



**BOTANICAL GARDENS
AS A PART OF EUROPEAN CULTURAL HERITAGE**

Methodology

2020

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Erasmus+



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B-Ardent! Botanical Gardens as Part of European Cultural Heritage

Project number 2018-1-CZ01-KA202-048171

We thank the European Union for supporting this project.



The European Commission support for the production of this publication does not constitute an endorsement of the contents which solely reflect the views of the authors. The European Commission cannot be held responsible for any use which may be made of the information contained therein.

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B-Ardent! participants attending a guided walk in Park der Gärten in 2019

From left: Christian Wandscher, Matěj Skalka, Małgorzata Gębala, Zuzana Caspers, Justyna Kiersnowska, Hanne Rupp, Hanna Jarosz, Gitana Štukėnienė, Lina Galinskaitė, Björn Ehsen and Markéta Macháčková



HOW TO USE THIS METHODOLOGY

This methodology was created within the European Union's Erasmus + international program. It is the result of cooperation between European botanical gardens, namely:

Průhonice Botanic garden (Institute of Botany, Czech Academy of Sciences),

University of Wrocław Botanical Garden – Poland,

Vilnius University Botanical gardens – Lithuania,

Gartenkulturzentrum Niedersachsen Park der Gärten – Germany.

It aims to be an educative and informative guide for professionals and the general public as well as training material for young employees or students. It focuses on an innovative comparison of the gardens in search of similarities, inspiration and a mutual understanding of the historical, cultural, social, educational, economic and horticultural characteristics as well as practices of botanical gardens in different European countries. Although the botanical gardens in Europe have similar historical, cultural and social roots, they also have country-specific conditions for their origin, mission and development. The botanical gardens located in different countries have a varying climate, depending on the country and specific locality, as well as soil, resources, maintenance, pests and diseases. However, they can indeed grow the same plants. There are many levels to working in a botanical garden and it can offer a multitude of opportunities for informal learning. Every botanical garden is a unique location for educating students, young people and the public.

This methodology dedicated to the topic of botanical gardens as a part of European cultural heritage is one part from a set of four booklets created within the project. It shall be followed up by three publications focused on significant iris, peony and daylily plant genera. The methodology is divided into eleven chapters allowing the reader to understand the issue of botanical gardens and collections of historical plants in terms of their scientific and historical significance. The first part is dedicated to the European and national history of botanical gardens followed by an introduction of the gardens themselves and their corporations. The second part of the booklet deals with culture, arts and education in the context of the botanical gardens. And the last part offers a summary of the legal and economic indicators as they apply in each of the European countries for different institutions. The information is compiled in survey sheets and complemented with photographs to represent the garden premises and their history, mission or collections. The publication also highlights examples of good practice, which are important and useful for the reader. At the very end of the methodology booklet, literature resources are listed. They can serve as either inspiration or educational material.



University of Wrocław Botanical Garden, sculpture of Carl von Linné



INTRODUCTION TO THE CULTURAL HERITAGE


Botanical gardens are an important part of European cultural heritage. As they are connected with the founding of monasteries, convents and universities, they must be considered as an important part of European history as well as science. When it comes to the introduction of exotic plants or botanical descriptions, botanical gardens have been places of deep knowledge and professional skills for centuries. They keep large and diverse plant collections for different purposes (plants for medicinal purposes, for biological and botanical studies, research, recreation and other uses). These plant collections can also be seen as a demonstration of the continual human effort to create specific (horti) cultural values. Plant breeding is a long lasting process which requires a lot of knowledge and endurance. Its results are often pieces of art which are to be preserved as expressions of biological diversity. The various gardens have different missions and concerns on how to present their assortments and their historical, cultural and social values to the public.

The cooperation of botanical gardens is essential for the sustainability and advancement of the tradition and is being enhanced under the conditions of global climate change which carry new problems and challenges in plant production (e.g. sudden weather changes, droughts, late frosts or no frost). Globalization is stimulating the expansion of invasive plant species and plant diseases and pests. The cooperation of botanical gardens is even important for new sources for herbal medicines and the preservation of biodiversity. The formation of partnerships between gardens from different countries enables various ways of cooperation. They are all part of European cultural heritage and contribute to a common transboundary project for the encouragement of internationalization in Europe.

Definition of Cultural Heritage

The use and meaning of the term cultural heritage has evolved considerably over time. The first document that works with the notion of general heritage is the Venice Chart (1964). In it, general heritage is understood as a memory filled with a message from the past carrying it, so that the age-old traditions can be fully authentically perceived even today. It mentions not only important works of art, but also more common works of the past, which have gained cultural significance over the years because they were the scene of historical events or their development is significant. The Venetian Chart also emphasizes the urban or rural environment of these monuments as evidence of this development.

The UNESCO Convention on the Protection of World Cultural and Natural Heritage (1972) puts it on an equal footing. This document considers the cultural heritage



of monuments, groups of buildings and habitats. Monuments are architectural works, magnificent sculptures or paintings, objects of an archaeological nature, cave dwellings or combinations thereof with significant general value in terms of the history of art and science. A group of buildings means a group whose architecture, homogeneity or place in the landscape has significant general value in terms of history, art or science. The habitats are then to be human works or collective works of people and nature and territories, including archaeological sites of significant universal value from a historical, aesthetic, ethnological or anthropological point of view.

As you can see, the concept of cultural heritage is dynamic and is still evolving. It will not be equally perceived in all parts of the world. UNESCO (2017) provides a general definition: Cultural heritage is the heritage of the physical creations and intangible attributes of a group or society that are inherited from previous generations and preserved to the present and lent to future generations.

The concept of cultural heritage is now detached from the notion of the most fascinating architectural works of the distant past. Cultural heritage is tangible, but also the intangible. This enrichment came to Western culture from Japan and other countries in the Far East, where monuments are considered only as something that is to revive tradition, spirituality and ability and carry them between generations – as mere bearers of these values. The extension to intangible monuments was inscribed on the UNESCO World Heritage List only in 2001.

Today, even small pieces or even thought activities themselves can be covered by this term when they are transmitted long enough. Cultural heritage today can be anything of value that inspired people at the time of its inception and inspires those who encounter it today.

“A CONCERTED EFFORT TO PRESERVE OUR HERITAGE IS A VITAL LINK TO OUR CULTURAL, EDUCATIONAL, AESTHETIC, INSPIRATIONAL AND ECONOMIC LEGACIES – ALL OF THE THINGS THAT QUITE LITERALLY MAKE US WHO WE ARE.”

(Steve Berry – American novelist and former attorney)



Definition of Botanical Garden

In 1989, Botanic Gardens Conservation International (BGCI) defined the term botanical garden by the list of the following characteristics in the document Strategy of Botanical Gardens in Conservation:

- the corresponding labeling of plants
- the collections have a scientific basis
- information is shared with other institutions and the public
- plant material is exchanged with other botanical gardens, arboreta and science stations
- long-term efforts and the responsibility to preserve plant collections
- conducting research programs on plant taxonomy in attached herbariums
- observing plants in collections
- are open to the public
- promoting conservation through educational activities
- correct collection documentation
- plant research

However, many institutions are botanical gardens without fulfilling all these characteristics. Therefore, as a current definition, it states:


“Botanical Gardens are institutions that maintain well-documented collections of live plants for scientific research, conservation, plant presentation and education purposes.”

The American Public Gardens Association, more or less in line with BGCI, sets out the following criteria that a botanical garden should meet:

- it has been open to the public for at least some time
- the garden functions as an ornamental exhibition, educational exposition and / or research site
- the garden maintains records of plant
- the garden has at least one professional (paid or not)
- garden visitors can identify plants with name tags, maps, or other material.

According to the Cambridge Dictionary:

Botanical garden is a garden, usually open to the public, where a wide range of plants are grown for scientific and educational purposes. The same vocabulary defines an arboretum as a large garden where many species of trees are grown to be looked at and studied for scientific purposes.



As an example of national definitions of botanical gardens, the Czech Botanical Gardens Union requires these criteria to become its member:


- The botanical garden grows at least 500 taxa or plant cultivars.
- The garden is open to the public for at least 2 months a year or is used regularly for educational purposes.
- It has a team of workers professionally qualified to meet the criteria for the activities of the botanical garden and takes care of their continuous professional growth. The quality and number of professional staff corresponds to the number of cultivated plants.

Refining criteria:

A Regular Member must meet at least 7 requirements.

An Associate Member at least 4 of the criteria.

- Cultivated plants are visibly marked with name tags, or they can be easily identified using the provided guide, worksheet or electronic reading device.
- It has a functional information system - orientation system, map of expositions, individual information panels.
- It informs about activities and events on websites, in the press or periodically published overviews of events.
- Participates in or organizes educational and training programs in the field of botany, dendrology, horticulture, forestry or nature conservation.
- It regularly organizes events for the public focused on botany, nature conservation and horticulture.
- It deals with grants or participates in research or development beneficial for the knowledge and protection of plants, the characteristics and preservation of the gene pool, the breeding or optimization of cultivation practices.
- It is used to maintain the gene pool of plants.
- Records of plants in collections and exhibitions in incremental or planting books, GIS or computer database are kept. The records take into account the requirements arising from the Convention on Biological Diversity, especially in relation to the origin of genetic material.
- It regularly publishes the Index Seminum in printed form or electronically.
- It has professionally processed the management of collections and exhibitions of permanent cultures of live plants.
- It ensures the continuity of the botanical garden, enabling the systematic maintenance and development of collections.
- The garden collections are in good health.
- Through monitoring and effective measures, it tries to prevent the spread of both non-native cultivated species and related organisms outside the garden environment.
- It documents its activities and regularly publishes its results.



International Agenda for Botanic Gardens (BGCI, 2000) emphasizes the importance of the collections in botanical gardens and the resulting impact in terms of urbanization and loss of contact with nature or the natural environment for many people. Some other authors draw attention to the importance of ornamental functions and landscape research. The botanical garden also has the function of a park – a place to provide space for recreation. Often the extensive and unique collections of botanical gardens allow for a similar form of exhibition as museums, except that botanical gardens offer a more sensory experience and an outdoor experience, making them a unique institution. The collections themselves can have a unique value – plants that are no longer present elsewhere are grown here. Sometimes collections contain ornamental plants, which have never had a natural environment, and could have been displaced from gardens by temporary fashion.

As it is mentioned in the Action Plan for Botanical Gardens in the European Union (BGCI, 2000). In addition to plant collections of botanical gardens, the architecture and landscape architecture of the garden and its buildings can also be of value to the visitor. Botanical gardens are often, or were, at the time of their creation, a prestigious and influential institution – the botanical gardens in Amsterdam or Kew demonopolized by plant cultivation great empires in their trade. These gardens have thus had an opportunity to cooperate with the greatest architects of their time. In Europe, two botanical gardens are listed as UNESCO World Heritage Sites. These are Kew Botanical Gardens in Great Britain and Padua Botanical Gardens (Orto Botanico di Padova) in Italy. Both these gardens and their buildings are an important architectural and landscape-architectural work that has influenced many architects of that time. They have also been and still are an important center of research and cultural events. Thanks to these characteristics, these gardens have been included in the UNESCO World Heritage List. However, only the most important works are included in this list, and many other parks and botanical gardens in Europe can be of comparable value. Some are not of global significance, but may have national significance. Botanical gardens are responsible for this legacy and should be a patron of this value.

According to the International Agenda for Botanical Gardens, the role of the botanical garden is largely determined by who the garden is financed by and how they are involved in the organizational structure of the institution under which they operate. Botanical gardens may belong to universities, municipalities, secondary schools, research institutes, non-profit organizations and private individuals who have a varying influence on the garden. The management of schools and municipalities is changing periodically and often they do not understand the importance of botanical gardens. Thus, in order to remain independent and relevant, gardens often seek self-financing.



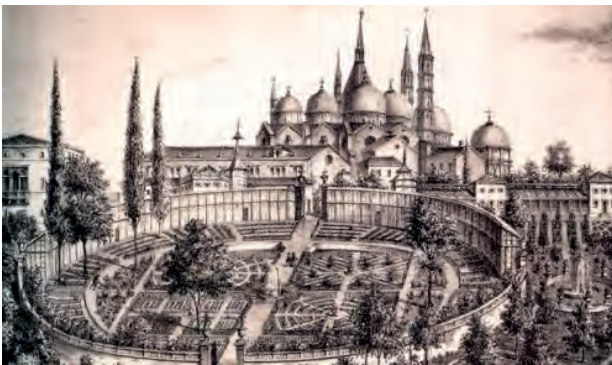
Flowers in a Wooden Vessel, Jan Brueghel the Elder, oil on wood, (1606 – 1607), <https://commons.wikimedia.org/>



HISTORY OF BOTANICAL GARDENS

European History of Botanical Gardens

The rise of botanical gardens is closely connected with the origin of gardens in general, because humans enriched their surroundings with new, lesser known, beneficial and utility plants. Together with these purely practical needs, there were also aspects of beauty and aesthetics, which were increasingly emphasized. Some authors argue that the oldest botanical gardens were in ancient Babylon. At that time, plants were traded actively, ornamental plants were also part of war plunder, and the monarch logically concentrated them in one place. We know from history that many gardens were composed according to contemporary principles of architecture. As ancient ancestors of botanical gardens we can mention Theophrastus Gardens in Athens (around 340 BC), and the garden of Antonius Castor in Rome (1st century BC) mentioned by Pliny the Great, who used to visit the garden and studied mainly plants important in medicine. Early medieval gardens were established under the Arabic influence in connection with medicine. They excelled in architectural design, the use of ornamental trees, water features and geometric layout. The famous Spanish gardens in Seville, Cordoba or Granada are nice examples of this era. As are the utility and medicinal gardens of the monasteries, whose expansion can already be seen during the 5th century. One of the oldest historical records of a monastery garden are plans from St. Gallen monastery in Switzerland. However, it is not certain if the garden ever existed. Exceptional development of the collection and cultivation of botanical gardens were experienced in the times of the early discovery journeys. They brought along an introduction of new plant species and the development of knowledge, especially of the natural sciences. The gardens in Padua date from this era (1545). The gardens were a work of art that essentially laid the foundation for the city's urban concept; the circular radial disposition is preserved to this day. The city of Pisa, in competition with Padua, build its garden in 1547.




Historical layout of Padua botanical garden (wikimedia.com, Votruba, 2000)



Padua Botanical Garden is one of two botanical gardens listed as UNESCO World Heritage Sites.

At this point, we can mention two great personalities connecting European botanical gardens to the Renaissance. One of them is Pietro Andrea Gregorio Mattioli or Matthiolus (1501 – 1577) who studied medicine at the University of Padua but lived in Prague from 1554 as a personal physician of the Czech Vice-Regent, the Archduke Ferdinand II. He published an extended Czech translation of his Herbarium there, which was published for the first time in 1544 in Italian. He described 100 new plants, even though the Herbarium was originally created as a commentary on Dioscurid's already mentioned work *De materia medica*. However, Mattioli was constantly expanding it, so each subsequent edition from his lifetime is more extensive than the previous one. It was one of the most important botanical books of the 16th century, which has been published many more times and is still published to this day.

Another pioneering botanist, perhaps the most influential of all 16th-century scientific horticulturists, was Carolus Clusius (1526 – 1609). In 1573 he was appointed prefect (director) of the imperial medical garden in Vienna by Emperor Maximilian II. His friend Ogier Ghiselin de Busbecq, who had been ambassador to the Ottoman Empire under the previous Emperor, was a keen gardener and soon arranged for exotic bulbs to be sent from the court at Constantinople to the gardens in Vienna. Clusius performed many breeding experiments with them and thus, although paradoxically in Vienna, his cultivation of tulips in the botanical gardens there, laid the foundations of the Dutch tulip bulb industry. He was responsible for the cultivation of a number of plants, new to Europe, including not only the tulip, but also the potato, tobacco, horse chestnut, lilac, sycamore and many bulbous plants into Central Europe. Clusius was discharged from the imperial court shortly after the accession of Rudolf II in 1576 like all other Protestant courtiers. Then he moved to Leiden in the Netherlands. There he became the first prefect of the city's new botanical garden, the Hortus Academicus, associated with the University of Leiden. He played a role in helping to create one of the earliest formal botanical gardens of Europe there. His work *Rariorum plantarum historia* (1601), contains Spanish and Austrian flora and adds more information about new plants. It is illustrated with many woodcuts of botanical specimens, and is indicative of the new interest in botany and botanical gardens which arose during the Renaissance.



Another concept of distinctly decorative botanical gardens were in France, the first in Montpellier (1598) and also in Germany – Leipzig, Jena and Nuremberg (1560). British gardens such as Oxford (1632), Edinburgh, and Cambridge also significantly intertwine with the evolution of European botanical gardens. The tradition of English gardens is also followed by properties in Moscow (1706) and St. Petersburg (1714). During the 16th century, a number of botanical gardens were founded in Europe at important universities (e.g. Hamburg – 1540, Zurich – 1555). Prague had to wait for its University Botanical Garden until the middle of the 18th century.

A significant turning point and impulse for the development of botanical gardens is the founding of the Royal Botanical Gardens in Kew in 1841. Its conception, structure and architecture, in means of both constructions (glass houses, orangery and other buildings like the ten-story Pagoda of Princess Augusta) and landscape founded a new concept in the collection activity and in the architectural concept of the time. Many important personalities, such as botanist John Lindley, contributed to its foundation, and the collections were enriched by adventurers such as Sir J. Banks, Captain Cook's guide to his overseas travels. To this day, this garden maintains a leading role among European botanical gardens, has been building its collections for more than 200 years, and the area of the garden has gradually grown to 121 ha.

A similar role in the introduction of exotic plants and creating plant collections was played by Saint Petersburg Botanical Garden, the oldest botanical garden in Russia. The later imperial garden was founded by Peter I. in 1714 as a herb garden. A famous botanist Eduard August von Regel was associated with the garden from 1855. Today the garden is part of the Institute of Botany, the Russian Academy of Sciences.

During the 18th and 19th century introductions, gardens gained importance as places for acclimatization for plant material from oversea colonies. Some of them operate until today: The Italian Orto Botanico di *Palermo, Sicily* or the Spanish *Jardín de Aclimatación de La Orotava in Puerto de La Cruz, Tenerife, Canary Islands* with its 200 year old fig tree.

Botanical gardens focused on local flora were being developed from the 19th century in the countries of Western and Central Europe. Most of them were alpine botanical gardens in the Alps for example Lindauer Hütte (Austria), La Chanousia (Italy), Giardino Botanico Alpino di Campo Imperatore (Italy), Lautaret (France), Alpinum Juliana (Slovenia), Jardin Alpin La Rambertia (Switzerland), but we can also see them in lower altitudes in places of high biodiversity such as Velebitski botanički vrt (Croatia) or Giardino botanico di Carso (Italy), Jardín Botánico La Cortijuela and Jardín Botánico Hoya de Pedraza (Sierra Nevada, Spain). Endemic flora of Balearic Islands is gathered in Sóller Botanical Garden in Mallorca.



A 200 year old fig tree in Jardín de Aclimatación de La Orotava, Canary Islands



Orto Botanico di Palermo, Italy

During the 18th and 19th century, along with botanical gardens, the phenomenon of arboreta and landscape parks were ascending. They focused on the ornamental features of trees and other woody plants. Nevertheless one example of an early European tree collection is the Trsteno Arboretum in Croatia. The date of its founding is unknown, but it was already in existence by 1492, when a 15m span aqueduct to irrigate the arboretum was constructed; this aqueduct is still in use. Two unique and ancient Old world Sycamore (*Platanus orientalis*) remain standing until today.

The significance and mission of collections throughout history has always been aimed at reconciling scientific interest (collection, cognitive) with aesthetic interest. The outdoor human space has been enriched with new plants in an environment of new aesthetic appeal, in the concept and structure of contemporary botanical gardens and their collections and exhibitions.

EXAMPLES OF THE OLDEST BOTANICAL GARDENS AND THEIR PRECURSORS				
World	Founded	Project Partners' Countries		Founded
Tokyo, Japan	1684	Czech	Prague	1350
St. Petersburg, Russia	1713	Poland	Wrocław	1540
Calcutta, India	1787	Lithuania	Vilnius	1781
New York, USA	1805	Germany	Leipzig	1542



Alpine botanical gardens Lautaret, France



Sóller Botanic Garden, Mallorca


Czech Botanical Gardens

The first Czech garden as an ancestor of botanical gardens is Hortus Angelicus in Prague, the herb garden of a pharmacist, Angel of Florence, in the court of Charles IV. In 1360, it received special privileges, which, among other benefits, including being exempt from taxes. Various medicinal plants, aromatic herbs, vines and exotics were grown in the garden. It was abolished in 1782 and today the main post office is located at the site.



Zlatá koruna monastery, illustrated in a 17th century painting.

Gardens called yards of paradise were also part of monasteries. Church orders in general have been bearers of knowledge since medieval times and their connections within Europe helped to share plants from one monastery to another to enhance the gardens. Some of them were not only production or medicinal gardens, but also served for plant introduction and teaching. In the countries of the Czech crown, there have been many wealthy monasteries with extensive plant collections. Some of them no longer exist. One example could be Prague's



Carthusian monastery called Hortus Sanctae Mariae (St. Mary's Garden) in Latin, which was founded in 1341 but destroyed during the Hussite wars in 1419. It held a large garden enclave on the site of the monastery's many vineyards.

A very important monastery in terms of botany and horticulture has been the Convent of the Merciful Brothers in Valtice. It was founded in 1605 as a hospital. It is a fact that the Merciful Brothers' pharmacists devoted themselves intensively to botany. With the arrival of brother Norbert Boccius in 1763, the school library gained a comprehensive herbarium as well. Today, it is one of the oldest herbariums in the Czech Republic. Boccius, as a keen botanist, established extensive medicinal gardens in Valtice, complemented with ornamental plants and fruit trees, where he also performed selective breeding. His masterpiece in the field of botany is his encyclopedia "Hortus botanicus" (botanical garden) describing all plants known to Boccius, including exotics, in 14 volumes and 2 700 aquarelles. Items are organized according to the known botanical system with notes comparing it to Linnaeus. Following his heritage, famous plant collections called Herbaria were created there. Afterwards, a horticulture school in nearby Lednice was opened in 1894, which today is the Faculty of Horticulture at Mendel University in Brno.

Another example of monastery gardens, depicted here on a color painting, is the Zlatá koruna Cistercian monastery in South Bohemia, founded in 1263. The monastery was closed in 1785, but the original mulberry trees still grow there, which are more than 200 years old.

