

WHY DO HETEROTROPHIC FLAGELLATES PROLIFERATE
UNDER BACTERIA-LIMITING CONDITIONS IN
SEA-ICE COMMUNITIES? (ABSTRACT)

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Microzooplankton communities were studied under the first-year ice of both Saroma Kō lagoon and Resolute Passage as a part of the SARES International Project. Evidence from both sites showed that bacterial standing stock was probably insufficient to provide the required energy for the growth of their main predator, the phagotrophic flagellates. From these results we concluded that flagellates may need additional energy sources, such as high molecular weight compounds, in order to complete a substantial part of their diet. However, because of methodological limitations, there was no published information on DOC utilization rates by natural populations of protozoa. Here we present results from fluorescence extinction measurements and from epifluorescence microscopy which have allowed us to determine the ingestion rates of fluorescently labeled polysaccharide dextran (over the molecular weight range of 4 to 2000 kDaltons) by sea-ice flagellates from the Greenland Sea. These organisms were found to rapidly ingest high molecular weight dextran, clearing up to $1.3 \text{ mg C l}^{-1} \text{ h}^{-1}$ in melted ice samples. Field data indicate that DOC utilization by flagellates account for 50% of their carbon requirements and could directly channel up to 6% of primary production to higher trophic levels.

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