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A Revision of the Genus *Euthelepus* (Terebellidae: Thelepinae)

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ABSTRACT. The genus *Euthelepus* is redefined, and of the 7 species currently assigned to it only 2 species belong to the genus, plus a newly described species *E. serratus* n.sp. The remaining species belong either to *Thelepus* or *Streblosoma*. A full description of each species is given where necessary, based upon a re-examination of type material. A key to the species of *Euthelepus* is given. Comments are made upon the validity of some of the characters which have been used traditionally in terebellid taxonomy.

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The genus *Euthelepus* was erected by McIntosh (1885) for *E. setubalensis,* and since then 7 other species have been assigned to the genus, plus the new species *E. serratus* described in this paper. However, on examining the literature it became apparent that *Euthelepus* was a mixture of species belonging to several genera. We therefore decided to examine type material of all the species which had been assigned to the genus, redescribe the species where necessary and assign it to correct genus.

Of the eight species which have been assigned to this genus, two species—*E. setubalensis* McIntosh, 1885, the type species, and *E. kinsemboensis* Augener, 1918—belong to the genus *Euthelepus*, plus a new species described in this paper. The remaining 6 species belong to either *Thelepus (E. malayensis* Caullery, 1944, *E. tenuis* (Verrill, 1900), *E. abranchiatus* Hartman & Fauchald, 1971 and *E. pascua* Fauchald, 1977a) or *Streblosoma (E. chilensis* McIntosh, 1885 and *E. atlanticus* Hartman & Fauchald, 1971). This has also necessitated the redefining of the genus *Euthelepus* and in the Discussion we comment on the usefulness of some of the generic characters which have been used in the subfamily Thelepinae.

The following abbreviations have been used in the text:

AHF Allan Hancock Foundation, Los Angeles
AM The Australian Museum, Sydney
BMNH British Museum of Natural History, London
HZM Zoologisches Institut und Zoologisches Museum der Universitét Hamburg, Hamburg
USNM National Museum of Natural History, Washington, D.C.
YPM Peabody Museum of Natural History, Yale University, New Haven
ZMA Zoologisch Museum, Universiteit van Amsterdam, Amsterdam.

TAXONOMIC ACCOUNT

Genus *Euthelepus* McIntosh

Euthelepus McIntosh, 1885:465.

Type species. *E. setubalensis* McIntosh

Prostomium compact, with numerous grooved buccal tentacles. Three pairs of long, thick filaments, relatively sparse in number on segments 2, 3 and 4. Notosetae present from segment 3 and continuing for a variable number of segments. Notosetae either all smooth-tipped or a mixture of smooth-tipped and serrated setae. Neurosetae present from segment 5, continuing to pygidium; uncini with dorsal attachment button. Lateral lobes present on segments 2-3 and sometimes 4.

Key to species of *Euthelepus*

1. All notosetae smooth-tipped. ... *E. setubalensis*

——Notosetae of 2 kinds, smooth- and serrate-tipped. 2

2. Small, digitiform post-setal lobe present on some anterior notopodia. . *E. kinsemboensis*

——Post-setal lobe absent on anterior notopodia. ..... *E. serratus* n.sp.

Euthelepus kinsemboensis Augener

Figs 1a–d; 4a

Euthelepus kinsemboensis Augener, 1918: 548, pl. 6 fig. 161, pl. 7 fig. 250, text-fig. 93; Fauvel, 1930: 553–4, fig. IX a–f; Day, 1967: 726, fig. 36.5 e–i.

Material examined. HOLOTYPE (HZM V896): Kinsembo, Angola, coll. A. Hupfer; consists of two fragments, an anterior one of 2.5 mm length, 12 setigers, 0.7 mm width in good condition and a posterior fragment about 2.0 mm long, 7 setigers, 0.4 mm width extremely flattened, in poor condition.

Description. Body slender, brittle. Prostomium obscured. Buccal tentacles thick, deeply grooved, with a crenate margin, extending beyond setiger 12. Eyespots not visible. Peristomium ventrally with a shelf-like lower lip; a deep cleft separating the peristomium from segment 2 ventrally (Fig. 1a). Lateral lobes small, 2 pairs, present on segments 2 and 3, anterior pair slightly larger and slightly ventrally displaced; a third pair of very small lateral lobes present on segment 4. Branchiae long, with slightly tapered filaments on segments 2–4 arranged as follows: segment 2, 6 in a continuous line;

