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Amorphous Si and Ca affect microbial community structure in arctic permafrost soils

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Arctic warming affects the permafrost soils in different ways. Increase soil temperature and thawing of deeper horizons modifies the release of greenhouse gases (GHG) by release of nutrients. A lot of research was done about nutrient cycling of C, N and P, but little is known about the influence of Ca and amorphous Si (ASi) on this elements. To show the potential of this two elements in the Arctic systems, we analysed the effect of ASi and Ca on microbial community structure with next generation sequencing and qPCR. We analyzed fungal and bacterial community structure in two different soils from Greenland after incubation with different levels of ASi and Ca. Microbial community reacted differently in the high Arctic (Peary Land) and low Arctic soil (Disko Island) to changing concentrations of ASi and Ca. We found a significant change with linear correlation from gram-negative to gram-positive bacteria classes with increasing Ca and/or ASi levels. Further, abundance of Ascomycota and Basidiomycota changed. We postulate this changes as an important factor for changed GHG production as potential response to modified nutrient availability.