

BOOK OF ABSTRACTS

1st ICHBG

Edited by M^a DALILA ESPÍRITO SANTO International Association of Botanic Gardens (IABG)

1st International Congress of Historic Botanical Gardens

Lisbon, Portugal, 11 - 12 October 2021 MUSEU NACIONAL DE HISTÓRIA NATURAL e DA CIÊNCIA



1st INTERNATIONAL CONGRESS OF HISTORIC BOTANICAL GARDENS

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1st International Congress of Historic Botanical Gardens

In support of the European Route of Historic Gardens



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SPONSORS



Welcome

Over recent years, there has been a renewed interest in the care and value of historic botanical gardens – those with built heritage, historical collections, or historical connections. Such gardens have made a major contribution to our understanding of the origin and development of botanical science, and to related disciplines such as herbal medicine, ethnobotany and ethnopharmacology. They have also influenced many of the crops we grow, the food we eat and the trees, shrubs and herbs that adorn our streets, parks, and gardens.

However, unless prompt action is taken, many of these unique resources risk falling into neglect, decay or in some cases total loss. This is already happening in many places, and it is timely to celebrate and protect the treasures held in these historic botanic gardens. The 1st International Congress of Historic Botanical Gardens is held in Lisbon, 11-12 October 2021. In the second year of the great pandemic that conditioned our activity, we will meet in person, safely, or virtually, with the perks of those who may be present.

We dedicate this congress to Vernon Heywood, an intense and passionate life for Botany and Conservation of Biodiversity.



CONGRESS COMMITTEES

HONOUR COMMITTEE

Rector of the University of Lisbon, Professor António Cruz Serra

President of Instituto Superior de Agronomia, Professor António Brito

Director of National Museum of Natural History, Doutora Marta Lourenço

President of Linking Landscape, Environment, Agriculture and Food Research Centre, **Professora** Isabel Sousa

President of Lisbon Municipality, Doutor Fernando Medina

SCIENTIFIC COMMITTEE ADVISORY COUNCIL

Tim Entwisle, (IABG, Royal Botanic Gardens Victoria, Melbourne, Australia) &
Michael Kiehn (IABG, EBGC, Botanischer Garten der Universitat Wien, Autrich) – Coordinators
Peter Wyse Jackson, Missouri Botanical Garden, St Louis, USA
Paul J.A. Keßler, Hortus Botanicus Leiden, Leiden Universiteit, Netherland
Nikolaos Thymakis, Institute of Agricultural Sciences, Greece
Krasimir Kosev, University Botanic Gardens, Sofia, Bulgaria
Maria Cristina Duarte, Faculdade de Ciências, ULisboa, Portugal
Raquel Barata, MUHNAC, ULisboa, Portugal
César Garcia, Jardim Botânico de Lisboa, MUHNAC, ULisboa, Portugal
Teresa Girão, Jardim Botânico da Universidade de Coimbra, Portugal
Luis Goulão, LEAF – Landscape Architecture, Biodiversity and Conservation



ORGANIZING COMMITTEE

International Association of Botanical Gardens (IABG) & Instituto Superior de Agronomia (ISA), LEAF – Linking Landscape, Environment, Agriculture and Food, ULisboa

Dalila Espírito Santo, General Coordination

Jardim Botânico da Ajuda (JBA), ISA, ULisboa, Ana Luísa Soares, President

Museu Nacional de História Natural e da Ciência (MUHNAC), ULisboa, Ana Godinho

Portuguese Association of Historic Gardens (AJH), Maria Matos Silva

ISA, LEAF, ULisboa, Pedro Arsénio, Vera Freire, Ana Rita Pina, Secretariat

Friends Association of Jardim Botânico da Ajuda (AAJBA), Sónia Talhé Azambuja, Treasurer, Fátima Matias, Administration

Câmara Municipal de Lisboa, José Sá Fernandes, Councilor for Environment, Green Infrastructure, Climate and Energy

Museu da Ciência da Universidade de Coimbra, Ana Cristina Tavares

Botanic Gardens Conservation International (BGCI), Suzanne Sharrock

European Botanic Gardens Consortium (EBGC), Eleni Maloupa

Red-CultIVA, Esteban Hernandez Bermejo



THE CONGRESS

The congress is the first of a series that the International Association of Botanic Gardens (IABG) pretend organize, which aims to strength the capacity and collaboration among historic botanical gardens all over the world as well as proposing targets and objectives for this type of gardens, that besides to be historical also are botanicals.

International Congresses of Historical Botanic Gardens will be organised every three years by the hosting institution with support from IABG, Botanic Gardens Conservation International and European Consortium of Botanical Gardens.

THE CONGRESS HOST - Jardim Botânico da Ajuda (JBA)

In 1755, most of the downtown area of the city of Lisbon was destroyed by a catastrophic earthquake and tidal wave. The king, D. José I, decided to move the royal residence to safer ground on the hillside of Ajuda. Refusing out of fear to live in any buildings made of stone, the king instead ordered the construction of a royal pavilion made entirely out of wood, which was completed in 1756. Once installed with his family, D. José ordered the construction of an adjoining botanical garden for the education and entertainment of his grandchildren, Prince José and Prince João (the future King João VI), sons of the king's daughter, D. Maria I.

To build the garden, D. José sent for Domingos Vandelli, a naturalist from Padua, who started work in 1764. The Real Jardim Botânico da Ajuda (Royal Botanic Gardens of Ajuda) was founded around 1768 and was the first botanical garden in Portugal, occupying an area of 3.8 hectares and composed of two south-facing terraces, forming a unique vantage point from which visitors can enjoy a magnificent view of the River Tagus. In the late 18th century, botanical missions to Portugal's overseas colonies greatly enriched the collection, which at that time grew to around 5,000 specimens. During the French invasions of the early 19th century, many of the garden's botanical specimens were removed to Paris by order of General Junot.

However, the garden survived, and through the professional care of Felix de Avelar Brotero managed to regain its prestige. In 1873, with the completion of another botanical garden at the Escola Politécnica, the botanical function of the Ajuda Garden came to an end. The garden passed



to the administration of the royal palace and, once again, became a space of leisure for the Portuguese royal family.

With the establishment of the Portuguese Republic in 1910, the garden was renamed as the Jardim Botânico da Ajuda and placed under the care of the Instituto Superior de Agronomia (ISA), which performed a major renovation. The garden has been open to the public ever since, and in recent years has been used to support the ISA course in Landscape Architecture and other courses of Lisbon University.

At the end of the 20th century, the ISA applied successfully for European Commission funding to conserve the architectural heritage of the garden. The funding allowed for important restoration works: between 1994 and 1997, under the guidance of Professor Cristina Castelarchitectural features of Branco, the and sculptural the two terraces were cleaned and restored, and the stone beds that house the botanical collection on the upper terrace were rebuilt according to drawings from 1869. The checkerboard-like pattern of 1,200 stone beds containing herbaceous and small shrubs is organised by phytogeographic area, according to the layout of the bicentennial trees already established in this area. At the same time, the cottage near the Calcada da Ajuda gate was restored and the Jardim de Aromas (scent garden) constructed. In a lively addition to the garden, the greenhouse near the Calçada do Galvão gate was converted into a restaurant, Estufa Real. Also on this occasion the Association of Ajuda Botanic Garden Friends was founded. This Association has an annual program of different kinds of courses related to nature and gardening, organizes excursions all over the world to gain knowledge of the art and history cultural of Gardens but also for observation of Nature, and it is responsible for the restoration works made to the JBA in the last years.

Despite the many challenges faced by the Jardim Botânico da Ajuda, most of the original vegetal elements remain to this day, especially its magnificent trees, which include a Dracaena draco, a Ficus microcarpa and a Ficus macrophylla, a Schotia afra and a Ocotea foetens. The live collection in open space has been rebuilt over the years and today numbers 1,602 taxa, all of them labelled. The collection of cactus and other xerophytic plants is also under development in another green house. In the Year of Biodiversity, 2010, a seed bank (Banco de Sementes Prof. João do Amaral Franco) was founded and since this date has contributed to the Millennium Seed Bank and store of Serra da Arrábida (a protected area) seeds, according to biodiversity conservation principles.



The Jardim Botânico da Ajuda is a space for everyone. Besides its educational and research functions, its airy terraces are the perfect place to go for a gentle stroll and take in the serene beauty of the River Tagus flowing below. It has a programme of guided tours for schools and the public and organizes very popular cultural events like the Spring Festival. For more information visit: www.isa.ulisboa.pt/jba

CONGRESS VENUE - National Museum of Natural History and Sciences

The MUHNAC / Museums of the University of Lisbon aims to promote curiosity and public understanding of nature and science, bringing the University closer to Society. This mission is achieved through the valorization of its collections and the university heritage, research, organization of exhibitions, conferences and other scientific, educational, cultural and leisure activities. The Museums are a Specialized Unit of the University of Lisbon, constituted by MUHNAC - National Museum of Natural History and Science in the area of Principe Real (Rua da Escola Politécnica), integrating the Lisbon Botanical Garden and the Astronomical Observatory of Lisbon (in Tapada da Ajuda, near the School of Agronomy).

The Museum supports research and teaching in the fields of zoology and anthropology, botany, mineralogy and geology, and other natural sciences and encourages the study and dissemination of the history of science and technology, contributing to the scientific and cultural education of students in these fields.

The museum also assumes a responsibility extended to the national context, regarding the conservation and study of biological and geological collections and historical and scientific cultural heritage, establishing partnerships for the valorisation and use of museum collections and the heritage of Lisbon University and other institutions.

SOCIAL PROGRAMME

WELCOME COCKTAIL Monday, October 11th 19:00 Pavilhão Chinês, Rua D. Pedro V 89, 1250-093 *Lisboa*

CONGRESS DINNER Tuesday, October 12th 20:00 Restaurante "La Paparrucha", Rua D. Pedro V, 18 a 20, 1250-094 *Lisboa*



THEMES

Conference themes (*Promoting and protecting our historical legacy*):

- 1. Historic Botanic Gardens (case studies and definitions).
- 2. Botanic Gardens and the introduction of economically important species.
- 3. History is now documenting and protecting contemporary gardens for posterity.
- 4. Managing Historic Botanic Gardens (problems and issues): Preserving the past while responding to contemporary needs.
- 5. Tourism opportunities for Historical Botanic Gardens.

Round Table: Promoting and protecting our historical legacy.



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DETAILED PROGRAMME



MONDAY, OCTOBER 11th, 2021

8:00 I 9:30 Registration

9:30 I 10:00

CONGRESS OPENING CEREMONY Chair: Maria Matos Silva

Michael Kiehn - Vice President of International Association of Botanic Gardens

Teresa Andresen - President of the Association of Historic Gardens

Isabel Sousa – President of School of Agronomy Assembly and Linking Landscape, Environment, Agriculture and Food - LEAF Research Centre

Marta Lourenço - Director of National Museum of Natural History and Science

Ana Luísa Soares - Director of the Botanic Garden of Ajuda

10:00 I 10:30

OPEN CONFERENCE

The International Association of Botanic Gardens (IABG) and some thoughts on managing historical botanic gardens

Tim Entwisle, Royal Botanic Gardens Victoria, Australia, and President of International Association of Botanic Gardens

10:30 I 11:00 **Coffee break**

11:00 I 11:30

Theme 1 : HISTORIC BOTANIC GARDENS (CASE STUDIES AND DEFINITIONS).

