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AN EXAMINATION OF FIVE BLUEGILLS FROM HOUSEMAN LAKE, NEWAYGO COUNTY, MICHIGAN

by

M. L. Livingston

The subject fish were sent to the Institute for Fisheries Research by Mr. Stanley W. Barnett of Grand Rapids, Michigan. In a letter which accompanied the specimens, Mr. Barnett stated that there had been a heavy mortality of bluegills in Houseman Lake and that a total of 1,050 dead or dying bluegills had been counted around the shore of the lake during the week end of April 20, 1946. He further noted that all of the bluegills were of about the same size and that although bass were known to be plentiful in the lake only 3 dead ones had been seen. Mr. Barnett described Houseman Lake as being in the northern part of Newaygo County (T. 16 N., R. 13 W., Sec. 9 and 16), of about 50 acres in area, and with no inlet or outlet. The water is clear and fresh, and the lake is said to be 25 to 30 feet deep. The bluegills had been dying for almost a month and local residents say that there is a similar but much smaller mortality of bluegills every spring. Although neighboring lakes have winterkilled in past years there has been no such occurrence in Houseman Lake, to Mr. Barnett's knowledge. No account of possible organic or inorganic pollution was given.

The bluegills were received in good condition and an examination of them was made by the writer. The fish averaged 8.2 inches in length ranging from 7.5 to 8.7 inches long. An examination of the scales of these fish revealed that their ages ranged from 5 to 6 years. This is a somewhat larger size than that shown by Beckman (1942) as the average for bluegills of these age groups. His data indicate that the average lengths of 5- to 6-year fish range from 6.7 to 7.4 inches, and that bluegills usually reach the lengths of the subject fish at an age of 7 to 10 years.

The results of the parasitological examination are set forth in Table 1. All of these fish were in apparently normal condition and their stomachs were full of food, mostly insects and plant debris. All specimens had light to moderately heavy infections of "black spot," Neascus ambloplitis, on the fins, skin, and in the general musculature. This parasite is a larval trematode or flatworm which is encased in a thin pigmented cyst. A few larval tapeworms (probably the bass tapeworm, Proteocephalus ambloplitis) were found in the liver of each fish and on the surface of the testes on one bluegill. Two of the fish had light infections of the trematode Crepidostomum sp. in their intestines and one acanthocephalan, or spiny-headed worm, was found. Heavy infections of Neascus sp. (vancleavei?) were common to the livers as well as the heart surfaces and kidneys of all specimens. This latter parasite is of the same genus as the common "black spot" trematode; but it is distinguished by the fact that the cyst wall is transparent and not pigmented, in contrast with N. ambloplitis.

There were no apparent evidences of protozoan or bacterial infections. The gills appeared normal, except for air bubbles in the cartilages supporting the gill rakers which may or may not be of pathological significance. Light to heavy hemorrhagic areas were noted at the bases

of all fins, particularly the anal fins. This condition may have been caused by injury due to wave action as the fish lay near the shore.

None of the parasitic infections observed are believed to be severe enough to cause death by themselves. The heavy infection of Neascus sp. in the livers is not uncommon to members of the sunfish group, and the writer has examined other centrarchids which were heavily infested with this fluke and yet in vigorous and healthy condition when captured.

The actual cause or causes of the death of these bluegills can not be definitely assigned to any specific agent on the basis of this examination. The possibility of virus or bacterial infections cannot be ruled out. Comparatively little is known about such diseases among fishes, and study along these lines would require intensive investigations over an extended period of time.

The possible effect of old age must not be overlooked. These fish were in the age groups which show mortality due to senescence, and this may have been a contributing factor in the death of these bluegills. The heavy infections of Neascus in the livers and other organs almost certainly would weaken the resistance of the fish to adverse physical and/or biological conditions. The hemorrhagic areas do not appear to be of pathological significance.

Summary and Conclusions

1. An examination was made of five dead bluegills sent to the Institute for Fisheries Research by Mr. Stanley Barnett of Grand Rapids, Michigan.

2. Heavy infections of Neascus sp. were found in the livers, kidneys, and on the heart surfaces of all fish; and light to moderate infections of Neascus ambloplitis were found on the skin and in the general musculature

of all fish. Very light infections of larval tapeworms, flukes, and acanthocephala were present in the viscera. Hemorrhagic areas, cause unknown, were noted at the bases of all fins, particularly the anal fins.

3. The fish were from 5 to 6 years old and large in size for that age.

4. The cause of death cannot be determined definitely but may have been due to a combination of senescence and parasitological infection or to bacterial or virus diseases.

5. No recommendations as to the control of this mortality can be made on the basis of this investigation.

INSTITUTE FOR FISHERIES RESEARCH

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Beckman, William C.
1942. Growth Rate of Some Michigan Fishes. Institute for Fisheries Research., Report No. 741, 34 pp., typewritten. Ann Arbor, Michigan.

Table 1

Summary of parasitological examination

of five bluegills from Houseman Lake

Parasite or disease condition	Part of body	Number of bluegills on which disease was found	Degree of parasitization
Neascus ambloplitis	Skin, fins, mouth cavity, general musculature	5	Light to moderate
Neascus sp. (*vancleavei*?)	Liver, heart surface	5	Heavy to very heavy
Larval tapeworms (*Proteocephalus ambloplitis*?)	Liver, surface of testes	4	Light
Crepidostomum sp.	Intestine	2	Very light
Acanthocephala	Intestine	1	Very light
Hemorrhagic areas	Musculature at bases of fins	4	Light to moderate hemorrhages