Two New Genera of Pseudophyllidean Cestodes from Deep-Sea Fishes

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ABSTRACT: Two new genera of pseudophyllidean cestodes are described from the deep-sea teleost Alepocephalus agassizi Goode and Bean, 1883. Probothriocephalus muelleri gen. et sp. n. is a parabothriocephalid distinguished by the combination of a neck, marginal genital pores, indistinct metamericism, unarmed cirrus, and circumcortical vitellaria. Philobythiidae Campbell, 1977 is emended to include a new genus, Philobythoides, which differs from Philobythos in having the testes restricted to the extreme anterior region of the segment, a single embryo per capsule, and scolex lacking an apical disk.

Adult cestodes have been infrequently encountered among more than 1,700 deep sea engymbentic teleosts examined from trawls in the environs of Hudson Submarine Canyon, northwest Atlantic (39°27'N, 70°28'W). Among those recovered are two new genera of pseudophyllideans from the intestine and pyloric ceca of Alepocephalus agassizi Goode and Bean, 1883. Mixed infections were observed on several occasions. Fish were caught in trawls at mean depths of 1,691 to 2,293 m and worms removed and processed from both freshly caught and preserved hosts by methods previously described (Campbell, 1977). Whole mounts were stained with Mayer's paracarmine or Ehrlich's acid hematoxylin and mounted in Kleermount or Canada balsam. Frontal and transverse serial sections of the strobilas were cut at 10 μm and stained with Harris' hematoxylin and eosin. Descriptive measurements are expressed as length by width, include the range, and the mean in parentheses. Measurements are in micrometers unless otherwise indicated.

Probothriocephalus gen. n.


TYPE AND ONLY SPECIES: Probothriocephalus muelleri sp. n.

Probothriocephalus muelleri sp. n.
(Figs. 1, 5, 6, 7, 9, 10)

DESCRIPTION (based on 17 specimens; 5 measured): Probothriocephalus. Scolex somewhat elongate, tapering anteriorly, 1.4–1.9 mm by 700–940. Neck about 780 by 740. Strobila fairly broad and uniform, 10.5–41.7 cm by 1.7–2.3 mm, longitudinal furrows lacking. Segmentation poorly developed, proglottisation uniform. All segments broader than long, anterior and posterior borders marked by presence of uterine sacs. Mature segments 0.8–1.1 mm by 2–2.1 mm; gravid

HOST: *Alepocephalus agassizi* Goode and Bean, 1883 (Alepocephalidae).

LOCALITY: Hudson Submarine Canyon in northwest Atlantic and adjacent continental slope.


ETYMOLOGY: The species is named after Dr. Justus F. Mueller, parasitologist, S. U. N. Y. Upstate Medical Center, Syracuse, New York.

Remarks

The presence of operculate, unembryonated eggs in this species in combination with its other features does not clearly separate it from the Amphicotylidae Ariola, 1899. Amphicotylids having cortical vitellaria and marginal genital pores like *Probothriocephalus* are *Eubothrium*, *Amphicotyle*, and *Pseud amphicotyle* and comprise the subfamily Amphicotylinae Lühe, 1902. In addition to the differences in eggs, features differentiating *Probothriocephalus* from these genera are: the lack of dorsal and ventral median furrows and distinct segmentation, and the vagina opening posterior to the cirrus instead of anteriorly as in *Eubothrium*; the possession of simple bothria and ventral uterine pore instead of the dorsal pore and bothridial suckers of *Amphicotyle*; and, by lacking the loculate bothria, terminal disk, and segmentation of *Pseud amphicotyle*.

