

2019-2024

MANAGEMENT PLAN



**NATURAL HISTORY AND SCIENCE MUSEUM
OF UNIVERSITY OF PORTO**

Botanical Garden of Porto

U. PORTO

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INTRODUCTION



1. Introduction

1.1. Location

The Botanical Garden of Porto is located in a densely populated area of the joint parishes of Lordelo do Ouro and Massarelos and integrated in U.Porto's Campus (Faculty of Sciences, Faculty of Arts, Faculty of Architecture and future Faculty of Nutrition and Food Sciences).

With its main entrance located on Rua de Campo Alegre, the Garden is also home to the Hall of Biodiversity – CCV, a museum where art meets science and natural history.

Other gardens/museums of interest can be found within a relatively short distance from the Garden, such as the Serralves Park and Museum of Contemporary Art, the Palácio de Cristal and its gardens, the Soares dos Reis National Museum, the Tramcar Museum and the Romantic Museum.

1.2. Ownership and management

The Botanical Garden and the Hall of Biodiversity - CCV are two units of the U.Porto Museum of Science and Natural History (MHNC-UP) and thus belong to the University of Porto. They are both independently managed under the superior management of MHNC-UP, which, in turn, is supervised by the vice-dean for Culture, *U.Porto Edições* (university press) and Museums.

1.3. A brief history of the Garden

The Quinta do Campo Alegre (Campo Alegre Rural Property) was originally owned by the Order of Christ and bought by João Salabert in 1802. However, in 1817, his property was confiscated, and the Quinta was purchased by João José da Costa (1820), In 1875, the Quinta

was bought by José Silva Monteiro, who built the palace, the greenhouses and changed the structure of the Garden. The Quinta was again purchased by João Henrique Andresen (1895), and the Andresen family made further changes to the palace and gardens. The owners, João and Joana Andresen, were the grandparents of two famous Portuguese writers, Sophia de Mello Breyner Andresen and Ruben A.

In 1949 the Portuguese Government bought the property from the Andresen family and in 1951 the Botanic Garden of Porto was settled as part of the Faculty of Sciences of University of Porto. In 1954, Karl Koepp, a German landscape architect, drew up a master plan in order to adapt the Quinta to a Botanic Garden. The proposed plan was focused on the conservation and adaptation of existing spaces as well as the creation of new gardens.

With the construction of the Arrábida Bridge, the area of the Botanic Garden was reduced from 12 to 4 hectares. As a compensation for this loss, the Quinta Burmester was added to the Botanic Garden (1,8 hectares).

In 1974, the Garden showed signs of degradation and in 1983 was closed to the public.

In 2001, the University of Porto appointed a commission to recover the Garden and started a maintenance program to contain the degradation; the Garden reopened to the public this year.

In 2006, the Botanical Garden temporarily closed its doors to the public for renovations, reopening in 2007.

In 2008, management of the Botanical Garden passed from the Faculty of Sciences to the Dean

of the University of Porto, under the supervision of the Museum of Science and Natural History.

1.4. Features of the Garden

With an area of around 4 hectares, the Botanical Garden is a place of reference in Porto. It has been shaped across different periods of time and its historical value is evidenced by the preservation of the botanic collections and layout of the gardens.

Scenic, floral and literary elements coexist in what was once an inspirational place to Sophia de Mello Breyner Andresen and Rúben Andresen Leitão.

The Botanical Garden is currently organized in three tiers with distinct characteristics. The first tier includes the Hall of Biodiversity and the formal gardens, separated by high hedges of centenary camellias and influenced by the Arts and Crafts movement. The formal gardens are divided into several spaces: the groves, the Shale Garden, the Fish Garden, the Rose Garden and the "J's" Garden.

1.4.1. Groves

The groves represent the tastes of the late 19th and early 20th centuries, with a predominance of azaleas and rhododendrons.

The groves are small, ordered woods that surround the house at north, east and west. They display a naturalistic composition, casting an ambiance of shade and faint light. Unveiling a typical collector's interest, they create multi-layered habitats of large trees and shrubs with an unusual assemblage of exotic species mainly represented by cedar, araucaria, sweetgum, lime, tulip tree, camellia, rhododendron and redwood. Some places in these groves are

mentioned in Sophia's tales and poems. It feels good to walk in the dappled shade and look up through the fine lace of branches to the sky above.

The entrance to the Botanical Garden is flanked by the **Araucaria Grove** and the **Cedar Grove**.

The **Bronze Boy Grove** is linked to Sophia de Mello Breyner Andresen's short story "The Bronze Boy". The statue of the lady in the middle of the lake inspired the central character of this flower tale – the Bronze Boy. The garden dates back the late 19th century but was subject to alterations in the 1950s.

The **Sweet Gum Grove** gets its name from the existing sweet gum specimen (*Liquidambar styraciflua*), and is also a place of reference in Sophia's story "The Bronze Boy".



Bronze Boy Grove

1.4.2. Rose Garden

The Rose Garden is a formal garden delimited by high hedges of old camellia cultivars. It develops like a huge carpet, facing the south of the house, with a geometric pattern layout typical of the late 19th century. It is a simplified habitat, dominated by shrubs and sub-shrubs, displaying a floristic composition with a significant chromatic, textural and olfactory contrast. It is the most luminous and central space of the Garden, where hybrid

tea rose cultivars grow among aromatic bushes. In its corners, young cypresses rise, pointing up to the open sky.

At the back of the Rose Garden, there used to be a bust of Professor Américo Pires de Lima, a Professor of the University of Porto and the main advocate for the establishment of the Botanical Garden in Quinta do Campo Alegre.



Rose garden

1.1.1. Fish garden

The Fish Garden is a space enclosed by high hedges of camellia, made of grass beds bordered by low boxwood hedges ("parterre a l'anglaise"). Created in the 1950's, the garden owes its name to the shape of the central flowerbed. It forms a habitat dominated by herbaceous and shrub coverings, punctuated by citrus and cypresses, with a small collection of ancient roses celebrating Spring. It is sunny and bright, good for outdoor performances, and also to be sitting, to read and paint.



Fish garden

1.1.2. "J's" garden

The "J's" Garden is a formal space designed by low boxwood hedges, encircled by historic camellia hedges. It maintains the symmetrical tracing of the late 19th century, with J-shaped beds — the initials of João and Joana Andresen, former owners of the Campo Alegre estate.

It is a habitat of shrubs and herbaceous plants (bulbs and annuals), where the wavy flowerbeds invite the children to wander and play, exploring the possible labyrinth. At the northern top, under a wisteria, a tiled bench creates a space for contemplation and romance.



"J's" garden.

1.1.3. Shale garden

The shale Garden was built in the 1950s with a modern geometric layout softened by the rustic irregularity of the stones. The circular small ponds in its centre form a constructed habitat where cattails, papyrus and water lilies thrive. The garden also suggests a certain warmth of Douro landscapes, with its schist walls and sidewalks, vineyards, strawberry trees, and lavender. A pedunculate oak surmounts it at south, emphasizing an autochthonous note.

It is a beloved place of events and meetings, where poetry, singing, frogs, and reflexes coexist tunefully from time to time. Occasionally, a heron

dawns on the edge of the lake expecting a fat carp to spring.

The Shale Garden celebrates Porto's connection to wine, vineyards and the Douro region. Its low walls, shale pavements and characteristic plants evoke scenery and elements of the Douro region.



Shale Garden.

1.1.4. The cactus garden and greenhouses

The xerophytic garden, created in the late 1950s, houses an interesting collection of cactus and succulents, being complemented at south by desert and tropical greenhouses.

This space exhibits a pseudo-arid environment where plants almost perform like sculptural elements of different sizes and shapes, mainly stressed by aloe, opuntia, cereus, agave, and euphorbia. Under the blazing sun, the bold forms of plants expose a setting of southern textures and colours, casting sharp shadows on the gravel.



Cactus and succulent greenhouse

1.1.5. Orchids Greenhouse

The orchid greenhouse, standing in the original location of the greenhouses of Quinta do Campo Alegre, currently shelters the collection of orchids and serves as a plant nursery. It was renovated in 2015 but maintains its original structure. Among the plants it houses, the genus *Cimbidium*, *Paphiopedilum* and *Cattleya*, *Dendrobium* are of particular relevance.



Zone of orchid greenhouse

1.1.6. Arboretum

To the south, at lower levels and occupying approximately half of the Garden, coexist woody plants of various bioclimatic regions of the world.

Along meandering paths, one experiences a more informal set of spaces where a variety of forest habitats blend and many trees and shrubs can be appreciated developing their natural forms.

Several species of deciduous trees, gymnosperms, palms, magnolias, eucalyptus, bischofia and tristania stand out, conspicuously.

Crossed by jays and wood pigeons, it is a place of contrasting light and shade, trunks and branches, stems and leaves, where it feels nice

to walk over the fallen leaves on wet autumn mornings.



Arboretum

1.1.7. Mixed borders

The Hall of Biodiversity and the Salabert House/E-learning café are surrounded by mixed flower borders growing semi-freely. The border around the Hall of Biodiversity is predominantly composed of indigenous specimens such as *Prunus avium*, *Acer monspessulanum*, *Crataegus monogyna*, *Rosmarinus officinalis*.



Mixed border around the Hall of Biodiversity

1.1.8. Technical Area

The technical area is located on the west side of the Botanical Garden, near the University Residence Halls. It encompasses the parking area, the gardeners' changing room, visitor toilets and the tool shed. The area was subject to improvement works in 2018, particularly the buildings and pavements.



Tool shed.



Pavement around the Hall of Biodiversity



Parking area



Visitor toilets



Master plan of Botanical Garden of Porto. Manuel Gentil, 2019

WELCOME PLACE



2. Welcome place

2.1. Good and safe access

There are several public transportation options for reaching the Botanical Garden. The bus stop is a 2-minute walk (lines 200, 204, 207 and 504) and the nearest subway station (Casa da Música) is a 15-minute walk from the Garden.

The GPS coordinates are 41°09'14.7"N | 8°38'32.7"W.

2.2. Signage

At the request of the MHNC-UP, the City Council of Porto erected 3 signboards publicizing the Hall of Biodiversity/Botanical Garden in the vicinity - one on Rua da Venezuela, one on the corner formed by Avenida da Boavista and Rua António Cardoso and one on the corner formed by Rua António Cardoso and Rua da Venezuela.

2.3. Entrances

The main entrance to the Botanical Garden is located at Rua do Campo Alegre, 1191. Visitors are welcomed by a wide gate with the historic palace in the background, framed by groves that announce an historic garden. There are 4 more entrances to the Botanical Garden – one by car and three pedestrian entrances (one is dedicated to visitors of the e-learning café, another one links the garden with the Faculty of Sciences of the University of Porto, and the third one is currently closed to the public, at the intersection of Rua do Campo Alegre with Travessa de Entrecampos). The third pedestrian entrance is accessible to visitors on wheelchairs but is only opened upon request.

Through the main entrance, visitors can access the Hall of Biodiversity, where they can find flyers with information about the Botanical Garden/Hall of Biodiversity and other events taking place in the city.

The Garden is open to the public every day from 9 a.m. to 7.p.m, and entrance is free. The cactus and tropical greenhouses are closed to the public and can only be visited on guided tours or under the supervision of staff members. The orchid greenhouse, being a working place and housing plants that require special care, is not open for visits.

The Hall of Biodiversity is open from Tuesdays to Sundays, from 10 a.m. to 6.p.m., and tickets are available at reception or on-line at www.bol.pt.

2.3.1. Entrance panels

At the main entrance of the Botanical Garden, four information panels with the opening hours of the Botanical Garden/Hall of Biodiversity and information about ongoing events and activities invite visitors to discover the Garden.

2.4. Pathways

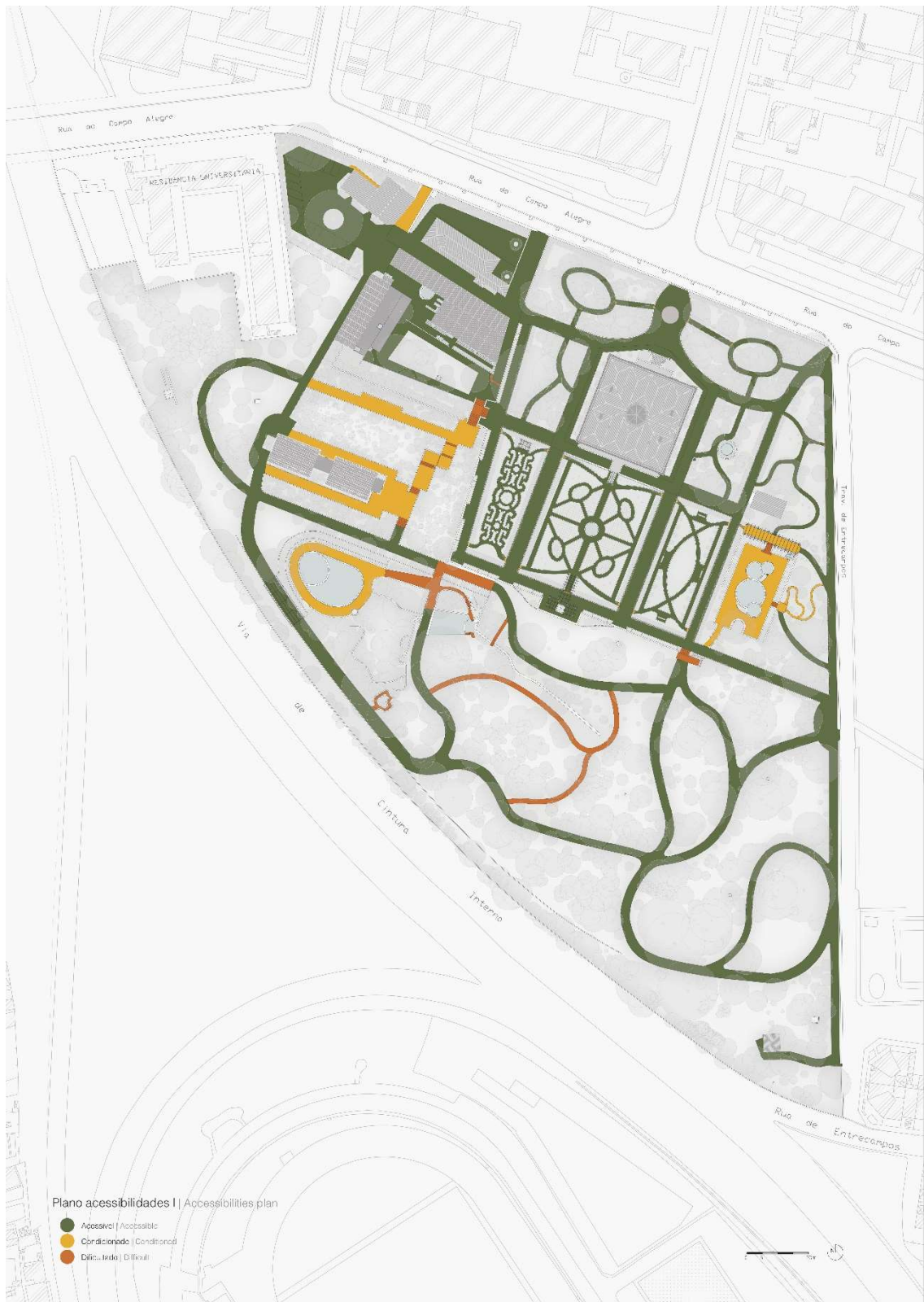
The paths of the Botanical Garden have an extension of about 4,050 meters. Most pathways are wide, but the ones inside the formal gardens are narrower ("J's", Rose and Fish gardens). The Garden's paths are exclusively pedestrian and are only used by staff vehicles/machines when authorized for maintenance purposes.

More than 90% of the Garden's total area is accessible to all visitors. However, some existing slopes, staircases and irregular pavements make access to certain areas more difficult for those with reduced mobility. One of the paths of the

Cactus Garden has several stairs, but there is an alternative path. The central tier of the Garden is totally accessible, but the entrance to the formal gardens (“J’s” Garden, Rose Garden, Fish Garden and Shale Garden), may be hampered by the existing thresholds (4 cm high).

2.4.1. Access by car

The Garden can be accessed by car through a dedicated entrance (in special and duly authorized cases, it can also be accessed through the gate of the e-learning café). Vehicles are restricted to the parking area, as driving inside the Garden is strictly forbidden. Circulation of the Garden’s power tiller and the occasional loading and unloading of cargo in the Garden/Hall of Biodiversity are exceptions to this rule.



Accessibilities plan. Manuel Gentil, 2019

HEALTHY, SAFE AND SECURE



3. Healthy, safe and secure

3.1. Health and well being

The Botanical Garden serves as a place of leisure and entertainment for locals and students of the various campus faculties.

The connection between the Botanical Garden and the Hall of Biodiversity is fundamental to the operation of both units. The reception is located in the Hall of Biodiversity, where visitors can book guided tours and ask for information. Currently, there is a dual-sided flyer available with information about the Hall of Biodiversity and the Botanical Garden.



JARDIM BOTÂNICO DO PORTO
CENTRO CIÊNCIA VIVA
MUSEU DE HISTÓRIA NATURAL E DE ETNÓLOGIA DA UNIVERSIDADE DO PORTO
Em torno da Galeria da Biodiversidade – CCV, e estendendo-se por quatro hectares, encontram-se plantas autóctones e exóticas, vivaceiras, o Jardim Botânico do Porto assume-se como um espaço de referência, com um encanto e deslumbramento, com elevado interesse ecológico e estético.
ABERTO: Todos os dias 9h30 – 19h30
Surrounding the Hall of Biodiversity – CCV, and spreading across the hectares in which indigenous and exotic plants coexist, Porto's Botanical Garden occupies an immense, stimulating and designed reference space, a considerable ecological and aesthetic interest.
OPEN: Every day 9:30 – 19:30
Rua do Campo Alegre, 1015-030 - 4150-017 Porto - Portugal
+351 221 749 700 - jardim@fc.up.pt
www.fc.up.pt/garden-science-education - www.facebook.com/gardenbotanicporto



Dual-sided flyer



GALERIA DA BIODIVERSIDADE
CENTRO CIÊNCIA VIVA
MUSEU DE HISTÓRIA NATURAL E DE ETNÓLOGIA DA UNIVERSIDADE DO PORTO
Um espaço original, inspirado no Jardim Botânico do Porto, onde a arte se cruza com a ciência e a natureza, a Galeria da Biodiversidade – CCV encontra-se a celebrar a vida e a revelar a sua biodiversidade, através de um vasto conjunto de objetos reais e recriados, que contam uma história fascinante do planeta e do nosso ambiente.
ABERTO: terça a domingo 10h00 – 18h00
A unique space at the heart of the Historical-Biological Garden, where the art meets science and nature, the Hall of Biodiversity – CCV invites us to celebrate life and unveil its biodiversity. By interacting with an exquisite selection of real objects displayed according to an innovative disposition, we tell a fascinating story of the planet and our environment.
OPEN: Tuesday to Sunday 10h00 – 18h00
Rua do Campo Alegre, 1015-030 - 4150-017 Porto - Portugal
+351 221 749 700 - galeria@fc.up.pt - www.fc.up.pt/galeria-da-biodiversidade
www.facebook.com/mnh.fc.up



Dual-sided flyer

The e-learning café also adds value to the Garden as it attracts many students daily, turning it into a place of socialization, learning and inspiration. It is open every day from 10 a.m. to 12:00 a.m. and the security guard of the café provides support to the security guard of the Hall of Biodiversity and Botanical Garden.

3.2. Garden design

The current design of the Botanical Garden is the result of several interventions throughout time, with the groves, the Bronze Boy Garden, the Rose Garden, the Fish Garden and the “J's” Garden dating back to the 19th century. The Shale, Cactus and Succulent Gardens and the Cactus Greenhouse were designed by landscape architect Karl Koepp when the property was adapted into the Botanical Garden. The Arboretum has been subject to changes since the establishment of the Botanical Garden. The area of the large lake was designed and built more recently (at the end of the 1960s). The mixed border around the Hall of Biodiversity was designed and implemented in 2010, and the Salabert's garden border was implemented in 2015, during the improvement works of the building.

Recently, the Garden has updated some plots to reorganize its collections. The collection of citrus fruit has been concentrated in the Fish Garden, the collection of roses in the Rose Garden has been expanded, dead boxwood in the formal gardens replaced, the Dwarfes' Garden has been updated with more mild-climate plants and the Arboretum has been restructured.

Also of note is the installation of vineyard trellises in the Shale Garden, which was only possible with the collaboration of the Symington Family Estates winery. Besides providing labour, materials and plants from one of its properties in the Douro region, it also installed the vineyard trellis in the Botanical Garden using the same traditional techniques as those used in the vineyard.

The design of the first tier is structured by the camellia hedges, which divide the space into several gardens and make the Garden more coherent and welcoming.

3.3. Equipment and facilities

3.3.1. Toilets

The toilets are open during the opening hours of the Garden (9 a.m. to 7.p.m.) every day. To use the toilets, visitors must request the keys from a staff member. The toilets were rebuilt in 2018, in the warehouse building, but the entrance is independent.

3.3.2. Cafeteria

The Hall of Biodiversity has a cafeteria area which is currently not open. The Hall of Biodiversity is responsible for the concession of this space, which we believe may be operational in the near future.

3.3.3. Parking area

The parking area is reserved for staff members. However, there are two parking spaces reserved for visitors with reduced mobility and a bicycle park available to all visitors. The pathways to the Garden are accessible to visitors with reduced mobility, including wheelchair users. All other visitors can park in the surrounding areas, however, street parking is paid.

3.3.4. Drinking fountains

The Botanical Garden has 2 drinking fountains, one at the Bronze Boy Garden, (currently out of service due to a missing mouthpiece); and another one in the parking area (Make: Laurus, Model: Urbus).

3.3.5. Structures

There are 4 wooden pergolas in the Garden: one at the Shale Garden, one at the Rose Garden, one near the highway, and another one above the bench of the “J's” Garden.

There are 3 garden benches in the Fish Garden fitted with wooden and iron supports for plants.

At the entrance of the Arboretum, there is a bench made of slatted wood on the small wall.

Beneath the pergola of the “J's” Garden, there is a bench made of cement and glazed tile.

