

LITOBOTHRIMUM GRACILE SP. N. (EUCESTODA: LITOBOTHRIDEA) FROM THE SAND SHARK (*ODONTASPIS FEROX*)

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ABSTRACT: *Litobothrium gracile* sp. n. is described from adult specimens recovered from the spiral valve of the sand shark, *Odontaspis ferox* (Risso, 1810), caught at 22 fathoms off San Clemente Island, California. It most resembles *L. coniformis* Dailey, 1969, in having only 3 anterior segments with dorsoventral projections but differs in size of apical sucker, length and width of strobila, number of proglottids, number, size, and distribution of testes, lack of minute spines under lateral margins of anterior proglottids, and size of cirrus pouch.

During necropsy of a single sand shark, *Odontaspis ferox* (Risso, 1810), large numbers of cestodes were recovered from the spiral valve. The shark had been caught by the California Department of Fish and Game off China Point at San Clemente Island, California, in 22 fathoms (132 ft) of water. Further studies showed them to be an undescribed species of *Litobothrium* Dailey, 1969, other species of which have been found only in the bigeye thresher shark, *Alopias superciliosus* (Lorne, 1840).

METHODS

Worms were removed from the spiral valve and fixed in Lavdowsky's fluid (AFA), stained with celestine blue B and Semichon's carmine, dehydrated in ethanol, cleared in xylene, and mounted in Piccolyte. Drawings were made with the aid of a microprojector and drawing tube. All measurements are in microns unless otherwise stated. Average measurements are given, with ranges in parentheses.

Litobothrium gracile sp. n. (Figs. 1-8)

Specific diagnosis (description based on 25 specimens): Small, lacinated, craspedote, apolytic worms, measuring 12.9 mm (6.4 to 16.5) in length. Strobila consists of 60 (51 to 68) segments (Fig. 1). Mature proglottid approximately 6 times longer than broad, 1,260 (816 to 1,680) long by 280 (153 to 415) wide. Apical sucker bowl-shaped, weakly muscled, measuring 49 (32 to 60)

in diameter by 27 (19 to 32) deep (Fig. 2). Anterior 3 segments with dorsoventral projections. Strobila swelling in width to 97 (63 to 109) immediately posterior to apical sucker, reaching maximum width of 187 (133 to 226) at segment 5 or 6. Elongation of proglottids begins at segments 10 to 12, while muscular margins fold posteriorly forming pronounced lacination, which extends approximately from proglottids 25 to 41 (Figs. 3-4). Proglottids shorten in length from approximately segments 42 to 48 before lengthening to maximum length in mature proglottid (Figs. 5-7). Testes 38 (30 to 47) in number, spherical to subspherical, 59 (30 to 91) in diameter; 18 (13 to 28) preporal, 3 (1 to 6) antiporal, 17 (11 to 23) postporal. Vas deferens highly coiled in mature proglottid. Cirrus pouch small, extending just past center of proglottid, 162 (102 to 232) long by 70 (36 to 109) wide. Cirrus unarmed. Genital aperture lateral, irregularly alternating, approximately midsegment. Ovary bilobed, irregularly shaped. Vitellaria follicular, occurring as small discrete spheres encircling proglottid (Fig. 8).

Host: Sand shark, *Odontaspis ferox*.

Location: Spiral valve.

Locality: San Clemente Island, California.

Type specimens: Holotype and paratypes USNM Helm. Coll. Nos. 70730, 70731.