A special role in Czech horticulture was played by the Royal Gardens at Prague Castle established in 1534 – 1536 by Ferdinand I, Holy Roman Emperor. It was the gardener Francesco, probably the one who founded the University Botanical Garden in Padua, who was called to Prague to create the Royal Gardens. Matthioli also participated in the garden's development as its warden. In addition, Constantinople's ambassador Busbecq mediated diplomatic presents in the form of introducing oriental plants to Prague and Vienna with the help of the emperor's counselor Clusius. There is a record of growing tulips there from 1563. Emperor Maximilian II then continued in introducing new plants to the garden. The glory of the garden continued during the reign of Emperor Rudolf II as well. He was a keen collector of both art and exotic plants. He assembled his second collection garden in Brandýs nad Labem. At this time, the interest in flower collections and botany also grew among the townspeople, and flower collections were popping up in Prague and Vienna. One example is the garden of the vineyard master Jan Pytlík, which became a part of today's famous Wallenstein Garden. Citruses were an attribute of the Habsburgs monarchy as a symbol of invincibility. In order to grow lemon trees and other exotic plants, even in Prague's conditions, a shelter must be provided. So the first stone orangery in Europe was built around 1601. It was completely destroyed during the Thirty Years' War. The Royal Garden lost its importance as an introductory and botanical garden after the death of Rudolf II.

Another mention of Czech botanical gardens originated from the mid-17th century. For instance, the extensive medicinal and botanical garden of physician Jan Ferdinand Hertod in Mikulov.



Rudolf II as Vertumnus (1590), the Roman god of metamorphoses in nature and in life (wikimedia), by Giuseppe Arcimboldo.

Later in history, the organizational integration and property relations of Czech botanical gardens gained different levels, but they have kept the same mission defining the botanical garden's functions.

University gardens are represented by the Botanical garden of Charles University in Prague, originally arising in 1775 in the Jesuit garden in Smíchov. In 1840, it registered 12 800 cultivated taxa, while in 1880 that number was already 20 000. The garden suffered from floods several times and in 1909 it disappeared due to the regulation of the Vltava river bank. It was moved to another botanical garden called Na Slupi, founded ahead of time in 1898. The second oldest university garden of medical-surgical lyceum in Olomouc was founded in 1787. Today, other university botanical gardens include for instance Mendel University in Brno (1919), Masaryk University in Brno (1922), University of Ostrava (1968), Faculty of Pharmacy, Charles University in Hradec Králové (1969).

High school gardens are a phenomenon related to the establishment of school botanical gardens as a practical teaching aid, which was based on the order of the Provincial School Council from 1873 for grammar and vocational schools.

Examples of still existing school gardens of that era include the botanical gardens in Tábor (1866), Děčín (1850) or Mělník (1894).


City botanical gardens operated by the municipal authority are located, for example, in Liberec and Teplice, while there is also the Zoological and Botanical Garden Plzeň and Prague Botanical Garden. It was founded in 1968, but opened to the public much later in 1991 (exhibitions and cultural education events had been held there previously) and its further development toward public visitors occurred with the construction of the unique Fata Morgana greenhouse in 2004.



The Japanese stone garden in Plzeň Botanical Garden is interwoven with hidden symbols


Botanical gardens related to **medical institutes** are another category. Gardens and arboreta used to be planted around medical institutes as well. Some of them later became members of the Czech Botanical Gardens Union, like Pulmonary Sanatorium park in Jablunkov (founded in 1888). Before World War II, it was probably the second most extensive park in terms of collections in Czechoslovakia. Other examples include Arboretum Žampach from the end of the 19th century or Hamza's specialist hospital for children and adults in Košumberk - Luže. Its park and arboretum were founded in around 1900 near an institution that was probably the first medical institute for children afflicted with tuberculosis and scrofulosis in Europe.

Mountain gardens in Czech followed the mission of preserving the local and endemic flora. The first one was mentioned in around 1825 at the top of Sněžka Mountain (1604 m), the highest mountain in the Czech Republic and Poland. The garden was created to attract visitors to the mountains and become a tourist destination. Today, it is represented by several display beds in the garden of Vrchlabí monastery, which used to be the seat of Krkonoše National Park.



Aristocratic gardens and parks from the turn of the 18th and 19th century have a common background in most European countries. Not all of them had a scientific overlap, but there were a few gardens and arboreta in Czech which are worth mentioning. An interesting example is a Prague garden founded in 1787 by count J.E. Malabaila de Canal, the so-called Kanálka. In spite of its beautiful public park and valuable botanical collections, greenhouses for introduction experiments or educational activities in the field of botany, the garden ceased to exist shortly after changing ownership after 1830. A better illustration of still existing parks founded by aristocratic benefactors could include Arboretum Chudenice (1828), which used to be a dendrological collection and ornamental nursery focused on North American species. Today it is called Americká zahrada and it has the status of a National Natural Monument. The already mentioned Lednice also has an important horticultural and educational overlap. The estate entered the history of botanical gardens with the construction of a tropical greenhouse in the 1840s, which was considered a technical marvel in Austria at the time. Its rich collections of orchids, roses and conifers along with the alpine gardens and large landscape park also became famous. A horticulture institute was founded there later in 1895. Today it belongs to the Faculty of Horticulture of Mendel University in Brno.

The most significant plant collection of the end of the 19th century was probably in the chateau park in Průhonice. Reconstruction of the existing park began with Emanuel Count Silva-Tarouca after his arrival in Průhonice in 1885. He created a significant garden-landscape work with a vast number of exotic species. The formation of the park is closely connected with the Dendrological Society, which was also based in Průhonice and which the Count presided over. In 1927, the count sold the manor to the state. Průhonice was later shown to have played a significant role in future developments in the field of botany and horticulture. In 1956, there was a plan to locate the Central National Botanical Garden there, in a local area called Chotobuz. Based on its long tradition in horticulture, it was an ideal place for its foundation. In 1962, two institutions were established there. The **Czechoslovak Academy of Sciences** took over Průhonice Park, the chateau and the pomological arboretum in Chotobuz and, at the same time, the **Research Institute for Landscape and Ornamental Gardening** was established on the grounds of the former nurseries of the Dendrological Society. The Botanical Garden of the Czechoslovak Academy of Sciences was founded based on the Soviet model. However, the events of those times are difficult to decipher today. The ambitious plan to build a central garden was not fulfilled, while the funds originally earmarked for the maintenance and construction of the garden were partially delimited for the creation of a Prague Botanical Garden and used for the establishment of a new department of the Institute of Botany, Hydrobotanic Center in Třeboň (1971). Only basic maintenance has been carried out in the garden itself as well as the park for a long time. In response to the dismal state of the botanical garden of the Czechoslovak Academy of Sciences, which ceases to cooperate with hor-



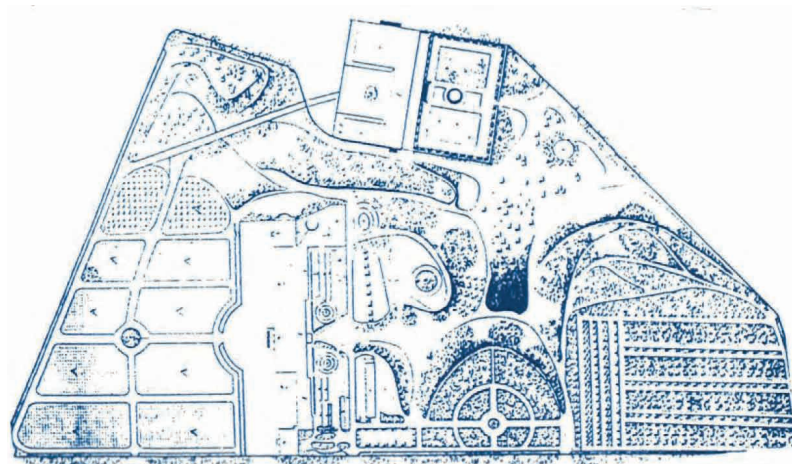
agricultural research and breeding, the Research Institute of Ornamental Gardening in Průhonice established the Dendrological Garden (1974). While Průhonice Park holds barely a quarter of the number of taxa once grown, the Dendrological Garden has become the most important Czech dendrological collection.



Reflection in water is one of the landscape design principles used while creating Průhonice Park.


Polish Botanical Gardens

The creation of gardens in Poland has a very long tradition, however, structured collections, whose aim was to teach or conduct research, were not created until the 16th and 18th centuries. Medieval monastery gardens, designed for medicinal plant cultivation, and called *herbularius* or *hortus sanitates*, were the prototype of the botanical gardens. Two private gardens in Wrocław established in the Renaissance period: Johannes Woyszel (founded around 1540) and Laurentius Scholz (before 1587) are considered to be the first botanical gardens – those used for collecting and observing plants and teaching botany, in the current Polish territory. In the 17th and 18th centuries, three gardens were set up in Gdańsk. They were established by Jakub Breyn and his son Jan Filip, Jakub Teodor Klein and Jan Gotfryd Reyger. The royal gardens, existing since 1650 in the close vicinity of the Royal Castle and behind Kazimierzowski Palace, are the oldest botanical gardens in Warsaw.



Warsaw Royal Gardens, 1827 (Votruba, 2000)

During the Enlightenment, botanical gardens, in today's meaning – those serving scientific and educational purposes – began to be created in the territories of the former Republic of Poland. The creation of such a garden in 1776 in Grodno at the Royal School of Medicine, in 1781 – at Vilnius University, and in 1783 – at the University of Cracow are one of the results of the Commission of National Education activities. The latter, now belonging to Jagiellonian University, is the oldest botanical garden in Poland. The garden at the Krzemieniec Lyceum in Volhynia, founded in 1805, also gained European importance, but after the school had been closed down in 1831, it was moved to Kiev. At the beginning of the nineteenth century, two of the university botanical gardens, that have survived until now, were cre-



ated: in Wrocław (1811) and in Warsaw in the Royal Gardens “Łazienki” (1818). The remaining gardens were established in the independent Poland: in 1925 in Poznań and in 1965 in Lublin. As early as in 1930 the School Botanical Garden was opened in Bydgoszcz, later transformed into the Municipal Botanical Garden, and in 1999 taken over by the Pedagogy Academy. (https://ogrod.ukw.edu.pl/jednostka/ogrod_botaniczny/). The youngest is the Botanical Garden of Zielona Góra University, opened in 2007.

There are 40 botanical gardens in Poland, including seven maintained by universities, namely: Botanical Garden of the University of Warsaw, Botanical Garden of the Jagiellonian University in Kraków, University of Wrocław Botanical Garden, Botanical Garden of the Adam Mickiewicz University in Poznań, Botanical Garden of the Maria Curie-Skłodowska University in Lublin, Botanical Garden of the Kazimierz Wielki University in Bydgoszcz and Botanical Garden of Zielona Góra University. In addition, among other owners of the gardens the following can be listed: Polish Academy of Sciences, Institute of Plant Breeding and Acclimatization, medical universities, cities, private individuals. Apart from the botanical gardens, there are also arboreta in many towns, including the historic Arboretum Kórnicki, dating back to the first half of the 19th century, near Poznań. Silesian Botanical Garden is a member of EGHN (European Garden Heritage Network) together with The Gardens of the Royal Castle in Warsaw and Silesia Park in Katowice. Arboretum Bolestraszyce keeps the Polish National Collection of water irises *Iris serie Laevigatae*.



Collection of water irises in Arboretum Bolestraszyce



Lithuanian Botanical Gardens

In Lithuania, there are four botanical gardens run by universities, namely: Vilnius University, Vytautas Magnus University, Klaipėda University, and Šiauliai University. Studies have shown that the number of visitors to botanical gardens has been increasing each year.

The use of the natural environment for human needs in Lithuania dates back to ancient times and is closely related to the ancient Lithuanian pagan faith. One of the first green spaces used for human purposes in Lithuania was most likely the sacred oak groves with shrines (alcoves), which were deeply worshiped and cherished by ancient Lithuanians. It was believed that trees and plants are alive, that they have a heart and a soul, and only the soul of the tree is "wet": resin is its blood and tears, and that the tree does not feel pain only when it is cut when needed. This was the belief not only of Lithuanians but of other European nations as well. This pagan faith survived in certain regions of the Grand Duchy of Lithuania even after the introduction of Christianity (in 1387) and was still observed until the end of the 17th century. The first practical purpose gardens came to Lithuania with Christianity and monasteries. Even the first Lithuanian historian Maciej Strykowski mentions in his chronicle (Chronicle of Poland, Lithuania, Samogitia and all Russia, 1582) the garden that King Jogaila (1377–1434) gave to the Archbishop of Vilnius Povilas Alšeniskis after his baptism. This king also ruled Poland and by a special path of faith he was elected Bohemian king (today Czech Rep.) during the times of the Hussite Civil War. In the 15th century, the gardens of Lithuanian monasteries were created following the example of Western European countries of that time. They used to grow herbs and spices, shrubs and fruit trees. Initially, in both medieval Europe and in Lithuania, "parks, gardens and flower beds" were perceived as a single phenomenon because the orchard, vegetable garden and flower garden were in the same place. The first manifestations of ornamental horticulture in Lithuania are also known from historical sources. It is written in the chronicles that already in the beginning of the 15th century, Grand Duke Vytautas of the Grand Duchy of Lithuania brought a variety of ornamental and medicinal plants from Western Europe, which were taken care of by gardeners invited from Hungary. Gardens therefore became a decorative element of palaces or hunting castles of the rulers and the nobility of Lithuania. The first decorative gardens in front of the palace of Lithuanian noblemen were not created until the 16th century, when Renaissance traditions came from the West. Their spread was greatly influenced by the marriage of King Sigismund I of Lithuania and Poland with Bona Sforza (1494 – 1557), Duchess of Milan and Bari of the Medici family. She was an energetic and educated queen, and her domination was very important to Lithuania as Italian culture began to be spread in the country at that time. Namely thanks to her, as early as the 16th century, a number of vegetables not known in North Eastern Europe began to be cultivated in Lithuania, and today their names demonstrate their Italian origin. * At that time, the cultivation of vines, gooseberries, currants, ligusts, and yews began.

* Until today, it is clear that Italian names formed many other national names for vegetables, mostly in the eastern part of Europe. German names are in general closer to English:

VEGETABLE NAMES IN EUROPEAN LANGUAGES					
English	Italian	Lithuanian	Czech	Polish	German
Cabbage	cappuccio	kapusta	kapusta	kapusta	Kohl
Kohlrabi	cavolo rapa	kaljaras	kedlubna	kalarepa	Kohlrabi
Leek	porro	porai	pórek	por	Poree
Hemp	cannapa	kanapės	konopí	konopie	Hanf

As an example of the later growth of aristocratic ambitions in horticulture, Palanga Botanical Park can be mentioned. It was founded in 1897 in the same era as Prūhonice by Count Felix Tiškevičius around his new palace. The park was designed by the famous French landscape architect and botanist Eduard Fransua Andre, with the assistance of Belgian gardener Buysen de Coulon. Exotic trees and shrubs were brought to Palanga from Berlin and other European botanical gardens. It was introduced in the magazine “Revue Horticole” in 1906. Today, the park is financed by the city of Palanga, which maintains the park and organizes events. An amber museum is located in the palace.



In Palanga Botanical Park, landscape features like flower beds and statues complement relicts of ancient pine forests.



German Botanical Gardens

The oldest botanical garden in Germany is in Leipzig and dates back to at least 1542. The garden has moved within Leipzig four times over its long history, with the last time occurring in 1876. Shortly after Leipzig, Jena followed in 1586 with its Hortus Medicus and later Hortus Botanicus and Heidelberg in 1593. At the beginning of the 17th century, Gießen (1609) and Freiburg (1620) founded their botanical gardens, which, however, were all still integrated into the medical faculty as Hortus Medicus. It was not until the Botanical Garden of Kiel was established by Johann Daniel Major in 1669 that a botanical garden in the narrower sense, as we understand it today, was founded.

The largest botanical garden in Germany is located in Berlin–Dahlem and was opened in 1899. It covers around 43 hectares with around 22 000 plant species and is affiliated with the Free University of Berlin. For the most part, it is designed as a landscaped garden with an area of 12,9 hectares as a geographical system and 13,9 hectares as an arboretum.

More than half of the over 90 botanical gardens in Germany are university institutions. The living collections of the average Botanical Garden in Germany is comprised of 6 000 – 12 000 species, while those of the major gardens like Berlin–Dahlem, München or Palmengarten in Frankfurt am Main hold over 12 000 species. Through specialties in history, research projects and facilities as well as horticultural abilities, also medium (or small) gardens – like those of Bonn or Darmstadt – usually have partly unique collections of importance for research and conservation purposes.

According to a survey by Tripadvisor, the Berggarten, which belongs to the Herrenhäuser Gärten in Hannover, is the most popular botanical garden in Germany. Created in 1666 as a vegetable garden, it now houses Europe's largest orchid collection. 11 000 plant species from a wide variety of climates complete the magnificent impression. Wilhelma Zoo and Botanical Garden in Stuttgart made it to second place. The zoological and botanical garden is comprised of around 9 000 animal and 6 000 plant species from a wide variety of climates. It is the only zoological and botanical garden in Germany. The New Botanical Garden in München achieved third place. It connects directly to the parks of Nymphenburg Palace and guides visitors for a small fee through around 14 000 plant species from all over the world. 4th place is the largest botanical garden in Germany: the botanical garden in Berlin is home to the oldest plant: a 160 year-old tree fern.

The Palmengarten in Frankfurt made it to number 5 of the most popular botanical gardens in Germany. It was opened following a citizens' initiative in 1871 and is now home to 13 000 tropical and subtropical plant species. You can also take a boat ride on the small lakes.



Today's botanical garden doesn't need to present perfectly shaped flower beds
(Like Botanischer Garten und Botanisches Museum Berlin here presenting a flowering meadow)

OVERVIEW OF PARTICIPATING GARDENS

The botanical gardens are located in different European countries and within various organizations (Academy of Sciences, universities, legal persons), they have a different climate, soil, resources, maintenance, pests and diseases. However, they can grow the same plants and focus on the same assortment. The project's main goal is to introduce each of the participating botanical gardens, share common knowledge and practices and take precautions for possible threats (changing climate, invasive pests).




Biogeographic regions in Europe (<https://commons.wikimedia.org>)

Průhonice Botanic Garden, Czech Republic

It has already been mentioned that Průhonice is a very special place for Czech horticulture. Průhonice Botanic Garden belongs to the administration of the Institute of Botany, the Czech Academy of Sciences and it is part of the Průhonice Park Department. Průhonice Park is a National Cultural Monument and a UNESCO World Heritage Site.

The 250 hectare landscape park was founded in 1885 by Count Arnošt Emanuel Silva-Tarouca. He utilized the rugged valley of Botič Brook and its two tributaries, using the original native tree species in combination with imported exotic tree species. As the basis of the park's composition, he founded masterfully chosen vistas. The stands of trees, groups of trees and shrubs alternated with meadow areas, ponds, streams and their blind branches. He skillfully used the variability

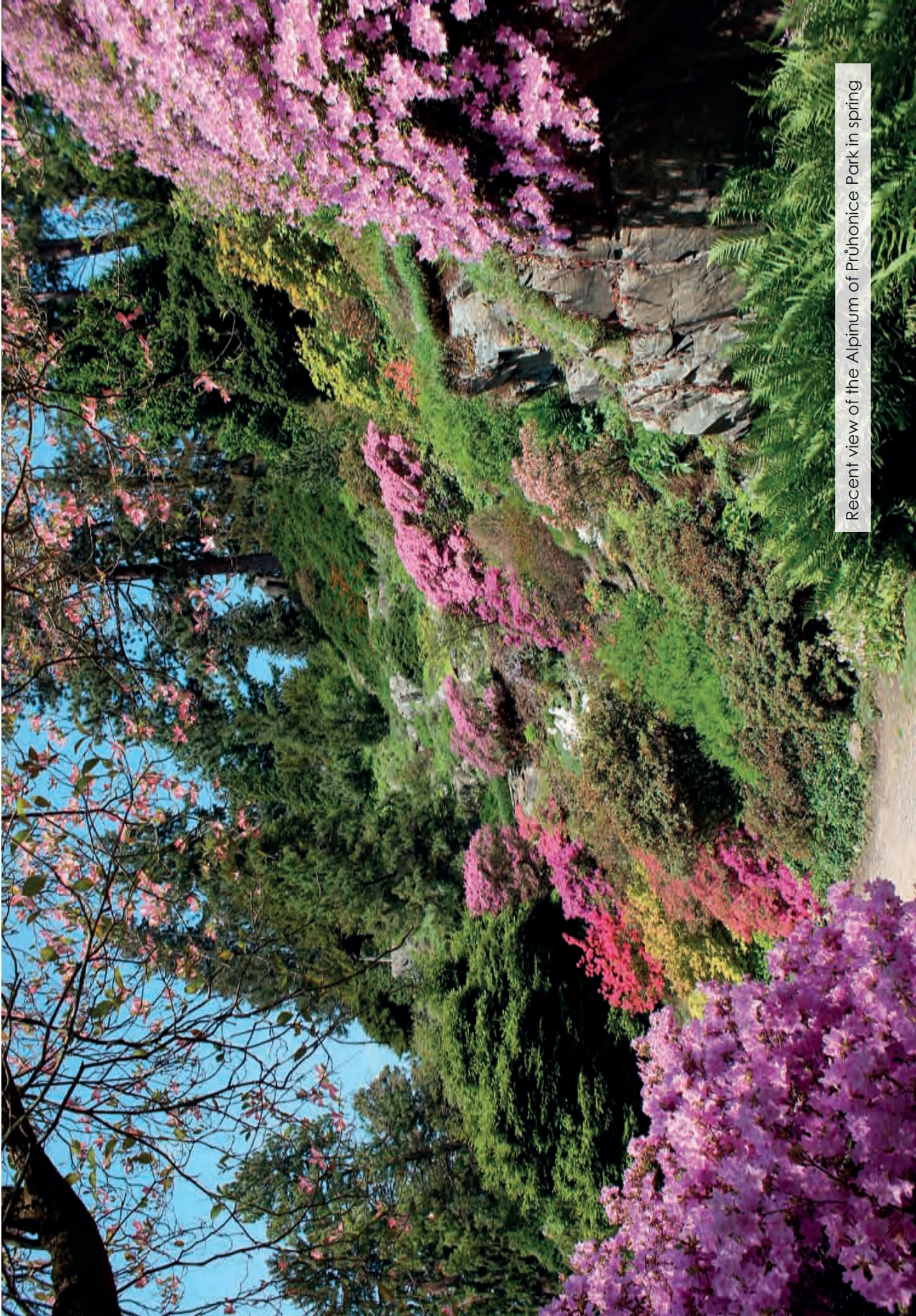


of tree species in different seasons. The result of his lifelong efforts is a world-class masterpiece of landscape, which he created in his own original way. Apart from the artistic-historical significance, the park is also valuable dendrologically, as a collection of domestic and exotic trees – about 1 600 species. The collection of rhododendrons of around 8 000 pieces in 100 species and cultivars is exceptional. The Wood Collection of the Institute came from the results of the introduction of exotic and ornamental trees in Průhonice Park. With 2 659 items in the collection, it is among the three largest collections in the world. The collection is used for educational purposes; cones, seeds and fruits, and wood and bark are important discerning traits for determining individual taxa. Průhonice has been a part of Czechoslovak horticulture history for over a century due to the activities of the Czechoslovak Dendrological Society (1922–1954), which was founded by Silva-Tarouca in 1908 in Vienna as Dendrological Society of Austria-Hungary. Together with the introduction of plant material from the whole world, there is a phenomenal collection called Alpinum, which was intended from the outset for the cultivation of alpine and mountain flora, as well as for the cultivation of the latest and rarest tree species and perennials.

