

# *Probosciphontodes* n. gen., a new genus of the family Ancorabolidae, with the description of two new species (Copepoda, Harpacticoida)

by Frank FIERS

## Summary

The new genus *Probosciphontodes* n. gen is erected for two new ancorabolid species: *P. stellata* n. sp. and *P. ptenopostica* n. sp. The former was found in sediment samples from the Comoros, the latter in samples from the northern coast of Papua New Guinea.

**Key-words:** Ancorabolidae, *P. stellata* n. sp., *P. ptenopostica* n. sp., Comoros, Papua New Guinea.

## Résumé

Le nouveau genre *Probosciphontodes* n. gen. est créé pour deux espèces de la famille des Ancorabolidae: *P. stellata* n. sp. et *P. ptenopostica* n. sp. La première a été trouvée dans des sédiments provenant de la Grande-Comore, la deuxième des sédiments provenant de la côte septentrionale de la Papouasie Nouvelle-Guinée.

**Mots-clefs:** Ancorabolidae, *P. stellata* n. sp., *P. ptenopostica* n. sp., Iles Comores, Papouasie Nouvelle-Guinée.

## Introduction

In the course of a study on the Laophontidae from the Indian and the West Pacific Oceans, two new species were found, representing a new genus of the family Ancorabolidae. *Probosciphontodes stellata* n. sp., found in sediment samples from the Comoro Islands, and *P. ptenopostica* n. sp., found along the northern coast of Papua New Guinea, are closely related and differ from each other mainly by the shape of the prae-anal segment.

At first sight, the difference between the two species is rather small. However, the presence or absence of an expanded segment is believed to be due to a heterochronic phenomenon in the phylogenesis of the species.

Recently, WELLS & HICKS (in *Monoculus* 16, May 1988) stressed the importance of illustrations of the habitus in the description of species. Indeed, the minor differences between the present species clearly demonstrate the necessity of such illustrations, since without them it is almost impossible to discriminate *P. ptenopostica* n. sp. from *P. stellata* n. sp.

The specimens were illustrated with the aid of a camera lucida. Dissected specimens were mounted in lactophenol,

and the coverglass sealed with glyceel. Preserved specimens are stored in 70 % neutralized alcohol and deposited in the collections of the "Koninklijk Belgisch Instituut voor Natuurwetenschappen", Brussels.

## Systematic account

### *Probosciphontodes* n. gen.

#### DIAGNOSIS

#### *Female:*

Body strongly depressed and characterized by peculiarly large lateral expansions of the somites; dorsal integument without sclerifications or peculiar ornamentations; rostrum fused with cephalothorax and strongly prominent; frontal rostral porus bearing a long hyaline tubular canal; furcal rami cylindrical; antennule four-segmented, with setulose setae on first and second segments; antenna with an inner sub-apical seta on the allobasis, without exopodite; P<sub>1</sub>-basis not transversally prolonged; basis of P<sub>2</sub>-P<sub>4</sub> transversally prolonged; first endopodal segment of P<sub>1</sub> twice as long as the exopodite; exopodites P<sub>2</sub>-P<sub>4</sub> three-segmented bearing respectively two, two and three outer spines on the third segment; endopodites of P<sub>2</sub>-P<sub>4</sub> absent; exopodite P<sub>5</sub> fused with the baseoendopodite; baseoendopodite transversally prolonged, without endopodal process but with two slender endopodal setae; endopodal part of P<sub>5</sub> with five setae: an outer, two apical and two inner ones.

#### *Male:*

Identical with the female in all aspects except for the unfused genital segments, the less pronounced lateral expansion of the first genital segment; absence of a P<sub>6</sub> and chirocer antennule.

#### TYPE-SPECIES

*P. stellata* n. sp., here designated.

## ETYMOLOGY

The generic name is a conjunction of the Latin word *proboscis* and the suffix *-phontodes* and refers to the obviously prolonged tubes of the rostrum. The gender is feminine.

## DISCUSSION

*Probosciphontodes* n. gen. is a unique genus in the family Ancorabolidae because of the absence of endopodites in the P<sub>2</sub>-P<sub>4</sub>. Other ancorabolid genera such as *Paralaophontodes* LANG, *Tapholaophontodes* SOYER and *Algeniella* COTTARELLI & BALDARI are characterized by reduced endopodal segments, but always have at least one endopodite present.

