

Lisbon's hundred year-old trees, the dragonflies in its gardens and the owls and bats in its buildings... The second scientific guide to Lisbon is dedicated to biodiversity in the city. Other titles:

1 Wandering the streets

Is it possible to explain the beauty of Lisbon? Perhaps not the beauty, but all the rest you can.

3 Places of knowledge

The places and institutions related to the history of science in Lisbon.

4 Tastes of the City

Discover the physics and chemistry behind the *pastéis de Belém* or the traditional *ginjinha*.

5 Rocks and Hills

How were the hills and valleys of Lisbon formed?

Pavilion of knowledge-Ciência Viva

Situated in the Parque das Nações in Lisbon, the Pavilion of Knowledge – Ciência Viva is the largest interactive science and technology centre in Portugal. Major thematic exhibitions and hundreds of interactive exhibits encourage visitors of all ages to explore and experiment the physical world. Physics, mathematics, technology and other areas of knowledge are spread over an area of 11,000 m². Science and the thrill of discovery are brought together under the same roof. Workshops, seminars, scientific laboratories and other activities make this place a house of science for everyone. Timetable: Tuesday to Friday (10h-18h), Weekends and Public Holidays (11h-19h) Underground and Train (CP): **Oriente** Bus: 28

Scientific verification by Henrique Cabral (CO-FCUL), José Pedro Granadeiro (MNHN-UL), Maria José Costa (CO-FCUL), Otilia Correia (CBA-FCUL), Rui Rebelo (CBA-FCUL), Sergio Chozas (CBA-FCUL), Teresa Rebelo (FCUL/CESAM). Translation nota bene.



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EXOTIC SPECIES

As with so many other things in Lisbon, the city's fauna and flora has diverse origins. Besides the native species typical of the region, you can find exotic species from the four corners of the globe here. There are 10 species of exotic birds in the city; one of the most prominent examples of this are the flocks of Ring-necked Parakeets (of Asian origin) which can often be seen in the Jardim da Estrela or the Estefânia neighbourhood, embellishing the city with their calls. Lisbon is also one of the most cosmopolitan cities when it comes to flora. The Discoveries and the influence of other cultures contributed to the presence of species from all over the world. Examples include exuberant jacarandas from Brazil and magnolias from the United States. In **Belém** you can admire the North African date palms, and be sure not to miss out on a visit to the **Jardim Botânico Tropical**.

Tram 25. Bus 28



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MUSHROOMS

Death Cap mushrooms, Parasol mushrooms, Penny Bun Buletus, Latticed Stinkhorns or Hygroscopic Earthstars are just some of the mushrooms that you'll be able to find in Lisbon's parks and gardens. With the first autumn rains, a great variety of these fungi sprout from the capital's soil, lending it greater colour and variety. In fact, every year over 100 species of mushrooms appear in Lisbon, including medicinal, hallucinogenic, edible and poisonous varieties. The curiosity they arouse has led to the creation of several associations dedicated to the study and preservation of all of this mycological wealth. These associations organize various tours of the city's parks, particularly Monsanto. However, it is even possible to see a wide variety of these species on **Avenida da Liberdade**, where you can get to know the mysterious world of mushrooms a little better.

Underground **Avenida**



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THE TAGUS ESTUARY

If you go walking or cycling in the eastern part of the city (**oriente**) you might be lucky enough to see flamingos feeding in the river. Lisbon is the only European capital where you'll be able to witness such a surprising scene. This is due to the immense Tagus estuary, the largest in Western Europe. With its mud flats and marshes, reed plantations, and the man-made marshlands and salt works, the estuary is a sanctuary for polychaetes, mollusks and crustaceans and a nursery for several species of fish, such as Sole and Sea Bass. In addition, over one hundred thousand wintering birds (encompassing 194 different species) seek shelter here. For all these reasons, the Tagus estuary is one of the most important wetlands of Europe, and it's right on Lisbon's doorstep.

