**ECOLOGICAL SPECIFICITY OF POLAR LICHEN MICROBIOMES**

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Polar regions are likely the areas of the world where lichen communities show their highest degree of development leading to the formation of dense cryptogamic covers on soils. In these areas, lichens and bryophytes growing on the soil surface can be associated with different microorganisms, such as cyanobacteria and heterotrophic bacteria. Under that surface, edaphic prokaryotic (bacteria and archaea) and eukaryotic (algae and fungi) microorganisms coexist forming specific microbial communities. However, the diversity and roles of the microbiome in lichens from Polar Regions remains underexplored. Hence, we proposed to characterize the bacterial community structure of different lichens and mosses species colonizing glacier forefields from both Polar Regions, and the soils under them, in order to assess its specificity. To do so, we combined high-throughput amplicon sequencing with electron microscopy. Our results showed that bacterial communities differed less among microbiomes of cryptogamic covers dominated by different cryptogam species, than between these microbiomes and the bacterial communities from soils beneath. The edaphic bacterial community presented higher diversity than the cryptogamic cover microbiome, as shown by the higher abundance of specific edaphic OTUs. However, certain species specificity was also found in the microbiomes of different lichens and moss species. On the other hand, the microbial community structure of soils with cryptogamic cover was markedly different to that of the bare soils, suggesting a strong influence of the cryptogamic cover development on the edaphic communities. Finally, the electron microscopy revealed that bacteria appear mainly in non-healthy parts of the cryptogams, but also associated to the cell walls of some healthy cells and to soil particles integrated in the cover. All these results suggest that bacteria associated to cryptogamic covers might play an important role in their establishment and functioning, and consequently in the colonization of deglaciated areas. Funding: (MINECO, CTM2015-64728-C2-2-R)