Průhonice Botanical Garden is a member of the Czech Botanical Gardens Union, is an accredited BGCI garden and an ArbNet accredited level III arboretum. The botanical garden is part of the IPEN network with the acronym PRUHO. The collections are in the Florius.cz database, which is a Czech database for the record keeping of plants in botanical gardens.



The Alpinum offers natural slopes combined with artificial structures for mountain plants (historical photograph, 1909)



Recent view of the Alpinum of Průhonice Park in spring



Průhonice Castle has changed from a manor (around 1880) to a neo-renaissance chateau with a great park (2016) during reconstructions carried out by Count Silva-Tarouca


The collections of the botanical garden have developed with regard to the focus of the garden and its capacities. Collections can be divided into core, complementary and landscape. The core collections are irises, roses, daylilies and peonies. They cover the development of breeding from the variability of the wild species and ancient, historical cultivars to novelties. Each core collection has a curator. Complementary collections are historical (e.g. fruit trees), that we maintain, and partly new collections that are used in expositions to make them more attractive for visitors. They include bulbs, grove plants, magnolias, rhododendrons and aquatic plants.



Deciduous azaleas and rhododendrons are part of the complementary collections

Landscape collections are used primarily to complement the garden landscape and preserve native plant species. They are mainly regional varieties of apple and pear trees, which are maintained in cooperation with external experts.

The collection of irises is the garden's flagship. The genesis of the iris collection is related to Mgr. Milan Blažek, who has been studying and breeding irises his whole life. He founded the collection in 1955 as a private one. The collection included domestic wild species and all historical iris cultivars cultivated around Prague. The collection was moved to the Průhonice Botanical Garden in 1963. The high num-




ber of wild irises, selected by the options at the time of flowering, were sampled from a large part of Europe. The domestic sources of irises were Czech nurseries. Mrs. Helen von Stein, the owner of Staudengärtnerei Gräfin von Zeppelin in Laufen, Germany, also donated irises from her collection, which is one of the world's most important collections of irises. After 2007, the selection of cultivars focused more on cultivars from Czech breeders. Gene pool resources of Czech origin were included in the National Programme on Conservation and the Utilization of Plant, Animal and Microbial Genetic Resources Important for Food and Agriculture. In recent decades, the collection has been extended due to cooperation with the Prague Botanical Garden and the Botanical Garden and Arboretum of Mendel University (Czech Republic), the Institute of Botany of the Chinese Academy of Sciences (China), The Botanical Garden of Vilnius University (Lithuania) and University of Wrocław Botanical Garden (Poland). A broader cooperation with the most famous American Iris Garden – Presby Iris Memorial Gardens, has been launched.

The iris collection of Průhonice Botanic Garden – **The Iridarium** – is one of the world's largest collections of its type. The collection includes typical and atypical individuals of wild species, historical interspecific hybrids and a number of hybrids from our experimental work. The largest part of the collection manifests a structured set of cultivars from the oldest ones, which are among the rarest, to the latest novelties. It represents a selection of individuals, which shows the gene pool of the genus, and a comprehensive comparison of archaic and historical bearded irises. Today, the iris collection contains 3 412 items, while the largest part of bearded irises introduces 1 946 cultivars. Within the B-Ardent! project, an individual booklet on the genus *Iris* was compiled.



Flowering irises bring many visitors to the garden



The rosarium (rose garden) of the botanical garden consists of two collections, botanical and cultural roses. Each of them has its own history and they were created and operated individually.

The collection of botanical roses was transferred to Průhonice in the autumn of 1963. The collection of cultural roses was also moved there in 1963, when the Botanical Garden was founded. In 2020, there were 1 717 specimens of roses in the collections listed in Florius database. (<http://florius.cz/>)

The peony collection was founded from 1968 – 1969. The basis of the collection were plants obtained from The Silva Tarouca Research Institute for Landscape and Ornamental Gardening (RILOG), where they were evaluated in terms of garden use by Ing. Milada Opatrná in 1956 – 1975. The collection was then extended due to purchases from domestic nurseries and also from abroad. In the 1980s, Ing. Uljana Blažková reviewed the collection and introduced interspecific hybrids of herbaceous peonies. After 2010, the evaluation of local seedlings was completed and the collection was expanded mainly by wild species of known origin, cultivars of tree peonies and inter-group peonies. The database Florius enlists 852 items of *Paeonia* today. Within the B-Ardent! project, an individual booklet on the genus *Paeonia* was compiled as well.



The peony collection is organized by color and breeding origin in semi-circles

The collection of daylilies has been growing gradually since the 1980s to cover the variability of botanical species and the development of breeding. The collection is related to the research aimed at the assortment's evaluation of 109 cultivars of daylily, carried out by Ing. Milada Opatrná in RILOG in the 1960s. In 1983, she published a summary "Research of the World Assortment of Perennials Hemero-



callis". Nevertheless, the core of the collection was donated by Mrs. Helen von Stein-Zeppelin. The display of daylilies in the public part of the garden is arranged in chronological order. Czech cultivars were donated by Pavel Roubín, Jiří Šťastný, Petr Mimránek and Jiří Dudek. In 2019, there were 11 *Hemerocallis* species, 480 world wide and 150 Czech cultivars in the collection. Within the B-Ardent! project, an individual booklet on the genus *Hemerocallis* was compiled as well.



Daylilies create the highlight of the summer in the garden



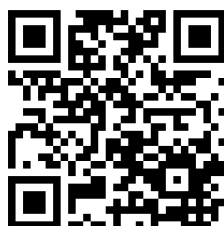
Shrub roses are an important part of the rose collection in Průhonice Botanical Garden



Autumn perennials (*Aster* sp., *Eupatorium* sp.) in combination with grasses (*Panicum* sp.) make the garden interesting throughout the season



Rhododendrons are popular among visitors in the garden




For the complete garden assortment visit:
<http://www.florius.cz/botanickyustav>



More information about Průhonice
Botanic Garden: <http://www.ibotky.cz/en/>

Ex situ conservation in Průhonice Botanic Garden

The Botanical Garden actively participates in the Czech Botanical Gardens Union and its working group for gene pools. We specialize in the preservation of ancient and historical cultivars of ornamental plants and selected endangered domestic plant species. The National Program on the Conservation and Utilization of Plants, Animals and Microbial Genetic Resources Important for Nutrition and Agriculture was established by the Ministry of Agriculture in 1993 in order to ensure the permanent preservation, availability and sustainable use of genetic resources important for food and agriculture in the Czech Republic. The National Program is to ensure to the necessary extent, in accordance with national legislation, international conventions, norms and standards, and also according to the needs of users, activities necessary for the safe long-term preservation and efficient use of genetic resources. The National Program is to contribute to the global efforts to preserve



and sustainably use genetic resources and biodiversity. There are 12 research institutions, breeding stations and universities participating in the National Program of Plant Genetic Resources. Coordination is provided by the gene bank of The Crop Research Institute. In 2006, the Institute of Botany of the CAS also became a part of the National Program, initially with the collection of irises. Since 2015, the collections of daylilies and peonies have also been included. The National Program includes species and cultivars from our collection that are important genetic resources or important milestones in breeding, and also ancient cultivars grown in the Czech Republic and cultivars of Czech origin. The rules for keeping plants in the National Program include the identification by passport data (origin of plants) and description using a classifier, which unmistakably describes the cultivar or species using morphological characters.



<https://grinczech.vurv.cz/gringlobal/>



During expeditions of the botanical garden, we collect and then preserve ancient cultivars of ornamental plants, especially irises (*Iris* × *germanica* s.l., *I. pallida* × *variegata* group), peonies (*Paeonia officinalis* group) and daylilies (*Hemerocallis fulva*). In the field, ancient cultivars often occur in anthropogenic and near-natural habitats (cemeteries, rural gardens, castle ruins, vineyard walls). We cultivate these plants in the garden; selected taxa are long-term preserved in collections.

The Institute of Botany is involved in the project TAČR – EPSILON “Methodology of ex situ conservation for local populations of endangered plant species in changing climate’s conditions”. Within this project, we preserve the variability of three selected species: *Iris pumila* and *I. arenaria* (South Moravian Region) and *Galanthus nivalis* (Central Bohemian Region and Olomouc Region).

In 2017, we started to build serpentine rockery within the project Life for Minuartia, which is implemented by the Institute of Botany, Czech Academy of Sciences and the Czech Union for Nature Conservation in Vlašim and the Ministry of the Environment of the Czech Republic. The rockery is intended for *Minuartia smejkalii*, a critically endangered endemic species of Central Bohemia. Individual populations are conserved by individual project partners. The litter was brought to the rockery from the locality, from which other accompanying species germinate.



The pomology arboretum in Průhonice Botanic Garden is maintained in cooperation with experts on old local fruit varieties from the Czech Union for Nature Conservation (ČSOP)

A significant achievement was contributed by Heinrich Robert Göppert (1800 – 1884) who is considered the proper creator of the garden. He was the first German paleobotanist, a pharmacist and a doctor by education. Between 1852 and 1884 he reorganized most of the departments, enlarged the collection of plants to 12 000 species and labelled them with durable labels. He set up a model of hard coal deposits from the Walbrzych Coal Basin and rebuilt large exhibition greenhouses, including a three-part palm house.



Greenhouses and Mexican plants



Greenhouse with the *Victoria cruziana*


For several years, the Botanical Garden was lead by a world-famous taxonomist and plant geographer Adolf Engler (1844 – 1930) who elaborated the systemic assumptions during his scientific activity in Wrocław. Then the management of the garden was taken over by Ferdinand Albin Pax (1858 – 1942), who was constantly developing plant collections and arranging them according to the natural system. Pax became famous as a researcher of the Sudetes and Carpathian Mountains flora and he was also the author of the Flora of Silesia entitled "Schlesiens Pflanzenwelt" (1915).



Model of hard coal deposits




The ruined greenhouses, after 1945



In the spring of 1945, the Garden suffered serious damage, anti-aircraft artillery stations and ammunition bunkers were located on the Garden premises. Unfortunately, as a result of war activities, especially on Easter Monday, the 2nd of April, the buildings were damaged, greenhouse plants died and only half of the stands and a few perennials were left standing. As early as the beginning of May 1945, a group of academics, mainly from Lviv universities, came to Wrocław and organized a Polish university in the ruined city. The leader of this group, Stanisław Kulczyński – known primarily as the author of works on the Polesie peat bogs, became the first post-war manager of the ruined Garden. The rebuilding of the Garden started already in 1948. The plant system, arboretum – a collection of trees and shrubs from the temperate zone, the alpine section - hills with mountain plants were gradually reconstructed, arranged and modernized. A lot of work was carried out without financial outlay also by the army and many Wrocław enterprises hurried with aid. The Garden was already open to the general public by 1950 and, in the same year, the Garden hosted the Congress of the Polish Botanical Society. The experimental and exhibition greenhouses were rebuilt and a Department of morphology and biology of plants was established. During this time, the Botanical Garden was enlarged to 7,4 hectares. This was made possible because the urban areas in Świętokrzyska Street were incorporated into the Garden premises and consequently, a new department of ground ornamental plants with a garden pond was created. Greenhouse collections were re-established and the succulent department was expanded and became one the most important in Europe. At the same time, the Water and marshy plant department with aquariums contained a unique collection of tropical freshwater plants. In 1958, the picturesque wooden bridge over the pond, one of the symbols and the most recognizable elements of the Garden, was built with the contribution of the Mechanical Engineering Military Academy in Wrocław.



Construction of the wooden bridge in 1958, which has become the symbol of the Garden today



In 1974, the Garden was registered in the Register of Historical Monuments of the Lower Silesian Voivodeship (formerly Wrocław), and in 1994 – pursuant to an order of the President of the Republic of Poland, Lech Wałęsa – it was located in the historical city centre under special conservation protection. In 1988, the University of Wrocław Botanical Garden took over a new, facility – the Arboretum Wojstawice, the historic manor park, established in the 1820s.


Introduction of the University of Wrocław Botanical Garden

The Botanical Garden in Wrocław is one of the most important institutions in Poland with the largest collection of plants and a long tradition of the ex situ protection of rare and endangered species. The Garden is the one of the important and well recognizable green areas located in the center of the city as an object for recreation, education, cultural events and tourism.



Plant Taxonomy Department

Currently, the Garden consist of about 12 000 plant species and cultivars, kept in an open area and in several greenhouses, with a total area of 1 870 m². It consists of the following departments: plant systematics, arboretum, water and marshy plants sections, ground ornamental plants, climbing species section, greenhouse plants, and environmental education. In total, about 350 native species are kept in the section of protected and endangered species in Poland in the collection. In addition, 400 species are included in the IUCN Red List. Many taxa are also in-



cluded on the CITES list – 550 in total. This part of the collection is nowadays one of the biggest in Poland. A programme of water and marshy species restitution has been in place for a number of years. It focuses on disappearing and endangered species in Poland, such as: *Aldrovanda vesiculosa*, *Caldesia parnassifolia*, *Gladiolus palustris*, *Luronium natans*, *Marsilea quadrifolia*, and *Schoenoplectus mucronatus*.

From the very beginning of its existence, the Garden has been a place of scientific activity. It also included activities like foreign plant acclimatization, taxonomy, parent plant research, ecology and plant geography. The Botanical Garden is famous for its large collection of succulents with about 1 200 taxa. In 2011, The Polish Botanical Gardens Society granted six collections in Wrocław the status of **National Collections**: the family *Bromeliaceae*, wintering species and cultivars of the *Nymphaeaceae* family, genera *Hedera*, *Paeonia*, *Anubias* and *Echinodorus*. In 2018, for the first time in history, the Garden was opened to the general public in winter. The visitors can admire the greenhouse collections, aquariums and the Panorama of Nature permanent exhibition. They can also have a walk in the outdoor area. Winter sightseeing of the Garden was met with great interest among Wrocław residents and tourists.

A key task of the gardens is to preserve biodiversity and to keep the collected and documented plant collections ready for research. In cooperation with Kew Gardens, the Dutch Proefstation Boskoop, and the German Society of Perennial Friends (Gesellschaft der Staudenfreunde) (<https://www.gds-staudenfreunde.de/>) the Garden participates in the European evaluation of coneflower (*Echinacea*) and daylily (*Hemerocallis*) cultivars performed in Arboretum Wojstawice. Local staff develop plant selections and carry out their own breeding and they also select new plant cultivars (over 300 new selections have been registered, mainly from the genus *Hemerocallis*).



National Collection of genus *Hedera*



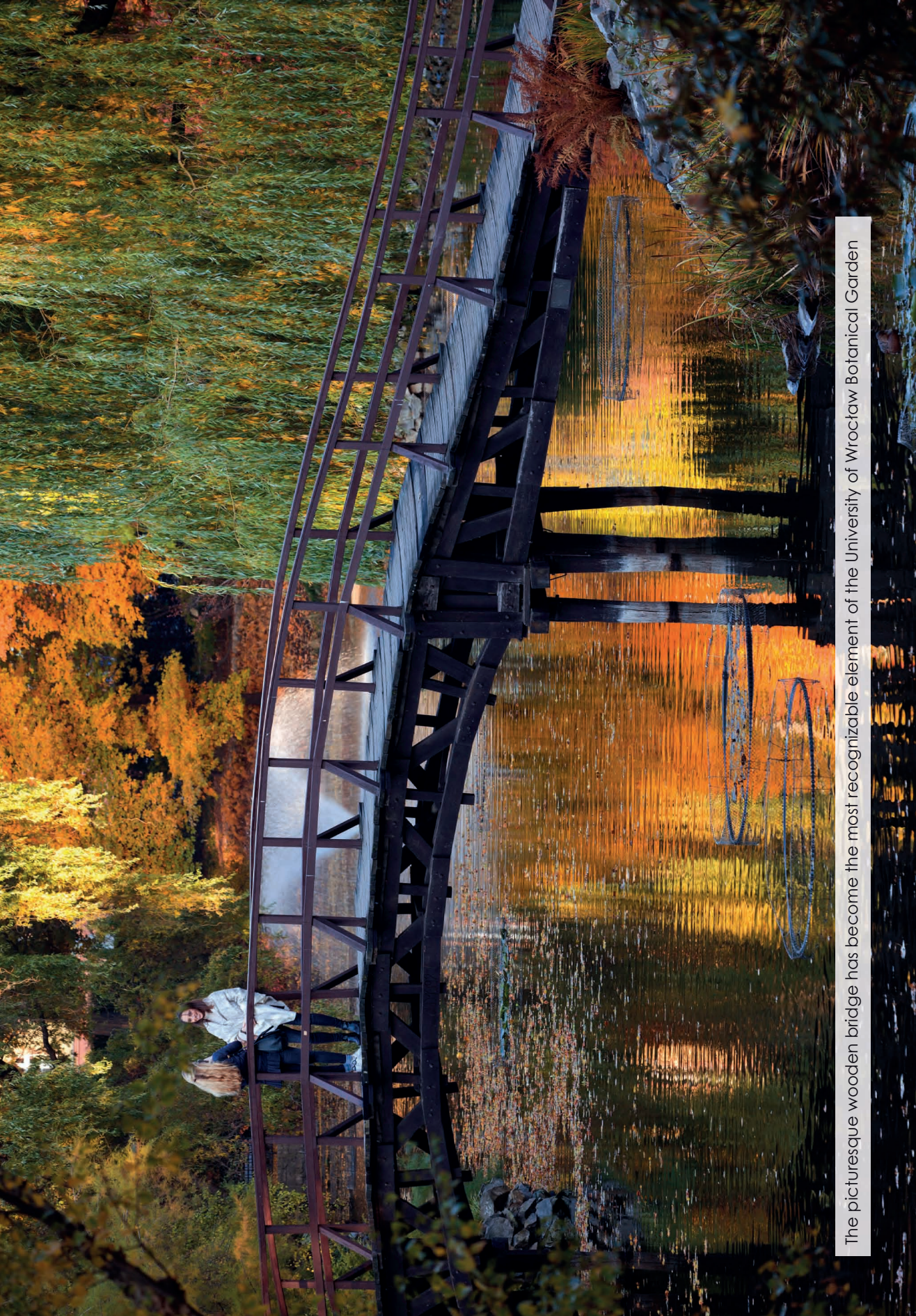
Echinocactus grusonii in the greenhouse called "Succulents of Mexico"



For more information about the University of Wrocław Botanical Garden visit: www.ogrodbotaniczny.wroclaw.pl



For more information about Arboretum Wojsławice: www.arboretumwojswlawice.pl



The picturesque wooden bridge has become the most recognizable element of the University of Wrocław Botanical Garden

Introduction of Arboretum Wojstawice

The history of the Wojstawice settlement, which belonged to the castle of Niemcza from the Middle Ages, dates back to the 11th century. The oldest name, documented in 1366, is Woislowitz and it is derived from the name of the knight Wojstaw. The first gardens were founded in the mid-sixteenth century by Piast prince Jerzy II. From 1703, for 90 years, they were the property of a knightly family with Polish roots, von Prittwitz-Gaffron. For the next half a century, Wojstawice belonged to von Aulock family, who established the first romantic park in Silesia there. The owners of the mansion and palace in Wojstawice in that time, established a manor park with the character of a "wild promenade" adapting the natural landscape. A Silesian family von Oheimb was the last German owner of Wojstawice in the years 1880 – 1945, and it was they who gave the present-day character to the Arboretum. The landowner Friedrich von Oheimb (1850 – 1928) restored the palace and thoroughly extended the park. Oheimb also proved to be an outstanding expert in the genus rhododendron (*Rhododendron*). Oheimb kept contacts with numerous owners of the best European nurseries, and it enabled him to expand his collection. He cooperated with botanical gardens, especially in Tharandt, Bonn, Dresden and Wrocław. He was the author of nearly 100 publications in popular science magazines and the co-founder of Deutsche Dendrologische Gesellschaft (DDG, 1892). The small park in Wojstawice gained its fame and recognition during the times of Fritz von Oheimb and became an experimental facility of the DDG.



Friedrich von Oheimb (1850 – 1928) – main creator of the park in Wojstawice



Rhododendron 'Von Oheimb Woislowitz' (T.J.R. Seidel, 1896/1906) – late-flowering cultivar commemorating the gardening merits of Fritz von Oheimb



T.J. Rudolf Seidel (1861 – 1918) – breeder of frost-resistant *Rhododendrons* from Grüngräbchen near Dresden and von Oheimb's friend



Guests rest under the ancient oak, Wojstawice 1903



Wojstawice grange and palace in the 1920s



Flowering Rhododendrons in Wojstawice in June 1924 ("Gartenschönheit", 1924)

In 1928, the eldest son of F. Oheimb, Arno (1882 – 1958) established a 3 hectare plant nursery, advertising it in significant gardening magazines in the 1930s. He continued his father's work until the day of his deportation, the 23 August 1946.



