

## Abstract

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We tested the hypothesis that grazing on bacteria would vary between lakes with differing plankton community structures. Paul and Tuesday lakes (Gogebic County, MI) are respectively dominated by piscivorous and planktivorous fish. Consequently, zooplankton in Paul are primarily large daphnids, while zooplankton in Tuesday are primarily small cladocerans and copepods. We measured flagellate grazing on bacteria using a fluorescent minicell method, while cladoceran grazing was estimated from the relationship between body length and filtering rate. We predicted that cladoceran grazing on bacteria would be higher in Paul, and flagellate grazing would be higher in Tuesday. Cladoceran grazing on bacteria was important in both lakes contrary to our initial expectation. Large populations of the small cladoceran, *Bosmina longirostris*, in Tuesday exerted a grazing pressure ( $0.18\text{--}35 \times 10^6$  bacteria  $1^{-1}$  h $^{-1}$ ) approximately equal to that of the large cladoceran, *Daphnia pulex*, in Paul ( $0.34\text{--}30 \times 10^6$  bacteria  $1^{-1}$  h $^{-1}$ ). Flagellate grazing was higher in Tuesday as predicted (range: Paul,  $0.1\text{--}6 \times 10^6$  bacteria  $1^{-1}$  h $^{-1}$ ; Tuesday,  $0.2\text{--}20 \times 10^6$  bacteria  $1^{-1}$  h $^{-1}$ ). However, there was not a simple relationship between total abundance of flagellates and total grazing rates. High community grazing by flagellates occurred when attached choanoflagellates were present. These flagellates had higher ingestion rates than free forms. We find no clear evidence that differences in food-web structure between the two lakes influence the process of grazing on bacteria. Instead, our results emphasize the significance of cladocerans and attached flagellates as consumers of bacteria in freshwater ecosystems.