



Where do the fine-grained cryoconite quartz originate from? A case study from the Russell Glacier, southwest Greenland.

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Spherical-shape cryoconite holes, carrying dark coloured material, occur on glacier surfaces and have been studied worldwide. Here, we focus on fine-grained mineral material of the cryoconite holes from the Greenland ice sheet, which is related to the ablation zone of the Russell Glacier, southwest Greenland. Since in this area, quartz is abundant and largely constitutes the mineral matter of cryoconite, we analyse the shape, character of surface and microtextures of mineral quartz particles in scanning electron microscope (SEM) to provide information about particles character and their origin (Kalińska-Nartiša et al., 2017).

In general, investigated quartz grains carry transportation features originating from numerous, but local sources, except few grains with so-called bulbous incrustation. These latter grains argue for a dry and warm climate conditions, thus likely travelled from distant deserts. Among grains originating from local sources, glacial grains with triangular-faceted and sharp edges dominate and are followed by grains with abraded edges and smooth surface. Rounding and smoothing is a result either of chemical solution in alkaline meltwater or mechanical processes attributed to wind action.

Finally, relatively limited number of grains with encrustation occur meaning that seasonal and daily frost action took place.

References

Kalińska-Nartiša, E., Lamsters, K., Karušs, J., Krievāns, M., Rečs, A., Meija, R. 2017. Fine-grained quartz from cryoconite holes of the Russell Glacier, southwest Greenland – a scanning electron microscopy study. *Baltica* 30 (2), 63 – 73.