

The snow and ice algal communities of mountain glaciers in Suntar Khayata region, Eastern Siberia

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Snow and ice algae are photosynthetic microorganisms which can grow on snow and ice and they are observed in many parts of the world. Blooms of them can reduce the surface albedo of snow and ice and accelerate their melting since the algal cells are usually occupied with pigments. Understanding their ecology is important both to the biology and the geophysics of glaciers.

Our previous works revealed that snow and ice algal community shows geographical variation. The structures on glaciers vary among geographical locations of world. For example, the algal community is dominated by green algae in Alaskan glacier while it is dominated by filamentous cyanobacteria and contains little green algae in central Asian glacier. In particular, the latter community can compose cryoconite granule which has large effect on glacier melting.

We investigated four glaciers in Suntar Khayata Mountain Range, eastern Siberia, where the one of the blank area of algal study from 2012 to 2014.

Two taxa of green algae and five taxa of cyanobacteria were observed. The algal community was dominated by green algae: *Ancylonema nordenskioldii* in bare ice area and *Chloromonas* sp. snow covered area. The total algal biomass showed the highest on the middle part of the glacier. These characteristics of community structure are also observed on other Alaskan and Greenlandic glaciers but differ from those on Central Asian glaciers. The algal community of Suntar Khayata region can classify to 'Arctic type' snow and ice algal community.

These characteristics of algal community were approximately common in all four glaciers which we investigated in this region and did not show annual change for three years. The dominant taxa did not change and total algal biomass showed the highest on middle part of glacier. This fact support the suggestion which our result shows characteristics of algal community which are common in current years. The exception was the average value of total algal biomass. However we conducted investigations at same period every year, the average total algal biomass of whole glacier in 2013 was one-tenth of that in 2012. In contrast to cryoconite granule which can be preserved on glacier surface every year, it is indicated that green algae decrease under snow cover during winter and re-increase in summer. It is thought that the total algal biomass was affected by annual weather condition and showed greatly change because of the dominance of green algae in algal community of this region.

Keywords: Snow and ice algae, Arctic region, Mountain glacier, Annual change, Community structure, Regional characteristics