jardí botànic
Parc de Montjuïc

nat museu de ciències naturals de Barcelona

EXHIBITION

MORE THAN BEES
POLLINATORS AND FLOWERS
LIFE AT STAKE

OCTOBER 2020/2021

jardí botànic
Parc de Montjuïc
museu de ciències naturals de Barcelona

CONTENTS

jardí botànic
Parc de Montjuïc
nat museu de ciències naturals de Barcelona

“The decline in the numbers of pollinators around the world is jeopardising the sustainability of our agriculture and our food supply.”

World Bee Day, **United Nations, 2017**

A. The exhibition: objectives and content

[return to Contents]

The decline in the numbers of pollinators on all the world's continents is jeopardizing the survival of plant species, the sustainability of our agriculture, and, indeed, human life. Nine out of every ten plants need an insect in order to bear fruit and seeds, and it is calculated that 75% of food produced around the world depends on insect pollination. Given this situation, the Botanical Garden of Barcelona, with the support of the European, Spanish, Catalan, and municipal administrations, decided to create this exhibition to raise public awareness of the essential role of pollinators, and particularly wild bees, in guaranteeing the survival of the majority of plants on the Earth. Most of us know about honey bees, yet these are but one species among countless others. On the Iberian Peninsula there are around one thousand different solitary bee species that do not live in hives or make honey, and they are the true heroes of pollination and of this exhibition.

Taking a visual and educational approach across several different reading levels, to reach everyone from schoolchildren to the scientific community, this exhibition recreates the natural life of bees and uncovers how pollination works, how bees interact with flowers and insects, and the role bees play in the ecological balance of our planet. It goes on to explore the main causes of the constant decline in insect pollinator populations, which include the use of insecticides, the fragmentation and loss of habitats, environmental pollution, and climate change. The exhibition proposes good practices that all of us can undertake to turn this situation around, such as responsible consumption, decorating balconies and terraces with aromatic plants for local pollinator species, and building bee hotels, among others. It also outlines the different environmental initiatives currently being promoted by institutions, associations, and European, state, regional and local governmental administrations, and concludes with a schedule of activities for all audiences.

But that's not all! The exhibition continues outdoors in the Insect Garden, comprising a bee hotel, an aromatic plant spiral, and a fruit tree orchard, enabling visitors to see first-hand everything they have learned from the pollinators.

B. Exhibition design

[return to Contents]

The exhibition has been conceived as a highly visual and educational outreach project to attract visitors of all ages and backgrounds, from school children to members of the scientific community. In doing so, it provides materials at different reading levels for all visitors. The texts displayed in each area provide basic information that can be expanded upon with the tool called **To Find Out More**, which highlights a given aspect covered in these initial texts. Visitors can explore subjects in-depth through the **Pills of Science**, scientific articles that can be accessed via a QR code and that have been used as source texts for the exhibition's main discourse, and that naturally complement the material exhibited in the museum.

Throughout the exhibition there are nine remarkable audio-visual displays showing the tireless work of bees, unique images, a giant model of a wild bee, and five models of insects and flowers, as well as interactive games and two large tables, located towards the end of the exhibition, where visitors can learn how to make bee hotels and aromatic plant spirals.

The objective of the exhibition is to spread a message of both warning and hope, by providing solutions to the pollinator crisis. To this end, it has been conceived as a show that would be easy to replicate and adapt to any space to facilitate its display and, therefore, the transmission of its important message. The European Commission has shown an interest in replicating the exhibition in Brussels, although this initiative has been temporarily interrupted by the COVID-19 pandemic.

Visitors to the exhibition are offered a safe and hygienic audio guide that does not require external devices, as it uses a personalised card and a unique code that allows access to the multimedia content through personal mobile phones.

All materials used in the construction of the exhibition are recyclable and, for the first time, recycled materials incorporating natural enzymatic treatment for cellulose waste have been used for the exhibition panels.