*Probosciphontodes* n. gen. is also distinct from the other ancorabolid genera by its strongly depressed body-shape and the particularly long lateral extensions of the pleural areas. Except for *Laophontodes expansus*, which has a depressed body, all other ancorabolid species have a more or less cylindrical body-shape. *Laophontodes* and *Paralaophontodes* show strong sclerifications of the lateral sides and have one or two curved expansions on the lateral side of the cephalothorax, but basically they still have a cylindrical body-shape.

Other remarkable features of *Probosciphontodes* n. gen. are the prominent rostrum, the conspicuously long hyaline tubes of the pores and the position of the legs. The long hyaline tubes are probably an adaptation of the secretorial system to the remarkable behaviour of these animals accumulating filamentous materials on the dorsum and between the lateral expansions of the somites. All the examined specimens were covered with a fine layer of such materials stuck on the pleurotergites by an adhesive substance. Attempts to remove this layer by ultrasonic treatment or by washing the animals in a 7.5 % KOH solution failed. The exact contours of the body became visible only under a strong microscopical light.

Leaving aside the question whether this behaviour is caused by the animals' search for food supply or functions as a kind of camouflage, it seems clear that the secretions produced by the integumental organs need to be brought outside the covering coat. The extension of certain pore-orifices with a long hyaline tube may be an accommodation of the secretorial system in order to release its products beyond the covering layer. The unmodified pores probably secrete the adhesive substance by means of which the filaments stick on the pleurotergites.

In harpacticoid copepods, dorsal and lateral surfaces of the somites are rarely covered up in this way. However, this peculiar phenomenon has been observed (pers. obs.) in the genera *Echinolaophonte* NICHOLLS (family Laophontidae, Laophontinae) and *Cletopsyllus* WILLEY (Normanellinae). The most primitive species of both genera were never seen bearing foreign materials on their pleurotergites, but some of the advanced members were always found with a lot of filamentous structures on their backs. As a matter of fact, *Echinolaophonte mirabilis* GURNEY, known only from the type-locality (Suez Canal) and from a locality along

the Chinese coast (ZHANG & LI, 1976), has been found in several other localities throughout the Indian Ocean and along the northern coast of Papua New Guinea. In nearly all cases the animals were entirely covered with foreign materials and only the legs and the antennulae were visible. *Probosciphontodes* n. gen. is undoubtedly a genus of the subfamily Laophontodinae as defined by LANG (1948), but how it is related to the other genera is not clear at all. Actually, the subfamily Laophontodinae comprises the genera *Laophontodes* T. SCOTT, *Paralaophontodes* LANG, *Tapholaophontodes* SOYER, *Algeniella* COTTARELLI & BALDARI and *Patagoniaella* PALLARES. *Laophontodes* and *Paralaophontodes* are sister-groups (adelphotaxa), sharing many features such as the sculpted dorsum (omitted in SARS, 1908, pers. obs.) and the transversally strongly extended bases of the P<sub>2</sub>-P<sub>4</sub>. On the other hand, *Tapholaophontodes*, *Algeniella* and *Patagoniaella* seem to be closely related and differ from *Paralaophontodes* and *Laophontodes* by the absence of ornamentations on the dorsal surfaces of the somites and the much smaller bases in P<sub>2</sub>-P<sub>4</sub>.

*Probosciphontodes* n. gen. takes an intermediary position between the two genus-groups. The legs of this genus closely resemble those of *Paralaophontodes*-*Laophontodes* but the fact that the pleurotergites have no peculiar sclerifications or ornamentations on the dorsal surfaces of the somites indicates a relationship of the genus to *Tapholaophontodes*, *Algeniella* and *Patagoniaella*.

***Probosciphontodes stellata* n. sp.**

## TYPE-LOCALITY

Comoro Islands, Grande Comore : Foubouni. Sand sample from the upper layer of a sandy patch between corals, collected at - 14 m. Leg. : "Groupe Plongée de l'Expédition Karthala '81". August 1, 1981, collection number : IG. 26330, station number 6.

