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Structure and microbes of cryoconite granules on Asian glaciers

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There are many impurities on the surface of glacier, such as mineral particles and organic matters. These impurities are called cryoconite and form granularity complexes, named cryoconite granules. Cryoconite granules are formed by cyanobacteria growing on the glacier with entwine mineral particles and organic matters. Cryoconite granules have spherical shape about 1mm in diameter and have darkish color from bacterial humus. Asian glaciers have amount of cryoconite granules on their surface, and cryoconite granules have property that decrease glacier surface albedo and accelerate melting. To define the cryoconite granules' making process and its' makers are important to think about glaciel variation. In this study, I analyze three samples of cryoconite granules, are picked on different part of Asian glacier. Urumqi No.1 glacier in Tenshan mountains and Qiyi glacier in Qilian mountains, China, Yala glacier in Himalaya mountains, Nepal.
From the results of analyze cryoconite granules' shapes, there are some differences in three glaciers. Cryoconite granules in Urumqi No.1 glacier are average 1.11mm in diameter and have blackish brown. Cryoconite granules in Qiyi glacier are average 0.94mm and have brighter color than Urumqi's one. Cryoconite granules in Yala glacier are average 0.56mm and have darkest color than others. From the results of analyze cryoconite granules' cross section structure, the structure found in most of granules' cross section and it is formed by brown layer and darker layer. Brown layer takes most of the part in cross section and contains fine mineral particles. Structures are grouped in to four types and those ratios are different in each glacier. These four structures may indicate the steps of formations and condition of formation environment on the glacier.

Keywords: Cryoconite, Cryoconite granule, Glacier, Structure, organism