



PhD thesis topic:

Mechanisms of evolutionary adaptations of cyanobacteria

Genome, epigenome, transcriptome, and phenotype

Cyanobacteria belong to the most important primary producers thriving in all environments with sufficient light intensity for billions of years. They inhabit extreme environments such as deserts, therefore, they are adapted to broad temperature fluctuation, high UV radiation, and drought stress. With climate change, the drylands are expanding, and the importance of cyanobacteria rise. The PhD project will be focused on the transcriptome and epigenome response to the environmental stresses (e.g. drought stress) in several species of cyanobacteria. The transcriptome of the strains will be sequenced by short reads using Illumina. Furthermore, the PhD student will use third-generation sequencing (Oxford Nanopore) to reconstruct epigenomic profiles in several related species of cyanobacteria. The epigenomic profiles will be investigated at the population and species levels. The expression profiles will be connected with phenotype, epigenome, and genome diversity. Altogether, the result will provide unique data for our understanding of the role of adaptation, selection, and environment in the speciation of cyanobacteria.

Number of positions: 2

Place: Algological Laboratory, Department of Botany, Palacký University Olomouc. The laboratory is focused on the evolution and taxonomy of cyanobacteria and algae. We established a wide network of collaborations in Europe and the USA (University of North Florida, USA; University of Florida, USA; Stockholm University, Sweden; Natural History Museum London, UK etc.).

Supervisor: doc. Mgr. Petr Dvořák, Ph.D., Department of Botany, Palacký University Olomouc

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Start: September 2024 or as negotiated

Grant resource: GAČR (Factors driving the global diversification of cosmopolitan cyanobacterium *Microcoleus*; principal investigator P. Dvořák)

