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BIOLOGICAL CONTROL OF A TREMATODE PARASITE OF BLUEGILL

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ABSTRACT

An investigation was begun July 1, 1962 to determine the potential of snails infected with cercariae of *Posthodiplostomum minimum* to produce infection in bluegills, *Lepomis macrochirus*. Infected snails, in aluminum wire baskets, were stocked into plastic-lined pools at rates of 1 or 5 per pool. Bluegills of 2 sizes, 1-inch or 3-inch, were stocked into the pools. All bluegills were exposed to cercariae for 24 days at which time the experiment was terminated. One month later counts were made of the parasites found in each fish. One-inch bluegills contained an average of 20 parasites per fish when exposed to cercariae from 1 infected snail and 37 parasites per fish when exposed to cercariae from 5 infected snails. Three-inch bluegills contained an average of 110 parasites per fish when exposed to cercariae from 1 infected snail and 200 parasites per fish when exposed to cercariae from 5 infected snails. Comparison of treatment means revealed that the intensity of infection was related more to the size of the fish than to the number of infected snails to which the bluegills were exposed.

An investigation was begun October 10, 1962 to determine the effectiveness of the redear sunfish, *L. microlophus*, in reducing infection of *P. minimum* in bluegills through the destruction of the snail host. Infected snails were stocked free into plastic-lined pools at rates of 1, 5, or 10 per pool. Parasite-free snails were also stocked into all of the pools so that each pool contained a combined total of 100 snails. Bluegills were stocked into all of the pools. Some pools were stocked with redear, while others received no redear and were held as controls. One-half of the pools which received redear contained vegetation. All bluegills were exposed to cercariae for 37 days at which time the experiment was terminated. One month later counts were made of the parasites found in each fish.

When stocked alone with 1, 5 or 10 infected snails, bluegills averaged 38, 83, and 114 parasites per fish respectively. In pools stocked with redear, bluegills contained an average of 16, 16 and 48 parasites per fish. In the presence of redear and vegetation, bluegills

contained an average of 7, 9 and 32 parasites. Comparison of treatment means revealed that the redeal was effective in significantly reducing infection of *P. minimum* in bluegills, and that the presence of aquatic vegetation did not reduce the effectiveness of the redeal.

SOME HOST RESPONSES OF WHITE CATFISH

to *Ichthyophthirius multifiliis*, Fouquet*

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Introduction

The causative organism of white spot disease or ichthyophthiriasis, *Ichthyophthirius multifiliis* Fouquet, may reach epizootic proportions where fish are held under crowded conditions. Experiments were conducted with fingerlings of white catfish, *Ictalurus catus*, to determine some of the host responses to this parasite at various infection rates and at different temperatures.

Effect of Infection Rates on Survival

An experiment was designed to determine the effect of the rate of the initial infection with *I. multifiliis* on the survival of white catfish fingerlings. Eighteen 40-liter aquaria were stocked with one white catfish each at a water temperature of 78°F. Infection rates of 1, 10, 50, 100, 500, and 1000 trophozoites per fish were used. Each infection rate was replicated three times. Re-infection by second-generation tomites was prevented by periodic treatments with 5 p.p.m. formaldehyde. The water was changed every twelve hours after the formaldehyde applications to insure the presence of enough formaldehyde to control all amoebulae. At infection rates of 1 and 10 mature trophozoites per fish, there were no mortalities. At infection rates of 50 and 100 trophozoites per fish, 33.3 per cent of the fish died. Infection rates of 500 and 1,000 trophozoites per fish resulted in a 100 per cent mortality of the fish ten days after the initial infection.

Immune Response to *Ichthyophthirius* at Four Challenge Levels

In a second experiment the degree of immunity of white catfish to *I. multililiis* at different challenge levels was studied. An immune population was produced by exposing 190 white catfish fingerlings, 10 per aquarium, to 10 trophozoites per fish in 40-liter aquaria. The water temperature was 78°F. Symptoms of infection appeared four days later. All fish were then treated with 0.10 p.p.m. Malachite Green. Three days after treatment the fish were transferred to a feeding trough and fed a prepared fish feed at the rate of three per cent of their body weight per day. Fifteen days after their initial exposure

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