ENGLISH

PROVINCIA di TRIESTE

GIARDINO BOTANICO CARSIANA

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WELCOME…

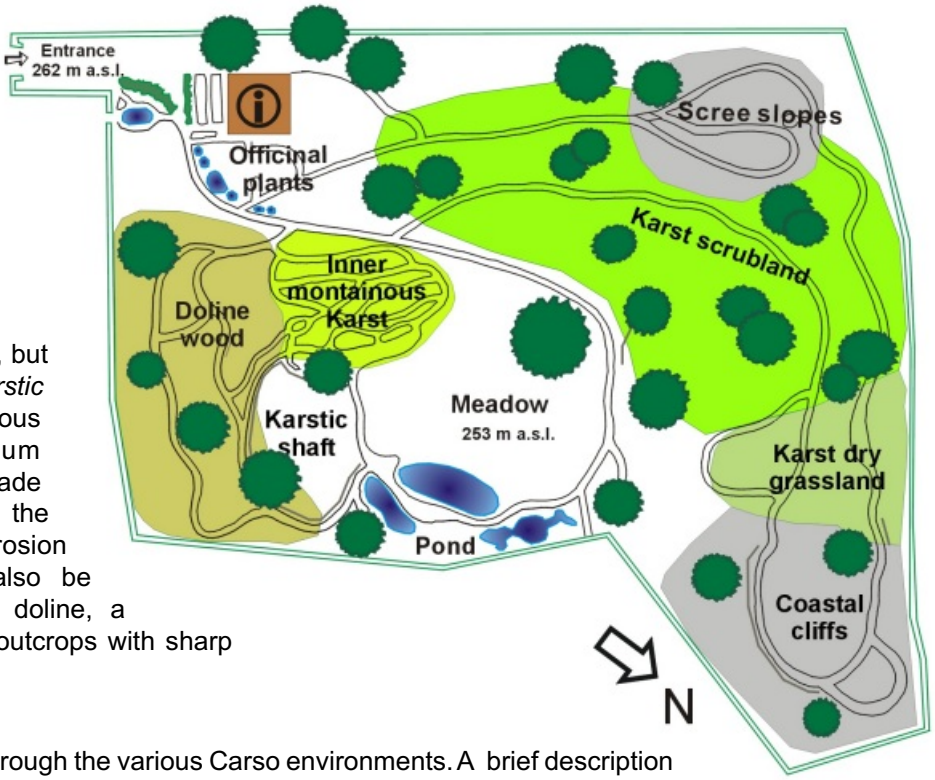
Carsiana is a botanical garden devoted to the flora and habitats of the Carso. Here you can get an idea of the nature and landscapes of an area covering approximately 450 square kilometres and extending from Italy to Slovenia and from the mountains to the sea. This area encompasses habitats with very diverse climates and ecological characteristics, and all these habitats have been reproduced at Carsiana by planting approximately 600 plant species.

THE HISTORY OF CARSIANA

Carsiana was founded in 1964 by a group of experts in karst flora. The territory of origin of the various plant species extends from the river Timavo to the Vipava Valley, to Mounts Vremščica and Slavnik (in Slovenia), down to the mouth of the river Dragonja. The Province of Trieste supported the management of the garden since 1972 and eventually purchased it in 2002. Carsiana has been open to the public since 1978, and over the years it has become a major centre for environmental awareness and education.

THE LAYOUT OF THE GARDEN

The plants are not grouped by botanical classification, but they are placed within natural settings that best suit their ecological needs (light, moisture, soil…). Each species is labelled with its scientific name in Latin, common name in Italian and Slovene, family of origin, and flowering months (indicated in Roman numbers).



CARSO GEOLOGY

On display in the garden are not only plants, but also the geology of the Carso region and *karstic phenomena*. The Carso is formed of calcareous rock, prevalently composed of calcium carbonate, which is corroded by the rain made slightly acidic by the carbon dioxide in the atmosphere. The slow process of corrosion produces karstic phenomena that can also be appreciated at Carsiana: a 9-metre-deep doline, a vertical shaft cave, and *karren fields* (rock outcrops with sharp ridges, cracks and holes).

THE TOUR

The paths marked on the map will take you through the various Carso environments. A brief description of the characteristics and most important plants of each environment is given in the following sections.

THE SCREE SLOPES

These are more-or-less steep accumulations of rock fragments that form at the base of mountain cliffs. On the Carso, scree slopes can be found in Val Rosandra (Trieste), on Mount Nanos and on the Trnovo plateau (Slovenia).
Scree slopes are colonised by a sparse grassy vegetation that is able to survive the lack of water and nutrients, prolonged sun exposure, extreme temperatures and unstable soil that tends to slide downwards. Plants here have very long roots to search for water deep below the surface and thin leaves to retain moisture.
Typical species include *Festuca spectabilis subsp. carniolica*, of the grass family Gramineae, that stabilises the scree with its thick branched roots, and *Genista holopetala*, an endangered species that in Italy can only be found in Val Rosandra.