Seidel's rhododendron nursery catalogue in the journal "Gartenschönheit", 1915



Advertisements of the perennial nursery in Wojstawice published in the journal "Gartenschönheit" in 1924 – 1928



Invitation to Wojstawice in the tourist map Nimptscher Berg-Vereins, 1925

Luckily, Wojstawice was not affected by the war damages. In 1948, a post of a qualified gardener was assigned and the Committee for Nature Conservation of the Polish Academy of Arts and Sciences in Kraków took care of the Park. Engineer Tadeusz Szymanowski carried out a thorough cleaning of the Park and conducted a valuable study *Park in Wojstawice and its dendrological collections*,

demonstrating the existence of 169 species and cultivars of deciduous trees and shrubs (not including rhododendrons) and 93 phanerogams. *Major trees and shrubs in some parks of Western Poland* is one of the first Polish publications of Wojstawice. The professors wrote: "The park in Wojstawice is a real dendrological curiosity" listing the following as extremely interesting taxa: Korean pine (*Pinus koraiensis*), Japanese pine (*Sciadopitys verticillata*), trees of palm maple cultivars (*Acer palmatum*) and Coastal sweetpepperbush (*Clethra alnifolia*).



Tadeusz Szymanowski during the first post-war dendrological inventory at the Arboretum Wojstawice in 1950



Polish cultivar of *Actinidia kolomikta* 'Dr Szymanowski', commemorating Polish dendrologist Tadeusz Szymanowski

In 1958 Dr. Ju, the Head of the Botanical Garden of the Chinese Academy of Sciences, who had cooperated with Oheimb before the war, visited the Garden and his visit saved it from destruction. The same year, the Municipal National Council in Niemcza took care of Arboretum. In May 1962, to the tourists delight, the gates of the park opened. Enamelled plaques with the names of trees and shrubs were set in place and entrance tickets were introduced. In 1977, the Commission of Botanical Gardens and Arboreta in Poland awarded the park in Wojstawice the rank of an arboretum, and in 1983 the whole complex was entered in the register of monuments. Over the next few years, the garden decay deepened and a portion of the plants got lost. Due to the lack of Polish specialists, the *Rhododendron* collection remained unassessed and unlabelled. Alfred Węglowski, M.Sc. from the University of Wrocław Botanical Garden, started conducting research on the topic and the results were published, among other places in the *Collection of Rhododendrons from the Arboretum Wojstawice* (Hryniewicz-Sudnik 1986/1987). It turned out that both the verification and labelling of historical rhododendron cultivars from the Arboretum was a hard task, as most of the former plaques had been lost and, the more than hundred-year-old cultivars were difficult to find – even in specialist nurseries. It was only possible to label them in 1996, when Hanna Grzeszczak-Nowak from the University of Wrocław Botanical Garden invited for cooperation: Karel

Hiecke from the RILOG in Průhonice, Walter Schmalscheidt from the Lehr – und Versuchsanstalt für Gartenbau Research Institute in Bad Zwischenahn, a German expert in the field of Seidel cultivars, and his friend, a Polish doctor Janusz Kwaśnik from Strücklingen and enthusiast of both, rhododendrons and Wojstawice. On 29 February 1988, thanks to the efforts of the director of the University of Wrocław Botanical Garden Tomasz Nowak, the Arboretum was transferred to the University of Wrocław and few years later a detailed collection inventory was completed and a plant database was introduced.



Aerial view of the Arboretum Wojstawice, a south-western panorama, with a location map of the arboretum in Poland

The most valuable and spectacular tree stand, from the turn of the 19th and 20th century, is located in the historic part, called the old park. Since 1890, observations have been conducted there, on acclimatization, growth, plant health and their practical use. The Arboretum also preserves historical, horticultural cultivars and assesses the value of new ones, such as *Hemerocallis*, *Rhododendron* and *Echinacea*. Currently, ex situ cultivation includes 50 globally endangered species (IUCN 2020), 65 species threatened with extinction in Poland, 58 plant species under strict protection in Poland and 30 species under partial protection (Journal of Laws of 2014, item 1409). The Arboretum Wojstawice specializes in Polish ornamental and utility cultivars (over 1500 taxa) and in heather plant cultivation (*Ericaceae* – 1589). The largest and most valuable collections of taxa from the genera *Rhododendron*, *Buxus* and *Hemerocallis* – obtained the status of National Collections in 2011.

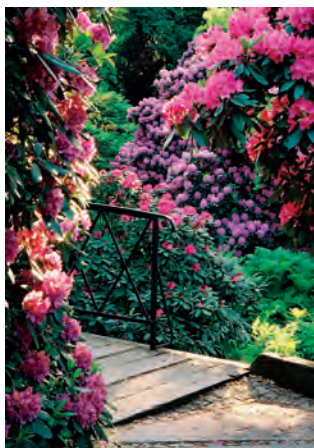
National Collections in Arboretum Wojstawice are as follows:

- **Rhododendron** cultivars of the Historical Lusatian Rhododendron planted between 1899 and 1918 by Fritz von Oheimb. They were bred by Rudolf T.J. Seidel, at a horticultural company with a more than 200-year tradition, therefore the cultivars are also called "Seidel cultivars". Frost resistant and vigorous, they are adapted to our climate. Our collection of these plants, constantly expanding since 1994, currently includes 160 cultivars.
- The genus boxwood (**Buxus**) is a collection of more than 140 species and cultivars, mainly of European and the USA origin. As many of them are being cultivated in Poland for the first time, they are valuable material for research and acclimatization. The most numerous are the cultivars of common boxwood (*B. sempervirens*) and small-leaved boxwood (*B. microphylla*). The oldest specimens were planted at the beginning of the 20th century, in the times of von Oheimb.



Collection of frost-resistant Czech azaleas (so-called Jelinkovy Azalky from Průhonice) from the Kiusianum group in Arboretum Wojstawice

- The daylily (**Hemerocallis**) collection is the largest one of its kind in Europe. The impressive collection includes over 3 500 species and cultivars. They have been systematized and the following cultivar groups have been distinguished: historical, landscape, full-flower, spider, miniature, Polish, German, Czech, American and many others. In 2013, the Wojstawice daylily (*Hemerocallis*) collection received the prestigious certificate of the Display Garden of the American Hemerocallis Society.



Rhododendron Valley
in May – Arboretum
Wojstawice



Arboretum Wojstawice in
June




Flower beds of blooming
daylilies in July – Arboretum
Wojstawice

Currently, the following collections are selected for the national collection certificate: *Hydrangea* – 531 taxa, *Paeonia* – 411, *Vinca* – 40 and the *Hamamelidaceae* family – 84. As the microclimate is favourable, attempts are being made to grow trees and shrubs not fully frost-resistant in other parts of Poland, for example the following genera: *Pieris*, *Cedrus*, *Cryptomeria*, *Sequoiadendron*. The Arboretum plant collection counts 14 010 different species, including 6 565 taxa of ligneous plants.

For more information visit: <http://arboretumwojstlawice.pl/index-plantarum/>



GEOratum in Arboretum Wojstawice



The year 2005 was important for the development of the Arboretum because about 54 hectares of valuable natural land and a ruined historic manor farm were included. In 2007 – 2008, with the help of a subsidy from the National Fund for Environmental Protection in Warsaw, an orchard of historical cherry cultivars (*Prunus avium*) was established on the slope of Ostra Góra. In 2007 an open-air exposition – GEOretum was opened. Located in an old, former shale quarry, it displays rocks and minerals occurring in the Sudetenland Foothills.

The most recent and innovative Arboretum department is the Polish Millennium Garden. The aim of this assumption is to preserve the achievements of Polish nurseries and to popularize the cultivars of Polish breeders. It also focuses on expanding both the plant collection and educational area. The Polish Millennium Garden, located on 8 hectares, is comprised of:

- Polish cultivars garden – ornamental and orchard plants received from Polish breeders.
- Protection cultivation – it aims to protect *ex situ* (lat. off-site) 16 selected native plant species – vanishing, endangered and protected. Additional species are planned to be grown.

Guests can freely use the designated picnic spots or book a bonfire in the so-called wigwam. Numerous arbours, benches and deckchairs and all lawns available for those who want to go for a walk and have a rest, are another tourist attraction. When the cherry trees from the orchard produce fruit, the visitors have the opportunity to taste the cherries. There are also umbrellas, wheelchairs and a designed, adapted place, where dogs can wait for their owners. At the car park there is a plant sales point. Tourists appreciate the variety of activities offered by the Arboretum, and their number is constantly growing. More than 110 thousand tourists visit the Arboretum each year. Thanks to their votes, the facility was awarded the emblem "Tourism Service of the Year 2017" for tourism, cultural and educational activities representing the highest standards, and in the competition "Great Discovery of Lower Silesia" it received the certificate "Tourist Attraction of the Year 2018".

Several prestigious certificates and awards summed up during the more than thirty-year activity of University of Wrocław Botanical Garden – Arboretum Wojstawice:

- Honorary Laurel 2009 – an award of the Polish Nurserymen Association and Greenery Promotion Agency for the management of the Botanical Garden and Arboretum for consistent and creative promotion of ornamental plants and gardening culture,
- Lower Silesia Key to Success 2018 – award in the category of the Best Tourist Enterprise in Lower Silesia,



Panoramic view of the orchard of historical sweet cherry cultivars – Arboretum Wojstawice, May 2019

- Sudeten Crystals 2019 – the most important award in the Sudetes region in the category of the Best Tourist Product,
- Honorary Laurel 2019 – award of the Polish Nurserymen Association for the management of the Botanical Garden and Arboretum for creating the Polish Millennium Garden.



Poetry path in a cherry orchard – Arboretum Wojstawice, May 2019


Vilnius University Botanical Garden, Lithuania

Based on archaeological findings from burial grounds, the area of Kairėnai Estate (currently, it is home of the Vilnius University Botanical Garden) was inhabited as early as the 4th – 5th century AD. Two inhumation graves with brass artefacts from that period were found on a small hill now overgrown with pines. Another small hill nearby was identified by archaeologists as a burial (tumulus) from that same period. At the initiative of the Friends of the Garden Club, a sculpture Perkūnas' Oak (Perkūnas was Baltic god of thunder) was placed on this site in order to mark this archaeological monument. Moreover, large and widely spaced 19th century estate buildings are the protected architectural heritage: stables (now the Museum) and the mill (now the Visitor Information Centre and Café) have traits of Romanticism whereas a coach house, housekeeper and stableman's houses and barn are examples of folk architecture. Today, the Garden is characterized by picturesque tree compositions and the intimate relationship between vegetation and water. Although the landscape features of the Garden were developed in the 19th century, the orderly terraced layout is a relic of the Renaissance epoch, some of it still preserved to this day.



S. Smolikowski, Jezuit palace in Vingis Park, 1850

As the long and complicated history of the Vilnius University Botanical Garden (hereinafter the Garden) proves, political factors are the key factors that have been influencing its development. Geopolitical events taking place in the world and in Europe at the end of the 20th century and at the beginning of the 21st

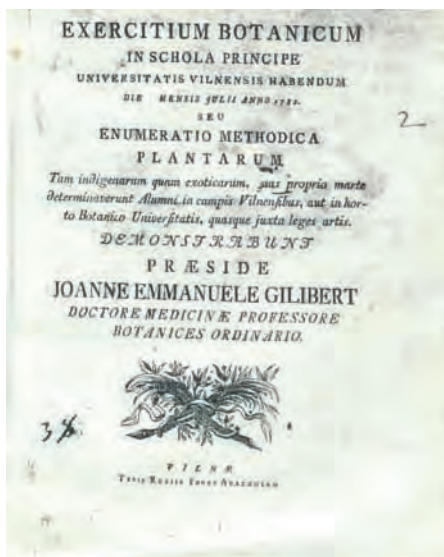


century provided great opportunities for the fast development of the Garden. The accession of Lithuania to the European Union (EU) had a particularly positive impact on the life of the whole state as well as on Vilnius University and the Garden. This event can be considered as one of the essential factors of the rapid development of the modern Vilnius University Botanical Garden. Namely this event led to the emergence of entirely new opportunities for the development of international relations, the development of various activities, and for significant economic change. Lithuania's accession to the EU enabled evident progress of the infrastructure of the Garden by using the financial resources of the EU structural funds and investment programs of the economically strengthened Republic of Lithuania. After 2004, the Vilnius University Botanical Garden became a member of a number of international (global, European, Baltic Sea Region) organizations, networks coordinating the activities of botanical gardens. The Vilnius University Botanical Garden is one of a few botanical gardens with a very rich cultural heritage. The State Cultural Heritage Register involves the following objects of the Garden located in Kairėnai: the Baltic burial ground of the 4th and 5th centuries, a mound located nearby, Kairėnai manor complex (known from the 16th century) with the surviving outbuildings, the old manor park (named by the famous 19th century gardener S. Wodzickis as one of the best landscape parks in all the former Grand Duchy of Lithuania), the remains of two manor houses (of the 16th and 18th centuries). In Vingis (located in Vingis Park, in Vilnius), a part of Lukiškės manor homestead, which is even more well-known in the history of Lithuania, is owned by the Garden, too. From the 16th century this place was known as the residence of noblemen Radvilos, from which they tried to spread the ideas of the Reformation in Lithuania, later it was donated to Vilnius Jesuits (founders of Vilnius University). For more than 240 years, this place has been more or less associated with Vilnius University, and the first herb garden in our country was established there. The following objects have remained until today: the 17th century masonry fence, two 17th century masonry buildings, ruins of the Jesuit Academy Palace, a wooden building from the beginning of the 20th century and the complex of the first greenhouses of the Vilnius University Botanical Garden built at that time. Unfortunately, at present, all the buildings of the Garden in Vingis Department are in very bad condition.

Vilnius University was established in 1579, whereas the Vilnius University Botanical Garden was established in 1781. The Garden was founded by the French professor Jean-Emmanuel Gilibert in a small plot of 200 square metres as a part of the Department of the Nature History (the first scientific institution of nature science in Lithuania). From 1784 to 1787 the Garden was headed by the famous German traveler and scholar Johann Georg Adam Forster, who participated in the second voyage of James Cook. J.G.A. Forster obtained funds for acquiring a plot in an area called Sereikiškės.



Mateusz Przybilski, Botanical Garden in Sereikiškės, 1835 lithography after Karol Raczynski's drawing



The Text Book of Botany by Jean-Emmanuel Gilbert



Right Johan Georg Adam Forster in Vilnius

Professor of medicine Ferdinand Spitznagel, who came to Vilnius in 1792, attempted to transfer the Garden to a new location, but historic events stopped the work until the end of 1799. Professor Stanisław Bonifacy Jundziłł began the transfer of the Garden and took over its management before 1824. The Garden was later under the management of Professor Józef Jundziłł, Karl Witzel from Kremenec (now Ukraine) and Professor Stanisław Batys Gorski. It is the oldest and the largest (area 199 ha) botanical garden in Lithuania with the most numerous collections (10 000 names of plants). The Garden is an interesting heritage complex, too: historical (related to the history of the Garden and the areas where the Garden was located), archaeological, architectural, and the landscape. Since 1781, the Garden was situated in four different locations in Vilnius: 1781 – 1799 at a courtyard which is now Pilies Str. 22; 1799 – 1842 at Sereikiškės (now Bernardinai Garden); since 1919 in Vingis Park (now Vingis Department); since 1974 in Kairėnai. Now the first two locations are only of historical interest as they no longer belong to Vilnius University.



Old Kairėnai Estate with “Grandmothers flower bed” is amended with new office building

The glory time of the Garden was the first half of the 19th century, when thousands of plants from all over the world flourished in the Garden, and this place became known as a famous centre for the spreading of botany knowledge in Lithuania and the neighbouring countries. This period was interrupted by big geopolitical changes.

The Russian government closed the Garden in 1842. The best part of greenhouse plants, herbaria, seeds, books and other collections were given away to other uni-


versities: Kiev (Ukraine), Tartu (Estonia), Samara (Russia). Herbariums were sent to Kiev University in 1841: 1 – Herbarium Gilibertii; 2 – Herbarium Linnaeanum; 3 – Herbarium Horti Botanici Vilnensis; 4 – Herbarium Tournefortii; 5 – Herbarium Plantarum Cultarum in Horto Botanico Vilnensis; 6 – Herbarium Eichvaldi; 7 – Herbarium Witzelianum; 8 – Catalogue of Herbarium Linnaeanum; 9 – Catalogue of Herbarium Witzelianum; 10 – fruits and seeds. The name of the Garden was erased from the pages of the history of Lithuania for a long 77 years.

Only in 1919, a new period of the Garden started as a part of the Stefan Batory University in a new place – Vingis Estate. The Garden was under the management of Polish botanists for twenty years: Professors Piotr Wiśniewski, Józef Trzebiński and Franciszek Xavery Skupieński, the Garden inspectors Andrzej Michalski and Konstanty Prószyński.



Begonia painting by the Garden inspector K. Prószyński (1920 – 1936)

In the beginning of World War II in 1939, Vilnius was returned to Lithuania, the Polish university was closed down, and the Lithuanian university was transferred from Kaunas to Vilnius. After the war, the Garden was in a rather poor state. The true revival of the Garden began in 1954, when Aldona Lučinskienė was appointed its head. Later the Garden became cramped; therefore, in 1974 a new plot of nearly 150 hectares was allocated in Kairėnai. The Garden in Vingis was reorganized into the Department. The Garden in Kairėnai took over the neglected complex of buildings and an old park of the former estate. At present, the Garden has a well-developed and visitor-friendly infrastructure. The heritage makes the Garden more attractive, and the visitors get acquainted not only with plants, but also with the history and architecture of the country.



The Vingis estate history is related to the spread of reformation (1551 – 1593), Jesuits activities (1593 – 1774), the Russian-French War in 1812 and others. The remains of these times are a protected buildings-landscape complex: the wall of the Jesuits times, buildings of the 19th century, a 200 year-old lime tree lane and others. The Garden of the times of the Stefan Batory University (1919 – 1939) is reminded of by an original annex attached to the old greenhouses, two small ponds for water plants and a few trees planted at this time.

The oldest place in Kairėnai grounds is the archeological site of Baltic barrow dating back to the 4th – 6th century AD. The Kairėnai estate dates come back to 1545. Over the years the estate was changed from Renaissance architecture and a Regular Park to Classicism architecture and an English Style Park. Now the estate complex of the 19th century is protected: buildings – stables, mill, stableman house, barn and other – and landscape – Old Park with a system of 14 ponds. Over its 45 year history, the Garden has had three directors:

J. Meidus, (1975 – 1990), Dr. E. V. Navys (1990 – 2002) and Dr. A. Skridaila (since 2002). The first trees were planted in the fields of Kairėnai in 1977. In the spring of 1979, on the occasion of the 400th anniversary of Vilnius University, professors and lecturers from Vilnius University Faculty of Natural Sciences, together with foresters, planted a grove of 400 English oaks (*Quercus robur* L.). Initially, it was just an idea to create exhibitions in the main 'open field'. Everything had to start from seedbeds, 'mother' collections, planting in seedbeds, perennial beds, hot beds and summer greenhouses. During 1975–1990, the Pomology collections grew fastest, and from 1985, when the Dendrology Department was fully-staffed, the dendrology collections grew fastest as well. The first seed exchange catalog (Index Seminum) with the names of the seeds gathered at the Garden in Kairėnai was published in 1985. After 1992, plant collections grew fastest in the Floriculture Department – over 3 000 taxa collected in a few years. After Lithuania regained its independence in 1990, the employees of the Garden were allowed to travel abroad.

The Vilnius University Botanical Garden was established during the great education reform of the Lithuanian-Polish Commonwealth at the end of the 18th century. The Garden was founded more than 230 years ago together with the Natural History Department, and throughout all these years the two were closely associated. Despite its honourable age, the Garden remains young because it has changed its place four times. Historical circumstances led to the Garden being moved from one place to another. Nowadays the Garden is located in two places: in Vingis Park and in Kairėnai. In the latter location, in Kairėnai, the history of the Vilnius University Botanical Garden began in 1974. It was decided that the previous Garden's area in Vingis Park was too small for large University research projects and experiments, and the best way to guarantee prosperity for the Garden in the future, was to obtain a 148 plot of land in Kairėnai. By Order of the Lithuanian Council of Ministries, on 14th May 1974, a plot of land, the remains of an old former


manor place and a garden in Kairėnai, was given to Vilnius University to found an experimental research station with a botanical garden. In fact, the scenery was beautiful: there were a lot of natural springs, ponds, expressive landscape, and many units of heritage.



Christmas time brings a new dimension into garden in Kairėnai

Introduction of Vilnius University Botanical Garden

Vilnius University is the leading institution of high quality of science and education in Lithuania. But in parallel it is proud of its rich history and the owned valuable heritage. The Vilnius University core department – the Botanical Garden is also leading, and it is a representative garden of the country. Main research areas: plant Geno taxonomy, biotechnology (including micro propagation in vitro and mycorrhiza), cultivation and reproduction of plants; conservation and preservation of plant genetic resources. The current place of the Garden is located on the East-North boundary of Vilnius city, in the former Kairėnai estate. The buildings and the garden are used as venue for various performances and art exhibitions. In addition, visitors are offered a variety of attractions including horse riding facilities and horse-drawn carriage rides.



Within the last decade, a few big infrastructural projects were successfully implemented, which enhanced the base of the Garden so much that the place became one of the most popular sites in the city as an object for recreation, education, cultural events and tourism. Now the Garden has an important scientific and thematic collection of the open ground. More than 450 species of vascular plants (a community of dry slope, ponds, wetland forest, broadleaved forest and pine forest) are found growing naturally in the Garden (about 25% of all Lithuanian flora species). There are also over 120 native vertebrate species, a quarter of them being birds. To manage plant collections, the online database „Index Plantarum“ of the Vilnius University Botanical Garden is used (<http://botsodas.lt/indexplantarum>). These collections were accumulated within last century under the influence of different political, economic and social events, trends and streams in the country. Nowadays the Garden collections represent a wide array of thematic groups. Every year it attracts thousands of visitors.




The garden is proud of its extensive collections of irises and peonies like this Lithuanian iris cultivar 'Lietuvos Karys' (Puidokas, 2017) on the right

Nowadays botanical gardens have been seeking to play a key role in the conservation of the world's plant diversity. The biggest treasure of any botanical garden is its plant collections. As of 31st December 2019, 10 102 taxa belonging to 1 024 genus, 236 families were grown at the Vilnius University Botanical Garden.



