

## **Botanic gardens and the implementation of the Global Strategy for Plant Conservation in Austria**

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### **Abstract**

Austrian botanic gardens have been actively involved in the implementation of the Global Strategy for Plant Conservation since the GSPC was adopted at CBD CoP 6 in The Hague (The Netherlands) in 2002. This paper gives a brief survey of the GSPC-related activities of the Austrian botanic gardens, indicates the relevance of selected BG-projects to achieve certain GSPC-targets, and shows effects for the botanic gardens as a result of their involvement in GSPC issues.

### **Key words**

Austria, Botanical Gardens, GSPC-implementation

### **GSPC-implementation in Austria**

In 2003, a GSPC kick-off-meeting was organised by the Austrian CBD-Focal Point (which also acts as GSPC Focal Point) at the Ministry of Agriculture, Forestry, Environment and Water Management. At this meeting, the author of this paper (as representative of the Austrian botanic gardens) was invited to present and explain the GSPC targets and objectives to potential stakeholders.

In 2004, the Austrian Biodiversity Strategy was developed by the Austrian Biodiversity Commission which includes BG representatives. GSPC targets were incorporated into this strategy.

Between 2004 and 2007, the Austrian botanic gardens mainly focussed their work on two GSPC targets, target 8 (ex-situ conservation) and target 10 (alien invasive species).

In 2007, the first (of three) Austrian GSPC-expert workshop took place. It was initiated by the Austrian botanical gardens and the GSPC Focal Point and organised by the Botanical Garden, University of Vienna. This workshop provided, for the first time, an overview of current GSPC-related activities in Austria, and, at the same time, established a dialogue between the stakeholders on individual and organisational levels. The workshop identified options, impediments and gaps in implementing the GSPC in Austria and resulted in a "GSPC-roadmap to 2010" including proposals for actions.

In line with the roadmap, a number of GSPC-related projects were carried out between 2008 and 2010, several of them at Austrian botanical gardens. These projects were coordinated by the Botanical Garden, University of Vienna and co-financed by the Austrian GSPC Focal Point. The results of the projects were reported at the workshops in 2008 and 2009 where they were discussed and their outcomes were used to adjust actions for the follow-up activities.

A summarizing GSPC workshop is planned for November 2010 to evaluate the achievements in the first phase of the GSPC and to set the frame for the activities required by the second GSPC proposed for adoption at CBD CoP 7 in Nagoya (Japan) in October, 2010.

### **Austrian botanical gardens and their contributions to selected GSPC-targets**

Austrian botanical gardens and their staff have been involved in the implementation of all 16 GSPC targets. Some targets, however, were subject to more intensive work in the botanical

garden community. The following chapter summarizes the activities of Austrian botanical gardens related to those targets during the last 8 years.

- Target 1 (A widely accessible working list of known plant species, as a step towards a complete world flora)

An important step to reach this target for Austria was the publication of the third edition of the “Exkursionsflora von Österreich, Liechtenstein und Südtirol” (Fischer *et al.* 2008). Several scientists based at Austrian botanical gardens participated in the preparation of this work. As part of the GSPC implementation efforts in Austria and financially supported by the GSPC Focal Point, an online version of the “flora” has been started in 2007 (Fischer *et al.*, 2007). It includes contributions from botanical gardens’ staff members. Besides these Austrian based checklist activities, researchers from the Botanic Garden, University of Vienna, have compiled a database of all names of *Bulbophyllum*, the largest genus in the orchid family, and recently published a CITES checklist of this genus based on the database (Sieder *et al.*, 2009).

- Target 3 (Development of models with protocols for plant conservation and sustainable use, based on research and practical experience) and
- Target 8 (60% of threatened plant species in accessible *ex situ* collections, preferably in the country of origin and 10% of them included in recovery and restoration programmes)

Several botanic gardens in Austria (i.e., of the University of Applied Life Sciences Vienna, the City of Linz, the Carinthian Centre of Botany Klagenfurt, the Karl-Franzens-University of Graz, and the University of Vienna) have, since 2002, established programmes for integrated *ex situ/in situ* conservation of Austrian endangered species. These programmes include seed collection activities according to established protocols (like the seed collecting manual of ENSCONET: ENSCONET, 2009), germination tests and cultivation at botanical gardens and planting programmes *ex situ*. They, finally, aim at replanting the corresponding species at sites of their original occurrence, as part of *in situ* habitat restoration activities (e.g., in connection with LIFE-Nature-projects like “Pannonic Steppes and Dry Grasslands”, 2004-2008, Wiesbauer, 2009). One example of a target species for such activities is *Dracocephalum austriacum* (Lamiaceae), today restricted to two localities in Austria.

