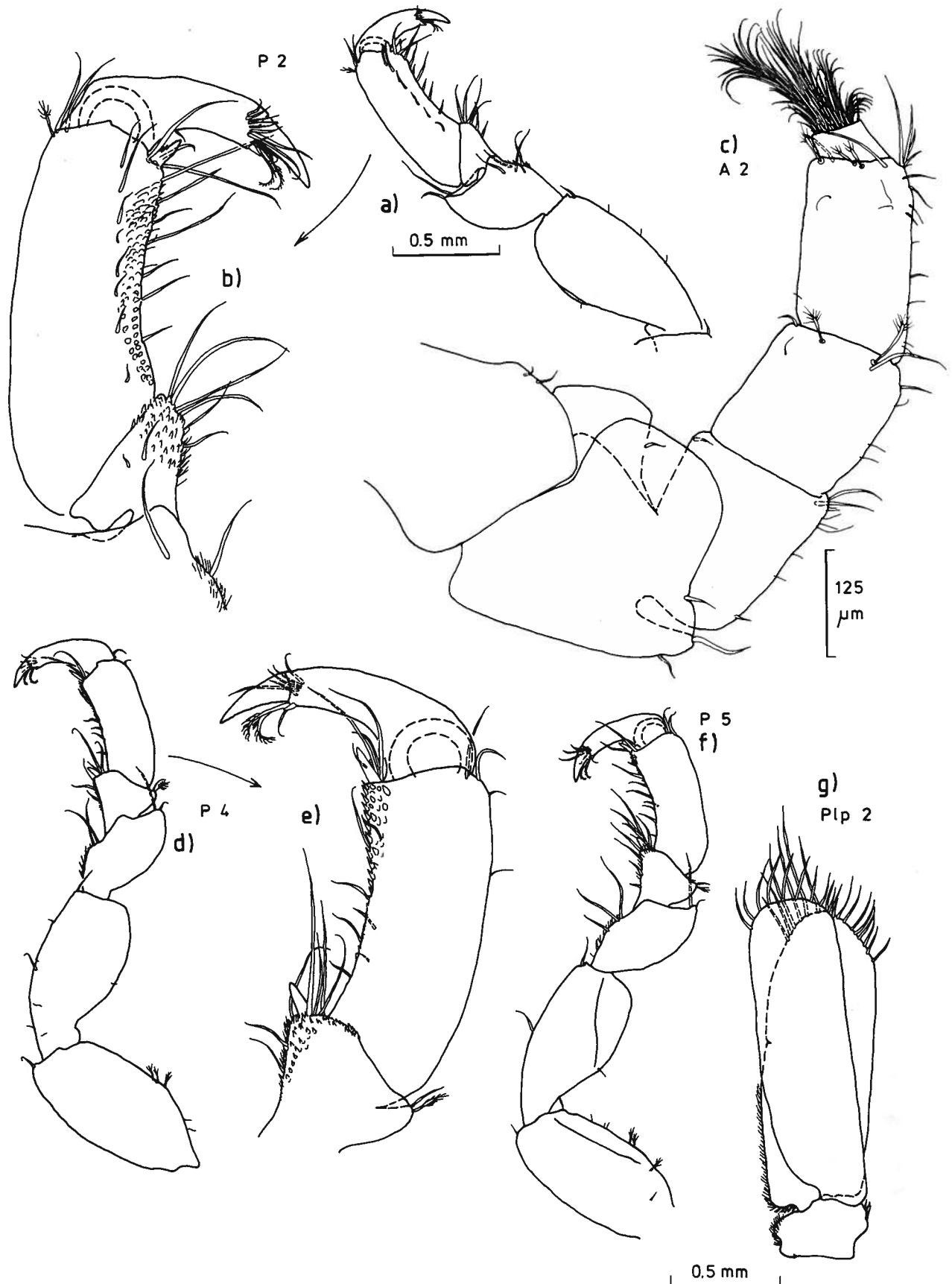


Fig. 6. *Mesanthura nubifera* sp. n., female holotype. —a-b. P2 with enlarged distal articles (b). —c. A2. —d-e. P4 with enlarged distal articles (e). —f. P5. —g. Plp 2; swimming setae shown as simple setae.

