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Snow algae in an ice core drilled on Grigoriev Ice cap in the Kyrgyz Tien Shen Mountains

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Snow algae are photosynthetic microorganisms and are living on the surfase of glaciers. They grow on melting surface from spring to summer and their the biomass and community structure are changed with physical and chemical conditions on glaciers. Ice cores drilled from glaciers also contain snow algae that grew in the past. Studying biomass and community structure of snow algae in ice cores may reveal that not only temporal variation in snow algae in the past but also environmental condition relating propagation of snow algae. In this study, we aim to describe snow algae on the surface and in an ice core of Grigoriev Ice cap located in eastern Kyrgyzstan of the central Asia.

The ice and snow samples corrected at various parts on the glacier surface contained at least three taxa of filamentous cyanobacteria, a unicellular cyanobacterium, and two green algae. The samples of pit and ice core collected on the top of the glacier also contained a filamentous cyanobacterium, an unicellular cyanobacterium, and an green alga. The quantitative analyses of the algae in the 18 m deep ice core samples revealed that the algal biomass showed several peaks. Based on the dating by pollen grains, the 18 m core covers 46 years. The results suggest that the snow algae did not grow every year on the top of the ice cap, and their biomass and community structure varied greatly from year to year.

Keywords: snow algae, ice core, Grigoriev Ice cap