Underground **Oriente**. Bus 28



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POLLINATORS

Moving from flower to flower, pollinating insects ensure the reproduction of the many herbaceous plants, bushes and trees of the city, a mission they share with the wind. In the **Jardim do Torel** you'll be able to hear the busy buzzing of the bees and bumblebees looking for pollen in the plants. The majority of diurnal and some nocturnal butterflies are also excellent pollinators in Monsanto or any other garden of the city. The pollinators are so well adapted to cities that some, like the European honey bee, even build hives beneath the roofs of abandoned buildings. And if you come across a beetle or a Flat Footed Bug in your flowerbed, remember that if it weren't for them your flowers might not exist. Look out for them on a plant near you.

Elevador do Lavra



© Sergio Chozas

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SWALLOWS AND LITTLE LETTUCES

Even though the fado goes “nobody holds on to the fantasy/ that destiny leads them to/ because one swallow dying/doesn't mean that spring is over”, it is perhaps in the hope that spring will last forever that the inhabitants of Lisbon hang earthenware swallows on the walls of their homes. For the same reason, every year on Ascension Thursday, small bunches of wheat, daisies, poppies, olive branches, vines, and rosemary are gathered in the countryside in remembrance of harvest blessing celebrations. Even during Lisbon's Santo António celebrations, the saint shares the limelight with sardines, dwarf basil, carnations and artichokes; this demonstrates the strong rural character that used to characterise the city, as well as the very close relationship the capital's inhabitants had with nature. So close, in fact, that Lisbon's inhabitants are nicknamed *alfacinhas* (little lettuces).

Underground **Rossio**



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FLORA

Did you know that in Lisbon there are 114 species of trees and hundreds of species of bushes and herbaceous plants? The green spaces play a fundamental role in the cultural and social balance of the city. On an ecological level, they improve air quality and are a habitat for many species of animals. Lisbon has trees from all over the world, many of which are classified as of public interest, and are seen as having great ecological and historical value, as well as importance to the landscape where they are located. This is due to their origin, rarity or antiquity. It is certainly worth getting to know the flora of Lisbon, be it under the shade of the Mexican cypress in **Príncipe Real**, with its 20-metre diameter tree top, or in a Monsanto meadow among the poppies and daisies.

Underground **Rato**

Guide 2

IN LISBON: DISCOVERING SCIENCE AND TECHNOLOGY

BIODIVERSITY IN THE CITY



Line Management: Rui Martins, João Pereira

From the second half of the 19th century onwards, Lisbon started expanding at a faster rate and occupying formerly rural lands. In spite of this, the city was still able to maintain its unique biodiversity. The large number of species that can be found in Lisbon are mainly due to the capital's climate and location by the Tagus estuary, and also the fact that the city is close to the sea and at the foot of the Monsanto hills. In addition to this, Lisbon's rich history of exchange with other cultures resulted in species being imported from all over the world. Did you know that you can find herons, frogs and dragonflies in the gardens of Lisbon? Or that the city's buildings shelter owls, kestrels and even bats? Accept our invitation, and, with the help of binoculars, guides or simply your own curiosity, wander around Lisbon and explore its biodiversity.



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VEGETABLE GARDENS

Cultivation in cities is becoming increasingly common. Vegetable gardens are a ubiquitous sight in Lisbon, either on the sides of roads or small wasteland plots. The growing of broad beans, corn, beans, and even cassava reflects the diverse origins of Lisboners. In addition to their economic and social function, vegetable gardens are essential for biodiversity, since they provide food and shelter for species such as moles, the Greater white-toothed shrew, the West European hedgehog and several pollinating insects. Visit the **Graça** vegetable gardens, which are being revived by the Town Hall, and find out what is grown there.

Tram 28



3

MONSANTO

For centuries, Monsanto was used for pasture and the cultivation of cereal crops. Reforestation began in 1938 and it went on to become one of the most important places for biodiversity in Lisbon. Here, close to the heart of the city, you can find a Mediterranean forest featuring species of great botanical value, such as the cork oak, Holm oak, Kermes oak and Strawberry trees. In addition, numerous species of fauna shelter, feed and reproduce in this forest. As you walk in the park you might come across Mottled Owls, woodpeckers, Common Buzzards, Eurasian Jays, rabbits, European Hedgehogs, red squirrels, and many species of reptiles and amphibians. Half of the information points included on the *Biodiversity Route* walking itinerary organized by Lisbon Town Hall are located in **Monsanto**.