## TYPE-MATERIAL

Holotype : one dissected female, mounted on a slide and labeled COP 2886; allotype : one dissected male, mounted on a slide and labeled 2887; paratypes : 1 dissected male (COP 2888), mounted on a slide and 1 female, 4 males and 1 juvenile female (fifth copepodid) preserved in alcohol (COP 2889).

## ETYMOLOGY

The specific name from the Latin word *stellatus*, refers to the particularly large lateral expansions of the pleurites of the somites resembling the radiations of a star.

## FIGURES

Holotype : Fig. 1b, c; Fig. 2a; Fig. 3a-g; Fig. 4a-e; paratype (female) : Fig. 1a; allotype : Fig. 1d; Fig. 2b.

DESCRIPTION

*Female (holotype) :*

Habitus (Fig. 1a, b, c) : body strongly depressed, leaf-like; length, including rostrum and furcal rami : 584  $\mu$ m; cephalothorax nearly a quarter of the entire body-length and oblong in dorsal view; anterior extension about half as long as the posterior one; dorsal surface of the cephalothorax with a strongly sclerified rib on both sides and running from the anterior expansion towards the posterior margin; thoracic segments, each with a large lateral blunt extension, arising from the posterior area of the pleural region; genital and abdominal segments (Fig. 1b) with smaller lateral extensions, but as conspicuous as the thoracic ones; thoracic extensions arising perpendicularly to the body-axis, abdominal extensions more or less posteriorly directed; prae-anal segment without protruded margins.

Anal segment (Fig. 1c) ovate in cross-section and about 2.5 times as wide as long; anal operculum convex and smooth; anal area hairy, having a large semi-circular smooth area in ventral view (Fig. 1b); furcal rami cylindrical, three times as long as wide; two lateral setae implanted in the middle of the outer margin, one lateral seta implanted on the outer distal edge; apical setae not fused; inner apical seta small, slightly longer than one third of the entire ramus; outer apical seta barbed along the outer margin of the stem and nearly twice as long as the ramus; all other furcal setae smooth; dorsal seta arising on a small socle, articulating on two basal parts and implanted in the apical third of the ramus.

Genital area (Fig. 1b & 3d) : represented as a small, strongly sclerified part of the outermost anterior edge of the first genital segment; clasping organ represented by two smooth setae.

Integumental structures : entire body densely clothed with very minute, irregularly implanted spinules; anterior margin of the cephalothorax and lateral margins of the pleural extensions of all somites set with long and slender spinules; postero-dorsal margin of the somites spinulose and hairy; ventral surface of the genital complex smooth; postero-ventral margin of the second genital segment hairy, that of the second and third abdominal segments spinulose.

Integumental organs : hair-sensillae implanted in a symmetrical pattern on the somites; prae-anal segment without sensillae; no pores observed on the cephalothorax; pores of the thoracic and abdominal segments with large external tubular projections (indicated with an arrow in the figures); peculiarly long tubes on the rostrum, the anal segment and the furcal rami; pore-tubes of the anal segment reaching far beyond the apical margin of the furcal rami, tubes on the furcal rami arising from the ventral apical edge and longer than the outer apical setae.

Rostrum (Fig. 3a) : strongly prominent and fused with the cephalothorax; lateral margins set with long and fragile spinules; sensillae implanted on a distinct socle; rostral tip with an apical pore bearing a long (longer than the entire length of the rostrum) hyaline tube.

Antennule (Fig. 2a) : four-segmented; aesthetasc implanted on the third segment; first segment three times longer than

wide, bearing a thick, feathered seta and several long and fragile spinules; second segment with eight feathered setae and a tuft of long spinules, as fine as a hair, and arising from a small bump on the outer margin of the segment; third segment nearly seven times longer than wide, with a tuft of spinules as in the former segment and with eight naked setae; ultimate segment bearing nine setae along the margins and two apical setae, the latter fused near their implantation; dorsal surface of the first and second segment clothed with minute spinules, irregularly set.

Antenna (Fig. 3g) : allobasis without exopodite but with a smooth and small seta implanted in the apical third of the inner margin; endopodite with two spines and a slender seta along the margin, and two spines and four (one very small) setae on the apical margin.

