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Report 218

GROWTH AND CONDITION OF SMALL MOUTH BASS IN UPPER PENINSULA LAKES

I. Sample Furnished by C. M. McDonald of Detroit, through Department of Conservation.

Considerable evidence has been accumulating to indicate small-mouth bass are not faring well in the inland lakes of the Upper Peninsula. The bass tapeworm disease is naturally under suspicion as a cause. This seems to be almost certainly true for a sample of three specimens caught May 29, 1933, by C. M. McDonald of Detroit. These were submitted to the Institute for investigation as to dwarfing, etc., through the Department of Conservation. Following is the date on size and age:

Overall length in inches	Standard length in millimeters	Age (No. of winters)
5 1/4	105	II
7 1/2	150	III
7 3/4	163	III

These fish were unquestionably dwarfed. They all appeared to be in fair condition, and showed no external indication of disease.

On being examined internally, all three fish showed to a moderate degree the adhesions of the internal organs which is a symptom of the bass tapeworm disease. The cause was obviously the presence of many cysts of tapeworms in the immature plerocercoid stage, ~~all~~ among and through the internal organs. These plerocercoids, still alive when the bass were examined on June 1, were identified as a species of Proteocephalus. So far as indicated by a hurried comparison with published figures they seemed to be the species Proteocephalus ambloplitis, which is the well-known cause of the bass tapeworm disease.

The abundance of the tapeworms among the internal organs provided an ample cause for the dwarfing.

The two larger specimens were females, and the plerocercoids were found common through the tissue of the ovary. The parasites in the ovary would presumably have rendered these little bass sterile, for that is a common result of this disease.

Inside the stomach and intestine, few parasites were found: only two acanthocephalan worms, and one cestode worm which was developing into the adult stage and seemed to be another bass tapeworm (Proteocephalus ambloplites).

The important question "What can be done about it" is not answerable. A number of the leading American fish parasitologists have studied this very serious problem, but have not found any means of controlling the disease in a lake. Control in bass ponds seems reasonably to be hoped for, but not in lakes. It has been found that the parasite is carried in a chain of three hosts: first, a minute free-swimming crystacean (Cyclops); second, a perch or other small fish; third, a bass or occasionally some other predaceous fish. To eradicate the parasite would call for the killing of the plankton (which is the basic food supply in the lake), of the perch and other smaller fish and finally of all the bass. All this would be very doubtfully desirable even if possible of accomplishment, in an inland lake.

It is possible that many lakes will have to be given up so far as smallmouth bass are concerned, on account of this seemingly uncontrolable disease. Further research may show this pesimistic viewpoint to be unfounded, but at present we see no reasonable chance for the control of the disease where it is well established, as it seems to be in a considerable number of Upper Peninsula lakes.

APPENDIX: IMPORTANT PUBLICATIONS ON THE BASS TAPEWORM DISEASE

Bangham, Ralph V.

1925. A study of the cestode parasites of the black bass in Ohio, with special reference to their life history and distribution. Ohio Jour. Sci., 25 (6): 255-270, pl. 1-2.

1927 Life history of the bass cestode Proteocephalus ambloplitis. Tran. Am. Fish. Soc., 57: 206-209.

Cooper, A. R.

1915 Contributions to the life history of Proteocephalus ambloplites Leidy. A. Parasite of the black bass. Contr. Can. Biol., 8 (Sessional Paper, Marine & Fisheries, No. 39 b): 177-194, pl. 19-21.

Hunter, George W., III

1928 Contributions to the life history of Proteocephalus ambloplitis (Leidy). Jour. Parasitology, 14: 229-242, pl. 11.

Hunter, George W., III, and Hunter, Wanda Sanborn

1929 Further experimental studies on the bass tapeworm Proteocephalus ambloplitis (Leidy). Rep. Biol. Surv. Erie-Niagara System (Suppl. to 18th Ann. Rep. N. Y. St. Cons. Dept., 1928): 198-207, pl. 1-2.

Moore, Emmeline

1926a Problems in fresh water fisheries. 15th Ann. Rep. N. Y. Cons. Comm., 1925: 22 pp.

1926b Further observations on the bass flatworms—Proteocephalus ambloplitis. Trans. Am. Fish. Soc., 56: 91-96.

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