Chair: Eleni Maloupa

Video-Confer - Historic botanic gardens – providing solid foundations for a global botanical community.

Peter Wyse Jackson - President of the Missouri Botanical Garden and of GPPC

11:30 I 11: 50



Video-Confer - The Botanical Collections of the Austrian Federal Gardens between tradition and modern functions

Claudia Gröschel, Daniel Rohrauer

 $11{:}50 \ \mathrm{I} \ 12 \ 10$

The Botanic Garden of Pisa: from the invention of the academic botanic gardens until today

Marco D'Antraccoli, Lorenzo Peruzzi

12:10 I 12:30

Natural heritage of Lisbon botanic gardens: an integrative conservation approach with unique tree collections

Ana Raquel Cunha, Ana Luísa Soares, Miguel Brilhante, Pedro Arsénio, Teresa Vasconcelos, Dalila Espirito-Santo, Maria Cristina Duarte & Maria M. Romeiras

12:30 I 12:50

200-150-70 - Fate-turnings of National Botanic Garden Vácrátót

Vince Zsigmond

12:50 I 13:10

Historical Gardens of Lousada

Diego Alves, Rosa Pinho, Cristiano Cardoso, Milene Matos, Manuel Nunes

13:10 I 14:30

Lunch

14:30 I 14:50

From the Royal Garden of medicinal plants to the current botanic gardens and research departments, a longstanding tradition for meeting societal needs

Maïté Delmas

14:50 I 15:30

Theme 2 - BOTANIC GARDENS AND THE INTRODUCTION OF ECONOMICALLY IMPORTANT SPECIES.

Chair: Maria M. Romeiras



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Promoting and Protecting our Historical Legacy

The role of botanical gardens in the transfer of species of economic interest. Do we know the full story?

J. Esteban Hernández Bermejo

15:30 I 15:50

Video-Confer - Efforts to conserve rare, endangered, and economically useful medicinal plants of western ghats of India

Raviraja Shetty G

15:50 I 16:30

Theme 3 - HISTORY IS NOW - DOCUMENTING AND PROTECTING CONTEMPORARY GARDENS FOR POSTERITY

Chair: Maïté Delmas

History is now - documenting and protecting contemporary gardens for posterity.

Michael Kiehn, IABG, EBGC, Botanischer Garten der Universität Wien, Austria

- Coffee break 16:30 I 16:50
- 16:50 I 17:10

The copy of the historical orchid collection that King Luis I created 1881 is recreated

Pekka Ranta

17:10 I 17:30

Tapada da Ajuda Botanical Park: a hotspot of plant diversity in the heart of Lisbon

Maria M. Romeiras, Teresa Vasconcelos, Ana Raquel Cunha, Paulo Forte, Miguel Brilhante, Pedro Arsénio, Ana Luísa Soares

17:30 I 18:30 POSTERS PRESENTATION

The National Garden of Athens as a Botanical Resource for the City Elisavet Bargiani, Katerina Agorastou, Thymakis Nikolaos Analysis of ornamental flora in the La Concepción Historical Botanical Garden in the 19th Century

Blanca Lasso de la Vega Westendorp

City development and its impact on the environmental conditions and functioning of the Botanical Garden of the Adam Mickiewicz University in Poznań (Poland)

Jaskulska Joanna1, Rekoś Monika1, Sowelo Mateusz1



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Collection, Documentation and ex situ Conservation of Greek Native Forest. Fruit Trees and Shrubs Eleni Maloupa, Aliki Xanthopoulou, Nikos Krigas, Katerina Papanastasi, Olga Dichala, Antonis Karydas, Eleftherios Karapatzak, Dimitris Kyrkas, Paraskevi Ifanti, Nikolaos Nikisianis, Giorgos Patakioutas The Succulent collection of the Botanical Garden of the University of Adam Mickiewicz in Poznań Ewa Kaźmierczak-Grygiel O Chão das Artes - botanical garden, Casa da Cerca - Contemporary Art Centre Sónia Francisco Botanical Gardens of Ukraine in historical retrospective Andriy Prokopiv The enjoyment of green spaces. Towards a new mindset in the management of historical garden Blanca Lasso de la Vega Westendorp Linking historical past with the contemporary challenges in the University of Warsaw **Botanic Garden** Agnieszka Krzyk, Monika Lathowska The management of a historical botanical garden in Poland - requirements and challenges Justyna Wiland-Szymańska, Alicja Kolasińska, Justyna Chrzanowska Tried, Tested Opportunities for Private Botanical Gardens in the tourist industry Réka Folly

18:30 I 19:15 Visit to the Museum

19:15 Wellcome cocktail (Pavihão Chinês)

TUESDAY, OCTOBER 12th, 2021

9:00 I 9:40

Thème 4: MANAGING HISTORIC BOTANIC GARDENS (PROBLEMS AND ISSUES): PRESERVING THE PAST WHILE RESPONDING TO CONTEMPORARY NEEDS.

Chair: Michael Khien

Tourist routes and Portuguese historic botanical gardens

Teresa Andresen - President of the Association of Historic Gardens

9:40 I 10:00

Revitalization of the historical plant geographical division of the Botanical Garden, University of Vienna: Trial area for hardiness studies in times of climate change

Barbara Knickmann & Michael Kiehn



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Restoration of La Rosaleda, Real Jardín Botánico-CSIC (Madrid, España)

Mariano Sánchez, Beatriz Perlines, Susana G. Aguilar, Patricia Alonso, Jesús de Dios, María Bellet, Marisa Esteban, Jesús García Rodrigo, Clara Vignolo, Isabel Sanmartín, María P. Martín, Esteban Manrique

10:20 I 10:40

The Real Jardín Botánico (RJB) of Madrid, 265 years at the edge of the botanical research in Spain: New challenges and conservation approach Historical

Esteban Manrique Reol

10:40 I 11:00

Renovation of the historic Glasshouse of the Botanical Garden Graz

Christian Berg, Ursula Brosch & Jonathan Wilfling

11:00 I 11:20

Coffee break

11:20 I 11:40

The Wise Trees Project - An initiative for helping historic botanical gardens of the Carpathian Basin in wise management and familiarization of historic trees

Zsuzsa Szendi, Vince Zsigmond

11:40 I 12:00

Rare and threatened plant species in the living collections of the Lisbon Botanical Garden and Tropical Botanical Garden. Preserving the past, the present and conserving the future.

César Garcia, M. Cristina Duarte & Ana Luísa Soares

12:00 I 13:30

ROUND TABLE – Promoting and protecting our historical legacy.

MODERATOR: Teresa Andresen

13:30 I 15:00

Lunch



15:00I 15:40

Theme 5 - TOURISM OPPORTUNITIES FOR HISTORICAL BOTANIC GARDENS.

Chair: Vince Zsigmond

Tourism & Funding for garden

Nuno Oliveira, Parques de Sintra - Monte da Lua

15:40 I 16:00

The History in the stones of the Botanical Garden of the University of Coimbra

Andreia Melo, Ana Cristina Tavares

- 16:00 I 16:30 **Coffee break**
- 16:30 I 16:50

Tried, tested - Opportunities for private botanical gardens in the tourist industry

Réka Folly

16:50 I 17:10

Telling stories about endangered plants in a garden: creating last chance visitation experiences using maps and storytelling

Liliana Carvalho, Daniel Paiva, Eduardo Brito-Henriques, Ana Matilde

$17{:}10 \ \mathrm{I} \ 17{:}30$

Presentation of the Book "Portuguese Botanical Gardens"

Dalila Espírito Santo

17:30-18:00

Conclusions

Close Session

18:00-19:30

International Assocation of Botanical Gardens Meeting



20:00

Congress Dinner

WEDNESDAY, OCTOBER 13th, 2021

9.00 - 12.00

European Consortium of Botanic Gardens Meeting

12.00 - 13.00

Lunch break

Extra Program

13.00 - 14.00

Open session on Beech Leaf Disease

14.00 - 15.00

BGCI Webinar – State of the World's Trees – What is next? (BGCI Webinar Series: State of the World's Trees - What is Next? | Botanic Gardens Conservation International)



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KEYNOTE ADDRESSES



O1



The International Association of Botanic Gardens (IABG) and some thoughts on managing historical botanic gardens

Tim Entwisle, Royal Botanic Gardens Victoria, Australia

The International Association of Botanic Gardens is an intergovernmental collective that has been representing and supporting botanic gardens around the world since 1954. It has several formal roles associated with the United Nations and the planning of the International Botanical Congresses. Over the last 67 years it has managed a global list of botanic gardens and supported training workshops and conferences around the globe, much as it is doing on this occasion in Lisbon.

has promoted and supported the development of accreditation schemes for botanic gardens and is working presently on a certification to cover historic, cultural, landscape and horticultural aspects their business. A current review of its governance is likely to result in an 'association of associations' membership structure, and new opportunities to influence the establishment and promotion of botanic gardens worldwide. I

will also provide a few personal thoughts on the management of older botanic gardens, ending with an example from Royal Botanic Gardens Victoria. The White Oak project is a good case study for how to celebrate the life of a recently diseased fallen tree, while watching its climate-adapted replacements emerge. Mature, as well as young, botanic gardens must plan and plant for a climate challenged future.





Theme 1: HISTORIC BOTANIC GARDENS (CASE STUDIES AND DEFINITIONS)

Historic botanic gardens – providing solid foundations for a global botanical community

Peter Wyse Jackson, Missouri Botanical Garden, U.S.A

In this presentation an overview on the development of botanic gardens worldwide from the earliest times will be provided, outlining their historic roots and the ways in which their priorities, roles, influences and resources have changed over the centuries. The presentation also plots the fundamental changes in the international biodiversity and environmental policies and concerns over the last thirty years and how this has had a profound impact on the numbers, activities and perspectives for botanic gardens everywhere.

It highlights how the first botanic gardens of the modern era were created in Europe, mainly associated with universities and often linked with medical teaching. It explores how these evolved to become important institutions in the development of botany, and influential in many parts of the world in the discovery of the plants and to support agricultural development, particularly in the tropical colonies of European countries.

It points out how many European university botanic gardens evolved to become institutions for plant discovery, taxonomy and plant introduction, leaving the hugely important legacy of extensive living collections, herbaria and libraries.

It describes the roots of many historic botanic gardens in other regions of the world too, including Latin America, Africa, Australasia and North America and how many such botanic gardens, particularly in temperate regions, maintained a focus on horticulture rather than on research.

The presentation points out how a remarkable number of botanic gardens that have been created worldwide over the last 40 years, with many new botanic gardens created in most regions of the world. The shifts in policies and practices among botanic gardens had been greatly influenced by the development of an increasingly crowded international



dimension in international policies, particularly in relation to biodiversity, sustainably development and, more recently, by climate change responses.

Important milestones for botanic gardens over the last 40 years are identified, including, amongst others, the establishment of Botanic Gardens Conservation International (1987), the publication of the Botanic Gardens Conservation Strategy (1989), the agreement of the Global Strategy for Plant Conservation (2002) and the U.N. Sustainable Development goals (2015). Some definitions of botanic gardens are considered and how these reflect changing roles and perspectives of botanic gardens.

The paper finishes with a call for more botanic gardens to respond to addressing the great global challenges we face in the future, learning from our past and developing priorities that align with the greatest needs to safeguard plants and nature over the coming century.





Theme 2: BOTANIC GARDENS AND THE INTRODUCTION OF ECONOMICALLY IMPORTANT SPECIES

The role of botanical gardens in the transfer of species of economic interest. Do we know the full story?