Mandible (Fig. 3b) : gnathobasis slender, bearing a single seta, four articulating teeth and a bilobed apical tooth; mandible-palp, one-segmented and cylindrical; endopodite represented by a single seta, exopodite by three setae; apical edge furnished with two feathered setae.

Maxillule (Fig. 3f) : arthrite rather long and slender, having two lateral setae and four apical spines; surface smooth except for a few minute spinules in the proximal half of the setulose margin; coxa represented as a small cylinder, one and a half times longer than wide, bearing two setae; basis tapering towards the apical edge and about twice as long as wide; setal formule of the basis : two endopodal, two exopodal and two apical setae.

Maxilla (Fig. 3e) : syn-coxa furnished with strong spinules and bearing two endites, each with two setae; basis typically prolonged, forming a hook-shaped process, bearing two naked setae.

Maxilliped (Fig. 3c) : proximal podomer having a single seta; second podomer with a tuft of spinules near the middle of the inner margin and along the distal half of the outer edge; claw short and strong, toothless, and bearing a smooth seta.

Table I :

*Chaetotaxy of the legs of Probosciphontodes n. gen.*

	P <sub>1</sub>	P <sub>2</sub>	P <sub>3</sub>	P <sub>4</sub>
exo	0-0-022	0-0-022	0-0-022	0-0-23
end	0-111	—	—	—

P<sub>1</sub> (Fig. 4a) : basis not transversally prolonged, having divergent lateral margins; outer seta of the basis implanted in the middle of the margin, the inner one implanted near the inner distal edge; exopodite three-segmented (chaetotaxy in table I), bearing geniculated setae on the second and third segment; first endopodal segment twice as long as the exopodite and nearly four times as long as wide; inner margin of the first endopodal segment with a few fragile spinules; second endopodal segment quadrate, having a small seta on the inner edge, a strong toothless claw and a long naked seta implanted on the posterior surface.

P<sub>2</sub>-P<sub>4</sub> (Fig. 4b, c and d, respectively): coxae well developed, having strongly sclerified margins and some small rows of sharp spinules; bases strongly prolonged, four times longer than wide; outer margins spinulose, surfaces smooth; outer seta of the bases smooth in P<sub>2</sub> and P<sub>4</sub> but setulose in P<sub>3</sub>; porus near the seta with a long external hyaline tube in P<sub>2</sub> and P<sub>4</sub> but without a similar tubular structure in P<sub>3</sub>; endopodite absent without any trace of a former articulation or implantation of setae; exopodite three-segmented; exopodal outer spines set with strong spinules except for the spines of the second and third segment of the P<sub>3</sub>-exopodite; inner apical seta of the third segment slender and smooth.

P<sub>2</sub> and P<sub>3</sub> situated in a plane perpendicular to the body-axis; exopodite P<sub>2</sub> in a position oblique to the axis of the basis but the axis of the P<sub>3</sub>-exopodite nearly parallel to the axis of the basis; P<sub>4</sub> directed posteriorly with the exopodite parallel to the exopodite of the P<sub>5</sub>.

P<sub>5</sub> (Fig. 4e): baseoendopodite and exopodite fused, forming an L-shaped appendage with the axis of the baseoendopodite nearly parallel to the ventral surface of the body; surface of the P<sub>5</sub> with several rows of spinules and hyaline tubes of the pores (indicated with an arrow in Fig. 4e); baseoendopodite with two slender and naked endopodal setae, implanted near the articulation of the P<sub>5</sub> with the somite; outer baseoendopodal seta implanted on a long cylindrical structure; exopodite (i.e. the part above the outer baseoendopodal seta) tapering distally and bearing one outer, two inner and two apical setae; stem of the exopodal setae naked or furnished with a plume of strong spinules;

#### Male (allotype):

Habitus as in the female except for the following differences:

- sixth thoracic (first genital) segment not fused with the first abdominal one;
- lateral expansions of the genital and abdominal segment less developed, but still very distinct;
- postero-ventral margin of the first abdominal segment hairy as in the female but with an additional median row of strong spinules.

Antennule (Fig. 2b): five-segmented, chirocerate; shape and setal number of first and second segments as in the female; third segment rather small, with five setae; fourth segment ovate and bearing three setae; ultimate segment with four lateral and two apical setae.