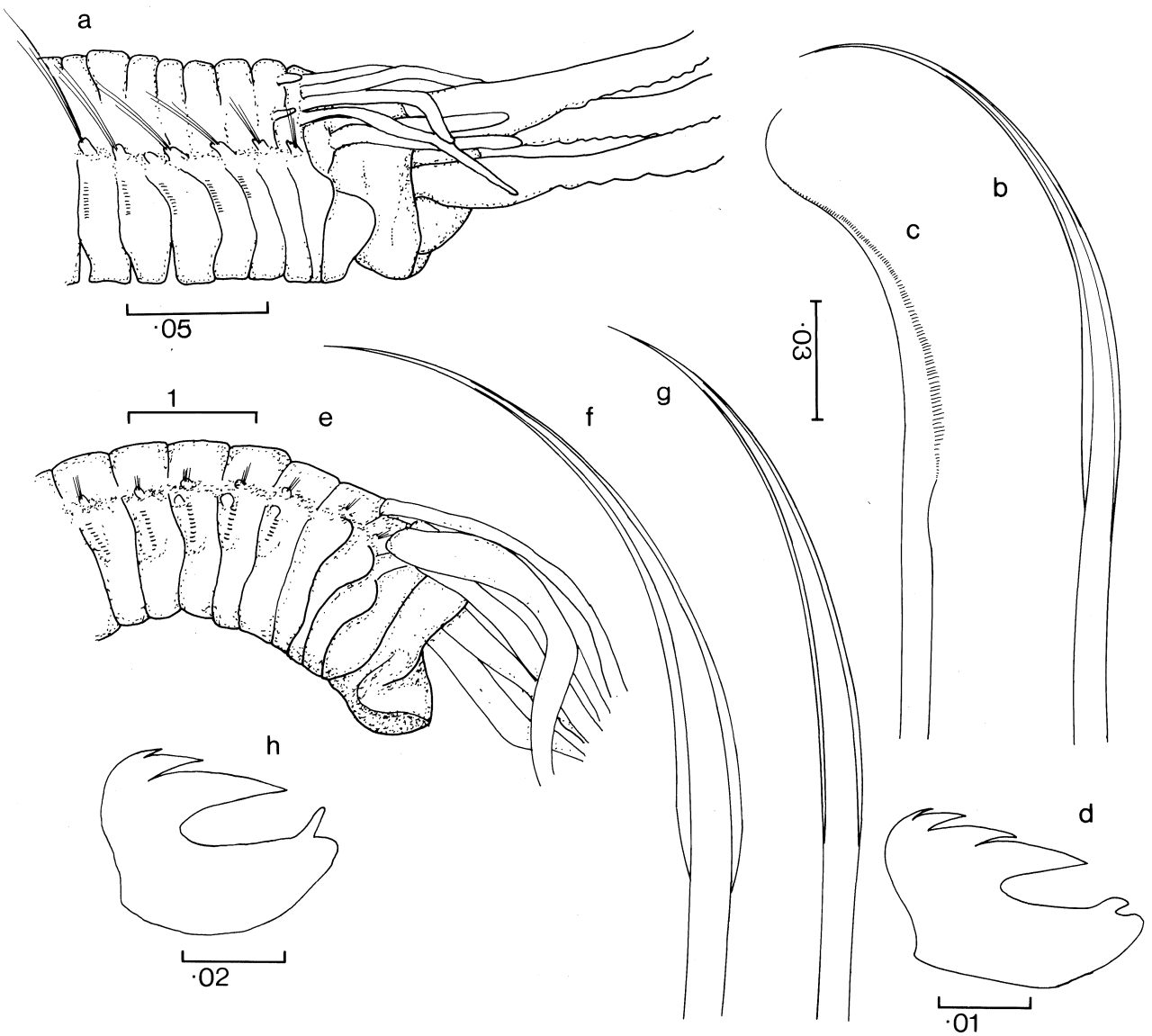

Fig. 1. *Euthelepus kinsemboensis,* holotype: **a**, head end, dorsolateral view; **b, c**, two types of notosetae from setiger 12; **d**, uncinus from setiger 12. *Euthelepus setubalensis,* holotype: **e**, head end, lateral view; **f, g**, two notosetae from setiger 10; **h**, anterior uncinus. All measurements in mm.

segment 3, 4 in a continuous line; segment 4, 2 filaments, with a very small medial gap.

Notosetae from segment 3, extending for at least 19 setigers; two types including smooth, broad winged capillaries and finely serrated capillaries of similar length (Fig. 1b,c). Notopodia of at least first 12 setigers with small, digitiform post-setal lobes. Avicular uncini from segment 5, arranged in single, short rows. Uncini with a hooked dorsal button and pointed prow (Figs 1d; 4a); dental formula of anterior uncini varying within a row as follows: MF:2:3:6–10 with the most distal row possibly comprising two rows. Uncinial tori low, rectangular. Nephridial papillae absent. Ventral pads distinct on segments 5–13.

Comments. *Euthelepus kinsemboensis* most closely resembles the new species, *E. serratus* n.sp., in having serrated as well as smooth notosetae. The serrated notosetae in this species, however, are the same length as the smooth type, not shorter as in *E. serratus* n.sp.

Day (1967) suggests that *E. kinsemboensis* should possibly be transferred to the genus *Amphitrite* which also has serrated notosetae and lateral lobes, even though in *Amphitrite* the first notosetae start on segment 4 (seg. 3 in *Euthelepus).* We feel however, that the segment on which the notosetae begin is an important generic character, at least in adult animals. In addition, *E. kinsemboensis* would seem to share more characters in common with *Euthelepus* (presence of lateral lobes, notosetae from segment 3, uncini from segment 5, 3 pairs of branchiae, form of uncini, form of serrated notosetae) than with *Amphitrite.* The serrated notosetae in *E. kinsemboensis* and probably in Thelepinae in general appear to be quite different from those in the Amphitritinae.

Habitat. Littoral and sub-littoral, coral reefs at Ile des Pins.

Distribution. Angola; Ile des Pins, New Caledonia.

Euthelepus serratus n.sp.

Figs 2a–e; 4b; Pl. 1a–f

Material examined. HOLOTYPE: Wreck Bay, New South Wales, 150°37′E 35°20′S (AM W199007) complete, 82 setigers, 54 mm long, 2.2 mm wide (maximum). PARATYPES: Port Gregory, Western Australia, 114°15′E 28°12′S, 1(AM W5443), 1(USNM 97887); Two Islands, Great Barrier Reef, Queensland 15°09′S 145°27′E 1(BMNH ZB 1985. 95). Paratypes incomplete, ranging in width from 1.6–2.2 mm.

Description. Body long, uniformly slender throughout. Prostomium large, horse-shoe shaped, slightly inflated with smooth surface, posteriorly forming a tentacular ring, slightly deflated posteriorly. Tentacles with a deep medial groove and crenate margins arising from anterior edge of tentacular ring. Posterior edge of tentacular ring with numerous small, red eyespots in a broad band, widest laterally. Peristomium equal in length to segment 2, with a thickened anterior margin on dorsal surface, ventrally forming a large, plaque-like lower lip (Fig. 2a).

Branchiae arising from anterior margin of segments 2–4, short, tapered with many irregular transverse wrinkles. Numbers of filaments on segments 2–4 respectively as follows: 13, 8, 4; filaments extending across dorsum in 1 row on segments 2, 3, without medial gap; on segment 4 a small medial gap present. Two pairs of small lateral lobes on segments 2–4, extending slightly ventrally, each with a crenate margin.

Notosetae from segment 3, extending for 44 setigers, of two types including long, smooth, narrow-winged capillaries and shorter, finely serrated capillaries (Fig. 2b,c; Pl. 1a–e). Notopodial lobes elongate, rectangular throughout with glandular pocket at base. Avicular uncini from segment 5, arranged in single, straight to slightly curved rows to pygidial segment; uncinial rows in posterior part of abdomen about ⅓ length of thoracic ones. Uncini with prominent, hooked dorsal button (Figs 2d,e; 4b), dental formulae variable, with a row as follows: MF:2:1–2 (anterior rows), MF:2:2–4:4–6 (posterior rows) (Pl. 1f). Uncinigerous tori on glandular pads, slightly raised from body wall throughout, decreasing in size posteriorly.

Nephridial papillae absent. Ventral pads distinctly glandular on segments 2–10, thereafter ventrum increasingly dissected, glandular to setiger 24, followed by a narrow medial groove to near pygidium.

Variation. The paratype material generally resembles the holotype closely. The dorsal surface of the prostomium appears papillate in some specimens. The number of eyespots in the Queensland specimen is considerably fewer and they are absent on the medial portion of the tentacular ring. Branchial filaments short, tapered in all specimens, varying in number as follows: segment 2, 11–14; segment 3, 8–9; segment 4, 2–4. Lateral lobes often smooth, without crenate margin.

The number of pairs of notosetae ranges from 32–42. Uncini taken from setiger 5 and a posterior setiger show the following variation between animals: MF:2–3:1–2 (setiger 5), MF:2–4:3–6:4–10 (posterior rows). The abdominal uncinial tori in the specimens from Port Gregory (AM W5443) are slightly more elongate than in the holotype, reaching ⅓ the body width in some far posterior setigers.

Comments. *Euthelepus serratus* shows typical characters of the genus, i.e. branchiae on segments 2–4, lateral lobes present, notosetae from the second branchial segment (segment 3), and uncini present from the first post-branchial segment (segment 5) (after Fauchald, 1977b). Like *E. kinsemboensis,* however, it differs from the type species in having serrated as well as smooth notosetae. Although the presence of such setae is often considered of generic importance in the Amphitritinae, it is not thought to be the case in the Thelepinae (see Discussion). The serrated notosetae of *Euthelepus serratus* are quite different from anything found in the Amphitritinae and are thought to represent an extreme example of a modified smooth seta in which the chiton layers comprising the blade have separated (Pl. 1a, b). For this reason the species is put into the

genus *Euthelepus*.

