**NUANCED QUALITATIVE TRAIT APPROACHES REVEAL STRONG ENVIRONMENTAL FILTERING AND PHYLOGENETIC CONSTRAINTS ON LICHEN COMMUNITIES DURING TROPICAL FOREST SUCCESSION**

Natália M. Koch1\*; Daniel Stanton1; Sandra C. Müller2; Adriano A. Spielmann3; Robert Lücking4

1 Department of Ecology, Evolution and Behavior, University of Minnesota, Saint Paul, MN, USA; 2Departamento de Ecologia, Instituto de Biociências, Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil; 3Instituto de Biociências, Universidade Federal de Mato Grosso do Sul, Campo Grande, MS, Brazil; 4 Botanischer Garten und Botanisches Museum, Freie Universität Berlin, Germany;

\*E-mail: nkoch@umn.edu

Quantitative functional trait approaches have proven to be very powerful in ecological studies when there is a well-established framework of trade-offs, but the latter is still unclear in many organisms, such as lichens. We propose that a nuanced qualitative trait approach, grounded in established functional attributes, has the potential to reveal previously overlooked patterns, especially in a phylogenetic framework. We evaluated how environmental filtering and phylogenetic constraints act on lichen community assembly along natural succession of Atlantic Rainforest, using a functional approach based on nuanced traits. Lichens were sampled on tree trunks in different successional stages. We detected changes in taxonomic, functional and phylogenetic composition, as well as in structure and diversity, along this gradient. Functional traits such as photobiont genus, type of cortex, reproductive strategy, propagule size, and protection strategy, showed strong responses to succession even when controlled for phylogenetic relationships. We conclude that mature forests with a closed canopy structure work as a strong environmental filter for understory lichens, reflected in species turnover, limiting phylogenetic, functional and species diversity, but also with a unique functional and phylogenetic composition. The use of a nuanced qualitative trait approach may overcome some limitations related to the use of categorical traits and reveal previously overlooked key lichen functional attributes, including carbon concentrating mechanisms in photobionts, cortex anatomy and chemistry, and propagule size. This is the first study analyzing patterns of phylogenetic community structure for lichens along a forest succession gradient, setting the stage for studies in other regions and ecosystem types. Funding: Coordenação de Aperfeiçoamento de Pessoal de Nível Superior – CAPES.