3.3.6. Water elements

The Garden has many water elements of different sizes. The largest ones, which can pose some risk as they are ground level, are in the large lake, the weir and the Shale Garden. The smaller tanks are located in the Bronze Boy Garden, the Rose Garden, the Greenhouses and the Arboretum.

3.3.7. Busts

There used to be 4 busts in the Garden. The bust of Professor Américo Pires de Lima used to stand under the pergola of the Rose Garden, the bust of Sophia de Mello Breyner Andresen used to be in the “J's” Garden and the busts of Professor Gonçalo Sampaio and Rúben A. used to be in the Brazilian Pine Grove, right at the entrance of the Garden. In 2015, the busts of Professor Américo Pires de Lima and Sophia de Mello Breyner Andresen were stolen and, as a preventive measure, the Botanical Garden removed the remaining busts and now conserves them inside the Hall of Biodiversity. The Garden is planning to create replicas to replace the missing busts.



Bust of Professor Américo Pires de Lima



Bust of Sophia de Mello Breyner Andresen



Busto of Professor Dr. Gonçalo Sampaio



Bust of Rúben A.

3.4. Pathways

There are several types of pavements in the Botanical Garden. In the gardens of the first tier, the pavements are made of clay, irregular granite, regular granite slab, fine gravel and irregular shale slab. In the Cactus Garden and in the area of the large lake, the pavement is made of coarse gravel. Near the e-learning café, the pavements are made of gravel and granite cubes (11x11). In the Arboretum, the pavements are made of terraway and irregular granite slab. The pavement of the parking area is made of granite cubes (11x11).

In 2006, the pavements of the Arboretum were refurbished and the network of pathways was redesigned. In 2015, during the improvement works in Salabert House, the areas around the building were also paved.

The parking area was paved in 2018 and cobblestone and regular granite slab paving was installed around the Hall of Biodiversity.

In 2018, the pavements around the Hall of Biodiversity were improved due to the considerable wear and unevenness of the existing clay pavement. The clay was replaced with cobblestone and regular granite slab paving, which proved very comfortable for all visitors, including persons with reduced mobility.

3.5. Security

The Hall of Biodiversity has security personnel 24 hours a day. The security guard is responsible for patrolling the Botanical Garden and alerting visitors to the closing hours and rules of operation. This permanent surveillance makes

visitors feel safer. The security services are provided by an external company.

3.6. Rules

When entering through the main gate, visitors can see a general map of the Garden and the rules of operation. If any visitor engages in inappropriate behaviour, the security team will be called to give a warning to the visitor.

3.7. Surroundings Environment

The location of the Botanical Garden opens it up to two major vulnerabilities. The first one is its proximity to the highway (A20), resulting in high ambient noise (nearly 400 m of the southern edge of the Garden is in contact with the highway). The heavy road traffic leaves a big visual and noise impact on the Garden, which is particularly disturbing in the area of the Arboretum. On certain days, the noise impacts the entire Garden, which compromises visitors' comfort and time spent in the Garden. There is, therefore, a need to implement solutions to minimize the negative impacts of the motorway.

A priority measure is the installation of a visual and noise barrier near the border of the Botanical Garden with the VCI (one of the areas most affected by noise and the sighting of intense traffic).

WELL MAINTAINED AND CLEAN



4. Well maintained and clean

4.1. Litter and waste management

The Botanical Garden has a waste deposit point near the e-learning café. The gardening team deposits larger volumes of waste in the refuse containers on Travessa de Entrecampos, near the gate that connects the Garden and the Faculty of Sciences.

4.2. The Team

The staff of the Botanical Garden are members of the Museum of Science and Natural History of the University of Porto who work specifically in the Garden. The team is composed of 1 director of landscape architecture, 1 landscape architect, 1 biological engineer and 5 gardeners.

The maintenance of the Garden is secured by external companies, which are responsible for maintaining the Arboretum (2 hectares), trimming the camellia-hedges and the boxwoods, whitewashing the greenhouses, carrying out arboriculture works and servicing the structures.

Guided tours and activities are managed by a team of instructors, which are hired as needed for each activity.

4.3. Gardening equipment

All available equipment belongs to the Botanical Garden and the gardeners are responsible for the maintenance of each machine/piece of equipment. All equipment is stored in the gardening warehouse and its inventory is regularly updated. In case of a breakdown, we request technical assistance from external companies. Some of the equipment was rather old, so in 2018 the chainsaw, the grinder, the

high-pressure washer, the welding machine and the compressor all needed to be replaced.

Existing legislation requires the use of Personal Protection Equipment (PPE) for gardening work, so our team of gardeners is equipped with steel-tipped boots with insoles, plastic goggles and plastic aprons, safety goggles, ear plugs and gloves.

4.4. Infrastructure

Several members of the Garden team are responsible for reporting errors or problems with the management and maintenance of the space, and all identified needs are reported to the directors of the MHNC-UP, which evaluates the possibility of investing in repairs.

Smaller repairs, such as replacing irrigation fittings, maintaining the granite cube pavements, etc., are carried out by the gardeners of the Botanical Garden.

Heavier and more specialized works, such as whitewashing the greenhouses, repairing leaks in the irrigation system and rebuilding walls, are outsourced.

4.4.1. Pathways

The conservation status of the pavements is checked on a regular basis and significant alterations are noted in a floor plan.

Keeping the pathways clean is the responsibility of the gardeners and the Arboretum is maintained by an external company. The pathways of the Garden are cleaned once a week with a blower.

Gardeners can perform small repairs in the pavements of clay and regular granite (cubes), however, repairs of gravel, terrazzo, paved and regular pavements require the intervention of an external, specialized company.

Gardeners have repaired some depressions in the terraway pavement with a *tout-venant* filling to reduce any risk to visitors.

4.4.2. Irrigation system

The irrigation system is inspected each spring to prevent possible water outages due to the failure of any of the components during periods of increased use. Depending on the severity of the failure, it can be serviced by the gardeners of the Botanical Garden or by specialised external services.

4.4.3. Toilets

The toilets are located in the technical area and managed by the Botanical Garden. They are accessible to all visitors, including visitors with reduced mobility and in wheelchairs. There are 3 types of cabins: male users, female users, and mixed gender users with reduced mobility, which also include a baby-changing station. Using the toilets is free of charge, however, to avoid acts of vandalism, they are permanently locked, and visitors must request the keys from the security guard or at reception (Hall of Biodiversity). The toilets are cleaned daily by an external company.

4.4.4. Parking area

The parking area has 12 places allocated to MHNC-UP staff and two spaces for visitors with reduced mobility. Maintenance of the parking area is ensured by the Garden and carried out by the gardeners, who are responsible for caring for the paved floor and for the flowerbed with a multilayer border in that area.

4.4.5. Structures

The structures of the Garden are regularly inspected by the staff. The cleaning and maintenance of the structures is carried out by the team of gardeners. However, for more specialized repairs, the Garden hires external services.

The pergola of the Rose Garden was damaged in 2013 due to bad weather conditions, but was immediately repaired.



Reconstruction of the pergola of the Rose Garden

In 2018, the fall of a branch from the Sweet Gum damaged the adjacent balustrade, which was also repaired by an external company.

4.4.6. Signage

Although most plants are identified, they are lacking signs that allow visitors to access such information. Therefore, the Garden has produced PVC signs for the remarkable trees and plastic labels for other specimens. Despite their low durability, plastic labels have low production costs and are a practical solution until more PVC signs are produced.

4.4.7. Water elements

If the water level in the tanks decreases or overflows, a more rigorous inspection is carried out to check for water leakages or clogging of

the drainage channel. The last major intervention in the tanks was made in 2015, in the Shale Garden, since the water level of the tanks was constantly dropping. The tanks were completely emptied, cleaned, and the cracks in the tank walls were repaired.

All water elements require cleaning at the water's surface to avoid the accumulation of residue on the bottom. In the shallower tanks, such as the one in the Bronze Boy Garden, it is sometimes necessary to clean the bottom due to the accumulation of sludge, which makes the water turbid.

In the case of the weir, water cleaning requires the removal of fallen branches from the surrounding vegetation and control of the common duckweed, which is present in large numbers and dominates the surface of the water.

4.5. Buildings management

4.5.1. Technical area

The technical area of the Botanical Garden comprises several facilities that provide support to the Garden. There is a building commonly referred to as the "house of the gardeners" that has a kitchen and bathrooms with showers for the exclusive use of the gardeners. The gardening warehouse, adjacent to the house of the gardeners, is where the gardeners' workbenches are located and all the gardening equipment and tools are stored. The cleaning of these buildings is the responsibility of the gardeners.

4.5.2. Toilets

The public toilets have been rebuilt and are now located inside the warehouse, but with a

separate entrance. The daily cleaning and restocking of consumables are secured by an external company that also cleans the Hall of Biodiversity.

4.5.3. Water deposit and pumping system

One of the oldest buildings of the Garden, the winery, is located in the first tier of the Garden. It was named "the winery" due to its former purpose in the Quinta do Campo Alegre. Currently, the roof of the structure is a deposit for irrigation water. However, the leaks in this deposit are causing many humidity and infiltration problems in the winery. The preservation of this building requires emptying the deposit and repairing the leaks.

The central hub of the irrigation system is located at the south-west edge of the Garden, in a building that accommodates all pumping and irrigation equipment (pumps, filters, autoclaves, etc.).

4.5.4. Greenhouses

The maintenance of the greenhouses, which is secured by the gardeners, requires cleaning, oiling the hardware, checking on the filling and draining systems of the tanks and unclogging boilers and rainwater downpipes.

All these buildings are regularly inspected by the Staff of the Garden. The Garden team performs small repairs while major interventions, such as replacing and whitewashing windows, are secured by external services.

4.5.5. Hall of Biodiversity

The maintenance of the Hall of Biodiversity is the responsibility of the Hall of Biodiversity

team. All maintenance works—cleaning and maintenance of the exhibition modules and of the entire infrastructure—are secured by external companies.

4.5.6. Salabert house / E-learning café

The e-learning café is managed and maintained by the Social Services of the University of Porto.

4.6. Horticulture and arboriculture management

4.6.1. Horticulture management

There is a need to reduce costs and efforts with maintenance works while keeping the aesthetic and historical integrity of the Garden. With this in mind, some spaces were evaluated to replace more intensive maintenance plants with lower maintenance vegetation, (for example, replacing the lavender flowerbeds in the Rose Garden with meadow).

The Garden staff is responsible for the daily maintenance of the gardens in the first tier, the Cactus and Succulent Garden, the greenhouses and the Salabert Garden. Due to a lack of human resources, an external company is hired to secure the maintenance of the Arboretum. Each space requires a different type of upkeep. The Arboretum requires more mechanical maintenance, with the use of a lawnmower to cut the meadows and a blower to clean the pathways. The gardens of the first tier, the Cactus and the Salabert gardens require, aside from the mechanical labour (meadow mowing and pathway blowing), other manual tasks such as weeding, pruning and replenishing *mulch*.

Specific tasks such as hedge pruning and arboriculture works are secured by external

companies, since the Botanical Garden has neither the necessary staff resources nor equipment for such tasks.

4.6.2. Arboriculture management

An inspection is carried out annually to assess the state of conservation of the larger trees, check for existing damages and evaluate the need to reduce the load of the branches. After that, the Garden hires a company specialized in arboriculture to assess the needs and carry out cleaning works, with the assistance of a member of the Botanical Garden. The smaller trees and bushes are monitored daily by the staff, and any necessary intervention is carried out by the gardeners of the Botanical Garden. Every year, the team carries out a general assessment, flags priority interventions and records the work that is carried out.

Jardim Botânico do Porto | Plano de Manutenção

Botanical Garden of Porto | Maintenance plan



Maintenance plan. Patrícia Varela, 2019

Task	Frequency
Zone 1	
Herbs (Shale Garden)	
Herb pruning	Annually (Autumn)
Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Zone 2	
Herbs: Bear's breeches	
Cutting of <i>Acanthus mollis</i> (Bear's breeches) leaves and flowers	Annually (after flowering)
Reorganizing and controlling blotches	Annually (after flowering)
Zone 3	
Herbs: ferns	
Cleaning to reduce the volume of <i>Pteridium aquilinum</i> (ferns)	Annually (Spring)
Weed control (<i>Tradescantia</i> sp.)	Annually (Spring/Summer)
Zone 4	
Multilayer borders	
Maintenance pruning of subshrubs such as <i>Lavandula angustifolia</i> , <i>Helychrisum italicum</i> , etc	Annually (July)
Deadheading of <i>Rosa</i> sp. (Rose bushes) and <i>Hydrangea</i> sp.	Twice a week during the flowering stage
Bush pruning	Annually (Jan./Feb.)
Herbal pruning	Annually (after flowering)
Control of blotches of <i>Vinca</i> sp.	Annually (Sep.)
Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Pricking out of <i>Iris germanica</i>	Annually (Aug.)
Mulch replenishment	Annually (Spring)
Zone 5	
Bushes	
Bush pruning	Annually (Jan./Feb.)
Weeding of flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Zone 6	
Bushes: Rose bushes and Hydrangeas	
<i>Hydrangea</i> sp. pruning (Hydrangeas)	Annually (Jan./Feb.)

<i>Rosa</i> sp. pruning (Rose bushes)	Annually (Jan./Feb.)
<i>Rosa</i> sp. deadheading	Once a week during the flowering stage
Weeding	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Mulch replenishment	Annually (Spring)
Zone 7	
Bushes: Rose bushes + curry plant	
Maintenance pruning of <i>Lavandula angustifolia</i> , <i>Helychrisum italicum</i>	Annually (after flowering – Jul.)
<i>Rosa</i> sp. pruning (Rose bushes)	Annually (Jan./Feb.)
<i>Rosa</i> sp. deadheading	Once a week during the flowering stage
Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Mulch replenishment	Annually (Spring)
Zone 8	
Boxwood hedges	
Pruning of <i>Buxus</i> sp. hedges (Boxwood)	Annually (Jan./Feb.)
Drip irrigation	Second irrigation plan
Phytosanitary treatment	Twice a year (Spring and Summer)
Zone 9	
Camellia-hedges	
Pruning of <i>Camellia japonica</i> hedges. (Camellias)	Annually (second fortnight of May)
Zone 10	
Grapevine trellis + subshrubs + Herbs	
<i>Vitis</i> sp. pruning (Grapevines)	Annually (Jan./Feb.)
Maintenance pruning of <i>Lavandula</i> sp, <i>Cistus</i> sp.	Annually (July)
Cleaning of <i>Saponaria</i> <i>Officinalis</i>	Annually (Sep./Oct.)
Replenishment of annual plants (<i>Digitalis purpurea</i> , <i>Verbascum</i> sp. and <i>Dipsacus</i> sp.)	Annually (Mar.)
Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Mulch replenishment	Annually (Spring)

Zone 11	
Climbing plants: Bougainvillea and grapevines	
Maintenance pruning of Bougainvillea	Annually (Jan./Feb.)
Vitis sp. pruning (Grapevines)	Annually (Jan./Feb.)
Pruning of the climbing plants above the benches of the Fish Garden	Annually (Jan./Feb.)
Zone 12	
Climbing plants: Rose Bushes	
<i>Rosa</i> sp. pruning (Rose bushes)	Annually (Jan./Feb.)
<i>Rosa</i> sp. deadheading	Once a week during the flowering stage
Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Zone 13	
Climbing plants: Wisteria	
Maintenance pruning of <i>Wisteria sinensis</i> (Wisteria)	Annually (Jan. and Aug.)
Zone 14	
Palm tree	
Phytosanitary treatment of the <i>Phoenix canariensis</i> (Canary Island date palm)	Monthly
Note: includes periodic inspections and pruning of the leaves affected by the disease	
Zone 15	
Meadows and Herbs	
Meadow mowing (15.1, 15.2, 15.3)	Quarterly (Spring/Summer) Twice a month (Autumn/Winter)
Spray irrigation (15.3) – Fish Garden	Second irrigation plan
Zone 16	
Lawn + bushes	
Meadow mowing	Once a month (Spring/Summer) Three times per month (Autumn/Winter)
Bush pruning	Annually (Jan./Feb.)
Weeding of the flowerbeds	Once a week (Spring/Summer) Twice a month (Autumn/Winter)

Zone 17**Enrich the soil with organic matter**

Cleaning of weeds with weeding machine	Once a month (Spring/Summer) Three times per month (Autumn/Winter)
Cleaning of the trees and bushes border nearby VCI	Annually (Jan./Feb.)

Zone 18**Mulch**

Weeding of the flowerbeds	Once a week (Spring/Summer) Once a month (Autumn/Winter)
Bush pruning	Annually (Jan./Feb.)
Mulch replenishment	Annually (Spring)

Zone 19**Paths**

Manual (broom) or mechanical (blower) cleaning of organic and inorganic waste	Once a week
Manual or mechanical (weeding machine) cleaning of weeds	Once a month (Spring/Summer) Three times per month (Autumn/Winter)

Zone 20**Lakes and tanks**

Cleaning of the surface and the bottom	Once every two months
Introduction of aquatic species (tropical water lilies) in the Rose and Shale Gardens	Annually (Mar./Apr.)
Cleaning of <i>Cyperus papyrus</i> (papyrus) in the lake of the Shale Garden	Annually (Mar./Apr.)

Zone 21**Weir**

Cleaning of the surface and deposits of residues accumulated in the bottom of the weir	Once every two months
Cleaning of the shores	Monthly

Zone 22**Shade house + nurseries**

Manual irrigation	Twice a week (Spring/Summer) Once a week (Autumn)
Cleaning of the tanks	Annually (Spring)

Weeding of vases	Once a week
Organization of the benches	Whenever necessary
Zone 23	
Orchid Greenhouse	
Manual irrigation	Twice a week (Spring/Summer)
Weeding of vases and flowerbeds	Twice a week
Fertilization of the orchids	Annually (Spring)
Whitewashing of the greenhouse windows	Annually (Spring)
Cleaning of the greenhouse windows	Annually (Spring)
Organization of the benches	Once a week
Cleaning of the tanks	Annually (Spring)
Transplant specimens into larger vases	Whenever necessary
Zone 24	
Tropical Greenhouse	
Manual irrigation	Twice a week
Cleaning of the greenhouse windows	Annually (Spring)
Organization of the plantations	Annually (Spring/Summer)
Cleaning of the lake	Once a week
Zone 25	
Desert greenhouse + Cactus and Succulent Garden	
Manual irrigation of the greenhouse	Twice a week
Cleaning of the greenhouse windows	Annually (Spring)
Unclogging boilers and downpipes	Annually (Spring)
Organization of the plantations	Annually (Spring/Summer)
Redesign of cactus and succulents' spots	Annually (Feb./Mar.)
Deadheading	Twice a week during the flowering stage
Weeding	Every day (Spring/Summer) Once a month (Autumn/Winter)
Throughout the entire Garden	
Trees	
Tree pruning	Sporadic, if there is a risk of falling branches, disease or structural damages

4.7. Vandalism

The Botanical Garden is located in a densely populated area, and near the Bairro do Aleixo, a social housing quarter with drug trafficking problems.

The garden is also subject to acts of vandalism by some visitors. Among the identified damages, the most critical ones were broken windows on a greenhouse, the removal of botanical plants and deposits of waste on flowerbeds and on the floor.

ENVIRONMENTAL MANAGEMENT



5. Environmental management

5.1. Chemical usage

No chemical products are used in the control of pests, except for the fungicides used on the boxwood hedges. To protect the Canary Island Date Palm against *Cylindrocladium buxicola* we use a nematode-based product.

The use of fertilizers is also minimal. In 2016, we used organic fertilizers on the rose bushes, camellias, azaleas, rhododendrons and remarkable trees. Each year we apply organic liquid fertilizer to the orchids of the greenhouse.

Despite the threat that weeds pose to the Garden, we remove them manually, without resorting to herbicides.

5.2. Water usage

The water used for irrigation comes from the artesian aquifer and, alternatively, from a well.

The gardens of the central tier have automatic drip and drop-by-drop irrigation systems. Efforts are being made to reduce the number of irrigated areas. In 2015, as a result of changing the plantations in the Rose Garden, the pipe for the drip system was reduced and limited to the boxwood hedges.

The most recent vegetation extensions, namely, the border near the Hall of Biodiversity, the garden of the e-learning café and the border of the parking area, are watered using a drop-by-drop system.

5.3. Green waste and composting

The green waste produced at the Botanical Garden is used to create compost. There is an area in the Garden dedicated to the deposit of materials, which are divided into piles according to their decomposition time. The resulting compost is then used in the Garden and Greenhouses.

Currently, the Garden is establishing a partnership with LIPOR, the Intermunicipal Waste Management Service of Greater Porto (Portugal). This entity is responsible for managing, recovering and treating the Urban Waste produced by the eight municipalities it serves: Espinho, Gondomar, Maia, Matosinhos, Porto, Póvoa de Varzim, Valongo and Vila do Conde. The partnership includes the installation of a composting area in the Botanical Garden, which will be used to deposit green waste produced by the Garden and as an educational component on guided tours and activities that promote waste recovery.



Location of the composting area.

The composting piles will be placed in the same area where the deposits of green waste are currently located.

The plant litter that results from the cleaning of the pavements is deposited in bare flowerbeds. This helps control weeds, provides organic matter for the soil and contributes to strengthen areas with a shortage of soil.

BIODIVERSITY, LANDSCAPE AND HERITAGE



6. Biodiversity, Landscape and Heritage

6.1. Historic features

The major promoter of the installation of the Botanical Garden at Quinta do Campo Alegre was Professor Américo Pires de Lima. A connoisseur of the space, its plants and its potential for improvement, he proposed the acquisition of the Quinta by the Polytechnic Academy. And thus, in 1951, the Botanical Garden was established in Quinta do Campo Alegre. Afterwards, Franz Koepp, a German landscape architect was hired to adapt the Quinta into the Botanical Garden.

The preservation of the historical places and gardens has always been a priority and, today, we can still find elements of the original Quinta and references to the work of Sophia de Mello Breyner Andresen.

We can see connections to the works of the writer throughout the entire Garden, through the vegetation, the structures and the settings that are clearly described in her works.

