Crop Wild Relative Conservation and Use

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Plant genetic resources collecting, maintenance, evaluation, preservation and research of their variability are among the hotspots of recent plant sciences. Nevertheless, most of the work in this area has been focused on cultivated plants, their landraces and cultivars until now. However, it was recognised by plant scientists and breeders during the last few decades that the genetic variability of cultivated plants is rather limited. For future improvement of cultivated plants it is necessary that also crop wild relatives (CWR) will be collected, maintained, and their biological diversity will be preserved for future utilisation in plant breeding and general benefit of all people. CWR are considered to be wild plant species closely related to crops and belonging to the same or closely related gene pools. However, it was recognised that the genetic diversity of CWR is currently threatened by habitat reduction and loss, their fragmentation and disturbance, global changes leading to the reduction of CWR natural distribution and reduction of their genetic diversity, and that no adequate system of their conservation has been developed. During the last few years development of CWR collecting, conservation and characterisation has been in progress. In Europe the EC-funded Plant Genetic Resources Forum project has been developed. The first results of this project and related activities were presented to the "First International Conference on Crop Wild Relative Conservation and Use", which was held in Sicily, Italy, in September 2005. The results presented to this conference are summarised in this volume which brings the essential background to the knowledge and understanding of CWR, their conservation and utilisation.

The volume is dedicated to Professor Jack Hawkes (1915–2007), one of the founders and world leaders on plant germplasm collecting, conservation, research and use. He was probably the first to establish the independent university Master's course focused on the discipline of Conservation and Utilisation of Plant Genetic Resources (Birmingham University, Birmingham, UK, 1969).

The contents of the book are divided into 10 parts/chapters which cover various aspects related to the CWR. Part I is an overview focused on the crop wild relative conservation and use. Altogether four contributions deal with CWR conservation and use from general aspects, and the international and European policy context. The last contribution is a case study showing these aspects on an example of Armenia.

Part II analyses the establishment of inventories and conservation priorities. In eight contributions different aspects related to the conservation priorities in various regions (e.g. Euro-Mediterranean region, United Kingdom, Russia, Finland, the Netherlands) are summarised, and also the topics like conservation priorities for CWR, forest genetic resources and use of GIS models for the location of wheat wild relative in Palestine.

Threat and conservation assessment is the main topic of Part III, which contains three contributions. IUCN (International Union for Conservation of Nature and Natural Resources) Red Listing of CWR is considered and analysed as a very important topic. The authors conclude that the global assessment is possible on the basis of national approaches to the IUCN Red Listing of CWR. There is only one main critical limitation represented by the lack of comparable data sets from adjacent regions. The other two contributions focus on *in situ* conservation (example of *Cicer* spp. from south-eastern Turkey) and *ex situ* collections and their ecogeographical CWR representatives (example of *Lupinus* spp. from Spain).

The main topic of Part IV is genetic erosion and genetic pollution. In general and specific terms are analysed achievements and perspectives of PGR Forum on the questions related to genetic erosion and genetic pollution of CWR. The potential for ecological harm from the gene flow to crop wild relatives is also assessed. A practical example of reciprocal introgression between wild and cultivated peach palm (*Bactris gasipaes*) is presented from Western Ecuador. Impoverishment of the gene pool of the genus *Aegilops* is presented from Armenia.

Next two parts (V and VI) are focused on *in situ* and *ex situ* conservation of CWR. Altogether thirteen contributions bring a huge amount of information on these two important topics from the viewpoint of CWR. The *in situ* part is mostly aimed at CWR *in situ* management and monitoring, their interaction with agriculture, conservation of local agrobiodiversity, *in situ* conservation of specific crops (lima bean – *Phaseolus lunatus*, *Arnica montana*, *Triticum dicoccoides*) and integration of wild plants and landrace conservation in farming systems. The *ex situ* part provides an excellent reviews on the role of botanic gardens in *ex situ* conservation of CWR. Some case studies focused on *Avena canariensis* and wild *Lactuca* spp. are presented. The final contribution summarises information on linking *in situ* and *ex situ* conservation of CWR.

Part VII focuses on information management. In five contributions are summarised and discussed the topics related to different information systems and databases (e.g. CWRIS and ECPGR), development of CWR information systems, management of passport data and very useful summary where it is possible to find sources of news about CWR.

The characterisation of CWR as gene donors for crop improvement is summarised in part VIII. In five contributions news is presented about the use of CWR for crop improvement from the viewpoint of recent trends and perspectives, CWR as sources of useful genes, genetic systems and the CWR conservation. Case studies show examples of barley and wheat improvement.

The use of CWR in underutilised species is the main topic of Part IX. After general introduction there is a discussion about underutilised minor crops, medicinal plants, market perspective of CWR and *Quercus ilex* subsp. *rotundifolia* as an example of traditional agro-sylvo-pastoral systems in Portugal.

The final part analyses global issues of CWR conservation and use from the viewpoint of the IUCN Species Survival Commission and presents an attempt to formulate a global strategy for this purpose.

This book represents an excellent and comprehensive review and integration of the latest information about crop wild relatives, their diversity, collecting, conservation, management and use. The contents of the book are well arranged and easy to read and understand. The book is aimed at advanced students and postgraduates as well as at scientists and practical plant biologists engaged in plant taxonomy, biodiversity, nature and plant germplasm conservation, plant sciences and agriculture, genetics and plant breeding.

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