SOME STRUCTURAL PECULIARITIES OF STENOBOTHRIUM MACROBOTHRIUM, DIESING

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The species described in this paper has been known to science since the time of Diesing, in 1863, though no description of it has ever been published. Specimens are to be found in the Museums of Washington, Berlin and Vienna. About fourteen different hosts are reported. Of these the following are the more common: the Dolphin (Coryphaena hippuris), the Swordfish (Xiphias gladius), the Dusky Shark (Carcharius obscurus), the Tiger Shark (Galeocerdo tigrinus), the Artic Shark (Galeocerdo arcticus), and the Blue Shark (Caracharinus Milberti). The material at my disposal all came from the shark. The size of the specimens varies between 32 and 230 millimeters. The highest number of segments counted in any specimen was 140.

The head is several times as long as the remaining bothridial portion. The proboscides are poorly developed being thin, short, threadlike, only about a millimeter long, with uniform, widely separated hooks arranged in spirals, each spiral bearing about seven solid hooks. There is marked dorso-ventral differentiation. Individual segments are from 2.5 to 3 millimeters broad, while one of the last segments measured .025 millimeters in length.

The species is clearly protandrous, i.e., the male elements reaching maturity before those of the female. The primary end segment was missing in nearly all the specimens examined. A typical specimen having this end segment was found to have a total of 120 segments, and the uteri of the last 60 contained eggs. Portions of the strobila were found that contained no eggs at all. The explanation for this phenomenon was given by Van Beneden more than seventy years ago. The segments on stimulation by chemcial or mechanical means, or even on mere contact with water, burst and send out streams of eggs.

The cuticle is thick and covered with minute hairs visible only under the oil immersion lens. The muscular system has one specific characteristic. This is a strong muscular band that runs medially throughout the entire length of the individual both on the dorsal and on the ventral surfaces. This muscle is so compact that individual organs, as, for instance, the bladder, are diverted from their regular position and bent sideways. This muscle forms a longitudinal furrow that is visible along the whole length of the strobila and is the most conspicuous single characteristic of the species when viewed microscopically only.

The excretory system differs in several important details from that usually indicated in this genus. There is a branching from a main trunk which gives rise to numerous islands, and, secondly, there is a bladder in each segment. This branching is not to be understood as a mere splitting of the main trunk into smaller tubes and a further division of these into still smaller tubes till relatively minute capillaries are reached. It is rather an anastomosing of the smaller branches to meet again in a continuation of the same, the spaces between forming the island already mentioned. The bladder must be recognized as constituting a generic characteristic. There are on the dorsal surface of each segment several discharging vessels of the excretory system that lead through a very narrow dorso-ventrally situated passage into a bladder. In this species,

the bladder is evidently connected with a complicated network of canals of the system. The excretory pore may be seen in whole mounts. Here it appears as a diagonal split. Up to the present, this aperture has not been understood. There might be some difficulty in locating its position with certitude, as well as in distinguishing it from the openings of the uterus. However, the uterine openings in macrobothrium are rather high up in about the middle of the segment, while the excretory pore is very definitely situated in the posterior margin. The two points that need to be emphasized are the occurrence of this excretory pore in linear position on an apolytic chain of segments, and, secondly, its occurrence in the dorsal position.

A final characteristic of the species is that there are no preformed uterine openings. The uterus bursts in the same place in all the segments and pours out its contents. This fact is of prime systematic importance. The laceration for the aperture always occurs in the ventral median surface of the segment.

In conclusion, the following list of specific characters is offered for Stenobothrium macrobothrium.

1. An anaoplytic strobila with all segments even the last wider than long.
2. A muscular band running medially throughout the entire length of the individual on both dorsal and ventral surfaces.
3. A double layer of muscles at either end of each segment.
4. A many-branched excretory system whose branches meet again as continuations—the enclosed spaces forming island.
5. A complicated canal system of the excretory apparatus which discharges into a metameric bladder in each segment.
6. A marginal genital cloaca, situated anteriorly and ventrally.
7. A vagina opening beside the cirrus, under it and dorsal.
8. No preformed uterine openings.
9. Nucleoli in the larger germ cells.