

PhD position in polyploid evolution of *Cardamine amara* (Brassicaceae)

Dept. of Botany, Faculty of Science, Charles University in Prague, Czech Republic

We are seeking a highly motivated student to join a project focused on ecological and evolutionary consequences of genome duplication (polyploidization) in plants. Although polyploidization is a leading force in plant evolution including crops, we know little about evolutionary drivers promoting origin and coexistence of different ploidy levels within a species. By combining field surveys, cytogenomics, population genomics and crossing experiments, we aim to identify major forces shaping polyploid evolution in natural populations of *Cardamine amara*, a member of plant model family Brassicaceae. Specifically, the project will address following objectives: What was the role of ploidy (parallel) ecological adaptation in genetic divergence? Was ecological divergence linked with (parallel) whole genome duplication events? What is the strength of realized gene flow between diploid and tetraploid populations and do there exist intrinsic barriers restricting such gene flow? Had the genome of *C. amara* contributed to the formation of polyploid lineages in other species within the genus?

Biogeographic and biosystematics part will be lead by Prof. Karol Marhold (<https://botany.natur.cuni.cz/brassiploidy/>). Population genomic analyses and experimental work will be done under co-supervision of Dr. Filip Kolář, group of Ecological genomics (<https://botany.natur.cuni.cz/ecolgen>) and the cytogenomics in collaboration with Ass. Prof. Martin Lysak (<http://www.plantcytogenomics.org/>). Additional training in population genomics will be provided under international collaboration with the Yant lab (University of Nottingham, UK).

The student will gain multi-disciplinary experience by addressing following tasks:

- field surveys across European range of the species and in ploidy contact zones in central Europe
- ploidy level estimation using flow cytometry complemented by cytogenomic techniques (GISH, chromosome painting)
- crossing experiment between individuals of different ploidy
- analysis of high-throughput sequencing data (RADseq, genome resequencing)

We offer

- work in an inspiring student-dominated environment of two interconnected teams of Ecological genomics and Brassicaceae polyploidy
- competitive salary topping-up the standard university scholarship (altogether monthly net income of 800 EUR) with rise in the following years when fulfilling additional PhD study duties
- additional experience by international collaborations
- work in the historical centre of the UNESCO heritage site of Prague city

We require

- strong motivation for interdisciplinary research at the border of ecology, biosystematics and population genomics
- a MSc degree in Biology or related fields (in summer 2019 at the latest)

Please send your CV, contacts for at least one reference person and a short motivation letter (max A4) to the project leader, Karol Marhold (Karol.Marhold@savba.sk). Review of the applications will begin on **March 1st 2019** and will continue until the position has been filled. The position is available from **September 2019**.