Bus 70



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BATS

On spring and summer evenings it's possible to see hundreds of bats flying out of their shelters to hunt for insects around streetlights. These winged mammals play an important ecological role, since they consume tons of insects every day, thus contributing towards a more pleasant environment in the city. Lisbon is home to a variety of bats, which use trees, streetlights, old buildings and even window blind shafts as shelters. The most common species is the *Pipistrellus pygmaeus*, although the Serotine bat and the European free-tailed bat are also regularly spotted in the city. Some monuments are refuges for rare and vulnerable species, such as the Common Bent-wing Bat, which lives in the subterranean chambers of the Museu do Traje. Another example of this phenomenon is the Brown long-eared bats that live in the Aqueduto das Águas Livres. Look out for these bats in the **Jardim da Estrela** on a hot summer's night.

Tram 28. Underground Rato



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LISBON CROWS

Legend has it that two crows accompanied the boat carrying the remains of Saint Vincent the Martyr on its journey from Sagres to Lisbon. Although these birds became a symbol of the capital, they can no longer be found among the city's 134 species of bird. In the Estrela or Gulbenkian Foundation gardens there are Eurasian Jays, sparrows, Great Tits and Blue Tits, Blackbirds, European Greenfinches and many species of small birds. And in the riverside areas of Belém, Matinha or Parque das Nações you can find Cormorants, herons, seagulls and waders such as the Pied Avocet or Common Sandpiper. On the other hand, the wooded areas of Monsanto, **Tapada das Necessidades** or Ajuda are among the best places to observe passerines. Pick up your binoculars and come and discover Lisbon's birdlife.

Buses 12, 13, 27. Tram 12



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REPTILES AND AMPHIBIANS

Lisbon is home to several species of reptiles and amphibians. Horseshoe Whip Snakes, Moorish Wall Geckos and Iberian Wall Lizards can be found hidden in old buildings. On the other hand, parks and gardens, such as the **Tapada da Ajuda** provide refuge for Iberian Water Frogs, and Mediterranean Pond Turtles. Two recent arrivals include the Italian Wall Lizard (a species brought to Lisbon when the Expo '98 site was being constructed, and which can still be found there) and the Common Slider Turtle, which was introduced in the '70s and is common in the city's gardens. Both are invasive and therefore prejudicial to the other species. The greatest variety of reptiles and amphibians can be found in Monsanto's humid environment. It is an oasis for Viperine snakes, Common toads, Mediterranean Tree Frogs, Bosca's newts and Fire Salamanders.

Tram 18



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BIRDS OF PREY

Did you know that there are birds of prey flying freely over Lisbon, finding food and shelter in plentiful supply? Examples are the Common Barn Owl, which feeds on rodents, and the Little Owl and Common Kestrel, which hunt for insects in the city's wastelands and parks. Common Kestrels have built nests in the towers of the Torre do Tombo archives and there are signs that Common Barn Owls have built nests in the **Jardim Botânico (Botanical Gardens)**. You might also find Common Buzzards and Mottled Owls in Monsanto. Take a walk in **Campo Grande** or other green spaces in Lisbon to discover the capital's birds of prey.

Underground Rato

Underground Campo Grande



4

LIFE ON THE RIVER

Many people still remember seeing dolphins in the River Tagus. Although this is a rare occurrence nowadays, the river is still teeming with life. On the pontoons of **Belém**, where mussels are found in abundance, you'll be able to see Sanderlings and Ruddy Turnstones searching for food and cormorants perching. Here, fishermen try their luck at catching Sea Bass, Croakers and Grey Mulletts. Further north, at Parque das Nações, the influence of the Tagus estuary can be seen in the marshes where there are Peppery Furrows, whelks, shrimps, crabs, a great variety of aquatic birds and fish, such as Sea Bream, Lusitanian toadfish, Rock Gobies and Sole. If you have the opportunity, speak to a local fisherman about the river's fauna.

Tram 25