C. Activities around the exhibition

[return to Contents]

C.1 Activities for the general public

C.1.1 Nature up close – Bee diversity

Using different optical instruments, we will observe bees up close and ask ourselves questions that will help us discover their world. We recommend visiting the "More than bees" exhibition beforehand.

1st Sunday of the month: 1 November and 6 December, 11am – 2pm

Half-hour sessions, with 15 min breaks to disinfect materials: 11 / 11:45 / 12:30 / 1:15

All ages from 7 years

On-site activity

Capacity: 9 visitors per session, distributed in a maximum of 3 households units

Free admission

Registration: TBA

C.1.2 Listen to the sounds of nature in the Botanical Garden

Birds are extremely active in the autumn, following their summer break. This is also a migration period when certain birds from Northern Europe stop in to see us along their way to the African regions, where they will spend the winter. And, if it isn't too cold, we'll be able to see, listen to, and record the buzzing of bees and other insects… Let's discover the autumn sounds of nature, maybe with a recording device in hand?

Sunday 8 November, 10 am

Duration: 1 h 15 min

All ages from 10 years

On-site activity

Capacity: 12 people

Activity free of charge with admission to the Botanical Garden of Barcelona

Online registration open 15 days before the date of the activity

Observations: bearing in mind current health and safety measures, all participants will be required to bring their own earphones

C.2 Family activities

[return to Contents]

C.2.1 A thousand and one bees (and other insects)

A family event where science and literature come together. Drawing upon three fantastic stories and a diverse range of characters, we'll create some very alluring flowers and pollinators, and enjoy some fun family reading time!

2nd Saturday of the month: 14 November and 12 December, 12 pm. Duration: 1 h 30 min

Families, with children between ages 4 and 7

On-site activity

Capacity: 9 visitors per session, distributed in a maximum of 3 household units

Activity free of charge with admission to the Botanical Garden of Barcelona

Online registration open 15 days before the date of the activity

C.3 Self-guided activities

C.3.1 From flower to flower, plant seduction in the Botanical Garden

We invite you to imagine a flower, with all its seductive features (colour, shape, and scent), and relate it to a pollinator… This is the starting premise of this activity. With a workbook of self-guided material created for the exhibit, you will follow a path through the Botanical Garden and discover the wonderful world of flowers and pollinators.

You will find the workbook as you exit the main exhibition. This is an activity designed for family groups.

From Sunday 8 November, during the opening hours of the exhibition

Families, with children ages 6 and older

On-site activity

No capacity limit

Activity free of charge with admission to the Botanical Garden of Barcelona

Registration not required

C.3.2 Open reading area

As you exit the main exhibition you will find a space for rest and reading where you can continue to enjoy and learn about the world of insect pollinators. Here you will discover books for children and adults, stories, illustrated books, field guides, etc. A selection of publications from the Museum's departments of Documentation, Arthropods, and Education and Activities.

From Tuesday 20 October, during the opening hours of the exhibition

All ages

On-site activity

Limited capacity in line with current health and safety measures regarding COVID-19

Activity free of charge with admission to the Botanical Garden of Barcelona

Registration not required

C.4 School activities

The exhibition also serves as the setting for a wide array of fascinating activities aimed at school groups. Bees, pollination, and dispersion vectors are at the core of the activities "Pollen Stories", "A Playground for Everyone", and "Plant Seduction", which are designed for primary and secondary school groups. Reservations for all three activities is open and available to all schools in the country, which can also book free visits to the exhibition.

Also for schools, the Museum's department of Education and Activities offers a third edition of the 'Connectem amb… ' ("Let's connect with…") community educational project. Pollination, territory, and radio are the main components of this programme, which primary schools in the Montjuïc area can apply for, and it will take place between January and May 2021.