6.2. Promotion of Biodiversity

One of the priorities of the Botanical Garden is to promote biodiversity. With that in mind, several measures are put into practice:

- The wood resulting from pruning works is deposited in strategic flowerbeds to create a habitat for microfauna and wildlife;
- The plant litter resulting from the cleaning of the pavements is placed in specific flowerbeds that promote its decomposition and the creation of organic matter, which is then incorporated in the soil;
- The promotion of animal life in the water elements, namely, amphibians (true frogs and newts);
- Some stones resulting from the dismantling of walls are kept as habitats for small reptiles;
- The creation of a collection of Oaks with different origins with the goal of creating a reference collection in the Garden, and drafting layouts to improve the green areas;
- The installation of borders predominantly composed of indigenous plants;
- The execution of several BioBlitzes, with the collaboration of the entire MHNC-UP team, to record all the species (flora and fauna) of the Garden;
- Keeping plants in a "free growth" regime;
- Participation in the "Future – 100 000 trees project" to receive and plant indigenous species in the metropolitan area of Porto.
- The creation of flowerbeds of aromatic plants fines herbes;
- The expansion and upgrade of the aquatic plants collection;
- The development of plant breeding techniques (cutting, grafting, seeding) to expand and upgrade existing collections;
- Installation of birds nests.

6.3. Infrastructure and historic buildings

6.3.1. Hall of Biodiversity

The building of the Hall of Biodiversity used to be the Andresen House.

The construction of the palace started around 1875. It was named Andresen House after the Andresen family.

In the 20th century, it became the headquarters of the Mocidade Portuguesa (Portuguese youth organization) and a university residence before becoming the office of the Botany department of the U.Porto Faculty of Sciences.

In 2009, FCUP's Botany department moved to a new office outside the Botanical Garden. In 2010, the Andresen House underwent improvements to host the "Evolution of Darwin" exhibition and the Museum of Natural History.

In 2015, the basement of the Andresen House was adapted to become the back-office of the Hall of Biodiversity.

6.3.2. Salabert house / E-learning café

Both houses took the name of their former owners. The Salabert House was the first house of the Quinta, bought by João Salabert in 1802, with 12 hectares at the time. The Quinta became known as Quinta Grande do Salabert (Salabert's Big Quinta). After the construction of the palace in 1875, it is believed that the Salabert House became the house of the housekeeper, a farm building and place for cutting the animals.

The Salabert House, hosting a e-learning café, is a space of modernity and opportunity, dedicated to students as a result of a creative,

rigorous and cost-controlled architectural rehabilitation.

6.3.3. Botanical Garden of Porto

The Botanical Garden has been subject to several improvements throughout the years. The most recent interventions took place in 2006, 2010, 2015 and 2018. In 2006, the Garden upgraded infrastructures such as the irrigation network, drainage network and pavements, built structures and installed the negatives for the electricity grid.

In 2010, in addition to the 1st phase of improvement works in the Andresen House, the cactus and succulent greenhouses were refurbished. Several works have been carried out, such as cleaning and painting the walls, replacing the windows of the roof, treating the interior woods and cleaning the pavements and the tank.

In 2015, during the 2nd phase of improvement works of the Andresen House, the orchid greenhouses were also upgraded. The wooden structures were removed, the metal structures were treated, new windows were installed and the flowerbeds were replaced with meadow. The orchid greenhouse currently houses the collection of orchids and is also the nursery of other plants, namely, oaks, cactus, succulents, tropical plants and camellias.

The remaining greenhouses shelter a bonsai collection, aromatic plants, fines herbes and work as open vivariums.

In 2018, the technical area of the Botanical Garden was improved. The works included the improvement of the parking area, the demolition of the old toilets, the replacement of

the warehouse roof, the painting of the gardeners' house, the construction of new toilets inside the warehouse, the replacement of the pavements around the Hall of Biodiversity and the installation of a border of trees and bushes around the parking area.

6.4. Vegetation

Currently, the Botanical Garden shelters around 1,138 species of vascular plants, including those cultivated in the greenhouses. Within its historical collections, the collections of camellias, rhododendrons, azaleas, orchids, cactus and succulents stand out. There has been an effort to upgrade the existing collections by identifying, charting and, on occasion, breeding specimens in the greenhouses.

Many of the remarkable trees are older than the Botanical Garden itself, dating back to the original Quinta do Campo Alegre. Among the remarkable trees, the Cork Oaks, Pine Trees, Sweet Gum, Camellias, Hornbeams, Brazilian Pines, Cedars, Sequoias and Magnolias stand out.

The camellia-hedges, delimiting each of the gardens of the first tier, are an important defining element of the Garden. The fact that they are evergreen plants secures the division of the gardens throughout the entire year and protects the gardens against strong winds coming from the sea. It is estimated that the plantation of camellias on the hedges began in 1897. They were very appreciated at the time, and a symbol of prosperity. They were densely planted by the richest families of Porto, and today, Porto is known as "The City of Camellias".

We are currently developing works in partnership with the Portuguese Association of Camellias to identify and chart all camellias of the Botanical Garden with the goal to apply for the "Camellia Garden of Excellence" distinction. Other measures have been adopted in order to upgrade the collection of camellias, such as planting new specimens in the groves and Arboretum, breeding existing camellias and replacing dead specimens with new stems.

The historic boxwood hedges comprise different species of Boxwood - *Buxus sempervirens* 'Suffruticosa' and *Buxus microphylla*, and are currently infected with *Cylindrocladium buxicola*. To improve the hedges, dead stems were replaced with boxwood cultivars less likely to be affected by the fungus - *Buxus sempervirens* 'Myrtifolia' and fungicide was applied to minimize the development of the fungus.

The Canary Island Date Palm is also a centenary specimen and, in 2015, it began showing symptoms of *Rinchoforus ferrugineus*. Since then, it has been subject to monthly treatments, which do not solve the problem but control the propagation of the insect and allow the tree to regenerate with new leaves.

In 2018, the iconic specimen of *Liquidambar styraciflua*, which gives its the name to the Sweet Gum Garden, was severely damaged and lost two major limbs. To avoid the premature felling of the tree, we opted to reduce the size of the crown, along with the risk of further limb falling, to secure the safety of our staff and visitors.

We continue to monitor the phytosanitary state and growth of the tree in order to extend its life.

6.5. Fauna and Flora

The Botanical Garden shelters several animals, namely, birds, amphibians, fish, insects and small mammals and reptiles.

We have identified the fauna species with 2 BioBlitzes carried out with the collaboration of all MHNC-UP researchers. We identified 6 species of birds, 5 mammals, 3 amphibians, 1 reptile, 24 invertebrates, 78 bryophytes and lichens and 3 fungi.

COMMUNITY INVOLVEMENT



7. Community Involvement

7.1. Educational use

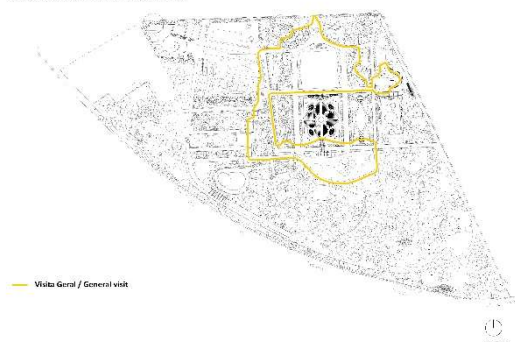
7.1.1. Guided tours

The mission of the Botanical Garden is to promote sustainable practices and raise community awareness of the importance of biodiversity conservation. The Garden welcomes groups on guided tours or self-guided visits throughout the year. The Garden is mostly sought by school groups and groups of elderly people. Guided tours require prior booking by filling out the form available on the Botanical Garden Website (<https://inscricoes.jardimbotanico.up.pt/>).

Given its distinct elements, the Botanical Garden offers 3 types of guided tours: the general tour, the botanic tour and the literary tour.

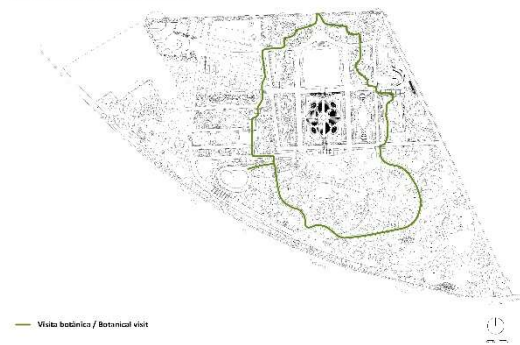
The General Tour focuses on the history of Quinta do Campo Alegre up until the establishment of the Botanical Garden of Porto, as well as on general aspects of the plants. The Botanic Tour focuses on the evolution of the plants. The Literary Tour establishes a connection between the works of Sophia de Mello Breyner Andresen and the estate.

Jardim Botânico do Porto | Percursos das visitas
Botanical Garden of Porto | Visits routes



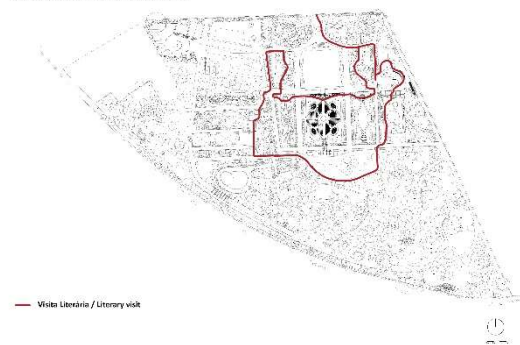
Route of the Literary Tour.

Jardim Botânico do Porto | Percursos das visitas
Botanical Garden of Porto | Visits routes

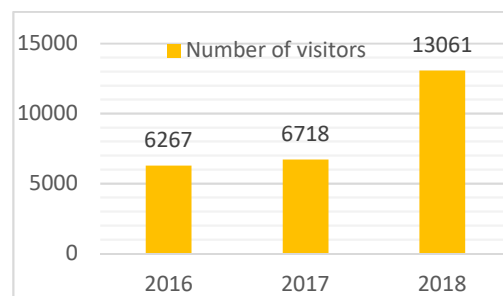
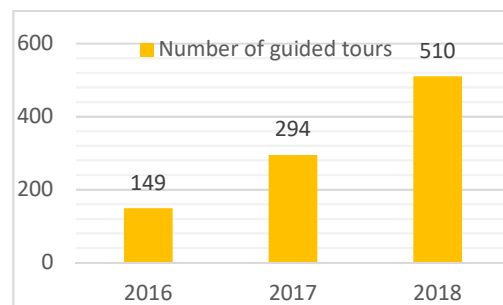


Route of the General Tour.

Jardim Botânico do Porto | Percursos das visitas
Botanical Garden of Porto | Visits routes



Route of the Botanic Tour.



The number of visitors and guided tours has been increasing since 2016, and last year the number of participants on guided tours doubled. This is largely due to the opening of the Hall of Biodiversity to the public, in June 2017, which attracted more visitors to the Botanical Garden.

The booking of guided tours is made online, by filling out a form, and if the group wishes to visit the Hall of Biodiversity, both visits are linked. There is also the possibility of engaging in a practical activity as a complement to the tour.

7.1.2. Children workshops

During school holidays, we promote workshops for children aged 6 to 12, covering topics such as biodiversity conservation, botany, zoology and arts. The activities are coordinated by the educational services of the Hall of Biodiversity and instructors from the Junior University (a Summer Course programme of the University of Porto for young people).

During Summer, the Botanical Garden and the Hall of Biodiversity also host activities of the Junior University developed by other organic units of the University of Porto, such as FCUP or CIIMAR.

7.1.3. Academic classes

The Botanical Garden is also sought after by academics as a learning space. Some of the guided tours are conducted for classes within courses of Architecture, Biology, Landscape Architecture and Heritage Management, among others.

In recent years, the Parks and Gardens Management class of FCUP's Landscape Architecture course has been developing gardening activities in different areas of the

Botanical Garden, as a practical complement to theoretical classes.

7.2. Volunteering

Over the past years, the Botanical Garden has enjoyed help from volunteers in several maintenance and gardening activities. Some volunteers are responsible for the curation of botanic collections, e.g., orchids, cactus and aquatic. Besides tending to the plants, volunteer activities also include the identification and organization of specimens.

7.3. Curatorship

Since 2018, the Botanical Garden of Porto houses the private bonsai collection of Professor José Teixeira Gomes, who wishes to offer it to the Garden. The professor maintains the Bonsai himself, and the collection can be seen by any visitor, as it is housed in one of the open greenhouses.

The Botanical Garden also shelters plants from visitors who wish to donate them. The visitor contacts the Garden and, should it be in the interests of the Garden, the plant is received and sheltered free of charge.

7.4. Traineeships

The Botanical Garden of Porto accepts several Higher Education traineeships. Students of the Master's in Landscape Architecture of the Faculty of Sciences of the University of Porto are those who most frequently seek out the Garden to pursue their training. However, we have also welcomed students from the Bachelor in Heritage Management of the Graduate School

of Education and foreign students from the Erasmus+ programme.

7.5. Cultural events

The Hall of Biodiversity and the Botanical Garden organize several cultural events, such as seminars and exhibitions on biodiversity, plants, literature and natural history.

The Botanical Garden also participates in community engagement activities organized by other institutions. Examples include the Camellias Exhibition of Porto, Lousada and Vila do Conde and the Orchid Exhibition.

MARKETING AND COMMUNICATION



8. Marketing and Communication

8.1. Information boards

The external information boards at the Garden's entrance allow visitors to check the opening and closing hours of the Botanical Garden and Hall of Biodiversity. Inside the Garden, near the main entrance, there is a board with a general map of the Garden and rules of use. Despite being a temporary solution, these information boards are very useful for visitors.

At the entrance of the individual gardens, there are information signs with a short description of each and the plants they contain. Since some of the signs are damaged, all texts have been revised and the signs will soon be replaced.

Along the pathways of the Botanical Garden, the identification plates for existing flora were created on different occasions, and many of the plants aren't even identified. The Garden has recently produced content for 150 new plates to identify the more emblematic species.

Plates with information on the biodiversity of each area have also been planned with the support of researchers from MHNC-UP.

8.2. Events

The Botanical Garden is a popular venue for events such as photo sessions for clothing and footwear brands, book launches, dinners, and cocktails.

8.3. Website

The website <http://mhnc.up.pt/> provides general information on all units of the Museum of Science and Natural History of the University

of Porto, including the Botanical Garden of Porto.

The website <https://jardimbotanico.up.pt/> provides more detailed information on the Botanical Garden, including its history, flora directories, habitats of the gardens, a form for booking guided tours, contact information and opening hours.

8.4. Leaflets

At the reception of the Hall of Biodiversity, there is a dual-sided flyer with information about the Hall of Biodiversity and the Botanical Garden produced by the MHNC-UP.

Specific flyers are created for specific events or activities, as required.



Workshops Flyer.

R&D RESEARCH AND DEVELOPMENT

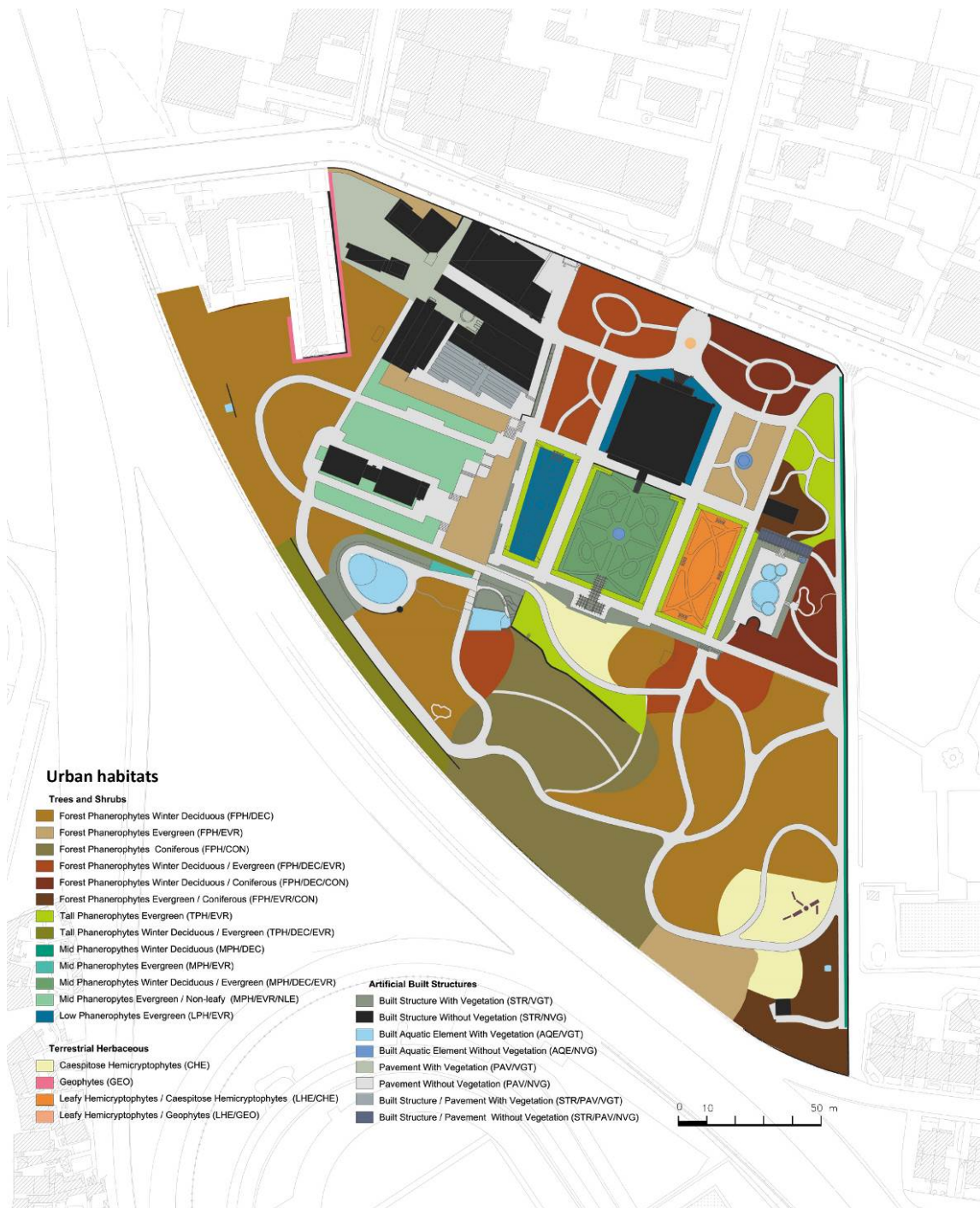


9. R&D – Research and Development

A research project entitled "Green Urban Structure: Study of the relation between public space morphology and flora and fauna diversity in the city of Porto" and funded by the Foundation for Science and Technology was initiated in 2009. The multidisciplinary team of researchers and consultants led by Paulo Farinha Marques studied several habitats in parks and gardens in the city of Porto, including the Botanical Garden. This project resulted in the publication of two e-books: "Morphology & Biodiversity in the Urban Green Spaces of the City of Porto – Book I – Selection of the Areas of Study" and "Morphology and Biodiversity in the Urban Green Spaces of the City of Porto. Book II - Habitat Mapping and Characterization".

9.1. Books

The book "Jardim Botânico do Porto – 150 anos de culto pelas plantas" (Botanical Garden of Porto – 150 years dedicated to plants), by Teresa Andresen and Ana Catarina Antunes, published in 2018, describes several aspects of the Botanical Garden, from its origins to the present day. The book can be purchased in various bookstores and at the reception of the Hall of Biodiversity.



Map of Habitats of Botanical Garden of Porto. “Morphology and Biodiversity in the Urban Green Spaces of the city of Porto – Book II - Habitat Mapping and Characterization”. Paulo Farinha Marques, Cláudia Fernandes, Filipa Guilherme, José Miguel Lameiras, Paulo Alves, Robert Bunce. 2015.

MANAGEMENT AND ACTION PLAN



10. Management and action plan

10.1. Goals

The management plan and corresponding action plan proposed here aim to reach several goals, namely: raising the maintenance and conservation standards of the Garden, harnessing resources by reducing maintenance efforts and costs, promoting community engagement, systematizing daily management and maintenance tasks, increasing the information available to visitors and responding to current needs and demands while, at the same time, preserving the historical, botanical and literary characteristics of the Garden.

10.2. Finances

The annual budget of the Botanical Garden depends on the budget allocated to the MHNC-UP, which distributes it throughout its several units. The average annual budget of the Botanical Garden is about € 160,000. This budget covers maintenance costs, human resources and outsourced maintenance services. If there is a need for improvement or repair works, a budget increase is requested from the MHNC-UP.

10.3. Partnership

The Garden intends to keep its partnerships with organizations such as the Portuguese Association of Camellias, the Portuguese Association of Orchidophilia and LIPOR.

There is a partnership protocol with the Portuguese Association of Camellias which authorizes the Association to be headquartered in the Botanical Garden. With this partnership, the Botanical Garden also intends to apply for

the distinction of "Camellia Garden of Excellence" and, to that end, we are carrying out a joint work of identifying and upgrading the collection of camellias. The Garden also intends to promote activities and workshops to disseminate this plant genus.

In its partnership with the Portuguese Association of Orchids, the Garden intends to promote and disseminate knowledge about orchids, while also upgrading the collection of the Botanical Garden.

LIPOR is studying the best method to install a compost area in the Botanical Garden. The proposal has already been submitted to LIPOR's experts, who welcomed it with great interest. This partnership will provide the Botanical Garden with technical advice and assistance in this field, while LIPOR will have a new space to promote its environmental education and public awareness activities. The Garden is interested in establishing more partnerships with associations or groups of people with an interest in gardens, plants and horticulture.

10.4. Action plan (2019-2024)

Besides the maintenance activities mentioned in point 4.6 "Horticulture and arboriculture management", the action plan also includes occasional works that will help the Garden achieve the goals set for the 2019 - 2024 period. The table below summarizes the tasks that are not part of the daily maintenance of the Garden.

