

**Using imaging cytometry to assess the trophic role of micro- and mesozooplankton.**

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**Abstract**

Microzooplankton herbivory constitutes a major source of mortality for phytoplankton in many marine ecosystems, and microzooplankton are themselves important prey for mesozooplankton. A series of 12 microzooplankton dilution experiments coupled with copepod feeding experiments were conducted over a period of 1 year to investigate their trophic roles at an open shelf station in the Western English Channel, which included the development of a spring and autumn phytoplankton bloom. Changes in meso- and microzooplankton grazing on major phytoplankton groups were determined using a combination of flow cytometry and FlowCam. Data generated from these experiments were used to determine grazing impact on primary producers and top-down predation on microzooplankton. Microzooplankton were the main consumers of autotrophs. Their grazing controlled autotrophic stocks outside of spring and autumn bloom periods. We test the hypothesis that the larger diatom taxa can escape microzooplankton grazing control, allowing them to form blooms. The time-series of physical data, stoichiometry and grazing impact from the E1 site are discussed in relation to modelling approaches to understand bloom dynamics.

**Keywords:**

microzooplankton, phytoplankton, growth, grazing

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