More information:

- Pollen Stories: https://edunat.museuciencies.cat/activitat/histories-de-pollen/
- A Playground for Everyone: https://edunat.museuciencies.cat/activitat/un-pati-per-a-tothom/
- Plant Seduction: https://edunat.museuciencies.cat/activitat/seduccio-vegetal/
- Let's connect with…: https://edunat.museuciencies.cat/projectes/connectem/
- Open visit: https://edunat.museuciencies.cat/activitat/visita-lliure-mes-que-bees/

D. The Museum and the Garden, new members of the Global Coalition for Biodiversity

[return to Contents]

The Museu de Ciències Naturals de Barcelona (Natural Science Museum of Barcelona – The Nat) and the Jardí Botànic de Barcelona (JBB – Botanical Garden of Barcelona) wish to mark the opening of the exhibition ***More than bees*** with their entrance into the Global Coalition for Biodiversity, a European Commission initiative. The Garden will thus be the second to join the coalition, after the Jardim Botânico do Porto (Botanical Garden of Porto), and the Museum will be the first such member in Spain and the fifth in the world.

This coalition encourages national research centres, such as natural science museums, botanical gardens, zoos, aquariums and parks, among others, to mobilize and make their voices heard on the crisis of nature and the alarming decline of species.

The aim of the coalition is to join forces for the UN Biodiversity Conference (COP15) in 2021. It is anticipated that by the end of 2020 more than 500 institutions will have signed up.

jardí botànic
Parc de Montjuïc
nat museu de ciències naturals de Barcelona

E. Practical information

[return to Contents]

Botanical Garden of Barcelona

Carrer del Doctor Font i Quer, 2 (between the Olympic Stadium and Montjuïc Castle)

Parc de Montjuïc

08038 Barcelona

Botanical Garden of Barcelona temporary exhibition space

Exhibition dates**: 20/10/2020** to **17/10/2021**

Follow and share with the tag **#MesQueAbellesMCNB**

Press: 932 565 973 or 636 081 599

comunicaciomcnb@bcn.cat

Hours

Tuesday to Sunday

November, December, January: 10am – 5pm

February, March: 10am – 6pm

April, May, September, October: 10am – 7pm

June, July, August: 10am – 8pm

Closed

1 January, 1 May, 24 June, 25 December

Free entry

The first Sunday of every month, all day, and every Sunday after 3pm; 12 February, St Eulalia;

18 May, International Museum Day, and 24 September, La Mercè (Barcelona City Festival)

Prices and tickets

Entrance to the temporary exhibition includes a visit to the Botanical Garden of Barcelona

General admission: € 5

Reduced admission: € 2.50

jardí botànic
Parc de Montjuïc
museu de ciències naturals de Barcelona

How to get there?

Metro

L1 and L3

To station: Plaça Espanya

From Plaça d'Espanya: walk 2.5 km, approximately 35 minutes

Bus

Buses from Plaça Espanya include:

- 150: from Plaça Espanya – Maria Cristina to the stop on Avinguda de l'Estadi
- 13: from Plaça Espanya to the stop on Avinguda de l'Estadi
- 55: from Avinguda Paral·lel – Carrer Lleida to the stop at Avinguda de l'Estadi – Passeig Olímpic

Montjuïc funicular

Links from Metro lines L3 and L2; then walk 10-15 minutes to the Botanical Garden of Barcelona.

By car

Free parking at the main entrance to the Botanical Garden

F. The Botanical Garden of Barcelona, 20 years of service to the people

[return to Contents]

The Botanical Garden of Barcelona, located in Montjuïc between the Castle and the Olympic Stadium, opened its doors on 18 April 1999 with a simple idea: to bring together in Barcelona plants from five different regions of the world that have adapted to live in a Mediterranean climate. Beyond the Mediterranean basin, these regions include Australia, South Africa, Chile, and California.

Designed by an interdisciplinary team headed by the architect Carlos Ferrater, the Botanical Garden of Barcelona hosts approximately 20,000 individual plants of 2,000 different species, distributed according to their geographical origins and, at the same time, grouped according to the landscapes they would naturally form. Thus, over some 14 hectares and in the heart of Montjuïc, we can traverse four continents in a unique landscape and architectural setting, with excellent views of the city, the Collserola mountain range, and the metropolitan area. The Garden, which won a FAD Architecture Award in 2002, has a collection of bonsai Mediterranean species that is permanently on display, and organizes all kinds of activities related to botany for all ages and audiences.