J. Esteban Hernández Bermejo, Córdoba University, Spain

With the collaboration of Yalbeiry Labarca, Francisca Herrera, Pablo Stampella, Norma Hilgert, María Lelia Pochettino, Expiración García and Julia Mª Carabaza.

Our answer to this question is NO. We intend to demonstrate it here and suggest a way forward.

Indeed, it is true that there are many well-known chapters in the record and documentation of this important component in the history of mankind and of botanical gardens. We refer to the transfer of species of economic interest between continents and distant cultures and the transfer of their germplasm, traditional knowledge associated, techniques for their conservation, propagation, and cultivation. We have spoken and written many times about the role played by the great protagonists of the history of botanical gardens and some episodes of this history have become - we would say today trending topics. This is the case, for example, of the role played by the botanical gardens of the Italian Renaissance (Saccardo, 1909; Garbari and Raimondo, 1986) during the 16th century, or that of the Leiden Botanical Garden and the activity of its director, Charles l'Ecluse, in the promotion of bulbous plants from the Mediterranean peninsulas and the Near East (Jan de Koning, 1993) or that of the leading role played by Kew Gardens in the introduction of species throughout the British Empire during the 18th, 19th and 20th centuries (Plant Hunting for Kew, 1989), especially with reference to the famous trip of the Bounty under the command of Captain Bligh (the story naively focused on a supposed transport of the breadfruit tree from Polynesia to the British colonies in the Caribbean) or the controversial "introduction" of the rubber tree from Brazil to Ceylon.



There are other chapters that have less media coverage, such as those that took place in Spain during the Enlightenment, with the Botanical Gardens of Valencia, Orotava and the Madrid, something that has also been written about, albeit in Spanish, so as usual, it has gone unnoticed by the international scientific establishment. And something similar has happened with the Portuguese botanical gardens and their role during the 18th and 19th centuries.

But other cases have been much more neglected and barely noticed by the managers, technicians and scientists of botanical gardens. These are chapters of this history that we would like to bring out of oblivion. Here are some examples in chronological order:

a) The case of Persian gardens: From the time of Pasargadae under Cyrus the Great and Persepolis under Darius I, and later in the history of Persia (e.g., during the Seljuk reign), Persian gardens have served not only as a link between East Asia and Mediterranean cultures, but also as a platform for the domestication and selection of numerous food and ornamental crops (pistachio, pomegranate, saffron, tulips).

b) The gardens of al-Andalus during the 10th-14th centuries (Cordoba, Toledo, Seville) and their great role in the introduction of food, medicinal and ornamental species between the Near East, North Africa, and SW Europe (eggplants, rice, sugar cane, citrus fruits, love trees, paradises, chinaberry tree, tulips too!) Species that thanks to their introduction in Spain, Italy or Portugal, immediately traveled to America.

c) The Jesuit missionary gardens and orchards in the Guarani area (XVII and XVIII centuries) and in relation to them the one in the Orto Vaticano Indico where some of the species arrived from South America (and Asia!) and that the Jesuits brought with them when they were expelled from their missions in that continent.

d) The botanical gardens of the Caribbean during the 18th and 19th centuries and their role in the introduction of Asian spices (cinnamon, indigo, cloves, pepper, nutmeg).

After analyzing these cases, we will propose the constitution of an editorial working group that can compile a summary of case studies, updating well-known chapters of this exciting history of botanical gardens, along with other lesser-known chapters, and analyze the processes of transfer, diffusion, transculturation, and resignification of many species of economic interest carried out by botanical gardens.





Theme 3: HISTORY IS NOW – DOCUMENTING AND PROTECTING CONTEMPORARY GARDENS FOR POSTERITY

History is now – documenting and protecting contemporary gardens for posterity

Michael Kiehn, Vice-President of IABG, EBGC, Botanischer Garten der Universität Wien, Austria

History is not static, but a process in space and time. Thus, also botanic gardens permanently face changes regarding their missions, their collections as well as their buildings or their design.

Potential reasons for such changes are manifold: administrative, scientific, budgetdriven, staff-related, society-related, "fashion"-driven, or target group-orientated, to mention only a few. Often such changes (and even rationales for new developments) are also reflected in mission statements.

"Documentation" is a flashlight at a certain point of a historical development process. To secure meaningful documentation it is important to have clear reference data related to all kinds of changes in a botanical garden. Such reference data help future generations to decide which elements of botanical gardens could be valuable for protection.

"Protection" of botanical gardens should not be a value per-se. It must be meaningful and shall not negatively interfere with the mission and tasks of a garden. Arguments what to consider worth protecting might change over time. They might include, i.a., the scientific value and/or the uniqueness of collections, or buildings and/or garden designs typical for certain periods.

Looking back into the past, and using examples from contemporary "historical" gardens, the talk will present ideas how we can "prepare" botanical gardens for a meaningful documentation and protection for future generations.





Theme 4: MANAGING HISTORIC BOTANIC GARDENS (PROBLEMS AND ISSUES): PRESERVING THE PAST WHILE RESPONDING TO CONTEMPORARY NEEDS.

Tourist routes and Portuguese historic botanical gardens

Teresa Andresen, President of AJH – Portuguese Association of Historic Gardens

Culture and nature based touristic routes, such as historic garden routes, contribute to distinctiveness and authenticity in the perception of the value and meaning of heritage. Historic botanical gardens are of special interest also because of their scientific dimension. The role of botanical gardens is evolving according to new society needs, such as adaption to climate change, as centuries old living laboratories where important plant species from a diversity of geographies grow and have acclimated to their living ecosystem. Besides their historical value, richness of built and living elements, herbariums, collections or books, when visited they offer a unique stage for the debate on autochthons versus allochthons, indigenous versus exotic, productive versus ornamental, aromatic, medical or invasive species.

Tourism is an important means of enhancing culture, nature and landscape for the bonds and synergies it creates among property owners, managers, operators and visitors as well as for the income it generates that can be applied in heritage conservation and maintenance. The 12 touristic routes of historic gardens of AJH, the Portuguese Association of Historic Gardens, have been organized between 2019-2020 with this motivation. Marketing is on the way - still much under the influence of the pandemia - aware that gardens as a touristic product are part of complimentary offer to be shared with other products such as the offer of accommodation, catering, nature walks, wine or horses. The 12 routes include the three botanical gardens in Lisbon, Coimbra Botanical Garden, Porto Botanical Garden and Madeira Botanic Garden. However, the touristic routes include other gardens with a significant plant heritage both autochthons and exotic.





Theme 5: TOURISM OPPORTUNITIES FOR HISTORICAL BOTANIC GARDENS

Tourism & Funding for Garden

Nuno Oliveira, Technical Director of Parques de Sintra



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ORAL PRESENTATIONS





The Botanical Collections of the Austrian Federal Gardens between tradition and modern functions

Claudia Gröschel, Daniel Rohrauer

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Dating back to 1569, the botanical collections of the Republic of Austria maintained by the Austrian Federal Gardens contain at the moment more than 130.000 specimen representing some 15.827 species and sorts from all regions of the world. More than 450 years ago the Habsburgian caesarean collection of plants started as a part of the cabinet of curiosities. The early beginnings can even be traced back in the first half of the 16th century. Due to the royal interest in collecting things, objects were gathered randomly with the aim of getting a complete collection of curiosities.

The 18th century brought a clear structure into the collections and clear orders in enlarging the stocks. Plants were collected out of economic reasons, nutritional and/ or medical reasons and sovereign representation needs. The Habsburg empire organized expeditions well beyond its own dominion. Trading, exchanging and acquiring practices helped to establish one of the biggest botanical gardens of that time in Vienna. During the second half of the 19th century, the main focus increasingly changed to the targeted collection for conservation of species and completing existing botanically prioritized focus collections.

Nowadays the Botanical Collections of the Austrian Federal Gardens are an important gene pool, supporting research facilities and science and make an important contribution to the national and international species conservation. On top of it, the Botanical Collections of the Austrian Federal Gardens are part of the UNESCO world heritage Schönbrunn.

The main tasks of the Botanical Collections of the Austrian Federal Gardens (maintaining and developing the historical and botanical important plant collections) correlate with the international commitment on keeping the biodiversity and the "Austrian strategy on biodiversity 2020+".



The presentation will offer an overview about development, change of interests and focus over the centuries and the resulting uniqueness of the contemporary plant collection. By presenting chosen parts of the collections and single plants the following questions will be debated: What are the current functions of historical botanic collections and what makes the collections of the Austrian Federal Gardens unique in comparison to other collections? What functions, developments and cooperation can be served and initiated by historical botanic collections?

Keywords: historical botanic collection Vienna, garden history, history of botanic collections, keeping biodiversity ex-situ

Literature

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The Botanic Garden of Pisa: from the invention of the academic botanic gardens until today

Marco D'Antraccoli¹ & Lorenzo Peruzzi²

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The rise of academic botanic gardens took place in Italy during the Renaissance, in the middle of 16th century: the first academic botanic garden was founded in 1543 in Pisa by Luca Ghini. Nowadays, the Botanic Garden of Pisa has a variegated spectrum of activities, in line with the definition of a botanic garden provided by the Botanic Garden Conservation International. Originally built on the banks of the river Arno, the Garden was moved to the current site in 1591 and then gradually expanded



up to ca. 25,000 m². It is currently divided in seven sectors, hosting about 2,000 taxa arranged across 29 thematic collections.

The documentation of plant material is performed through an *ad hoc* developed software platform (*U-Plant*), from which the staff also coordinates the labelling activities of plants. A freely accessible online platform (*U-plant DISCOVER*), providing the exact position of specimens in the garden and other primary data, is currently in course of publication.

The Botanic Garden supports research activities of several Departments of Pisa University, and especially of the Department of Biology. The major focuses of the researches involving the support of the Botanic Garden are: (a) taxonomy and systematics, (b) phytochemistry, (c) reproductive biology, (d) conservation, and (e) plant ecology. The conservation of plant diversity is an issue of particular interest for the Garden. The *ex-situ* management of threatened species is achieved both through direct cultivation and seeds storing in a Germplasm Bank located in the garden. The Garden supported a translocation project of two species of national conservation interest in 2014-2015, namely *Hypericum elodes* L. and *Symphytum tanaicense* Steven.

The average number of visitors of the Botanic Garden and Museum of Pisa per year is ca. 60,000. The spectrum of educational activities ranges from nursery school up to university; in 2019 (the most recent pre-Covid year), didactic activities were offered to 248 mandatory schools' classes, involving thousands of students. Additional educational activities are periodically organised, such as seminars, courses or citizen science events. In general terms, the Botanic Garden allows only events aiming to contribute to the transmission of botany, thus excluding the use of its spaces as simple location of events

such as concerts, readings, markets (even if related to horticulture). The Botanic Garden and Museum of Pisa has three social accounts: Facebook (@OrtoBotUnipi, > 8.5K followers), Instagram (@ortobotanicopisa, > 3.5K followers), and Twitter (@Orto_unipi, 136 followers). In recent years the Garden is increasing the attention towards the improvement of its social role. As example, we implemented personalised inclusive experiences for people affected by autism spectrum disorder, video-guides in LIS (Italian Sign Language), and projects of social rehabilitation for inmates through gardening activities.