animal becomes a sexually mature male. The present specimen (USNM No. 86344) is slightly damaged (broken setae), but in most features similar to the foregoing specimen. The following differences can be seen: A 1 as in

the mature male with 11 flagellar articles, articles 4 to 8 with few (3-4) short aesthetascs and 1-2 simple setae (setae of last articles unfortunately not preserved) (Fig. 4f). Plp 1 with incompletely developed appendix

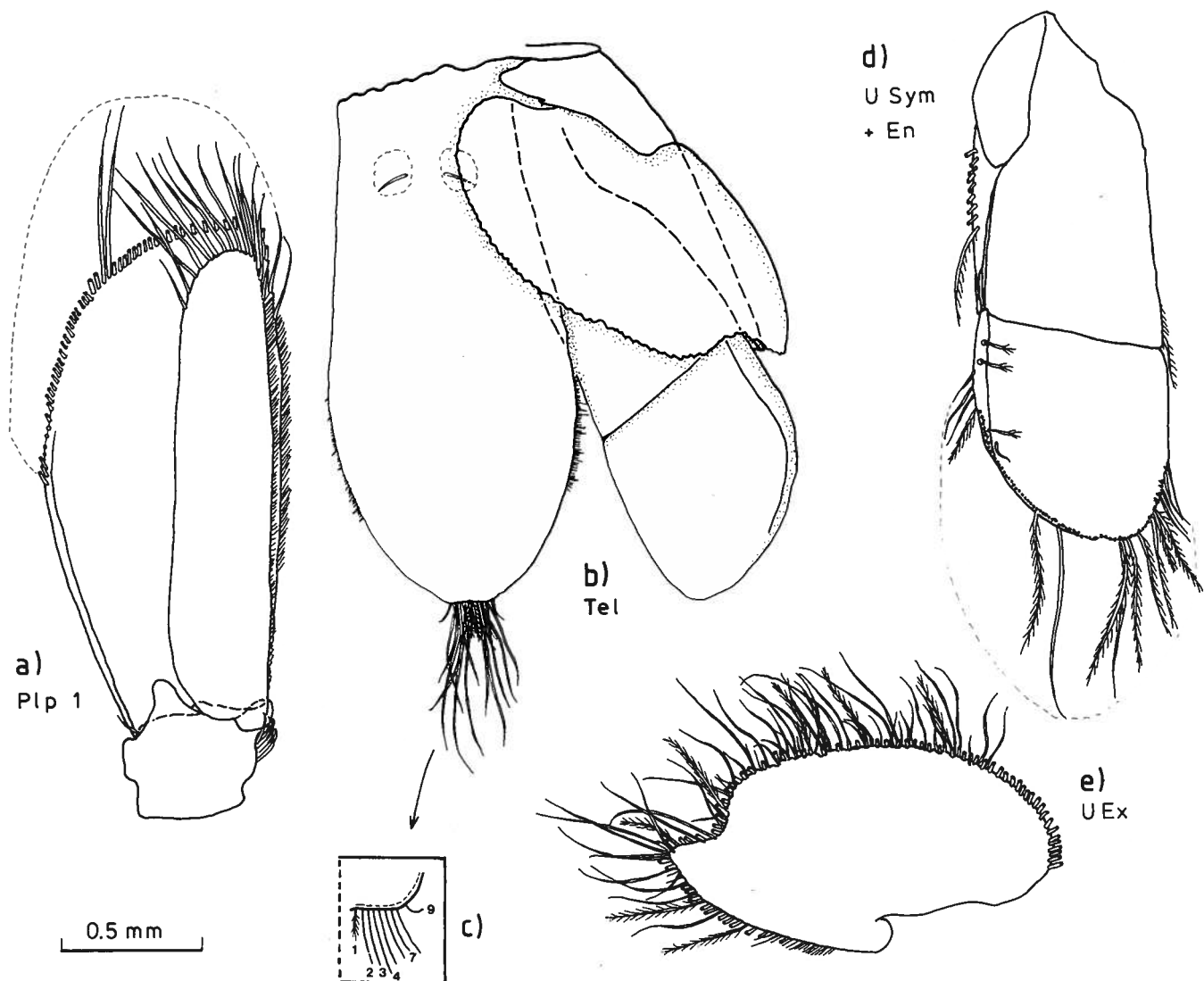


Fig. 7. *Mesanthura nubifera* sp.n., female holotype.—a. Plp 1; swimming setae shown as simple setae.—b. Tel and outline of right Urp.—c. Schematic drawing of apical setation of Tel.—d–e. Uropod; most simple setae of U En and most plumose setae of U Ex cut off.

masculina (Fig. 4e), apex simply rounded.