Mediterranean vegetation is considered to be one of the richest in terms of species diversity, but it is currently heavily threatened by human actions. For this reason, the Garden' main objectives are to contribute to the preservation of plant species for the future and to raise awareness among citizens. The seed bank and the nurseries are two tools that the Garden maintains to allow research studies to be carried out and plants to be obtained and reintroduced into their natural habitat.

The Botanical Garden has a close relationship with the Institut Botànic de Barcelona (IBB – Botanical Institute of Barcelona), a mixed centre (Barcelona City Council – CSIC) dedicated to botanical research of established prestige, which has an important library and one of the largest herbariums in Catalonia. The IBB is located inside the Botanical Garden and houses the Salvador family's Cabinet of Curiosities, a unique treasure of Barcelona's scientific heritage.

G. The Natural Science Museum of Barcelona

[return to Contents]

The Museu de Ciències Naturals de Barcelona (MCNB – Natural Science Museum of Barcelona) is an institution with more than **140 years of history** that conserves a heritage of almost **four million specimens** in the fields of **zoology, mineralogy, petrology, palaeontology** and **botany**.

The Natural Science Museum of Barcelona currently has four sites located in three emblematic parks in the city: **Fòrum** park, the **museum headquarters,** which last summer added the **Living Terrace** – the first wild green roof in the city; **Montjuïc** park, including the **Botanical Garden** and the **Jardí Botànic Històric** (**JBH – Historical Botanical Garden**); and, in Ciutadella Park, the **Castell dels Tres Dragons (Three Dragons Castle)** and the **Museu Martorell (Martorell Museum)** (the former museums of Zoology and Geology), which have become the Museum's research centre. These last two buildings house the Museum's **collections**, **research departments**, and **documentation centre**.

The headquarters of the **Natural Science Museum**, at the Fòrum park, opened in March 2011, and has extensive and modern facilities that have enabled the innovative development of the Museum's educational and informative programmes. Its services and facilities, over a total of 9,000 m^2 distributed across two floors, are structured around an immense lobby with free access that is the start and end point for all of the Museum's programmes, including the permanent exhibition '**Planeta Vida**', spaces for temporary exhibitions, the media library, the Science Nest (for children up to 6 years of age), classrooms, the assembly hall, workshops, headquarters for naturalist associations, and the shop.

The Natural Science Museum of Barcelona and the Botanical Garden have recently become members of the European Commission's Global Coalition for Biodiversity. This coalition encourages national research centres, such as natural science museums, botanical gardens, zoos, aquariums and parks, among others, to mobilise to make their voices heard on the current crisis of nature.

Annex. Areas and detailed content of the exhibition

[return to Contents]

The exhibition is divided into 9 areas:
1. Welcome, **2.** Pollination, **3**. Insects, **4.** Wild bees, **5.** Pollination and human food, **6.** Biodiversity at risk, **7.** What can you do for bees?, **8.** What are institutions, associations, and the authorities doing?, **9.** The Insect Garden, outdoor area.

1. Welcome

An audio-visual presentation showing how the current economic model is endangering the essential link between plants and animals, and therefore between nature and people.

2. Pollination

This is the process of the sexual reproduction of plants, and it typically takes place inside flowers. So that plants can reproduce, it is necessary for the pollen from the male organs of flowers to reach the female organs and fertilize them. The result of pollination is seeds and fruit.

Flowers can have female or male reproductive organs, or both.

Pollinating agents are responsible for transporting pollen from the male organs of the flower to the female organs of the same or another flower. There are two types: **abiotic**, i.e., lifeless, like wind and water, and **biotic**, i.e., living beings such as insects, lizards, bats, and birds.