Action	Estimated cost	Date	Responsibility
Welcome place			
Replace the board with the general map and rules of the Garden (to include the parking area and the two reserved slots, the bicycle park and the refuse bins)	€ 200	2019	BGP
Clean and repair the external wall	€400	2019	BGP
Place an information board at the entrance of the Garden with information on BGP and HB	€ 1500	2020	MHNC-UP/BGP
Include a telephone number or a video intercom system on the main gate for support requests (important for visitors with reduced mobility)	€ 750	2020	HB/BGP
Install botanical and informational signs throughout the Garden	€ 5000	2020	MHNC-UP/BGP
Install a panel with a map and information on the side Gate	€ 200	2020	BGP
Replace the side entrance gate with one with security bars	€ 2000	2020	BGP
Install a panel on the corner entrance gate with a welcome message and directions to the main entrance	€ 200	2020	BGP
Healthy, safe and secure			
Identify the concessionaire of the cafeteria	Ongoing	Ongoing	MHNC-UP/HB
Install a mouthpiece in the drinking fountain of the Bronze Boy Garden	€ 200	2019	BGP
Acquisition of equipment to handle the chainsaw.	€ 250	2019	BGP
Articulate with FCUP to determine the placement of the refuse bins near the Botanical Garden	-	2019	BGP/FCUP
Install refuse bins	€ 800	2020	BGP
Place signs with information about the depth of the tanks	€ 150	2020	BGP
Place a barrier fence around the lakes	€ 2,800	2021	MHNC-UP/BGP
Install more benches	€ 1,500	2021	BGP

Repair the terraway pavements	€ 20,000	Subject to the availability of funds	MHNC-UP/BGP
Replenish the pavements of fine and coarse gravel	€ 30,000	Subject to the availability of funds	MHNC-UP/BGP
Install acoustic and visual barriers near the highway (along 40 metres in an initial phase)	1ª phase – € 20,000 2ª phase – Subject to the availability of funds	1ª phase (40 m) – 2021 2ª phase (360m) - Subject to the availability of funds	MHNC-UP/JP
Well maintained and clear			
Redesign cactus and succulent placement in the Cactus Garden	-	Ongoing	BGP
Replace the stolen busts	€ 2,500	Ongoing	BGP
Keep the Garden railing free from lichens and mosses	-	2019-2014	BGP
Replace broken windows on the orchid greenhouse	€ 1,800	2019	BGP
Reorganize the area adjacent to the parking area, which currently works as a deposit of wood and stones.	€ 1,600	2019	BGP
Improve the Dwarves' Garden, near the winery	€ 300	2019	BGP
Keep the flowerbeds free from weeds	-	2019-2024	BGP
Keep the Cactus Garden free from weeds	-	2019-2014	BGP
Transplant Dahlias from the Rose Garden and the "J's" Garden into a flowerbed and combine them with other species (Iris sp.)	-	2019	BGP
Identify and transplant bulbous plants (<i>Narcissus</i> sp.) from the Shale into the greenhouse	-	2019	BGP
Inspect the state of preservation of structures, vegetation, water elements, pavements, buildings and urban furniture and record the interventions carried out.	-	2019-2014	BGP
Repair the wall and railing near the gate at the intersection of Rua do	€ 2,200	2020	BGP

Campo Alegre with Travessa de Entrecampos			
Repair the pavement of shale - place soil between the slabs and fix the loose slabs	-	2020	BGP
Repair leaks in the water deposit	€ 200	2020	BGP
Transplant <i>Cycas</i> sp. From the Arboretum	€ 500	2020	BGP
Replace the substrate of the orchids' vases	€ 400	2020	BGP
Improve the large lake area by introducing tropical species.	€ 800	2021	BGP
Repair the drainage system of the Shale Garden's tanks	€ 1,500	2023	BGP
Environmental management			
Install recycling bins in key points	€ 300	2020	BGP
Reduce the crown of the Camellia-hedges in the groves	€ 500	2020	BGP
Lop the camellia-hedges of the Bronze Boy and Dwarves' Gardens	€ 250	2020	BGP
Install a more organized and functional composting area	€ 250	2021	BGP in partnership with LIPOR
Biodiversity, landscape and heritage			
Catalogue the species of the Botanical Garden, with a special focus on camellias, cactus, succulents, orchids, conifers and bulbous plants.	-	Ongoing	BGP
Install a camellia-hedge near the University Halls of Residence and parking area	Previously purchased plants	Ongoing	BGP
Create flowerbeds of fines herbes	€ 400	2019	BGP
Create shelter and feeding troughs for birds.	-	2019-2020	BGP in partnership with FCUP
Plant more camellias and Boxwoods	€ 3,500	2019 – 2024	BGP
Marketing and communication			
Development of new flyers	-	Ongoing	MHNC-UP/BGP
Add contents to the website of the BGP, accessibility maps, points with	-	2019	BGP

refuse bins and information about bicycle parking and parking spaces reserved for visitors with reduced mobility.			
Install new botanical signs	€ 1,000	2020	MHNC-UP/BGP

MHNC-UP – Natural History and Science Museum of the University of Porto

BGP – Botanical Garden of Porto

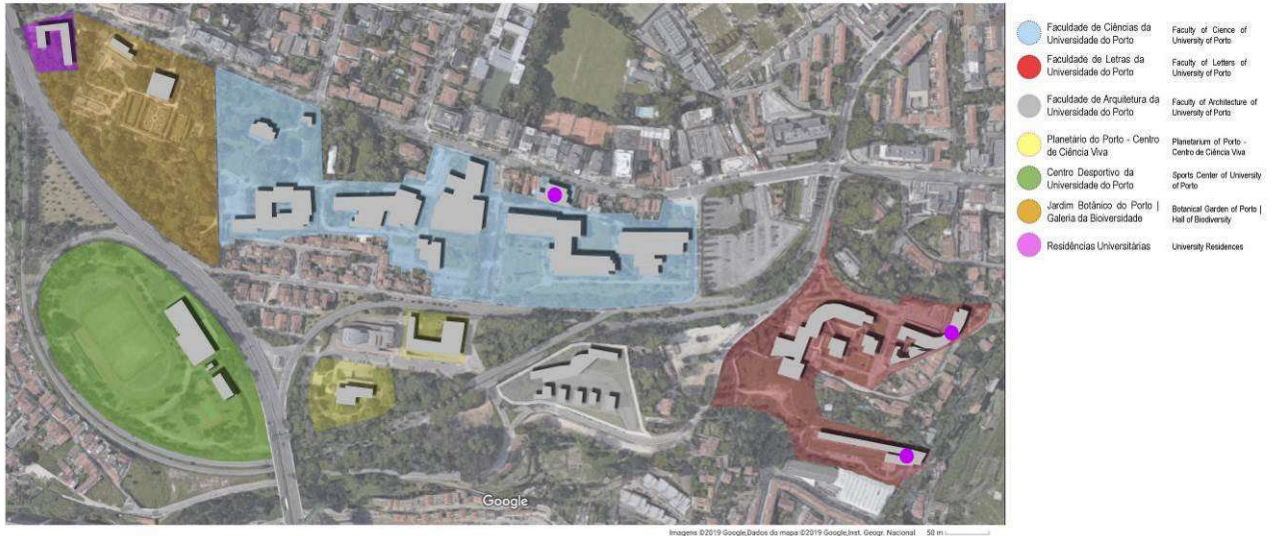
HB – Hall of Biodiversity

FCUP – Faculty of Sciences of University of Porto

APPENDICES

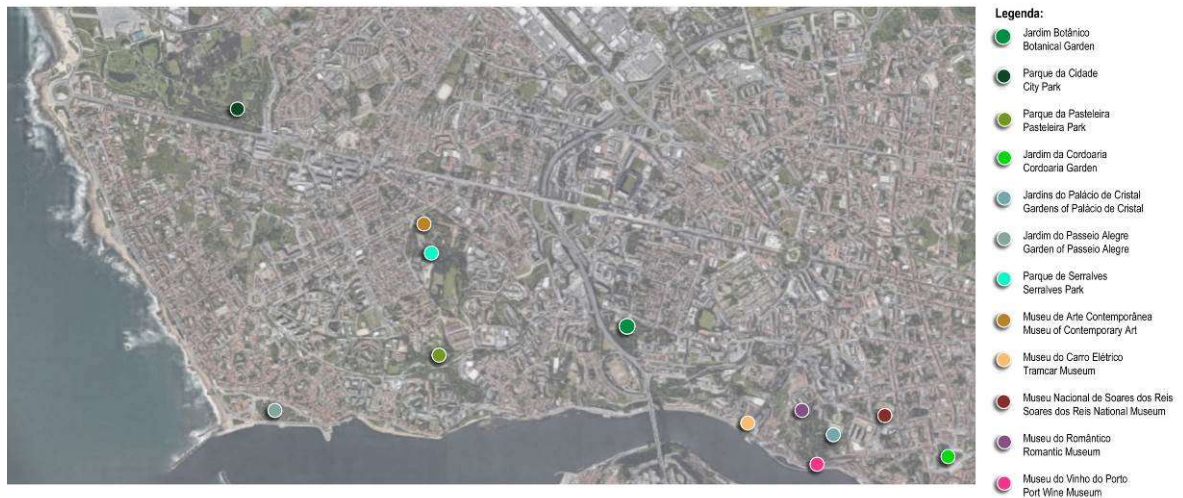
Map of University of Porto Campus

Jardim Botânico do Porto | Campus Universitário Botanical Garden of Porto | University Campus



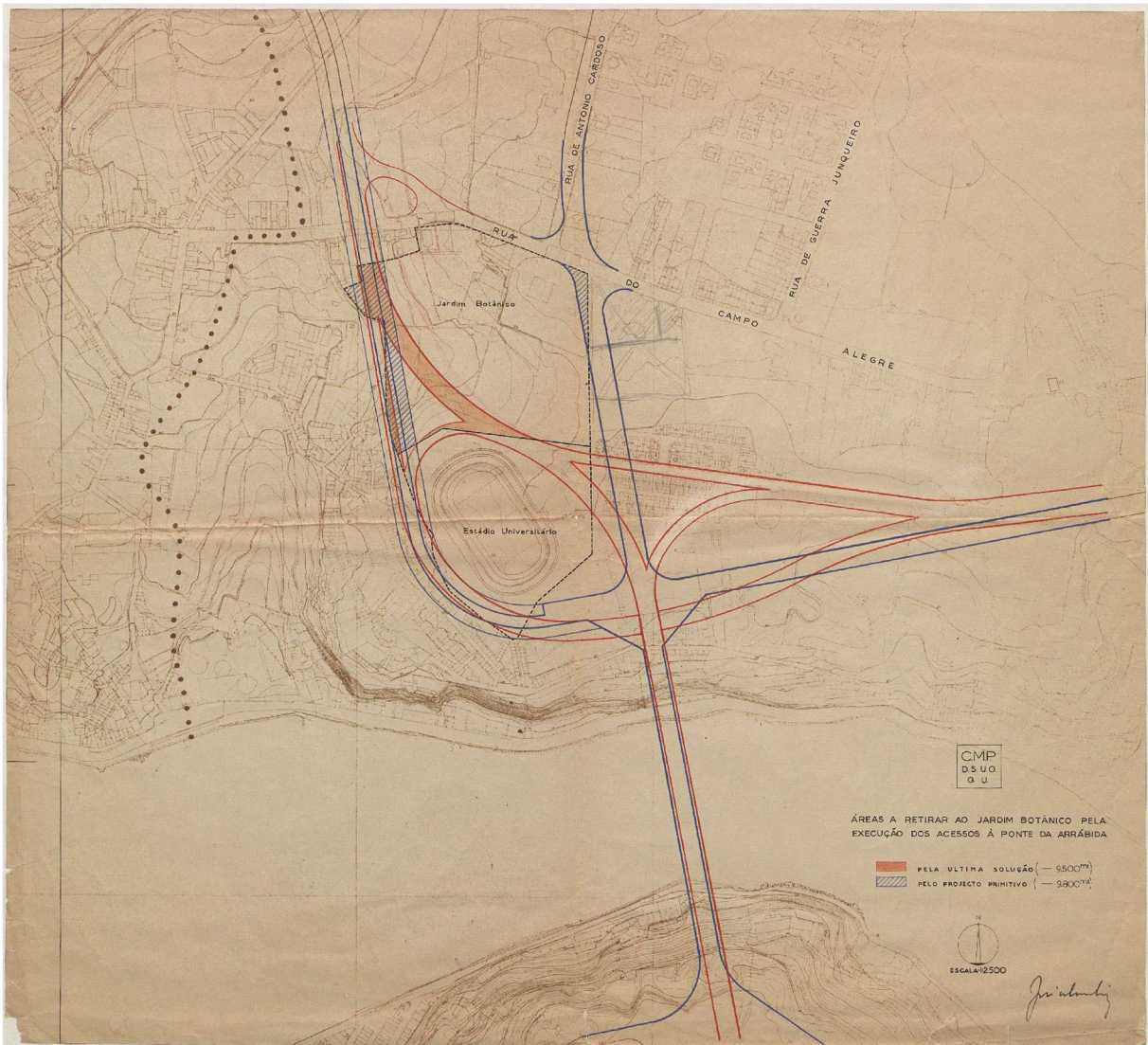
Adapted from www.google.pt/maps. 2019

Map of surrounding area.



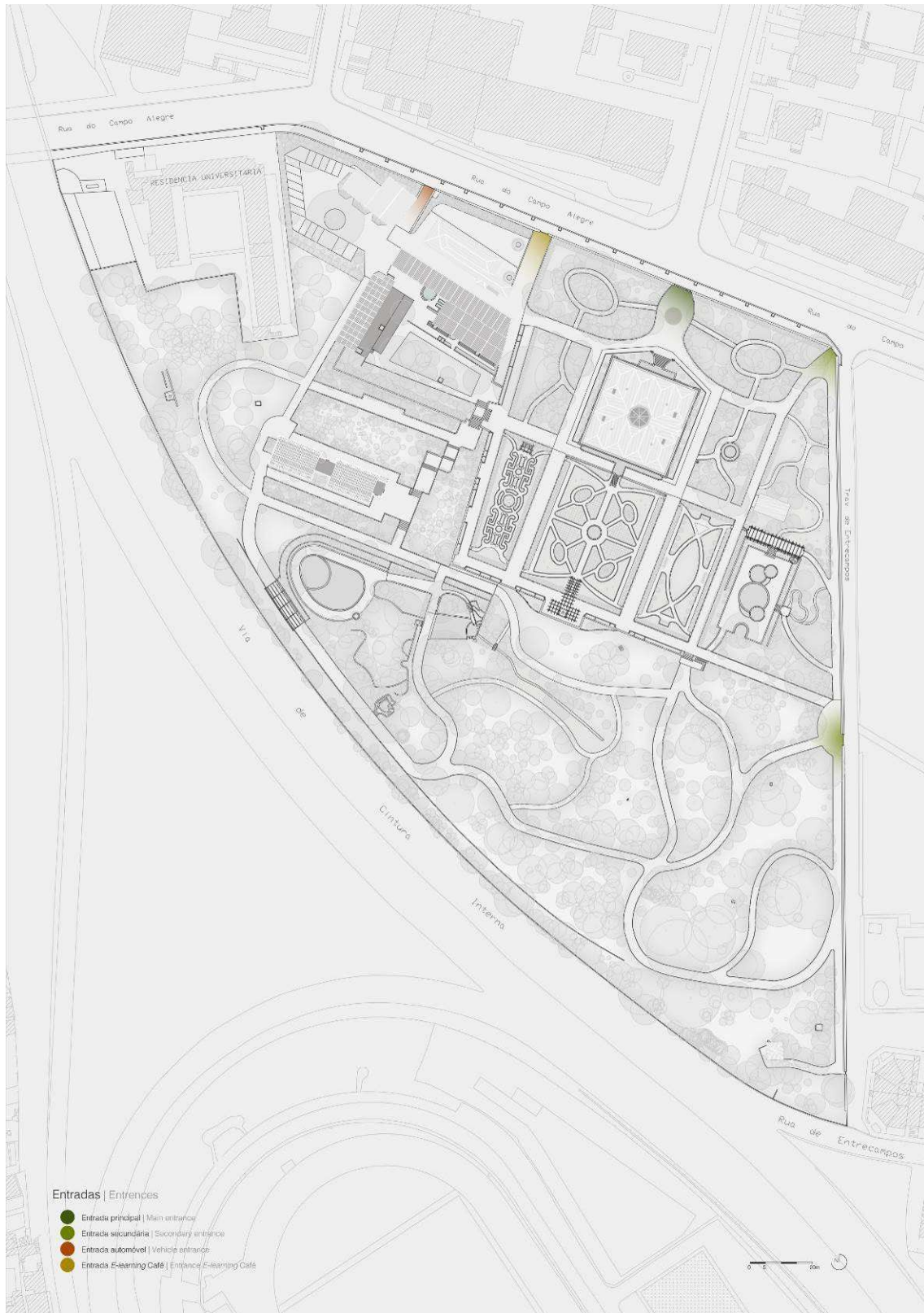
Adapted form www.google.pt/maps. 2019

Design of accesses of Arrábida Bridge



https://repositorio-tematico.up.pt/bitstream/10405/2777/1/245_1AP-9.png

Entrances of Botanical Garden of Porto



Manuel Gentil, 2019

Gardening equipment

Equipament	Brand and model
Blower	Stihl BR420
Brush cutter	Kubota D430
Mower	John Deere R43s WBM e John Deere JX90CB WBM
Chainsaw	Stihl MS 180
Grinding machine	Bosch GWS 7-115 Professional
Pressure Washer	Makita HW102
Air compressor	Hyundai 2HP HYAC50-2
Soldering machine	Great Tool Fury 1600

Record of arboriculture works

Ano	Espécie	Intervenções
2017	<i>Liquidambar styraciflua</i>	Aeration pruning of the inside part of the crown, reduction of branches with excessive loads and removal of dead or damaged branches
2017	<i>Eugenia smithii</i>	Removal of dead or damaged branches
2017	<i>Fraxinus angustifolia</i>	Reduction of the crown and removal of dead or damaged branches
2017	<i>Tilia tomentosa</i>	Removal of branches with excessive loads, aeration pruning of the crown and installation of strops to secure both co-dominances.
2017	4 <i>Cedros libani</i>	Felling. The specimens were dead and at risk of falling.
2017	2 <i>Cedrus libani</i>	Removal of dead or damaged branches
2017	<i>Quercus rubra</i>	Felling
2018	<i>Zelkova carpinifolia</i>	Removal of dead branches/branches in the process of breakage.
2018	<i>Eucalyptus botryoides</i>	Reduction of the branches facing the highway and Travessa de Entre Campos by about 40% and removal of dead branches
2019	<i>Liquidambar styraciflua</i>	Reduction of the crown to alleviate the load, following the damages caused by the falling of 2 limbs in December 2018

Record of interventions/repairs/maintenance

	Intervention/repairs/maintenance	Date	Responsible team
Equipment	Servicing of the blower	January 2015	Rectromaia
	Replacement of the lawnmower blade	January 2015	Rectromaia
	Replacement of the autoclaves	August 2015	Hidroval
	Theft of the busts of Sophia de Mello Breyner Andresen and Professor Américo Pires de Lima	October 2015	---
Pavements	Servicing of a leak in the irrigation system in the terraway pavement near the cactus greenhouses	August 2015	Hidroval
Irrigation system	Servicing of a leak in the irrigation system on the clay pavement near the "J's" Garden	October 2015	Botanical Garden of Porto
Vegetation	Maintenance of the Arboretum	March to December 2015	Floricultura Sta. Filomena
	Pruning and felling of the tree and bush border near highway	March 2015	Floricultura Sta. Filomena
	Donation of 20 orchid specimens	March 2015	Associação Portuguesa de Orquidofilia
	Planting of <i>Lavandula angustifolia</i> "Munsteadwood", Rose bushes and Tulip and Daffodil bulbs in the top flowerbeds of the Rose Garden	March 2015	Botanical Garden of Porto
	Beginning of the improvement of the orchid greenhouse (identification, organization and upgrade of the collection)	March 2015	Botanical Garden of Porto
	Planting 24 specimens of "Michelangelo" Rose and 12 specimens of climbing Rose bushes in the pergola of the Rose Garden	April 2015	Botanical Garden of Porto
	Installing a meadow in the Rose Garden	April 2015	Botanical Garden of Porto
	Camellia-hedge pruning	May 2015	A Magnólia
	Supply of 46 specimens of camellia cultivars	December 2015	Camelias Park Flavius

	Intervention/repairs/maintenance	Date	Responsible team
Irrigation system	Replace the digital electric box of the irrigation system	February 2016	Irrinova
	Servicing of a leakage in the irrigation pipe on the pavement near the greenhouse meadow	March 2016	Botanical Garden of Porto
Equipment	Fuel supply for gardening machines	September to December 2016	Transportes Faria
Structures	Installation of a new metal fence on the border with the highway	July 2016	Construções Alto do Padrão
	Relocation of the base of the bust of Sophia de Mello Breyner Andresen into the southern flowerbed of the “J's” Garden and removal of the remaining bases	November 2016	Botanical Garden of Porto
Vegetation	Maintenance of the Arboretum	January to December 2016	Floricultura Sta. Filomena
	Improvement of vegetation in the Rose Garden (planting of begonias, dahlias, violas, Madonna lilies, yellow bidens, chrysanthus, marigold, petunias, cypresses and lavender)	January to April 2016	Botanical Garden of Porto
	Felling and removal of <i>Cupressus lusitanica</i> damaged in December 2015 in the area of the construction site	March 2016	Flor do Penedo
	Planting 46 camellias, extending from the groves up to the Arboretum.	March 2016	Botanical Garden of Porto
	Planting of trees (citrus fruit and cypresses) in the Fish Garden	April to May 2016	Botanical Garden of Porto
	Creation of fines herbes flowerbeds in the open greenhouse	April 2016	Botanical Garden of Porto
	Reception of 20 trees (6 species)	April 2016	Futuro: Projeto de 100 000 árvores
	Installation of a “green bench” in an external bench of the shade house to simulate extensive green roofing	June 2016	Botanical Garden of Porto
	Cleaning and whitewashing of the windows of the orchid greenhouse	July 2016	Floricultura Sta. Filomena

