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Microbial communities and their potential for degradation of dissolved organic carbon in cryoconite hole environments of Himalaya and Antarctica

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Abstract

Cryoconite holes (cylindrical melt-holes on the glacier surface) are important hydrological and biological systems within glacial environments that support diverse microbial communities and biogeochemical processes. This study describes retrievable heterotrophic microbes in cryoconite hole water from three geographically distinct sites in Antarctica and a Himalayan glacier, along with their potential to degrade organic compounds found in these environments. Microcosm experiments (22 days) show that 13–60% of the dissolved organic carbon in the water within cryoconite holes is bio-available to resident microbes. Biodegradation tests of organic compounds such as lactate, acetate, formate, propionate and

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