P<sub>6</sub> (Fig. 1d): not differentiated as a distinct leg.

#### Copepodid V (female):

Resembling the adults in all aspects, except for the less pronounced lateral extensions on the abdominal segments and the free genital segments; body with nine somites.

Mouthparts and legs as in adults, differing from them in the less dense ornamentation of spinules along the margins of the podomeres.

Genital area or P<sub>6</sub> absent.

### Probosciphontodes ptenopostica n. sp.

#### TYPE-LOCALITY

Papua New Guinea, Madang province: Megiar Harbour. Coral and sand from shallow tidal pools, north of the shipyard. Leg. Dr. J. VAN GOETHEM, July 21, 1981, collection number: IG. 26373, station number 81/496.

#### TYPE-MATERIAL

Holotype: one dissected female, mounted on a slide and labeled COP 2890; allotype: one dissected male, mounted and labeled COP 2891; paratypes: 5 females, 2 males and 1 juvenile female (fifth copepodid) preserved in alcohol, COP 2892.

#### ETYMOLOGY

The specific name is a conjunction of the Greek word *ptenos* (having wings) and the Latin word *postica* (the last). The specific name refers to the expansion of the prae-anal segment, discriminating the species from its congener.

#### FIGURES

Holotype: Fig. 2d; paratype (Cop. V, female): Fig. 4c.

#### DESCRIPTION

*P. ptenopostica* n. sp. resembles *P. stellata* n. sp. in many aspects. The description deals exclusively with the differences between the two species.

Habitus (Fig. 2d): prae-anal segment with lateral extensions, about half as long as the extensions of the former segment, but distinctly present and furnished with long spinules along the anterior and apical margins; anal operculum with slightly longer integumental structures on the surface and with some hairs on the margin.

Integumental organs: dorso-median pores of the last thoracic segments without a tubular extension; dorso-median pore of the second genital segment much longer than in *P. stellata* and reaching the posterior margin of the next segment.

Rostrum: tubular extension of the frontal pore shorter than the length of the rostrum.

Furcal rami with straight inner margins, apical outer seta as long as the inner one and only half as long as the supporting ramus; dorsal seta with two equal basal parts; tube of the pores of the anal segment and the furcal rami as long as in the preceding species.

Antennule and mouthparts as in *P. stellata* except for the maxillule, having the endopodite represented by a single seta only.

#### Copepodid V (female):

Habitus as in the female copepodid V of *P. stellata*; prae-anal segment indistinct (Fig. 2c); lateral margins of the

anal-prae-anal segment complex without any trace of lateral expansions.

Furcal rami 2.5 times longer than wide, bearing the same ornamentations and chaetotaxy as the adults.

#### DISCUSSION

At first sight, *P. stellata* n. sp. and *P. ptenopostica* n. sp. differ from each other by some minor details, namely the length of the tubular projections on the rostrum and on the genital segments, the length of the outer apical furcal seta and the shape of the inner margin of the furcal rami. However, the main diagnostic feature between the two species is the presence or absence of lateral extensions on the prae-anal segment. These additional lateral expansions of the pleural area are typical for *P. ptenopostica* n. sp. In both species the female fifth copepodid lacks lateral expansions on the prae-anal segment (which is still fused with the anal one, Fig. 2c). During the final moult, the prae-anal segment becomes separated and develops lateral

extensions comparable with the extensions of the preceding segments only in *P. ptenopostica* n. sp.

The absence or presence of processes on the prae-anal segment obviously results from a heterochronic shift (McNAMARA, 1986) in the phylogenesis of the species. However, without a known adelphotaxon it is impossible at this moment to decide whether the pattern resulted from peramorphosis or paedomorphosis (terminal addition or terminal deletion *sensu* KLUGE & STRAUSS, 1985).