Gene pool collection of genus *Sempervivum* in Vilnius University Botanical Garden




It has a valuable gene pool (specimens of 298 names of these plants are included in the lists of Lithuanian National Genetic Resources, 324 specimens are of internationally protected plant species – included in the IUCN Red List). The Vilnius University Botanical Garden has accumulated especially large collections of perennial cultivars developed by Lithuanian breeders (*Dahlia*, *Hemerocallis*, *Gladiolus*, *Iris*, *Lilium*, *Paeonia*, *Narcissus*, *Lilium*, *Tulipa*, *Primula*, *Clematis*, *Crocus*, *Fritillaria*, *Lophospermum*, and *Saintpaulia*.). Also, it has collected a *Ribes* collection, which is one of the largest in Europe (386 taxa and numerous specimens of *Rhododendron* (339), park roses (100), *Paeonia* (250), *Dahlia* (360), *Gladiolus* (120), *Iris* (400), *Hemerocallis* (400), climbing plants (150) and ornamental conifers (370). It could be noted that these are one of the largest collections of live plants in the Baltic States, and the creation of the database is contributed to improving the management of these plant collections. In 2019, the Garden began to apply GIS for the preparation of the Garden plant layout plans, and the plant database has been currently improved.



Rhododendron collection extends itself to Japanese garden in the Botanical Garden

The **Floriculture Department** of the Vilnius University Botanical Garden was established in 1992. Its main goals are the introduction of herbaceous decorative plants (field flowers), the accumulation of plants for collections, their care, conservation, and creation of the plant exposition. Herbaceous ornamental plants collections



are rich in genera, species, cultivars, and hybrids (3 200 plant names of 78 families and 312 genera). At present, genetic resources collections consist of 500 perennial taxa developed by Lithuanian plant breeders. They are originals, adapted to the local climate conditions, and it is urgent to conserve, investigate and foster them as a part of the land's culture. Cultivars created by Lithuanian plant breeders are introduced and grown in special collection nurseries in the Floriculture Department of the Vilnius University Botanical Garden. The investigations, descriptions and evaluations of morphological and ornamental properties of ornamental plants were carried out in the period of 1998 – 2020 according to the requirements of the International Union for the Protection of New Varieties of Plants (UPOV), Biodiversity International (BI) and methodologies used in neighboring countries.

In 2003, the Lithuania **Ornamental Plant Genetic Resources Coordination Center** was established at the Vilnius University. The Vilnius University Botanical Garden coordinates the collection, evaluation and selection of several species, partly in the frame of the Lithuanian National Plant Genetic Resources Program run by the Ministry of Environment of the Republic of Lithuania. The plant species granted the status in the above-mentioned program are described in a manner corresponding to the documents of Biodiversity International (BI) requirements, and the data are recorded in the central database. For many years, the Vilnius University Botanical Garden has been part of the International Plant Exchange Network: exchanging seeds with 300 partners in 50 countries. Every year about 800 packets of plant seeds are sent out to research institutions around the globe and about the same amount is received in exchange.


In 2001, the Parliament of the Republic of Lithuania adopted the Law on National Genetic Resources of Plants, which regulates the accumulation, preservation and use of national genetic resources of plants and stipulates how to provide for a sparing use of these resources, protect them from devastation, extinction and complete destruction as well as to save the biological diversity. According to the provisions of this law, the genetic resources of plants, which have ecological, selective and economic value for the Republic of Lithuania, are selected and included into the central database of National Genetic Resources of Plants. This might be plant populations or their parts, single plants or their groups, or reproductive parts of plants (seeds, pollen, embryos, meristematic tissues, buds, sprouts). In accordance with the Joint Order of the Minister of Environment and the Minister of Education and Science, four science and study institutions, including Vilnius University, which coordinates accumulation, analysis and preservation of ornamental plants, are prescribed to perform the functions of the coordinative centers of genetic resources. The Plant Gene Bank with coordination centers of different plant groups (agricultural plant, forest trees, fruits and vegetables, medical plants and ornamental plants) has been established and is still operating.



The President of Lithuania Dalia Grybauskaitė (far left) is talking to garden employees while visiting flower exhibition with Lithuanian cultivars of lilies

At present, genetic resources collections consist of 600 perennial taxa developed by Lithuanian plant breeders. Lithuanian breeders of perennial plants created cultivars of:

- **Dahlia** – P. Rotomskis, J. Petravičienė, J.A. Liutkevičius, A. Gražys, T. Kacevičienė, D. Simonaitienė
- **Gladiolus** – A. Kuzavinis, S. Eicher–Lorka, P. Balčikonis, J.A. Liutkevičius, A. Markevičius, D. Simonaitienė, A. Žobakas, A. Karla, B. Kazelka, A. Lukoševičius, P. Čiplijauskas, A. Jachimovičienė, V. Kaminskas, A. Mačiūnas, L. Pernavienė, M. Radzevičius, P. Šlajus
- **Iris** – S. Eicher–Lorka, P. Balčikonis, J.A. Liutkevičius, J. Tarvidas, G. Klimaitis, A. Gražys, O. Griniuvienė, D. Žigarienė
- **Paeonia** – O. Skeivienė, E. Tarvidienė and J. Tarvidas, S. Eicher–Lorka
- **Narcissus** – J. Tarvidas
- **Lilium** – P. Balčikonis, J.A. Liutkevičius, S. Eicher–Lorka, J. Proscėvičius, V. Vyšniauskienė, R. Maršėlienė
- **Tulipa** – P. Balčikonis, J.A. Liutkevičius, M. Radzevičius, A. Markevičius
- **Primula** – O.Skeivienė, J. Tarvidas
- **Clematis** – A. Samboras, L. Bakevičius, J. Vestartienė
- **Crocus, Fritillaria** – L. Bondarenko
- **Lophospermum** – S. Gliožeris
- **Hemerocallis** – J.A. Liutkevičius, A. Markevičius, E. Misiukevičius, P. Puidokas D. Žigarienė
- **Saintpaulia** – O. Griniuvienė, T. Dambrauskienė



In 1986, the Vilnius University Botanical Garden started creating a database system for the accounting of plants in collections. There was only one computer at the time. The information of only 1 500 taxa of plants was possible to keep in two rewritable discs. Nevertheless, the database containing information of all plants collections (including new software, design of the system) was developed in 2003. This program is used for the Vilnius University Botanical Garden collections data up till now without any significant changes. The database is partly open for the public (QR codes can be scanned) using the webpage: <http://www.botsodas.lt/index-plantarum>. The database was very helpful for unification of the plant registration system in the Vilnius University Botanical Garden, for the development of an accessioning system, for creating a unified system of accumulation of information of the plants growing in the Vilnius University Botanical Garden.




The Japanese garden is a favorite place in the garden



List of grown assortment available at <http://botsodas.lt/indexplantarum>



More information about Vilnius University Botanical Garden



In Lithuania, the use of QR is not widespread in green areas yet. It started in 2014 in the territories of the Vilnius University Botanical Garden. When used for educational purposes, the code is one of mostly simple and convenient ways to provide various types of information about plants. It works really fast and today's youngsters enjoy it. When opening the link, particular information about a plant, namely the number of the sample, its Latin name, the author of the species name, etc., is provided. Information on the webpage is in Lithuanian or could be provided in Lithuanian and English. In such a way, visitors are directed to the webpage where they can find all relevant information. The monitoring of visiting the Vilnius University Botanical Garden is conducted via the Internet access. In 2017, links to plants were opened 3 000 times. Nevertheless, QR codes are not popular in Lithuania yet. In 2019, the Vilnius University Botanical Garden began to apply GIS for the preparation of its plant layout plans, and the plant database has been improved.

In recent decades, the diversity and supply of ornamental plants has increased significantly. The changing environmental conditions, urbanization, the increasing pollution of the environment and the spread of diseases and pests have set new requirements for ornamental plants. Both the composition of the range of plant species and plant cultivars have been constantly changing. The territory of the Floriculture Department involves different soil structures and humidity which enables selecting plots with diverse ecological conditions that are the most appropriate for the plants to be exposed in. The expositions are designed and arranged not only to be decorative, convenient for collecting and providing scientific information to visitors of the Botanical Garden, but also for the simplified plant care. The expositions are developed, and each year they are supplemented with the most recent plant species and cultivars so that visitors can get acquainted with the achievements of Lithuanian and foreign breeders as well as the fashions and trends of flower selection. Perennial cultivars created by Lithuanian breeders occupy an appropriate place in the expositions in the old Kairėnai Park. From the last snow in spring till the first snow in autumn, some plants are blooming in the Botanical Garden. The old park and the newly cultivated land plots are equipped with seasonal flower beds (herbaceous plants blooming in spring, summer and autumn); ornamental herbaceous plants of a damp shade and an open place; ornamental plants of a sunny, dry place (mountain vegetation); a small garden; a flower path; spontaneous coastal and meadows vegetation. Collecting less common perennial flowers in Lithuania, we sought not only to highlight their species diversity but also to acquire the cultivars of these genera developed in different countries (asters, astilbes, primroses, phloxes and peonies).



Illumination of Park der Gärten's walkway during Mystic Night in August



Park der Gärten, Germany

The Park of Gardens is situated in the heart of the region of Ammerland, one of the largest production centres for hardy nursery stock in Europe. For more than 100 years, approximately 3 500 nurserymen and nurserywomen in 450 nurseries have been growing woody plants on 4 000 ha, which are shipped to many places all over Europe.




Cultivation of pruned plants (Bruns Pflanzen) and *Calluna* in containers

The Park of Gardens originates from a 3,5 ha arboretum. It was planted in 1976 by the Chamber of Agriculture (Landwirtschaftskammer) Weser-Ems for evergreen plants, which are typical for this region. The park is situated on the former Centre for Garden Culture Lower Saxony. In 2002, the first Garden Show of Lower Saxony was arranged in this place and attracted approximately 1 million visitors.



B-Ardent! attendants next to solitaire plants in "spring-rings" on a guided walk in Bruns




The Park of Gardens with its 36 partly supra-regional famous and worldwide unique plant collections with altogether nearly 9 000 different labelled plants is multiply cross-linked. Besides the Botanical Garden and Rhododendronpark Bremen, the Park of Gardens with its nearly 2 000 species and cultivars of Rhododendron is the major plant collecting partner of the network **German Gene Bank Rhododendron** (Deutsche Genbank Rhododendron).

www.genbank-rhododendron.de



Collection of *Rhododendron* cultivars in Park der Gärten, planted in 1976

The German Gene Bank Rhododendron's aim is to prevent historical cultivars of Rhododendron from disappearing and to preserve old as well as new cultivars, together with the species they originate from, in their whole diversity. The plants are not being planted in a central place, but in a network of 51 collections. This gene bank was created as an example for other ornamental plant collections and an instrument for the preservation of diversity. Contrary to the other existing gene banks of agricultural crops, the German Gene Bank Rhododendron has discovered new ways: Cooperating nurseries, botanical gardens, public and private gardens take the functions of a gene bank in a work-sharing system. This network serves the purposes of national and international programs for the preservation of horticultural crops. In a public database, the collections give a comprehensive overview of German Rhododendron breeding and the existence of international cultivars and species in Germany. They are a unique documentation of horticultural development.



The ***Hemerocallis* collection**, which includes approximately 560 species and cultivars of daylilies, gives an overview in a ring-like circular bed on this plant species. Based on the variety of wild species, 100 years of breeding history of daylily cultivars are being shown. The circular daylily bed of the Park of Gardens was approved in 2007 by the American Hemerocallis Society, the worldwide institution for daylilies as an international display garden, the first worldwide approved daylily display garden out of North America. For its multiplicity of historic cultivars, it was additionally approved as a historic garden in 2009. In April 2015, a partnership between the European AHS-display gardens started: the daylily collection of the Park of Gardens and the Arboretum Wojstawice, Poland.



Collection of *Hemerocallis* planted in circular beds



More information about Park der Gärten:
<https://www.park-der-gaerten.de/en/>



INTERNATIONAL ORGANIZATIONS CONNECTING THE BOTANICAL GARDENS

Botanical gardens in general are divided into several types; however, apart from plant protection and scientific research, almost all of them are united by openness to the society as well as the performed cognitive and educational function. Recently, botanical gardens have been expanding their functions and increasingly focusing on the needs of the society and a social role of the institution. Considering botanical gardens as organizations, it is observed that a number of organizations are engaged in similar activities and perform a lot of the same functions. Many of the world's botanical gardens are run by universities. According to the BGCI GardenSearch database in March 2020, there are 3 670 botanical gardens and arboreta in 180 countries worldwide.



BGCI, **Botanic Gardens Conservation International** is a membership organization, representing botanical gardens around the world. It is an independent UK charity established in 1987 to link the botanical gardens of the world in a global network for plant conservation. Its mission is to mobilize botanical gardens and engage partners in securing plant diversity for the well-being of people and the planet. (<https://www.bgci.org/>)



Representatives of the national networks come together in the **European Botanic Gardens Consortium**, of which BGCI is the convenor. The Consortium was established in 1994 to plan Europe-wide initiatives for botanical gardens, especially within the context of the implementation of the Convention on Biological Diversity and other European biodiversity policies and strategies. The Consortium consists of representatives of all EU member countries, along with Croatia, Iceland, Norway and Switzerland. (<http://www.botanicgardens.eu/>)



ArbNet is a global network for tree-focused professionals. It facilitates the sharing of knowledge, experience, and resources to help arboreta meet their institutional goals. The mission of ArbNet is to foster the establishment and professionalism of arboreta; identify arboreta capable of participating or collaborating in certain scientific, collections, or conservation activity; and advance the planting and conservation of trees. (<http://www.arbnet.org/>)



UNESCO, United Nations Educational, Scientific and Cultural organization is one of the most important organizations dealing with cultural heritage in Europe. There are a many historical and ornamental gardens protected by this organization, but only two botanical gardens are listed as World Heritage Sites: Padua Botanical Gardens and the Royal Kew Botanical Gardens. (<https://whc.unesco.org/>)



Some botanical gardens participate in projects connected to **The Food and Agriculture Organization (FAO)**, a specialized agency of the United Nations. Its goal is to achieve food security for all. Among other things, it deals with intergovernmental treaties like International Plant Protection Convention and secures an agency for gene pool conservation mostly in agriculture. Some ornamental plants have medicinal and utility properties and need protection as well. FAO provides standards for conservation as well as taxonomy and other international policies. (<http://www.fao.org/home/en/>)



The European Garden Heritage Network is a nonprofit organization established to foster transnational co-operation in regional development and cultural heritage. It brings together garden experts, government services, foundations, and tourism agencies to preserve, develop, and promote gardens of historic interest within northwestern Europe. It consist of approximately 150 gardens along with 120 cultural landscapes. (<https://wp.eghn.org/en/european-garden-heritage-network-eghn/>)



Middle European Iris Society MEIS can be presented as an example of hobby organization based on cooperation between growers, breeders and friends of irises from European countries. Members of MEIS are Průhonice Botanic Garden and Vilnius University Botanical Garden and the University of Wrocław Botanical Garden. (www.euroiris.net)

For many years, the University of Wrocław Botanical Garden has been an active member of several international organizations. It is a member of Deutsche Rhododendron-Gesellschaft (since 1995); Deutsche Efeu-Gesellschaft (since 2006); Deutsche Fuchsien-Gesellschaft (since 2007); Gesellschaft der Staudenfreunde, Hemerocallis section (since 2010); Deutsche Dendrologische Gesellschaft, National Trust for Places of Historic Interest for Natural Beauty (member since 1995). The garden cooperates with Nikicki Botanical Garden, Ukraine



(since 1995); Botanical Garden of Ivan Franko National University of Lviv (since 2003), Botanical Gardens in Bonn (Germany) and Utrecht (Holland); Botanische Sammlungen, Pirna-Zuschendorf, Germany, Iris Society (since 2019) and the International Agenda for Botanical Gardens in Conservation (Botanical Garden is a registered participant in the worldwide implementation of the International Agenda in support of plant conservation, environmental awareness and sustainable development). Garden employees cooperate with the majority of Polish botanical gardens.

The Vilnius University Botanical Garden maintains relations with a wide range of partners abroad (over 400 institutions in 51 countries) and in Lithuania. This provides a great opportunity to develop the qualification of the employees and to evaluate the level of the Garden (as an institution) fairly objectively in a global context, and at the same time to set the appropriate operational goals and objectives. The Garden is an active member of several international organizations of botanical gardens: Association of the Baltic Botanical Gardens (a member since 1992, and the chair of this organization in 2014 – 2015); Botanic Gardens Conservation International (a member since 2003); the European Botanic Gardens Consortium (a member since 2004); Botanical Gardens in the Baltic Sea Region (a co-founder and member of this network since 2008). Moreover, the very fact that the Garden was entrusted to administer the Central European Database of *Ribes L.* and *Rubus L.* may be considered as a sign of international recognition of the high competence of the Garden. In 2018, encouraged by the BGCI and ArbNet networks (which provided financial support), the Garden signed a cooperation agreement with the Tasmanian Arboretum. In the same year, a memorandum of cooperation was signed with the A.N. Diomeda Botanical Garden (Athens, Greece). In 2019, the Garden established relations with the Botanical Garden of the University of Padova (Italy), the Don Botanical Garden (Ukraine) and joint research was carried out with the Institute of Dendrology and Arboretum of the Polish Academy of Sciences.

The Park of Gardens is currently linked as a member of the **European Garden Heritage Network** (www.eghn.org) to more than 190 parks and gardens in 14 European countries. Both historical and contemporary, small or large sized gardens are starting points in the regions of the European Garden Heritage Network to experience the art of gardening, history, nature, culture and regional identity, to discover the new and hidden, to see the well-known with different eyes and to enjoy the specialties. Each “Route of Gardening Art” (Route der Gartenkunst) has a regional slogan, to push the characteristics and sometimes surprising aspects of the region into focus.



Simply put, a garden is a great place to meet. Here Park der Gärten during the spring season.

NATIONAL ORGANIZATIONS IN HORTICULTURE

Czech Horticultural Organizations

Historically from 1971 to 1997, the Advisory Board for Botanical Gardens of the Ministry of Culture of the Czechoslovak Republic coordinated cooperation between botanical gardens, state administration bodies, schools and other organizations. It organized regular conferences, training for young workers, exhibitions, and the Botanical Gardens Newsletter.



Today, the Union of Botanical Gardens of the Czech Republic (**Unie botanických zahrad České republiky**) follows its duties. It was founded in 2005 as a civic association of persons and institutions representing botanical gardens, arboreta and important botanical collections of the Union of Botanical Gardens of the Czech Republic.

Since 2016, the Gene pool working group started its work within the union. Its headquarters is the Prague Botanical Garden. It currently has 37 members. The objectives of the Union are set up to develop botanical gardens. The purpose of the Union's action is to promote the mission of the botanical gardens and their overall development. (<http://ubzcr.cz/>)

The Czech Union of Allotment and Leisure Gardeners (**Český zahrádkářský svaz, ČZS**). As they introduce themselves: "It is a fully democratic, non-political, hobby association, the history of which goes as early as the times of King Charles IV. The first written records about growing and establishing gardens have existed since the 16th century. It is here for all friends of gardens, lovers of fruit and vegetables and growers of beautiful flowers. It brings about 170 000 members from the whole Czech Republic together, in 3 000 local organizations and 16 specialized ones (e.g. Gladiris for sword lilies, irises and daylilies, Iris Hlučín for irises, Martagon for lilies, Rosa Klub, Pelagronie, Narcis Kladno, Citrus growers etc.). The Union guides its members to spend their free time on their hobby, there is great emphasis for the social use of the gardens and upbringing of the young generation with a good relation to nature." (www.zahradkari.cz)

Other associations cooperating with botanical gardens are:

- The Czech Association of Perennial Growers (**Český spolek perenářů**), which promotes and popularizes winter-hardy perennial garden flowers, simply perennials. This association organizes seminars, workshops and a promotion called Perennial of the year. Lately, they have been focusing on creating lists

of recommended perennial cultivars for Czech climatic conditions. (<https://pereny.org/>)

- Czech Landscape and Garden Society (**Společnost pro zahradní a krajinářskou tvorbu**), (<https://szkt.cz/>)
- Association for the Establishing and Maintenance of Greenery (**Svaz zakládání a údržby zeleně**) <http://szuz.cz/>
- Nurserymen Association of the Czech Republic (**Svaz školkařů ČR**) (<http://svaz-skolkaru.cz/>)
- The Prague Rock Garden Club (KSP– **Klub skalničkářů Praha**) (<https://skalnickari.cz/>)

Polish Horticultural Organizations

Since 1972, the network of the Polish botanical gardens has been called The Council of Botanical Gardens in Poland (**Rada Ogrodów Botanicznych i Arboretów w Polsce**). At first, it was established as a commission within the structures of the Polish Botanical Society, later as a commission of the Botany Committee of the Polish Academy of Sciences. The Council of Botanical Gardens in Poland is a non-profit association of botanical gardens acting under the rules and regulations of the association. There are 34 members of the council – 17 botanical gardens, 14 arboreta and 3 gardens of medicinal plants.



Autumnal discoloration of plants in the Arboretum Wojstawice



Lithuanian Horticultural Organizations

The Association of Botanical Gardens of Lithuanian Universities (**LUBSA** – Lietuvos universitetų Botanikos sodų asociacija) is a public organization uniting Lithuanian Botanical Gardens, arboreta and other institutions or their subdivisions as well as private persons gathering plant collections. It was founded in 2005. The purpose of LUBSA is to coordinate the activities of the members of the association, to represent and defend the interests of the members of the association and to support their scientific and educational activities. Moreover, the Botanical Garden of Vilnius University initiated the foundation of this organization in 2005. Its profile can be found at www.botanikos-sodai.lt.

Regular members: Botanical Garden of Vilnius University, Vytautas Magnus University Botanical Garden in Kaunas, Botanical Garden of Klaipeda University, Šiauliai University Botanical Garden.

Affiliate Members: Arboretum of Vytautas Magnus University Agriculture Academy, Dubrava Arboretum, Conservatory of Vytautas Magnus University Education Academy, V. Motiekaityte Botanical Center and Garden Hortus Raginensis.

Botanical Garden Friends Club is a voluntary organizations providing help at Vilnius Botanical gardens. Some members are active whereas others just assist. In 2003, at the invitation of the club, Mrs. McDonald from the United Kingdom arrived, and she began a tradition of donating benches. At present, there are over 150 donated benches in the garden.



