



Conservation of the threatened wild relatives of socio-economically important plants in Europe

S. P. Kell, N. Maxted and B.V. Ford-Lloyd¹

European crop wild relative diversity assessment and conservation forum

PGR Forum - EVK2-2001-00192
Fifth Framework Programme for Energy, Environment and Sustainable Development

What are crop wild relatives?

Crop wild relatives are also related to species of direct socio-economic importance. Socio-economically important species include food, fodder and forage crops, medicinal plants, condiments, ornamental and forestry species, as well as plants used for industrial purposes, such as oils and fibres. Crop wild relatives include plants harvested directly from the wild, and under-utilised species.

Europe is an important centre for crop wild relative diversity, with more than 21,000 taxa found across the region. Major crops such as oats (*Avena sativa*), sugar beet (*Beta vulgaris*), apple (*Malus domestica*), annual meadow grass (*Festuca pratensis*), and white clover (*Trifolium repens*), have wild relatives in Europe. Many minor crops have also been developed and domesticated in the region, such as arrisso (*Artemisia montana*), asparagus (*Asparagus officinalis*), lettuce (*Lactuca sativa*), and sage (*Salvia officinalis*).



Allium achaeoprasorum
Photographer: Kiki Horne-Rasmussen

Guidelines for crop wild relative conservation

Although it is acknowledged that populations of crop wild relatives throughout Europe are under threat from habitat alteration and loss, their conservation across the region has received relatively little systematic attention, and while some European crop wild relative material is conserved *ex situ*, their conservation *in situ* has not been the subject of significant debate.

PGR Forum is developing guidelines for the conservation of crop wild relatives, with a particular focus on *in situ* techniques. These practical guidelines will include methodologies for *in situ* data management, threat and conservation assessment, genetic reserve location and management, population monitoring, and genetic erosion and pollution assessment.

Threats to European crop wild relatives

Crop wild relatives are essential components of natural and semi-natural habitats, as well as agricultural systems. Major threats to crop wild relatives are habitat alteration and loss, changes in agricultural practices, and genetic pollution. Many crop wild relatives have limited distributions and habitat niches. For example, *Asparagus officinalis* subsp. *prostratus* (Dumont.) Corb. is confined to fine draining sea cliffs and sand dunes. In the British Isles, this restricted taxon is threatened by changes in land use and agricultural practices, tourism, and soil erosion.

A threat unique to crop wild relatives is that many taxa are weedy and associated with traditional farming practices and cultivation of local varieties (landraces). With an increase in industrial farming and cultivation of high yielding varieties, the associated crop wild relative diversity decreases, resulting in loss of genetic diversity and potential local extinction. A further hidden threat to crop wild relatives is that many of the less common species are overlooked in conservation planning. Without active management, these taxa are also at risk.



Artemisia montana
Photographer: Karsten Chausen

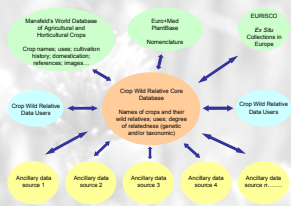


Figure 1. Conceptual model for a European crop wild relative information system. The European crop wild relative core database is at the core of the infrastructure and linked to external data sources. Some auxiliary data sources are indicated in green. The two-way arrows indicate the reciprocal nature of the system.

A gateway for crop wild relative information

PGR Forum is developing an online information system to provide access to data on crop wild relatives. A conceptual model is shown in Figure 1. At the core of the system is a catalogue of European crops and their wild relatives.

The core database contains information on crop uses, and the degree of genetic and/or taxonomic relatedness between taxa. An XML schema (Extensible Markup Language) acts as a means of linking the database to other data sources.

A case study database focusing on a selection of crop wild relative taxa is under development to illustrate the full scope and functionality of the crop wild relative information system.

www.pgrforum.org

¹School of Biosciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK
Email: s.p.kell@bham.ac.uk

Conserving Europe's plant genetic resources for use now and in the future



Abstract

Crop wild relatives are essential components of natural and semi-natural habitats, as well as agricultural systems. Major threats to crop wild relatives are habitat alteration and loss, changes in agricultural practices, and genetic pollution. Europe is an important centre for crop wild relative diversity, with more than 21,000 taxa found across the region. Although it is acknowledged that populations of crop wild relatives throughout Europe are under threat from habitat alteration and loss, their conservation has received relatively little systematic attention. The European Community funded project, PGR Forum (European crop wild relative diversity assessment and conservation forum) is building an online information system to draw attention to these threatened taxa and provide access to crop wild relative data, and is developing guidelines for their conservation, with a particular focus on *in situ* techniques.

Authors

S.P. Kell, N. Maxted and B.V. Ford-Lloyd
School of Biosciences, University of Birmingham, Edgbaston, Birmingham, B15 2TT, UK
Email: s.p.kell@bham.ac.uk