This specimen already shows the long antennular flagellum, which is typical for the male, but the tufts of aesthetascs are not yet developed.

#### Discussion

The morphology of many species of *Paranthura* is known only to an unsatisfying degree. There are obviously some groups of species with common features. One feels that within the genus different lines of evolution can be found, but they cannot be described correctly at present. One line leads to the species with an enlarged tailfan. These species have a rectangular telson with continuous rows of marginal setae, while other species of the genus have a more oval, distally rounded telson with few distal setae. *Paranthura longitelson* sp.n. has the longest tailfan of all known species of *Paranthura*, but the arrangement and the reduction of the pleon is similar in *P. bellicauda* Miller & Menzies, 1952 (from Hawaii) and *P. infundibulata* (= *verillii*) Richardson, 1902 (from Bermuda, Belize, St. Thomas: Richardson 1902; Barnard 1925; Kensley 1982). The telson of the latter species has an outline more or less

similar to *P. longitelson*; in *P. bellicauda* the telson is broader distally than proximally. The tiny *P. polynesica* Kensley, 1979, has longer, fused pleonites, much fewer setae on the tailfan, fewer setae and spines on the pereopods and in the immature adult a shorter flagellum of A 1. At present further comparisons are fruitless. One has the impression that this group of species evolved in the Pacific Ocean; *P. longitelson* and *P. infundibulata* could be sister species that are separated now by the Central American land bridge.

It seems very probable that these species live in tubes, like other Anthuridea, and use their tailfan to close the entrance. Wägele (1981) observed that even species with a small tailfan (*Paranthura nigropunctata*, *P. costana*) climb into interstices of the rhizome of *Posidonia* following their prey; they also have been seen entering tubes of tanaisids, using them as hiding-places. The evolution of an operculiform tailfan occurred analogously in different genera (e.g. *Eisothistos*, *Anthura*, *Haliophasma*).

The new species differs clearly from other, Californian, species (*P. californiae* Nunomura, 1979; *P. elegans* Menzies, 1951) by its typical tailfan.