In 2003, the Austrian BGs have started a documentation of their *ex situ* collections of rare and endangered plant species of Austria in order to establish a coordinated approach to secure all threatened species in Austria *ex situ* in botanical gardens (in living collections as well as in seed banks). The following gardens actively participate in this project, which is co-financed by the Austrian GSPC Focal Point and coordinated by the Botanical Garden, University of Vienna: Alpine Garden Villacher Alpe; Arche Noah; Botanical Garden City of Linz; Botanical Garden Karl-Franzens-University Graz; Botanical Garden Carinthian Center of Botany Klagenfurt; Botanical Garden University of Applied Life Sciences Vienna; Botanical Garden University of Innsbruck; Botanical Garden University of Salzburg; Botanical Garden University of Vienna; Flower Gardens Hirschstetten, City of Vienna. The basis for this project is the “Red List of endangered *Pteridophyta* und *Spermatophyta* of Austria” (Niklfeld 1999), which lists 1,798 species as endangered in Austria (incl. subspecies, microspecies and regionally endangered species). According to the recent survey in the Austrian botanical gardens (Fuchshuber & Kiehn, unpubl.) 779 of the 1,798 endangered species are actually present in *ex situ* collections, 406 of those with documentation of their origin. Of the 520 species considered to be critically endangered in the “Red List”, 191 are found in *ex situ* collections, 100 of them with documentation of origin. 382 of the 779 cultivated endangered species are present in only one *ex situ* collection. 106 of those are critically endangered and 7 extinct in the wild. Of these 113 taxa, only 55 have documentation of their origin. As a consequence of this evaluation, the Austrian botanical gardens will not only strengthen their cooperative effort to include additional species into *ex situ* collections, especially of the 520 taxa considered to be critically endangered. They will also look at the accessions already

present in the collections without documentation of origin, and, if necessary, replace them with material from a known origin. This evaluation might, especially in the case of species considered to be rare on a worldwide scale, require the use of molecular markers (e.g., fingerprint methods like AFLPs): one pilot study has clearly indicated that plants of the Lamiaceae *Phlomis tuberosa* of unknown origin cultivated at the Botanical Garden, University of Vienna, cluster together with other Austrian populations of this species (and are genetically different from populations occurring further East). Thus the material in cultivation is likely to have come from an Austrian source (Schönswetter & Kiehn, unpubl.), and, therefore, at least for the time being, will not be replaced.

Besides being cultivated in living *ex situ* collections, the rare and endangered Austrian plant species are also the subject of an Austrian-wide seedbanking project. Initiated in the context of the EU-project ENSCONET and coordinated by the Botanical Garden, University of Vienna, three local seed banks have been established (at the Botanical Garden, Karl-Franzens-University of Graz; the Botanical Garden, University of Applied Life Sciences Vienna, and the Botanical Garden, Carinthian Centre of Botany Klagenfurt (Kiehn *et al.*, 2009). This collaborative approach aims at collecting as many of the rare and endangered species of Austria as possible as well as more common species from endangered habitats. The project is linked with seed bank projects on the European level (especially the ENSCRI-project proposal for the 7<sup>th</sup> EU framework programme), which, for example, provides the facilities for backup storage of seed material, or gives the background for prioritising species for collecting efforts.

An additional aspect of both living collections and seed banks relates to the potential effects of global warming. In order to proactively adjust collection policies in this context, the Austrian botanical gardens have established links with monitoring programmes like Gloria (GLobal Observation Research Initiative in Alpine environments; <http://www.gloria.ac.at/>).

- **Target 10** (Management plans in place of at least 100 major alien species that threaten plants, plant communities and associated habitats and ecosystems)

At their annual meeting in Graz in 2007, the Austrian botanical gardens agreed to install a neophytes-related information homepage on the network homepage (Berg 2007). The instalment and the maintenance of this homepage (<http://www.botanik.univie.ac.at/hbv/index.php?nav=83b>) are financed by the Botanical Garden, University of Vienna, with support from the Austrian GSPC Focal Point in 2008 and 2009.

Several representatives of Austrian botanical gardens have participated in the development of an action plan for the botanical gardens of German speaking countries related to invasive and potentially invasive neophytes. These guidelines were adopted by the Austrian botanical gardens in 2008 (Kiehn *et al.* 2007; english version: Kiehn *et al.*, 2008). One activity in the context of this action plan was the eradication of *Toxicodendron radicans* (Poison Ivy) at the Botanical Garden, University of Vienna, and an information campaign related to the serious health problems caused by this species. Actually, data for the species are collected on the European level (please communicate reports for this species to the author of this paper: [michael.kiehn@univie.ac.at](mailto:michael.kiehn@univie.ac.at)).

Scientists from botanical gardens of the University of Salzburg, the Karl-Franzens-University Graz, the Carinthian Centre of Botany Klagenfurt, and the University of Vienna have started a series of publications on little documented, potentially invasive species observed in botanic gardens in Austria/Europa (Eberwein *et al.*, 2010, Eberwein & Berg, 2010); an evaluation of a selection of such taxa is the subject of a current diploma thesis project at the Botanical Garden, University of Vienna (Lechner & Kiehn, 2010).

## Summary

Botanic gardens are intensively involved in the implementation of the GSPC targets in Austria. They coordinate and participate in relevant scientific and conservation projects. This involvement not only considerably contributes to reach the goals of the GSPC targets, it also helps to raise the socio-economic and political profile and recognition of the Austrian botanic gardens community. Thus, GSPC-activities are likely to improve options for securing employment of competent staff and mid-term financial support. The Austrian botanic gardens will continue their commitment towards reaching GSPC targets in 2010. They will also work on visions for useful activities beyond 2010.

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