

Distinct snow algae communities along an elevational gradient

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Abstract

Abstract: Snow algae grow in melting summer snowfields throughout polar and alpine regions, forming extensive blooms that can alter snow surface albedo and increase melt rate. Snow algae community composition is reported to be similar between snow algae blooms in different continents; here, we report community composition can vary widely from patch to patch on the same mountain, and varies with elevation and date. We used dual-marker *rbcL* and 18S amplicon high-throughput sequencing (HTS) and light microscopy to assess community composition in 33 snow algae samples from the Coast Range of British Columbia, Canada. We found lower elevation snow algae blooms (800 - 1400 m) were dominated by *Chloromonas*, while *Sanguina* was restricted to higher elevations (1400 - 2200 m). Samples from higher elevation had higher phylogenetic diversity, and included several potentially novel clades of algae. Low elevation sites dominated by *Chloromonas krienitzii* remained green throughout the season in subsurface samples, but developed orange pigment at the surface. Taken together, our results suggest that microscopy and 18S amplicon HTS alone may not be sufficient to resolve differences between snow algae communities, and that snow algae may be specially adapted to distinct micro-habitats within the melting snow microbiome.

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1.1 header2

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plot(pressure)
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