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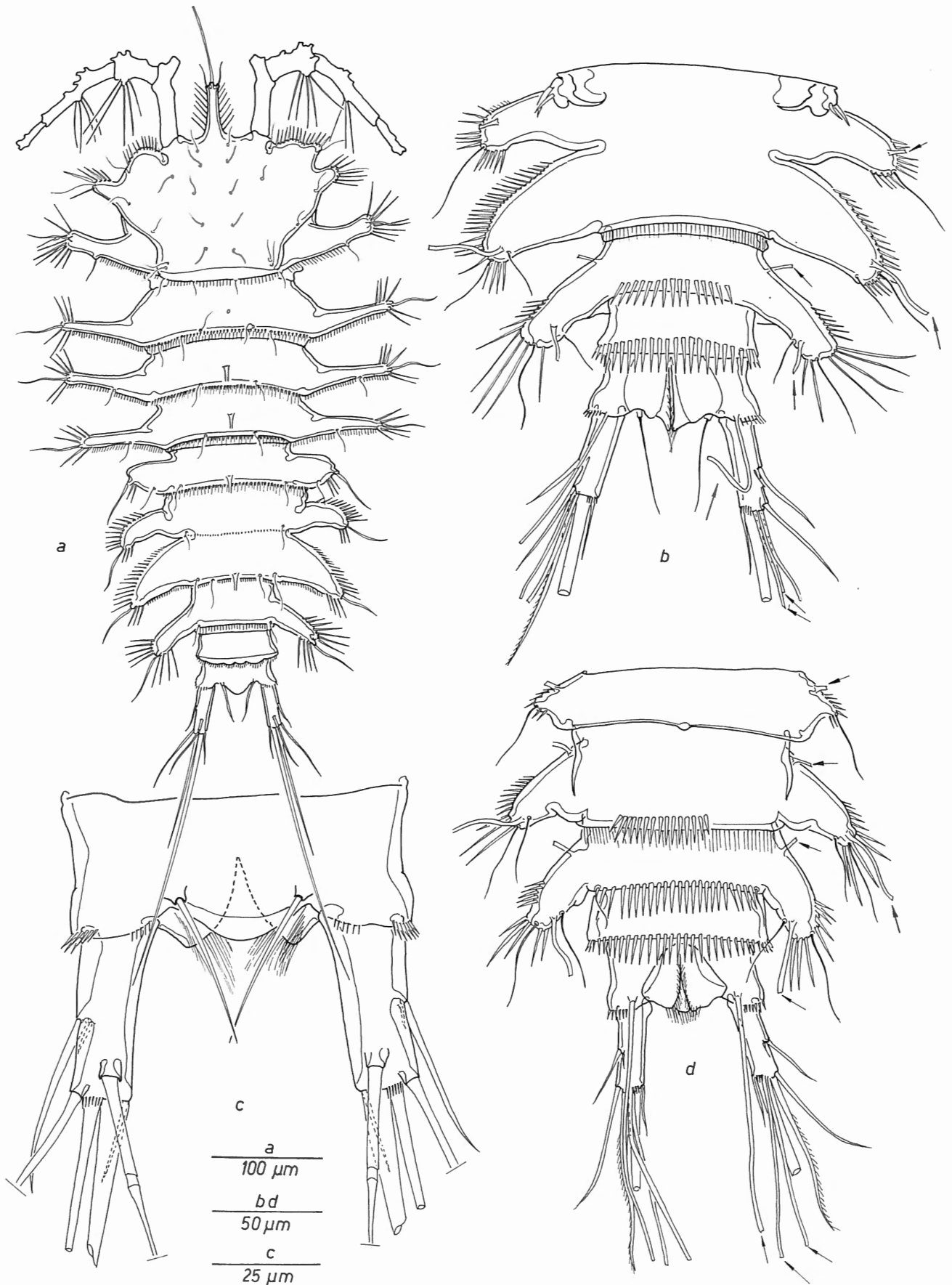


Fig. 1. – *Probosciphontodes stellata* n. gen., n. sp.: a. habitus in dorsal view; b. abdomen in ventral view; c. anal segment and furcal rami in dorsal view; d. abdomen in ventral view (a-c of the female; d of the male).

Fig. 2. – *Probosciphontodes stellata* n. gen., n. sp.: a. antennule in ventral view; b. antennule in dorsal view; *P. ptenopositica* n. sp.: c. abdomen of the copepodid V, in dorsal view; d. abdomen in dorsal view (a, c-d of the female; b of the male).