The game of seduction. Flowers must attract and seduce pollinating agents into paying attention to them in order to transport pollen. To get the attention of insects, flowers take on striking colours and shapes, and also offer food, **pollen and nectar**. Insects visit the flowers, attracted mainly by this nectar and pollen, and unwittingly pollinate them. The pollination of flowers by insects is therefore a coincidental event.

3. Insects

Over the years – millions of years – the organisms most successful at adapting have taken over. Plants and insects have evolved together, and the benefit has been mutual. This is called **co-evolution**.

As a result of co-evolution, pollination by insects is the main and essential form of plant reproduction. In fact, nine out of ten plants need an insect to bear fruit and seeds. If we humans prevent this relationship between plants and insects, we will endanger one of the foundations of life on Earth.

4. Wild bees

[return to Contents]

Wild bees are the great protagonists of pollination. It is estimated that 90% of the pollination of flowering plants depends on insects, and especially on bees. Unlike other insects that only visit flowers to feed, bees take advantage of their visits to also collect food and take it to their larvae. This means that wild bees need large amounts of pollen and visit flowers much more often than other insects.

What is a bee? Most of us associate bees with honey and beehives. We imagine them living in complex societies made up of a queen bee, a few male bees, and an army of worker bees. But honey bees are only one species among many. On the Iberian Peninsula alone there are more than 1,000 species of wild bees. Most of these species do not live in hives, nor do they make honey. Neither do they organize themselves into societies. Let us call them the "other bees".

What are "other bees" like? It is estimated that there are between 25,000 and 30,000 species of wild bees on earth. Indeed, there are so many that some are not even known. **There are more species of bees than mammals, birds, and reptiles combined**. Some wild bees look like honey bees and have yellow and brown stripes, but most are different in colour and size.

How do they make their nests? Most wild bees are solitary and nest underground. Others, however, do so inside wood or take advantage of a hole, such as the inside of a reed or the empty shell of a snail.

A year to live. Bees live for about one year. Most of this year, however, is spent in the form of larvae inside the nest; their adult life lasts only a few weeks. This is a time of very intense activity: they move around non-stop, visiting flowers and collecting pollen and nectar. As well as feeding themselves, they also take food to the nest to feed their young.

How do female bees transport pollen? Almost all of them have *scopae*, which are very hairy specialized organs where they accumulate the pollen they collect**.**

How do bees see? Bees have a vision system that differentiates a much wider range of colours than humans. To ensure that insects pay attention, many flowers have ultraviolet light signals in addition to bright colours.

How do bees find pollen? Some flowers have deep corolla tubes, and some bees have very long tongues that can reach the pollen that accumulates inside. This is a case of joint evolution, and if this did not happen, plants with this type of flower would have become extinct, as no insect would be able to pollinate them.

5. Pollination and human food

[return to Contents]

Pollination also affects humans. Plants and insects are not isolated elements of nature, they are some of the many components of our natural ecosystems. And it is on the balance of these ecosystems that our food, and therefore our survival, depends, among other things.

Some 75% of the food produced worldwide depends upon insect pollination, especially the pollination of bees.

Human health. The health of insect pollinators is related to that of humans. Plants produce many essential vitamins and micronutrients.

Some plants store large amounts of vitamins A, C, and E, folic acid, and minerals.

Through our diets, humans have been using these essential elements that plants produce for thousands of years. The disappearance of insect pollinators will lead to a decrease in the number of crops and wild plants.

As a consequence, our health will suffer.

Are domestic bees the solution to the problem?

Putting hives of honey bees in places where natural pollinators have disappeared is not the solution.

On the one hand, wild bees are just as efficient or more so than domestic bees when it comes to pollinating most crops.

On the other hand, honey bees do not pollinate most wild plants.

This means that if the insects that pollinate wild plants disappear, these plants will be driven to extinction.

In conclusion, we can say that for some crops the honey bee can complement the pollinating action of other insects.

However, it will never fulfil the role of a substitute that will stop the progressive disappearance of wild plants that have been left without pollinators.

6. Biodiversity at risk

[return to Contents]

Insect pollinators are threatened all over the planet.

