

Crop wild relatives: a vital resource for a sustainable future

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European crop wild relative diversity assessment and conservation forum

What are crop wild relatives?

Crop wild relatives (CWR) are taxa related to species of direct socio-economic importance, including 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 minor crops or under-utilised species.

The role of crop wild relatives in poverty alleviation and sustainable development

Crop wild relatives are vital for improving agricultural production, increasing food security, and sustaining the environment. They are essential components of natural and semi-natural habitats, as well as agricultural systems, and are critical for maintaining ecosystem health.

Crop wild relative germplasm (genetic material) has been utilised by humankind for thousands of years to improve the quality and yield of crops. Farmers have used traditional breeding methods for millennia, and more recently, plant breeders have utilised crop wild relative genes to improve crops for resistance to pests and diseases, and abiotic stresses such as drought and salinity. Other uses include increased protein and vitamin content, and the improvement of medicinal plants and pharmaceuticals.

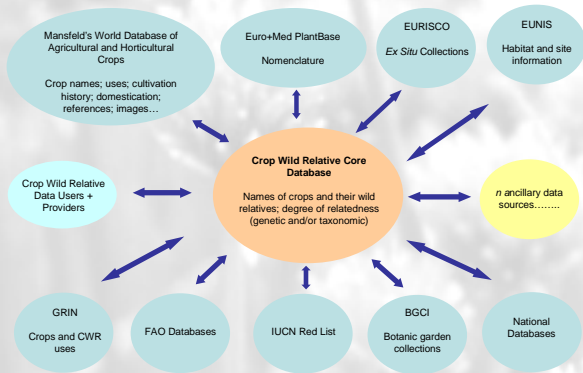


Figure 1: CWRIS Model

The CWR taxon database is at the core of the system and linked to *n* external data sources.



Photo: Lothar Frese

Beta webbiana Moq., a source of disease resistance. This species belongs to the tertiary gene pool of *Beta* (Section *Procumbentes*), which has its major distribution area in the Canary Islands but can also be found in Southeast Spain and along the coast of Morocco. It is adapted to arid conditions and grows on dry roadsides or ruderal places in or around villages. (Frese, 2004)

Threats to crop wild relatives

Major threats to crop wild relatives are habitat alteration and loss, changes in agricultural practices, and genetic pollution. Many crop wild relatives also have limited distributions and habitat niches. For example, *Asparagus officinalis* subsp. *prostratus* (Dumort.) Corb. is confined to free 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 (UK Biodiversity Steering Group, 1998; Rich *et al.*, 2002).

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.



Photo: Emilio Laguna

Kosteletzkya pentacarpos (L.) Ledeb., a fibre plant anciently cultivated around the Black Sea. This species is protected by the EU's Habitats Directive. (Laguna, 2004) Image taken in the Plant Micro-Reserve "Llacuna del Samarç" in Valencia, Spain.

Guidelines for crop wild relative conservation

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

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



Photo: Kerstin Olsson

Arnica montana L., harvested from the wild for its medicinal qualities. Although widely distributed, this species is threatened in some countries due to its locally restricted range, in addition to habitat alteration and loss.

A gateway to crop wild relative information

PGR Forum has initiated a Crop Wild Relative Information System (CWRIS) (Figure 1), which provides essential information to policy-makers, protected area managers, plant breeders, conservationists, taxonomists and the wider public. At the core of the CWRIS is a catalogue of crops and their wild relatives containing more than 23,000 species. The system provides a platform for access to data on current plant uses and utilisation potential, geographical distribution, biology, demography, habitats, threats (including IUCN Red List assessments) and conservation actions; information that is vital for the continued sustainable utilisation and conservation of crop wild relatives.

Literature cited

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