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Report No. 70

THE BLACK SPOTS ON BROOK TROUT AT THE FONTINALIS CLUB,
VANDERBILT, MICHIGAN

This investigation was undertaken in response to word received through the Department of Conservation that the brook trout at the Fontinalis Club, near Vanderbilt, Michigan, were affected with black specks on the skin.

We reported on June 7, 1931 to Mr. C. A. Peterson at the Club who informed us of the circumstances necessitating an investigation. He showed us specimens of trout which had black spots on them. Club members, according to Mr. Peterson, were desirous of finding out what these spots were, and what chance there was of an epidemic breaking out among the fish.

The Club is located about three and one-half miles east of Vanderbilt, Michigan, on the Sturgeon River. Their trout ponds are formed by damming up the river, and according to Mr. Peterson, there are five ponds.

A trout with the black spots well iced was taken to Ann Arbor for examination. The spots were found to be the result of a parasite infection. (The parasites attach themselves to the skin of the fish, bore into it and encyst. The fish responds to the encystment of the parasite by producing an additional fibrous, heavily-pigmented cyst around the parasite which results in the black spot and is easily seen with the naked eye.) At this season of the year the parasites are disintegrating in the skin and being absorbed by the tissues of the fish. Eleven cysts were removed from a trout

and only one contained a living parasite. The black spots on the fish at the present time are the result of infections obtained last year.

The single larval specimen was not sufficient for a positive identification, but it is the larva of one of two species, (Crassiphiala bulboglossa or C. ambloplitis), both of which occur as adults in the kingfisher. The fish host of C. ambloplitis is usually the rock bass, but black bass and even other kind of fish may carry the cysts, while the recorded fish host of C. bulboglossa is the perch and it is possible that minnows also carry them. Trout in nature are rarely affected by these parasites. Judging from the position of the cysts in the trout, one would conclude that this parasite is Crassiphiala bulboglossa. Most of the life history of Crassiphiala bulboglossa is known but the work has not been published. What is known of the life history of C. ambloplitis is based on feeding six fledging kingfishers encysted parasites from fish. Information concerning both life histories is inadequate, although it is our opinion that the parts of the life histories which have been worked out are correct.

Fish parasites are commonly called trematodes and are of special interest on account of their complicated life history. A snail, a fish, and a bird are necessary for the completion of the life cycle of the parasites under discussion. The snail host of both of these forms, apparently, is not known.

The spread of the parasite in these ponds can be prevented by destroying any one of the hosts. It is probably not practicable to destroy the snail host so that destruction of the bird, the kingfisher, must be resorted to in this particular case.

The artificial ponds are especially favorable for the spread of the parasite. The dams slow up the water so that the larvae from the parasite eggs dropped in the bird feces have an opportunity to find a snail and in turn the larvae from the snail, since they are produced by the thousands as a result of a single larva entering the snail, and since they live for from 24 to 36 hours in the water, have plenty of time to

come in contact with trout which they penetrate. The large amount of wood in the enormously increased area of shallow water is favorable in producing great quantities of snails since there is plenty of food for them. The retarding of the flow of water and spreading it out increases the temperature which, judging from experience with many forms, is essential in getting the larval parasites to leave the snails. Therefore, the destruction of kingfishers is the only feasible means of control under existing conditions.

A moderate number of cysts will do the trout no appreciable harm. The fish are as palatable as any fish and are only injurious from an aesthetic point of view. The parasites themselves, without the cysts, are just visible to the naked eye.

Whether these parasites cause mortality among fish is practically unsolved. The larvae which leave the snail and penetrate the skin of the fish are called cercariae. The status of knowledge regarding the effects of their penetration can be judged from the following quotation, taken from a recent reference on this subject.

"Blochmann (1910) has actually proved that the penetration of a few cercariae of certain kinds into a small fish will kill it very quickly. Just how extensive and important this is as a cause of death is still an open problem. Szidat (1927) is of the opinion that the penetration by cercariae may be responsible for the killing of large numbers of fish in the Kurisches Haff, a great area of shallow water in East Prussia."

In July or August, when new cysts will be formed, we would like to have the opportunity of examining additional specimens to definitely determine the species of parasite.

We wish to thank Mr. C. A. Peterson for his willingness to cooperate with us in working out some of these problems.

INSTITUTE FOR FISHERIES RESEARCH

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