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# Current research on the biology of threatened plant species of the Mediterranean Basin and Macaronesia: a database

**Abstract**

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A database on current research on the biology of threatened species of the Mediterranean Basin and Macaronesia has been created by the OPTIMA Commission for the Conservation of Plant Resources. Information is given on the present status of the database and future guidelines.

## Introduction

Information is a key tool in the struggle against biodiversity loss on our planet. Once priorities are set on the species for which the danger of extinction is most imminent, conservation planners and managers need information on their biology and habitats in order to plan appropriate action and take adequate measures. In many cases, such information already exists; however, it is not always easily available due to the large number of disciplines involved and the diverse character of the institutions concerned with corresponding research activities.

Fortunately, governments are becoming increasingly aware of the relevance of information for biodiversity conservation. Article 6 of the Convention on Biological Diversity requires that the ratifying countries undertake to develop an information basis for promoting national biodiversity strategies and action plans. Among the up-to-date, reliable data necessary for the effective implementation of the measures prescribed in the Convention's articles, those related to threatened species are considered as being of high priority.

At the VI OPTIMA Meeting in Delphi (Greece), in 1989, the members of the OPTIMA Commission for the Conservation of Plant Resources agreed that the Commission become involved in assembling information on past and current research on the biology of threatened plants of the Mediterranean Basin and the Atlantic Islands (Macaronesia). Four years later, at the VII OPTIMA Meeting in Borovec (Bulgaria), a preliminary draft inventory was presented, containing data on 201 species. With further information and other species added, the

complete database, with accounts on 281 species, was published as a separate volume at the end of the following year (Iriondo & al. 1994). In 1996, the whole data set was transferred to a new database structure based on Microsoft Access for Windows. Meanwhile, new data kept pouring in.

The main objectives of this project are to:

- establish a list of threatened plant species of the Mediterranean Basin and Macaronesia that are or were the subject of some type of biological study;
- provide information on research teams that work with threatened plant species in specific areas of biology;
- facilitate communication among research teams that study threatened plant species belonging to particular taxonomic groups;
- provide bibliographical references related to studies on the biology of threatened plant species of the Mediterranean Basin and Macaronesia; and
- give planners and managers a complete picture on the overall state of knowledge on any particular threatened plant species.

## Materials and methods

Data have been gathered mainly through a questionnaire distributed to institutions working in such fields. The questionnaire asks for information relating to Mediterranean and Macaronesian plant species which, on a world-wide scale, are rated as extinct in the wild (EW), critically endangered (CR), endangered (EN), vulnerable (VU) and at lower risk (LR), according to the new IUCN categories (Anonymous 1994); or as endangered (E), vulnerable (V) or rare (R) according to the old IUCN criteria (Anonymous 1977).

The entries in the questionnaire are: name of the species and family, IUCN category, distribution, name of researcher(s), institution, postal address, area of study, period of study, and bibliography.

In order to reach as many institutions working in this area as possible the questionnaire has been:

- distributed to the members of the OPTIMA Commission for the Conservation of Plant Resources so that they might circulate it to all institutions with interests in these fields, in their respective countries;
- published in the *OPTIMA Newsletter* (Iriondo 1991, Albert 1997);
- inserted in the European edition of *Botanic gardens conservation news* (Iriondo 1993);
- handed out at congresses, workshops and symposia attended by the authors.

Additional information has been gathered from publications traced through a computerized bibliography search in main international databases.

At present, the data are structured in four interrelated tables (Table 1): "Taxon", containing data relevant to the endangered plant species; "Researcher", with information on the research group and institution; "Bibliography", listing pertinent bibliographic references; and "Data", recording the field and period of study of a particular species by any one research team.

Table 1. Structure of the database (tables and fields).

| Tables | Fields | Notes |
|---|---|---|
| Taxon | TAXREF | link to "Bibliography" and "Data" |
| | FAMILY | |
| | GENUS | |
| | SPECIES | specific epithet |
| | AUTSP | species name authorship |
| | SUBSP | subspecies epithet |
| | AUTSUB | subspecies name authorship |
| | IUCNCAT | IUCN category |
| | DISTR | distribution |
| Researcher | RESREF | link to "Data" |
| | RNAME | |
| | RINSTITUTION | |
| | RADDRESS | |
| | RCOUNTRY | ISO code |
| | RPHONE | |
| | RFAX | |
| Bibliography | BIBREF | alphanumerical code |
| | TAXREF | link to "Taxon" |
| | AUTHORS | |
| | TITLE-SOURCE | title, book or journal, volume, pages |
| | YEAR | from-to |
| | KEYWORDS | |
| Data | DATAREF | alphanumerical code |
| | TAXREF | link to "Taxon" |
| | RESREF | link to "Researcher" |
| | RAREA | areas of research |
| | YEAR | from-to (project period) |