According to studies conducted in recent years, the presence of insect pollinators is declining on all continents. As we have seen, this has direct consequences for pollination, the survival of plant species, food production, and human life.

From an environmental point of view, the disappearance of insect pollinators can upset the balance of natural ecosystems and endanger life as we know it.

From an economic point of view, the decline of pollinators can lead to great losses in the agricultural and food sectors. This may also mean that many communities lose their main source of income.

From a social point of view, a decline in food production can lead to an unprecedented food crisis.

But how did we get into this situation?

There are several reasons for the disappearance of insect pollinators. They include: industrial agriculture, fragmentation and loss of habitats, pollution of the environment, and the globalization of viruses and bacteria.

- **Industrial agriculture.** This is agricultural activity aimed at achieving the maximum yield from the land. With this objective, aggressive farming methods are employed, such as the use of large quantities of pesticides to stop pests from affecting crops. To increase the cultivated area, the margins around fields and patches of natural vegetation surrounding them are removed.
- **Fragmentation and loss of habitats.** Over the last few decades, the expansion of construction has had two major consequences for biodiversity. On the one hand, natural habitats have disappeared. Many animals, including insects, have had to leave the places where they lived. On the other hand, these natural habitats have been modified and animal and plant species have had to adapt to environments where they have less surface area and fewer resources.
- **Globalization of viruses and bacteria.** Over the past few decades the globalization of viruses, bacteria, and entomopathogenic fungi has increased considerably as a result of the globalization of the economy worldwide. The pervasive and rapid exchange of people and goods from all around the world highlights the vulnerability of individuals in a globalized world.
- **Climate change.** Scientific evidence accumulated year after year seems to confirm that human actions are directly affecting the planet's climate. This effect, known as climate change, has been occurring since the beginning of the industrial revolution due to the massive burning of fossil fuels, such as coal, oil, and natural gas.

7. What can you do for bees?

[return to Contents]

Helping to conserve wild pollinator species doesn't have to mean taking on big projects. For example, **responsible consumption** is very important. Our preferences as consumers have a big impact. If we choose organic and local products when we buy, we will be protecting bees. But why stop there? We can help wild bees and other insects with small actions on our balcony, patio, or in the garden. Think about the benefits they bring us, and let's give them a hand!

- **Buy local and seasonal food.** Organic farming uses natural pesticides, such as macerated or infused products, organic fertilisers, and recovers traditional varieties that are better adapted to local conditions. You will recognise them by their logos.
- **Aromatic plants for the local pollinator species.** When decorating your balcony, terrace, or garden, it is a good idea to choose native plants. These are the ones that will best suit the characteristics of the area, and the needs of local wild pollinators. Examples are rosemary, thyme, sage, and savory.
- **Create a vegetable garden at home or at school.** A vegetable garden, however simple, allows you to learn about plants. Indeed, it is the best educational tool for learning about the life cycle of plants and how to look after them.
- **Avoid the use of pesticides.** Pesticides are dangerous products. They contain toxic substances, many of which are carcinogenic. These substances can also disperse and contaminate soil and water. As they are not biodegradable, they do not disappear: they tend to become concentrated in the environment and organisms where they are used. Pesticides should be replaced with plant extracts that take advantage of natural chemical reactions in plants that protect them from herbivorous species.
- **Build an insect hotel** from natural materials, such as logs, pine cones, branches, bark, straw, reeds, porous bricks, terracotta, etc. The more materials you use, the more varied your clientele will be. And diversity always helps the conservation of ecosystems. The aim of the hotel is to offer insects a protected space to use as a nest during their long periods of hibernation. To encourage insects to settle in, the hotel should reproduce the natural habitats where they live. If we manage to attract insects, we will have pollinators right next to our gardens and balconies. And in exchange for food and a place to live, they will support the reproduction of our plants.

