Biological diversity funding and experience sharing in environmental project programming and implementation

The Hungarian experience

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Abstract

The Pannon Seedbank Project

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The main pillar of the Convention on Biological Diversity is to preserve all life forms and genetic diversity on Earth. The EU Biodiversity Action Plan elaborated for the implementation of the EU Biodiversity Strategy aims to identify and fill critical gaps in EU ex situ conservation programmes for wild species.

In compliance with the above, the '**Establishment of the Pannon Seed Bank for the long-term ex-situ conservation of Hungarian vascular wild plants**' project supported under the LIFE+ Biodiversity program aims the long-term seed preservation of the wild vascular flora of the Pannonian biogeographical region in order to assist and complement in situ species conservation activities. In addition to the increased safety in case of accidental loss or degradation of endangered populations of rare species in the natural, native habitats, ex situ seed banks may provide additional possibilities for monitoring genetic changes in wild populations, facilitate access to research material without increasing the rate of disturbance of and pressure on the original habitats, and assist multidisciplinary studies on factors involved in the maintenance of diversity and stability in plant associations. Samples stored in the seed bank may also facilitate reconstruction of disturbed, deteriorated habitats within the Pannonian biogeographical region.

This project uses international and national experiences and knowledge in this field by assessing available scientific literature, carrying out study tours and foreign trainings, cooperating with seed banking experts and using existing knowledge of related conventions, agreements and networks. Seed collection strategy and methodology have been developed with the involvement of prominent botanists by the Centre for Ecological Research, Hungarian Academy of Sciences, Vácrátót, Hungary. Collection is being carried out by botanical experts. Due to its special objectives (establishment of a representative seed bank for an entire biogeographical region), the project covers a high number of species and habitats. While a total of 2,200 wild vascular plant species occur in Hungary, the Hungarian native flora consists of approximately 1,600 species. By the end of the project, approximately 50 percent – at least 800 species – of the wild native flora will be collected if no unexpected natural hazard occurs that may influence the seed bearing capacity of vascular plants. Species with nature conservation importance (endemisms, sub-endemisms, other threatened species), species with ecological importance (e.g. environmental indicators) and with economic importance (e.g. crop wild relatives) will be handled as priorities.

Besides increasing the natural value of disturbed areas, field testing of seed bank samples are also be carried out. Therefore reintroduction of 10 species characteristic to Pannonic sand steppes and inland dune (Natura 2000 Annex I 6260, 2340) habitats is carried out on ex-arable

fields in the vicinity of the Fülöpháza Sand Dune Area of the Kiskunság National Park, which itself is a Natura 2000 designated site.

All seed collections need to be cleaned before storage to remove dirt and unnecessary plant parts. Seed cleaning aims to process fieldharvested material to a collection of clean, viable plant propagules (seeds or fruits) without incurring damage or loss.

The most reliable measure of a seed's viability is a germination test, because only viable seeds are proper for storing. The conditions needed for germination vary considerably between different species and even between different populations of the same species. However the project mainly focuses on species with (presumably) orthodox storage behavior, species with no information related to storing also are examined.

During drying the moisture content of seeds is decreased in such degree, which extends the storage longevity and increase the regeneration interval. Once the seed has been dried to the required level it is packaged and placed in the cold room where it is kept at a temperature of 0°C and -20°C. The length of time that each collection can be stored for is fixed by the biology of the seed. Depending on the species, seeds may live decades, centuries and, in some cases, even millennia.

Seed samples will be safeguarded in the Base and Active storage facilities of the Pannon Seed Bank at Research Centre for Agrobiodiversity. The Base collection storage (storage at -20° C) serves the long term conservation of reserved samples, while the Active collection (storage at 0°C) helps to facilitate research and distribution of research material.

A duplicate store of the Active seed collection was established at the Centre for Ecological Research, Hungarian Academy of Sciences and a duplicate store of the Base seed collection will be established inside the Esztramos Mountain of the Aggtelek National Park Directorate in order to achieve full safety.