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Analysis of microbial community of red snow from alpine snowfields

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As the temperature rises in the spring and summer of polar and alpine environments, green, orange and pink coloration paint the snowfields. Psychrophilic microalgae cause such coloration in the snow, making use of the window of opportunity where conditions are sufficient for growth, followed by mating and returning to a resting state to survive extreme conditions such as high light, freezing conditions and desiccation. Along with algae, heterotrophic bacteria are known to co-habit such psychrophilic ecological niche in an interconnected metabolic network where algae presumably provide the bacteria with fixed carbon and bacteria recycle nutrients back into the environment. Algae photosynthesize and fix carbon, of which gets released into the environment, supporting heterotrophic bacteria growth, while bacteria recycle elements back into the environment and can also provide algae with crucial nutrients, such as vitamins, or signals important in the life cycle of algae. Although algae coloring snowy peaks have been observed for many years, the community dynamics and cellular processes of organisms in such environments are understudied.In order to further understand the community dynamics of snow algae and bacteria, colored snow from Mount Asahidake (Hokkaido) was collected over three time points in June and July, 2016, for physicochemical, community sequencing and culture-based analyses. Both red and green-orange colored snow patches were observed, and upon analysis, stark differences in the photosynthetic activity and community profile these two types of snow emerged. Furthermore, the microbial community profile of the red snow also shifted over time. Preliminary data on bacteria associated with these snow algal species from culture-independent and ？dependent methods will be presented.