THE KARST SCRUBLAND

The most common environment on the Carso is scrubland consisting of sparse vegetation, with plants suited to living on thin, dry soils that are poor in nutrients.
The most common trees are the European hop-hornbeam (*Ostrya carpinifolia*), the manna ash tree (*Fraxinus ornus*) and the downy oak (*Quercus pubescens*), which retains its dry leaves through the winter. Other frequent trees are the field maple (*Acer campestre*) and the Montpellier maple (*Acer monspessulanum*). At the edges of the scrubland grows the European cornel (*Cornus mas*), which in February is covered in yellow flowers, and the Mahaleb cherry (*Prunus mahaleb*), whose flowers yield a high-quality honey.
Sufficient light penetrates the undergrowth to allow the growth of shrubs such as the hawthorn (*Crataegus monogyna*) and the smoke tree (*Cotinus coggygria*); the grass cover is formed by autumn moor grass (*Sesleria autumnalis*). In spring you can admire the large showy flowers of the peony (*Paeonia officinalis*), a protected species.

Paeonia officinalis

THE KARST DRY GRASSLAND

A dry grassland with outcropping rocks, this landscape formed during the Bronze Age (1800 B.C.) with the development of sheep husbandry. It consists of plants that tolerate trampling and grazing, and species that do not appeal to animals either because they are thorny like the juniper (*Juniperus communis*) and the amethyst sea holly (*Eryngium amethystinum*) or because their sap contains irritant substances like the Mediterranean spurge *Euphorbia nicaeensis*.
Owing to the variety of its flora, the Karst dry grassland constitutes a habitat of great scientific value that is protected by the European Union. It has over forty plant species per square metre; among the most important are the Illyrian iris (*Iris cengialti subsp. illyrica*), the *Potentilla acaulis subsp. tommasiniana*, the pasqueflower (*Pulsatilla montana*), the Carso thistle (*Jurinea mollis*), and the feather grass *Stipa eriocaulis*.

THE COASTAL CLIFFS

The north end of the Carsiana doline, which is sunny and rocky, is colonised by species typical of the Mediterranean, Dalmatia and the Kvarner. In the Trieste area these species grow between Duino and Grignano, on the cliff face overlooking the sea, where they are exposed to sunlight and sheltered from the Bora. These plants developed between 5000 and 3000 B.C., when the climate was drier and 2-3°C warmer than today. As the temperature decreased, they only survived in areas with a warm microclimate, where they are known as “relic species”.
Typical trees and shrubs are the holly oak (*Quercus ilex*), an evergreen oak, the terebinth (*Pistacia terebinthus*) and the bay laurel (*Laurus nobilis*). Herbaceous plants include the common sage (*Salvia officinalis*), the wulfen spurge (*Euphorbia wulfenii)*, the chimney bellflower (*Campanula pyramidalis*) and the wild asparagus (*Asparagus acutifolius*).

THE DOLINE WOOD

Dolines are rounded depressions of varying depth in the ground surface. They form on areas with cracks or holes in the rocks, through which the rain water is drained. Over time the depression grows deeper, as sinkholes or caves are often present on its floor.
A feature of dolines is “thermal inversion”, that is, the temperature drops the further down you go, whereas under normal conditions (as in the mountains) the temperature decreases with height.
A typical vegetation develops on the floor of the doline, where cold, damp air collects. This is known as the *Asaro-Carpinetum betuli*, from the association of its characteristic plants: a herbaceous plant, the hazelwort (*Asarum europaeum*), and a tree, the hornbeam (*Carpinus betulus*). Other species that grow in dolines are the Turkey oak (*Quercus cerris*), the sessile oak (*Quercus petraea*), the small-leaf lime tree (*Tilia cordata*) and the common hazel (*Corylus avellana*). In the undergrowth are various herbaceous species that start flowering in March. These include the rue anemone (*Thalictrella thalictroides*), the dog's tooth violet (*Erythronium dens-canis*) and the fragrant hellebore (*Helleborus odorus* var. *istriacus*).

Helleborus odorus var. istriacus

THE INNER MOUNTAINOUS KARST

This collection of species comes from the inner Karst, in Slovenia, where mountains higher than 1000 metres can be found. Compared with the coastal areas, here it rains and snows more and the temperatures are colder. To allow the survival of alpine plants, which require constant moisture, a network of fresh-water canals and pools, covered with gravel and soil, has been created at Carsiana. Among the most important species are the martagon lily (*Lilium martagon*), the *Scopolia carniolica,* the rhododendron *(Rhododendron hirsutum)* and the lady's slipper orchid (*Cypripedium calceolus*).

THE KARSTIC SHAFT

At the bottom of the doline is a cave consisting of two vertical shafts reaching an overall depth of 39.50 m. The base of the first shaft is at a depth of 23 m, whereas the second is concealed by a projecting rock.
The shaft walls are inhabited by species that do not require much light: ferns like the long-leaved Hart's tongue fern (*Asplenium scolopendrium*), the common polypody fern (*Polypodium vulgare*) and a variety of mosses.

THE POND

Rain on the Carso rapidly penetrates the subsoil through the holes and cracks in the rocks. This means that, with the exception of the lakes Doberdò and Pietrarossa, natural wetlands are uncommon. There are, however, several man-made ponds that were created to ensure access to water supplies.
The outer edges of the pond banks are inhabited by rushes (*Juncus inflexus* and *J. articulatus*), whereas the portions more subject to periodic submersion are inhabited by the fen ragwort (*Senecio paludosus*), the yellow flag iris (*Iris pseudacorus*), the yellow loosestrife (*Lysimachia vulgaris*) and the purple loosestrife (*Lythrum salicaria*). In submerged zones live the common reed (*Phragmites australis*), the common bulrush (*Typha latifolia*), and, in the middle of the pond, the white waterlily (*Nymphaea alba*) and the yellow waterlily (*Nuphar lutea*).

FURTHER INFORMATION: at the entrance desk and during the guided tour of the garden

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