T1.4

Natural heritage of Lisbon botanic gardens: an integrative conservation approach with unique tree collections

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Botanic gardens have a long history of contributions to plant science and have played a leading role in the development of fields such as *ex-situ* Conservation, Botany or Garden Art History. The University of Lisbon holds a rich natural and historical heritage that serves as a valuable scientific resource, three botanical gardens – Botanical Garden of Ajuda (JBA), Lisbon Botanical Garden (JBL), and Tropical Botanical Garden (JBT). Lisbon city has three very different gardens, created in three different times but with overall purposes: research, plant conservation, horticulture, and education. It is essential to know this heritage and all that it represents. The study of these gardens and their collections provide an indispensable source of knowledge in Garden Art History and Biodiversity knowledge. We aimed to contribute to disseminate the heritage represented by the botanical gardens of Lisbon, by coupling the history and the characteristics of the tree layer that dominates them. With this approach, we intended to explain why the presence of three botanical gardens in Lisbon is not redundant and to highlight their continued relevance for



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knowledge and for urban sustainability. Our results showed that the tree layers of the three Lisbon's

Botanical Gardens contain a total of 2546 specimens, corresponding to 462 taxa of trees. Of these, 85 taxa are found in the three gardens, and more than half of the taxa are hosted in JBL (334 taxa), whereas 230 and 201 taxa were recorded in JBT and JBA, respectively. The motivations for the creation of each garden are reflected on the different geographic origins of the taxa they host. The Palearctic species are dominant in JBA and JBL, and tropical tree taxa prevail in JBT, which holds a large number of Neotropical, Eastern and Afrotropical species. This study contributes to reveal the historical and natural heritage of Lisbon's Botanical Gardens, improving its role as a living museum. Also, it constitutes a tool to protect and enhance the botanical gardens and their botanical assessment in order to protect and promote this legacy as cultural heritage with high ecological, recreational, artistic, aesthetic, social and tourism value.

Keywords: Conservation; historical heritage; living trees collections; Portugal; spermatophytes; trees; urban green spaces.

200-150-70 – Fate-turnings of National Botanic Garden Vácrátót

Vince ZSIGMOND, National Botanic Garden Vácrátót / Institute of Ecology and Botany / Centre for Ecological Research

National Botanic Garden Vácrátót, Hungary is an approximately 200 years old garden established by the noble family Gheczy, who created an English landscape garden in the beginning of XIXth Century there.

In 1871 Count Sándor VIGYÁZÓ bought the property as a wedding present for his wife, Baroness Zsuzsanna Podmaniczky, and started to improve the garden to be a sentimental landscape garden with several romantic built elements, e.g. artificial ruin and watermill, etc.

In 1921, 50 years later, Count Vigyázó died and passed his whole huge wealth down to the Hungarian Academy of Sciences. His last will came into effect when his son, Ferenc died without successor in 1928. Tributing to his eminence approach and patriotic decision we

T1.5



reckon Count Vigyázó the founder of the NBG Vácrátót.

Unfortunately, the next two decades were a period of uncertainty and devastation.

Collateral relatives litigated for the inheritance, the garden was left without maintenance and the castle was demolished. After the World War II the communist dictatorship secularized every property of aristocrats and bourgeoisie; the Vácrátót property was amongst them, of course.

In 1951, the Hungarian Academy of Sciences became the owner again and established the Research Institute of Botany in the Vácrátót property, as well as started on reconstruction and turned the garden into a botanic garden in 1952.

Thanks to the talented and enthusiastic leaders and colleagues who have been working for nearly 70 years for in the botanic garden in Vácrátót, it has been developed to be the leader BG in Hungary with its prominently richest collections within the country and simultaneously saving its wonderful built heritage as historic garden. Due to its double value, NBG Vácrátót is a protected Nature Conservation Area and listed built heritage, furthermore it has had the National Botanic Garden denomination since 2005.

National Botanic Garden Vácrátót is located in the northern part of the Great Hungarian Plain, about 40 kilometres from Budapest. However, this region is dry and cold relatively, crossing Sződ-Rákos stream and lakes in the centre of the garden have some positive effect on the microclimate. The whole area of the garden is 22 hectares today, which involves Dendrological, Perennial, Systematic and Green House Collections, and NBG has a Seed Bank, additionally.

Keywords: historic garden, botanic garden, Vácrátót, Institute of Ecology and Botany of CER, Hungarian Academy of Sciences, sentimental landscape garden, built heritage, nature conservation area

T1.6

HISTORICAL GARDENS OF LOUSADA

Diego Alves¹, Rosa Pinho², Cristiano Cardoso¹, Milene Matos¹, Manuel Nunes¹

¹Municipality of Lousada; ²Department of Biology, University of Aveiro



The Municipality of Lousada, located in the peri-urban territory of Greater Porto, faces increasingly unrelenting anthropogenic pressures. The incessant pace of urbanization, agricultural and forestry intensification, and various public and private enterprises add challenges to the already complex task of making economic development compatible with quality of life, which necessarily depends on environmental quality.

Thus, in a deep commitment to improving the municipality's environmental condition, the municipality assumed in 2015 a transformative Municipal Strategy for Sustainability.

Based on scientific knowledge, this Strategy sought the most diverse means to promote environmental literacy and education, worked to protect biodiversity and cemented fundamental partnerships with the most varied public and private agents in the territory, in order to accelerate the process of change but, more importantly, ensuring its acceptance and ownership by the community.

The first works of ecological characterization of the county made it possible to discover its rich biodiversity, but also to establish priorities for intervention. It was immediately possible to see that the old manor houses, with the gardens, outbuildings and forest areas that are usually associated with them, constitute small "oases" of biodiversity. Clearly deserving a closer look, and from the perspective of the various sciences that study and dignify our heritage – biology and botany, archeology, and history, among others – the 'Lousada Jardins' project started in 2018.

This project aimed to discover and characterize all the floristic, cultural, archeological and architectural heritage associated with the historic gardens of the manor houses in Lousada, as a starting point for their enhancement, promotion and conservation.

The value of historic gardens is not limited to the material and biological heritage they comprise; it also has enormous pedagogical and awareness-raising potential. The historic gardens are authentic open-air museums, ethnographic repositories, records of a time that shaped local history. They combine, in a restricted area, the biological representation of various parts of the world, as was seen in this work. In the more than 50 historic gardens in Lousada, 192 species of trees and shrubs have been identified, and many more are found in the forest and other adjacent areas.


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The characterization work resulted in the publication of a Guide where 136 species of trees and shrubs present in 25 manor houses in the county were compiled, whose gardens are of a size and conservation status in line with group visitation.

In the second part of the guide, the files of the botanical species were organized, in order to help visitors in identifying the trees and shrubs.

Routes for visiting the gardens were also proposed.

The Guide and the Visitation Routes are a humble tribute to the heritage of excellence that the Manor Houses and Gardens contain and are important steps towards the characterization and promotion of this heritage of excellence.

T1.7

FROM THE ROYAL GARDEN OF MEDICINAL PLANTS TO THE CURRENT BOTANIC GARDENS AND RESEARCH DEPARTMENTS, A LONGSTANDING TRADITION FOR MEETING SOCIETAL NEEDS

Maïté Delmas, Direction des relations européennes et internationales, Muséum National d'Histoire Naturelle

Situated at the crossroads of Earth, Man and Life sciences, the Museum National d'Histoire Naturelle, (the Museum), is a unique national institution with a 400 years rich history, a diversity of missions and domain of research and impressive naturalist and documentary collections. The first vocation of the Museum was botanical and the discipline remains central to its activity. The Royal Garden of medicinal plants, which later became the Jardin des Plantes, has never ceased to be a place dedicated to the study, conservation, monitoring and awareness raising of the Earth botanica diversity.

Today, thanks to the actions deployed in its 4 botanic gardens, in the departments dedicated to the study of living, herbarium and ethnobotanical specimens, to the monitoring and conservation of the regional plant diversity and to its implication in capacity building initiatives and its involvement in national and international networks, the institution is actively involved in contributing to the 5 themes and the 16 targets of the Global Strategy for Plant Conservation, GSPC.



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This presentation will highlight some of the key programs and action developed in each of the five themes of the GSPC:

- Plant diversity is well understood, documented, and recognized
- Plant diversity is urgently and effectively conserved
- Plant diversity is used in a sustainable and equitable manner
- Education and awareness about plant diversity, its role in sustainable livelihoods and importance to all life on Earth is promoted
- The capacities and public engagement necessary to implement the strategy have been developed.

In all its fields of expertise, the Museum is fully committed to tackling the 21st century challenges and responding to the current societal needs. It is also demonstrating that nearly 400 years of existence have not weakened its implication in the study, the teaching, and conservation of Plant and Fungi diversity. It is particularly engaged in contributing to the implementation of the Global Strategy for Plant Conservation and its European application, the European Strategy for Plant Conservation.

T2.2

EFFORTS TO CONSERVE RARE, ENDANGERED AND ECONOMICALLY USEFUL MEDICINAL PLANTS OF WESTERN GHATS OF INDIA

Raviraja Shetty G, University of Agricultural & Horticultural Sciences, Shivamogga, Karnataka, India

The Western Ghats of India is among the ecologically richest regions and one of the major repositories of tropical medicinal plants. It can be noted that the plants that were very common in the area when they were first studied have got into the IUCN Red List over the years. There is an urgent need to develop efficient *ex situ* conservation strategies for these species to prevent further genetic erosion. In the present study, five endangered medicinal plants viz. *Holostemma-ada-kodien, Gloriosa superba, Salacia reticulate, Tinospora sinensis* and *Decalepis hamiltonii* were explored, collected and conserved for sustainable utilization. The species are selected considering its status in terms of threat, use in traditional medicine and demand in the pharmaceutical industry. A total of thirty three plants with a maximum of fifteen in *Gloriosa superba*, eight in *Decalepis hamiltonii*, four each in *Holostemma-ada-kodien* and *Salacia reticulata* and two in *Tinospora sinensis* were collected and their growth



parameters were recorded. Medicinal plants collected and conserved in the Field Gene Bank were characterized using species specific descriptors. Based on the observations, data base was generated for documentation. The propagation studies for all the collected species have been undertaken and seed and vegetative propagation methods were standardized. The results of the experiment are found to be useful for further multiplication and conservation of these medicinal plants for their sustainable use. Education programmes on conservation of medicinal plants were organized for students and public to foster ecological responsibility and to encourage joyful interaction with the natural world.

Key words: Western Ghats, Medicinal plants, conservation, propagation, education

T3.2

THE COPY OF THE HISTORICAL ORCHID COLLECTION THAT KING LUIS I CREATED 1881 IS RECREATED

Pekka Ranta Janhuan Orkidearanta Oy, Finland

Luis I, the king of Portugal created an orchid collection for the Botanic Garden of Ajuda. The collection can be considered as ready as 1881. There is a list of plants showing names of 438 different orchid species including a few hybrids. At that time there were also about 250 other orchid species in the Garden. These had not yet shown any flowers, so the director was waiting to define the names. So, the total amount of different orchids was about 680.

An estimate of the value of Ajuda's orchid collection can be made by comparing this number (680) to the number of orchid species and variations in the leading manual for orchid growers. In the edition from 1877 it had 930 orchids described. So Ajuda had about 70% of the best-known orchids at that time.

The orchid house that was made for this orchid collection has been considered as modern and technically high-quality. It was described as such in the known article in a portuguese horticultural journal. The real quality was described in the annual report of Luiz de Mello Breyner, the director of the Garden 1881. He was clearly sad because he had lost



T3.3

a special collection of 25 *Masdevallia* spp. because he had only primitive greenhouses to grow the orchids.

