Thaiszia - J. Bot., Košice, 25, Suppl. 1: 13-17, 2015
http://www.bz.upjs.sk/thaiszia

THAISZIA
JOURNAL OF
BOTANY

The importance of the Botanic Gardens at SUA, Nitra, in relation to their engagement in scientific research and education

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Mňahončáková E. (2015): The importance of the Botanic Gardens at SPU, Nitra, in relation to their engagement in scientific research and education. – Thaiszia – J. Bot. 25 (Suppl. 1): 13-17. – ISSN 1210-0420.

Abstract: The Botanic Gardens should become a prestigious institution, it must become a source of inspiration for its "garden art" and that the transformation is completed in good taste.
Its history is described in scientific studies, publishing and scientific journals. It is influenced by its participation in various nature protection projects. The aim of the Botanic Gardens is to build up collections of plants and additionally undertake scientific research, using modern methods in order to preserve the hereditary factors of the various plant types.

Keywords: introduction, The Botanic Gardens, scientific research tasks, collections

Introduction

The creation of Botanic Gardens is directly related to the planting of gardens in general; people wishing to enrich their surroundings with new and less well-known plants.

It was in the 3rd millennium BC, when the Botanic Gardens in Alexandria were established; plants from all over the world were collected there, mostly Mediterranean flora.

Botanic Gardens with a significantly scientific model were established in the 16th century; in the renaissance years and during the period of expeditions of discovery years.

The first Botanic Gardens with more exotic kinds of plants were created in Pisa, Italy in 1534, then in Florence in 1543 and in Bologna in 1568. These gardens were masterpieces of design; plant beds were planted in the shape of ornaments (MOCHNACKÝ 1998, HALAJOVÁ & RÓZOVÁ 2002).

The Botanic Gardens at SUA in Nitra have a specific role within the Botanic Gardens and arboretums in Slovakia; their main field of operation is agro-botanic science.

It is unique in Slovakia and surrounding countries, due to its collection of agricultural plants and technologies used for growing, protection, use and evaluation of the quality of the production. The Botanic Gardens co-operate with 420 Botanic Gardens and institutions around the world within the international network of seed exchange; Index Seminum.

Material and methods

The Botanic Gardens were established in 1982, as a part of the University of Agriculture in Nitra. The Botanic Gardens are situated on university grounds, divided into sub-sections.

Each section is separated. There is also a public park. A fee is charged for admission to the glasshouses and vivarium. Other areas of the gardens are closed to the public.

Results and discussion

The Botanic Gardens also have a mandated role in the collection, growing and reproduction of indigenous and unoriginal plant taxons. According to world-wide trends, there is a tendency to imitate specific groups of plants in a way that illustrates the environment and conditions in which they grow in their native country. Exhibitions are displayed both indoors and outdoors. It is a problem to identify and listing all items in the Botanic Gardens as its area is big and diverse. The most precise inventory and listing of the plants which are in the Botanic Gardens are needed mainly for needs of research and study.

The greenhouses are part of the internal exhibition. Between 1983 and 1984, there were five greenhouses constructed; two designed for exhibitions and three for cultivation purposes. Currently, the restricted height of the glass panels does not allow the growth of tall species.

Additionally, the greenhouses designed for exhibitions are small in size and therefore not suitable for accommodating a large number of visitors.

However, the Botanic Gardens are proud of their collection of orchids and tillandsias, obtained during various expeditions to Mexico, Tunisia and Nicaragua. Cacti (Cactaceae) are another plants grown in the greenhouses. The Botanic Gardens are tasked with archiving endangered and protected varieties of orchid under the recommendations of CITES.

The Botanic Gardens are home to 36 species of *Paphiopedilum* (IA) and 59 species of *Phragmipedium* (IA). These collections give a sense of what life is like

in the tropics, sub-tropics and desert regions. The exhibitions are part of the educational process and are also used by students during their thesis research. Students of FZKI use the collections for study of plants as part of their curriculum.

In the laboratory, they have created new cultures of banana trees and carnivorous plants. In addition, they developed a new culture of another hybrid species *Paulownia*. Cultivation of these species is part of the programme focused on fast growing tree species of the genus Paulownia which are mainly used in bioenergy as part of the AGROBIOTECH project.

Currently, one of the main priorities of the Botanic Gardens is to preserve its phytogenetics database and create a gene bank containing plant specimens. The phytogenetic collections are comprised of partially modified plant specimens and also original varieties.

The outdoor exhibitions are situated in the park and in a garden purposely built for demonstrations.