The holotype of *E. kinsemboensis* was also examined and compared with the new species. *Euthelepus kinsemboensis* differs from *E. serratus* in having postsetal notopodial lobes in some anterior setigers, and in the form of the notosetae. In *E. kinsemboensis,* the serrated notosetae are the same length as the smooth notosetae whereas in *E. serratus* n.sp. the serrated type is considerably shorter. In addition, the smooth notosetae in *E. kinsemboensis* have greater development of the wing than in the new species. The form of the uncini in both species is very similar.

The apparently discontinuous distribution of the species probably reflects the lack of subtidal collecting which has occurred off the Australian coast.

Habitat. Rocky substrates, often associated with detritus, 1–20 m.

Distribution. Australia (Port Gregory, Western Australia; Wreck Bay, New South Wales; Two Isles, Queensland).

Etymology. The specific name *serratus* refers to the serrated notosetae, and is a Latin adjective.

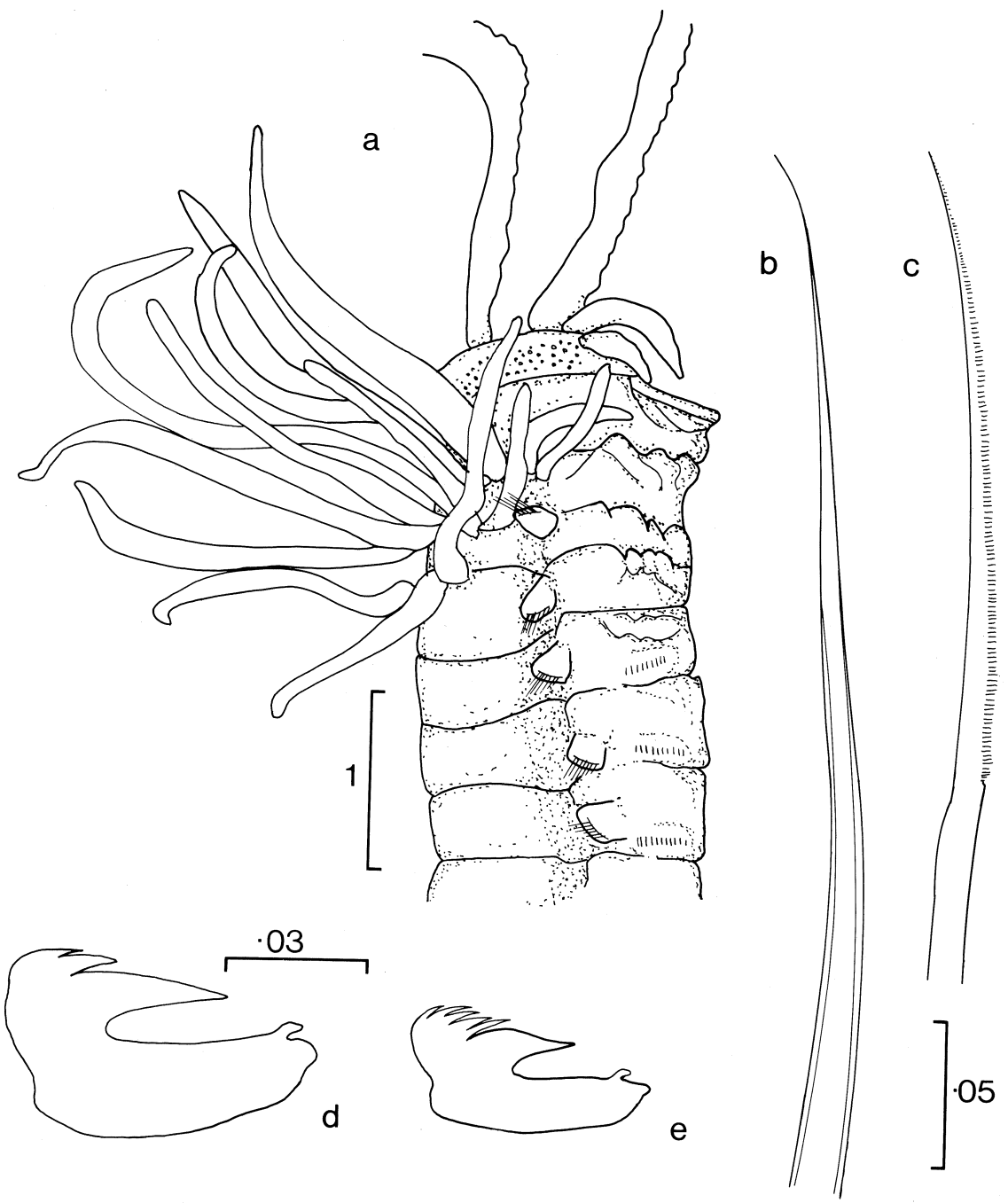

Fig. 2. *Euthelepus serratus* n.sp., holotype: **a,** head end, lateral view; **b, c,** two types of notosetae from setiger 10; **d,** anterior uncinus; **e,** posterior uncinus. All measurements in mm.

Euthelepus setubalensis McIntosh

Figs 1e–h; 4c

Euthelepus setubalensis McIntosh, 1885: 465–467, pl. L fig. 4; pl. XXVIIIA fig. 13; Fauvel, 1927: 275–276; Amoureux, 1974: 146, 148, fig. 6.

Material examined. HOLOTYPE: collected off Setubal, Portugal (BMNH ZK 1885.12.1.358). Specimen in two pieces, anterior portion including head 3.2 mm long, 9 segments, 1.4 mm wide, posterior portion incomplete, 7.2 mm long, 10 segments, 1.4 mm wide.

Description. Body small, robust, anterior segments short, well defined. Prostomium short, broadly U-shaped with shallow, transverse grooves on dorsal surface, ventrally forming longitudinally grooved upper lip, posteriorly produced as a marginally thickened, upturned tentacular ring. Buccal tentacles missing. Peristomium a complete ring dorsally, slightly longer than segment 2, ventrally forming lower lip, about 2x length of segment 2. Lateral lobes poorly developed, rounded, present on segments 2–4; slight lateral thickening on peristomium resembling a fourth lateral lobe (Fig. 1e).