Display of Lithuanian sand dunes in the Botanical Garden of Klaipeda University



German Horticultural Organizations

The German horticultural society (**Deutsche Gartenbaugesellschaft**), founded in 1822, initiated the Network of plant collections called Netzwerk Pflanzensammlungen (www.netzwerkpflanzensammlungen.de) which links public and private plant collections together on a combined platform. It documents the diversity of genetic resources in Germany and supports endangered plant collections in their search for fosters. It protects and preserves rare plant collections for future generations and is part of the German Gene Bank Ornamental Plants. It is coordinated by the Bundessortenamt, the federal authority for plant assortments. Since 2014, the Park of Gardens presents two exceptionally precious plant collections in the nationwide network for plant collections: the daylily circular bed and the conifer collection of zu Jeddelloh nurseries.

The tradition of national plant collections, which is common in many other countries, is unknown in Germany

The Garden Academy Lower Saxony of the Chamber of Agriculture Lower Saxony (**Niedersächsische Gartenakademie der Landwirtschaftskammer Niedersachsen**) is the main contact for all persons who are interested in gardening, no matter on which level. The hobby of horticulture is part of the growing trend of owning a home and so the need for horticultural education and advice is growing. Comprehensive, top-quality and independent information is also offered to members of horticultural societies and associations, individual homeowners as well as professionals. It is the partner for education activities of the Park der Gärten like advice, workshops and lectures for hobby gardeners.



Collection
of Knap-Hill Azaleas
in Park der Gärten



STATUTORY REGULATION FOR BOTANICAL GARDENS

Czech Republic

Botanical gardens are not regulated by any law. The Czech Botanical Garden Union prepares a bill, but for many years the political situation hasn't been ideal for its enforcement.

Germany


The term "Botanical garden" is not regulated by any legal definition or act in Germany. Among the German botanical gardens community, it is informally considered a membership in the Association of Botanical Gardens as an indicator for the decision of whether an institution is a botanical garden or not. Membership goes along with accepting and following the Association's definition of botanical garden and the other codes of conduct (e.g. on invasive species etc.).

Lithuania

At the recommendation of the Ministry of Education and Science, the Government approved the guidelines for the development of botanical gardens of Lithuanian universities. It was done seeking to ensure the stability and continuity of their activities, so that all the institutions concerned would cooperate in solving different issues.

The guidelines set out the key priorities and implementation directions for the development of botanical gardens of Lithuanian universities. They aim at coordinating the activities of the institutions concerned – the Ministries of Environment and Culture, municipalities and universities – by providing opportunities for the botanical gardens to participate in projects and tenders run by the Government institutions as well as to find ways to renew infrastructure and maintain plant collections.

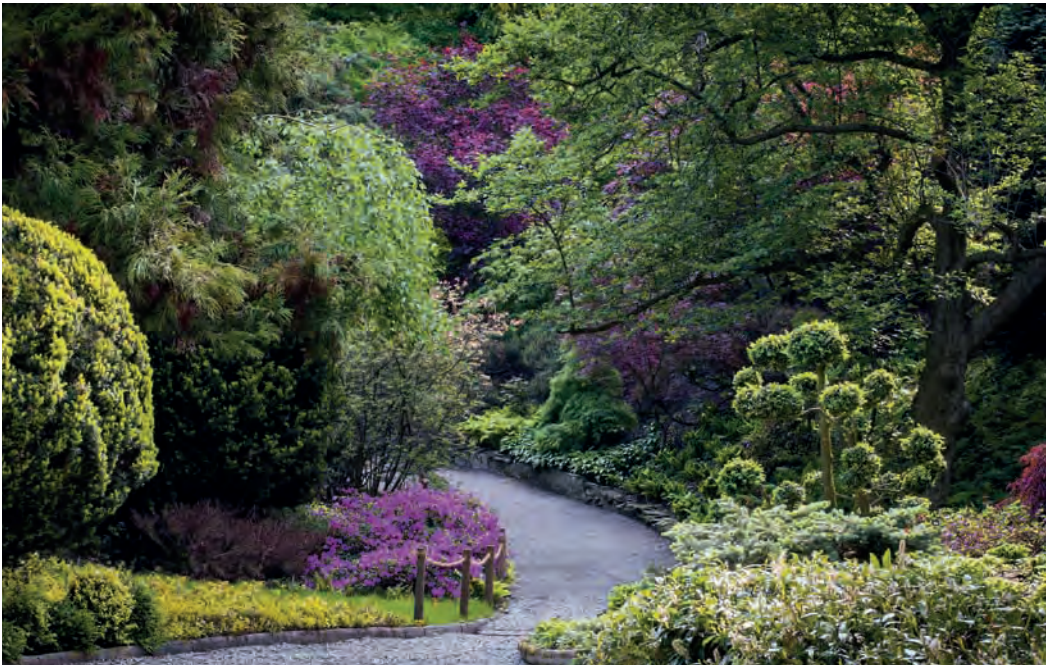
Botanical gardens participate in studies, research, educational activities, collect and preserve plant collections, participate in the organization of various events for the public, perform recreational tourism and cultural functions; however, due to insufficient legal regulation, it is difficult for botanical gardens to obtain funding for all these activities. We expect that these guidelines will contribute to the possibility for botanical gardens to participate not only in projects and competitions carried out by the Ministry of Education and Science but also by other ministries if they are related to the activities implemented by botanical gardens. We are certain that this will help to find more efficient ways of dealing with the renewal of infrastructure and the maintenance of plant collections. Recently, the public interest in botanical gardens has been increasing. The number of visitors of botanical gardens has tripled in the last decade. Botanical gardens organize environ-



mental, science and cultural events and implement international projects for the conservation of biological diversity.

Poland

Botanical gardens in Poland act under legal acts regulated by the state. Their activities are based on the Act on the protection of nature of 16th April 2004 (Journal of Laws of 2020, No. 55). The regulation specifies a botanical garden as an arranged and developed area with technical infrastructure and functional buildings associated with it, being a place of protection *ex situ*, plant cultivation of different climate zones and habitats, plant cultivation of a particular species and doing research and carrying out education. Chapter 3, Art. 65, paragraph 1 says that setting up and running a botanical or zoological garden permit requires the general approval of the Director of Environmental Protection.



View of the Rhododendron Valley in Arboretum Wojstawice in May



CULTURE AND ARTS IN BOTANICAL GARDENS

Plants as a Theme in Culture

As a demonstration of a flower, which has been displayed for most of human history since ancient times, we can choose the iris. One of the most famous symbols is “Fleur de lis”. It is a stylized lily flower that is used as a decorative design or symbol. However, it is actually a stylized version of the species *Iris pseudacorus* (yellow flag). It is the Coat of Arms of the Kingdom of France as well as the Coat of Arms of Florence. But the symbol can also be seen in many other places from mosques to military badges, or as the logo of most scouting organizations. Besides the noble heraldic uses, it has also served in less appealing roles. According to Louisiana Code Noir (1724) “a runaway slave shall be branded with the flower de luce on the shoulder”. As well as in Dumas’s *The Three Musketeers* for the old custom of branding a criminal with this symbol.

According to the Journal of the Historic Iris Preservation Society, in Renaissance paintings, irises have been linked to Mary, the mother of Christ, but their meaning may be more complex. The white iris is probably *Iris xgermanica* ‘Florentina’ used for the production of orris and possibly linking it to the anointing of Christ’s body. The blue iris could be *Iris xgermanica*; the “old blue flag” and the iris so widely grown that we don’t know where it originated. Was it merchants and bankers, noblemen coming back from earlier crusades or monks and priests who were carefully spreading and nurturing these useful and beautiful medicinal plants? For instance Jan Brueghel the Elder in his *Allegory of Smell* (1617 – 1618) depicted among other plants, *Iris xgermanica* ‘Florentina’, *Iris pallida* together with blue flag and Spanish iris. It is possible that the informal planting in the foreground area of the painting, boosted with pots of flowering plants, represent a typical noble garden around 1600. It is believed the picture tells us not only about the wide range of flowers growing (without a green house) in the Netherlands in the early 17th century, but also something about how they were grown and displayed in the gardens of the nobility. It illustrates how important flowers gardens were at this time. The painting also shows how the role of flowering plants was changing from the medieval symbolic and medicinal to a more aesthetic part of a beautiful garden. The idea of the plant collector was appearing, and at the same time gardeners and apothecaries were taking a more scientific approach to the understanding of plants. ([https://commons.wikimedia.org/wiki/File:Jan_Brueghel_I_%26_Peter_Paul_Rubens_-_Smell_\(Museo_del_Prado\).jpg](https://commons.wikimedia.org/wiki/File:Jan_Brueghel_I_%26_Peter_Paul_Rubens_-_Smell_(Museo_del_Prado).jpg))

When it comes to plants and flowers in art, we must not forget the era known as Art Nouveau or Modern Style with its famous artist Alfons Mucha. Born in Czech, living in Paris and United States, he used flower designs not only as a theme but also as decorative motive in his paintings. Here are designs consisting of daylilies (*Hemerocallis*) and peonies (*Paeonia*).



Alphonse Mucha's floral designs are famous world-wide, here are lilies, daylilies and peonies (wikimedia)



The palm of St. Peter in Padua Botanical Garden grows among medicinal plants



Heritage Plants in Botanical Gardens

A great demonstration of a plant which became heritage is a palm in the Padua Botanical Garden. The palm of St. Peter (*Chamaerops humilis* L.), planted in 1585, is universally known as the “Goethe palm”. The great German poet, after admiring it in 1786, formulated his evolutionary intuition in the “Essay on the metamorphosis of plants” published in 1790. This palm is found inside the “*Hortus sphaericus*”, in a special octagonal greenhouse.

A definition of a veteran tree or legacy tree: it is a tree which, because of its great age, size or condition, is of exceptional cultural, landscape or nature conservation value. In the Czech Republic, even though a law defining botanical gardens is absent in legislation, the legacy trees are defined by the law on nature and landscape protection. The oldest tree in the Czech Republic is the yew tree (*Taxus baccata*) called Vilémovický tis. It is called the oldest tree in central Europe with its estimated age being 1 500 – 2 000 years. But it does not grow in any botanical garden. In Poland, numerous old trees are preserved, including protected ones as monuments of nature. As was mentioned earlier in the section on Lithuania, the sacred oak groves with shrines were deeply worshiped and cherished by ancient Lithuanians. One of these treasures has survived until today: The Stelmužė Oak (Stelmužės ąžuolas) is an English oak (*Quercus robur*). It is believed to be at least 1 500 - 2 000 years old; which makes it the oldest oak in Lithuania and one of the oldest in Europe. It has been declared a natural monument.

Czech Botanical Gardens

When it comes to the heritage plants in Czech botanical gardens, it is necessary to mention these:

- The probably 200 year-old Indian cycad (*Cycas circinalis*), owned by the Botanical Garden of Charles University in Prague Na Slupi.
- Five tree-shaped camellias in Liberec Botanical Garden are among the oldest in Europe. Their estimated age is more than 200 years.
- Juniper bonsai (*Juniperus chinensis* L. ‘Echiniformis’) also in Liberec Botanical Garden was brought to Europe from Japan in 1882, at that time, however, it must have been at least a century old. The estimated age is over 230 years, which makes it the oldest known bonsai in Europe.
- The Prague ginkgo (*Ginkgo biloba* ‘Praga’) growing in the Botanical Garden of Charles University is at least 130 years old and it resembles a giant bonsai.

Polish Botanical Gardens - University of Wrocław Botanical Gardens

The most valuable tree specimens in the University of Wrocław Botanical Garden are old tree stands from the turn of the 19th century and 27 trees which are protected as a monument of nature. In the Arboretum Wojstawice, the largest and oldest specimen of Japanese umbrella-pine *Sciadopitys verticillata* in Poland and one of the oldest Polish specimens in of giant sequoia *Sequoiadendron giganteum* grow.



A 200 year-old common oak
(*Quercus robur*)



150 year-old male and female
maidenhair tree (*Ginkgo biloba*)

Polish National Collections

In Poland, national collections are established and maintained. They are the richest, properly documented, exemplarily marked collections within the defined systematic group, which are managed by plant specialists. New collections are still being created. Today, the University of Wrocław Botanical Garden has 9 National Collections in total.

The gene pools of native plant species threatened with extinction in Poland and the region are protected by creating their protection cultivation, numbering about 500 specimens. Plants for cultivation are propagated from diaspores gathered in nature, therefore in the event of a threat to the wild population they can be introduced into the natural environment.



The garden gathers old and local varieties of cherries, which before 1939 formed numerous roadside avenues and orchards. To protect the genetic diversity of old varieties of fruit trees, an orchard of historic sweet cherry varieties was established on the area of Arboretum Wojstawice. The cultivars were collected from the region of Lower Silesia. On an area of 12 hectares, 2 500 trees were planted, so they could serve as a gene bank.

In addition to plant cultivars with beautiful flowers and leaves, historical cultivars are also collected in the gardens, sometimes not very attractive, but with scientific and didactic significance.



The Polish Millennium Garden was created in 2019

There are known cases that after the death of a breeder, all their cultivars disappeared without a trace. Therefore, to enable the preservation of Polish cultivars for future generations, the **Polish Millennium Garden** was created in the Arboretum Wojstawice. It gathers the entire achievements of Polish breeders – both old cultivars found years later in private collections, as well as the latest ones.




Hemerocallis 'Brat Stefan Franczak' (Byczyński–Nowak, 2009)



Hemerocallis 'Henryk Sienkiewicz' (Byczyński–Nowak, 2010)



Hemerocallis 'Janusz Zakrzeński' (Byczyński–Nowak, 2010)



The Arboretum Wojstawice has carried out the breeding of daylily cultivars thanks to cooperation with several Polish plant breeders. A total of 219 new cultivars have been registered in the American Daylily Society. Some of the cultivar names were given to celebrate prominent figures from the Polish culture and science world, as well as important people distinguished in Polish history e.g. Brother Stefan Franczak – a Polish Jesuit and horticulturist, famous clematis and daylily breeder, Henryk Sienkiewicz – journalist, novelist and Nobel Prize laureate or Janusz Zakrzeński – prominent actor died in the 2010 Polish Air Force crash in Smolensk.

Lithuanian Botanical Gardens - Vilnius Botanical Garden

At Vilnius Botanical Garden, we are glad to have linden alleys which are about two hundred years old. But the tradition is still being carried on. On 7th April 2014, representatives of the parliaments and ambassadors of 28 EU countries visited the Botanical Garden and planted a symbolic ring of the EU countries from European linden (*Tilia xeuropaea*).

German Botanical Gardens – Park der Gärten

Breeders of the Region

The Park of Gardens is not a very old institution and it isn't a botanical garden in usual terms. They prefer to represent heritage plants in a different way, focusing on special gardeners and their breeding work in the Breeders of the Region series. Both theoretically in the exhibition Green Treasure Chest, as well as practically through special plant collections in the park itself, visitors learn about three local gardeners through interactive and playful elements. Each of the breeders has its own area in the park, which must be discovered afterwards. The characters are as different and unique as the facilities to represent them are. The general enthusiasm for plants and the joy of discovery, a pinch of adventurousness and the joy of beauty characterize these people. Their particular plant preferences are as different as their lives. The Park preserves this breeding fund and expertly cultivates it as a living gene pool, in a way like a reserve for the hereditary grounds of garden plants. But through the presentation of collections of already deceased breeders, Park der Gärten wants to present a sense of sustainable memory and the transfer of gardening knowledge. The presentation of important breeders of the region is also an expression of the deep roots of the park in one of the most important horticultural regions.

Ernst Pagels (1913 – 2007)

He, as a trained gardener, had the opportunity to work for Karl Foerster, the well-known perennial gardener and breeder from Potsdam. This had a decisive influence on his life as a perennial breeder. Like his teacher, he sees his work as a cultural task and not as a source of economic income. One focus of his breeding activities was on the *Salvia nemorosa* range. As his life's work, Ernst Pagels leaves behind more than 140 new perennial breeds from all walks of life. Today, around 70 cultivars are found in Germany's nurseries and, in some cases, worldwide,



Blue *Salvia nemorosa* in the Ernst-Pagels-Garten

such as China reeds (*Miscanthus sinensis*). Numerous awards prove the special qualities of these perennials. Proven and excellent Pagels' breeds are, for example, *Salvia nemorosa* 'Ostfriesland', *Epimedium perralchicum* 'Frohnleiten' or *Miscanthus sinensis* 'Malepartus'. He placed high demands on "his" perennials, and it took years of observation before he was sure that a new cultivar could be named and placed on the market and thus into the gardens. The Ernst Pagels Garden in the Park of Gardens was opened in 2005. With an area of just over 1 200 square meters, it is the largest plot in the park of the gardens. Both his well-known perennial breeds as well as others are brought into harmony there with their accompanying plants according to a special color concept.

Johann-Diedrich zu Jeddelloh (1914 – 1999)

Until his death in 1999, Johann-Dietrich was one of the most internationally recognized conifer specialists and collectors. From 1950, he devoted himself systematically to the breeding of conifers, especially *Pinus*. His passion was devoted to conifers from the very beginning and he immediately developed an eye for the special, the extraordinary. He discovered a black pine mutation that is remarkably small. In 1955, Jeddelloh launched it as *Pinus nigra* 'Jeddelloh'. *Tsuga canadensis* 'Jeddelloh' was the first resounding success of his breeding work, for which he was awarded many medals. As an enthusiastic dendrologist, he travelled throughout the world and brought rarities from all continents. He has collected, tested, selected and propagated a total of about 1 000 different conifers in species and cultivars from all over the world – 50 he even bred himself. The Pinetum – a linguistic creation of Pinus-Arboretum-Alpinum presents a small section of the collection

of Johann-Dietrich zu Jeddelloh senior in the Park of Gardens with about 200 species and cultivars of conifers. On an area of more than 300 square meters, dwarf-growing woods form the focal point of the collection, which differ in size, color, beface, and growth character in many different ways.



The nursery Zu Jeddelloh presents a collection of dwarf conifers combined with perennials and grasses in the Pinetum of Park der Gärten



Heather garden at Park der Gärten

Kurt Kramer (born 1943)

Kurt Kramer from Edeweicht began his professional career in 1958 with an ornamental horticultural apprenticeship. In 1970, he took over his parents' farm and began his independence with nursery crops and heather plants. In 1979, he received plant cultivar protection for the first time for *Calluna vulgaris* 'Annemarie', a randomly found red mutant. Another stage in the breeding work was in 1991 the issue of plant cultivar protection for the first bud-blooming heather 'Melanie'. This cultivar still has a market significance to this day and is marketed worldwide together with other breeds of the bud-blooming *Calluna* under the brand name "Gardengirls". To date he has registered numerous other heather cultivars for plant cultivar protection. It takes about seven to eight years from the breeding to the introduction of a new cultivar. Numerous cultivars of Kurt Kramer are planted in the heather garden of the Park of Gärten. The complex of this heather garden is designed according to natural images of the heathland landscapes. In addition, so-called island-beds show how heather plants can be embedded in the lawn.



Performing Art: Into the Welcoming Hour 2.0, Průhonice Botanic Garden, May 2019



GARDENS AS PLACES FOR CULTURAL EVENTS

Flower Exhibitions

Exhibitions are one of the ways how to present the garden assortment. Botanical gardens have extensive collections of different plants. Some of the gardens try to represent as much as possible of the whole range of the plant kingdom, others focus on selected genera. All of them have the same goal: to introduce the plants to people, from students of natural sciences to the general public. One of the best ways how to bring plants to people is a flower exhibition.

Průhonice Botanic Garden

This garden works with a limited number of plant genera, but with a vast number of items in each of the collections. When presenting its garden assortment, it uses the historical premises of Průhonice Castle. The flower shows are dedicated to one genera from natural species to modern cultivars. Together with flower arrangements, there are single cut flowers with cultivar names indicated, posters and information panels to educate visitors on the topic.



Flower exhibitions in Průhonice are popular among visitors

University of Wrocław Botanical Garden

Among other events propagating the garden's collections, Arboretum Wojstawice has been organizing a daylily enthusiasts meeting called HEMEROMania. It takes place during the full blooming period of the daylilies, usually in the second week of July. Together with the participation of daylily cultivation and breeding specialists from Poland and Europe, interesting lectures on daylilies are given, floral shows and exhibitions of the most beautiful cultivars of these plants take place, too.

Similar events are RODOMania dedicated to rhododendrons in May, the Peony Festival in June and the Festival of Decorative Grasses and Autumn Flowers in September. For an annual description, visit www.arboretumwojstawice.pl.



Peony Day exhibition in Arboretum Wojstawice



HEMEROMania in Arboretum Wojstawice is an annual event dedicated to daylilies

Vilnius University Botanical Garden

In Lithuania, people from Vilnius University Botanical Garden introduce flower exhibitions as the presentation of the garden's assortment as well. To increase the popularity of plants, the employees of the botanical garden organized dozens of flower exhibitions (of national and local importance) in Vilnius, Kaunas, Kalvarija (Marijampolė district), Šiauliai, Druskininkai, Telšiai, Naujoji Akmenė, Klaipėda, Panevėžys, Kretinga, Simnas (Alytus district), Marijampolė, Vilkaviškis and Merkinė (Varėna district). Plants grown in the Botanical Garden have been exhibited at international flower shows in Lithuania and abroad.



Peony flower exhibition in Vilnius University Botanical Garden



Flower exhibition in Vilnius municipality



Daylily flower shows are accompanied by guided walks to introduce the collections



A display of vegetables introduces the wide range and beauty of utility plants



The art of "skiautiniai" displayed in Vilnius University Botanical Garden



Gallery in Arboretum Wojstawice represents various artistic projects



Art Exhibitions

Botanical Gardens and their spacious lawn, meadows, groves, courtyards or galleries offer great opportunities for exhibitions of many kinds. Presenting arts, which are not necessarily related to botany or gardens, is another dimension of representing heritage and cultural life in the botanical gardens. Many of them cooperate with local artists on a regular base and hold shows connected to a certain season of the year of the specific event. Exhibitions can be a short time or permanent, when the art connects with the garden landscape. Various installations from different materials keep visitors interested all year round.

A very special event has been carried out at Průhonice Botanic Garden on, called Painting in the Garden, it combines an interactive part in which children create their works of arts directly in the garden together with its later presentation in a form of an exhibition in the gallery of Průhonice Park.



