

ABSTRACT

Pond enclosure experiments were conducted for two years to test the effects of zebra mussel (Dreissena polymorpha) presence (6,000/m²) on zoobenthos, and the diet and growth of yellow perch (Perca flavescens). Enclosures consisted of the following treatments: (1) yellow perch with zebra mussels; (2) yellow perch without zebra mussels; (3) zebra mussels only; and (4) no zebra mussels or fish. The hypothesis predicted higher growth rates for yellow perch with zebra mussels. In 1992, yellow perch with zebra mussels did not increase their wet biomass significantly more than yellow perch without zebra mussels ($X^2 = 0.015$, $df = 1$, $P = 0.90$). In 1993, however, yellow perch with zebra mussels either maintained or increased their wet biomass and yellow perch without zebra mussels lost weight. This difference in growth was highly significant ($X^2 = 55.63$, $df = 1$, $P < 0.001$). Although it was not possible to demonstrate a positive correlation between total dry weights of stomach contents and yellow perch growth, there was a significantly higher dry weight of amphipods and isopods in zebra mussel treatments. This suggests that crustaceans may have played a crucial role in the observed yellow perch growth difference. Diet analyses also provided significant evidence of reduced consumption of zooplankton by yellow perch with zebra mussels.

The benthic macroinvertebrate community tended to be dominated by Hirudinea and Diptera (mostly Chironomidae) regardless of the presence or absence of zebra mussels, yellow perch, or both. Other macroinvertebrate taxa appeared to respond to the presence of zebra mussels, some positively (triclads and oligochaetes), and at least or negatively (Gastropoda).

A concurrent experiment was conducted in the pond enclosures in 1992 to test the quantitative predator impact of freshwater drum (Aplodinotus grunniens) on zebra

mussels. The hypothesis predicted freshwater drum (standard length > 250 mm) would substantially reduce a population of zebra mussels. Two treatments, (1) freshwater drum and zebra mussels, and (2) freshwater drum and no zebra mussels were used. Evidence that freshwater drum were feeding on zebra mussels was unobtainable since these fish appeared to have become behaviorally stressed during the study, and subsequently did not feed on zebra mussels. They are not recommended for shallow pond studies such as this one.