Branchiae on segments 2–4 represented by long, thick,

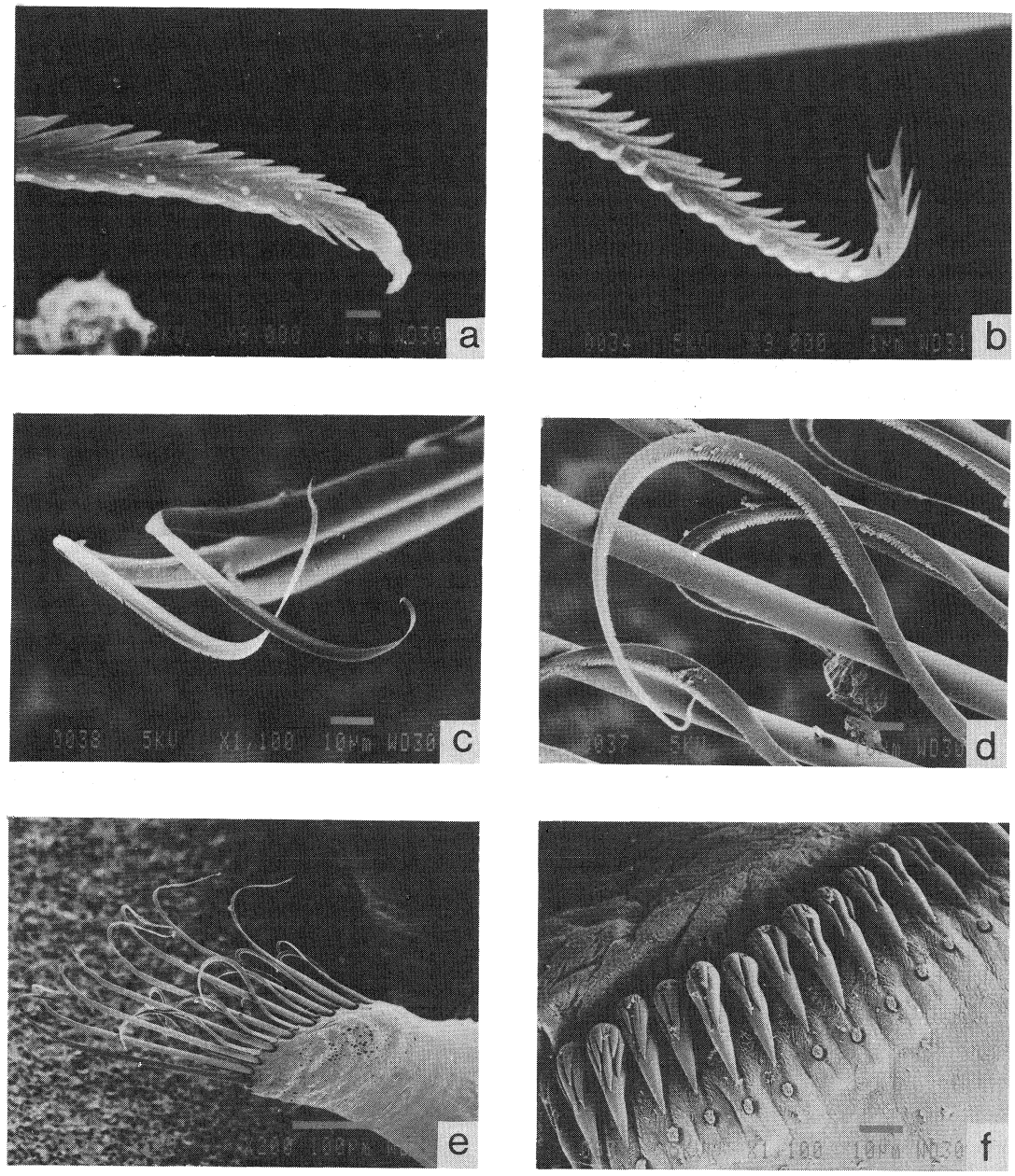

Plate 1. Scanning electron microscope photographs of *Euthelepus serratus* n.sp. showing: **a,** tip of a long, nominally smooth type seta (x9,000); **b,** tip of a short serrated type seta (x9,000); **c,** as a, (1,100x); **d,** as b, (1,100x); **e,** notosetal fascicle from midbody showing two types of notosetae (200x); **f,** mid section of uncinial row from midbody (1,100x).

annulated, simple filaments, arising from anterior margin of segment, arranged as follows: segment 2, 1 + 1; segment 3, 1 + 1; segment 4, 1 + 1. Filaments on segments 2 and 4 displaced toward midline, with very small medial gap; filaments on segment 3 just dorsal to notosetae and separated by a large medial gap.

Notosetae are smooth, winged capillaries (Fig. 1f,g), extending from segment 3 for at least 17 segments; first 2 pairs with reduced notosetae, no notopodial lobes; subsequent pairs with small, dome-shaped notopodial lobes projecting from glandular pockets. Avicular uncini present from segment 5, arranged in straight rows on poorly developed, sessile tori. Uncini with elongate dorsal button, and well developed prow (Figs 1h; 4c); dental formula variable in one row as follows: MF:2:2:2:α. Nephridial papillae small, globular, present on posterior edge of segments 5–7 in line with top of uncinial row. Entire ventrum of first 9 segments glandular, discrete pads absent; posteriorly, anterior margin of segments with a narrow glandular strip connecting notopodia and neuropodia of one side with those of the other.

Comments. Many of the notosetae in the type specimen have damaged tips, but it appears that only smooth setae are present. Lateral lobes, although small, are present on segments 2–4. The only other Thelepinae having lateral lobes are *Euthelepus kinsemboensis* and *E. serratus* n.sp. Both of these species may be distinguished from *E. setubalensis* in having serrated as well as smooth notosetae.

In the original description, McIntosh states that rudimentary bristle tufts (notosetae) are present on all three branchiferous segments (segments 2–4), but we could detect bristle tufts only on segments 3 and 4 in the type specimen. Similarly, Day (1963), on re-examining the type, found that notosetae began on segment 3. Caullery (1915), in a key to the Thelepinae, states that notosetae start on segment 3 in *Euthelepus,* although we are unsure how he arrived at this conclusion or if he looked at the type species.

McIntosh believed that this genus could be distinguished from other genera within the Thelepinae in regard to the structure and arrangement of the branchiae and the shape of the uncinus, in particular the position and orientation of the attachment button. However, we feel that the shape and arrangement of branchiae is not a good generic character in the Thelepinae, although it is a good specific character (Hutchings & Glasby, in press) and is probably related to the depth (see Discussion).

Habitat. Mud, calcareous sediment, 360–900 m.

Distribution. Atlantic Ocean, off Portugal.

Genus *Streblosoma* Sars

Streblosoma Sars, 1872 : 413.
Grymaea Malmgren, 1866 : 388. Not Fresenius, 1858 (Protozoa).
Eugrymaea Verrill, 1900 : 662.

Type species. *Grymaea bairdi* Malmgren, 1866.

Tentacular lobe short and compact, numerous buccal tentacles. Nil to 3 pairs of simple unbranched branchial filaments. Notosetae present from segment 2 (1st branchiferous) and continuing for a variable number of segments, setae smooth-tipped, capillaries. Uncini present from segment 5 (setiger 4).

Streblosoma atlanticus (Hartman & Fauchald) new combination

Figs 3a; 4d

Euthelepus atlanticus Hartman & Fauchald, 1971: 172–174, pl. 29 figs a–d.

Material examined. HOLOTYPE (AHF Poly 0918): incomplete, 16 setigers, 8.1 mm long, 0.6 mm wide. PARATYPES: many (AHF Poly 0919) ranging from 11–25 mm long, 0.8–1 mm wide. All specimens collected from Station A73, 39°46.5′N 70°43.3′W north-west Atlantic.

Comments. The description given by Hartman & Fauchald, 1971 appears to be a composite description based on the paratypes. The holotype lies outside the size range given in the description and is also without a pygidium, yet a pygidium is mentioned in the description. Nevertheless, the holotype agrees with the description in all respects except one. A very small pair of notosetae consisting of only a few setae in each fascicle occurs on the first branchiferous segment (segment 2) arising just posterolaterally to the branchiae. The paratypes also appear to have notosetae from segment 2, although in the smallest animals the exact position of commencement could not be determined. The notosetae on segment 2 were overlooked by Hartman & Fauchald, who stated that the first pair occurs on the second branchiferous segment (segment 3).

