**PHOTOBIONT DIVERSITY IN PALEOTROPICAL CYANOLICHENS: NEW INSIGHTS FROM EAST AFRICA AND NEW CALEDONIA**

Jouko Rikkinen1\*; Maarit Jylhä1; Ulla Kaasalainen1

1 University of Helsinki, Finland; 2 University of Göttingen, Germany; \*E-mail: jouko.rikkinen@helsinki.fi

Filamentous cyanobacteria are important primary producers and N2 fixers in some terrestrial ecosystems and a wide diversity of lichen-forming fungi have cyanobacteria as photosynthetic symbionts and/or as N2-fixing symbionts. Symbiotic associations with cyanobacteria have evolved independently in several fungal lineages, and this process has often resulted in convergent thallus morphologies in distantly related groups. When in symbiosis, the morphology of filamentous cyanobacteria is strongly modified, usually hindering direct comparisons between symbiotic cyanobacteria and their aposymbiotic relatives. However, DNA methods are now routinely used to identify symbiotic cyanobacteria both from fresh material and dry herbarium specimens. *Nostoc* is by far the most common genus of cyanobacteria encountered in lichen thalli, but also several other genera, including the recently re-circumscribed *Rhizonema*, include lichen-symbiotic taxa. Vertical transmission of photobionts from one host generation to the next occurs in many lichens. Often the production of specialized symbiotic propagules helps to maintain pairwise symbiotic interactions over time and ultimately promotes the likelihood of coevolution between specific partners. Many lichen-symbiotic cyanobacteria seem to be practically unculturable and some genotypes may have lost their ability to survive outside symbiosis. The environmental availability of appropriate photobionts is likely to be a major factor in explaining patterns of lichen species occurrence; as appropriate photobionts are not ubiquitously distributed along environmental gradients, also variability in establishment success can be expected. Results from many recent studies indicate that we have underestimated the diversity of lichen-forming ascomycetes especially in the tropics and lichen photobionts are more diverse than previously thought. Here we present new findings from the paleotropics, with emphasis on photobiont diversity observed in cyanolichens with *Rhizonema* photobionts in East Africa and New Caledonia.