Functional Roles of Mysis and Amphipods Between Lake Basins Faced by Two Different Stressors: Zebra Mussels and Cyanobacteria Blooms

Ali, Hiba (School: South Burlington High School)

Temperate aquatic ecosystems in North America face threats due to the introduction of zebra mussels and harmful algal blooms (HABs). Zebra mussels and cyanobacteria, a common type of HAB, can alter the food web structure of lakes. Additionally, these stressors can impact benthic invertebrates by making it difficult to find food sources due to nutrient sequestration and competition for resources, and decreasing dissolved oxygen . Mysis diluviana and G. fasciatus are two benthic invertebrates found in the main lake - where zebra mussel densities are high, and Northeast (NE) Arm of Lake Champlain - where cyanobacteria blooms are common in the summer. Studying the ecological function of Mysis and amphipods in the setting of these stressors is crucial to understanding the ecological roles these species have in the food web. Stable isotope analysis was used to determine if the ecological function of each invertebrate was different in each basin of the lake. Results showed that from May-June, Mysis and zooplankton in the main lake shared a similar carbon isotope value, indicating their common food source of diatoms in the deep chlorophyll layer of the hypolimnion, while in the later months, Mysis preyed on zooplankton. In the NE arm, both amphipods and zooplankton mainly preyed on epilimnetic phytoplankton. These results suggest that amphipods and Mysis are adaptable to their respective stressors, and play a similar ecological role within the food web of their resident basin in Lake Champlain.

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