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## Shifts in phytoplankton size structure and community composition during grazing by contrasting zooplankton assemblages<sup>1</sup>

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### *Abstract*

Contrasting zooplankton assemblages consistently produced different compositional shifts in a phytoplankton community. Two experiments in 120-liter enclosures were used to assess the responses of the algae to two different-sized zooplankton communities. Grazing by a mixture of small copepods, *Bosmina longirostris*, and rotifers led to increased growth of phytoplankters with greatest axial linear dimensions  $<25\ \mu\text{m}$  and ratios of surface area to volume  $<2.6$ , such as *Chlamydomonas* and Chlorococcales. Larger phytoplankton taxa such as *Asterionella formosa*, *Closteriopsis longisimus*, and *Synedra* sp. declined in the presence of small zooplankters. In contrast, a mixture of large zooplankters dominated by *Daphnia pulex* and *Diaptomus oregonensis* caused declines in phytoplankters with greatest axial linear dimensions  $<60\ \mu\text{m}$  and ratios of surface area to volume  $<2.75$ , while larger algae such as *Aphanocapsa* and *Dinobryon* increased. Discriminant analyses showed that volume and surface area were the most effective characters for determining the response of algae to grazers. Zooplankton community structure was important in determining the responses of algal assemblages to grazing.