

SPRINGTIME SEDIMENTATION OF ICE ALGAE UNDER
FIRST-YEAR ICE: A COMPARATIVE
STUDY (ABSTRACT)

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Under-ice sedimentation of ice algae was assessed during the period of growth and decline of the bottom ice algal community in Saroma Ko lagoon (Okhotsk Sea; 44°06'N, 143°56'E) and Resolute Passage (Canadian Arctic; 74°41'N, 95°16'W). Sediment traps were attached from the ice at two shallow depths (0.5 m, 2.5 m) and a deeper one (7.5 m in Saroma Ko; 15 m in Resolute). The traps were recovered every 3 to 4 days, from 21 February to 23 March in Saroma Ko and from 1 May to 24 June in Resolute, in 1992. Concurrently, the algal biomass suspended in the water column was monitored.

At both sites, a period of high ice-algal sedimentation was evidenced from sediment trap data (e.g. increase in chlorophyll *a* flux, high proportion of pennate diatoms, decrease in the POC/chl. *a* ratio). However, the relative export of chlorophyll *a* versus pheopigments differed from one site to the other. In Saroma Ko, chlorophyll *a* made up most of the sedimented pigments throughout the season (ca. 60 to 96%), whereas in Resolute the proportion of chlorophyll *a* varied with total pigment flux (from ca. 20 to 60%). The particulate organic matter flux was correlated with pigment flux in Saroma Ko; however this was not the case in Resolute. In Saroma Ko, the high suspended chlorophyll *a* concentrations (from 1 to 10 mg m⁻³) were mainly in the >5 μm fraction (ca. 80%). In Resolute, very low suspended chlorophyll *a* concentrations (ca. 0.1 mg m⁻³) were observed until ice algae were released from the bottom ice into the water column (ca. 50 mg m⁻³ at 0.5 m).

These results indicate distinct sedimentation patterns at each site. In Saroma Ko, algal biomass contributed largely to the sedimented organic material. In Resolute, a large part of the algal biomass was exported through sedimentation of fecal material.

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