In the holotype, notosetae are all smooth, winged capillaries (Fig. 3a). The first 2 setigers have no notopodial lobe, subsequent setigers to setiger 14 (the first of the longer, cylindrical segments mentioned by Hartman & Fauchald) have prominent, rectangular notopodial lobes; from setiger 14 the notopodial lobes are slightly reduced in size. Uncini start on segment 5 (setiger 3) as stated by Hartman & Fauchald. Dental formula for uncini on setiger 4 has the following range: MF:3–4:5–7:8–10:α. Uncini have a prominent up-turned dorsal button (Fig. 4d) and are arranged in short, slightly curved rows located immediately below the notopodia on sessile tori.

For comments as to why we are transferring this species to the genus *Streblosoma* see Discussion.

Habitat. Slope depths, 1330–1470 m.

Distribution. Known only from the north-west Atlantic.

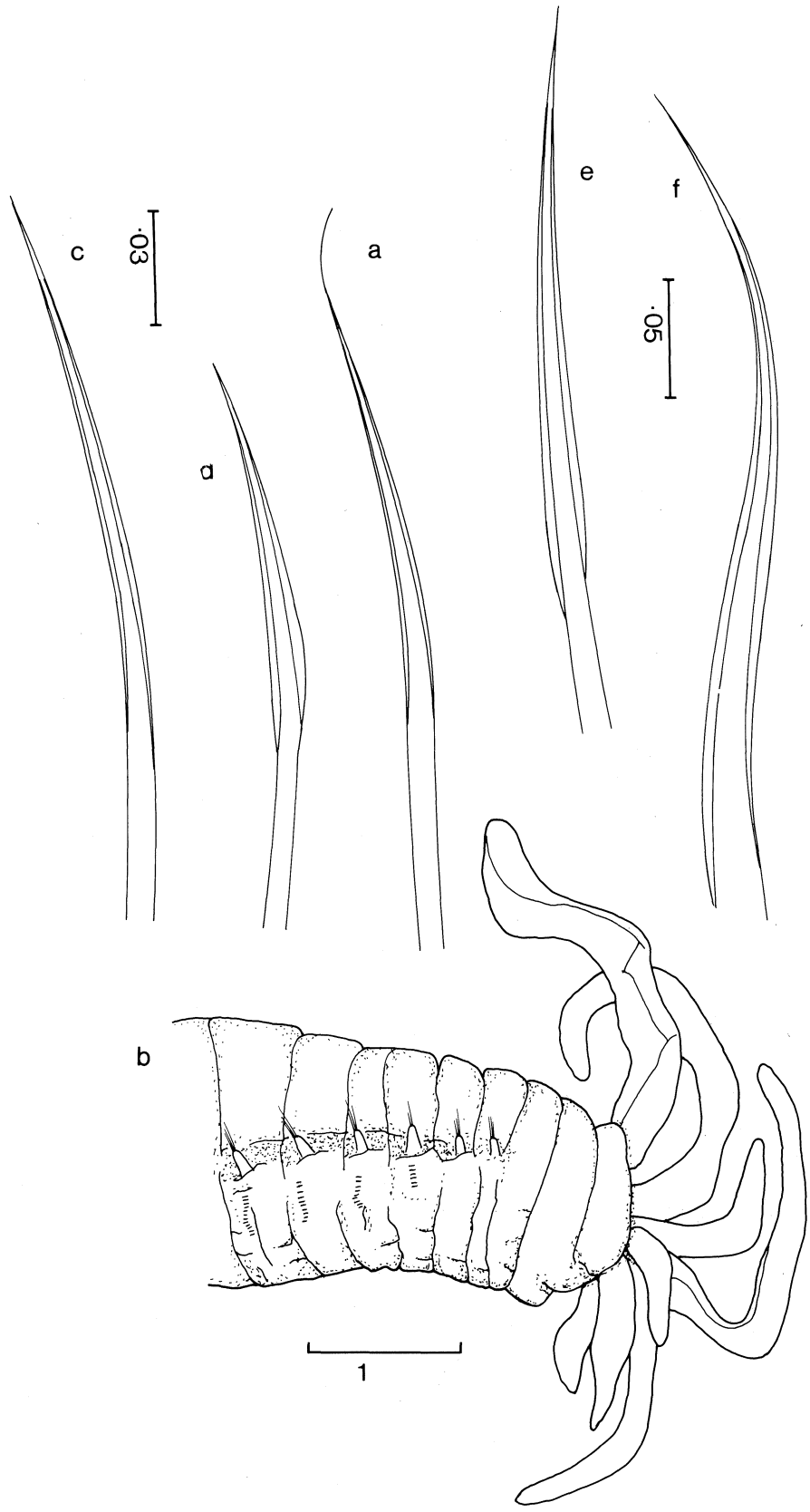

Fig. 3. *Streblosoma atlanticus,* paratype Poly 0919: **a,** notoseta from setiger 11. *Thelepus abranchiatus,* paratype Poly 0921: **b,** head end, lateral view; **c, d,** two notosetae from setiger 12. *Thelepus malayensis*, holotype: **e, f,** two types of notosetae from setiger 7. All measurements in mm.

Streblosoma chilensis (McIntosh)
Fig. 4e

Euthelepus chilensis McIntosh, 1885: 467–468, pl. L1 figs 4, 5, pl. XXVIIIA figs 14, 15.
Streblosoma chilensis.—Day, 1963: 370.

Material examined. LECTOTYPE (BMNH ZK 1885.12.1.359): incomplete, consists of two fragments, head end 16 setigers, 13.0 mm long, 2.3 mm wide, mid section 9 setigers, 9.0 mm long, 1.6 mm wide; branchiae and most tentacles detached, poor condition. PARALECTOTYPES 2(BMNH ZK 1885.12.1.435): consist of two head ends, 14, 4 setigers, and 3 headless fragments; head ends range in width from 2.2–2.4 mm.

All material from Stn 299, 33°31′S 74°43′W off Valparaiso, Chile, 3950 m, grey mud, 14th December 1875, 'Challenger'.

Description. Lectotype with prostomium blunt-ended, flared into well defined tentacular ring. Buccal tentacles detached, with thick, very shallow food groove. Eyespots absent. Peristomium well developed, encircling prostomium, equal in length to segment 2. Lateral lobes absent. Branchiae detached , one pair on each of segments 2 and 3, indicated by branchial scars on anterior margins of segments, just above the notosetae.

Notosetae present as long, smooth, winged capillaries from segment 2, extending for at least 20 segments. Notopodial lobes short, rectangular for first few segments, thereafter reduced or absent. Neurosetae present as avicular uncini from segment 5, arranged in straight rows on poorly developed, sessile tori. Uncini with prominent, distally rounded, sub-terminal button and well developed rounded prow (Fig. 4e) ; dental formula of anterior uncinus: MF:1:3:2.

Nephridial papillae absent; coelomic gametes absent. Discrete glandular ventral pads absent, but ventrum glandular for first 10 segments.