The orchid collection lived at different times up to 1940. Then it disappeared, so that there was practically nothing left in 1970.

We decided in 2015 to recollect all those orchid species and open it to the public. Now the hard work has been done. We can show almost all those species and we have tested in a pilot orchid house the proper growing conditions for them.

TAPADA DA AJUDA BOTANICAL PARK: A HOTSPOT OF PLANT DIVERSITY IN THE HEART OF LISBON

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Tapada da Ajuda Botanical Park is located in Instituto Superior de Agronomia (ISA), between the Parque Florestal de Monsanto and Alcântara. This space is a botanical area with 100 hectares, and has a great botanical value, with several wild species characteristic from the native vegetation of Lisbon. The Tapada da Ajuda has its origins in the "Real Tapada da Ajuda" dating back from 17th century. In 1841, natural woods mainly of wild



olive trees (Olea europaea L. var. sylvestris (Mill.) Lehr) were cultivated. In 1910, the Instituto Superior de Agronomia (ISA) was created, and since then Tapada da Ajuda has been dedicated to research in the field of agronomy and to support teaching and studying botanical diversity. Within the Tapada da Ajuda, we can find a natural botanical reserve, which has an area of approximately 4.5 hectares and owns an enormous natural value. In 1951 it was named as "The Nature Botanical Reserve D. António Xavier Pereira Coutinho", by ISA's School Council of that time, during the celebration of the centenary of the Coutinho birth. The great botanical diversity of the Tapada da Ajuda is only possible due to its size, as well as, the various edaphic and climatic conditions it offers, allowing the acclimatization of plants from different biogeographical areas, of which about 550 taxa are trees and ca. 2500 are shrubs or perennial herbaceous. This communication presents the tools that have been implemented recently to contribute to the conservation, improvement and dissemination of the unique floristic patrimony of Tapada da Ajuda Botanical Park, namely: a) the geographical database of PBTA plant species; b) the characterization sheets for the botanical species of PBTA (available at http://www.isa.ulisboa.pt/pbta/colecaobotanica); and c) the identification plates of the PBTA species. With almost 400 years of existence, Tapada da Ajuda Botanical Park has a vast natural patrimony, landscape, architectural and cultural heritage. This area presents a hotspot of diversity within the city of Lisbon and hosts some taxa that were classified in threatened categories, playing an important role in their preservation.

Keywords: Biodiversity, Conservation, Botanical Park, Flora, Botanical Collections, exsitu Conservation.

T4.2

REVITALIZATION OF THE HISTORICAL PLANT GEOGRAPHICAL DIVISION OF THE BOTANICAL GARDEN, UNIVERSITY OF VIENNA: TRIAL AREA FOR HARDINESS STUDIES IN TIMES OF CLIMATE CHANGE

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The Botanical Garden of the University of Vienna was founded in 1754. Under the directorship of Anton Kerner von Marilaun, "plant geographical" display areas were established in 1879; this seems to be the first division explicitly dedicated to plant geography in a Botanic Garden worldwide. After an enlargement in 1889 the "Pflanzengeographischen Gruppen" comprised c. 25 different geographical areas with typical elements of their vegetation zones. The historical arrangement of these groups and the original plantings are well documented in publications, maps and by photos.

During World War II, the division was substantially damaged. In the 1970s, parts of the area were converted into research cultivation spaces. The remaining area was only managed at a minimum. Since the mid-1990s a new concept for revitalization of this part of the Botanical Garden was initiated, based on the historical evidence, but incorporating new scientific concepts as well. Using the remaining woody plants as backbone, the revitalization was started with herbaceous plants of known wild origin fitting to the original geographical groups, and now includes woody species as well.

Criteria for selecting new taxa to be planted are, i.e., representativeness for the geographical area, endemic species, or species/genera not yet cultivated at the Botanical Garden. Anticipating potential effects of climate change, the selection of the new species also takes hardiness aspects into account. Especially species reported "just not to be hardy in the Viennese climate" are tested. This approach, which is favored by the fact that the area is not accessible for the public and is surrounded by buildings from three sides, is likely to enlarge the number of species from different geographical regions of the world and also to provide long term information about the climate resistance of the selected species.

Keyword: Historical plant geographical displays, revitalization, climate change, hardiness

T4.3

RESTORATION OF *LA ROSALEDA*, REAL JARDÍN BOTÁNICO-CSIC (MADRID, ESPAÑA)

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The Real Jardín Botánico of the Spanish National Research Council (RJB-CSIC) was created in 1755 by order of Fernando VI in the Huerto de Migas Calientes, on the outskirts of Madrid. In 1774 Carlos III ordered its transfer to its present location in the Paseo del Prado.

The Rose Garden (*La Rosaleda*) of the RJB-CSIC is a unique space of about 2,800 m², located in the four central squares of the lower terrace of the RJB, close to the Paseo del Prado and adjacent to the Puerta del Rey, on both sides at the beginning of Paseo Carlos III.

Today, cultivation of roses in the Royal Botanical Garden has a purely ornamental function, but at the beginning of the 19th century the roses that were grown here were used to obtain perfumes for the royal palace. The rose collection brings together more than 340 specimens of different species, varieties and hybrids mainly from rose bushes donated in 1977 by Mrs. Blanca de Urquijo (1924-1997), the interexchange with the Parque del Oeste rose garden (Madrid) and a collection of wild roses from the Iberian Peninsula created with the support of Madrid municipal government. With the passage of time, the soil had become depleted, and the irrigation system had deteriorated, with many emitters clogged or broken, as well as poorly located. CHANEL, the French fashion house, after signing a collaboration agreement with the RJB-CSIC, has financed the restoration of *La Rosaleda*.

With this work, we have restored the walking trails and the irrigation system, improving the underground and aerial parts of the rose bushes. In our presentation we describe the different actions carried out, among them, the placement of mesh to control weeds, the mulching to reduce excessive evaporation and soil erosion, and the renewal of the substrate. Several specimens have also been relocated in order to form natural groups. This restoration has been carried out by the students and teachers of the School of Gardening (RJB-CSIC), under the supervision of the Gardener and Trees Unit RJB-CSIC.

We also acquired 22 new classic rose bushes, increasing the value of the RJB's collection, including Rosa phoenicia, predecessor of Damascenas, Albas, Centifolias and Mosgosas; Damask rose, 'Summer Damask' (= Rosa x damascena) or 'Old Blush', or a Chinese rose imported in the 18th century that gave ancient European roses the long-awaited repeated flowering.



To wrap up the restoration, within the framework of the collaboration with CHANEL, we developed a new digital interactive map that shows the specific location and documentation of 140 rose bushes to guide visitors, accessible through a QR code. This support is also available at the RJB-CSIC website.

Key words: irrigation system, Gardener School, mulching, Rose Garden, sponsorship

T4.4

THE REAL JARDÍN BOTÁNICO (RJB) OF MADRID, 265 YEARS AT THE EDGE OF THE BOTANICAL RESEARCH IN SPAIN: NEW CHALLENGES AND CONSERVATION APPROACH.

Esteban Manrique

Real Jardín Botánico CSIC, Madrid. Spain.

Since its creation in 1755 by the King Ferdinand VI and his transfer to its current location on the Paseo del Prado in Madrid in 1781 by King Carlos III, the RJB has gone through by periods and vicissitudes of a very variable nature. But, nevertheless the RJB has managed to get out forward until today. Therefore, 265 years have shaped a Garden that then and now shines for its scientific quality, its botanical collections, and its activity in environmental awareness in the center of the city of Madrid (Spain). From 1940 onwards, the RJB belongs to the National Scientific Research Council of Spain (CSIC) as a research institute in botany and fungi.

It is precisely that age what now makes the RJB more vulnerable to new environmental factors arising from human activities and the passage of time. On the one hand, the age of its living collections, especially the old trees, makes its conservation a difficult task in a polluted and hostile environment as it is the city of Madrid. Besides, the soil compaction after the passing years hinders the percolation of rainwater or irrigation. Moreover, air pollution, new pests and diseases and climate change are the new problems that the botanical gardens currently face. To face these factors, we will need to joint efforts to develop new strategies and tools. Along this presentation we will analyze each of these factors for which the RJB has to find adaptation or mitigation solutions.



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T4.5

Key words: Real Jardín Botánico, botanic gardens conservation, climate change, atmospheric pollution, soil compaction, pests and diseases.

REFURBISHMENT OF THE HISTORIC GLASSHOUSE OF THE BOTANICAL GARDEN GRAZ

Christian Berg, Ursula Brosch & Jonathan Wilfling

Graz University, Botanical Garden, Holteigasse, Graz, Austria.

The historic Glasshouse in the Botanical Garden Graz is one of the outstanding monuments of iron skeleton construction from the second half of the 19th century. It was built between 1888 and 1889 by the iron construction manufacture Ignaz Gridl, Vienna. While the style of the time was still Victorian, the house was already reminiscent of modernism. It was a modular building and was built at several locations, including at the Botanical Garden of Innsbruck.

After the construction of the new glasshouses in Graz from 1989 to 1995, the demolition of the historic glasshouse was planned, but Graz citizens and city parliamentarians, campaigned early on for the preservation of the house. Demolition was thus prevented, but the house was unused and left to decay. Late, in 2008, the building was declared a protected monument.

Even then, it took a long time before agreement was reached between all players of renovation, its financing and future use. The smaller, outer wings will serve as nursery houses for the Botanic Garden, and one of the larger wing houses will be used to cultivate plants for teaching and research. The second large wing house will be the future educational center of the "Botanic school". This finally opens up the possibilities to offer practical work and workshops also independent of the weather, but in a "botanical atmosphere". The highlight for the public will undoubtedly be the "Plantarium", as we have called the central cube. This will be a freely accessible space during the opening hours of the Botanic Garden, where exhibitions and university events can also take place.

The refurbishment began as early as 2019 with the demolition of the 1950 porches that were not part of the monument. The start of the actual refurbishment was then eagerly awaited once all technical and official issues had been clarified. It began in the spring of 2020 with the removal of the old glass. This was followed by a feat of structural engineering: the entire iron-steel structure was jacked up so that the foundation could then be removed



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and rebuilt, or rather underbuilt. The next major step was to remove the old paint, gradually enclosing the glass house in plastic sheeting to prevent dust emissions. Afterwards, the new green paint was applied in coordination with the Federal Office for the Protection of

Monuments. The installation of the glass also required a great deal of constructional skill, as the installation of the glass and the dismantling of the scaffolding had to be precisely coordinated. In addition to these externally visible renovations to the steel scaffolding, the entire interior and the brick building at the rear have also been elaborately and renovated. The completion of attractive outdoors will still take some time. The opening is planned for September 2021.

Keywords: historic glasshouses, iron skeleton construction, refurbishment

T4.6

THE WISE TREES PROJECT - AN INITIATIVE FOR HELPING HISTORIC BOTANICAL GARDENS OF THE CARPATHIAN BASIN IN WISE MANAGEMENT AND FAMILIARIZATION OF HISTORIC TREES

Zsuzsa Szendi, Vince Zsigmond

Hungarian Association of Arboreta and Botanic Gardens, Hungary

Trees, especially old, giant trees are of constantly growing public interest by many reasons. Even more scientific findings prove that trees are guardians of the Earth's future climate liveable for humans. Veteran trees are guardians of the past and history at the same time. Besides giving life space to a diverse complex of living organisms, they astonish and teach people in the present. Thinking over this complexity, we found WISE as most adequate attribute to historic/veteran trees in our initiative.

