



The Biodiversity Conservation Centre of Cagliari (Italy)

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Abstract. – *The Biodiversity Conservation Centre of Cagliari was established to study, manage and conserve the plant diversity in Sardinia. The strategy followed by the centre is to preserve the highest number of Sardinian endemic taxa and those having phytogeographical interest, both as seeds or spores, and as cultivated plants for ex situ conservation. Moreover, the Centre aims to study taxonomy, biosystematics and ecology of species in danger of extinction, and to propose the most fitting strategies to save the habitats where they live. Two projects have been started in the last two years: one to preserve threatened species in the province of Cagliari, the other to study the plant diversity in the west Mediterranean insular area. At present, the germplasm of more than 200 taxa is cryopreserved, while 250 entities have been multiplied in pots and in the rock garden. At the same time, floristic and biosystematic studies resulted in description of novelties in taxonomic revisions, determination of chromosome numbers and publication of local floras. The draft of a law regulating the protection of Sardinian flora has been submitted to the Regional Council.*

Key words: *biodiversity, conservation, seed bank, Sardinia.*

Introduction

The Biodiversity Conservation Centre of Cagliari (CCB) is a structure of the Botanical Department, University of Cagliari, established to study, manage and preserve the plant diversity in Sardinia. CCB was officially settled in April 2003 by a resolution of the Department board. Its foundation was possible thanks to MIUR (Ministero Istruzione, Università e Ricerca) funding (Law number 6-10.1.2000), which enabled the purchase of scientific instruments and machinery. The CCB includes a seed bank and a biodiversity rock garden, lately completed, and publishes an Index Seminum.

Aim of the centre is to preserve the highest number of Sardinian endemic taxa possible as well as those having phytogeographical interest, both as seeds or spores, and as cultivated plants for *ex situ* conservation. Moreover, the CCB aims to study taxonomy, biosystematics and ecology of the threatened species, and to propose the best strategies to preserve their habitats (Bocchieri & al. 2000).

Concerning the collaboration with other institutions, there are many projects of research and scientific popularization, e.g. two of them started in the last two years: a first one to preserve the species in danger of extinction in the province of Cagliari (Bocchieri & al. op.cit.), and a second one to study plant diversity in the W-Mediterranean insular area (Bacchetta & al. 2001a). These

initiatives have been accomplished in collaboration with the Provincial Administration of Cagliari and the Jardì Botànic of the University of Valencia (Spain).

CCB structures

CCB includes a seed bank, two research laboratories, six experimental fields and the rock garden for *ex situ* conservation; it publishes an Index Seminum. Though the seed Bank project dates back to 1997, places for its development were chosen only after an agreement with the local administration of Cagliari. Subsequently, all the buildings were completed and equipped with machinery and cold stores. In particular, two rooms for the processing of germplasm, one room for cold stores and the seed bank were built, together with a greenhouse with thermo-regulated benches for the study and propagation of the plant material. At present, the bank preserves the germplasm of more than 200 taxa belonging to the Sardinian Flora.

The preservation of all the most representative species of the W-Mediterranean insular area is going to be achieved in the next future, as planned in the above-mentioned Cagliari-Valencia project.

The Index Seminum is the oldest publication of Botanical Department: the first has been published by Patrizio Gennari in 1885. Since then the publication went on with only few forced interruptions until the year 2000. During the last years, in addition to the species collected in the Botanic Garden, species growing in Isola dei Cavoli (Villasimius, Cagliari) were also included. Today, after a pause of three years, due to economical and technical reasons, the Index ceased to be printed and became available on-line in a digital form. The germplasm in the Index Seminum has also changed, according to the biodiversity conservation policies adopted by the CCB. As a matter of fact, over the last years, several different strategies have been devoted to the conservation of endemic or phytogeographically interesting species existing in Sardinia and nearby territories. Two labs were appointed to conduct biosystematic researches and to process and keep germplasm. At the moment, the staff operating in these structures includes one researcher (Gianluigi Bacchetta), three technicians (Paolo Atzeri, Marco Pitzalis, Roberto Sarigu), three researchers under contract (Mauro Casti, Gianluca Iriti, Cristiano Pontecorvo) and one fellowship INTIME 36 (Alessandro Demurtas). Moreover, the structure works in collaboration with one Spanish fellowship (Pedro Català), and five students who are working on their degree thesis at the CCB: Martino Orrù, Laura Piras, Riccardo Vacca from the University of Cagliari; Laura Zattero from the University of Rome "La Sapienza"; Francesca Manconi from the University of Pisa.

