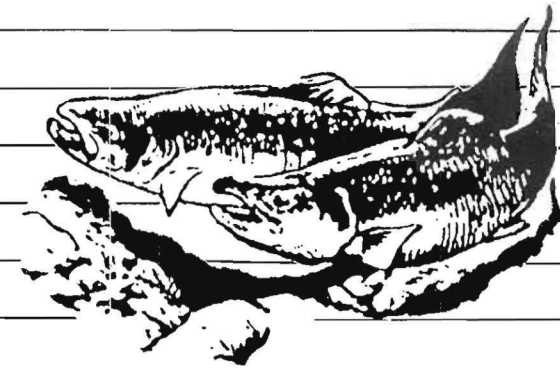
Research



Information bulletin

U.S. DEPARTMENT OF THE INTERIOR
NATIONAL BIOLOGICAL SURVEY

NO. 17
DATE 1994

Furunculosis Diagnosed in Mississippi River Fishes

In late summer 1993, many bowfin (*Amia calva*) and bigmouth buffalo (*Ictiobus cyprinellus*) from a fish farm on the Mississippi River died from an infectious disease. The bacterium *Aeromonas salmonicida* isolated from these fish confirmed a diagnosis of furunculosis. Furunculosis is a serious disease of bony fishes and can cause severe mortality—often approaching 100% within infected populations. The bacterium commonly produces hemorrhage of the fins, body surface, and viscera. Skin lesions initially appear as small, white areas that progress into furuncles that ultimately open to form deep necrotic ulcers in the musculature. The bacterium is a primary pathogen and the presence of two or three cells can initiate infection and cause rapid development of furunculosis in susceptible fish. This report adds bowfin and bigmouth buffalo to the list of susceptible hosts.

Biology of Diseased Fish

Bowfin range from the St. Lawrence River–Lake Champlain drainage of Quebec and Vermont across southern Ontario to the Mississippi drainage of Minnesota. Fish average 457–610 mm long and 0.75–1.12 kg. Adults (3–5 years old) spawn in spring. Bowfin are voracious, piscivorous predators that also eat crayfish and frogs. Regional common names include bowfin, dogfish, and mudfish.

Bigmouth buffalo are restricted in range to central North America. These fish average 254–457 mm long, and adults spawn in spring. This fish, with its terminal mouth and general body shape, is easily confused with carp. Bigmouth buffalo coexist in similar environments with other predaceous fish such as the bullhead, burbot, perch, pike, and walleye. Adults are probably free of predators. Regional common names include bigmouth buffalo, redmouth buffalo, buffalo, and buffalofish.

Predators for Retail Sale

Feral fish were captured in fyke nets by a commercial fishing operation between Mississippi River mile markers 679 and 648 and transported to earthen holding ponds on the Mississippi River at the junction of northeast Iowa, southeast Minnesota, and west-central Wisconsin. Fish were held for sale as predator fish to eliminate crowding or stunting conditions in fish ponds and small lakes. Crowding in earthen ponds was believed to be the predisposing stress that induced disease. After many died, fish with severe hemorrhaging of skin and mouth were brought to the Fish Disease Control Center (La Crosse, Wisconsin) where they were diagnosed with furunculosis. The etiologic agent was isolated and identified as *Aeromonas salmonicida*.

Confirmation of Diagnosis

Using Coomassie brilliant blue agar as the primary isolation medium, *A. salmonicida* was isolated from livers and kidneys of all examined fish. All bacterial cultures had typical phenotypic and biochemical profiles. This is believed to be the first confirmed case of furunculosis in bowfin and buffalo. Isolation of *A. salmonicida* from these fish suggests that the bacterium is endemic to the Mississippi River basin. The prevalence of this fish pathogen in feral populations of cool- and warmwater fishes is not known. Aquaculturists and fish health biologists must be aware that carrier populations exist in the wild and any stress encountered during the capture or holding of such fish introduces the possibility of a furunculosis epizootic.

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