

Supervisor thesis report

on Michaela Konečná's master thesis '**Reproductive biology in the genus *Ficaria*: reproductive modes, pollen viability and size, and experimental homoploid hybridization between selected taxa**'

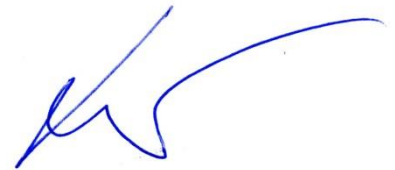
The genus *Ficaria* belongs to the neglected but in fact intricate polyploid complex, typical of high phenotypic variation, several ploidy levels, and unclear taxonomy. Our team has been studying this polyploid complex for several years. Hitherto, the gathered data showed rather complex patterns of ploidy diversity and distribution together with significant genome variation in some taxa. Several previous studies postulated that both hybridization and polyploidization played main roles in the current taxonomic complexity of the genus. Therefore, we were also interested in questions concerning reproductive modes, pollen viability, and reproductive isolation mechanisms between ploidy/taxa. Master thesis of Michaela Konečná was devoted to answer some of the abovementioned questions. She studied experimental plants that were previously collected in the field by the members of our research team and planted in the experimental garden. Michaela gathered data on pollen viability of almost all distinguished taxa and ploidy levels, experimentally tested the occurrence of several reproductive modes in the representatives of the genus, and did experimental homoploid crosses between two common but currently almost allopatric diploid taxa, and additionally also between geographically separated populations of a common tetraploid taxon, to estimate the level of reproductive isolation/potential gene flow between studied taxa/populations.

The specific phenology of *Ficaria* plants required concentrated experimental work in a relatively short time window during early spring (March, April). Unfortunately, COVID restrictions greatly limited Michaela's research in the first year (2020) and partly during spring of the second year. Despite this complication, Michaela gathered a large amount of data on pollen viability and reproductive modes of almost all known (to our team, so far unpublished) ploidy levels of the most known taxa. Moreover, she did experimental homoploid crosses between selected taxa and compared the results with intrataxa crossing. I appreciate that Michaela not only evaluated the success of crossing experiments but continued in the estimation of the fitness of offspring (ploidy, genome size, germination, survival, and pollen viability). Unfortunately, *Ficaria* offspring grow slowly and the seeds are dormant. Therefore, the study of the morphology and fertility of offspring and the potential of gene flow between parental taxa still need to be finished in future. I also appreciate that Michaela used still unpublished data of her colleague Jana Uhlířová (with the agreement of the Jana) to improve the interpretation of the obtained results.

Michaela worked independently, approached the subject of thesis responsibly, consulted the supervisor and the thesis consultant on problematic matters, tended the parcel of planted plants carefully. On the other hand, Michaela was having trouble figuring out how to properly plan the composition of a thesis while she was writing it, and in part interpreting some of the findings. The final form of the work thus feels partly rushed. Therefore, even the discussion in some parts seems to be incomplete, and would require further elaboration.

Technically, there are occasional misspellings in thesis, but the level of English of the thesis is acceptable, especially when it is a first-time English scientific text of the author.

Despite all these comments, Michaela Final's thesis is a valuable contribution to the knowledge of the biology of Ficaria's representatives. I can state that Michaela Konečná's thesis meets all the requirements for this type of thesis and I recommend thesis for the defence. I propose that the thesis be graded B.



Dr. Martin Duchoslav

Department of Botany, Palacky University

Olomouc 2021-08-17