Comments. The specimen designated as the lectotype here most closely resembles the diagrams of the head end in McIntosh's description, although his description appears to be based on all three type specimens. The paralectotypes are similarly in poor condition and closely resemble the lectotype. Day (1963) has transferred this species to the genus *Streblosoma* as the notosetae start on segment 2 and there are no lateral lobes, although he did not designate a lectotype. It clearly differs from the holotype of *Euthelepus setubalensis* in which notosetae start on segment 3 and lateral lobes, although small, are present on segments 2–4.

Habitat. Type specimens collected from blue mud in 3950 m. Day's (1963) specimen collected in 1240 m.

Distribution. Off Valparaiso, Chile; off west coast of Cape Town, South Africa.

Genus *Thelepus* Leuckart

Thelepus Leuckart 1849: 169.
Lumara Stimpson, 1854: 30.
Phenacia Quatrefages, 1865: 374.
Heterophenacia Quatrefages, 1865: 389.
Neottis Malmgren, 1866: 388.
Thelephusa Verrill, 1871:6.
Thelepodopsis Sars, 1872: 414.
Protothelepus Verrill, 1900:662.

Type species. *Amphitrite cincinnata* Fabricius, 1780.

Tentacular lobe short and collar like, usually with numerous eyespots. Branchiae consisting of numerous simple filaments arranged in transverse rows on segments 2–4. Notosetae from segment 3 (2nd branchiferous), continuing for numerous segments, consisting of smooth-tipped capillaries. Uncini from segment 5 (setiger 3) continuing for numerous segments.

Thelepus abranchiatus (Hartman & Fauchald)
new combination
Figs 3b–d; 4f

Euthelepus abranchiatus Hartman & Fauchald, 1971: 171–172, pl. 28 figs f–i.

Material examined. HOLOTYPE (AHF Poly 0920): nearly complete, about 80 segments, 27 mm long, 3 mm wide (max). PARATYPES 3 (AHF Poly 0921): one complete specimen about 76 segments, 23 mm long, 1.9 mm wide (max). Other specimens incomplete, 1.0–1.2 mm wide. All specimens collected from Stn Ch 103, 39°43.6′N 70° 37.4′W, north-west Atlantic.

Comments. In their account of the species, Hartman & Fauchald (1971) state that the next two segments after the tentacular segment are setigerous, but in our examination of both the holotype and paratypes we found both post-tentacular segments to be asetigerous. The discrepancy would seem to be due to a typing error, as the two asetigerous segments are well defined and we do not believe they could be overlooked (Fig. 3b). The notosetae, then, are first present from segment 3.

Other important specific characters not mentioned in the original description of the holotype include the following: 30 pairs of smooth, winged notosetae (Fig. 3c,d); 50 pairs of uncini (Fig. 4f); small rectangular notopodial lobes throughout; and uncinial tori which are sessile on the thorax and occur as small, squared pinnules increasing in size posteriorly on the abdomen.

This species differs from the type species of *Euthelepus, E. setubalensis,* in the absence of branchiae and absence of lateral lobes. It appears more closely related to the abranchiate *Thelepus* species which also have no lateral lobes and have notosetae from segment 3 and uncini from segment 5. For this reason it is transferred to the genus *Thelepus.*

There are three species of *Thelepus* recorded for which there are no, or only a few, minute branchial filaments present, viz. *T. abyssorum* Caullery, 1944, *T. paucibranchis* (Grube, 1878) and a new species of *Thelepus* described from Wollongong, Australia (Hutchings & Glasby, in press). *Thelepus abyssorum* most closely resembles *T. abranchiatus* in the total absence of branchiae and in the number of pairs of notosetae and profile of the uncini. *Thelepus abyssorum,* however, has very long, narrow-winged

notosetae unlike the shorter, broader-winged notosetae of *T. abranchiatus.*

The other two species differ from *T. abranchiatus* in having a few minute branchiae. In addition, *T. paucibranchis* differs in the profile and dentition of the uncini, and the new species from Australia differs in having well defined eyespots and in the shape of the anterior uncini, which have no prow.

Habitat. Abyssal depths, 2022 m.

Distribution. Species known only from the type specimens collected off Nova Scotia, north-west Atlantic.

Thelepus malayensis (Caullery)
new combination
Figs 3e; 4g

Euthelepus malayensis Caullery, 1944: 182, fig. 146 A–F.

Material examined. HOLOTYPE (ZMA V pol 1765): Siboga expedition, Stn 52, 9°3′4″S 119°12′E, 960m; consisting of 3 fragments, probably incomplete, anterior fragment of 15 segments, 7.0 mm long; middle fragment 31 segments, 16 mm long; posterior fragment, including pygidium, 32 segments, 11 mm long; maximum width of all fragments 1.0 mm.

Description. Body long, slender, tapering very gradually from midbody; first 6 segments not well defined, next 7 well defined, moniliform, then becoming longer, cylindrical, finally decreasing in length near pygidium; middle segments with brown pigment bands almost encircling body, but absent mid-dorsally and mid-ventrally.

Prostomium conical, produced posteriorly as short tentacular ring. Buccal tentacles slender, grooved, attached to anterior edge of tentacular ring. Eyespots absent. Peristomium smooth, about 2x length of segment 2. Lateral lobes absent.

Single branchia attached to posterior edge of segment 2 (the other branchia presumably missing) long, cylindrical, slightly tapered, extending back to about setiger 10. Segments 2 and 4 slightly elevated dorsally, segment 3 with prominent rounded dorsal crest on the anterior edge; dorsum over segments 2–4 slightly humped.

Notosetae consisting of smooth, winged capillaries of 2 lengths (Fig. 3e), present from segment 3, extending for at least 13 segments. Neurosetae present as avicular uncini, extending from segment 5 to near pygidium; arranged in single, short, straight to slightly curved rows throughout, decreasing in length after first few segments. Uncini with elongate, dorsal button and pointed prow (Fig. 4g); dental formula varying on setiger 10 as follows: MF:3:5–7:α. Uncini borne on slightly raised, glandular tori initially, becoming minute, squared, slightly elevated pinnules in middle and posterior segments.

Segments 4–13 with discrete ventral pads extending laterally to tori. Nephridial papillae absent.