	Intervention/repairs/maintenance	Date	Responsible team
Irrigation system	Servicing of the water pipe that supplies the e-learning café and the gardeners' facilities	May 2017	EOPP
	Acquisition of programming devices for the automatic irrigation system	July 2017	Irrinova
Equipment	Fuel supply for gardening machines	September to December 2017	Transportes Faria
Structures	Repair the balustrade between the central tier and the Arboretum	January 2017	Empripar – Obras públicas e privadas, S.A.
	A car accident with a heavy commercial vehicle has damaged the railing and wall of the Botanical Garden near Travessa de Entrecampos (it was not possible to identify the vehicle nor the driver)	January 2017	---
	The Cactus and Tropical Greenhouses were vandalized and several door and roof windows were broken (replaced in 2018)	July 2017	---
	Removal of a fallen limb from a eucalyptus of the Arboretum near the wall of Travessa de Entrecampos	July 2017	Botanical Garden of Porto
Vegetation	Maintenance of the Arboretum	January to december 2017	Pétalas Gloriosas
	Arboriculture	January to december 2017	Fundação de Serralves
	Improvement of the Dwarves' Garden (vegetation)	January to August 2017	Horto Flor do Penedo Botanical Garden of Porto
	Improvement of the Boxwood hedges in the formal gardens	January to March 2017	Botanical Garden of Porto
	Acquisition of 500 specimens of Boxwood	January 2017	Horto Flor do Penedo
	Maintenance of the Cactus Garden	March to December 2017	Horto Flor do Penedo
	Reception of <i>Ilex aquifolium</i> , two <i>Betula pubescens</i> , two <i>Cupressus sempervirens</i> and seeds of <i>Borago Officinalis</i> , <i>Hypericum perforatum</i> and <i>Papaver officinalis</i>	March 2017	Futuro: Projeto de 100 000 árvores
	Supply of 160 Azaleas and 60 Rhododendrons	May 2017	Alfredo Moreira da Silva & Filhos, Lda

	Planting of 2 specimens of <i>Punica granatum</i> in the Fish Garden	May 2017	Horto Flor do Penedo
	Camellia-hedge pruning	July 2017	Horto Flor do Penedo
	Cleaning and whitewashing of the windows of the orchid greenhouse	July 2017	Pétalas Gloriosas
	Introduction of new aquatic species: <i>Vitoria cruziana</i> and <i>Euryale ferox</i> in the Tropical Greenhouse	July 2017	Botanical Garden of Porto
	Reception of the Bonsai collection	October 2017	Dr. José Teixeira
	Reception of different Oak acorns and respective germination in the greenhouse	November 2017	Carlos Vila-Viçosa (CIBIO – Research Centre in Biodiversity and Genetic)

	Intervention/repairs/maintenance	Date	Responsible team
Irrigation system	Servicing of a leakage in the pipe that supplies the drinking fountain of the Bronze Boy Garden	January 2018	Botanical Garden of Porto
	Servicing of the water pipe that supplies the e-learning café and the gardeners' facilities	March 2018	Botanical Garden of Porto
Equipment	Fuel supply for gardening machines	September to December 2018	Transportes Faria
	Acquisition of chainsaw	September 2018	Torre Março
	Acquisition of a welding machine, grinder, high-pressure washer and compressor	November 2018	Ferexcel
Structures	Cleaning and whitewashing of the Orchid Greenhouse	June 2018	Palpitalecrim
	Replacement of broken windows in the doors and roof of the Cactus Greenhouse (2018)	September 2018	Vidraria Fonseca
	Improvement of the of technical area of the Garden, construction of toilets, improvement of the of pavements around the Hall of Biodiversity	May to October 2018	PEMI
Vegetation	Maintenance of the Arboretum	January to December 2018	Palpitalecrim
	Reception of different species of Oaks and respective germination in the greenhouse	January to December 2018	Carlos Vila-Viçosa (CIBIO – Research Centre in Biodiversity and

			Genetic) e Jardim Botânico
	Planting of camellias in the Arboretum	January 2018	Botanical Garden of Porto
	Improvement of the Dwarves' Garden	January, April and October 2018	Botanical Garden of Porto
	Supply of 10 Magnolias to expand the collection	March 2018	Horto Flor do Penedo
	Supply of 4 Palm trees to expand the collection	March 2018	Viveiros Juca
	Supply of 1200 Boxwoods to improve the hedges	May 2018	Horto Flor do Penedo
	Installation of vineyard trellis in the Shale Garden	March 2018	Symington S.A. e Jardim Botânico
	Reception of indigenous trees within the scope of the "Future – 100,000 trees" project	March to April 2018	Futuro: Projeto de 100 000 árvores
	Planting works in the groves (<i>Rhododendron</i> sp., <i>Magnolia</i> spp., <i>Bergenia cordifolia</i>)	March to April 2018	Jardim Botânico do Porto
	Supply of 100 camellias to expand the collection	May 2018	Camellias Park Flavius
	Improvement of the Shale's hedges	September 2018	Jardim Botânico do Porto
	Supply of several indigenous plants	October 2018	Sigmatum
	Planting of boxwood on the hedges of the formal gardens	November 2018	Botanical Garden of Porto
	Pruning of the camellia hedges	November de 2018	Horto Flor do Penedo
	Lopping the Boxwood hedges	November de 2018	Horto Flor do Penedo
	Cleaning of fallen limbs of the <i>Liquidambar styraciflua</i> in the Sweet Gum Garden	November and December 2018	Horto Flor do Penedo e Fundação de Serralves
	Improvement of the mixed border beds around the Hall of Biodiversity	December 2018	Botanical Garden of Porto

	Increase the beds bordering the parking area	December 2018	Botanical Garden of Porto
	Supply of several exotic plants to expand the collection	December 2018	Palpitalecrim

Record of species identified in the Botanical Garden

BIRDS	
<i>Apus sp.</i>	
<i>Columba livia</i>	
<i>Columba palombo</i>	
<i>Erithacus rubeola</i>	
<i>Garrulus glandarius</i>	
<i>Larus sp.</i>	
<i>Motacilla alba</i>	
<i>Parus ater</i>	
<i>Parus major</i>	
<i>Pica pica</i>	
<i>Regulus ignicapilla</i>	
<i>Streptopelia decaocto</i>	
<i>Sylvia atricapilla</i>	
<i>Troglodytes troglodytes</i>	
<i>Turdus merula</i>	
<i>Turdus philomelos</i>	
MAMMALS	
<i>Canis familiaris</i>	
<i>Crossidura russula</i>	
<i>Felix catus</i>	
<i>Mus spretus</i>	
<i>Rattus sp.</i>	
AMPHIBIANS	
<i>Lissotriton boscai</i>	
<i>Pelophylax perezi</i>	
<i>Triturus marmoratus</i>	
INVERTEBRATES	
<i>Apis mellifera</i>	<i>Thyatira batis</i>
<i>Autographa gamma</i>	<i>Volucella zonaria</i>
<i>Celastrina argiolus</i>	<i>Adalia bipunctata</i>
<i>Dicladispa testacea</i>	<i>Cacyreus marshalii</i>
<i>Ledra aurita</i>	<i>Dorcus parallelipipedus</i>
<i>Lilioceris lili</i>	<i>Pararge aegeria</i>
<i>Oxythyrea funesta</i>	<i>Pieris brassicae</i>
<i>Palpita vitrealis</i>	<i>Pieris rapae</i>
<i>Phragmatobia fuliginosa</i>	<i>Pyrrhocoris apterus</i>
<i>Polyphaenis sericata</i>	<i>Vanessa atalanta</i>
<i>Protaetia morio</i>	
<i>Rhagonycha fulva</i>	<i>Vespa velutina</i>
<i>Tebenna micalis</i>	

FUNGI*Cantharellus subpruinus**Ganoderma applanatum**Russula* sp.**REPTILES***Podarcis bocagei***BRYOPHYTES AND LICHENS***Anomobryum lusitanicum**Kindbergia praelonga**Anthoceros punctatus**Lassalia pustala**Aspicilia hoffmanniana**Lecanora semisia**Atrichum undulatum**Lepraria* sp.*Bryum argenteum**Leptodyctium riparium**Bryum capillare**Lophocolea bidentata**Caloplaca arenaria**Lophocolea heterophylla**Caloplaca ferruginea**Lunularia cruciata**Calypogeia arguta**Metzgeria furcata**Campylopus pilifer**Neckera complanata**Campylopus* sp.*Orthotrichum diaphanum**Candelariella vitellina**Orthotrichum* sp.*Cephaloziella divaricata**Oxyrrhynchium speciosum**Cladonia* sp.*Oxyrrhynchium hians**Collema* sp.*Oxyrrhynchium scheleicheri**Cololejeunea minutissima**Parmelia sulcata**Conocephalum conicum**Parmelina tiliacea**Cryphea heteromalla**Parmotrema chinense**Crysotriches candelaris**Petrusaria amara**Dicranella heteromalla**Philonotis* sp.*Dicranoweisia cirrata**Physcia* sp.*Didymodon insulanus**Physconia* sp.*Diploica canescens**Platyhypnidium riparioides**Evernia prunastri**Pogonatum aloides**Fissidens* sp.*Polytrichum juniperum**Fissidens viridulus**Porella obtusata**Flavoparmelia caperata**Pseudotaxyphyllum elegans**Fossombronina angulosa**Rhynchostegiella pumila**Frullania dilatata**Riccia fluitans**Funaria hygrometrica**Scapania compacta**Gongylanthus ericetorum**Scleropodium touretii**Grimmia pulvinata**Sematophyllum substrumosum**Grimmia tricophylla**Syntrichia laevipila**Gymnostomum calcareum**Targionia hypophylla**Homalothecium sericeum**Tortula muralis**Hypnum cupressiforme**Trichostomum brachydontium**Hypogymnia physodes**Xanthoparmelia pulla**Hypopterygium muelleri**Xanthoria parietina**Isothecium alopercurioides**Zygodon rupestris*

VASCULAR PLANTS		
<i>Abelia x grandiflora</i>	<i>Agapanthus praecox</i>	<i>Aloe striatula</i>
<i>Abies amabilis</i>	<i>Agathis robusta</i>	<i>Aloe tenuior</i>
<i>Abies cephalonica</i>	<i>Agave americana</i>	<i>Aloe variegata</i>
<i>Abies cilicica</i>	<i>Agathis robusta</i>	<i>Aloe vera</i>
<i>Abies firma</i>	<i>Agave americana</i>	<i>Aloe x spinosissima</i>
<i>Abies fraseri</i>	<i>Agave americana</i> var. <i>marginata</i>	<i>Aloysa triphylla</i>
<i>Abies koreana</i>	<i>Agave attenuata</i>	<i>Amphilophium buccinatorium</i>
<i>Abies nordmanniana</i>	<i>Agave falcata</i>	<i>Anacardium occidentale</i>
<i>Abies nordmanniana</i> ssp. <i>equi-trojani</i>	<i>Agave filifera</i>	<i>Ananas comosus</i>
<i>Abies pinsapo</i>	<i>Agave fourcroydes</i>	<i>Anemone x hybrida</i>
<i>Abies</i> sp.	<i>Agave lechuguilla</i>	<i>Anthoxanthum odoratum</i>
<i>Abromeitiella brevifolia</i>	<i>Agave mitis</i>	<i>Aponogeton distachyos</i>
<i>Acacia dealbata</i>	<i>Agave salmiana</i> var. <i>ferox</i>	<i>Araucaria angustifolia</i>
<i>Acacia melanoxylon</i>	<i>Agave sisalana</i>	<i>Araucaria araucana</i>
<i>Acacia nilotica</i>	<i>Agave</i> sp.	<i>Araucaria bidwillii</i>
<i>Acacia retinodes</i>	<i>Agave stricta</i>	<i>Araucaria columnaris</i>
<i>Acacia</i> sp.	<i>Agave victoriae-reginae</i>	<i>Araucaria cunninghamii</i>
<i>Acacia verticillata</i>	<i>Ageratina ligustrina</i>	<i>Araucaria heterophylla</i>
<i>Acanthus mollis</i>	<i>Agonis flexuosa</i>	<i>Arbutus unedo</i>
<i>Acca sellowiana</i>	<i>Ajuga reptans</i>	<i>Arbutus xalapensis</i>
<i>Acer buergerianum</i>	<i>Albizia julibrissin</i>	<i>Archontophoenix alexandrae</i>
<i>Acer japonicum</i>	<i>Albizia</i> sp.	<i>Archontophoenix</i> sp.
<i>Acer monspessulanum</i>	<i>Alisma lanceolata</i>	<i>Areca catechu</i>
<i>Acer negundo</i>	<i>Alisma plantago-aquatica</i>	<i>Armeria maritima</i>
<i>Acer palmatum</i>	<i>Allium schoenoprasum</i>	<i>Armeria monchiquensis</i>
<i>Acer pseudoplatanus</i>	<i>Allocasuarina litorallis</i>	<i>Armeria pubigera</i>
<i>Acer rubrum</i>	<i>Allocasuarina torulosa</i>	<i>Armeria pungens</i>
<i>Acer saccharum</i>	<i>Alluaudia procera</i>	<i>Armeria</i> sp.
<i>Acer</i> sp.	<i>Alnus acuminata</i>	<i>Artemisia dracunculus</i>
<i>Acourus calamus</i> "variegatus"	<i>Alnus glutinosa</i>	<i>Arundo donax</i>
<i>Adansonia digitata</i>	<i>Alnus incana</i>	<i>Arundo plinii</i>
<i>Adromischus maculatus</i>	<i>Alocasia macrorhizos</i>	<i>Asparagus</i> sp.
<i>Aeonium canariense</i>	<i>Aloe concinna</i>	<i>Asphodelus lusitanicum</i>
<i>Aeonium glandulosum</i>	<i>Aloe cryptopoda</i>	<i>Aster tripolium</i>
<i>Aeonium</i> sp.	<i>Aloe ferox</i>	<i>Astrophytum myriostigma</i>
<i>Aesculus californica</i>	<i>Aloe maculata</i>	<i>Astrophytum ornatum</i>
<i>Aesculus glabra</i>	<i>Aloe marlothii</i>	<i>Atriplex halimus</i>
<i>Aesculus hippocastanum</i>	<i>Aloe parvibracteata</i>	<i>Aucuba japonica</i>
<i>Aesculus pavia</i>	<i>Aloe perfoliata</i>	<i>Austrocylindropuntia subulata</i>
<i>Aesculus</i> sp.	<i>Aloe plicatilis</i>	<i>Azolla filiculoides</i>
<i>Afrocarpus gracilior</i>	<i>Aloe</i> sp.	<i>Azorina vidalii</i>
<i>Agapanthus africanus</i>	<i>Aloe striata</i>	<i>Babiana angustifolia</i>

<i>Bacopa monnieri</i>	<i>Brachychiton acerifolius</i>	
<i>Bactris gasipaes</i>	<i>Brachychiton bidwillii</i>	<i>Calocedrus decurrens</i>
<i>Balantium antarcticum</i>	<i>Brachychiton populneus</i>	<i>Calycanthus floridus</i> var. <i>glaucus</i>
<i>Bambusa vulgaris</i> 'vittata'	<i>Brachychiton rupestris</i>	<i>Camellia azalea</i>
<i>Banksia marginata</i>	<i>Broussonetia papyrifera</i>	<i>Camellia cuspidata</i>
<i>Bauhinia purpurea</i>	<i>Broussonetia</i> sp.	<i>Camellia euphlebia</i>
<i>Bauhinia</i> sp.	<i>Browningia hertlingiana</i>	<i>Camellia gauchonensis</i>
<i>Beaucarnea recurvata</i>	<i>Brugmansia sanguinea</i>	<i>Camellia hongkongensis</i>
<i>Berberis aquifolium</i>	<i>Brugmansia</i> sp.	<i>Camellia irrawadiensis</i>
<i>Berberis jamesiana</i>	<i>Brugmansia suaveolens</i>	<i>Camellia japonica</i> 'Alba Plena'
<i>Berberis julianae</i>	<i>Brugmansia</i> x <i>candida</i>	<i>Camellia japonica</i> 'Augusto Leal Gouveia Pinto'
<i>Berberis lempergiana</i>	<i>Bryophyllum daigremontianum</i>	<i>Camellia japonica</i> 'Mary Phobes Taylor'
<i>Berberis maderensis</i>	<i>Buddleja davidii</i>	<i>Camellia japonica</i> 'Mathotiana alba'
<i>Berberis</i> sp.	<i>Buddleja madagascariensis</i>	<i>Camellia japonica</i> 'Angelina Vieira'
<i>Berberis thunbergii</i>	<i>Bulbophyllum acutiflorum</i>	<i>Camellia japonica</i> 'António Bernardo Ferreira'
<i>Berberis veitchii</i>	<i>Bulbophyllum ambrosia</i>	<i>Camellia japonica</i> 'Augusto Leal Gouveia Pinto'
<i>Bergenia cordifolia</i>	<i>Bulbophyllum fascinator</i>	<i>Camellia japonica</i> 'Barallia '
<i>Bergeranthus scapiger</i>	<i>Butia capitata</i>	<i>Camellia japonica</i> 'Brotero'
<i>Betula alba</i>	<i>Buxus sempervirens</i>	<i>Camellia japonica</i> 'Calliope'
<i>Betula celtiberica</i>	<i>Buxus sempervirens</i> cv. 'Myrtifolia'	<i>Camellia japonica</i> 'Camillo Aureliano'
<i>Betula papyrifera</i>	<i>Buxus sempervirens</i> cv. 'Suffruticosa'	<i>Camellia japonica</i> 'Condessa da Torre'
<i>Betula pendula</i>	<i>Caesalpinia echinata</i>	<i>Camellia japonica</i> 'D. Pedro V'
<i>Betula pubescens</i>	<i>Caesalpinia spinosa</i>	<i>Camellia japonica</i> 'Dom Carlos Fernando'
<i>Betula</i> sp.	<i>Caladium</i> sp.	<i>Camellia japonica</i> 'Dr. Balthazar de Mello'
<i>Biarum arundinarum</i>	<i>Calamagrostis</i> x <i>acutiflora</i>	<i>Camellia japonica</i> 'Duarte de Oliveira'
<i>Bidens ferilifolia</i>	<i>Calendula lusitanica</i>	<i>Camellia japonica</i> 'Fada do Mirante'
<i>Bidens</i> sp.	<i>Calendula officinalis</i>	<i>Camellia japonica</i> 'Felícia Pimentel'
<i>Bifrenaria</i> sp.	<i>Calliandra</i> sp.	<i>Camellia japonica</i> 'Imperatriz do Brazil'
<i>Bischofia javanica</i>	<i>Calliandra tweedii</i>	<i>Camellia japonica</i> 'Imperial Lusitana'
<i>Bischofia polycarpa</i>	<i>Callistemon citrinus</i>	<i>Camellia japonica</i> 'Infanta D. Isabel Maria'
<i>Borago officinalis</i>	<i>Callistemon linearis</i>	<i>Camellia japonica</i> 'Infanta D. Maria Anna'
<i>Bougainvillea glabra</i>	<i>Callistemon salignus</i>	<i>Camellia japonica</i> 'Marquez da Fronteira'
<i>Bougainvillea</i> sp.	<i>Calluna vulgaris</i>	

<i>Camellia japonica</i> 'Moura Encantada'	<i>Camellia yuhsienensis</i>	
<i>Camellia japonica</i> 'Primeiro de Fevereiro'	<i>Carex</i> sp.	<i>Chamaecyparis thyoides</i>
<i>Camellia japonica</i> 'Rainha D. Mafalda'	<i>Carica papaya</i>	<i>Chamaerops humilis</i>
<i>Camellia japonica</i> 'Rainha Santa Isabel'	<i>Carissa bispinosa</i>	<i>Chamaedorea elegans</i>
<i>Camellia japonica</i> 'Surpreza de J.M. Loureiro'	<i>Carnegiea polylopha</i>	<i>Characea</i> sp.
<i>Camellia japonica</i> 'Tedinia'	<i>Carpinus betulus</i>	<i>Cheirolophus sempervirens</i>
<i>Camellia japonica</i> 'Urania'	<i>Carpinus japonica</i>	<i>Chimonanthus praecox</i>
<i>Camellia japonica</i> 'variegata'	<i>Carpinus orientalis</i>	<i>Chrysanthemoides monilifera</i>
<i>Camellia japonica</i> 'Vergine Collepecto'	<i>Castanea sativa</i>	<i>Cinnamomum camphora</i>
<i>Camellia japonica</i> 'Viscondessa de Loureiro'	<i>Castanospermum australe</i>	<i>Cinnamomum japonicum</i>
<i>Camellia japonica</i> 'Viscondessa de Loureiro'	<i>Casuarina cristata</i>	<i>Cinnamomum verum</i>
<i>Camellia miyagi</i>	<i>Casuarina cunninghamiana</i>	<i>Cissus quadrangularis</i>
<i>Camellia nokoensis</i>	<i>Casuarina equisetifolia</i>	<i>Cistus crispus</i>
<i>Camellia odorata</i>	<i>Catalpa bignonioides</i>	<i>Cistus palhinae</i>
<i>Camellia oleifera</i>	<i>Catalpa</i> sp.	<i>Cistus populifolius</i>
<i>Camellia oleracea</i>	<i>Cedrus atlantica</i>	<i>Cistus populifolius x ladanifer</i>
<i>Camellia petelotii</i>	<i>Cedrus deodara</i>	<i>Cistus salviifolius</i>
<i>Camellia pitardii</i>	<i>Cedrus libani</i>	<i>Citrofortunella mitis</i>
<i>Camellia polydonta</i>	<i>Ceiba insignis</i>	<i>Citrus x paradisi</i>
<i>Camellia pubipetala</i>	<i>Celtis australis</i>	<i>Citrus australasica</i>
<i>Camellia reticulata</i>	<i>Celtis occidentalis</i>	<i>Citrus japonica</i>
<i>Camellia sasanqua</i> 'Asakura'	<i>Cephalotaxus harringtonia</i>	<i>Citrus paradisi</i> Macfad. cv. 'Gigante'
<i>Camellia sasanqua</i> 'Barao de Soutelinho'	<i>Ceratonia siliqua</i>	<i>Citrus paradisi</i> Macfad. cv. 'Marsh Sedless'
<i>Camellia sasanqua</i> 'Choji-Guruma'	<i>Ceratophyllum demersum</i>	<i>Citrus paradisi</i> Macfad. cv. 'Star Ruby'
<i>Camellia sasanqua</i> 'Cleopatra'	<i>Cercidiphyllum japonicum</i>	<i>Citrus x paradisi</i> 'Star Ruby'
<i>Camellia sasanqua</i> 'Envangeline'	<i>Cercis siliquastrum</i>	<i>Citrus x sinensis</i> 'Maltesa'
<i>Camellia sasanqua</i> 'Frosted Star'	<i>Cereus hildmannianus</i>	<i>Citrus x sinensis</i> 'Moscatel'
<i>Camellia sasanqua</i> 'Hiryu'	<i>Cereus hildmannianus monstrose</i>	<i>Citrus x sinensis</i> 'Prata'
<i>Camellia sasanqua</i> 'Miss ED'	<i>Cereus jamacaru</i>	<i>Cleistocactus strausii</i>
<i>Camellia sasanqua</i> 'Navajo'	<i>Cestrum fasciculatum</i>	<i>Cleistocactus winteri</i>
<i>Camellia sasanqua</i> 'Shuchuca'	<i>Chaenomeles japonica</i>	<i>Clethra mexicana</i>
<i>Camellia semiserrata</i>	<i>Chamaecyparis lawsoniana</i>	<i>Clivia miniata</i>
<i>Camellia sinensis</i>	<i>Chamaecyparis lawsoniana</i> 'Pembury blue'	<i>Coelogyne cristata</i>
<i>Camellia synaptica</i>	<i>Chamaecyparis pisifera</i>	<i>Coelogyne fimbriata</i>
<i>Camellia tsaii</i>	<i>Chamaecyparis</i> sp.	<i>Coelogyne tomentosa</i>
<i>Camellia virgata</i>		<i>Coffea arabica</i>

