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FURUNCULOSIS IN RAINBOW TROUT FROM NATURAL WATERS

By

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Furunculosis, or boil disease, is a disease of trout caused by a bacterium, Aeromonas salmonicida. Brook trout and brown trout are susceptible to furunculosis, but rainbow trout normally are resistant to it. When held at hatcheries where outbreaks of the disease among brook and brown trout are common, rainbow trout rarely show symptoms of furunculosis. Although moderate mortalities of brown trout due to this bacterium have occurred yearly in Michigan streams, and similar mortalities of brook trout have occurred in rare instances, no mortality caused by furunculosis has been reported among rainbow trout in the natural waters of Michigan.

In May, 1951, Mr. Edward H. Andersen (District Fisheries Supervisor) reported a mortality of adult rainbow trout in the East Branch of the Au Gres River in Iosco County, Michigan. He noticed the mortality at the Au Gres Weir, where he had been studying the annual spring and fall migrations of rainbow trout from Lake Huron for the previous two years. He reported that sick and dying fish frequently

were marked with blisters and bloody lesions resembling furunculosis. This observation was particularly interesting because of the resistance of rainbow trout to the disease, and because in previous years only an occasional dead rainbow trout had been observed in the river.

Several fresh specimens of recently dead rainbow trout were collected from the vicinity. They demonstrated typical internal symptoms of furunculosis and positive cultures were obtained when material from the kidneys of affected fish was inoculated on Dr. S. F. Snieszko's culture media No. 4 for the isolation of A. salmonicida. The cultures were sent to Dr. Snieszko, bacteriologist in charge, U. S. Fish and Wildlife Service, Microbiological Laboratory, Leetown, West Virginia, who verified the diagnosis.

Since the presence of furunculosis was definitely established among rainbow trout that had migrated from Lake Huron into the Au Gres River to spawn in the spring of 1951, plans were made for more intensive study of the fall run of rainbow trout at the same location. A. salmonicida is carried in the blood of fish, so the bacteria are commonly found in the kidneys of affected specimens. The creel census clerk, Mr. Fred Bethel, was instructed to collect and preserve (in ten percent formalin) kidneys from as many rainbow trout as possible, to be sectioned and examined later for presence of furunculosis.

A moderate mortality of rainbow trout was observed by Mr. Bethel in the Au Gres River in the fall of 1951. Furunculosis was demonstrated by culture from several specimens collected (soon after death) on October 25 of that year. However, no bacteria were found in kidney sections, from 105 fish caught by anglers, collected by the

creel census clerk during October and November, 1951.

In November, 1951, Mr. Andersen observed a small number of dead and dying fish but reported that typical symptoms of furunculosis were absent. He collected several specimens which were kept in a deep freezer for three days before bacteriological cultures were made. Cultures from these specimens were negative for A. salmonicida, but the extreme cold may have rendered the bacteria inactive. Fresh specimens for examination were not obtained although the pathologist made several visits to the area in search of them.

In the spring of the following year, 1952, only a few dead or dying fish were observed by anglers. The one freshly dead specimen collected was marked with four open sea-lamprey wounds. The kidneys of this fish and of four other rainbow trout caught by anglers were sectioned and examined for presence of the bacteria. All were negative.

Since there is no barrier between Lake Huron, Lake Michigan and Lake Superior to restrict passage of fish, it was possible for rainbow trout in Lake Michigan and Lake Superior also to be infected with furunculosis. There was at that time a weir in operation on the Black River, Mackinac County, for study of rainbow trout runs from Lake Michigan. Mr. Thomas Stauffer, in charge, collected five specimens of dead or dying rainbow trout during the summer of 1952. No bacteria were found in kidney sections from these fish. No specimens were examined from Lake Superior but abnormal mortality of rainbow trout was not reported there.

With the meager information at hand it is not possible to determine the origin of the furunculosis outbreak that occurred among lake-run rainbow trout in the East Branch of the Au Gres River in 1951.

Although rainbow trout are resistant to furunculosis and only rarely contract the disease even when constantly exposed to it, they may act as carriers when transported from one body of water to another.

Furunculosis is endemic in brown trout in the upper Au Sable River system as evidenced by the annual limited mortalities observed in the East Branch, South Branch, and Main Stream of the river. The fish hatchery at Grayling is located on the East Branch of the Au Sable River and furunculosis is a disease problem among brown trout there. Although rainbow trout are resistant to the disease, typical symptoms have been found on this species on several occasions at the hatchery. Therefore, since rainbow trout from this hatchery were stocked in the Au Gres River for many years prior to the outbreak of furunculosis described here, it is entirely possible that the disease could have been carried to the Au Gres River at such a time when other conditions were favorable for transmission of furunculosis to the lake-run fish.

The epidemic in the Au Gres River did not result in a large mortality, but the possibility did exist that it might develop into a significant annual loss of fish. However, since 1952 there have been no reports from the district fisheries supervisor, local conservation officers or anglers regarding abnormal mortalities among either spring or fall runs of rainbow trout in this river. This report was delayed until the fall of 1956 to make certain that the disease had disappeared and that further study would not be required.

The assistance of Mr. Fred Bethel, Mr. Thomas Stauffer, and especially of Mr. Edward H. Andersen in collecting specimens and reporting observations is greatly appreciated.

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