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Snow algal community on Urumqi glacier No.1 in the Tien Shan Mountains, China

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Snow algae are cold-tolerant algae growing on snow and ice on glaciers. They can reduce the surface albedo of snow and ice and significantly affect their melting. In addition, snow algae can be used as an indicator of the paleo-environment in ice core research. Thus, it is important to understand the ecology of them. However, ecological information on snow algae is still limited, in particular on glaciers. This research aimed to describe a snow algal community on Urumqi glacier No. 1 in the Tien Shan, China. Two species of green algae and six species of cyanobacteria were observed on the glacier. The algal community structure changed with altitude. Oscillatoriaceae cyanobacteria was dominant in the ice area (3770-4010m a.s.l.) and *Chloromonas* sp. was dominant in the snow area (4090m a.s.l.). The total algal cell volume biomass also changed with altitude. It decreased rapidly as surface environment shifted from ice area to snow area. However, the biomass did not change in ice area. These are considered to be due to physical and chemical conditions of the glacier surface which continuously changes with altitude. The algal community on Urumqi glacier No. 1 significantly differed from those on other Asian high mountain glaciers. Cyanobacteria dominated in the community on the glacier (90%) whereas green algae dominated those on the other Asian glaciers. Higher pH of Urumqi glacier No. 1 are likely to cause the distinct community structure. This result suggest the existence of a geographical boundary of algal community structures between Altai and Tien Shan, and Tien Shan and Himalaya.

Keywords: snow algae, Cyanobacteria, community structure, altitudinal distribution, geographical boundary, pH