<i>Colletia paradoxa</i>	<i>Cupressus macrocarpa</i>	<i>Draceana deremensis</i>
<i>Colletia spinosissima</i>	<i>Cupressus sempervirens</i>	<i>Draceana</i> sp.
<i>Coprosma robusta</i>	<i>Cupressus</i> sp.	<i>Dracenas angustifolia</i>
<i>Cordyline australis</i>	<i>Curcuma longa</i>	<i>Drosera alicei</i>
<i>Cordyline stricta</i>	<i>Cyanotis somaliensis</i>	<i>Drosera binata</i> var. <i>dicotoma</i>
<i>Coriandrum sativum</i>	<i>Cyathea</i> sp.	<i>Drosera binata</i> var. <i>multifida</i>
<i>Cortaderia selloana</i>	<i>Cycas circinalis</i>	<i>Drosera capensis</i>
<i>Corylus avellana</i>	<i>Cycas revoluta</i>	<i>Drosera capensis</i> var. <i>alba</i>
<i>Corylus avellana</i> cv. 'Contorta'	<i>Cycas rumphii</i>	<i>Drosera madagascarensis</i>
<i>Corylus colurna</i>	<i>Cycas</i> sp.	<i>Drosera natalensis</i>
<i>Corymbia ficifolia</i>	<i>Cycas taitungensis</i>	<i>Drosera nidiformis</i>
<i>Coryphanta cornifera</i>	<i>Cydonia oblonga</i>	<i>Drosera pulchella</i>
<i>Cosmos bipinnatus</i>	<i>Cylindropuntia leptocaulis</i>	<i>Duranta erecta</i>
<i>Cotinus coggygria</i>	<i>Cylindropuntia</i> sp.	<i>Dyckia brevifolia</i>
<i>Cotoneaster cochleatus</i>	<i>Cylindropuntia spinosior</i>	<i>Dypsis decaryi</i>
<i>Cotoneaster franchetii</i>	<i>Cylindropuntia tunicata</i>	<i>Dypsis</i> sp.
<i>Cotoneaster integrifolius</i>	<i>Cylindropuntia whipplei</i>	<i>Echeveria x imbricata</i>
<i>Cotoneaster lacteus</i>	<i>Cymbidium 'Showgirl' Malibu</i>	<i>Echhornia crassipes</i>
<i>Cotoneaster obscurus</i>	<i>Cymbidium aloifolium</i>	<i>Echinocactus grusonii</i>
<i>Cotoneaster pannosus</i>	<i>Cyperus hassan</i>	<i>Echinocactus</i> sp.
<i>Cotoneaster salicifolius</i>	<i>Cyperus papyrus</i>	<i>Echinopsis langeniiformis</i>
<i>Cotoneaster</i> sp.	<i>Cytisus scoparius</i>	<i>Echinopsis</i> sp.
<i>Cotoneaster x watereri</i>	<i>Cytisus striatus</i>	<i>Echinopsis spachiana</i>
<i>Crassula falcata</i>	<i>Cytisus x praecox</i> cv. 'Allgold'	<i>Echium candicans</i>
<i>Crassula lactea</i>	<i>Dahlia</i> sp.	<i>Elaeagnus macrophylla</i>
<i>Crassula ovata</i>	<i>Delonix regia</i>	<i>Elaeagnus pungens</i>
<i>Crassula ovata</i> 'Gollum'	<i>Dendrobium kingianum</i>	<i>Elaeis guineensis</i>
<i>Crassula perfoliata</i> var. <i>minor</i>	<i>Dendrobium nobile</i>	<i>Elodia</i> sp.
<i>Crassula perforata</i>	<i>Dendrobium speciosum</i>	<i>Encephalartos caffer</i>
<i>Crataegus monogyna</i>	<i>Deschampsia caespitosa</i>	<i>Encephalartos</i> sp.
<i>Crataegus oxyacantha</i>	<i>Dianella ensifolia</i>	<i>Encephalartos villosus</i>
<i>Crataegus persimilis</i>	<i>Dicksonia antarctica</i>	<i>Enkianthus campanulatus</i>
<i>Crataegus</i> sp.	<i>Digitalis purpurea</i>	<i>Ensete ventriculosum</i>
<i>Crocus autumnalis</i>	<i>Digitalis thapsi</i>	<i>Ephedra fragilis</i>
<i>Crocus serotinus</i>	<i>Dioon edule</i>	<i>Epidendrum radicans</i>
<i>Crodyline terminalis</i>	<i>Diospyros kaki</i>	<i>Equisetum</i> sp.
<i>Cryptomeria japonica</i>	<i>Diospyros lotus</i>	<i>Erica arborea</i>
<i>Cryptomeria japonica</i> cv. "Elegans"	<i>Diospyros whyteana</i>	<i>Erica azorica</i>
<i>Cunninghamia lanceolata</i>	<i>Disocactus phyllanthoides</i>	<i>Erica cinerea</i>
<i>Cuphea micropetala</i>	<i>Dombeya x cayeuxii</i>	<i>Erica lusitanica</i>
<i>Cupressus arizonica</i>	<i>Dovyalis caffra</i>	<i>Erica</i> sp.
<i>Cupressus lusitanica</i>	<i>Dracaena aubryana</i>	<i>Eriobotrya japonica</i>
<i>Cupressus lusitanica</i> var. <i>benthamii</i>	<i>Dracaena draco</i>	<i>Eriobotrya</i> sp.

<i>Erythrina crista-galli</i>	<i>Euryale ferox</i>	<i>Grevillea</i> sp.
<i>Erythrina</i> sp.	<i>Euryops chrysanthemoides</i>	<i>Gymnocalycium cymbiformis</i>
<i>Erythrina variegata</i>	<i>Euterpe oleracea</i>	<i>Gymnocalycium</i> sp.
<i>Escallonia rubra</i>	<i>Exochorda racemosa</i>	<i>Gynostemma pentaphylla</i>
<i>Espositoa guentheri</i>	<i>Exochorda x macrantha</i>	<i>Hakea salicifolia</i>
<i>Espositoa lanata</i>	<i>Fagus crenata</i>	<i>Halesia carolina</i>
<i>Eubotrys racemosa</i>	<i>Fagus sylvatica</i>	<i>Halimium alissoides</i>
<i>Eucalyptus globulus</i>	<i>Fagus sylvaticacv. 'Pendula'</i>	<i>Halimium commutatum</i>
<i>Eucalyptus gunnii</i>	<i>Fargesia</i> sp.	<i>Halimium halimifolium</i> ssp. <i>halimifolium</i>
<i>Eucalyptus</i> sp.	<i>Fatsia japonica</i>	<i>Halimium</i> sp.
<i>Eucalyptus x trabuti</i>	<i>Ferocactus glaucescens</i>	<i>Halimium umbellata</i>
<i>Eucalytus citriodora</i>	<i>Ferocactus</i> sp.	<i>Hamamelis mollis</i>
<i>Eugenia uniflora</i>	<i>Festuca</i> sp.	<i>Harpophyllum</i> sp.
<i>Euonymus japonicus</i>	<i>Ficus bengalensis</i>	<i>Haworthia attenuata</i>
<i>Euonymus</i> sp.	<i>Ficus binnendijkii</i>	<i>Haworthia cymbiformis</i>
<i>Euphorbia triangularis</i>	<i>Ficus religiosa</i>	<i>Hebe andersonii</i>
<i>Euphorbia ammak</i>	<i>Ficus</i> sp.	<i>Hebe</i> sp.
<i>Euphorbia caerulescens</i>	<i>Firmiana simplex</i>	<i>Hedera helix</i>
<i>Euphorbia canariensis</i>	<i>Foeniculum vulgare</i>	<i>Heimia salicifolia</i>
<i>Euphorbia caput-medusae</i>	<i>Fontanesia phillyreoides</i>	<i>Helichrysum italicum</i>
<i>Euphorbia coerulescens</i>	<i>Forsythia suspensa</i>	<i>Helichrysum stoechas</i>
<i>Euphorbia dawei</i>	<i>Fragaria vesca</i>	<i>Heliopsis</i> sp.
<i>Euphorbia echinus</i>	<i>Frangula alnus</i>	<i>Hellianthus annuus</i>
<i>Euphorbia globosa</i>	<i>Fraxinus angustifolia</i> ssp. <i>oxycarpa</i>	<i>Hibbertia scandens</i>
<i>Euphorbia grandicornis</i>	<i>Fraxinus angustifolia</i> Vahl	<i>Hibiscus mutabilis</i>
<i>Euphorbia grandidens</i>	<i>Fraxinus floribunda</i>	<i>Hibiscus rosa-sinensis</i>
<i>Euphorbia heterochroma</i>	<i>Fraxinus ornus</i>	<i>Hibiscus schizopetalus</i>
<i>Euphorbia ingens</i>	<i>Fraxinus</i> sp.	<i>Hibiscus syriacus</i>
<i>Euphorbia mammillaris</i>	<i>Freylinia lanceolata</i>	<i>Hormidium pygmaeum</i>
<i>Euphorbia mammillaris</i> form. <i>Variegata</i>	<i>Fuchsia</i> sp.	<i>Howea forsteriana</i>
<i>Euphorbia milii</i>	<i>Gasteria maculata</i>	<i>Huernia primulina</i>
<i>Euphorbia milii</i> var. <i>splendens</i>	<i>Gazania rigens</i>	<i>Hydrangea macrophylla</i>
<i>Euphorbia nerifolia</i>	<i>Genista florida</i> var. <i>polyacantha</i>	<i>Hydrangea paniculata</i>
<i>Euphorbia obesa</i>	<i>Genista triacanthos</i>	<i>Hydrocleys nymphoides</i>
<i>Euphorbia officinarum</i>	<i>Geranium palmatum</i>	<i>Hypericum canariense</i>
<i>Euphorbia piscatoria</i>	<i>Geranium</i> sp.	<i>Hypericum perforatum</i>
<i>Euphorbia pseudocactus</i>	<i>Ginkgo biloba</i>	<i>Ilex aquifolium</i>
<i>Euphorbia resinifera</i>	<i>Gleditsia</i> sp.	<i>Ilex aquifolium</i> cv. 'Argentea Marginata'
<i>Euphorbia</i> sp.	<i>Gleditsia triacanthos</i>	<i>Ilex paraguariensis</i>
<i>Euphorbia triangularis</i>	<i>Glottiphyllum lomgum</i>	<i>Ilex perado</i> ssp. <i>azorica</i>
<i>Euphorbia trigona</i>	<i>Graptopetalum paraguayense</i>	<i>Ilex x iberica</i>
<i>Euphorbia woodii</i>	<i>Grevillea robusta</i>	<i>Indigofera heterantha</i>

<i>Indigofera kirilowii</i>	<i>Lavandula viridis</i>	<i>Malus prunifolia</i>
<i>Iris pseudacorus</i>	<i>Lavandula x alportensis</i>	<i>Malus sp.</i>
<i>Iris sp.</i>	<i>Lavatera sp.</i>	<i>Mammillaria longimmama</i>
<i>Iris x germanica</i>	<i>Ledum palustre</i>	<i>Mammillaria magnimamma</i>
<i>Jacaranda mimosifolia</i>	<i>Lemna sp.</i>	<i>Mammillaria prolifera</i>
<i>Jasminum mesnyi</i>	<i>Leonotis leonurus</i>	<i>Mammillaria rhodantha</i>
<i>Juglans nigra</i>	<i>Leuchtenbergia principis</i>	<i>Mammillaria sp.</i>
<i>Juniperus chinensis</i>	<i>Leucothoe fontanesiana</i>	<i>Mammillaria elongata</i>
<i>Juniperus communis</i>	<i>Ligustrum lucidum</i>	<i>Mandevilla laxa</i>
<i>Juniperus communis 'Blue'</i>	<i>Ligustrum ovalifolium</i>	<i>Mangifera indica</i>
<i>Juniperus excelsa</i>	<i>Ligustrum sinense</i>	<i>Marginatocereus marginatus</i>
<i>Juniperus navicularis</i>	<i>Lilium sp.</i>	<i>Marsilea mutica</i>
<i>Juniperus oxycedrus</i>	<i>Limonium sp.</i>	<i>Maxillaria densa</i>
<i>Juniperus sabina</i>	<i>Limonium vulgare</i>	<i>Maxillaria picta</i>
<i>Juniperus sp.</i>	<i>Liquidambar styraciflua</i>	<i>Melaleuca linariifolia</i>
<i>Juniperus squamata</i>	<i>Liriodendron tulipifera</i>	<i>Melaleuca nodosa</i>
<i>Juniperus virginiana</i>	<i>Livistona chinensis</i>	<i>Melaleuca preissiana</i>
<i>Juniperus x media</i>	<i>Lomandra longifolia</i>	<i>Melaleuca sp.</i>
<i>Juniperus x pfitzeriana</i>	<i>Lonicera japonica</i>	<i>Melia azedarach</i>
<i>Kalanchoe orgyalis</i>	<i>Lonicera maackii</i>	<i>Melissa officinalis</i>
<i>Kalanchoe rhombopilosa</i>	<i>Lonicera periclymenum</i>	<i>Mentha x piperita</i>
<i>Kalmia latifolia</i>	<i>Lonicera ruprechtiana</i>	<i>Mentha aquatica</i>
<i>Kerria japonica</i>	<i>Lonicera sp.</i>	<i>Mentha pulegium</i>
<i>Kigelia africana</i>	<i>Lonicera x bella</i>	<i>Mentha spicata</i>
<i>Koelreuteria paniculata</i>	<i>Lophophora williamsii</i>	<i>Mentha x piperita</i>
<i>Laburnum anagyroides</i>	<i>Lophostemon confertus</i>	<i>Mespilus germanica</i>
<i>Lactuca watsoniana</i>	<i>Lyonia ovalifolia</i>	<i>Metrosideros collina</i>
<i>Laelia anceps</i>	<i>Macadamia sp.</i>	<i>Metrosideros excelsa</i>
<i>Laelia lobata</i>	<i>Macadamia ternifolia</i>	<i>Metrosideros robusta</i>
<i>Laelia purpurata</i>	<i>Macrozamia communis</i>	<i>Metrosideros umbellata</i>
<i>Lagerstroemia fauriei</i>	<i>Magnolia acuminata</i>	<i>Metrosideros thomasi</i>
<i>Lagerstroemia indica</i>	<i>Magnolia champaca</i>	<i>Mimosa pudica</i>
<i>Lantana camara</i>	<i>Magnolia denudata</i>	<i>Mirabilis jalapa</i>
<i>Larix kaempferi</i>	<i>Magnolia figo</i>	<i>Miriofillum aquaticum</i>
<i>Laurus nobilis</i>	<i>Magnolia floribunda</i>	<i>Molinia caerulea</i>
<i>Lavandula angustifolia</i>	<i>Magnolia grandiflora</i>	<i>Morus nigra</i>
<i>Lavandula angustifolia 'Munsteadwood'</i>	<i>Magnolia liliflora</i>	<i>Musa acuminata</i>
<i>Lavandula dentata</i>	<i>Magnolia soulangeana</i>	<i>Musa sp.</i>
<i>Lavandula latifolia</i>	<i>Magnolia sp.</i>	<i>Musa x paradisiaca</i>
<i>Lavandula louisieri</i>	<i>Magnolia stellata</i>	<i>Myoporum laetum</i>
<i>Lavandula multifida</i>	<i>Magnolia tripetala</i>	<i>Myosotis sp.</i>
<i>Lavandula pedunculata</i>	<i>Magnolia tripetala</i>	<i>Myrtus communis</i>
<i>Lavandula stoechas</i>	<i>Mahonia bealei</i>	<i>Myrtus communisssp. tarentina</i>
<i>Nandina domestica</i>	<i>Pachycereus marginatus</i>	<i>Phoenix dactylifera</i>

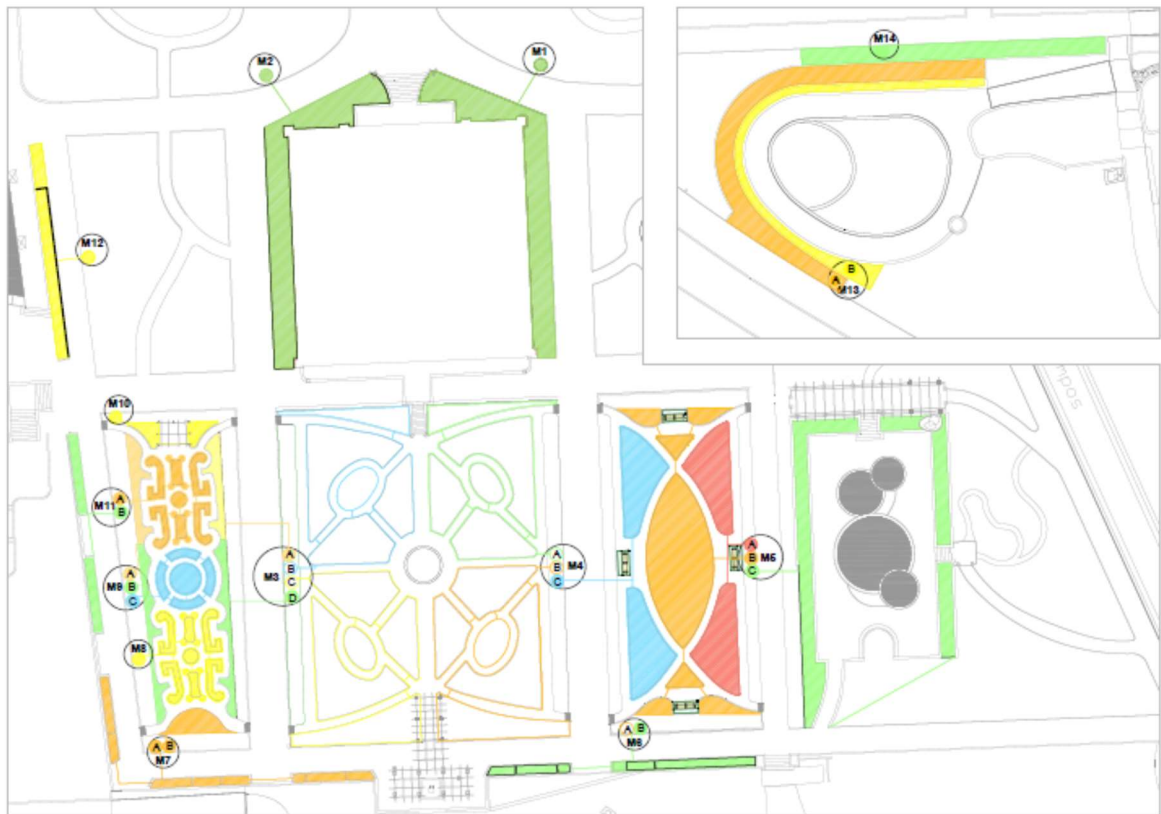
<i>Narcissus bulbocodium</i>	<i>Pachycereus pringlei</i>	<i>Phoenix reclinata</i>
<i>Narcissus munozii-garmendiae</i>	<i>Pachypodium lamerei</i>	<i>Photinia x fraseri</i>
<i>Narcissus</i> sp.	<i>Palmeira sabal</i>	<i>Phyllirea latifolia</i>
<i>Nassella tenuissima</i>	<i>Pandanus</i> sp.	<i>Phyllostachys aurea</i>
<i>Neobuxbaumia polylopha</i>	<i>Papaver officinalis</i>	<i>Physocarpus opulifolius</i>
<i>Nepenthes</i> sp.	<i>Paphiopedilum 'Aladin'</i>	<i>Phytolacca americana</i>
<i>Nerium oleander</i>	<i>Paphiopedilum 'Lathamianum'</i> (<i>P. villosum</i> x <i>spicerianum</i>)	<i>Phytolacca dioica</i>
<i>Nissa</i> sp.	<i>Paphiopedilum 'Albertianum'</i>	<i>Picconia azorica</i>
<i>Nitella</i> sp.	<i>Paphiopedilum 'Nitens'</i> (<i>P. insigne</i> x <i>spicerianum</i>)	<i>Picea abies</i>
<i>Notholithocarpus densiflorus</i>	<i>Paphiopedilum exul</i>	<i>Picea glauca</i>
<i>Nuphar</i> sp.	<i>Paphiopedilum insigne</i>	<i>Picea mariana</i>
<i>Nymphaea lotus</i>	<i>Paphiopedilum villosum</i>	<i>Picea omorika</i>
<i>Nymphaea mexicana</i>	<i>Paphiopedilum x dalatense</i> (<i>P. callosum</i> x <i>villosum</i> var. <i>annamense</i>)	<i>Picea orientalis</i>
<i>Nymphaea pubescens</i> var. <i>rubra</i>	<i>Parodia horstii</i>	<i>Picea pungens</i>
<i>Nymphaea</i> sp.	<i>Parodia leninghausii</i>	<i>Picea rubens</i>
<i>Nyssa sylvatica</i>	<i>Parodia magnifica</i>	<i>Picea sitchensis</i>
<i>Obenia</i> sp.	<i>Parthenocissus quinquefolia</i>	<i>Picea</i> sp.
<i>Ocimum basilicum</i>	<i>Parthenocissus tricuspidata</i>	<i>Picconia azorica</i>
<i>Ocimum minimum</i>	<i>Passiflora alata</i>	<i>Pieris japonica</i>
<i>Olea europaea</i>	<i>Passiflora caerulea</i>	<i>Pilosocereus leucocephalus</i>
<i>Omphalodes nitida</i>	<i>Passiflora edulis</i>	<i>Pinguicula hybrida</i>
<i>Oncidium</i> sp.	<i>Passiflora manicata</i>	<i>Pinus armandii</i>
<i>Opuntia dillenii</i>	<i>Passiflora mollissima</i>	<i>Pinus bungeana</i>
<i>Opuntia engelmannii</i>	<i>Passiflora quadrangularis</i>	<i>Pinus canariensis</i>
<i>Opuntia figusidrica</i>	<i>Passiflora</i> sp.	<i>Pinus halepensis</i>
<i>Opuntia imbricata</i>	<i>Paulownia tomentosa</i>	<i>Pinus nigra</i>
<i>Opuntia leucotricha</i>	<i>Pavonia intermedia</i>	<i>Pinus patula</i>
<i>Opuntia maxima</i>	<i>Pavonia spinifex</i>	<i>Pinus pinaster</i>
<i>Opuntia microdasys</i>	<i>Pentaglottis sempervirens</i>	<i>Pinus pinea</i>
<i>Opuntia monacantha</i>	<i>Peperomia pereskiiifolia</i>	<i>Pinus radiata</i>
<i>Opuntia polycantha</i>	<i>Pereskia aculeata</i>	<i>Pinus</i> sp.
<i>Opuntia robusta</i>	<i>Pereskia grandifolia</i>	<i>Pinus strobus</i>
<i>Opuntia</i> sp.	<i>Pericallis malvifolia</i>	<i>Pinus sylvestris</i>
<i>Opuntia spinulifera</i>	<i>Persea americana</i>	<i>Pinus wallichiana</i>
<i>Opuntia stricta</i>	<i>Persea indica</i>	<i>Pistacia chinensis</i>
<i>Opuntia tomentosa</i>	<i>Petroselinum sativum</i>	<i>Pistacia terebinthus</i>
<i>Origanum vulgare</i>	<i>Petroselinum crisoum</i>	<i>Pistia stratiotes</i>
<i>Osmanthus</i> sp.	<i>Phaius wallichii</i>	<i>Pittosporum crassifolium</i>
<i>Osmunda regalis</i>	<i>Phellodendron lavalleyi</i>	<i>Pittosporum eugenioides</i>
<i>Ostrya carpinifolia</i>	<i>Phillyrea angustifolia</i>	<i>Pittosporum tenuifolium</i>
<i>Osyris quadripartita</i>	<i>Phoenix canariensis</i>	<i>Pittosporum tobira</i>
<i>Pittosporum tobira</i>	<i>Quercus acutissima</i>	<i>Quercus humboldtii</i>

