



## Scientific background of ex-situ conservation and reintroduction of endemic plant species *Minuartia smejkalii*

(Oral and Poster)

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Ex-situ conservation and species reintroduction is a standard approach in many conservation actions. These actions should ensure that the new populations will be genetically diverse and will not suffer from loss of fitness due to inbreeding or outbreeding depression. Despite this, many projects establish new populations without previous scientific research.

We present the results of a genetic analysis and hybridization experiment aimed to provide background information for ex-situ conservation and reintroduction of *Minuartia smejkali*, a critically endangered endemic species included in Habitats directive 92/43/EEC. *M. smejkalii* is restricted to serpentine rocks and occurs only on two isolated regions with 8 populations in total.

Because of the rapid decrease of population size, the project LIFE for *Minuartia* (LIFE15 NAT/CZ/000818) focuses on revitalization of its habitats, enhancement of population size, establishment of ex-situ conservation and reintroduction of the species on localities where it went extinct. We performed genetic analysis and a hybridization experiment to understand the between population differentiation and thus to select appropriate population or their mixture to establish new populations. Genetic variability was analysed by nextRad sequencing using 20 individuals per population. Hybridization experiment was done by hand pollination of plants with pollen from the same plant, same population or other population. The developed capsules were collected and number of ripe seeds evaluated.

The results showed that populations from the two regions are genetically differentiated and therefore the ex-situ conservations should be established separately for each regions. Similarly it is necessary to keep regionality of plants used for reintroduction. On the other hand, populations within each region are not genetically different and their hybrids produced ripe seeds. Moreover, self-pollination reduced seed set. In the smallest population, plants pollinated by pollen from other population within the same region produced the highest amount of seeds. This suggests that for the establishment of new populations it is suitable to combine individuals from different populations within each region to avoid inbreeding depression. It is even the preferred strategy for the enhancement of population size of the smallest population in the nature. Prior to the realization of these actions in the nature we still need to test the germination rate of the seeds and fitness of hybrids.

To conclude, the data collected were crucial for proper design of species reintroduction and ex-situ conservation. They suggest that we should not combine individuals from the two regions. They also suggest that different populations within each region should be combined for establishment of new populations, and for the enhancement of the smallest natural population. This demonstrates that detailed scientific data on the species should be a key part of any conservation action.