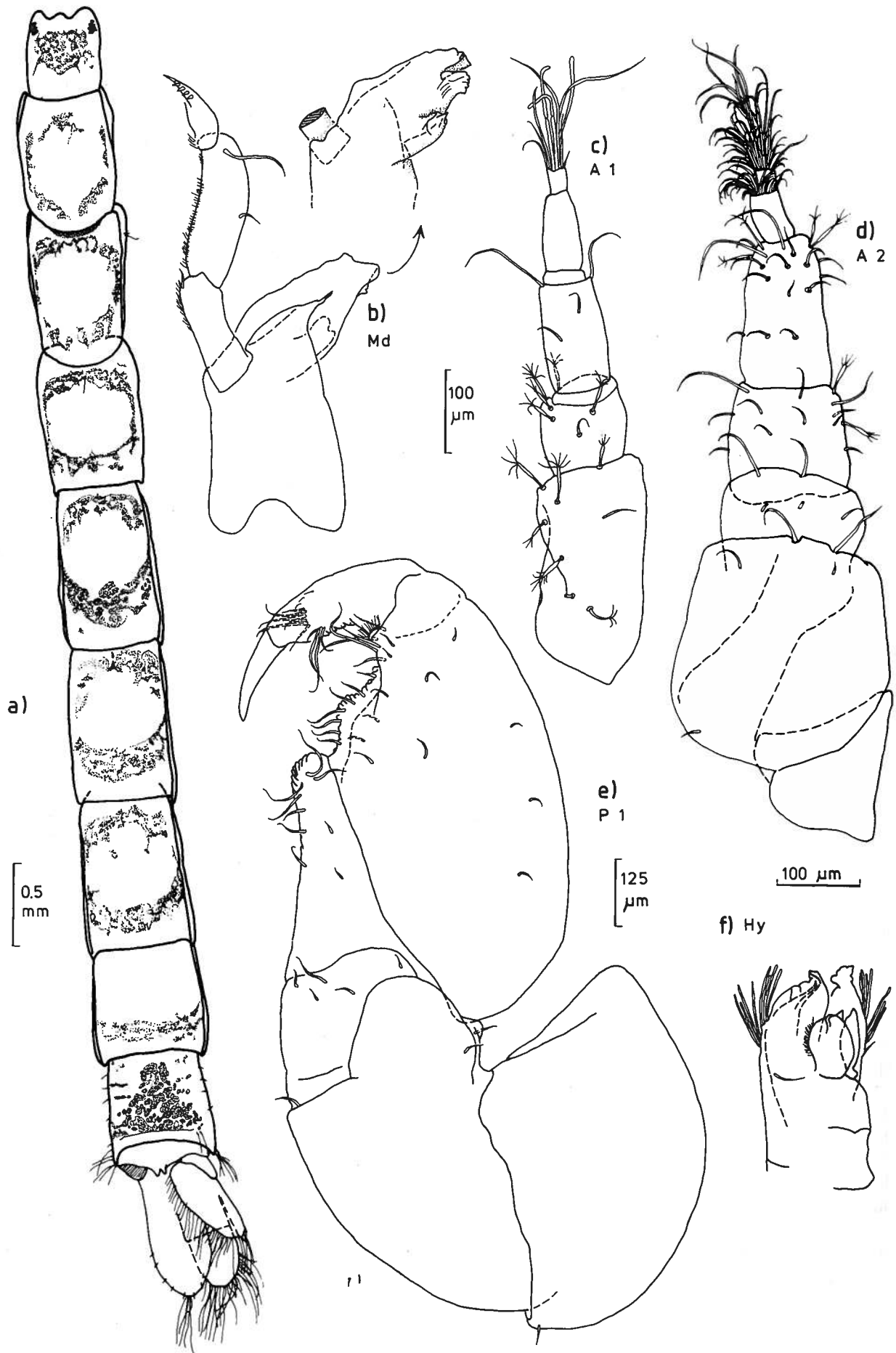


Fig. 8. *Mesanthura occidentalis* Menzies & Barnard, paratype (immature adult).—a. Total animal in dorsal view, without left uropod.—b. Md; endite shown in two different views.—c—d. A 1, A 2.—e. P 1.—f. Hy in ventrolateral view.