Painting in the Garden in Průhonice connects children with art and the garden



The open spaces of Vilnius University Botanical Garden host a variety of sculptures and art pieces. In mid-September, visitors are welcome to explore a large land art exhibition where artists from different fields present their works. The displayed pieces are created right at the Garden using natural and other materials; some of them remain at the Garden as decorative elements. The purpose of these exhibits is to unite art and nature, the artist and the spectator, and explore the relationships between them. From May to November, art exhibitions are held at the Museum of Lithuanian Nature. (More photos on page 101)



Land art installations in the Vilnius University Botanical Garden in all seasons



Installation "Society of the Future" in the Arboretum Wojstawice

Other Cultural Events

Music

Many gardens provide space for music performances. One example is a series of concert called Muzyka w Ogrodzie in the University of Wrocław Botanical Garden and Arboretum Wojstawice. From April to August, different music performers play for visitors in the afternoon once a month, sometimes as a part of larger public events like HEMEROMANIA. Park der Gärten, which has slightly different aims regarding the general public than the botanical gardens, presents about 15 – 20 music performances each season.



Concert from the “Music in the Garden” series – University of Wrocław Botanical Garden

Performing Art

The “Into the Welcoming Hour 2.0” project was a 2019 year-round research laboratory in collaboration with performers from the Department of Directing the Alternative and Puppet Theater at DAMU, which focuses on deepening relationships between people and the environment in which they live. The artistic performance, where performers build trust in interpersonal relationships, meditate, communicate with the environment, took place in the Průhonice Botanic Garden. (<https://www.youtube.com/watch?v=MM0d5DuJ6MA>)



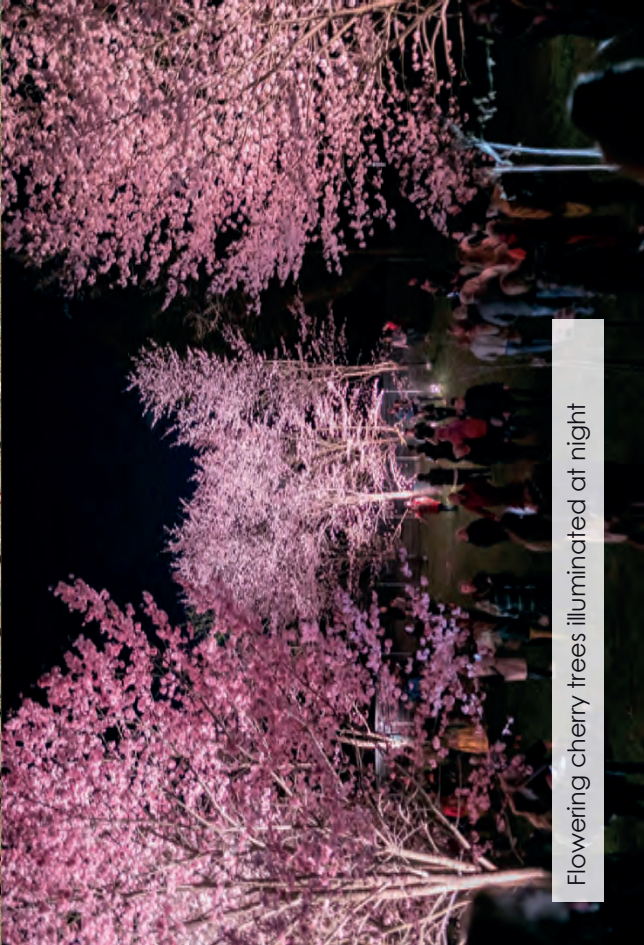
The live performance Into the Welcoming Hour 2.0 took place all around the Průhonice Botanic Garden



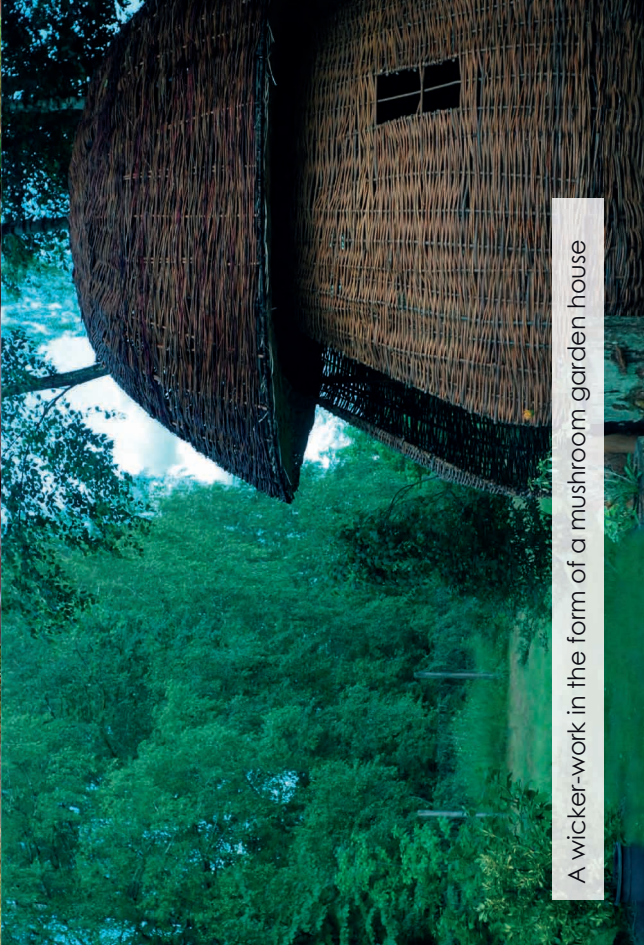
Guided walks in YU BG show different land art



Donated garden bench decorated with autumn foliage.



Flowering cherry trees illuminated at night



A wicker-work in the form of a mushroom garden house



EDUCATION IN BOTANICAL GARDENS

The organization Botanic Gardens Conservation International (BGCI) states as a current definition: “Botanical Gardens are institutions that maintain well-documented collections of live plants for scientific research, conservation, plant presentation and educational purposes.”

And again, according to the Cambridge Dictionary: “A botanical garden is a garden, usually open to the public, where a wide range of plants are grown for scientific and educational purposes.”

Which means education is one of the pillars of existence of botanical gardens. They can educate in many different ways with a focus on various target groups. In this part of the methodology booklet, examples from participating gardens follow to show similarities and distinctions in particular gardens.

Guided Walks

Together with other definitions, the American Public Gardens Association, more or less in line with BGCI, defines the term botanical garden, apart from a few others, by the following characteristics:

- It has been open to the public for at least some time.
- The garden functions as an ornamental exhibition, educational exposition and / or research site.
- Information is shared with other institutions and the public.

Guided walks are a common activity carried out by almost all botanical gardens. It is one of the best ways of how to introduce a botanical garden and its assortments, when curators of collections are brought together with the general public within guided walks in the garden. It can be only a small group of interested garden enthusiasts or a big crowd of tourists attending a large scale event in the garden. The best time for showing collections of plants is the peak of flowering of individual genera. Because for most of the collections, the flowers and breeding progress from natural species and first hybrids to the evolution of cultivars propelled by human effort, are the purpose of the collections. Guided walks represent an interactive method of educating people and sharing information about plants and their breeding progress, plant collections, their history and traditions and cultural heritage.



Guided walks can be focused on different plants e.g. irises in Průhonice Botanic Garden (left) or daylilies in Arboretum Wojstawice (right)



Curators of collections are like a treasure trove, when they lead guided walks; flowering Siberian irises in Vilnius University Botanical Garden (left) and daylilies in Park der Gärten (right)



Exhibition History of Forestry at the Visitors Centre of Průhonice Park, 2011

Educational Activities at Průhonice Botanic Garden

The garden has been open to the public since 1992, before it used to serve only for research purposes. Its focal point, when it comes to education, lies in guided walks dedicated to the gardens' selected genera: *Iris*, *Paeonia*, *Rosa* and *Hemerocallis*. Together with the garden presentation, occasional exhibitions with educational contents are organized. As an example we can mention a few. The exhibition called History of Forestry, held in cooperation with Arboretum Nový Dvůr, Department of Silesian Museum, was presented at the Visitors Centre of Průhonice Park in 2011. It presented dendrology in connection with Průhonice Park and explained the development of forestry throughout history and the continents.



Plants as Natural Cultural Heritage, Průhonice Botanic Garden, 2015

When the Czech academy of Sciences celebrated its 125th anniversary (1890 – 2015) in 2015, a special outdoor exhibition called **Plants as Natural and Cultural Heritage** was placed in Průhonice Botanic Garden along with examples of research programs of the Institute of Botany. This time, information panels were turned into oversized comics telling the story of plant journeys, re-discoveries, collections and the importance of preservation of ancient cultivars of ornamental plants.

Průhonice Botanic Garden also holds large historical orchards of fruit trees. To present this part of Czech heritage, since fruit trees are a significant part of the typical landscape in Bohemia and Moravia, **Pomological Days** were organized. It is organized in cooperation with the Czech Union for Nature Conservation (ČSOP),

the Research and Breeding Institute of Pomology Holovousy Ltd. (VŠÚO) and the Institute of Experimental Botany of the CAS. Visitors could see the fruit exhibition, taste freshly prepared ciders and juices and get acquainted with the novelties in apple breeding. The event also included a fruit display room, fruit determination performed by specialists and guided tours in our pomological arboretum with a tasting of just ripening pears and apples.



Display of local fruits – pears and apples during Pomological Days in Průhonice, 2020

Educational Activities in the University of Wrocław Botanical Garden

The Botanical Garden in Wrocław and Arboretum Wojstawice are beautiful places for people to relax, a major tourist attraction of Lower Silesia and they are also a scientific and educational center. The gardens provide an important background for scientific research and educational activities of the University of Wrocław and other universities and schools of the region. The gardens have a diverse collections of plants, and all the taxa in the collections are carefully and properly labelled. There are also a significant number of educational boards, so each visitor to the garden can individually expand their knowledge about plants. The educational offer also includes thematic guided walks, numerous gardening exhibitions, lectures and seminars, various workshops (photographic, artistic, culinary, floristic, etc.), expert advice and consultations on the protection and care of plants. Other educational activities include professional internships and appren-

ticsheps, horticultural therapy, integration with local action groups, dissemination of botanical and gardening knowledge in the media, and also the publication of folders, leaflets and other publications. In 2018 the Catalog of 1 000 Polish Varieties was published.

A large and diversified department of ecological education was established in the University of Wrocław Botanical Garden. It consists of an Alpine garden, special sections presenting the morphology and biology of plants as well as legally protected and endangered species. An important part of the educational offer of the Botanical Garden in Wrocław is also the exhibition – **Panorama of Nature**.



Panorama of Nature exhibition

In addition, the Arboretum Wojsławice includes permanent outdoor exhibitions – ethnographic collections of “Lower Silesian Village” and **GEoretum** complementing the set of cultural and educational offers. A historic manor farm, of a characteristic type called the manor-farm-park complex, along with its ethnographic collections are also a way to present the legacy of the Lower Silesia history and material culture.

Young visitors have a variety of playground and educational field games at their disposal, for example. **On the trail of the lost world**, the trail of “living fossils”, for trees that lived in the times when dinosaurs dominated the Earth.

3 Szzydlica japońska (*Cryptomeria japonica*)
Kopułki szczytów tych roślin zbliżone są do ok. 36 mln lat. W zbrakujących wyprawy 7 gatunków szczytów i były one ważnym składnikiem lasów. Obecnie pozostał tylko jeden – szzydlica japońska. Jej czołowe, zaszczone igły są sztywno wygięte, stąd nierzadko się polska nazwa. Te długowieczne drzewa żyją nawet kilka tysięcy lat. Najstarszy okaz, zwany Jomon Sugi, rośnie na wyspie Yakushima. Jego wiek szacuje się nawet na 3-6 tys. lat.



4 Mamutowiec olbrzymi (*Sequoia gigantea*)
Jedno z największych i najbardziej długowiecznych drzew na kuli ziemskiej. Rośnie tylko w górach Sierra Nevada w Kalifornii, w Parku Narodowym Sequoia. Wiek niektórych drzew szacowany jest na 3-3,5 tys. lat. Osiągają nawet 90 m wysokości, około 8 m średnicy pnia i wagi ponad 1200 ton. Najwyższy okaz, stąd już niemiętki, miał 133 m wysokości i 12 m średnicy. Skamieniałość świadczy, że przodkowie mamutowca pojawili się na Ziemi 145 mln lat temu.



5 Araukaria chilijska (*Araucaria arborescens*)
Te praktycznie nieznane drzewa iglaste. Ogniste szałwy do 50 m wys. i nagle porastają zbocza Andów – niektóre mają ponad 2,5 tysiąca lat. Pokojem przetrzymawszy długie lata w kłodach przekasło. Te wyjątkowe drzewa praktycznie nie zmieniły się od ery ordowickiej. Istnie zwały się ich dawne drzewo wyjątkowo cym gallego. Wyjątkowość i ogrom wielkości ludzkiej głowy wyjątkowo powściągnięty kłódki paproci.



ODSZUKAJ DRZEWIA, NA KTÓRE PATRZYWEY DINOZAURY!



LEGENDA

- kwatertereny parku
- sad
- horensje (*Hydrangea*)
- trawski kwiatowe
- koldkja drzew olejnych
- stianoczniki i azalee (*Rhododendron*)
- blonawe (*Fernowalle*)
- byliny
- sioke (*Rosa*)
- szlak „Dinozoro”

Era dinozaurów fascynuje ludzi na całym świecie. Czas egzystencji roślin i gadów to także okres formowania się kontynentów – superkontynent Pangea dzielił się, a woda, z osadów wulkanicznych wypiętrzania się góry i tworzenia wysokich gór zalewa wiele lądów. Na Ziemi dominuje bujna roślinność i klimat subtropikalny; dzień i nocma rozwija się imponująca fauna. Rodzime zwierzęta i lądodinozaury mają 16 m wys. 125 m dl., wazac przy tym ponad 80 ton. Dłopłok osiąga 27 m dl., a triceratops 9 m wys. i wazy 12 ton.

Dinozauri dominowały na Ziemi przez 135 mln lat
Pojawili się w trzecim, około 237 milia temu, rozprzestrzeni nych katastrof pod koniec kredy, 66 mln lat temu, na lądach rozpoczęło się wymieranie dinozaurów i roślin, a w morzach amonitów, belemnitów i wielu innych zwierząt. Dlatego większość z nich mamy wykastnie ze skamienia. Jednak nie wszystkie organizmy wymyly doszczętnie. Część zwierząt i roślin przeżyła katastrofę i dala początek współczesnym gatunkom. Niektóre rośliny nawzale się zmieniły od tamtych czasów, a ich potomkowie rosną w wojawickim Arboretum.

Gatunki relikwowe
to rośliny i zwierzęta, które stanowią pozostałość po dawnych epokach geologicznych (łac. relictum – pozostałość, przetrwały). W przeszłości miały szerszy zasięg geograficzny, a obecnie występują na niewielkim obszarze – często w ogrodach botanicznych, rezerwach przyrody i parkach narodowych. Zmniejszanie się terytorium ich występowania może świadczyć o procesie wymierania danego gatunku.

Żywe skamieniałości
to współcześnie żyjące organizmy, które obecnie nie są spokrewnione z żadnymi innymi gatunkami, a jedyni ich krewni są tznani ze skamieniałości.

Paleobotanika
to nauka o roślinności minionych er, zwana też botaniką przeszłości. Bada skamieniałe szczątki flory od prekambru do zwiartoredu.



Worksheets leading children around the living fossils trail



Various workshops guide visitors through educational and cultural topics in the Arboretum Wojstawice



GEOretum in the Arboretum Wojstawice – outdoor exhibition of rocks and minerals in Lower Silesia

Educational Activities in Vilnius University Botanical Garden

In the Vilnius University Botanical Garden, educational activities are carried out using the accumulated knowledge and experience. In the Garden 12 educational programs are prepared, while the Garden actively participates in science promotion events (such as Researchers' Night, science festival Spaceship Earth, etc.) The Garden has been open to the public since 2000 and now this territory has educational, recreation and tourism value, too. It is a wonderful educational space where botanical, ecological and heritage knowledge is communicated to students, schoolchildren and adults through interesting educational activities: guided tours, academic events, lectures, exhibitions, fairs and workshops. Information is available to visitors on the web-site www.botanikos-sodas.vu.lt. The web-site www.pilys presents the Garden as an object of cultural tourism.

Every year, Vilnius University Botanical Garden organizes an educational event called **Peonies**, which aims to introduce these plants to the general public and promote them in the country. A guided walk takes place in the peak flowering season of peonies. During the educational tour, the plant taxonomy, the species and cultivars growing in the botanical garden are introduced, the variety of decorative features is shown and the Lithuanian cultivars and breeders are introduced. Information on planting, cultivation and care, most common diseases, pests and ways to fight them are also provided.



Introduction of a perennial assortment in Vilnius University Botanical Garden

All collections in the garden are used for various thematic education events. The collections that are used in the activity depends on the topic, e.g. „The Most Beautiful Garden Blossoms and Their Secrets“ is conducted in May – September. The educational activity is more focused on children, but it can also be adapted for adults. During this education, the variety, colors and inflorescences of herbaceous and woody plants are introduced and flower attendees are observed. Plants that bloom and do not bloom are introduced. In the spring, the flowers of violets, primroses, tulips, peonies and irises are explored, in summer – lilies, roses, or astilbes, and in autumn – dahlias, gladioli, chrysanthemums, autumn crocuses and other plants. There are 75 free educational tours and 261 paid ones per year.



Educational Activities in Park der Gärten

In Park der Gärten, as soon as you enter the park, you can take a first look at the garden with three outstanding German gardening personalities. In the permanent exhibition called Green Treasure Chest (Grüne Schatztruhe), the visitor is acquainted with three gardeners through interactive and playful elements: Ernst Pagens, Johann-Diedrich zu Jeddelloh and Kurt Kramer. Each of these three breeders has its own area in the park, which must be discovered afterwards. The characters are as different and unique as the facilities that these three breeders represent in its series called Breeders of the Region. Both theoretically in the exhibition, as well as practically through special plant collections in the park itself. The exposition was created in 2013. Among other topics, it interactively demonstrates the journey of exotic plants from their faraway origins to the Park of Gardens in Germany. An attractive addition to the pedagogical offers is the interactive aspect of the experience within the exhibition, where school classes have the opportunity to discover and explore interesting aspects of the world of plants, for example in connection with a booked activity.

As a unique garden and park, the barrier-free Park of Gardens presents, as an approved out of school educational institution, a manifold pedagogical offer **School in Nature** (Schule im Grünen) for any type of school or grade also for integration or inclusion schools. This offer contains approximately 30 programs, is designed as age-based and is being constantly updated. The contents and methods are in line with actual practice and are focused on the core curricula and the acquisition of competences in the sense of education for sustainable development. The pedagogical choices can be used for introduction to a study topic, an extension and deepening of knowledge or can be used inter-disciplinarily. Each year, approximately 170 school classes book these offers.



Ward's Box in the Green Treasure Chest exhibition



Research station about the plants at Park der Gärten



Qualified educators or specialists of the educational partner organisations (e.g. Centre for Environmental Education of the district of Ammerland, and Botanical Garden Oldenburg) lead the 90-minute lessons.

The offer of the lessons are for:

- Elementary and primary schools: Playful exploration of nature (with all the senses) and first acquaintance with the basics knowledge of nature and plants including knowledge transfer.
- Secondary schools: Pedagogical offers about the diversity and the physiology of plants, plant descriptions and phenology, adaptation to location and climate, (flowering) plants and insects, biodiversity or future topics like renewable resources and bioenergy.
- High schools and professional education: Practical acquaintance with the occupational field of horticulture.



Playful exploration of nature, guided by educators

During the opening season from mid-April until the beginning of October, inter-company vocational training courses for landscaping apprentices from all over Lower Saxony take place at **Action Field Landscaping** („Aktionsfläche Garten – und Landschaftsbau“), demonstrating the occupation of landscapers to park visitors at the same time. In these inter-company level courses, contents are being taught and tightened which cannot be taught during in-company vocational training lessons.



Vocational training of landscape apprentices within the park as good advertising for the profession of gardeners

In the time between these above company landscaping courses, this place is also being used for practical instructions in educational courses for the “Meister” degree (which is a specialty in German practical professional education) of the professional school Master school in the green (Meisterschule im Grünen) nearby as well as for professional contests and vocational orientation of younger students.

Because of the abundance of the nearly 9 000 labelled plants, the park is also used for the education of apprentices and students in horticulture and in biology of the University Oldenburg. The park also provides itself as a partner for the University and works with students to realize bachelor's or master's and doctoral theses. This will give young academics the opportunity to conduct their research.

At the cashiers counter, an “explorer's diary” is offered, which guides a rallye through the park with tasks concerning nature and riddles about it. It is designed for young visitors in grades 2 to 6 (approximately 8 – 12 years old). For all children and teenagers up to 18 years of age accompanied by adults, the park entrance is free.

The Garden Academy Lower Saxony of the Chamber of Agriculture Lower Saxony (Niedersächsische Gartenakademie der Landwirtschaftskammer Niedersachsen) is the partner for education activities of the park like advice, workshops and lectures for hobby gardeners.



Explorer's diary with tasks concerning plants



Garden workshops by the Garden Academy Lower Saxony

The Garden Academy Lower Saxony offers among others:

- occupational training workshops for horticultural professionals
- workshops for hobby gardeners
- lectures for societies and groups
- a garden helpline (telephone)
- personal advice at a garden helpdesk in the Park of Gardens
- garden workshops with field trips
- radio garden tips



Lectures about brand new *Hydrangea* at the park stage

The green "cluster" consisting of the Park of Gardens, the neighbouring Research Station for Horticulture with its inter-company vocational courses for apprentices and the professional school „Meisterschule im Grünen" in this place forms a high concentration of competence and knowledge of horticulture for the benefit of the park visitors.



Pupils of elementary schools are learning the basics of plant propagation



SOCIAL OVERLAP FOR LOCAL COMMUNITIES AND RECREATION

Many botanical gardens participate in international events connecting the general public with scientists and the gardens. They can be for instance:

Fascination of Plants Day

Organized by European Plant Science – EPSO is an independent academic organization that represents more than 220 research institutes, departments and universities from 31 countries in Europe and beyond. EPSO's mission is to improve the impact and visibility of plant science in Europe. The goal of the event is to get as many people as possible around the world fascinated by plants and enthused about the importance of plant science for agriculture, in the sustainable production of food, as well as for horticulture, forestry, and all of the non-food products such as paper, timber, chemicals, energy, and pharmaceuticals. The role of plants in environmental conservation is also a key message. Fascination of Plants Days is now bi-annual with thousands of events across the world. (<https://epsoweb.org/events/>)

International Biodiversity Day

It is annually held on May 22. It was declared by the United Nations General Assembly to not only alert but also slow down the rate of loss of plant and animal species on our planet. The Convention seeks to protect species diversity at all levels (genetic, species, ecosystem and cultural), to make sustainable and rational use of its components, and to fairly distribute the profits of the use of genetic resources. (<https://www.cbd.int/idb/>)

Open Garden & Squares Weekend

The event started in 1998 in Great Britain, where the London Parks & Gardens Trust has been co-ordinating an annual event in June opening London's hidden green spaces to the public. The project met with great acclaim and gradually became traditional throughout Europe and the Commonwealth countries. Its mission is to increase people's awareness of garden art, garden architecture, parks, gardens and public spaces. To present the field to the public and to introduce individual objects with their stories and secrets and bring people an experience of knowledge.