Remarks

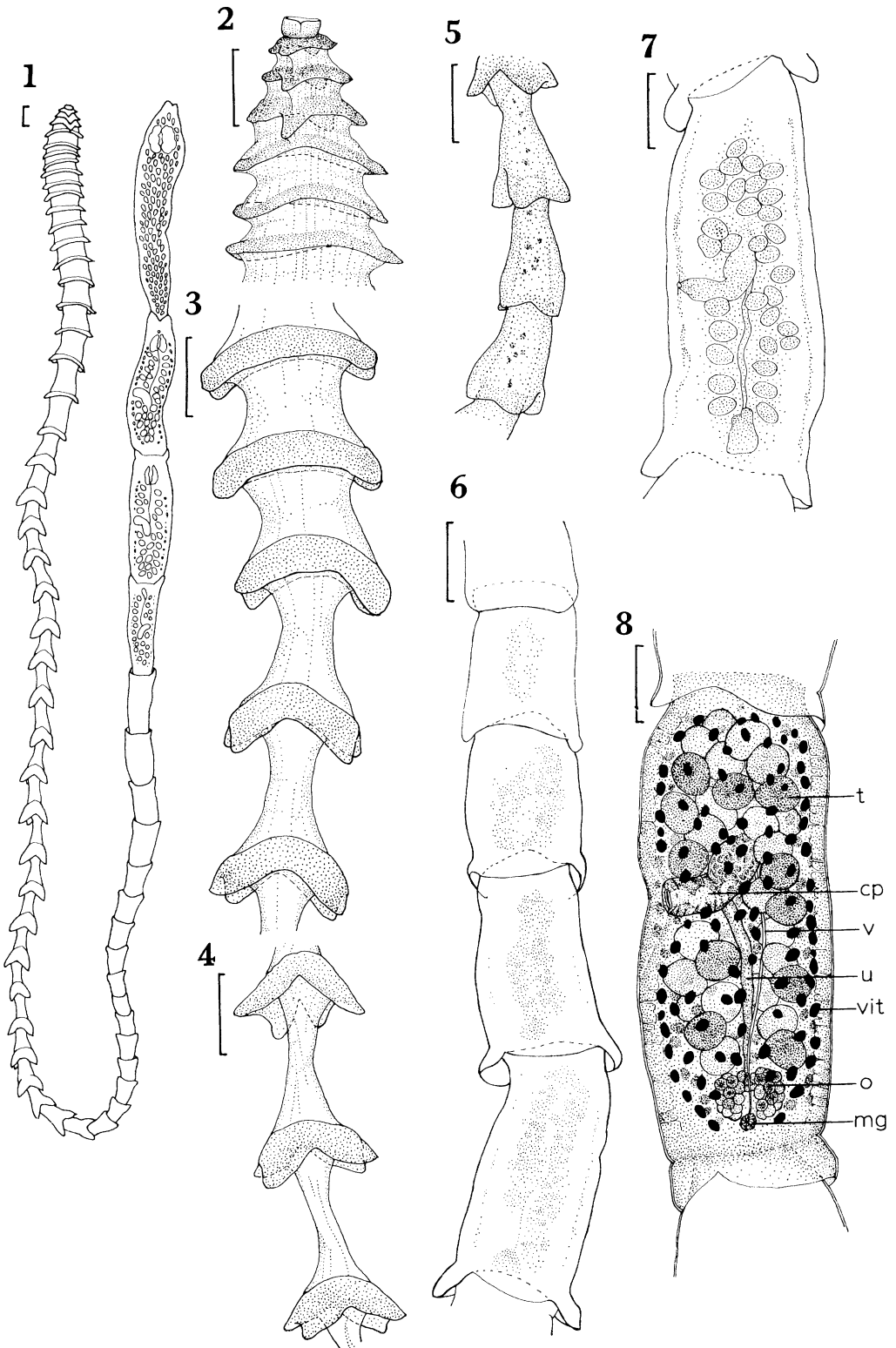
Currently the genus *Litobothrium* has two species, *L. alopias* Dailey, 1969, and *L. coniformis* Dailey, 1969. *L. gracile* sp. n. most resembles *L. coniformis* in having only three anterior segments with dorsoventral projections but differs in the following characters: length and width of strobila [*L. coniformis* 4.14 mm

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FIGURES 1-8. *Litobothrium gracile* sp. n. 1. Strobilate worm. 2. Anterior end of specimen showing apical sucker and modified segments. 3. Proglottids 27 to 32 showing posterior folding of muscular margins. 4. Proglottids 36 to 38 showing lacinated condition. 5. Proglottids 45 to 47. 6. Proglottids 53 to 57 showing elongation. 7. Immature proglottid with developing genitalia. 8. Mature proglottid.

Abbreviations: cp, cirrus pouch; mg, Mehlis' gland; o, ovary; t, testis; u, uterus; v, vagina; vit, vitellarium. Bars equal 0.1 mm.



(2.0 to 8.0) long, 515 (320 to 790) maximum width]; number of segments [*L. coniformis* 41 (29 to 51) segments]; number, size, and distribution of testes [*L. coniformis* 50 (47 to 52) in number, 36 (22 to 50) in diameter, 10 (1 to 11) preporeal, 32 (31 to 34) antiporeal, 8 (7 to 9) postporeal]; size of cirrus pouch [*L. coniformis* 209 (120 to 320) long, 205 (110 to 320) wide]; lack of minute spines under lateral margins of anterior proglottids and size of apical sucker [*L. coniformis* 62 (46 to 90) wide, 46 (22 to 70) deep].

Only two specimens of the host (*Odontaspis ferox*) have been previously recorded from the eastern Pacific (Kato et al., 1967) although it is a common species in the Atlantic. The occurrence of *L. gracile* sp. n. in *O. ferox* supports the recent work of Dr. Sheldon Applegate, Los Angeles County Museum (pers. comm.). Through comparative studies of teeth, verte-

brae, and endocrania Dr. Applegate has found phylogenetic evidence indicating the thresher sharks (Alopiidae) most probably originated from sand shark (Odontaspidae) stock.

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LITERATURE CITED

- DAILEY, M. D. 1969. *Litobothrium alopias* and *L. coniformis*, two new cestodes representing a new order from elasmobranch fishes. Proc. Helm. Soc. Wash. **36**: 218-224.
- KATO, S., S. SPRINGER, AND MARY H. WAGNER. 1967. Field guide to eastern Pacific and Hawaiian sharks. U. S. Dept. of the Interior, circular No. 271, 47 p.

ANNOUNCEMENT . . .

Short Course in Histochemistry

The sixth short course in Histochemistry for College and University Teachers of Zoology will be offered by the Department of Biology, Vanderbilt University, Nashville, Tennessee, from 2-21 August 1971. Living and travel expenses for 20 selected participants will be funded by a grant from the National Science Foundation. No tuition or fees will be charged. To be eligible, applicants must be members of the faculty of an accredited college or university and teach at least one course in some area of zoology. In addition, they must be interested in histochemistry either in teaching and/or research. Ten specialists in various areas of histo- and cytochemistry will lecture and conduct demonstrations. Deadline for receipt of application: 1 May 1971. For application forms, please write: Dr. Burton J. Bogitsh, Box 1733, Station B, Vanderbilt University, Nashville, Tennessee 37203.