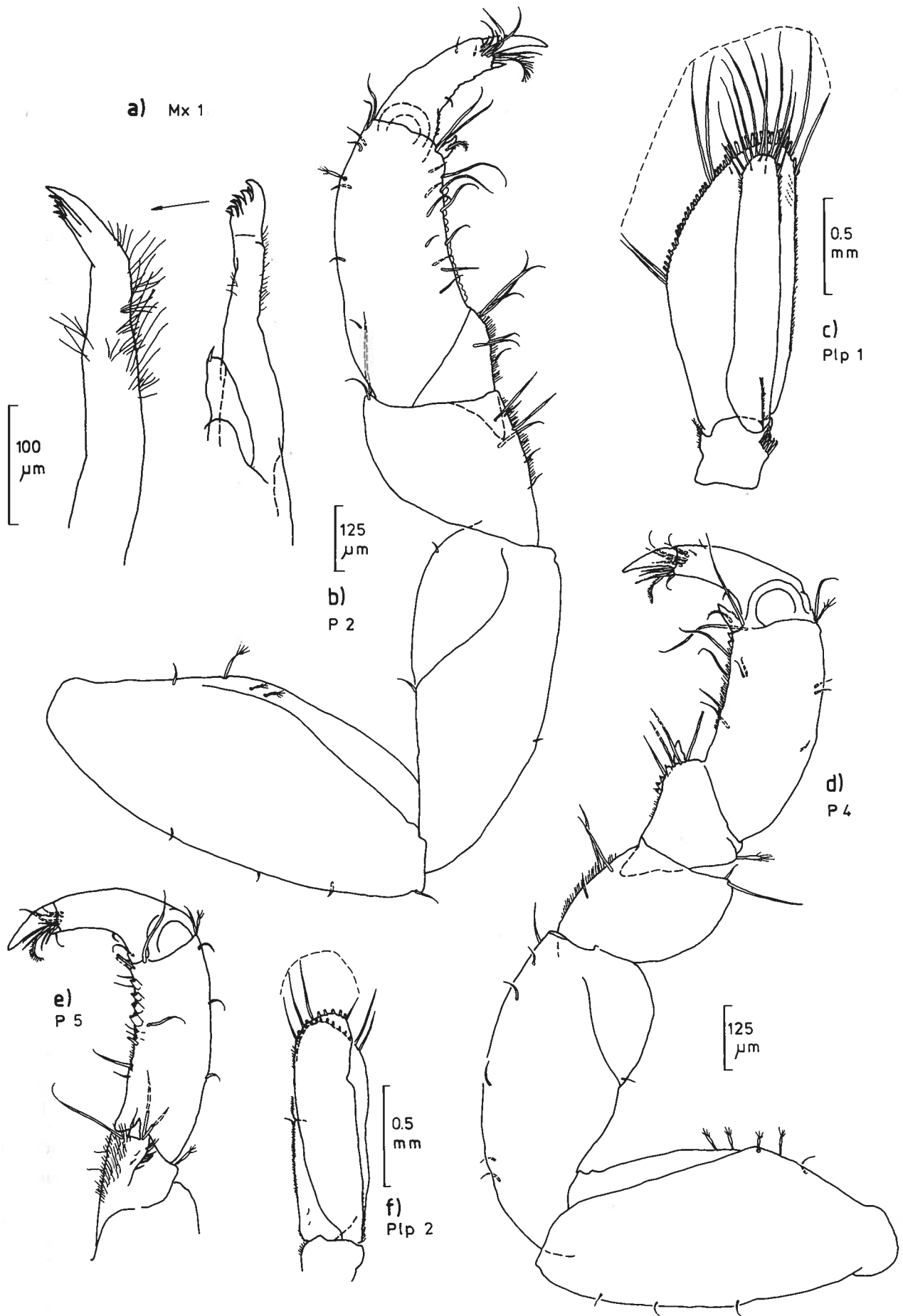


Fig. 9. *Mesanthura occidentalis* Menzies & Barnard, paratype.—a. Two views of Mx 1.—b, d–e. P 2, P 4, distal articles of P 5.—c, f. Plp 1, Plp 2; swimming setae cut off or drawn as simple setae.