Using the keys of Wardle and McLeod (1952), Wardle et al. (1974), Joyeux and Baer (1961), and Yamaguti (1959) *Pro bothriocephalus* can be keyed to the Bothriocephalidae Blanchard, 1849 or Parabothriocephalidae Yamaguti, 1959. Yamaguti (1959) separated *Parabothriocephalus*, *Parabothriocephaloides*, and *Glossobothrium* from the Bothriocephalidae and placed them in Parabothriocephalidae. *Pro bothriocephalus* is clearly closely related to the three genera in this family, especially *Parabothriocephaloides* and *Glossobothrium* which have cortical vitellaria. *Parabothriocephalus gracilis*, the genotype, has medullary vitellaria but *P. johnstoni* Prudhoe, 1969 from *Coryphaenoides whitsoni* has vitellaria intruding from the cortical into the medullary zone. These genera differ from *Pro bothriocephalus* in having a dorsosubmarginal cirrovaginal aperture, distinct segmentation, vagina divided into two distinct regions, and in lacking a neck. In addition *Glossobothrium* has bothrial appendages and an apical disk. Members of the Bothriocephalidae are widespread among shallow dwelling marine teleosts of the...
Figures 1–10. Deep-sea Pseudophyllidean Cestodes. 1, 5, 6, 7, 9, 10. Probothriocephalus muelleri:
1. Scolex. 5. Mature proglottids showing testes. 6. Mature proglottid showing vitellaria. 7. Gravid
world. Yamaguti's Parabothriocephalidae, included in the Bothriocephalidae by some authors, is known only from inshore teleosts except for *Parabothriocephalus johnstoni* from an Antarctic macrourid (Prudhoe, 1969).

**Philobythoides gen. n.**

**DIAGNOSIS:** Pseudophyllidea; Philobythiidae. Scolex conical, bothria well formed, apical disk absent. Segments markedly craspedote. Strobila anapolytic. Testes medullary, clustered near anterior border of segment. Uterus with lateral diverticula forming an inverted V. Embryos develop individually within membranous capsules. Parasites of marine teleosts.

**TYPE AND ONLY SPECIES:** *Philobythoides stunkardi* sp. n.

**ETYMOLOGY:** The genus is named for its similarity to *Philobythos*.

**Philobythoides stunkardi** sp. n.

(Figs. 2, 3, 4, 8)


**HOST:** *Alepocephalus agassizi* Goode and Bean, 1883 (Alepocephalidae).

**LOCALITY:** Hudson Submarine Canyon and adjacent continental slope.

**HOLOTYPE AND PARATYPE:** USNM Helm. Coll. Nos. 74873 and 74874.

**ETYMOLOGY:** The species is named after Dr. Horace W. Stunkard, parasitologist, at the American Museum of Natural History, New York.

**Remarks**

Presently, the family Philobythiidae Campbell, 1977 is monotypic being based on a single species, *Philobythos atlanticus*. *Philobythoides* resembles *Philobythos* in its markedly craspedote strobila, transversely elongate vitellarium, small cirrus pouch, uterus with preformed diverticula, and embryos developing in membranous capsules. However, *Philobythoides* differs from *Philobythos* in having a scolex lacking any evidence of an apical disk, testes restricted to the extreme anterior portion of the segment, and a single hexacanth embryo instead of multiple embryos per capsule.

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In view of the discovery of a second genus the family diagnosis is emended and *Philobythos* separately defined as follows:

**Philobythiidae Campbell, 1977, emended**


**TYPE GENUS**: *Philobythos* Campbell, 1977.

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**Philobythos** Campbell, 1977, emended

**DIAGNOSIS**: Pseudophyllidea; Philobythiidae. Scolex with bothria and weakly developed apical disk. Strobila craspedote, anapolytic. Primary and secondary segmentation precede proglottisation. Testes medullary, surrounding female reproductive system. Uterus with lateral diverticula forming an inverted V. Oncospheres develop in clusters within membranous capsules. Parasites of marine teleosts.

**TYPE AND ONLY SPECIES**: *Philobythos atlanticus* Campbell, 1977.

**Remarks**

The genera are distinguished as follows: *Philobythos*, with characters of the family; scolex with weakly developed apical disk, testes surrounding female reproductive system, multiple embryos per capsule.

*Philobythoides*, with characters of the family: scolex lacking apical disk, testes restricted to extreme anterior portion of segment, a single embryo per capsule.

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**Literature Cited**


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