Wise trees are key values and key attractions of historical botanic gardens expected to be retained, on the other hand the special maintenance needs of these trees face garden managers several hard problems to solve and requires serious resources.

Hungarian Association of Arboreta and Botanic Gardens developed a project with the mission to give long life, spotlight and reputation to these unique living creatures and to support historic gardens, especially botanic gardens and arboreta in the Carpathian Basin, the territory of the former Hungarian Kingdom in accomplishing this mission.



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WISE TREES initiative of HAABG provides complex means for complex needs of Hungarian Botanic Gardens and Arboreta, which have to maintain gardens in poor monetary and human conditions and without adequate legislations as exist e.g. in the UK.

With the support of the Slovakian-Hungarian Interreg Program of the European Union, HAABG together with the Slovak National Trust could start this work in 2021 and lay the grounds of a long term strategy.

In the project we

- compile an inventory of wise trees and their home gardens from dendrological, historical and tourism marketing aspects,

- give practical knowledge and complex approach to garden managers,

- support tree survey and arborist services and

- develop online and on the spot public services to encourage people, especially families for trips to gardens, and let them experience the exciting history and ecological importance of trees and gardens from different aspects by contemporary gamified methods.

An important feature of our approach is that we realise interdisciplinarity in practice involving several experts with different knowledge even in the same time and space from dendrologists along arborists to tourism marketing advisors. In the presentation we focus on the innovative mindset and the concept map of WISE TREES project and show some delightful veteran trees and historic botanical gardens from the Carpathian Basin less known by European garden experts.

Key words: veteran trees, historic value, arboriculture, interdisciplinary, Carpathian Basin

T4.7

RARE AND THREATENED PLANT SPECIES IN THE LIVING COLLECTIONS OF THE LISBON BOTANICAL GARDEN AND TROPICAL BOTANICAL GARDEN. PRESERVING THE PAST, THE PRESENT AND CONSERVING THE FUTURE

César Augusto Garcia, M. Cristina Duarte & Ana Luísa Soares

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The Lisbon Botanical Garden with an area of 5 ha is a scientific garden created in the mid-nineteenth century to complement modern teaching and botany research at the Polytechnic School. Here established between 1609 and 1759, however, it is only in 1873, through the initiative of the Count of Ficalho (1837-1903) and Andrade Corvo (1824-1890), teachers at the Polytechnic School, that the planting begins. The vast diversity of plants was first planted by the German Edmund Goeze (1838-1929) and the French Jules Daveau (1852-1929), Edmund Goeze, the first chief gardener, outlined the "Class" and Jules Daveau was in charge of the "Arboretum."

The Tropical Botanical Garden was created on January 25, 1906, by Royal Decree, situated, from 1914, in Belém (Lisbon) under the guidance of Henry Navel, French landscape gardener, occupying seven hectares near the river Tagus. It has been enriched with a remarkable diversity of native and important exotic plant species especially from tropical and subtropical regions. Was conceived as a Colonial Garden with a center of experimentation of cultures and as a space to accumulate knowledge regarding tropical agriculture and forestry.

Both gardens have numerous species with conservation interest. Plant diversity is currently being lost at an unprecedented rate, currently about a third of the world's 300,000–450,000 vascular plant species face extinction due to a variety of devastating anthropogenic activities, including destructive agricultural and forestry practices, establishment of pastures for farming, urbanization, land-use changes, exotic invasive species, climate change, pollution, systematic fires, illegal harvesting of seeds, wild juvenile, and adult plants etc. Due to the habitat threats, area of occupancy (AOO) and the extent of occurrence (EOO) are experiencing a continue declining for several taxa, and the plant populations is expected to continue declining into the future.

The living collections of the botanical gardens are also a potentially valuable source of material for reintroduction and restitution of vegetation and plant communities and there are already several examples of species considered to be extinct in the wild being reintroduced into their natural habitat thanks to botanical gardens specimens.

The National Museum of Natural History and Science of the University of Lisbon is responsible for the management of the two gardens, and both are national monument by the Ministry of Culture.

Key Words: Botanical garden, conservation, biodiversity, living collection, IUCN

T5.2

THE HISTORY IN THE STONES OF THE BOTANICAL GARDEN OF THE UNIVERSITY OF COIMBRA

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Two and a half centuries of history stand out from the living and built heritage, from diverse collections and unique spaces, to be discovered in the Botanical Garden of the University of Coimbra (JBUC). Founded by Marquis of Pombal in 1772, during the enlightenment reform, it brought innovation to scientific thinking and practices, and today it brings together a plethora of information and educational content, transversal to many subjects.

With the purpose of multiplying this vast and differentiated knowledge, the training course "Conhecedor intérprete do Jardim Botânico da Universidade de Coimbra" is promoted, open to students with higher education, encouraging the creation of new projects.

In the 2019/2020 edition of this Course, a new interpretative itinerary entitled "Historical visit through the JBUC's statues" is created. It is a journey through the statues and biographies of its directors, other architectural elements, and examples of living collections from the four corners of the world. Expected to last 90 minutes, the trail is intended for all audiences, being particularly aimed at school groups starting from the 6th grade, with special interest to secondary education students.

With an information leaflet available, the itinerary starts in the east gate, continuing through the Júlio Henriques Terrace and tropical greenhouse, followed by Lake Luís Carisso and the Central Square, the oldest terrace in the Garden.

In 5 special moments of stop, the speech crosses the contents of the history and of the mentors and individuals, from different origins and backgrounds, who left their mark in the Garden: Domenico Vandelli, Dalla Bella, "master Galinha", Félix de Avelar Brotero, Soares dos Reis, Henrique do Couto d'Almeida, José do Canto, Pedro Pezerat, Edmund Goëze, Antonino Rodrigues Vidal, Júlio Henriques, Soares Barata Feyo, Luís Carrisso, José Pereira dos Santos, Abílio Fernandes, Rosette Batarda, Cottinelli Telmo, Luís Cristino da Silva, José Mesquita.

Surrounded by beautiful specimens, it is unavoidable and enriching to present and describe the chaacteristics, properties, and curiosities of some botanical species, alternating to an interpretative trail of Science and Botany. *Ginkgo biloba, Liriodendron tulipifera, Sequoia sempervirens*, banana tree, *Chamaerops humilis, Afrocarpus falcatus*, dragon tree (*Dracaena draco*), *Araucaria angustifolia* and *Araucaria bidwillii*, cedar (*Cedrus deodara*), strangling fig (*Ficus macrophylla*), magnolias, *Ficus pumila*, yam (*Colocasia esculenta*), among others, are species to meet.

This multidisciplinary project promotes literacy and presents a pedagogical and training tool not to be wasted, meeting curricular goals of different Portuguese school grades and subjects (6th grade - history and geography of Portugal; 8th - history; 10th - history B; 11th - history A, history B, history of culture and arts; 12th - history A).



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Within the scope of the Historic Gardens, this proposal generates a tourist opportunity for diverse audiences at the JBUC, a UNESCO World Heritage Site since 2013.

Keywords: heritage; tourism; history; botany; education; gardens

T5.3

TRIED, TESTED - OPPORTUNITIES FOR PRIVATE BOTANICAL GARDENS IN THE TOURIST INDUSTRY

Réka FOLLY¹

¹Folly Arboretum and Winery, Badacsonyörs, Hungary

Our botanical garden is not simply an arboretum of many. It's not only a unique collection of cedars and cypresses, but a family history of four generations, a result of dedicated work and perseverance with the help of God.

This story begins hundred and sixteen years ago in 1905 with Gyula Folly MD, who planted the first conifers to the stoniest and steepest part of the Kisörs Hill, which is in Western Hungary, on the North shore of Lake Balaton. The whole estate is ten hectares, half of it is vineyards, the other half is the botanical garden. We have cedars, junipers, and an outstanding collection of cypresses that is about three hundred species of pines altogether.

The garden is still privately owned by the Folly family as opposed to the majority of other botanical gardens in Hungary and other ex-communist countries that are stately owned, or university affiliated.

A historical botanical garden, however well-kept and beautiful, can only attract a limited number of visitors solely by the merit of the plants it cultivates and the walkways it maintains. It requires much more effort to reach the crowds. Our philosophy revolves around the notion that the garden – above and beyond being just a collection if rare or valuable plants - must be provided as a beautiful backdrop to activities of everyday life. My presentation details the method and the ideas behind creating a buzzing tourist attraction. Some key points:

- existing strengths to build upon (location and panoramic views in our case)
- widening our reach (families with kids, wine enthusiasts etc)
- programs (guided tours, childcare with activities)



- branded quality products, some manufactured on site
- availability as a venue for special occasions (weddings, class outings, team building etc)
- strong presence in social and traditional media

Eleven years ago, when I took over the garden from my father, we decided to build up a serious brand as we would like to impress our visitors not only by the actual garden but we would like to send a message through our quality products beyond the arboretum.

After working hard for years, we can proudly say that the philosophy of our business strategy works. The number of our visitors has dramatically grown, therefore, the sales of our products also multiplied. We have managed to bring our business up onto a different level with creating so much more income which we can reinvest into the development of the Folly Arboretum.

Keywords: Arboretum, Winery, Pines, tourism, visitors

T5.4

TELLING STORIES ABOUT ENDANGERED PLANTS IN A GARDEN: CREATING LAST CHANCE VISITATION EXPERIENCES USING MAPS AND STORYTELLING

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Our research stems from the idea that narratives and geography can be integrated into a garden visitation experience through story mapping. Story maps use geographical contents to organize and present information. They can tell the story of a place, event or issue by combining interactive maps with contents like photos, texts, illustrations, video and audio. While maps can provide powerful visual representations, storytelling carries the potential to effect change, influence opinions and create awareness.

Considering the growing relevance that urban nature has assumed in the creation of more sustainable territories, we created an eco-fiction mixed-reality game – *Origenes Botanica* - using the story mapping software ESRI StoryMaps. The game is set in a futurist scenario: in 2100, climate change and ecosystem degradation has led to the disappearance of several



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plant species in the wild. One place, the Ajuda botanical garden in Lisbon, preserves specimens from various parts of the world that are threatened with extinction, the result of human action and the period of great acceleration that occurred from the mid-twentieth century. The user is part of a group of researchers that visits the garden and follows a virtual route through the five continents seeking plants and trees in each of these spaces. In a dialogue between virtual characters and with the support of illustration, the objective of the game is to make visitors aware of the dangers of biodiversity loss and to create, through storytelling, an artificial last-chance travel experience to visit and meet endangered species. Garden visitors will have access to information such as the description of the species, its place of origin, the cause of the threat of extinction and the places where they are endangered.

