

Short-Term Scientific Mission Grant - APPLICATION FORM¹ -

Action number: CA18201

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Details of the STSM

Title: An integrated taxonomic approach as tool for the assessment of two plant species conservation status and their update on the IUCN Red List: *Acer opalus* Mill. and *Luzula sylvatica* (Huds.) Gaudin.

Start and end date: 04/04/2024 to 10/04/2024

Goals of the STSM

The main purpose of this STSM is to contribute to an assessment of the conservation status of the species *Acer opalus* Mill. and *Luzula sylvatica* (Huds.) Gaudin through an integrated taxonomic approach. This integrated approach will analyse both morphological and molecular characters on several populations distributed within the ranges of the studied species, thus assessing not only the distribution and size but also the taxonomic differences of their populations. The taxonomic analysis could potentially reveal subspecies with fragmented or restricted ranges and with an endangered conservation status. The populations growing in the locations where the several taxa were firstly described are necessary to be sampled since they represent the locus classicus. This STSM will contribute to assess the populations of the studied species growing in the south-eastern part of France and south-west part of Switzerland. These regions hold particular values for such taxa, since *Acer opalus* subsp. *opulifolium* was firstly described by Dominique Chaix in 1785 in “Les Baux” (La Roche-des-Arnauds, France), while both *Acer opalus* subsp. *opalus* and *Luzula sylvatica* subsp. *sieberi* were reported as NT in some regions of the south-west part of Switzerland from the Swiss IUCN Red List in 2002.

Working Plan

The working plan mainly involves two phases: the first one regarding the populations sampling in the field, and the second phase regarding the analysis in the laboratory, through morphological measurements and a certain number of samples (about 10 per population) will be prepared for subsequent molecular analysis. The host institution which will hold the STSM is the Conservatoire Botanique National Alpin, located in Gap (France), is strategically positioned for sampling activities, since it is very close to both “Les Baux” (France), and relatively close to the south-west part of Switzerland.

First phase (04-07/04/2024) During the first phase, the locations where the two species are most likely to be found in the southern-east part of France will be identified, and collecting several individuals for each population in the

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sample areas will be carried out. The host institution can support significantly to identify areas for sampling, by providing herbarium specimens of the studied species that may contain site collection details. At least 25 individuals from each population will be collected, choosing individuals as complete as possible regarding the diagnostic characters. The collected samples will be successively dried and stored at the host institute to be analysed. Furthermore, data about the size and fragmentation of the assessed populations will be estimated in field.

Second phase (08-09/04/2024) During the second phase, morphometric measurements will be conducted both on the collected samples and on the herbarium specimens provided by the host institution, measuring the main diagnostic morphometric characters. Thereafter, a certain number of samples (about 10 per population) will be prepared for subsequent molecular analyses. Such analyses will enable to assess the morphological and genetic differences and similarities between the different collected populations and the individual from herbarium specimens.

Third phase (10-04/2024) After all the previous analysis will be finished, the resulting data will be statistically analysed and an IUCN assessment will be realized, considering the new taxonomic findings and comparing the distribution information deriving from the collected data with the ones obtained from the scientific literature.

Financial construction

The cost foreseen for the STSM categorised by the respective activities is as follows:

- round trip from institution home to institution host = 450 €
- fuel for the car provided for the 4 days of field surveys = 200 €
- accommodation for 6 nights = 400€
- meals = 350€
- materials for morphological analyses and samples preparation for molecular analysis = 100€

Total amount = 1500€

Expected outputs and contribution to the Action MoU objectives and deliverables.

The main expected results of the STSM are the contributions to the progress towards the taxonomic and conservation status gaps, considering also a genetic approach, of the species *Acer opalus* Mill. and *Luzula sylvatica* (Huds.) Gaudin. They can therefore contribute to the Action objectives of two Working Groups: the WG3 “Filling the gaps in plant conservation” and the WG5 “Genomic approaches in plant conservation”. Indeed, this study can provide a contribution to assess the distribution and size of the populations characterizing the two analysed species and revise their systematic framework. This can determine the possible merging or splitting of certain taxa with the creation of new ones, thus varying their actual corresponding range. Thus, after the taxonomic revision, some of them could exhibit fragmentation or restricted ranges, revealing an endangered conservation status, or others with very wide ranges and therefore without any need for conservation measures. For both species there are several gaps concerning their taxonomic classification and conservation status. For instance, several studies have found morphological differences between individuals belonging to different populations of such species, attributing *Acer opalus* to 7 subspecies (*opalus*, *opulifolium*, *rotundifolium*, *ambiguum*, *obtusatum*, *neapolitanum* and *aetnense*) while *Luzula sylvatica* to 4 subspecies (*sylvatica*, *sicula*, *sieberi* and *henriquesii*). However, no detailed analyses with an integrated taxonomic approach were carried out. Regarding the IUCN assessment, *Luzula sylvatica* was not assessed, while the species *Acer opalus* was reported as LC from the IUCN assessment of 2018, but in addition to not being updated, such assessment does not report any data about the population trend.

Furthermore, the genetic analysis that will be carried out subsequently will provide an understanding of the genetic makeup of the species, studying the genetic differences and similarities between the various populations. The comparison of the genetic findings between the collected field samples and herbarium specimens could also reveal genetic variations occurred during the time in the populations.

Moreover, being the species *Luzula sylvatica* cultivated and recently become very popular and used widely as a landscape plant, such study can contribute to assess the identity (referrable to which taxa) and provenance of the cultivated one, and this would be very useful in determining the origins of some 'suspect' populations that are probably escapes from cultivation.

During the STSM, the applicant will be able to improve the use of techniques for field sampling, sample preparation and analysis techniques, using different testing equipment to make precise measurements and statistical analysis softwares.