8. What are institutions, associations, and the authorities doing to protect bees?

[return to Contents]

This exhibition allows us to understand the level of responsibility of all public administrations, as well as the policies and actions they are carrying out to prevent the great risk that the disappearance of pollinators from the planet represents.

The **European Commission's Directorate-General for the Environment** promoted the first pollinator initiative in 2018, with more than 30 measures (mitigation of pesticides and invasive species, protection of habitats in rural and urban areas, etc.), which together with the European Green Deal (adopted in 2019) has boosted and expanded the EU's efforts to halt the loss of biodiversity and pollinators. To support these measures the EU is developing a monitoring system to accurately assess the status of pollinator populations. Citizen science is central to this task and the EU strongly supports it.

The **Spanish Ministry for the Ecological Transition and the Demographic Challenge** was one of the first EU bodies to join the Global Coalition of the Willing on Pollinators (2016) and recently, in September 2020, approved the National Strategy for Pollinator Conservation. This strategy develops lines of action to raise awareness and the dissemination of information on pollinators, such as the publication of the *Atlas y libro rojo de invertebrados amenazados en España* (`Spanish Atlas and the Red Book of Threatened Invertebrate Species'), and the promotion of research projects on pollinators and natural parks.

The **Generalitat de Catalunya** (Government of Catalonia) recognises the fundamental role of pollinators in the natural world. In 2018, the Natural Heritage and Biodiversity Strategy of Catalonia 2030 was approved, which provides for the preparation of an intersectoral plan for the conservation of wild pollinators. A guide has also been drawn up on how to encourage pollinators through environmental conservation actions, with a dedicated map indicating the most useful plant species for this purpose.

The **Ajuntament de Barcelona** (Barcelona City Council) is committed to the conservation of pollinators and has led various actions articulated through specific government measures (eradication of the use of glyphosate, for example), publications, and programmes aimed at generating favourable habitats, including the creation of shelters in parks and gardens, and the installation of structures for pollinator refuge and nesting in green spaces in the city.

Entities, associations, and private initiatives. When it comes to saving biodiversity, no action can be considered too small or insignificant. Wildlife is capable of responding very quickly if actions are taken to help it. This exhibition gathers together thousands of initiatives from all around the world aimed at this objective, which can be found here: https://museuciencies.cat/wp-content/uploads/2020/10/Iniciatives_salvar_biodiversitat.pdf.

9. The Insect Garden, outdoor area

[return to Contents]

Your visit doesn't end within the walls of the exhibition, but continues outside in the **Insect Garden**, and outdoor area featuring an **aromatic plant spiral**, a **bee hotel**, and a **fruit tree orchard**.

Aromatic plant spiral

This is a three-dimensional spiral of dry stone in which aromatic and other flowering plants are growing. The structure, which reaches a height of one metre at its centre, allows for many different microhabitats to develop within a very small space, taking advantage of the variety of humidity, temperature, and light conditions produced. Likewise, the concavities, walls, slopes, roofs, galleries, cracks, and fissures in the dry stone serve as refuges and shelters for many small creatures, including bumblebees, beetles, snails, earwigs, lizards, geckos, and toads, among others.

The upper and lower parts of the spiral offer very different temperature and humidity conditions, which are taken into account when planting:

Top of the spiral, dry and sunny: sage (*Salvia amplexicaulis*, *Salvia chamaedryoides*, *Salvia lavandulifolia*, *Salvia leucantha*), thyme (*Thymus mastichina, Thymus nitens, Thymus orospedanus*).

Slope of the spiral, dry and shady: more ambivalent plants, including onion flowers (*Allium cristophii, Allium flavum*), yarrow (*Achillea millefolium*), and borage (*Borago officinale*)

Base of the spiral, wetter and richer soil: here we find plants that dehydrate quickly, such as the daisy (*Leucanthemum vulgare*), marjoram (*Origanum majorana*), and comfrey (*Symphytum officinale*).

It is important that the spiral is in a place that gets good sunlight, since all flowering and pollination, in general, requires a dry and sunny atmosphere (on rainy or windy days, insects don't normally come out to pollinate flowers). It also allows many solitary bees and wasps to make holes in which to build their nests.