Keywords: Garden Visitation; Endangered Species; Storytelling; Mixed-Reality; Story Maps



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SHORT PRESENTATIONS



P1.1

THE NATIONAL GARDEN OF ATHENS AS A BOTANICAL RESOURCE FOR THE CITY

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The National Garden in Athens constitutes a Historic Garden with strong Botanical orientations since its creation. It used to be a Royal Garden that Queen Amalia envisaged in 1836 to surround her Palace symbolising the establishment of the modern Greek state by the Bavarian royalties. It was designed following English style landscape designs of the time, with meandering paths and opening views to the surrounding landscape and antiquities. The efforts put in for the completion of the Garden reaching almost its current size (15 hectares) were unprecedent for the country, considering the poor available means the newly established state could provide. Trial and error techniques were widely used by all specialists involved at the time: the famous Bavarian botanist Karl Nikolas Fraas, the French Landscape architect Francois Luis Barauld, the Bavarian agronomist Frederick Smidt. Indigenous tree species were introduced travelling from all over the country (such as Quercus ilex, Cupressus sempervirens, Ulmus campestris, Platanus orientalis) but also a great number of exotic plants were notoriously shipped from abroad (such as palm trees like Phoenix canariensis, Washingtonia robusta, Livistonia chinensis and other ornamentals like Melia azedarach, Koerleuteria paniculata, Schinus molle). Many of the species that form the landscape of the parks and streets of the City of Athens were introduced during that era.

The arid Athenian climate was harsh on plants and water hard to obtain. However, the water found from the ancient underground Peisistratus Aqueduct constituted and remains the main source of irrigation of the Garden. A wise system of surface channels running through the Garden from its highest to the lowest part forms its backbone ingredient and the reason of its existence until today.

The Garden became public in 1927 and was designated as a Historic landscape by the Ministry of Culture in 2011. It is now managed by the City of Athens and the newly



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created city-owned company, Green Athens SA. and participates in the National Network of Greek Botanic Gardens.

Keywords: Athens National Garden, historic garden, royal garden, botanic garden

P1.2

ANALYSIS OF ORNAMENTAL FLORA IN THE LA CONCEPCIÓN HISTORICAL BOTANICAL GARDEN IN THE 19TH CENTURY

Blanca Lasso de la Vega Westendorp, La Concepción Botanical and Historical Garden, Málaga, Spain.

In the second half of the 19th century, the city of Malaga saw exceptional growth in the number of gardens and in the plant diversity they were home to. This was influenced by the economic boom of the bourgeoisie, the fashion for collecting and the new communications. The singular fondness for plants and gardens led to contests, exhibitions, and the acclimatisation of rare exotic species. Numerous professionals (gardeners, nursery specialists and women, horticulturists, and engineers) came from abroad to practise, horticultural establishments multiplied, and businesses related to botany and gardening thrived. This also led to a change in Malaga's appearance, with the city becoming «greener» and healthier, in addition to gathering in its gardens a plant complexity that was surprising for the period.

One of the first gardens of the time was the garden of La Concepción, the result of a cluster of successive social, cultural, political, and artistic events that have favoured its development and survival to this day. Among them was the rise of the bourgeoisie in Malaga in the 19th century, which, together with the political and financial power they sustained, the taste for the European style, the collecting, and the fashion for the exotic, promoted the building of large villas with gardens on the outskirts of the city where species from various parts of the world were cultivated, endorsed by the Royal Order of 1863 issued by Isabel II for the acclimatisation and enhancement of foreign species.

The construction of the garden began in the second half of the 19th century as the result of the marriage between Jorge Loring y Oyarzábal, engineer, merchant, and politician,

and Amalia Heredia Livermore, daughter of one of the most influential men in the city at that time. In Europe, the hacienda became known from its beginnings for the magnificent



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collection of archaeological remains gathered by its owners, and which were the subject of study by prestigious researchers of the time.

Year after year, the introduction of numerous warm-climate plant species took place, because as was the case in other parts of Europe, the fashion of the exotic had arrived in the city. This plant enrichment had different origins. To find out about the flora existing in La Concepción, historic and current texts that refer to them or to the garden have been gathered. The engravings, postcards, and images from 1861 (the oldest found) to 1930 have been studied, as well as the chapter records, files and press of the time.

Keywords: Historical gardens, plants acclimatisation, Ornamental Flora, La Concepción, XIXth.

P1.3

City development and its impact on the environmental conditions and functioning of the Botanical Garden of the Adam Mickiewicz University in Poznań (Poland)

Joanna Jaskulska, Monika Rękoś, Mateusz Sowelo

Botanical Garden of Adam Mickiewicz University in Poznań, Poznań, Polland

The Botanical Garden of the Adam Mickiewicz University in Poznań was established in 1925 and at that time it was located on the outskirts of the city, surrounded by horticultural and agricultural lands. Initially, it occupied an area of approx. 2.5 ha, but over the years, it was expanded several times to fulfil the needs of developing collections. Currently, the area of the Garden is approx. 22 ha and further enlargement of the premises is not possible since it is surrounded by public roads on all sides.

The aim of this poster is to present that progressive urbanization has generated several factors that have a significant impact on the environmental conditions in the Garden as well as on the way it functions. Over the past decades, because of the development of the city, the borders of Poznańhave been constantly expanded.

One of the most significant problems resulting from increasing urbanization is constant lowering of groundwater levels. This factor, in combination with cyclically occurring meteorological drought in Poznań (as in the whole region of Greater Poland),



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generates stressful conditions for plants in the collections, especially for woody plants. Additionally, increasing noise pollution influences many aspects of the functioning of the garden. It, inter alia, discourages visitors from exploring the collections, adversely affects their leisure and makes it difficult to conduct educational activities. The lack of possibility to further expand the area of the Garden poses another problem for the constantly developing and expanding collections.

Although the development of the city has unquestionably a negative impact on the environmental conditions in the Garden, it has also some positive effects on its functioning. For example, due to the well-developed public transport network in the city, the number of visitors has increased.

From the beginning of its existence, the Garden was a place for recreation and leisure for the inhabitants of the continuously expanding city. Due to, among others, established cooperation with the city's authorities and local communities, the Garden has broadened its role. Because of continually developing educational infrastructure, each year more trips for preschoolers, school children and seniors are being organized. Moreover, over time, the Garden has become not only a center of cultural events and social interactions but also a green enclave for animals searching for food.

The specific environmental conditions in urban agglomerations have been an important topic of discussion in the world of science in recent years. The changes in the last decade have given rise adjustments in the resource management and skillful planning of further activities so that theBotanical Garden can function effectively and fulfill its targets for the next decades.

Key words: urbanization, environmental conditions, groundwater level, noise, meteorological drought



P2.1

COLLECTION, DOCUMENTATION AND *EXSITU* CONSERVATION OF GREEK NATIVE FOREST FRUIT TREES AND SHRUBS

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Fruit and shrub crops are an important sector of crop production. In recent decades domestic genetic material has been displaced by imported. Therefore, the conservation of indigenous genetic material is of utmost importance as there is an abundance of genotypes with special taste and cultivation characteristics as well as resistance to various stresses. Balkan Botanic Garden of Kroussia (BBGK), N. Greece, maintains about 7,000 species, constituting an excellent source of genetic material. Within the framework of the EcoVariety research project, 8 different wild-growing native forest trees and shrubs species from northern Greece (124 accessions): Amelanchier ovalis (9 accessions), Cornus mas (23 accessions), Prunus spinosa (15 accessions), Rhus coriaria (12 accessions), Rosa canina (14 accessions) were collected. One accession of A. ovalis, two accessions of P. spinosa and two accessions of R.canina are maintained in BBGK. The project's aims were to document these species in their habitat, to collect several samples from different sites, to develop asexual propagation protocols and ultimately apply this knowledge to pilot crop cultivations. Propagation trials for each collected population of each species have been



established in the laboratory of the Institute of Plant Breeding and Genetic Resources of ELGO Dimitra. S. nigra, C. mas, R. canina and R. idaeus responded well to the application of the selected rooting hormone (IBA) and the tested treatments presented higher rooting rates compared to the control (P<0.05). Contrastingly, P. spinosa, R. coriaria and A. ovalis presented comparatively lower rooting rates. All propagated plants have presented good adaptability at the ex-situ environment of Balkan Botanic Garden in Thermi, Thessaloniki, where currently are being cultivated successfully in pilot fields. Regarding S. nigra the 19.479 population had the highest growth rates compared to the other eight established plant populations of C. mas did not show particular growth in contrast to four established populations of R. canina plants that adapted perfectly and yielded. All populations of R. canina followed the same pattern and had similar growth rates (P>0.05). R. coriaria and P. spinosa showed to adapt quite well, without significant yield. Hence, this study can be the springboard for the commercialization and sustainable utilization in future breeding programs of Greek native population genotypes of wild-growing fruit species.

Keywords: native plants, wild-growing fruit species, preservation, asexual propagation, Botanic Garden

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P3.1

The Succulent collection of the Botanical Garden of the University of Adam Mickiewicz in Poznań

Ewa Kazimierczak-Grygiel, Botanical Garden, Adam Mickiewicz University in Poznań, ul. Dąbrowskiego 165, 60-594 Poznań, Poland

The Botanic Garden of the Adam Mickiewicz University in Poznań was established in 1925. However, the first greenhouses, with a total area of 500 m², was built just in the second half the 1950s. and extended by the next 250 m2 in the 1960s. Here began the



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collection of tropical plants including succulents. Collection was stared thanks to international exchange of seeds with other European and world greenhouses, gathering seeds and plants from the other research units in Poland and Europe, and thanks to contacts with private collectors.

The oldest dated specimens of coarse plants come from 1957. However, the development of collection and detailed documentation has begun in 1970s. and the largest number of specimens has been gathered in 1980s and 1990s. The first electronic database was established in 1999, which was expanded and modernized in the following years.

Currently the UAM Botanic gardens succulents' collection is placed in three greenhouses of a total area of 250 m² in various microclimatic conditions. Despite a little area, a variety of tropical species have been collected here in number of over 1000 *taxa* from 200 genera and 34 botanical families. The most numerous representatives come from *Cactaceae*, *Crassulaceae* and *Aizoaceae* families. Plants gathered in the collection of succulents represent all types of morphological and anatomical structure, show the adaptation of plants to drought in natural conditions, help to understand the phenomenon of convergence. Thanks to this, the collection is used in academic teaching and broadly understood general education.

At the time when the collection of succulents in was created, it had a very extensive terminology. Many years of research by a group of experts caused changes in the nomenclature of this group of plants at the beginning of the 21st century ("The Cactus Family" – E.F. Anderson, 2001 and Illustrated Handbook of Succulent Plants" - U.Eggli, E.K.Hartmann and others, 2001-2003). The introduction of changes in the names of genera and species required taxonomic verification of all plants in the collection. The biggest changes in our exposure concerned the *Cactaceae* family. Organizing plant names required a lot of work, changes in the database, changing labels, and in our mentality.

Managing the collection of succulents therefore requires constant substantive supervision, high commitment of employees dealing with the care, access to current literature and online databases, and the exchange of information with other botanical gardens.

Key words: succulents, plants collection, greenhouses



P3.2

O CHÃO DAS ARTES – BOTANICAL GARDEN

Sónia Francisco, Casa da Cerca Contemporary Art Centre, Almada, Portugal

O Chão das Artes is a young Botanical Garden housed in a Historic House (XVIII century).

In 1988, when the property was acquired by Almada City Council it was an unremarkable cultivation space, overgrown with weeds and flowers and punctuated by a few fruit trees.

In 1996, Casa da Cerca was classified by DGPC as a Property of Public Interest (Imóvel de Interesse Público (IIP), Decreto nº 2/96, DR, 1.ª série-B, n.º 56 de 06 março 1996) and, in 2013, was designated a Special Protection Area (Zona Especial Proteção (ZEP) Portaria n.º 48/2013, DR, 2.ª série, n.º 14, de 21 janeiro 2013) around the building and property.