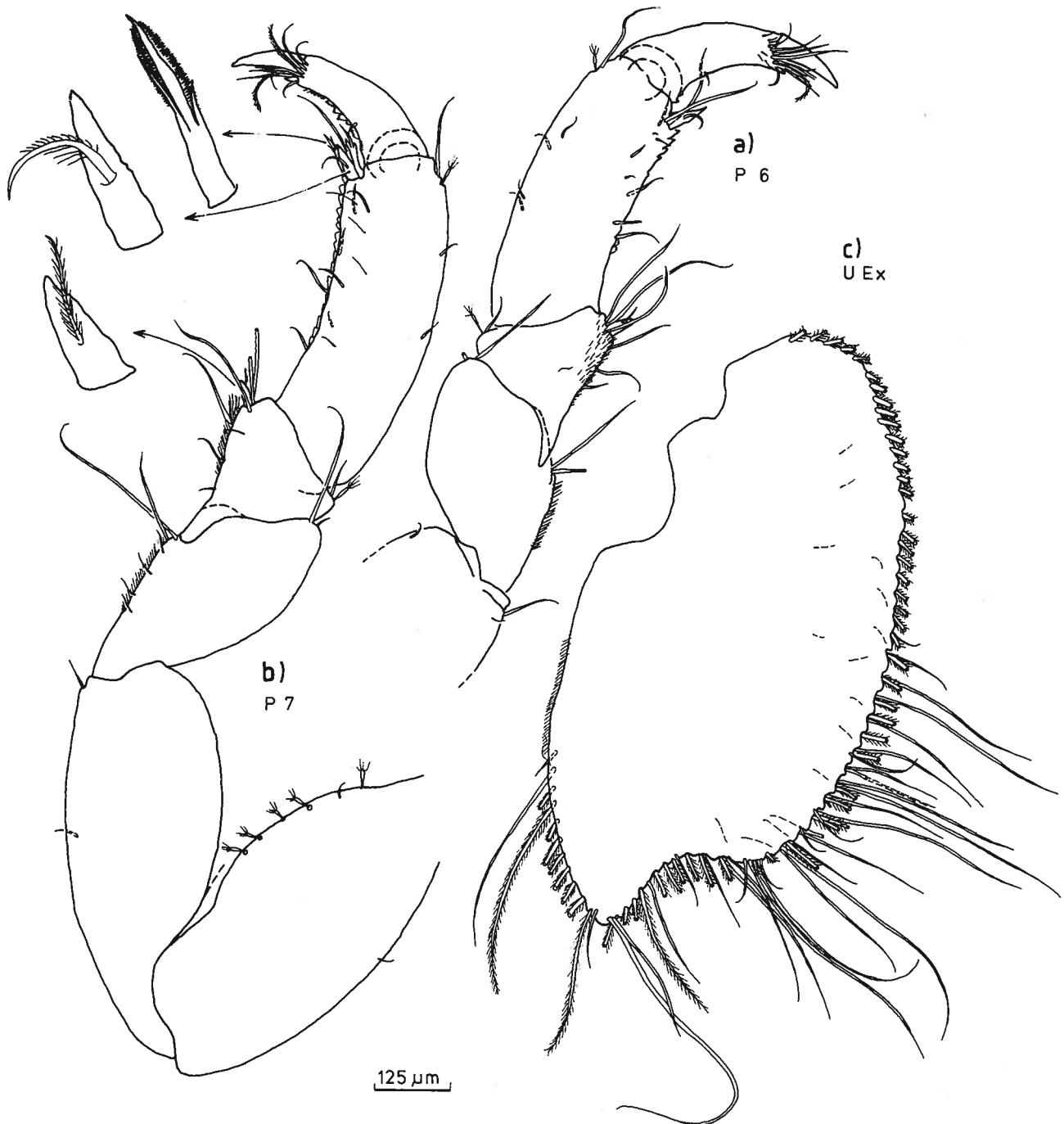


Fig. 10. *Mesanthura occidentalis* Menzies & Barnard, paratype.—a. P 6.—b. P 7 with some enlarged spines.—c. U Ex; most swimming setae of U Ex cut off.

***Mesanthura nubifera* sp.n. (Figs. 5–7)**

*Holotype*. 1 mature female, 14 mm, Calif. Acad. Sci. Cat. No. 25960.

*Locus typicus*. Baja California, northeast of Isla Turner, intertidal, leg. D. Chivers.

**Description of the holotype**

The specimen has a weak coloration with cloud-like patches of chromatophores, as shown in Fig. 5a. Cephalon shorter than pereonite 1, dorsolateral eyes present, rostral projection rounded. Pereonites 1 and 2 subequal, as long as 4 and 5, pereonites 3 and 6 somewhat shorter. Relative length of pereonites:  $1 = 2 > 3 < 4 = 5 > 6 > 7$ . Pleonites 1–5 fused, together shorter than pereonite 7. Oostegites on pereonites 2, 3, 4 and 5.

Peduncle of A 1 with few feather-like setae, third article bearing distally 4 simple setae; flagellum with 3 articles,

last article with 4 setae and 5 aesthetascs (Fig. 5e). A 2 with few setae and short hairs on the peduncle, flagellum reduced to one short article with an apical brush of simple setae (Fig. 6c). Mandibular palp 3-segmented, second article longest, last article with 10 spine-like setae; endite of Md as usual in the family without lacinia or spine row. Pars incisiva blunted, with 3 notches; lamina dentata with 5 small indentations; pars molaris short, with small distal point (Fig. 5b). Apex of lateral endite of Mx curved medially; besides the strong distal tooth 6 smaller teeth are visible (Fig. 5d). Mxp with 3-segmented palp, second segment longest. First segment with 3 medial spines, second segment bearing on medial margin 4 spines and totally 11 spines, last segment with 1 proximomedial plumose spine and more distally another 4 spines, 2 of them feather-like (Fig. 5c). P 1 with stout, subchelate

