

Bridging the gap: linking genotype to phenotype using experimental approaches

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More and more high-quality metagenomes have been produced in recent years, generating hypotheses that pose questions regarding environmental adaptation in lichens. These hypotheses must be tested in order to examine how the genotype of either main symbiotic partner (mycobiont and photobiont) can influence the phenotypic responses of a lichen thallus under changing environmental conditions. As lichens are the outcome of a complex symbiotic interplay between these main players, the individual attributes of interacting partners can influence the overall fate of an entire lichen thallus. Findings from experimental studies utilizing -omics, morphological and ecophysiological approaches to investigate the responses of lichens to stressful conditions provide insights into the distinct contribution of the main symbiotic partners and contribute towards an understanding of how lichens adapt to their environment. By synthesizing these insights, this symposium aims to highlight how emerging and combined techniques such as -omic tools and ecophysiological metrics can be used to test specific hypotheses of how observed allele changes affect lichen performance, and how symbiotic interplay contributes to the overall fitness of a lichen thallus.