<i>Pittosporum undulatum</i>	<i>Quercus agrifolia</i>	<i>Quercus hypophaea</i>
<i>Platanus orientalis</i>	<i>Quercus alba</i>	<i>Quercus ilex</i>
<i>Platanus</i> sp.	<i>Quercus alba x muehlenbergii</i>	<i>Quercus ilex</i> subsp. <i>rotundifolia</i> Lam.
<i>Platanus x hispanica</i>	<i>Quercus arizonica</i>	<i>Quercus ilicifolia</i>
<i>Platanus orientalis</i>	<i>Quercus benthamii</i>	<i>Quercus imbricaria</i>
<i>Platyserium bifurcatum</i>	<i>Quercus berberidifolia</i>	<i>Quercus infectoria</i>
<i>Platyclusus orientalis</i>	<i>Quercus bicolor</i>	<i>Quercus insignis</i>
<i>Plectranthus forsteri</i> 'Marginatus'	<i>Quercus brachyphylla</i>	<i>Quercus ithaburensis</i>
<i>Podocarpus elatus</i>	<i>Quercus brenesii</i>	<i>Quercus kelloggii</i>
<i>Podocarpus elongatus</i>	<i>Quercus broteroi</i>	<i>Quercus laurina</i>
<i>Podocarpus henkelii</i>	<i>Quercus calliprinos</i>	<i>Quercus libanii</i>
<i>Podocarpus macrophyllus</i>	<i>Quercus canariensis</i>	<i>Quercus lineata</i>
<i>Podocarpus</i> sp.	<i>Quercus canbyi</i>	<i>Quercus lobata</i>
<i>Polygala myrtifolia</i>	<i>Quercus castaneifolia</i>	<i>Quercus lusitanica</i>
<i>Populus alba</i>	<i>Quercus cerris</i>	<i>Quercus lyrata</i>
<i>Populus nigra</i>	<i>Quercus chrysolepis</i>	<i>Quercus macranthera</i>
<i>Populus x canadensis</i>	<i>Quercus coccifera x ilex</i>	<i>Quercus macrocarpa</i>
<i>Potamogeton</i> sp.	<i>Quercus coccinea</i>	<i>Quercus macrolepis</i>
<i>Prunus amygdalus</i>	<i>Quercus copeyensis</i>	<i>Quercus mas</i>
<i>Prunus avium</i>	<i>Quercus cupreata</i>	<i>Quercus mexicana</i>
<i>Prunus cerasifera</i> ssp. <i>pissardii</i>	<i>Quercus douglasii</i>	<i>Quercus michauxii</i>
<i>Prunus dulcis</i>	<i>Quercus douglasii x garryana</i>	<i>Quercus mongolica</i>
<i>Prunus laurocerasus</i>	<i>Quercus durata</i>	<i>Quercus muehlenbergii</i>
<i>Prunus lusitanica</i>	<i>Quercus engelmannii</i>	<i>Quercus myrsinifolia</i>
<i>Pseudosasa japonica</i>	<i>Quercus faginea</i>	<i>Quercus oblongata</i>
<i>Pseudotsuga menziesii</i>	<i>Quercus faginea</i> ssp. <i>fagine</i>	<i>Quercus oblongifolia</i>
<i>Pseudotsuga</i> sp.	<i>Quercus faginea</i> ssp. <i>broteroi x canariensis</i>	<i>Quercus obtusata</i>
<i>Psidium cattleianum</i>	<i>Quercus faginea</i> subsp. <i>marocana</i>	<i>Quercus oleoides</i>
<i>Psidium guajava</i>	<i>Quercus faginea x senneniana</i>	<i>Quercus oleoides</i> var. <i>australis</i>
<i>Psidium</i> sp.	<i>Quercus floribunda</i>	<i>Quercus orocantabrica</i>
<i>Pterocarya fraxinifolia</i>	<i>Quercus frainetto</i>	<i>Quercus palustris</i>
<i>Pterocarya x rehderiana</i>	<i>Quercus franchetii</i>	<i>Quercus petraea</i>
<i>Punica granatum</i>	<i>Quercus gambelii</i>	<i>Quercus petraea x faginea</i>
<i>Pyracantha angustifolia</i>	<i>Quercus garryana</i>	<i>Quercus phellos</i>
<i>Pyracantha coccinea</i>	<i>Quercus georgiana</i>	<i>Quercus phyllireoides</i>
<i>Pyracantha crenulata</i> var. <i>rogersiana</i>	<i>Quercus germana</i>	<i>Quercus pinnativenulosa</i>
<i>Pyracantha</i> sp.	<i>Quercus glauca</i>	<i>Quercus polymorpha</i>
<i>Pyrus betulifolia</i>	<i>Quercus gravesii</i>	<i>Quercus prinoides</i>
<i>Pyrus cordata</i>	<i>Quercus griffithii</i>	<i>Quercus prinoides x muehlenbergii</i>
<i>Pyrus malus</i>	<i>Quercus hartwisiana</i>	
<i>Quercus acerifolia</i>	<i>Quercus humboldtii</i>	<i>Quercus pubescens</i>
<i>Quercus pubescens x pyrenaica</i>	<i>Quercus x kernerii</i>	<i>Rosa sempervirens</i>

<i>Quercus pungens</i>	<i>Quercus x libanerris</i>	<i>Rosa rugosa</i> 'Pink Grootendorst'
<i>Quercus pyrenaica</i>	<i>Quercus x megaleia</i>	<i>Rosa</i> sp. 'Michelangelo'
<i>Quercus rivasmartinezii</i>	<i>Quercus x pacensis</i>	<i>Rosmarinus officinalis</i>
<i>Quercus robur</i>	<i>Quercus x pseudococcifera</i>	<i>Rosa</i> sp.
<i>Quercus robur x ilex</i>	<i>Quercus x salcedoi</i>	<i>Rosmarinus officinalis</i> cv. 'Prostratus Group'
<i>Quercus robusta</i>	<i>Quercus x saulii</i>	<i>Rubus radula</i>
<i>Quercus rotundifolia</i>	<i>Quercus x schuettei</i>	<i>Rubus sampaioanus</i>
<i>Quercus rotundifolia f. calycina</i>	<i>Quercus x senneniana</i>	<i>Rubus vagabundus</i>
<i>Quercus rubra</i>	<i>Quercus x substellata</i>	<i>Rumex azoricus</i>
<i>Quercus rugosa</i>	<i>Quercus x tentudaica</i>	<i>Ruscus aculeatus</i>
<i>Quercus sartorii</i>	<i>Quercus x trabutiana</i>	<i>Ruscus aculeatus</i>
<i>Quercus schottkyana</i>	<i>Quercus x turnerii</i>	<i>Russelia</i> sp.
<i>Quercus serrata</i>	<i>Quercus xalapensis</i>	<i>Saccharum officinarum</i>
<i>Quercus sessilifolia</i>	<i>Ravena</i> sp.	<i>Sagittaria latifolia</i>
<i>Quercus shumardii</i>	<i>Ravena rivularis</i>	<i>Sagittaria subulata</i>
<i>Quercus sinuata</i>	<i>Rhamnus alaternus</i>	<i>Salix atrocinerea</i>
<i>Quercus stellata</i>	<i>Rhamnus cathartica</i>	<i>Salix rosmarinifolia</i>
<i>Quercus stellata x muehlenbergii</i>	<i>Rhamnus</i> sp.	<i>Salix salvifolius</i>
<i>Quercus stenophylloides</i>	<i>Rhaphiolepis delacourii</i>	<i>Salix x sepulcralis</i> cv. 'Chrysocoma'
<i>Quercus suber</i>	<i>Rhaphiolepis indica</i>	<i>Salvia atropurpurea</i>
<i>Quercus turbinella</i>	<i>Rhaphiolepis umbellata</i>	<i>Salvia officinalis</i>
<i>Quercus vaseyana</i>	<i>Rhododendron arboreum</i>	<i>Salvinia molesta</i>
<i>Quercus velutina</i>	<i>Rhododendron indicum</i>	<i>Sambucus nigra</i>
<i>Quercus virginiana</i>	<i>Rhododendron makinoi</i>	<i>Sansevieria chrenbergii</i>
<i>Quercus wislizeni</i>	<i>Rhododendron ponticum</i>	<i>Sarcocornia perenis</i>
<i>Quercus x alvesii</i>	<i>Rhododendron</i> sp.	<i>Satureja hortensis</i>
<i>Quercus x autumnalis</i>	<i>Rhus succedanea</i>	<i>Scabiosa nitens</i>
<i>Quercus x auzandrii</i>	<i>Rhus typhina</i>	<i>Schinus terebinthifolius</i>
<i>Quercus x avellaniformis</i>	<i>Ribes rubrum</i>	<i>Schotia latifolia</i>
<i>Quercus x bebbiana</i>	<i>Ribes</i> sp.	<i>Sciadopitys verticillata</i>
<i>Quercus x cerrioides</i>	<i>Riccia fluitans</i>	<i>Scilla monophylus</i>
<i>Quercus x coutinhoi</i>	<i>Robinia pseudoacacia</i>	<i>Scilla socialis</i>
<i>Quercus x egglestonii</i>	<i>Romulea clusiana</i>	<i>Sedum amplexicaule</i>
<i>Quercus x exacta</i>	<i>Rosa</i> 'Botero'	<i>Sedum forsterianum</i>
<i>Quercus x faxonii</i>	<i>Rosa canina</i>	<i>Sedum morganianum</i>
<i>Quercus x fernowii</i>	<i>Rosa</i> cv. "Cécile Brünner"	<i>Sedum nussbaumerianum</i>
<i>Quercus x gallaecicus</i>	<i>Rosa</i> 'Jardins de Bagatelle'	<i>Sedum rubrotintum</i>
<i>Quercus x hickleyi</i>	<i>Rosa luciae</i>	<i>Sedum</i> sp.
<i>Quercus x hispanica</i>	<i>Rosa multiflora</i>	<i>Senecio crassissimus</i>
<i>Quercus x humidicola</i>	<i>Rosa</i> 'Nicholas Hulot'	<i>Sequoia sempervirens</i>
<i>Quercus x jackiana</i>	<i>Rosa</i> 'Paris Match'	<i>Sequoiadendron giganteum</i> (Lindl.) J.Buchholz
<i>Serapias lingua</i>	<i>Thymus mastichina</i>	<i>Vitis x instabilis</i>

<i>Serapias x todaroi</i>	<i>Thymus</i> sp.	<i>Washingtonia filifera</i>
<i>Sobralia macrantha</i>	<i>Thymus vulgaris</i>	<i>Weigela</i> sp.
<i>Sobralia 'Mirabilis'</i>	<i>Tibouchina heteromalla</i>	<i>Wisteria sinensis</i>
<i>Solanum</i> sp.	<i>Tibouchina urvilleana</i>	<i>Wolffia</i> sp.
<i>Sorbus aucuparia</i>	<i>Tilia cordata</i>	<i>Wollemia nobilis</i>
<i>Sorbus bristoliensis</i>	<i>Tilia mongolica</i>	<i>Woodwardia radicans</i>
<i>Sparaxis tricolor</i>	<i>Tilia</i> sp.	X <i>Cupressocyparis leylandii</i>
<i>Spergularia azorica</i>	<i>Tilia tomentosa</i>	<i>Yucca</i> sp.
<i>Spiraea cantoniensis</i>	<i>Trachycarpus fortunei</i>	<i>Yucca treculeana</i>
<i>Spiraea japonica</i>	<i>Tradescantia fluminensis</i>	<i>Zelkova carpinifolia</i>
<i>Spiraea nipponica</i>	<i>Tritonia crocata</i>	<i>Zingiber officinale</i>
<i>Spirodela punctata</i>	<i>Tsuga canadensis</i>	
<i>Stanhopea</i> sp.	<i>Tsuga diversifolia</i>	
<i>Stapelia hirsuta</i>	<i>Tuberaria lignosa</i>	
<i>Stenocarpus sinuatus</i>	<i>Tulipa hybrida</i>	
<i>Stenocereus griseus</i>	<i>Tulipa sylvestris</i>	
<i>Stipa gigantea</i>	<i>Tumbergia missouriensis</i>	
<i>Strelitzia nicolae</i>	<i>Typha angustifolia</i>	
<i>Strelitzia parvifolia</i>	<i>Typha latifolia</i>	
<i>Strelitzia reginae</i>	<i>Typha minima</i>	
<i>Syagrus romanzoffiana</i>	<i>Ulex europaeus</i>	
<i>Syringa vulgaris</i>	<i>Ulmus minor</i>	
<i>Syzygium jambos</i>	<i>Ulmus procera</i>	
<i>Syzygium smithii</i>	<i>Utricularia vulgaris</i>	
<i>Syzygium</i> sp.	<i>Vaccinium corymbosum</i>	
<i>Tabebuia</i> sp.	<i>Vachellia farnesiana</i>	
<i>Tamarindus indica</i>	<i>Vanda bicolor</i>	
<i>Tamarix gallica</i>	<i>Verbascum</i> sp.	
<i>Taxodium ascendens</i>	<i>Veronica officinalis</i>	
<i>Taxodium distichum</i>	<i>Viburnum farreri</i>	
<i>Taxus baccata</i>	<i>Viburnum lantana</i>	
<i>Taxus baccata</i> cv. 'Fastigiata'	<i>Viburnum opulus</i>	
<i>Tectona grandis</i>	<i>Viburnum rhytidophyllum</i>	
<i>Telopea speciosissima</i>	<i>Viburnum tinus</i>	
<i>Tephrocactus articulatus</i> var. <i>papyracantha</i>	<i>Viburnum x burkwoodii</i>	
<i>Ternstroemia gymnanthera</i>	<i>Victoria cruziana</i>	
<i>Tetraclinis articulata</i>	<i>Vinca difformis</i>	
<i>Teucrium fruticans</i>	<i>Vinca major</i>	
<i>Thuja occidentalis</i>	<i>Vinca minor</i>	
<i>Thuja plicata</i>	<i>Viola x hybrida</i>	
<i>Thujopsis dolabrata</i>	<i>Vitis</i> sp.	
<i>Thymus albicans</i>	<i>Vitis sylvestris</i>	
<i>Thymus lotocephalus</i>	<i>Vitis x alexanderi</i>	

Irrigation map



Program of watering by modules

Program of Watering by Modules - Summer

Garden	Module	Times/Week	Valves	No. of irrigations	Start	Duration of each watering	Total duration of watering
Cedar grove	M1	Everday		1	04:30 a.m.	5 min.	5 min.
Araucaria grove	M2	Everday		1	04:35 a.m.	5 min.	5 min.
Rose garden - north	M3	Everday	A	8	04:40 a.m./09:00 p.m.	15 + 15 min	120 min.
		Everday	B		04:55 a.m./09:15 p.m.	15 + 15 min	
		Everday	C		05:10 a.m./09:30 p.m.	15 + 15 min	
		Everday	D		05:25 a.m./09:45 p.m.	15 + 15 min	
Rose garden - East	M4	Everday	A	6	05:40 a.m./10:00 p.m.	15 + 15 min	66 min.
		Everday	B		05:55 a.m./10:15 p.m.	15 + 15 min	
		Everday	C		06:10 a.m./10:30 p.m.	3 + 3 min.	
Fish garden - East	M5	Everday	A	6	06:25 a.m./10:45 p.m.	3 + 3 min.	18 min.
		Everday	B		06:28 a.m./10:48 p.m.	3 + 3 min.	
		Everday	C		06:31 a.m./10:51 p.m.	3 + 3 min.	
Fish garden - South	M6	Everday		2	06:34 a.m.	15 + 15 min.	36 min.
		Everday			10:54 p.m.	3 + 3 min.	
Jays Garden - South	M7	Everday	A	4	06:52 a.m./11:13 p.m.	15 + 15 min.	40 min.
		Everday	B		07:07 a.m./11:28 p.m.	5 + 5 min.	
Jays garden - South	M8	Everday		2	07:12 a.m./11:33 p.m.	5 + 5 min	10 min.
Jays garden - West	M9	Everday	A	6	07:17 a.m./11:38 p.m.	5 + 5 min	30 min.
		Everday	B		07:22 a.m./11:43 p.m.	5 + 5 min	
		Everday	C		07:27 a.m./11:48 p.m.	5 + 5 min	
Jays garden - North	M10	Everday		2	07:32a.m./11:53 p.m.	2 + 2 min	4 min.
Jays garden - North	M11	Everday	A	4	07:34 a.m./11:55 p.m.	5 + 5 min	40 min.
		Everday	B		07:39 a.m./ 00:10 a.m.	15 + 15 min.	
Raised bed	M12	Everday		2	07:54 a.m./00:15 a.m	15 + 15 min.	30 min.
Big pond	M13	Everday	A	2	08:09 a.m.	5 min.	10 min.
		Everday	B		00:30 a.m.	5 min.	
Cactus	M14	Everday		2	08:14 a.m./00:35 a.m.	5 min.	5 min.

Program of Watering by Modules - Autumn

Garden	Module	Times/Week	Valves	No. of irrigations	Start	Duration of each watering	Total duration of watering
Cedar grove	M1	Thursday Friday		1	04:30 a.m.	5 min.	5 min.
Araucaria grove	M2	Thursday Friday		1	04:35 a.m.	5 min.	5 min.
Rose garden - north	M3	Thursday Friday	A	8	04:40 a.m./09:00 p.m.	15 + 15 min	120 min.
			B		04:55 a.m./09:15 p.m.	15 + 15 min	
			C		05:10 a.m./09:30 p.m.	15 + 15 min	
			D		05:25 a.m./09:45 p.m.	15 + 15 min	
Rose garden - East	M4	Thursday Friday	A	6	05:40 a.m./10:00 p.m.	15 + 15 min	66 min.
			B		05:55 a.m./10:15 p.m.	15 + 15 min	
			C		06:10 a.m./10:30 p.m.	3 + 3 min.	
Fish garden - East	M5	Thursday Friday	A	6	06:25 a.m./10:45 p.m.	3 + 3 min.	18 min.
			B		06:28 a.m./10:48 p.m.	3 + 3 min.	
			C		06:31 a.m./10:51 p.m.	3 + 3 min.	
Fish garden - South	M6	Thursday Friday		2	06:34 a.m.	15 + 15 min.	36 min.
					10:54 p.m.	3 + 3 min.	
Jays Garden - South	M7	Thursday Friday	A	4	06:52 a.m./11:13 p.m.	15 + 15 min.	34 min.
			B		07:07 a.m./11:28 p.m.	2 + 2 min.	
Jays garden - South	M8	Thursday Friday		2	07:12 a.m./11:33 p.m.	2 + 2 min	4 min.
Jays garden - West	M9	Thursday Friday	A	6	07:17 a.m./11:38 p.m.	2 + 2 min	12 min.
			B		07:22 a.m./11:43 p.m.	2 + 2 min	
			C		07:27 a.m./11:48 p.m.	2 + 2 min	
Jays garden - North	M10	Thursday Friday		2	07:32 a.m./11:53 p.m.	2 + 2 min	4 min.
Jays garden - North	M11	Thursday Friday	A	4	07:34 a.m./11:55 p.m.	2 + 2 min	34 min.
			B		07:39 a.m./00:00	15 + 15 min.	
Raised bed	M12	Thursday Friday		2	07:54 a.m./00:15 a.m.	15 + 15 min.	30 min.
Big pond	M13	Thursday Friday	A	2	08:09 a.m.	5 min.	10 min.
			B		00:30 a.m.	5 min.	
Cactus	M14	Thursday Friday		2	08:14 a.m./00:35 a.m.	5 min.	5 min.