Surrounded by walls on all sides, the gentle topographic slope of the site towards the north provides a view over the Tagus valley. The garden is accessed from adjacent spaces and the house by gates, reinforcing its isolated, almost autonomous character.

The garden is thus based on an approach to the visual arts, but one which goes beyond the final artistic product to focus on the origin of the materials used in artistic practices. In this context, *O Chão das Artes* - Botanical Garden is unique in its joint articulation of the scientificand the artistic approaches.

With a total area of around half a hectare, the Garden opened to the public on 9 June 2001 after three and a half years of work, offering visitors an original approach to the visual arts. Since that date, the Centre for Contemporary Art and the Botanical Garden have worked together to explore, research, and disseminate the connections between Art and Science. As of 2021, the Garden has a collection of over two hundred species that are maintained, promoted, studied, and explored through the prism of the materials these same plants produce.

Art is both the main source of inspiration and the main protagonist of *O Chão das Artes* – Botanical Garden, which has a mission to explore the connections between Art and Science through research and dissemination of its collection of plants, many of which are raw materials for the manufacture of visual arts materials.

The vision of *O Chão das Artes* - Botanical Garden is to promote knowledge of plants from around the world (though with a particular emphasis on Europe) that have been used to provide raw materials for artistic practice throughout history.

The Garden is divided into various areas: Pigments' Garden, Greenhouse, Gum



Orchard, Painters' Garden, Oil's Garden, Fibres' Garden and woods.

Keywords: Botanical garden, Contemporary Art Centre, Art and Science, raw materials, visual arts materials

P3.3

BOTANICAL GARDENS OF UKRAINE IN HISTORICAL RETROSPECTIVE

Andriy Prokopiv¹, Lyudmyla Buyun², Marina Gaidarzhy³ ¹Botanic Garden of Ivan Franko National University of Lviv, Lviv Ukraine

The history of creation of botanical gardens in Ukraine dates back to the beginning of the 19th century. The Botanical Garden of V. N. Karazin Kharkiv National University, founded in 1804, is the oldest botanical garden in Ukraine. Itis followed by the other old botanic gardens, such as Kremenets Botanical Garden (1809) and Nikitsky Botanical Garden (1812). In 1839, O.V. Fomin Botanical Garden was founded, initially subordinated to the Imperial University of St. Volodymyr (1834–1919) (now Taras Shevchenko National University of Kyiv). Later the Botanical Garden of Ivan Franko National University of Lviv (1852), Chernivtsi National University (1877) and Botanical Garden of Odesa National University (1880) were created.

These Botanical gardens function today and maintain the unique specimens (plants age within the range of 80–125 years) in both outdoor and indoor collections. In the 20th century a lot of new botanical gardens in Ukraine have been established. At present in Ukraine, the existence of 33 botanical gardens has been formalized. These gardens belong to different agencies: National Academy of Sciences, Ministry of Education and Science, Ministry of Ecology and Natural Resources, National Academy of Agrarian Sciences. Additionally, some of the botanical gardens have the local or regional status.

At the botanical gardens of universities linked with the education, the accumulated collections contain predominantly plants suitable for presentation of various forms of plant diversity (e.g. organ metamorphoses, ecological adaptations, distinct modes of vegetative propagation and seed dispersal), while the botanical gardens of National Academy of Sciences are mainly focused on collections appropriate for scientific researches or on *ex situ* conservation issues. In particular, M.M. Gryshko National Botanical Garden (NBG), NAS of Ukraine (founded in 1935), is one of the top botanical research institutions and Botanical Gardens in Ukraine.



Living collections of plants in Botanical Garden of Ukraine vary in number from a few hundred to several thousand different species, depending on institutional affiliation and an institution's objectives as well as the financial and scholarly resources.

At present time the most numerous living plant collections of tropical plants have been accumulated at O.V. Fomin Botanical Garden, Taras Shevchenko National University of Kyiv, Botanical Garden of Ivan Franko Lviv NationalUniversity and M.M. Gryshko National Botanical Garden. All of them have the status of National Heritage Collections of Ukraine and are supported through State funding.

Today, the main task of each botanical garden of Ukraine is to preserve existing collections and replenish them, but the issue of preserving human resources and the appropriate level of funding for institutions to cover the high costs of collection maintenance, remains extremely important.

If the priority tasks are solved, it will be possible to expand the existing development trends, which can be implemented in various ways, e.g., by participating in international research projects, development of educational programs and attracting tourists seeking to enter the botanical gardens as centers, representing cultural and historical heritage.

Key words: Ukraine, Botanical gardens, history, uniqueness, National Heritage Collections, purpose

P4.1

THE ENJOYMENT OF GREEN SPACES. TOWARDS A NEW MINDSET IN THE MANAGEMENT OF HISTORICAL GARDENS

Blanca Lasso de la Vega Westendorp. La Concepción Botanical and Historical Garden. Camino, Málaga, Spain.

Historical gardens are places to observe and feel. They are mostly places for strolling and contemplating, attracting people who are interested in plants, beauty, and the mark of past times. However, nowadays, green spaces promote a different approach to the experience of the simple walk, offering diverse activities for all ages, from modern technologies that allow you to find out about a plant or the history of the garden at the swipe of a mobile, all the way to "feeling" the park through photography, painting, sport,



meditation, exhibitions, and specific workshops that transmit knowledge of Botany, Horticulture, Gardening, History, Floral Art, Design, etc. Through all these activities, we can direct the visitor's gaze towards the respect and conservation of these unique enclaves, highlighting their value and dignifying their botanical and historical heritage, giving purpose to its existence and increasing the benefits that it can give to the city and the region that hosts it.

The *La Concepción* Historical Botanical Garden was created in 1855 by an affluent family from Malaga's bourgeoisie, who bought an agricultural estate in production in which they developed a garden with the help of a French horticulturist. In 1943 it was declared a historical-artistic garden (now a Site of Cultural Interest) and in 1990, Malaga's City Council acquired it to turn it into a historical botanical garden for all audiences. It was inaugurated in July 1994 and, since then, the aim has been to attract visitors through various activities, initially for schoolchildren, later for young people, and now for all audiences.

The experience accumulated over these years is presented in this congress in the hope that it will serve for the management of other parks and gardens.

Keywords: Historical gardens, Conservation, Management, La Concepción.

P4.2

LINKING HISTORICAL PAST WITH THE CONTEMPORARY CHALLENGES IN THE UNIVERSITY OF WARSAW BOTANIC GARDEN

Agnieszka KRZYK, Monika Joanna LATKOWSKA University of Warsaw Botanic Garden, Warszawa, POLAND

The University of Warsaw Botanic Garden is one of the oldest botanic gardens in Poland. It was founded in 1818 and has a remarkable history. In 1831 the Royal University of Warsaw was closed by the tsar and the Garden's area was severely reduced. In 1916 the Garden became a part of the re-established University of Warsaw, new sections were then created (plant biology, ornamental plants and a rose garden), renovation of greenhouses started, and collections of woody plants were extended. The greatly developing institution was destroyed during the 2nd World War. Just after the war Garden's buildings and greenhouses were rebuilt and the works on reconstructing collections began. At the end of



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the 20th century the section of plant biology regained its historical form, the collection of roses, climbers, medicinal and useful plants were modernised and enriched, and the original greenhouses have been renovated and extended.

Nowadays University of Warsaw Botanic Garden occupies an area of 5.16 ha. It includes nine sections (plant collections) and three greenhouses with tropical, subtropical and succulent plants. Live collections of *ca* 5,500 taxons are supplemented by a *Herbarium* and a digital collection of botanic illustrations (*Floratheca*). The Garden is located in the city centre at the Royal Route, surrounded by the historical parks. As a monument recorded on a list of heritage registers of Warsaw, the Garden is covered by the control of the provincial monument conservator. All reconstruction and modernization works requires conservator's acceptance, including the conservation of the old trees, among which there are 23 natural monuments. It is quite a challenge to adjust the monumental park and buildings to contemporary needs, linking the preservation of historic matter with the creation of modern collections, attractive and accessible for all users.

The paper presents how the University of Warsaw Botanic Garden meets the challenges of a modern scientific, educational and recreational centre, equally preserving its historical form.

Keywords: collection, greenhouse, monument

P4.3

THE MANAGEMENT OF A HISTORICAL BOTANICAL GARDEN IN POLAND – REQUIREMENTS AND CHALLENGES.

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²Department of Systematic and Environmental Botany, Faculty of Biology at Adam Mickiewicz University in Poznań, Poland

The functioning of botanical gardens in Poland is primarily determined by the Nature Conservation Law, a general normative act specifying the goals, principles and forms of nature and landscape protection. It defines administrative procedures related to activities carried out in green areas, including botanical gardens. At the same time,



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historical botanical gardens are subject to the rules resulting from the Law on the Protection of Monuments, which defines the procedures and activities of administrative bodies to ensure, among others, the continuity of historic garden arrangements. The presentation highlights the challenges related to the operation of a historical botanical garden, based on the example of the Botanical Garden of the Adam Mickiewicz University in Poznań.

The Botanical Garden in Poznań was officially opened in 1925 with an initial area

of 2.5 ha. Established as a didactic institution, the garden was mainly comprised of the Plant Systematic Section, developed according to the taxonomic system created by Adolf Engler. The most important architectural object built at that time was the wooden Summer Hall, where classes took place. During first 50 years of the Garden's existence, new areas were added, amounting to nearly 16 ha. The collections have been composed partly in a regular French style, partly in a landscape style, with characteristic alley layouts. Till today, both the Summer Hall and the original outline of walking paths are preserved. In the year 2000, the last 6 ha were added, completing thereby the premises of our institution (ca. 22 ha). No further enlargement is possible due to the urbanized area the Garden is surrounded by.

In 1975, the garden as a whole composition was included in the Register of Monuments, which is a list of historical objects under special legal protection in Poland. The particular items under conservation protection are: the Summer Hall with the benches in front of it, the main gate and garden sculptures. Today, the Garden has therefore a part protected only by the Nature Conservation Law (6 ha) and another covered additionally by the Law on Protection of Monuments (16 ha).

The protection in form of specific legal regulations is extremely important from the point of view of the preservation of historic monuments. At the same time, the specificity of the functioning of botanical gardens causes that some of the formal and legal requirements resulting from the Nature Conservation Law do not apply to them, e.g. it is not required to obtain an administrative decision to fell a tree.

However, such simplifications of procedures do not apply to the historical gardens, where all activities have to be consulted with the Conservation Office. Removal of dying or withering trees and shrubs as well as renovation of infrastructure, like roads or buildings are tasks that require appropriate administrative decisions to be obtained in advance.

This issue was discussed several times with national authorities, but so far no changes facilitating functioning of the historic botanical gardens in Poland have been introduced. Therefore, these institutions need to comply with two different legal acts.

• Keywords: historic botanical garden





TRIED, TESTED - OPPORTUNITIES FOR PRIVATE BOTANICAL GARDENS IN THE TOURIST INDUSTRY

Réka Folly¹

¹Folly Arboretum and Winery, Badacsonyörs, Hungary

This story begins hundred and sixteen years ago in 1905 with Gyula Folly MD, who planted the first conifers to the stoniest and steepest part of the Kisörs Hill, which is in Western Hungary, on the North shore of Lake Balaton. The garden is still privately owned by the Folly family. Our philosophy revolves around the notion that the garden – above and beyond being just a collection if rare or valuable plants - must be provided as a beautiful backdrop to activities of everyday life

Keywords: Arboretum, Winery, Pines, tourism, visitors



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