



Phytoplankton growth and microzooplankton grazing in the Chukchi borderland and Mendeleev Ridge, Arctic Ocean

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During August and September 2012, we measured phytoplankton growth and microzooplankton grazing rate in the Chukchi borderland and Mendeleev Ridge using the icebreaker R/V Araon. A variety of environmental condition and trophic condition were encountered, from low chlorophyll-a ($< 0.1 \text{ ug L}^{-1}$) in the Chukchi borderland to diatom bloom (maximum 17.1 ug L^{-1}) in the southern part of Mendeleev Ridge which is characterized by high phytoplankton biomass driven by the influx of more productive waters from the East Siberian Sea. The community of microzooplankton was dominated by naked ciliates and heterotrophic dinoflagellates (HDF). Ciliates dominated in low chlorophyll-a concentration sites and HDF dominated in high chlorophyll-a concentration sites. Microzooplankton biomass and size structure matched with the chlorophyll-a concentration and size-fraction. Grazing rate of microzooplankton varied from 0.01 to 0.85 d^{-1} , on average 0.34 d^{-1} . Phytoplankton growth rate varied from 0.09 to 0.76 d^{-1} , on average 0.39 d^{-1} . Phytoplankton growth rate and microzooplankton grazing rate were relatively higher in the Chukchi borderland than the Mendeleev Ridge. Microzooplankton grazed from 10.3 to 122.8% (average 82.9%) of daily chlorophyll-a production and from 11.3 to 57.2% (average 28.4%) of initial standing stock. In this study area, microzooplankton grazing and phytoplankton growth were high compared to rates reported summer in the other Arctic Ocean. The results suggest that microzooplankton were the major consumers of primary production, and that their grazing is one of the most important losses affecting the phytoplankton biomass during summer in the Arctic Ocean.