COMPARATIVE ANALYSIS OF MICROBIAL COMMUNITIES INHABITING TWO DIFFERENT ROCKS IN HIGH ARCTIC: MARTIAN ANALOGUE STUDIES. Y. H. Choe, M. Kim and Y. K. Lee, Korea Polar Research Institute (26 Songdomirae-ro, Yeonsu-gu, Incheon 406-840, Korea and yhchoe@kopri.re.kr).

Rocks in the high Arctic can be a suitable habitat for microorganisms by protecting them from harsh abiotic factors such as low temperatures, water deficit and high UV. The geochemical and textural properties of rocks affect how susceptible, or bioreceptive, a rock is to colonization by different microorganisms [1, 2]. In this study, to understand how different characteristics of the rock affect microbial community composition, we examined the diversity of rock-inhabiting microbes that colonize sandstone and limestone in Svalbard.

The Svalbard archipelago, situated in the Arctic Ocean north of mainland Europe (74 to 81N, 10 to 35E), has a cold (average temperature - 6C) and dry (210 mm of annual rainfall in Longyearbyen) climate and harbors numerous sites analogous to Mars. We collected two types of rocks (sandstone and limestone) in Svalbard. A combination of paired-end sequencing and microscopy methods was used to assess the diversity and abundance of rock-inhabiting microbial communities on the rocks. Also, we determined the geochemical and textural properties of rocks using several analytical procedures.

Preliminary results of taxonomic assignments of the sequence reads revealed that the dominant bacterial phyla, in both rock types, were *Actinobacteria*, *Acidobacteria* and *proteobacteria*, and that their relative distribution was slightly different between the two rocks. Other phyla such as *Bacteriodetes*, *Cyanobacteria*, and *Planctomycetes* were also present consistently across all samples, but in lower abundance (Fig. 1). To further understand diversity and composition of lithic microbes, we analyze archaea, eukaryote and fungi.

Our findings contribute to the current understanding of microbial diversity in both the high Arctic and different types of rocks, and identify physical and chemical rock properties as determinants of patterns in lithic microbial community. Also, this provide insight into geobiological processes that shape the biosphere and help us understand the cold and dry extraterrestrial habitats.

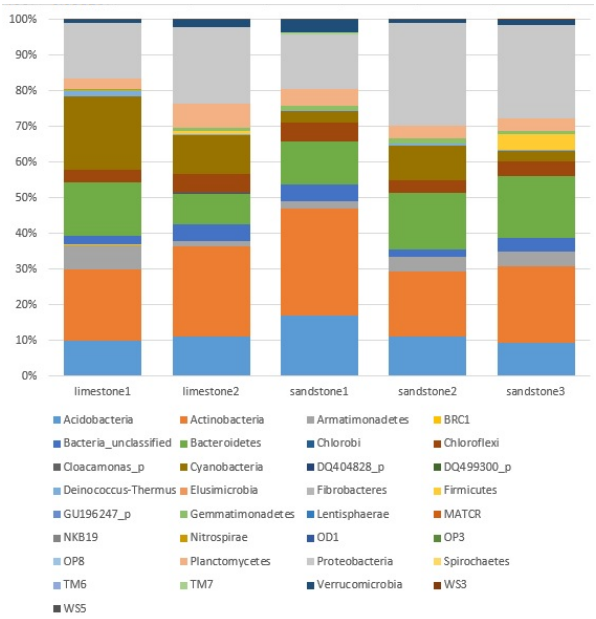

Fig. 1 Bacterial phyla composition

References: [1] Alexander Crits-Christoph. *et al.*, (2016) *Front. Microbiol., 7,* 301. [2] Beatriz Cámara. *et al.*, (2014) *Int. Microbiol., 17,* 235-247.