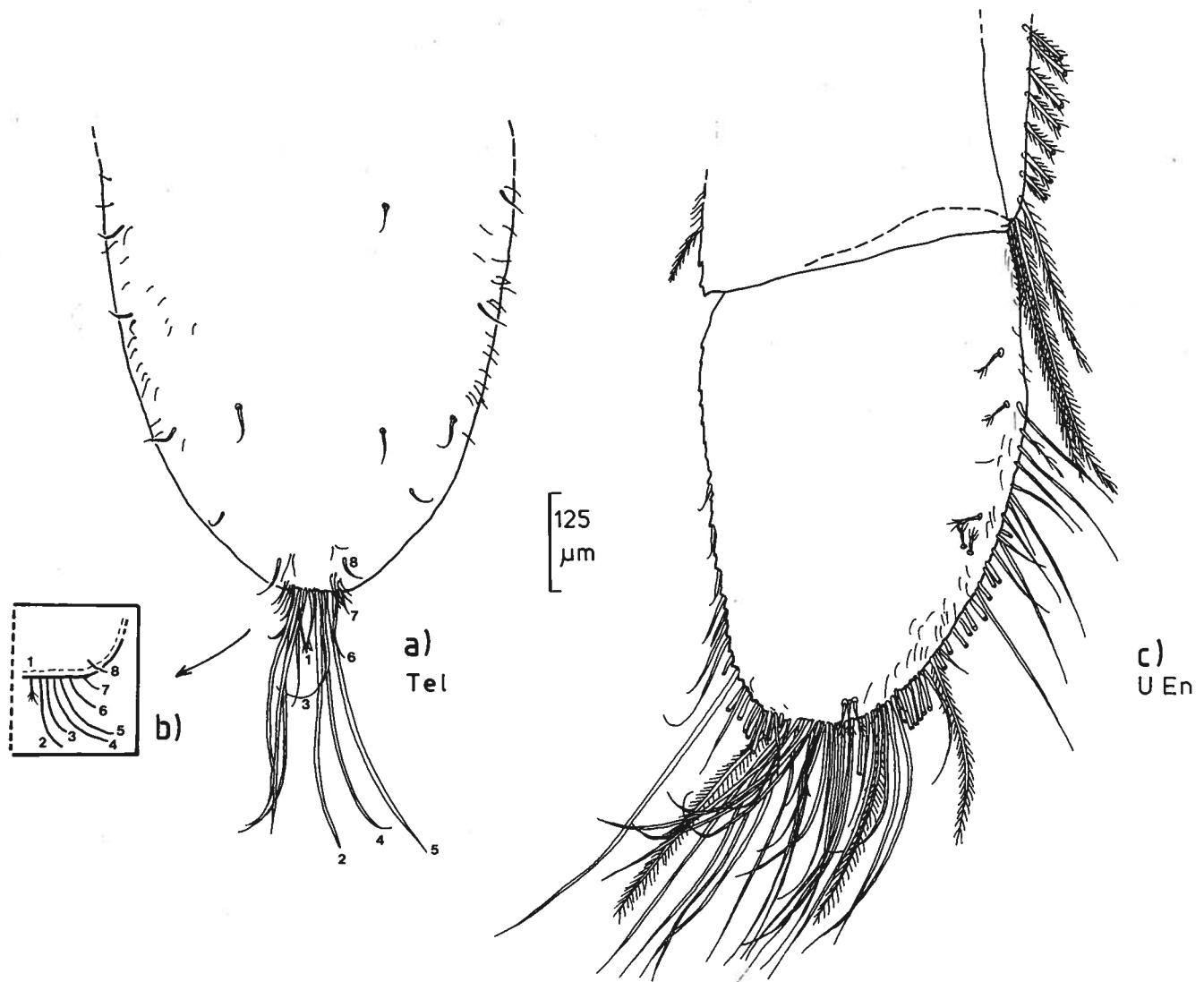


Fig. 11. *Mesanthura occidentalis* Menzies & Barnard, paratype.—a, b. Telsonic apex and schematic drawing of distal setation (b).—c. U Ep; most simple setae cut off.