In each of the countries, different organizations grant patronage to the event. For instance in the Czech Republic they include the Czech Landscape and Garden Society (Společnost pro zahradní a krajinářskou tvorbu) and the National Heritage Institute (Národní památkový ústav). (<https://www.opensquares.org/> ; <https://www.vikendotevrenychzahrad.cz/>)

CONNECTING CULTURES

Japanese Day in Průhonice Botanic Garden

On the first weekend in June, a **Japanese day** is regularly held in the Průhonice Botanical Garden in cooperation with the Czech-Japanese Association, Prague Sogetsu study Group and Japanese Embassy. An important part of the event is also an exhibition of ikebana, a Japanese style flower arrangement, usually accompanied by a workshop. There is also a regular children's painting competition Painting in the Garden at the same time. The following are a few examples from the wide range of performances:

- Martial arts demonstrations – Aikido Kenjukai (aikido), Kacubo Kenrikai (kendo), Nakagawa rju (kenjucu), Bujinkan Prague (ninjucu), Japanese archery (kjudo) and a workshop with a commented Judo show
- Other workshops – origami, dressing up in a kimono
- Music performances – Drum show Wadaiko Yosa-Yosa, bamboo flute shakuhachi
- Edibles – traditional Japanese pastry wagashi, tea ceremony performed by Urasenke Tea School and takeaways from Japanese restaurant Miyabi
- Lectures on Japanese culture, plants and gardens



Wadaiko Yosa-Yosa drum show, Průhonice, June 2019



Various activities take place on the Japanese Day in Průhonice Botanic Garden

Chinese Peony Day in Arboretum Wojstlawice

A **Peony Day** has been organised at the Arboretum Wojstlawice each year at the beginning of June since 2016. During that day, it is possible to participate in a wide range of attractions, including: Chinese calligraphy workshops, learning Chinese, taking part in “Gong-fu cha” – a tea ceremony. In the gallery building, visitors can admire the thematic floral exhibition of these noble flowers, seeking advice from specialists on cultivation, disease and pest control, as well as preparing peony soaps. The Peony Day is accompanied by guided walks and a plant fair. In 2019, in the parent unit in Wrocław, where Plant of the Year is chosen for each gardening season, the exhibition “Year of Chinese Plants” was organized. Peony had a special place in the exhibition. The Inauguration of the Year of Chinese Plants took place on 26 May, which could take place as a result of the cooperation with the Confucius Institute of the University of Wrocław. On that day, it was possible to take part in lectures given by scientists from both Poland and China, and in workshops on Chinese calligraphy, creating Chinese fans, painting patterns on Chinese porcelain and trying on a traditional Chinese costume. There were also shows of Chinese art, such as Chinese dance, a flute concert, Guzheng, Opera Huangmei, Guqin and taichi. There was also an opportunity to see a tea ceremony with a tea tasting. The garden guests also had the opportunity to buy peonies and other plants at the plant fair.



Peony Day exhibition in Arboretum Wojstlawice.

OTHER PUBLIC EVENTS IN BOTANICAL GARDENS

Pumpkin Festival in the University of Wrocław Botanical Garden

With a tradition of more than fifteen years, it is the most colourful autumn festival in Wrocław. Its main attractions include competitions for the biggest, strangest and most delicious pumpkin. Children and young people can take part in an outdoor visual art workshop. A large number of stalls offer various products, including edible and decorative pumpkins, local food products, jewellery or handicraft items.



Lower Silesian Pumpkin Festival

Vilnius University Botanical Garden

In 2019, the garden organized more than a hundred events for the general public in the Garden. Every year, a number of events take place at the Garden; some of them have already become traditional being held from year to year. On 22 May, the International Day for Biological Diversity is celebrated all over the world; the purpose of this day is to introduce the public to the enormous diversity of life on the Earth. Since 2001, this day has been celebrated in Lithuania; the festival organized on this occasion by the Vilnius University Botanical Garden together with the Ministry of Environment includes lectures, educational tours, art exhibits, and concerts. In September, the Researchers' Night event is organized in the Garden. The visitors can attempt to clone plants in the lab, evaluate the taste of fruits and berries as well as identify and describe various plants. The Garden has been awarded internationally. It has received an award of the website Trip Advisor – it got the Certificate of Excellence for “continually increasing a number of visitor-friendly responses”.



Park der Gärten

The Park of Gardens stands for far more than Germany's largest complex of sample gardens and a paradise for plant enthusiasts and specialists. Its „green“ and cultural events like the different garden fairs, plant topic sessions, lectures, guided tours or the „Mystic Nights“ as the largest light installation in Northwest Germany, make the park a pulsating meeting place for both young and old. It is a perfectly neat, multigenerational park and a place for recreation – a green oasis.



The Mystic Nights are the largest light installation in Northwest Germany

In a region with a lot of plant producers and breeders, the “baptism” of new cultivars in the Park of Gardens is very common. Nurseries often use the public location and the green surrounding for events to introduce their new plants, for example *Rhododendron*, *Rosa* and *Calluna*. Even in the future, the park aims to develop as a regional trendsetter for garden culture, an up-to-date showplace of the horticulture of Lower Saxony and a touristic light house in the heart of the Ammerland park region.

In contrast to botanical gardens, the Park of Gardens is currently a showplace for 140 commercial companies from all sectors of horticulture, presenting their products and services in sample gardens and in other contributions. Each year, a group of about 20 nurseries present their new plant breedings and introductions



to park visitors (“Trend- und Neuheitenschaufenster”). The visitors have the possibility to vote for their favourites. Most of the plants are planted afterwards in the park. Beside the presentation of plant collections, these more than 40 sample gardens serve as examples for landscapers and garden architects for their gardening work and other methods of education.



Baptism of Rosa ‘All-in-One’ by The breeder Reinhard Noack



Planting of the new Rose ‘Sweet Honey’ with the Deutsche Blumenfee and the Rosenkönigin Sangerhausen



Daylily auction




Garden fair



Presentation of brand-new cultivars from regional nurseries



The Mirror Garden (Spiegelgarten) presented by Böhle Nursery



Traditionally, the garden's season ends with The Day of Apples. It is an extensive exhibition of over 300 rare, regional or widespread apples accompanied by the determination of the apple varieties and large autumn plant market, plus more attractions focused on apples. With a topic saying: "Perhaps there are still old undiscovered treasures in your garden", anyone who owns an unfamiliar apple variety in the garden is most welcome.

A similar event is carried out at Průhonice Botanic Garden under the name Pomological Days only with a more scientific approach and guided walks in the gene-pool historical orchard, where visitors can taste different fruit.



Old German sorts of apples display in Park der Gärten

Treasure hunt through the park as a birthday program

Another offer for young park visitors is the opportunity to celebrate their children's birthday within the park. They have the choice between four different programs.



MANAGEMENT AND ECONOMIC INDICATORS

Botanical gardens can be seen as a significant part of European culture and history. Since medieval times, they have been connected with education through universities or monasteries. They gather different plant collections, for different purposes (medicinal plants, biological and botanical study, research, recreation, design or art). These plant collections can also be considered as a display of a continuous human effort creating specific cultural values. Plant breeding is a long process requiring deep knowledge and patience; its results are works of art. Different gardens have different ways of how to present the historical, cultural and social values of the gardens to the public. The botanical gardens cooperating on the B-Ardent! project are located in different countries, within various organizations. They have a different climate, soil, resources or maintenance. But after all, they can, focus on the same assortment of plants.

The co-operation of botanical gardens is essential for sustainability and further development of the traditions, recently in the new light of global climate change and globalization, which is bringing new problems and tasks in plant cultivation. Developing a partnership between gardens from different countries creates many ways of co-operation. They are all part of European cultural heritage and working together across borders on a common project promotes internalization within Europe. Partners of the project share their cultures and values, demonstrate their perspectives and exchange experiences.

Two examples of a different institution of the project are the following:

Vilnius University Botanical Garden

In 2019, the Garden was visited by more than 90 thousand of visitors (about 10% of them are the tourists from abroad). It is a well-known tourist destination in Vilnius, Lithuania. Competition between tourist objects in Vilnius including nature or thematic parks is high; therefore, it is important for tourism products such as the Vilnius University Botanical Garden to understand its visitors and their specific needs. This knowledge enables developing services related to the visitor's reception. Quantitative and qualitative research was conducted by means of a few surveys: staff questionnaires, income analysis, and Internet homepage visits. Visitors' behavior and demographic profiles were analyzed as well. More than a half of all the visitors came to the Garden with clear expectations: to visit either a fair or a guided tour, a concert or find other entertainment. Most of the visitors choose late spring, summer or early autumn, between 12 a.m. and 2 p.m. on Saturdays and Sundays. Most visitors are Lithuanian citizens from Vilnius or cities which are close to Vilnius. The most loyal visitors are female from 25 to 34 years old. The garden has been awarded by the European Garden Association (Natur im Garten International) with its headquarters in Austria as the winner of first place in the competition of

ecological gardening, the category Gardening without a garden for the transformation of a garden lab to the green multifunctional building.



Northern view to the awarded new green multifunctional building in VU BG

Park der Gärten

The Chamber of Agriculture Lower Saxony is the main proprietor of the non-profit corporation Park of Gardens (Park der Gärten gGmbH).

The park of gardens is the top certified park all over Germany. It is among others certified as

- Approved barrier-free "Reisen für Alle"
- Exceptionally child-friendly
- Service quality Germany (Service Qualität Deutschland).

The park stands for a high service quality, the staff members extraordinarily care for the complete satisfaction of the visitors. The park team permanently makes the effort to meet the service standards and even to improve them.



The touristic appeal of the park in connection to its revenue of entrance fees is an important economical aspect of the park. During the opening season, 130 persons are employed for maintenance and administration tasks, as tour guides, in the education program of the park, in the connected garden center or in the catering services.


Each year, approximately 155 000 paying visitors are counted, plus 25 000 children, teenagers and guests of the cultural events at night, which are to be paid separately. Actually the cost recovery from the ticket sales is approximately 80%. The shareholders of this non-profit corporation are the Chamber of Agriculture Lower Saxony (Landwirtschaftskammer Niedersachsen), the community of Bad Zwischenahn, the district of Ammerland and the professional organisations of the horticultural sectors, which co-finance the Park of Gardens through long-term payment liabilities. They ensure the future of the Park of Gardens as an institution for garden culture.



Mixed borders are among the highlights in the park

Management and Economic indicators

In this table, important economic issues are presented. In the form of survey information summarized in synoptic spreadsheets and charts, it is easier to understand the differences and similarities of participating botanical gardens.

	Průhonice Botanic Garden Czech Republic	University of Wrocław Botanical Garden Poland	Vilnius University Botanical Garden Lithuania	Park der Gärten Germany
How many botanical gardens and arboreetums are in your country?	40	40	9	68
Who is founder / provider / owner of your garden?	Institute of Botany, Czech Academy of Sciences	University of Wrocław	Vilnius University	Chamber of Agriculture Lower Saxony, Community of Bad Zwischenahn, District of Ammerland, horticultural companies
What type of legal entity is your garden?	Public Research Institution	Public Research Institution	Core Department of Vilnius University	gGmbH (nonprofit organisation)
What is size of your garden?	12 ha open to public 5 ha of background fields	Botanical Garden main branch 7.48 ha; Arboretum Wojstawice 62.0 ha	Total area is 199 ha	14 ha
What is your opening season of the garden?	May - September	April-October	January - December	April - October
How many employees are in the garden?	8 full time employees	64 full time employees	93 full time employees	5 full time employees
How many employees are gardeners and curators of living collections?	3 curators + 5 gardeners	10 curators + 42 gardeners	23 curators + 5 gardeners	3 gardeners
How many volunteers work in your garden?	0	2	401 persons (1308 hours)	15 persons for Hemerocallis season
Do you hire a company for the season?	No	No	No	2 companies during the season
What is approximate number of visitors per year?	20 326	225 500	90 000	180 000





FINANCIAL FLOWS

Summary of the Botanical Gardens Defaults and Structures

Institute of Botany, Czech Republic

It is a part of the Czech Academy of Sciences, registered as a public research institution. The Academy is owner and warden of the Průhonice Park and castle, which is a National Heritage Site and UNESCO World Heritage Site. The Průhonice Botanic Garden is a department of Průhonice Park, which was founded in 1885.

Vilnius University Botanical Garden, Lithuania

It is a core department of Vilnius University, the leading institution of the high quality of science and education in Lithuania. However, it is also proud of its rich history and the valuable heritage it owns. The Vilnius University Botanical Garden, established originally in 1781, is also the leading, representative garden of the country.

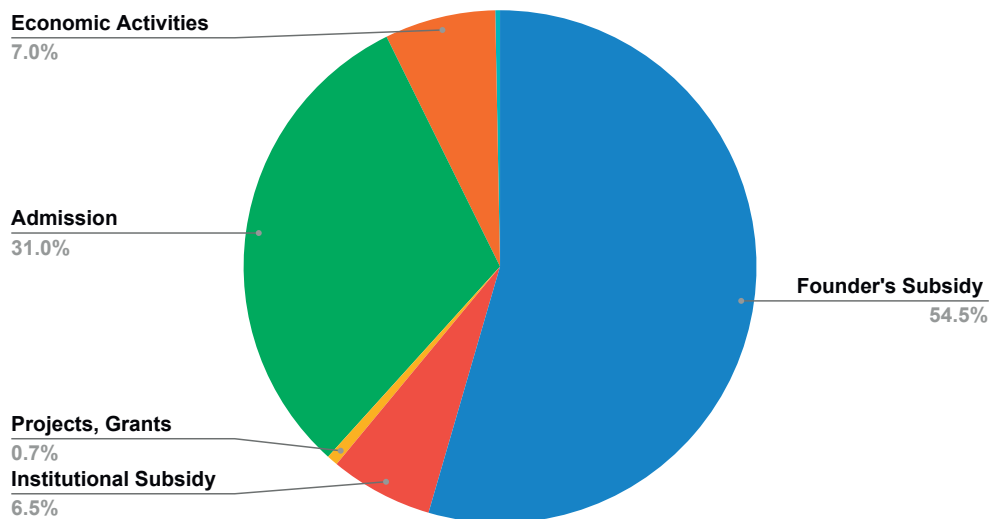
University of Wrocław Botanical Garden, Poland

It is the second oldest institution of this type in Poland and it is part of the national heritage. It was created in 1811. It is one of the most important institutions in Poland with the largest collection of plants. The Garden is an important and well recognizable green area located in the center of the city as an object for recreation, education, cultural events and tourism. Arboretum Wojstawice founded in 1821, has become a branch of the University of Wrocław Botanical Garden.

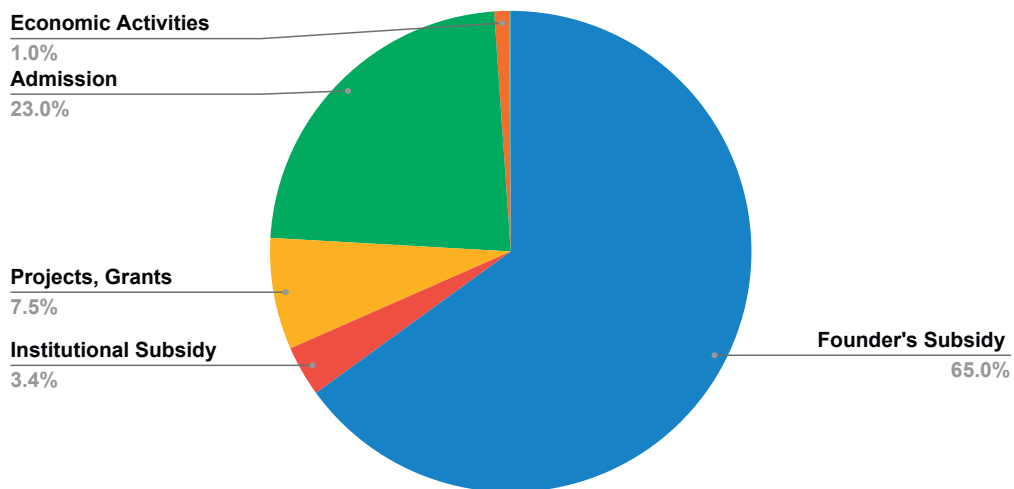
Park der Gärten, Germany

It is a nonprofit organization (gGmbH). Originally a park of the gardens initiated as the first Lower Saxony State Garden Show in 2002. The Park with its partly supra-regional famous and worldwide unique plant collections is multiply cross-linked. As heritage, it has risen in the heart of the region of Ammerland, one of the largest production centers for hardy nursery stock in Europe.

Financing of Průhonice Botanic Garden

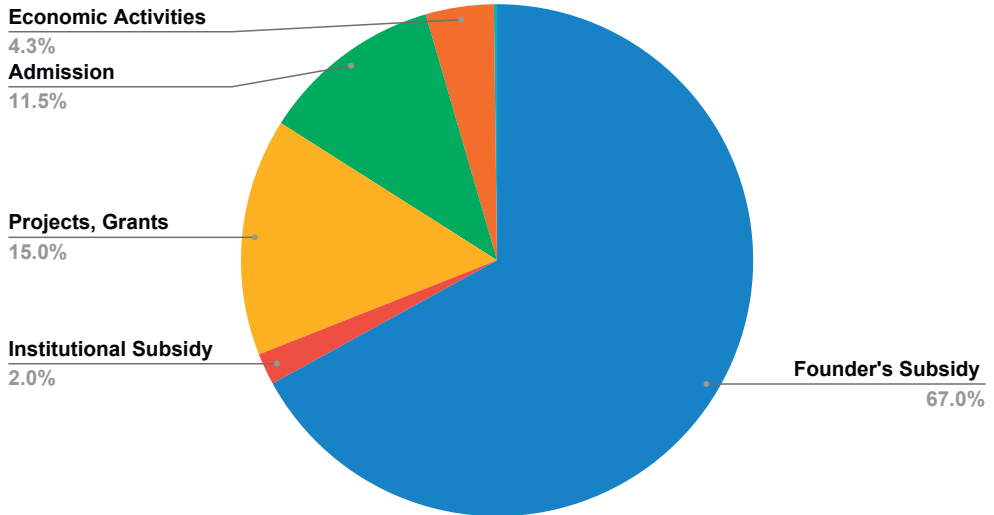


Financing of University of Wrocław Botanical Garden

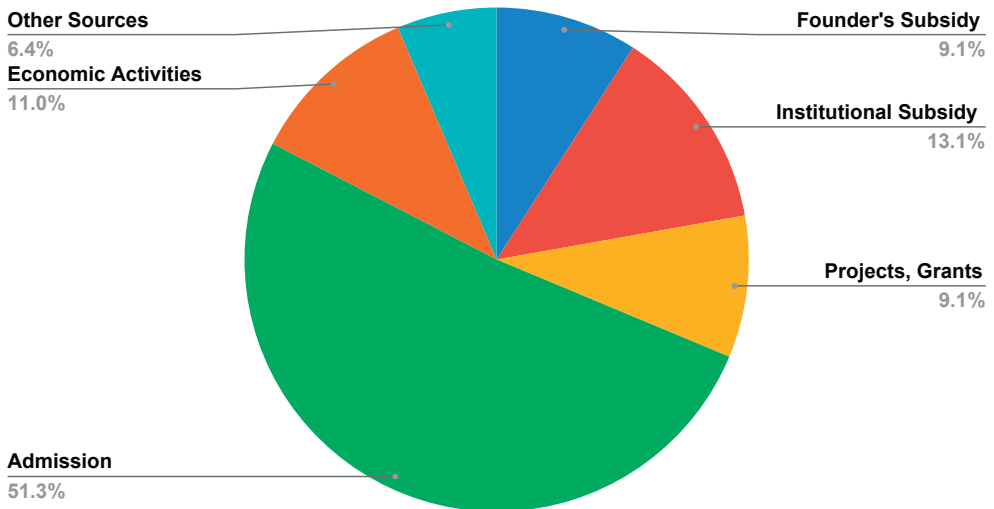




Financing of Vilnius University Botanical Garden



Financing of Park der Gärten





		Průhonice Botanic Garden	University of Wrocław Garden	Vilnius University Botanical Garden	Park der Gärten
Founder's Subsidy	%	54,5	65	67	9,10
Institutional Subsidy	%	6,5	3,4	2	13,10
Projects, Grants	%	0,7	7,5	15	9,10
Admission	%	31	23	11,5	51,30
Economic Activities	%	7	1	4,3	11,00
Other Sources	%	0,3	0,1	0,2	6,40

The gardens deal with different financial resources and organizational issues related to their history or are focused on different target groups of visitors. Educators and students work at each botanical garden and they can focus on research at the local or international level. Botanical Gardens offer season-specific jobs and initial training for new full-time or temporary staff. Working in a botanical garden has many levels from a tractor driver to collections' curator. Each botanical garden is a unique location with a common mission and they have proved to be a valuable part of European cultural heritage.

Connections in the heritage – the Botanical Garden in Wrocław is located next to the Collegiate Church of the Holy Cross and St. Bartholomew, where Nicolaus Copernicus took a sinecure during 1503 – 1538





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Arboretum Wojstawice. <https://www.arboretumwojstawice.pl>

Park der Gärten. <https://www.park-der-gaerten.de>

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Editor: Macháčková Markéta

English corrections: Alegro services, Praha. Czech Republic

Graphics and typesetting: Nová tiskárna Pelhřimov s.r.o, Czech Republic

Expert review: Ing. Lenka Křesadlová, Ph.D., Methodical Center of Garden Culture in Kroměříž, National Heritage Institute, Czech Republic

Published by: Botanický ústav AV ČR, v.v.i., Zámek 1, 252 43 Průhonice, Czech Republic, 2020

Print: Nová tiskárna Pelhřimov s.r.o, Czech Republic

Number of pages: 140

Number of copies: 1 000

ISBN: 978-80-86188-63-8