The experimental fields consist of a terraced area divided in three sectors, and three further fields where the multiplication of seeds occurs. The terraced area is used for the cultivation of biosystematically investigated taxa; the other fields are assigned to the growth of specimens for a future conservation *in situ*. The rock garden for biodiversity is devoted to *ex situ* conservation and it is also used for didactic and popularization activities. Before, the Botanic Garden had only few small areas intended for that use, but now, since the creation of the rock garden, most of the Sardinian taxa requiring conservation obtained a proper presentation.

The construction of the experimental field started in December 2001, and was completed in March 2003. The area is about 600 square metres, divided into calcareous, granitic and metamorphic sectors. The installation of propagated and potted species began in Autumn 2002, and is going to be completed in Spring 2004. The project also comprises enlargement by including a nearby rocky area, unused by now due to the steep slope.

Projects

CCB coordinates various research projects, some of which are mentioned in the introduction. It is to be highlighted how the well-established cooperation with the Jardì Botànic of the University of València, together with a strong will to extend similar synergies to other university structures, led

to the elaboration of an INTERREG project aiming to the creation of a Mediterranean network of seed banks. This project is called GENMEDOC and it will start over the next two years, during which other Departments and Botanic Gardens of the Mediterranean region (Barcelona, Catania, Chania, Marseille, Murcia, Palma de Mallorca, Tunis, Valencia) will be involved in the development of a common protocol and of a specific software for germplasm conservation, managing and exchange.

The project also intends a thorough study of the themes related to the reproductive biology of those species reported in the E.C. Directive Habitat 92/43 and its updates. The ultimate aim is the creation of a European System for germplasm conservation, in order to prevent the extinction of threatened species and of those having a great phytogeographical interest. Besides projects and collaborations already running between the University of València and Cagliari, a Life project for the conservation of taxa mentioned in the 43/92 Directive was presented together with the WWF and the University of Ancona (Italy). The joining of the IUCN European project for the preservation of biodiversity in the Mediterranean area and the WWF Planet Ecoregion project is expected during the current year. On the side of collaborations with other Italian and foreign institutes, taxonomic and biosystematic researches are currently going on in cooperation with the Universities of Berlin, Catania, Firenze, Trieste, València and Zurich. Other institutes will be involved, among which that of Napoli, with which contacts have been recently established, leading to the study of the herbarium material about Sardinian flora by Nicola Terracciano.

Results

At present it has been possible to cryopreserve the germplasm of more than 200 taxa, and to multiply 250 entities in vase and in the rock garden. At the same time, floristic and biosystematics studies have led to the description of new taxa (Mossa & al. 1999; Bacchetta & Brullo 2000; Bacchetta & al., 2000a; 2003), the revision of taxonomic groups (Mossa & al. 1998; Boscaiu & al. 2001; Bacchetta & al. 2001b), the determination of chromosome numbers (Bacchetta & al. 2000b; Cusma Velari & al. 1999; 2000; 2001; 2002) and the publication of local floras (e.g. Mossa & al. 1996; Mossa & Bacchetta 1998).

Concerning biodiversity, the draft of a law about the protection of Sardinian flora has been presented (Bacchetta & al. 1999); which should be discussed by the Regional council by 2003.

In addition to the already mentioned activities, a series of scientific and popularizing events have been planned to illustrate the results and to sensitize the public opinion to such themes as the preservation of species and habitats.

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