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EVIDENCE OF LIVING ICE ALGAE IN A FRESHWATER FLUVIAL LAKE

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Abstract:

Winter ice cover is a fundamental feature of north temperate aquatic systems and is usually associated with the least productive months of the year. Here we describe a previously unknown freshwater habitat for protist (microbes or algae) communities in the ice cover of the St. Lawrence River, Canada. Diversity and distribution of ice algae was investigated during winter 2005, ice cores were collected at five stations on the littoral zone. We observed different communities of sympagic organisms at each station made of diatoms, green algae, ciliates, amoeba and flagellates. Community structure and chlorophyll *a* distributions in ice cores showed vertical heterogeneity, with maximal biomass in the lower part of the core. We found high abundance of viable algal cells such as *Aulacoseira islandica* (diatom) and microbial assemblage growing in vertical channels and at the ice-water interface. The chlorophyll *a* concentrations increased throughout the winter with maximal values in April corresponding to the highest temperature and solar radiation regime during winter. To evaluate the potential contribution of these ice algae to spring primary production, we incubated inocula of water and melted ice separately in aquaria under the same conditions of light and nutrients during 13 days. The ice core inoculum showed 5.2 times more chl *a* than water inoculum at first day and 7.2 times after 13 days. Thus, ice algae could have an important role in the annual productivity budget of freshwater ecosystems and movement of ice in spring may act as seed inoculums for other riverine communities.