**HOW DO SYMBIOTIC ASSOCIATIONS IN LICHENS RESPOND TO THE VARYING CLIMATE CONDITIONS IN THE SOUTHERNMOST AREAS OF ANTARCTICA?**

Monika Wagner1, Georg Brunauer1, Arne C. Bathke1, S. Craig Cary2, Roman Fuchs1, Leopoldo G. Sancho3, Roman Türk1, Ulrike Ruprecht1\*

1 Paris Lodron Universität Salzburg; 2 The University of Waikato; 3 Universidad Complutense de Madrid; \*E-mail: ulrike.ruprecht@sbg.ac.at

Lecideoid lichens as dominant vegetation-forming organisms in the climatically harsh areas of the southern part of continental Antarctica showed clear preferences in their species composition in relation to environmental conditions (i.e. macroclimate). 306 lichen samples were included in the study, collected along the Ross Sea coast (78°S–85.5°S) at six climatically different sites. The species compositions as well as the associations of their two dominant symbiotic partners (myco- and photobiont) were set in context with environmental conditions along the latitudinal gradient. Diversity values were non-linear as reflected by the highest alpha diversity in the mild areas in the McMurdoDryValleys (78°S), the most southern areas (Durham Point, 85.5°S; Massaman Glacier, 84.5°S) and lowest in the climatically extreme Darwin Area (~79.8°S). Furthermore, the specificity of mycobiont species towards their photobionts decreased under more extreme climatic conditions. The *Trebouxia* OTU *Tr*\_A02 occurred at all sites and was dominant in milder areas. In contrast, higher relative abundance of other *Trebouxia* OTUs was found in colder areas. Accordingly, *Lecidea andersonii*, *Lecidella greenii* and *Rhizoplaca macleanii,* which were almost exclusively associated with *Tr*\_A02 were confined to the milder areas. The generalist lichen species *Lecanora fuscobrunnea* and *Lecidea cancriformis* were present in almost all habitats and when dominant, climatic conditions were extreme. In summary, the macroclimate is considered to be the main driver of species distribution, making certain species useful as bioindicators of climate conditions and, consequently, for detecting climate change. Funding: Austrian Science Fund (FWF) P26638; lichen collections: FRST-funded IPY Research Programme Understanding, valuing and protecting Antarctica’s unique terrestrial ecosystems: Predicting biocomplexity in Dry Valley ecosystems” and NZTABS supported through a grant to ICTAR at Waikato University. Antarctica New Zealand provided logistic and Waikato University (NZ) financial support. CRYPTOCOVER (Spanish Ministry of Science CTM2015- 64728-C2-1-R).