Bee and wasp hotel: see section 7 on page 17.

Orchard. A space where well known fruit trees, including apple trees (*Malus domestica*), quince (*Cydonia oblonga*), and other more exotic and rare trees (*Malus micromalus*, *Microcitrus australasica*, *Pyrus bourgeana*, *Malus sieboldii*, *Pseudocidonia sinensis*) have been planted. These all produce early flowering, which facilitates pollination by the many bumblebees and solitary bees surviving through winter. As spring arrives, great numbers of insect pollinators take advantage of the abundant flowering of these trees, generating a concert of buzzing wings. In summer, we find numerous caterpillars of many different types of insects gnawing at the leaves. Then in autumn, when the fruits ripen, butterflies and flies are attracted by their sweet juices.

MÉS QUE ABELLES
POL·LINITZADORS I FLORS. LA VIDA EN JOC

MÁS QUE ABEJAS
POLINIZADORES Y FLORES. LA VIDA EN JUEGO

MORE THAN BEES
POLLINATORS AND FLOWERS. LIFE AT STAKE

Producció / Producción / Production
Consorci del Museu de Ciències Naturals de Barcelona

Comissariat i guió / Comisariado y guión / Curatorship and script
David Bertran
Berta Caballero

Disseny expositiu / Diseño expositivo / Exhibition design
Xavi Torrent

Disseny gràfic / Diseño gráfico/ Graphic design
Carolina Trebol

Producció i muntatge / Producción y montaje / Production and assembly
Intervento. Museografía e iluminación

Maquetes / Maquetas / Models
Grop, Exposiciones y Museografía, SL

Realització audiovisual / Realización audiovisual / Audiovisual production
Xavier Pérez

Audioguia / Audioguía / Audio guide
Nubart

Fotografia / Fotografía / Photography
Óscar Aguado
Chelsey Ritner, Osmia images
Irene Terry
Adolfo Ventas

Revisió i traduccions / Revisión y traducciones / Corrections and translations
Associació Lectura Fàcil
Contextuàlia. Gestió de continguts, SL
Dirección General Medio Ambiente - Comisión Europea
Mike Lockwood

Assessorament científic / Asesoramiento científico / Scientific advice
Óscar Aguado. ANDRENA
Jordi Bosch. CREAF
Pau Bosch
Núria Cuch. ADV Baix Llobregat
Josep Montmany. FRUITS MONTMANY
David Notton. Natural History Museum - Londres
Anna Persson, Lund University
Sergi Romeu
Maj Rundlöf, Lund University

Agraïments / Agradecimientos / Acknowledgments
Mélina Aubert, ARTHROPOLOGIA
Carina Colomer
Charlotte Visage. INRA, Avignon
Fréderic Vyghen, ARTHROPOLOGIA

Fundación Española para la Ciencia y la Tecnología
Ministerio de Ciencia e Innovación (FECYT)
Dirección General Medio Ambiente - Comisión Europea
Ministerio para la Transición Ecológica y el Reto Demográfico (MITERD)
Generalitat de Catalunya - Departament de Territori i Sostenibilitat
Ajuntament de Barcelona - Institut Municipal de Parcs i Jardins

Amb la col·laboració de / Con la colaboración de / In collaboration with

jardí botànic
Parc de Montjuïc

nat museu de ciències naturals de Barcelona

Botanical Garden of Barcelona
C. de Font i Quer, 2. Parc de Montjuïc
museuciencies.cat

Amb la col·laboració de:

GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA E INNOVACIÓN FECYT FUNDACIÓN ESPAÑOLA PARA LA CIENCIA Y LA TECNOLOGÍA

GOBIERNO DE ESPAÑA MINISTERIO PARA LA TRANSICIÓN ECOLÓGICA Y EL RETO DEMOGRÁFICO

Generalitat de Catalunya
Departament de Territori i Sostenibilitat

Ajuntament de Barcelona