

# Ex situ and in situ conservation strategies for spontaneous plant species in Puglia (ITALY)



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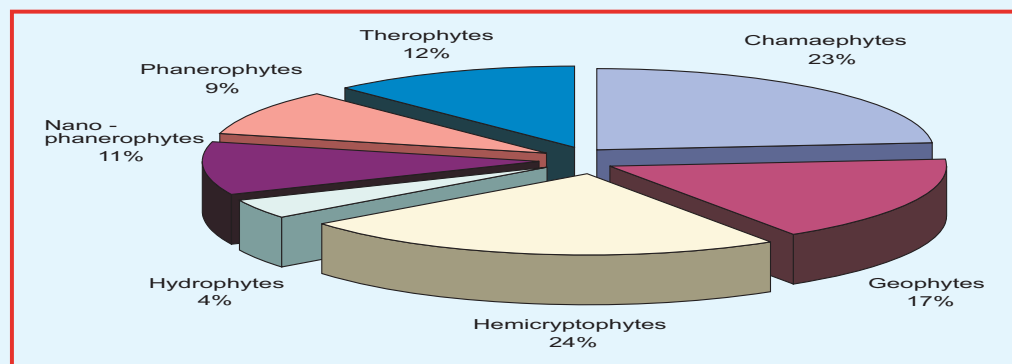
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## ABSTRACT

Of all nature conservation strategies, cultivation *ex situ* in botanical gardens is the most immediate; it enables the medium- and long-term survival of endangered and rare plants. The Botanical Garden of the University of the Salento has the following objectives: analysis of regional biodiversity; standardization of cultivation methods; propagation of those plant species which provide the structure of the main natural habitats; restoration of degraded environments with reintroduction of species typical of Mediterranean habitats (maquis, wetlands, dunes, evergreen woods). *In situ* conservation entails protecting endangered plants in their natural habitat; it provides for the rehabilitation and enhancement of natural ecosystems which host the above-mentioned species, in contexts where they interact with other organisms. The Botanical Garden also aims to provide appropriate and constant management of protected areas and to work closely with local government, in order to draw up guidelines and regulations for the implementation of conservation measures in the region.

*In situ* reintroduction, after propagation and cultivation in the Botanical Garden, has been tested using species included in the Italian National Red List: schools and local government have also been involved in environmental rehabilitation.



## MISSION STATEMENT

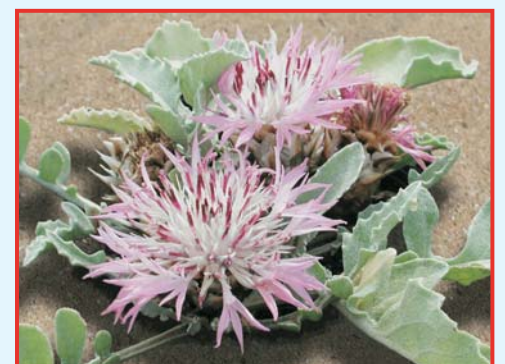
The most important function of a modern Botanical Garden is to protect regional biodiversity, paying special attention to the phytogeographical context in which it is situated and prioritising autochthonous and endangered flora.

The activities of the Lecce Botanical Garden include: analysis of regional biodiversity; collection of material for propagation; establishment of protocols for propagation and cultivation; multiplication of structural species, i.e., those which provide the main natural habitats; maintenance of thematic collections of living plants; measures to promote renaturalisation and restoration in degraded environments, reintroduction into the wild of species characteristic of the main habitats of the Salento peninsula; information and education activities.

## ENDANGERED FLORA

Puglia is a region with a rich spontaneous flora, estimated to include 2075 species of vascular plants. As well as common species found all over the region, there are many rare and localised species. A quantitative survey of flora species considered to be at risk of extinction in Puglia was conducted with reference to the criteria set out in the Italian national Red Book of plants (Conti et al., 1992) and the Italian regional Red Lists of plants (Conti et al., 1997), as well as unpublished data acquired more recently. It was estimated that of the 2297 species of flora in Puglia (Beccarisi et al. 2006), 180 taxa are at risk, including 74 species from the National Red List and 106 from the Regional Red List. The species of flora in Puglia at risk of extinction are subdivided into the IUCN categories shown in the table on the right).

IUCN Category	Description	Number of Species	Percentage
EW	Extinct in the wild	4	(2%)
CR	Critically endangered	69	(39%)
EN	Endangered	42	(25%)
VU	Vulnerable	46	(26%)
LR	Lower risk	9	(5%)
DD	Data deficient	9	(5%)



## HABITATS AT RISK

EU Directive 92/43/EEC contains an annex listing habitats considered to be at risk and thus requiring protection within the European Union. These habitats are classified into **priority habitats** and **habitats of community interest**. The former include rare or fragile habitats, and those generally located in areas subject to modification by human beings, which thus require urgent measures for their protection. The latter include habitats which are representative of the biodiversity of the territory of the EU, more common and thus at lower risk than the former but which also require protection. Puglia contains 43 habitats listed in Directive 92/43/EEC, subdivided into 13 priority habitats and 30 habitats of community interest. To these may be added 13 other habitats not mentioned in the Directive, but judged to be deserving of protection on a national or regional level and defined as "additional habitats".

Code	Priority habitat of Puglia
1120	Posidonia beds ( <i>Posidonia oceanica</i> )
1150	Coastal lagoons
1510	Mediterranean salt steppes ( <i>Limonetalia</i> )
2250	Coastal dunes with <i>Juniperus</i> spp.
2270	Wooded dunes with <i>Pinus pinea</i> and/or <i>P. pinaster</i>
3170	Mediterranean temporary ponds
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates ( <i>Festuco Brometalia</i> ) (*important orchid sites)
6220	Pseudo-steppe with grasses and annuals of the species of the <i>Thero-Brachypodietea</i>
7210	Calcareous fens with <i>Cladium mariscus</i> and species of the <i>Caricion davallianae</i>
9210	Apennine beech forest with <i>Taxus</i> and <i>Ilex</i>



## CONSERVATION EX SITU

Cultivation *ex situ* in Botanical Gardens is the most immediate conservation strategy, enabling the medium- to long-term survival of species which are rare or at risk.

Conservation *ex situ* involves the following issues: seed banks, micro-propagation, mother plants, cultivation in pots, reintroduction *in situ*, and exchange of information and material with other organisations. The conservation of plants and their reproductive parts is important both for the conservation of plant biodiversity and the improvement of growing techniques which enable the survival of the species being cultivated.

For nearly all the species, experiments have been conducted with both agamic and gametic reproduction, in the most natural conditions possible, in order to compare the capacity for diffusion and multiplication *in situ* and *ex situ*.

## CONSERVATION IN SITU AND ENVIRONMENTAL RECOVERY

The Botanical Garden of Lecce regularly participates in protection programmes involving the recovery of seriously threatened or degraded habitats, via the reconstruction of natural plant populations. This entails propagation of species characteristic of Mediterranean habitats – inland, on the coast and in wetlands. The retrieval and collection of plant species helps to identify potential biogenetic reserves in the region, and facilitates studies of the germination potential of seeds.

The reintroduction *in situ* of *Periploca greca* L., and *Limoniastrum monopetalum* (L.) Boiss, required the reconstruction of the entire habitat, starting with the structural species. This intervention also has an educational function, involving schools and local government in the affected areas, thus encouraging their active participation.

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