Comments. Our interpretation of the arrangement of segments at the head end differs somewhat from

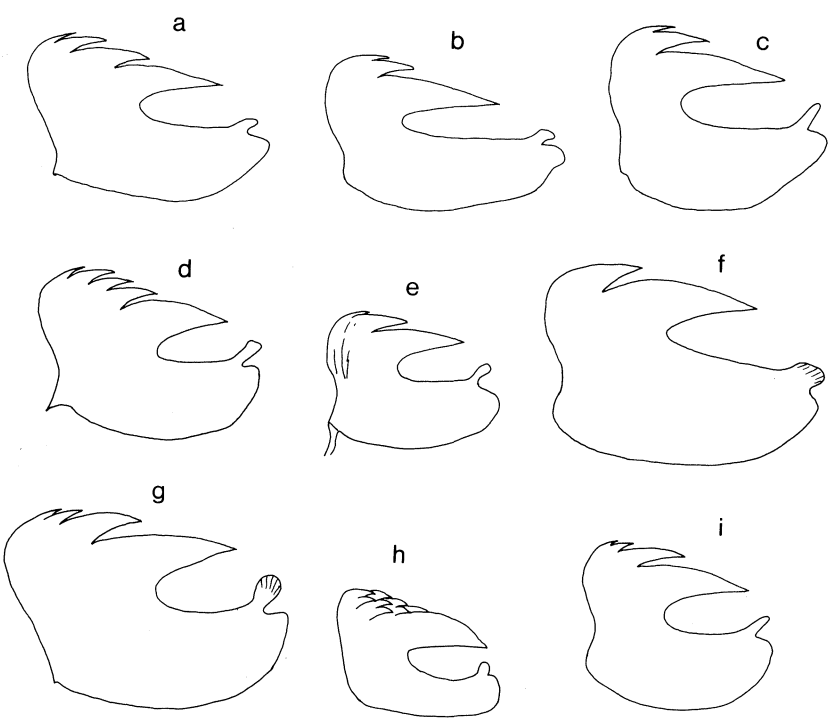

Fig. 4. A comparison of the shape of anterior uncini. **a,** *Euthelepus kinsemboensis,* holotype; **b,** *Euthelepus serratus* n.sp., holotype; **c,** *Euthelepus setubalensis,* holotype; **d,** *Streblosoma atlanticus,* paratype Poly 0919; **e,** *Streblosoma chilensis,* lectotype, drawn from McIntosh, 1885; **f,** *Thelepus abranchiatus,* paratype Poly 0921; **g,** *Thelepus malayensis,* holotype; **h,** *Thelepus pascua,* holotype, drawn from Fauchald 1977a; **i,** *Thelepus tenuis,* holotype YPM No.2864. Uncini drawn to different scales.

Caullery's. Caullery (1944) states that the cephalic segment (segment 1) is very small, segment 2 is very long and has a pair of branchiae inserted on the extreme posterior edge, segment 3 is much shorter and segment 4 has the first pair of notosetae. We feel that Caullery's segment 2 consists of 2 segments—the peristomium (our segment 1) which forms the lower lip ventrally, and a shorter segment posteriorly (our segment 2). The branchiae, we believe, are attached to the posterior edge of this shorter segment.

Caullery states that the first notosetae appear on the second post-branchial segment. It is evident from his figures of the head end of the animal that he overlooked the small setal fascicle on the first post-branchial segment; the left side one is damaged and barely visible.

Thus, *T. malayensis* has notosetae from segment 3, uncini from segment 5, 1 pair of branchiae attached to segment 2 and no lateral lobes. In these last 2 respects it differs most notably from the type species of *Euthelepus* and we therefore transfer it to *Thelepus*. *Thelepus malayensis* thus differs from other species of *Thelepus* in having 0–1 pair of branchiae, in having very long, cylindrical branchial filaments and a prominent dorsal crest on segment 3.

Habitat. From 960 m.

Distribution. Known only from the type specimen collected off Sumbawa, Indonesia.

Thelepus pascua (Fauchald)
new combination
Fig. 4h

Euthelepus pascua Fauchald, 1977a: 57–58, fig. 12d–h.

Material examined. HOLOTYPE (USNM 53093): Galeta Reef, Panama, 17th March 1972; posteriorly incomplete, 29 setigers, 4.5 mm long, 0.75 mm wide.

Comments. Fauchald (1977a) states that the first notosetae occur on the third post-peristomial segment (segment 4) and that uncini (Fig. 4h) are present from the fourth setiger. We have re-examined the type specimen and found that a short row of uncini is also present on the third setiger.

The prostomium, we believe, forms a hood over the mouth and posteriorly forms a slightly raised tentacular ring on which a pair of tentacles is attached laterally. The peristomium is asetigerous, about 2 times length of the next segment, and forms the lower lip ventrally (see Fauchald 1977a, fig. 12d). The next segment (2) is asetigerous and has a pair of branchiae arising from the anterior margin. Segment 3 carries the first pair of notosetae and a single branchial filament (presumably one is missing) arising from the anterior margin.

The exact origin of the branchial filaments is very difficult to determine. Fauchald believes they arise from the posterior margin of the segments. Our interpretation of the origin of the branchiae, which differs from Fauchald's, and the arrangement of anterior segments places the animal in the genus *Thelepus*. It does not belong to *Euthelepus* as no lateral lobes are present. Until more material can be examined and the segmental origins fully elucidated its relationship in the Thelepinae is uncertain. *Thelepus pascua* differs from most other species of *Thelepus* in having only 2 pair of branchiae, the only other species with 2 pairs are *Thelepus cincinnatus* (Fabricius), *T. hamatus* Moore and *Thelepus vaughani* (Gravier). These three species have far more branchial filaments than *T. pascua* which has only a single pair of branchial filaments on each of segments 2 and 3.

Habitat. On reef in *Laurencia* zone.

Distribution. Known only from the holotype collected at Panama, Atlantic Ocean.

?Thelepus tenuis (Verrill)
Fig. 4i

Protothelepus tenuis Verrill, 1900: 662–663.
Euthelepus tenuis.—Caullery, 1915: 46–47.

Material examined. HOLOTYPE (YPM No.2864): Bermuda; a mounted specimen in very poor condition. *Thelepus tenuis* 1 (USNM 097587) from Hungry Bay, Bermuda, coll. M. Jones.

Description. The holotype consists of an anterior fragment of 16 setigers, approximately 5 mm long and 1 mm wide. Notosetae consisting of smooth, winged capillaries and uncini, commencing on the third setiger, each with an elongate, subterminal button and rounded prow becoming more pointed posteriorly (Fig. 4i). The remaining body is unrecognisable and essentially unidentifiable.

The material from Bermuda has two pairs of simple branchial filaments, first pair much larger than the second. Notosetae occur from the second branchiferous segment and extend for 22 segments. Uncini begin on setiger 3 and continue to the pygidium; they occur on slightly elongate tori on abdominal segments. The prostomium is glandular and ventrally forms a horseshoe shaped upper lip. The ventrum is glandular, but no distinct pads are present.

Comments. Caullery (1915) transferred this species to the genus *Euthelepus* on the basis of Verrill's description, although he did not examine the type. Caullery admits to having some difficulty in interpreting the numbering of the anterior segments from Verrill's description. As Verrill does not describe any lateral lobes, and, providing he did not overlook them, the species clearly does not belong to the genus *Euthelepus*. We questionably refer the species to *Thelepus* on the basis of the material examined from Bermuda which has notosetae beginning on the 2nd branchiferous segment.

Habitat. Unknown.

Distribution. Bermuda.