The total area of the demonstration garden extends 5.75 ha and 728 different varieties of fruits are on display, of which 295 varieties are pome, 172 pit fruit, 33 nut and 47 are small fruits. The garden containing vegetable samples has an area of 20 ares and is primarily used by the Department of agro-chemistry and plant nutrition. In 2014 they produced 19 different types and 98 new varieties of vegetable.

A newly established area for samples has been planted with the latest assortment of columnar fruit trees (apples, pears, plums) is also worth mentioning. This collection of 141 trees is unique in Slovakia.

Ampelographical collection of samples and productive vineyard: the vineyard has an area of 2,712 m^2, on which there are 36 grape varieties and 30 table varieties.

The Park of the Botanic Gardens, situated on the grounds of SUA, has a total area of 6 ha and is located in the flood plains of the Nitra River, at an altitude of 141 meters. The terrain of the park is quite flat with only a few slightly elevated areas. The aim of the exhibition is to show new and progressive ways to integrate protection, as well as to act as a highly effective teaching aid.

The collection of roses, which were planted in 2012, has not only a decorative function, but also is a learning and teaching tool. The rose garden currently displays 50 varieties of roses.

Certain areas of the Botanic Gardens are designed to simulate natural vegetation formations that can be found in the lowlands and highlands of southwestern Slovakia.

In cooperation with the departments of Botany, research areas of selected, mainly rare species of biotypes of Slovakia were built in 2007 (salines, halophytic biotypes, pannonian gerbil communities). The new biotype „ Limy fen bogs with sawgrass and species of union *Caricion davallianae*" has grown in 2011 in the area of 40 m^2.

Part of the Botanic Gardens is a vivarium which, in the last year, contained approximately 70 different species of animal. The total number of animals was

220. The vivarium plays an important role as an educational tool. Both students of SUA and SPoS Nitra are learning how to care for exotic amphibians and lizards under various conditions (e.g. laboratory conditions and with regard to animal welfare), how to breed feed insects and laboratory animals and to get an understanding of the legislation regarding breeding and protection of animals and nature during scientific studies.

The students from the departments of Botany, The Environment and Zoology Studies, Veterinary Sciences, Landscaping and Landscape Design, Garden and Landscape Architecture, Agrochemistry and Plant Nutrition, and other departments (FZKI) attend classes, which are part of their curriculum, throughout the year.

The Botanical Gardens also provide fruit and plant material to help with students' theses and for conducting various analyses, teaching etc.

Employees participate in various projects e.g. VEGA, KEGA, cross-border projects within the framework of activities associated with the project Activity 7 HUSK, project 'Development of the Research Centre Agrobiotech.

Agenda 21, the action plan of The United Nations Conference on The Environment and Development (UNCED), held in Rio de Janeiro in 1992, confirmed the necessity to involve children and youths in the implementation of the programme, the objectives of which are to maintain the quality of life and living on Earth for future generations, to prevent further deterioration of natural resources and to ensure their better use in the future.

Children are very "confident advocates of environmental ideas", (reference?) their involvement in the program is described in chapter 25 of the plan. The Botanic Gardens are involved in organising the "Children's Summer University" in Nitra and also co-operates with Domino (a local centre for extracurricular activities). In 2015, there were seminars and workshops held that were designed for students and industry professionals in order to create a communication bridge between these groups.

The purpose of the lecture and the workshop called "Perennials in all their glory" (designed for students and industry professionals) was to provide relevant information on how to create, present and maintain beds of perennial flowers.

There were two lectures held as part of the exhibition 'Colours and Fruits of Autumn'; "Lesser-known Species of Horticultural Crops" and "Bees and Their Benefit".

By organizing regular events e.g. "Pumpkin Fest" and "Pre-Christmas Spirit" and by exhibiting at various events e.g. Mlyny, Agrokomplex, Gardenia and Kvetena in Banska Bystrica, the university shows not only the beauty of plants and fruits, but also informs the public of their use.

One of the roles of the Botanic Gardens is to promote and educate. Currently it provides tour guides and advertises their activities through their website and social media. Tour guide services are used mostly by primary schools, pre-schools, children from DOMINO, foreign visitors, Third Age University graduates and Rural Third Age University graduates.

Conclusion

The biological material is used to enrich the hereditary factors of the various plant types of Botanic Gardens at SUA in Nitra. The knowledge is used in practice for growing and preservation of biological material also in research, education and reproduction. Employees present their knowledge in a form of journal articles and also during scientific and international meetings.

References

MOCHNACKÝ S.(1998): Botanické záhrady a arboréta. Nitra: SPU 1998, ISBN 80-7137-521-7

HALAJOVÁ D. & RÓZOVÁ Z. (2002): Parková tvorba, Nitra: SPU 2002, ISBN 80-8069-719-3

Received: November 4th 2015
Revised: December 14th 2015
Accepted: December 15th 2015