propodus. Carpus distally rounded, palm of propodus with central projection, form and setation as in Fig. 5g; dactylus talon-like, distal claw as long as dactylus (Fig. 5f,g). P 2 with elongate, cylindrical propodus, palm bearing two rows of setae and short cuticular scales, distal sensory spine present; trapezoidal carpus short, merus broader than distal articles and longer than carpus (Fig. 6a,b). P 3 similar to P 2. Carpus of P 4–6 (Fig. 6d–f) longer in P 2/P 3, but still short trapezoidal, distal palm with 7 setae and 1 strong spine; propodus cylindrical, slightly curved, palm with few short setae and cuticular scales. P 6 similar to P 5, P 7 of holotype incomplete, regenerating. Pleopod 1 with enlarged operculiform exopod, bearing 59 swimming setae, endopod with 15 setae (Fig. 7a). Exopod of Plp 2 with 16, endopod with 10 swimming setae (Fig. 6g). Endopod of Urp considerably shorter than sympod, nearly as wide as long, with 90–100 marginal setae, some of them plumose (Fig. 7d). Exopod longer than sympod, of oval shape, distal margin deeply sinuous (Fig. 7e), margin bordered with plumose setae and among them some long simple setae. Telson linguiform, broadening distally, apically gently rounded. Apex bearing 9 pairs of setae (Fig. 7b,c). 2 statocysts present.

#### Discussion

Previous authors discerned many species of *Mesanthura* simply by their pigmentation. Meanwhile, several species with similar coloration are known (e.g. *Mesanthura pulchra*, *M. gerlachei*, *M. protei*) and a distinction of other, morphological features has become necessary. From the Californian coast only one species has been described until now, namely *M. occidentalis* Menzies & Barnard, 1959. This has a distinctive dorsal pattern, composed of more or less closed rings on pereonites 1–6. The new species *M. nubifera* has a different pattern with a less clear, patchy distribution of pigments, but at first sight its other features seemed to be similar to *M. occidentalis*. The original description of the latter species is very brief, and only with the help of a redescription (see below) could further differences be found: the manubial palp of *M. nubifera* bears a richer setation, the last article has 10 (instead of 5) setae. The antennae of *M. occidentalis* bear more short and more plumose setae. The 5 apical aesthetascs of the A 1 found in *M. nubifera* are unusual for this genus, and further specimens should be checked with regard to this feature. The basal part of the palm of P 1 is straighter and bears more setae in *M. nubifera*; the tailfan

is similar in both species, while the distal telsonic setation varies slightly. In the new species the telson has a smooth dorsal surface, while in *M. occidentalis* a few setae are present. For further comparisons more specimens have to be found, especially the males, which may show sexual dimorphism.

***Mesanthura occidentalis* Menzies & Barnard, 1959**

(Figs. 8–11)

Menzies & Barnard 1959: pp. 3–35, fig. 14.

*Material studied.* 1 immature adult, 7.5 mm, Allan Hancock Foundation, AHF No. 5710 (paratype).

*Locality.* Off Punta Concepcion, 34°27'15"N, 120°14'45"W, depth 11.3 m.

**Description of the paratype**

Dorsal pigment pattern as in Fig. 8a. Cephalon shorter than pereonite, slightly longer than broad, with small, rounded rostral projection, lateral eyes present. Relative length of pereonites:  $1 = 2 > 3 < 4 \approx 5 = 6 > 7$ . Pleonites 1–5 fused, together somewhat shorter than pereonite 7. Peduncle of A 1 with several scattered plumose setae; flagellum of 3 articles, last article with 7 setae and 3 aesthetascs (Fig. 8c). Flagellum of A 2 with short articles, bearing distally many simple setae (Fig. 8d). Md as in foregoing species, indented part of lamina dentata more protruding, distal palpal article with only 5 setae (Fig. 8b). Lateral endite of Mx with 7 distal teeth (sometimes only 6 are visible), medial endite short, with a short distal bristle (Fig. 9a). The Mxp of the paratype was lacking. Propodus of P 1 stout, subchelate, similar to foregoing species but with a different setation, medial projection of palm rounded, basal and distal part of palm concave (Fig. 8e). Propodi of P 2–7 elongate, slightly curved, shorter than in foregoing species (Fig. 9b), carpi of P 4–7 trapezoidal

(Figs. 9d, 10a,b). Exopod of Plp 1 operculiform, margin bearing 43 swimming setae, endopod with 11 swimming setae (Fig. 9c). Endopod of Urp longer than wide, margin bearing many simple and a few plumose setae (Fig. 11c), on the whole less than in *M. nubifera*. U Ex longer than sympod, of oval outline, distal margin sinuous as in foregoing species (Fig. 10c). Telson linguiform, broadening distally, apex rounded, with 8 pairs of setae (Fig. 11a,b), dorsal surface with some "hairs" and short setae.

**Acknowledgements**

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TIMOTHY D. STEBBINS