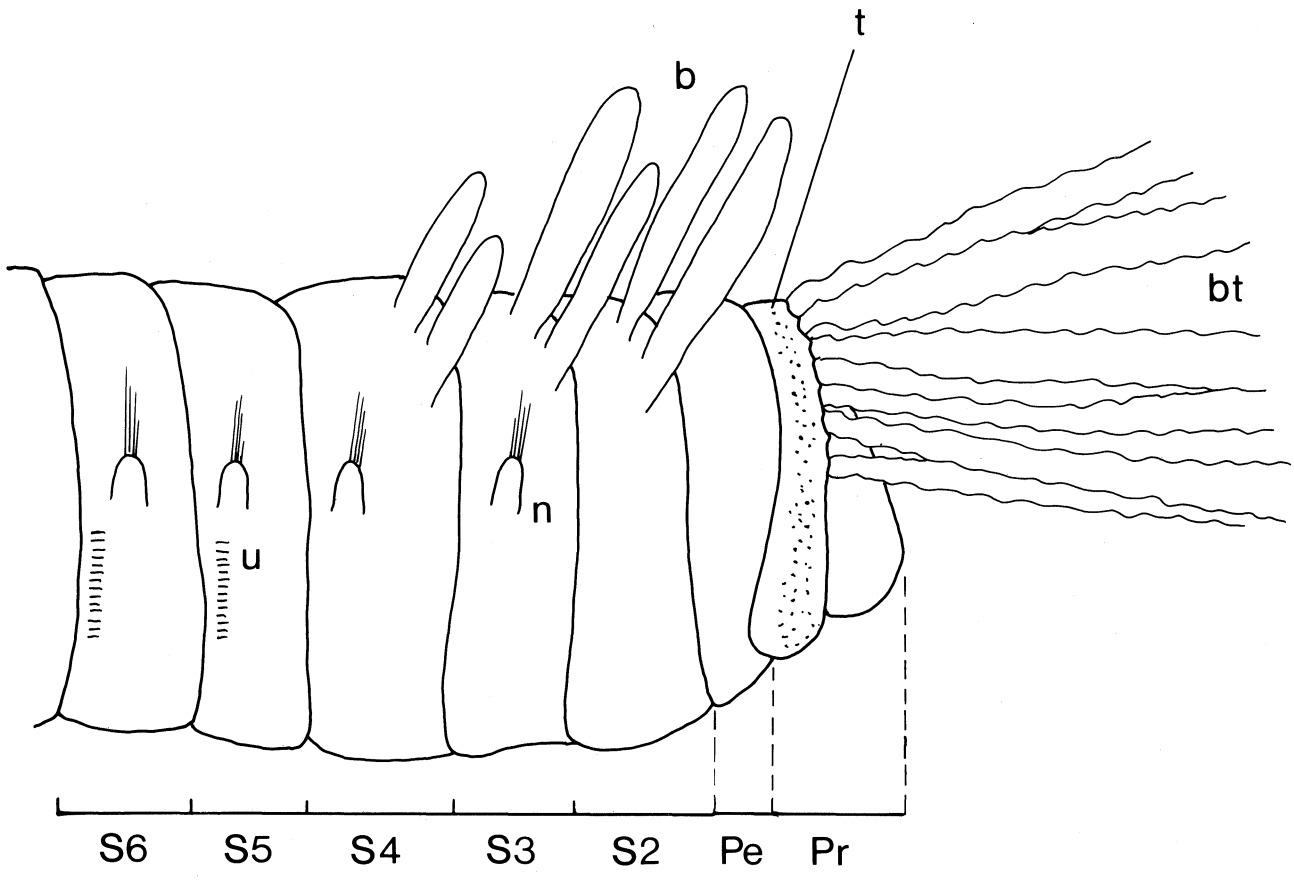

Fig. 5. An idealised Thelepinae (*Thelepus)* showing terminology and numbering sequence of segments used in the text. **Pr** = prostomium; **Pe** = peristomium; **S** = setiger; **bt** = buccal tentacles; **t** = tentacular ring; **b** = branchiae; **n** = notosetae; **u** = uncini.

DISCUSSION

As there has been some confusion in the literature as to the exact terminology and numbering of anterior segments in Thelepinae, the front end of an idealised Thelepinae is illustrated in Fig. 5. This interpretation is based on adult morphology, as we have not had the opportunity to study the development of segments in larval and juvenile worms. Confusion with the terminology of numbering has led to two species with notosetae beginning on segment 2, viz. *S. atlanticus* and *S. chilensis,* being transferred to *Streblosoma* (see Table 1). The segment on which both notosetae and neurosetae begin is a valid generic character and constant within a genus.

Of the remaining species originally described in *Euthelepus,* four species, viz. *T. abranchiatus, T. malayensis, T. pascua* and *T. tenuis,* lack lateral lobes, and these have been transferred to the genus *Thelepus.* The remaining species all have lateral lobes on segments

Table 1. A comparison of some important generic characters in existing species of *Euthelepus* and their revised generic status.

Former status	Segment first appearance		Lateral lobes	Serrated	No. of branchial	Revised
	notosetae	uncini	(segs)	notosetae	segments	
E. kinsemboensis	3	5	+(2–3,4?)	+	3	as former
E. serratus n.sp.	3	5	+(2–3)	+	3	—
E. setubalensis	3	5	+(2–4)	—	3	as former
E. atlanticus	2	5	—	—	2	*Streblosoma*
E. chilensis	2	5	—	—	2	transferred to *Streblosoma* by Day, 1963
E. abranchiatus	3	5	—	—	0	*Thelepus*
E. malayensis	3	5	—	—	1	*Thelepus*
E. pascua	3	5	—	—	2	*Thelepus*
E. tenuis	3	5	—	?	2	*Thelepus*

+ present
– absent

2–3 or 2–4, although having noto- and neurosetae beginning on the same segments as *Thelepus*. The presence of lateral lobes is a valid generic character and we believe may indicate perhaps a common origin with *Thelepus*. A change in tube construction or environment in which they lived, selected for the development of glandular lateral lobes. We therefore believe that the development of glandular lateral lobes is an apormorphic character. Other data from the notosetae tend to support the common origin of the 2 genera. All *Thelepus* species examined both in this paper and by Hutchings & Glasby (in press) have smooth notosetae. However, some species of *Euthelepus* have both smooth and serrated notosetae (Figs 1b,c; 2b,c; Plate 1a–e). Examination of both types of setae under the SEM reveals that they are of a similar structure and that only the degree of separation of the chitin layers differs. We therefore reject Day's (1967) comments that *E. kinsemboensis* Augener be transferred to the genus *Amphitrite* because of the presence of serrated notosetae. The serrated notosetae of *Amphitrite* have a very different structure from those of *E. kinsemboensis*. The uncini of *E. kinsemboensis* have far more in common with members of the subfamily Thelepinae than with the subfamily Amphitritinae (see Fig. 4). Other genera of terebellids are characterised by serrated notosetae but we contend that they are of a very different structure from those in *Euthelepus*. We therefore are willing to include both serrated and smooth notosetae within a genus, admitting that serrated notosetae elsewhere are a useful generic character. Another character which we originally considered useful is the presence, in many of the species originally assigned to *Euthelepus*, of few branchiae which are long and thickened at the base, somewhat resembling ampharetid branchiae. However, all the species with this sort of branchiae are abyssal species and we suggest that this is an apormorphic character associated with an abyssal habitat rather than a generic feature.

At this stage, little can be said about the distribution of the genus *Euthelepus:* one is a deep-water species occurring off Portugal, and the new species occurs in shallow subtidal depths off the Australian coast. Probably several other species remain to be described and it may be that other recorded Thelepinae have been incorrectly identified because much of the material we examined in museum collections had been wrongly assigned to a genus. Also, if some species of the genus occur in deep water, this may explain the paucity of described species of the genus.

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