Planning of practical classes

Planning of practical classes for the subject of Green Spaces Management Techniques – 2017

CLASSES	TASKS
9 February	Presentation, removal of agapanthus from the Dwarves' Garden.
16 February	Visit to the Botanical Garden, weeding of flowerbeds in the Fish, Rose and "J's" Gardens and vases in the open greenhouse.
23 February	Planting of <i>Buxus</i> sp. (Boxwood) in the hedges of the Fish and "J's" Gardens.
9 March	Cleaning of dead branches of <i>Rhododendron</i> sp. (Azaleas and Rhododendrons) in the Bronze Boy Garden, Sweet Gum Garden and Brazilian pine and Cedar Groves.
16 March	Pruning of <i>Helichrysum italicum</i> (curry plant) of the Rose Garden, pruning of <i>Buxus</i> sp. (Boxwood) planted in the "J's" Garden and Fish Garden, cutting of <i>Helichrysum italicum</i> (curry plant), <i>Buxus</i> sp. (Boxwood) and <i>Hedera helix</i> (Hera), planting of <i>Buxus</i> sp. (Boxwood) on the hedges of the "J's" and Fish Gardens.
23 March	Presentation of Ana Luísa Oliveira, a student from the Kew Gardens.
30 March	Replacement of weak or dead rose bushes with healthy rose bushes and replenishment of <i>Helichrysum italicum</i> (curry plant) in the Rose Garden.
6 April	Planting of <i>Myosotis</i> sp. (Myosotis) and <i>Anemone hybrida</i> (Anemone) in the Rose Garden, weeding and spreading of pine bark in 4 flowerbeds of the Rose Garden and staking of seeding areas in the Dwarves' Garden.
20 April	Inspection of the irrigation system of the Botanical Garden and its operation.
27 April	Planting of <i>Lavatera</i> sp. (Lavatera), <i>Heliopsis</i> sp. (Rough oxeye) and <i>Geranium</i> sp. (Geranium) in the "J's" Garden, planting of <i>Calendula</i> sp. (Pot marigold) and <i>Tagetes patula</i> (Marigold) in the Rose Garden, Planting of <i>Borago Officinalis</i> (Borage), <i>Lavandula multifida</i> (Lavender) and <i>Verbascum</i> sp. (Common mullein) in the mixed border. Preparation of the soil (weeding), grass sowing and irrigation in the Dwarves' Garden.

Planning of practical classes for the subject of Green Spaces Management Techniques – 2018

CLASSES	TASKS
15 February	Weeding and organization of vases in the orchid greenhouse
8 March	Division of acorns in the greenhouse
15 March	Preparation of the soil for planting works in the Dwarves' Garden, cleaning of rhododendrons and Azaleas (<i>Rhododendron</i> spp.)
22 March	Deadheading rose bushes, weeding, transplantations in the Rose Garden and cleaning of tanks in the Shale
5 April	Planting Rhododendrons (<i>Rhododendron</i> spp.), Boxwood (<i>Buxus sempervirens</i> 'Myrtifolia') and topping Boxwood (<i>Buxus</i> spp.) in the Fish and "J's" gardens.
3 May	Grass sowing in the Dwarves' Garden, weeding flowerbeds of the Shale and planting salvia cistus (<i>Cistus salvifolius</i>), lavender (<i>Lavandula angustifolia</i> and <i>Lavandula viridis</i>) and <i>Erygeron</i> sp. in the flowerbeds of the Shale.
9 May	Plantação de Buxo (<i>Buxus sempervirens</i> 'Myrtifolia') no Jardim do Peixe
14 May	Plantação de Buxo (<i>Buxus sempervirens</i> 'Myrtifolia') no Jardim dos Jotas

Record of the developed activities

Record of the developed activities – 2016

January to December	Guided tours for organized groups
18 October	Guided tour of a class from FBAUP (Faculty of Fine Arts of the University of Porto) taught by Professor Karen Lacroix, led by Professor Paulo Farinha Marques
8 to 10 February	Carnival Workshop
21 March to 1 April	Easter Workshop
1 August a 2 September	Summer Workshop
19 to 30 December	Christmas Workshop
2 and 3 April	Hosting of the basic course of scientific illustration, coordinated by instructor Francisca Cavaleiro.
27 June to 1 July	Hosting of the activity “Applied botany” within the framework of the Junior University
27 June to 22 July	Hosting of the activity “Living Ponds” within the framework of the Junior University
27 June to 22 July	Hosting of the activity “Safari in the Animals’ Lilliput” within the framework of the Junior University
29 January	Workshop “Park and Garden Management”.
20 and 21 February	Workshop “Knowing Orchids”. In collaboration with the Portuguese Association of Orchidophilia.
9 March	Workshop “A day with Camellias”. In collaboration with the Portuguese Association of Camellias.
8 April	Workshop “Annual Gardens”. In collaboration with Teresa Matos Fernandes and Ricardo Bravo.
9 and 10 July	Workshop “The allure of orchids” in collaboration with the Portuguese Association of Orchidophilia.
23 November	Workshop “I love trees” in collaboration with Teresa Matos Fernandes and Ricardo Bravo.
2 July	BioBlitz.
27 September	Workshop “Origins and Flavour of Tea” promoted by Nina Gruntkowski.
19 ti 21 July, 5 to 9 September and 12 to 15 Setember	Activity “Plants on the table”, in the context of the “Life Science in the Summer” programme.
5 and 6 de March	Participation in the XXI Exhibition of Camellias of Porto, at the Fundação de Serralves
21 May	On the International Museum Day and European Night of Museums, the Garden received the famous opera by Henry Purcell (1659-1695) “Dido and Aeneas”, organized by ESMAE (Polytechnic of Porto).
19 June	EcoPorto, an event with a fresh market, handicrafts, cooking and craft workshops and small artistic performances.

22 July	Show by the Jazz Choir "Bjazz".
2 December	Collaboration in the planting of a Cork Oak (<i>Quercus suber</i>) in the Wild Dry Garden (Faculty of Sciences of the University of Porto) in the context of the "WISE Project".
21 December	Collaboration with the Portuguese Association of Camellias in the launching of the book "The Cradle of the European Culture of camellias" by Jörg Daehnhardt.

Record of the developed activities – 2017

January to December	Guided tours for organized groups
6 de April	Guided tour "Forbidden Pleasures" by Professor Paulo Farinha Marques in collaboration with Professor Karen Laroix (FBAUP); from 7:30 p.m. to 9:30 p.m.
18 April	Guided tour organized by NEBUP (Association of Biology Students of the University of Porto) within the framework of "People, Insects and Dead Wood".
5 to 13 April	Easter Workshop
31 July to 1 September	Summer Workshop
18 to 29 December	Christmas Workshop
26 November	The "Magusto" (Chestnut roasting activity) with the children's workshop "Hair-raising experience" and free guided tours for visitors of the Garden.
3 to 28 July	"Bioexplorers" activity within the framework of Junior University activities, covering topics such as biodiversity conservation, taxonomy, etc.
	From 3 to 28 July, the Garden hosted several activities for the Junior University, namely:
3 to 28 July	Hosting "Living Ponds" for the Junior University
3 to 28 July	Hosting "Safari in the Animals' Lilliput" for the Junior University
10 to 14 July	Hosting "POP-UP Garden" for the Junior University
6 March	Workshop "Talking with Camellias" in partnership with the Portuguese Association of Camellias.
27 and 28 May	Workshop "The Allure of Orchids", in partnership with the Portuguese Association of Orchidophilia. The lecture of 27 July, addressed the subject of "Dendrobiums and how they grow on trees" (speaker Graziela Meister) and the lecture of 28 July on "The Cultivation of Cattleya" (speaker José Costa).
16 September	The BioBlitz of the Botanical Garden.
27 September	Workshop "Arboriculture in Fundação de Serralves", in partnership with Fundação de Serralves.

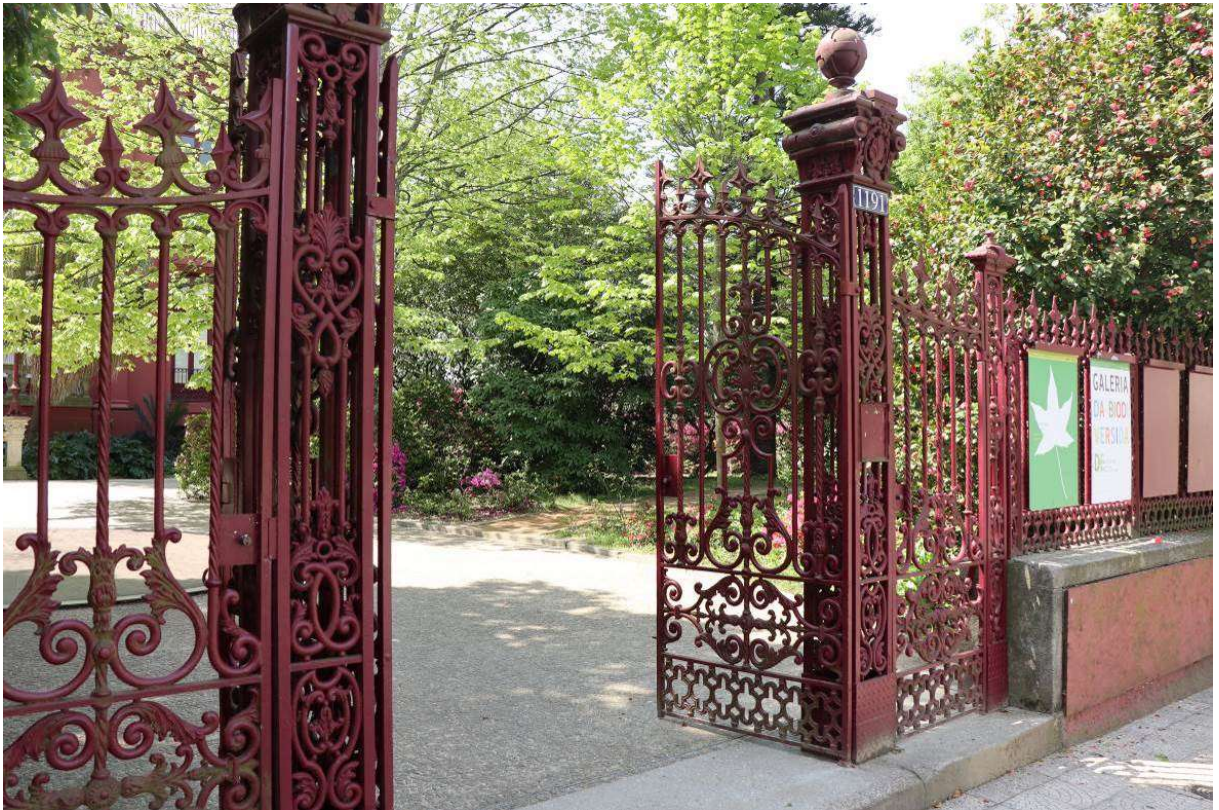
5 and 6 March	Participation in the XXII Exhibition of Camellias of Porto, at Fundação de Serralves
25 and 26 March	Participation in the Exhibition of camellias of Vila do Conde.
31 March to 2 de April	Participation in the 8th International Orchid Exhibition/Trade.
16 March	Hosting of the lecture “A journey through the world of permaculture”, coordinated by Professor Isabel Silva (FCUP) and speaker Eunice Lisboa Neves.
1 May	Hosting of ENEAP’s closing session.
21 June	Visit entitled “Solstice – poetry and drinks at dusk”, in partnership with Professor Karen Lacroix (FBAUP), with readings of Sophia de Mello Breyner Andresen poems and a guided tour.
22 September	“European Heritage Days”, in partnership with the City Council of Porto
22 Dezember	Guided tour of the Garden and Hall of Biodiversity, in partnership with Cultour and Casa da Arquitetura within the Programme for Contemporary Architecture.
28 October	Hosting of the activity “Camping with stories – Happy Readers Nights”, organized by the Association of Portuguese Book Publishers (APEL).
16, 17 and 22 December	Hosting of one of the “Scientific Illustration Courses of the University of Porto (CICUP)” modules at the Botanical Garden and Hall of Biodiversity, taught by Francisca Cavaleiro.

Record of the developed activities – 2018

January to December	Guided tours for organized groups
3 and 4 February	Participation in the Exhibition of Camellias of Vila do Conde.
24 and 25 February	Participation in the Exhibition of camellias of Lousada
3 and 4 March	Participation in the 23 rd Exhibition of Camellias of Porto
8 March	Workshop “Talking with the Camellias” in partnership with the Portuguese Association of Camellias
26 March to 6 April	Easter Workshop
3 July to 31 August	Summer Workshop
17 to 28 Dezember	Christmas Workshop
5 October	Activities for families “The husking.”
11 November	The “Magusto” (Chestnut roasting activity), with the Children’s Workshop “Hair-raising experience” and free guided tours for visitors of the Garden.

2 to 27 de July	"Bioexplorers" activity within the framework of the Junior University activities, covering topics such as biodiversity conservation, taxonomy, etc.
19 and 20 May	"The Allure of Orchids" exhibition and workshop in partnership with the Portuguese Association of Orchidophilia.
20 May	Tour: "Hall of Biodiversity – CCV and Botanical Garden by Night", guided by Professor Paulo Farinha Marques as part of the International Museum Day.
22 May	Guided tours to the Botanical Garden, as part of the International Biodiversity Day.
15 September	Tour guided by Professor Paulo Farinha Marques in the context of the "Knowledge Routes" initiative
30 September	Collaboration in the "Heritage Days" initiative, in partnership with the City Council of Porto.
February	Visit to the Cabanões and D. Pedro I Elementary Schools within the framework of the Echo-Schools project.
10 July	Promotion of the workshop "i-naturalist: exploring the educational potential of an app in a garden" as part of the 5 th International Meeting of Casa das Ciências (House of Sciences).

Photographic record



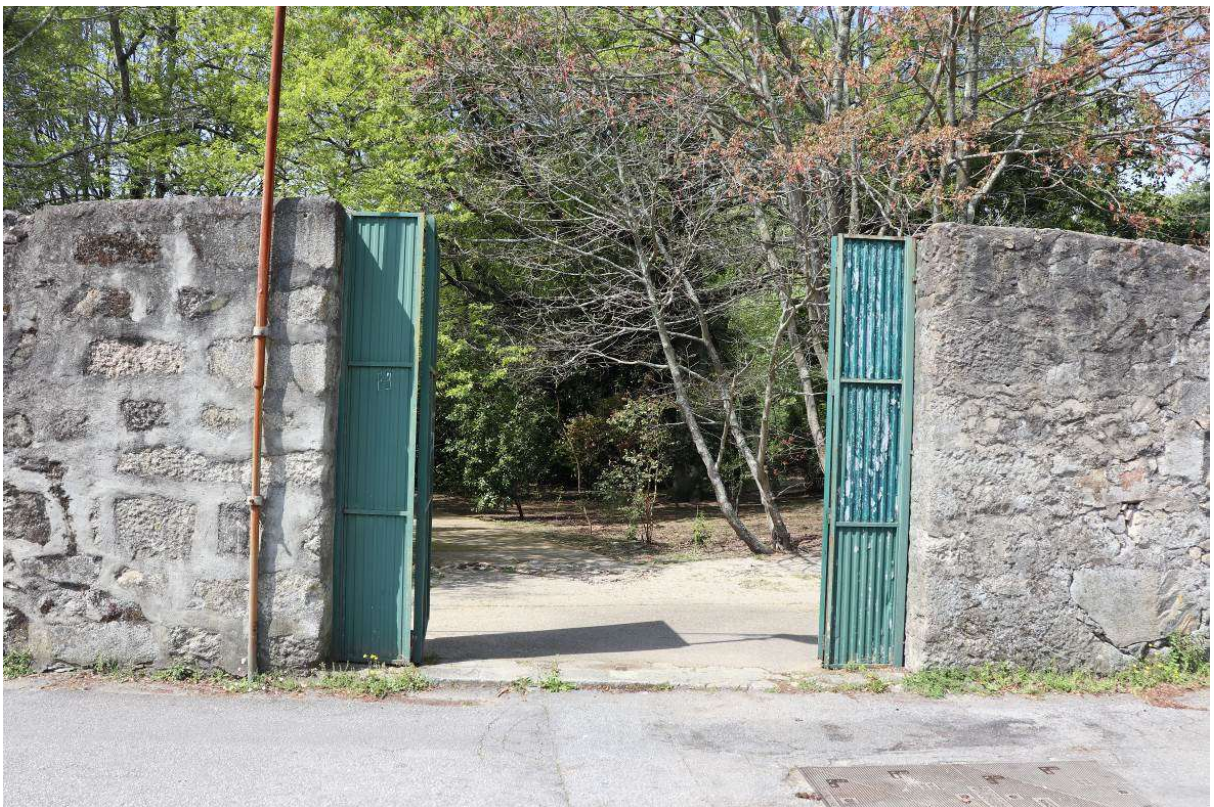
Main entrance to the Botanical Garden.



Entrance panel with information of Botanical Garden and Hall of Biodiversity.



Entrance dedicated to visitors of e-learning café.



Entrance that links the garden with the Faculty of Sciences of University of Porto.



Entrance at the intersection of the Rua do Campo Alegre with Travessa de Entrecampos.



Car entrance.



Parking area.



Drinking fountain in the parking área.



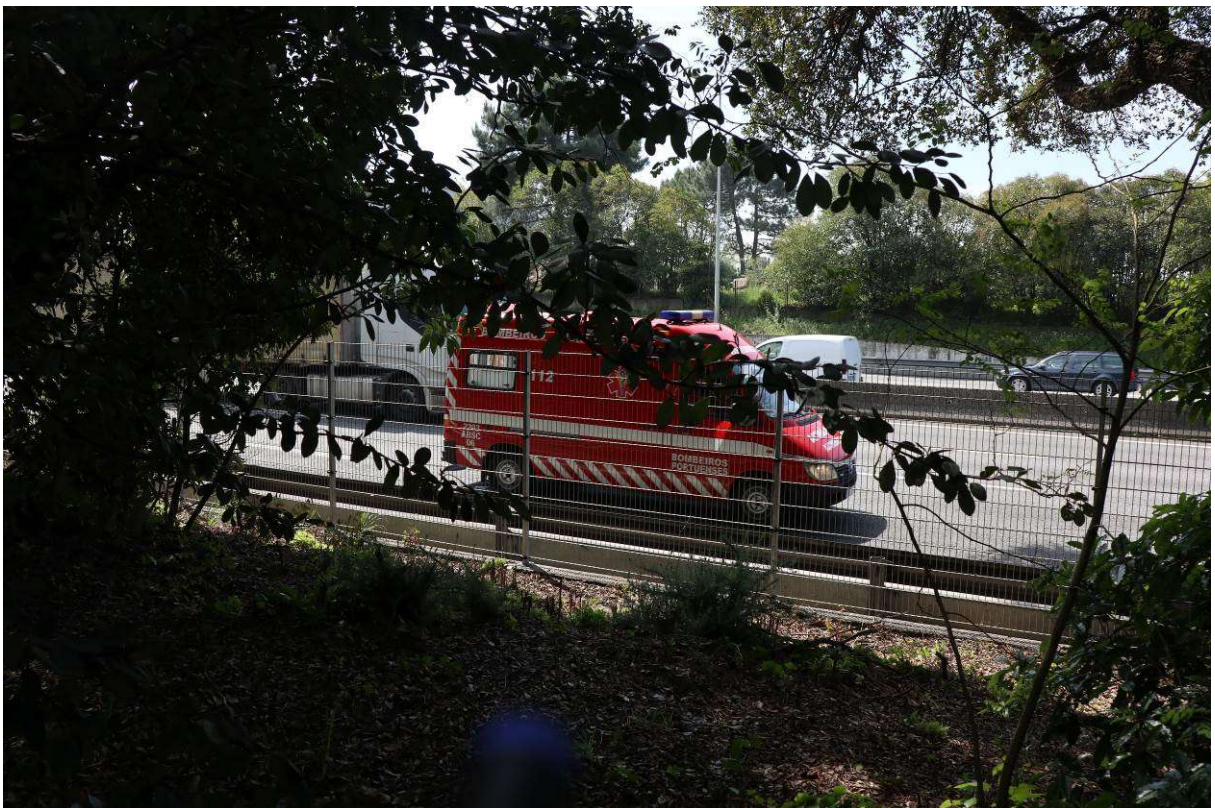
Pergola at the Shale Garden.



Pergola above the bench of the "J's" Garden.



Bench in the Fish Garden fitted with iron supports for plants.



Proximity of Botanical Garden to highway.



Plastic labels for specimens.



Water deposit.



Pumping house.



Salabert house/E-learning café



Wood deposited in strategic flowerbeds.



Organic matter placed in specific flowerbeds.



Water elements that promote the animal life.



Amphibians exist in water elements.



Stones deposited as habitat for small reptiles.



Collection of oaks.



Mix border of native plants around the Hall of Biodiversity.



Flowerbeds of aromatic plants.



Birds nests installed in the trees.



Bonsai collection.



Main entrance of Hall of Biodiversity.



Historic hedges of Camellia.



Historic hedges of boxwood.



Liquidambar styraciflua (Sweet gum) after damage in 2018.



Quercus suber (Cork tree) in the arboretum.



Pinus pinea (Pine tree) and *Carpinus betulus* (Hornbeams).



Carpinus betulus (Hornbeams) and *Pinus strobus* (Pine tree).



Araucaria heterophylla (Norfolk pine) in the groves.



Cedrus libanii (Cedars).



Sequoia sempervirens (Sequoias).



Azalea and Rhododendron.



Cactus and succulents collection.



Orchid greenhouse.

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Maps

Patrícia Varela

Manuel Gentil

Porto City Hall

<https://www.google.com/maps>

https://repositorio-tematico.up.pt/bitstream/10405/2777/1/245_1AP-9.png

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