**DYNAMICS OF ROCK COLONIZATION BY LICHENS IN POLAR GLACIER FOREFIELDS**

Isaac Garrido-Benavent1\*; Sergio Pérez-Ortega2; Starri Heiðmarsson3; Asunción de los Ríos1

1Dept. Biogeochemistry and Microbial Ecology, National Museum of Natural Sciences (CSIC), 28002 Madrid, Spain; 2Dept. Mycology, Real Jardín Botánico (CSIC), 28014 Madrid, Spain; 3Icelandic Institute of Natural History, Borgir Norðurslóð, IS-600 Akureyri, Iceland; \*E-mail: igbenavent@mncn.csic.es

An important consequence of glacier retreat is that new land is gradually exposed and, therefore, different lithic habitats are susceptible to biological colonization. Microorganisms, including fungi, are the first colonizers and starting point of primary succession processes. Lichens become conspicuous in subsequent successional states. In this study, we examined colonization and succession patterns in pioneering fungal and algal communities developing on moraine rocks at the Hurd Glacier forefield (Livingston Island, Antarctica). Rock samples were collected along a three-stage chronosequence representing <1, ca. 13 and 23 years since ice retreat. Illumina MySeq amplicon sequencing and scanning electron microscopy (SEM-BSE) were combined to examine the presence of lichen associations at different successional stages and to assess specific rock colonization features of polar deglaciated areas. The lithobiontic fungal amplicon sequence dataset clustered into 586 OTUs (and 563 Amplicon Sequence Variants, ASVs). The most abundant lineage was the *Ascomycota*, with *Lecanoromycetes* (*Caliciaceae*, *Umbilicariaceae*, and *Lecanoraceae*) as dominant classes and families. Along the chronosequence, an increase in relative abundance with time was found for *Eurotiomycetes* and *Lecanoromycetes*, including several lichen-forming fungal genera (*Austroplaca*, *Buellia*, *Mastodia*, *Umbilicaria* and *Verrucaria*). This agreed with our SEM-BSE observations, which revealed intimate fungal-algal interactions in some cavities and fissures in rocks from areas being ice-free for 23 years, although thalli were not observed on the rock surface. The development of lichen thalli, which occurred only at the latest successional state, induced the higher impacts on the colonized rock surface. Finally, we compared our results with data from glacier forefields in other polar regions in the Northern Hemisphere with a higher development of lichen communities. All in all, although thalli often remain invisible to the naked eye, lithobiontic lichen associations do occur and change over time in forefields of retreating glaciers, thus contributing to successional processes. Funding: (MINECO, CTM2015-64728-C2-2-R)