**Results and discussion**

Currently, this database holds information on over 300 Mediterranean (including Macaronesian) plant species of 56 different families, considered to be threatened on a world-wide scale according to IUCN criteria (Table 2). The largest represented family, in terms of species numbers, is *Asteraceae,* followed by *Brassicaceae, Caryophyllaceae, Plumbaginaceae, Fabaceae, Apiaceae,* and *Liliaceae.* Together they cover over 50 % of the species accounted for in the database. Regarding the categories of threat, the rare category (R) is most abundant, representing about one-third of the cases.

The database relates to research work of teams at 53 institutions in 15 different countries. So far data from Spain are particularly abundant. More than half of the species present in the database grow in the Canary Islands or Peninsular Spain.

Table 2. Families currently represented in the database, with number of species in each (as per 1 Apr 1997).

| Family | spp. | Family | spp. | Family | spp. |
|---|---|---|---|---|---|
| *Amaryllidaceae* | 6 | *Euphorbiaceae* | 8 | *Plumbaginaceae* | 22 |
| *Apiaceae* | 16 | *Fabaceae* | 17 | *Poaceae* | 5 |
| *Aquifoliaceae* | 1 | *Gentianaceae* | 3 | *Polygonaceae* | 1 |
| *Araceae* | 1 | *Geraniaceae* | 7 | *Primulaceae* | 5 |
| *Asteraceae* | 51 | *Gesneriaceae* | 3 | *Ranunculaceae* | 7 |
| *Boraginaceae* | 10 | *Globulariaceae* | 3 | *Rhamnaceae* | 2 |
| *Brassicaceae* | 32 | *Guttiferae* | 3 | *Rosaceae* | 1 |
| *Campanulaceae* | 3 | *Iridaceae* | 2 | *Rutaceae* | 2 |
| *Caprifoliaceae* | 1 | *Isoetaceae* | 1 | *Salicaceae* | 1 |
| *Caryophyllaceae* | 29 | *Lamiaceae* | 8 | *Sapotaceae* | 1 |
| *Celastraceae* | 2 | *Lauraceae* | 1 | *Scrophulariaceae* | 10 |
| *Chenopodiaceae* | 3 | *Lentibulariaceae* | 2 | *Solanaceae* | 2 |
| *Cistaceae* | 4 | *Liliaceae* | 12 | *Ternstroemiaceae* | 1 |
| *Convolvulaceae* | 4 | *Malvaceae* | 3 | *Thymelaeaceae* | 1 |
| *Crassulaceae* | 6 | *Myricaceae* | 1 | *Ulmaceae* | 1 |
| *Cupressaceae* | 1 | *Myrsinaceae* | 1 | *Urticaceae* | 1 |
| *Cyperaceae* | 3 | *Oleaceae* | 1 | *Valerianaceae* | 1 |
| *Dipsacaceae* | 1 | *Papaveraceae* | 2 | *Violaceae* | 1 |
| *Ericaceae* | 2 | *Pinaceae* | 2 | **Total = 56** | **321** |

The most frequently documented disciplines are the study of propagation methods, germination and dormancy, culture techniques, and micropropagation. In many cases, the bibliography section includes additional information on studies in other disciplines of biology. However, only references that deal specifically with the species in question or provide substantial information on some aspect of its biology have been included.

A considerable number of questionnaires have been received that include information on species threatened in a particular country, but not world-wide. In some cases, information on infraspecific taxa has been submitted. These data are not presently included in main database, but they are being stored separately for future use. Information on subspecies will be fed into the database as a matter of priority.

The information contained in the database covers the period 1805-1996. It is not as yet, obviously, an exhaustive compendium of all relevant information published during this period. However, it provides biologists, managers and planners with essential information, helps avoiding duplication of past efforts, permits to identify gaps of knowledge so that they may be filled, and thus expedites in many ways efficient the conservation of rare plants in the Mediterranean Basin and Macaronesia.

The database is very much alive and will be expanded in the near future by feeding new data into it, so as to provide information to all those who request it. In order to progress in this direction, the following measures are envisioned:

- to intensify efforts of data collection in the central and eastern Mediterranean region, in order to improve the geographical balance of the information base;
- to create a network of regional groups, each to collect data in its own area and to manage a subunit of the database, carrying responsibility for the species of that area;
- to improve contacts with international institutions that hold databases of a similar nature; and
- to implement a World-Wide-Web-based on-line information service.

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