

Implementing a plant record system for Brazilian Botanic Gardens

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Introduction

According to some studies, Brazil holds 20% of the total species of the planet (Kury *et al.* 2006). This makes the task of following international conservation guidelines, such as the ones proposed in the Convention on Biological Diversity, even more complex. The targets established by the Global Strategy for Plant Conservation (GSPC) are a great challenge for the mega-diverse countries. Meeting these targets requires the cooperative action and the integral involvement of governmental and non-governmental organizations, the private sector and other institutions. In this context, the role of botanic gardens is critical. In tune with its traditional mission of promoting *ex situ* conservation, botanic gardens are in a privileged position to achieve the goal of 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".

The Brazilian Botanic Gardens Network (BBGN), created in 1991, is committed to the consolidation of botanic gardens as centers of biodiversity conservation. Following the directives of the International Agenda for Botanic Gardens in Conservation, the BBGN has been working to strengthen of botanic gardens. Its 32 members differ in size, structure, available resources and administration. While longer-established gardens keep significant collections of native as well as exotic species, recent gardens tend to focus on the conservation of local flora. Most of them, apart from keeping live collections of native species, maintain nature reserves.

An important issue is the uneven distribution of Brazilian botanic gardens, which tend to concentrate in the Southeast region. Consequently, while the Atlantic forest environment is relatively well represented, other vegetation physiognomies are generally neglected (Peixoto *et al.*, 2004). In the last six years, seven botanic gardens have been created, five of which are in the Southeast region of the country. On the other hand, there are no botanic gardens in 11 out of the 27 units of the Federation.

In order to contribute to the implementation of the GSPC, in 2002 the Brazilian botanic gardens produced an Action Plan, which established national targets (Pereira *et al.* 2004). Concerning GSPC Target 8, there was a consensus that the conservation of 60% of the native threatened species was too ambitious a plan. The same goes for the GSPC suggestion that "priority should be given to critically endangered species, for which a target of 90% should be attained". The goal of protecting 50% of the critically endangered species in the live collections seemed more realistic, and was adopted instead.

The Brazilian Red List dates from 1992 and registers 107 species (Portaria Ibama nº 37-N, de 3 de abril de 1992). A preliminary survey indicates that botanic gardens hold 13% of these species total in their collections. However, the Red List is dated and incomplete, and does not reflect the current status of threatened species in the country. The List was recently revised, but has not yet been officially endorsed. According to this List, an estimated 1,537 species fall into IUCN threatened categories (Biodiversitas 2006). Of these, 297 are classified as critically endangered (Drummond, pers. comm.). This poses an even greater challenge to botanic gardens, faced with the task of conserving 149 species *ex situ*, in order to achieve its targets. A recent estimate suggests that botanic gardens already maintain 6% of the 1537 in their collections,

which indicates the need to enhance their conservation efforts. Documenting live collections of botanic gardens, as described in the Action Plan, is an urgent measure. This will provide an accurate overview of the *ex situ* conservation in botanic gardens and contribute to future conservation initiatives.

The process of recording the Brazilian botanic gardens collections is progressing more slowly than expected. This is partially due to insufficient financial resources to acquire database software packages or to develop new ones. Of the 22 Botanic gardens that completed a recent survey, two developed their own computer database systems, seven keep their records in Excel or Access, and 13 do not keep their records in computer systems. In order to change this state of affairs, a Brazilian version of BG Recorder (BGCI's collections data management software) is being developed, with the support of the BBGN and the Investing in Nature Project. Such a tool will enable the short-term documentation of botanic gardens collections.

The national survey of native plants kept in botanic gardens will inform the conservation plans for threatened species. It will then be possible to identify gaps, distribute responsibilities and establish priorities for an integrated action towards the achievement of Target 8.

BGRecorder Brasil (BGR-Brasil)

A Database Commission was in charge of making an analysis of the BG Recorder software package, considering the Brazilian botanic gardens realities and needs. The Commission revised database fields, lists and reports, among others items. A system analyst, a programmer and a biology trainee with knowledge of informatics were included in the team.

BGR Brasil is based on BG Recorder's original data modeling, but runs on a free database - Interbase Firebird. This will facilitate the adoption of the program by the botanic gardens, since there will be no further costs involved. Additionally, the BBGN will be in charge of importing the data already recorded in Excel or Access to the BGR Brasil software.

The first version of BGR Brasil was recently distributed to botanic gardens. The program will be continually revised and improved. Future versions will be upgraded in some aspects of management (exchanges, taxonomic actualization, reports), interface (images, internet uploads) and data exchange.

BGR Brasil will help with the collections management and electronic data integration. It will gather quantitative and qualitative information on the species held in each botanic garden, their provenance and genetic representation. It will also facilitate the standardization of data recording and the national survey of live collections.

Conclusion

The joint efforts of the Brazilian Botanic Gardens Network and the Investing in Nature Project are helping the botanic gardens to overcome some of the obstacles in the implementation of Target 8. One of the main outcomes is the development of a Brazilian version of the BG Recorder. The BGR Brasil software package will allow the assessment of the current status of threatened species held in the botanic gardens. It is a fundamental tool to manage *ex situ* collections and to draw up a strategy for integrated conservation that includes recovery and restoration projects. Access to the information stored in this database will enable increased cooperation and exchange of information between botanic gardens, as well as aiding their cooperation with other research institutes.

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