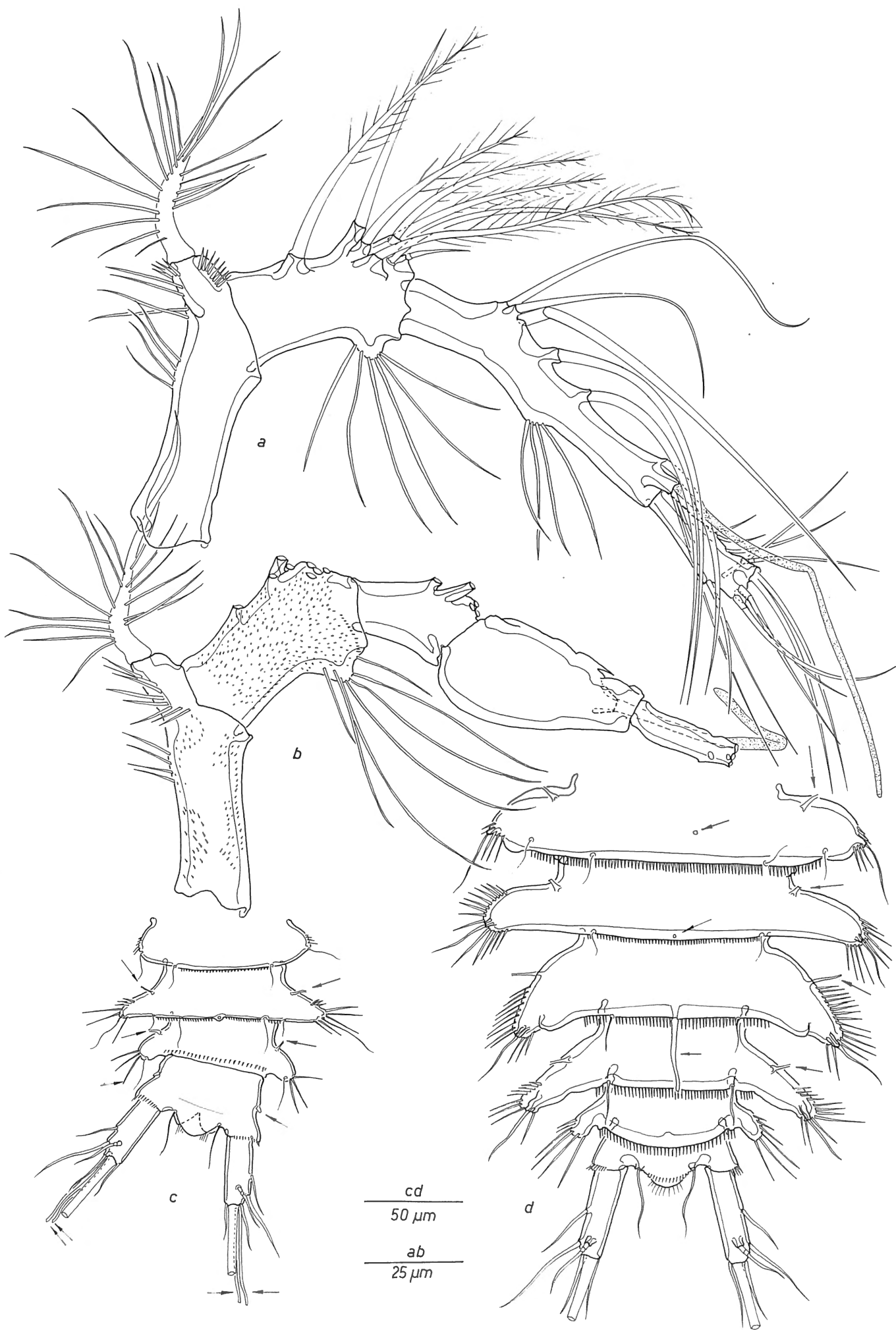








Fig. 4. – *Probosciphontodes stellata* n. gen., n. sp.: a.  $P_1$ ; b.  $P_2$ ; c.  $P_3, P_4$ ; e.  $P_5$  (a-e of the female).

Fig. 3. – *Probosciphontodes stellata* n. gen., n. sp.: a. rostrum; b. mandible; c. maxilliped; d. lateral side (clasper) of the female genital field; e. maxille; f. maxillule; g. antenna.