

# Conservation And Management Of Plant Genetic Resources From Cultural And Wildlife In Bulgaria

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**Abstract:** Preservation of plant biodiversity from cultural and wildlife is a priority activity of the Institute of Plant Genetic Resources, Sadovo. This is the first scientific agricultural center of Bulgaria, where it began introduction of new species and varieties and today in IPGR are collected and stored a rich variety of species and a variety of local and foreign germplasm. The aim of the paper is to focus on the preservation of existing plant wealth of usable germplasm and establishment of science-based strategy for management and conservation of biodiversity.

**Key words:** biodiversity, PGR, germplasm, in situ, in vitro, on farm

## INTRODUCTION

The preservation of plant biodiversity of Bulgarian flora is the main priority in the scientific activities of IPGR – Sadovo that is a part of the National programme in Plant Genetic Resources (PGR) through realization of the "Conservation, Management and Use of PGR in Bulgaria" Project. The main goal of the project is conservation of the national plant biodiversity.

## MATERIAL AND METHODS

Trends of research of PGR are created using the shuttle system, descriptive, evaluative and analytical methods, laboratory analyzes of seeds. For evaluation of the species were also used descriptors European program for PGR, SEEDnet, international classifications of UPOV and specific methods for some species [1,4].

## RESULTS AND DISCUSSION

Enrichment. The enrichment of the collections with plant germplasm of established groups of crops is mainly realized through free exchange with foreign partners, through expeditions and interchange. During the recent years collection is focused mainly on local varieties and populations of wild species and their wild relatives, rare, threatened or endemic species and foreign varieties and models to produce valuable qualities. During the period 2009-2013 was performed enrichment of the collections with a total of 5086 samples [3]. The largest share of 3062 species are samples received from expeditions mainly from our native flora and abroad / 132 number from China, Romania, Slovakia, Slovenia and Macedonia /. Through international exchanges with 40 countries were received and registered 1762 passport data samples. Enrichment of the collections with 393 samples and valuable breeding lines with Bulgarian origin had been made due to international exchange. Maintenance. Maintaining of the collected plant gene pool is done by applying appropriate methods according to the specific requirements of each culture:

- Annual reproducing for deposit in long-term and short-term storage of an average over 2000 samples. For the recovery of samples with reduced germination - 150-300 pieces are reproduced each year.
- In the ex situ field collections are maintained over 780 samples of vegetatively propagated crops: forage, medicinal, ornamental, cereals etc.
- In situ are maintained several localities of wild

fodder and medicinal species.

- In recent years, through the implementation of international projects are collected original old varieties and forms from different regions in Bulgaria.
- In in vitro collections are maintained about 350 samples vegetatively propagated species (potato vine, mint, hops, medicinal and essential oil), rare, protected and endemic plants [2].
- In the botanical garden in vivo collection is enriched with local germplasm and in 2013 had a total of 470 species from 45 plant families.

Storage in the National genebank. The National gene bank was built in 1984 and carry out science program for long-term storage of germplasm seed under controlled conditions in accordance with the FAO (1980/1995g), [5,6]. Maintaining the diversity of cultural plant species and their wild relatives is done in three collections:

**Baseline Collection** - Long-term is storage of samples in a confined airtight containers at -18 0 C.

**Work collection** - Ensure storage of seeds from three to ten years at +60 ° C.

**Exchange collection**- It provides free exchange with partners from national and international system.

National gene bank supports over 56 000 samples of 2670 plant species. In the base collection are stored 39,340 samples. The specific activity of the existing laboratory at the National Genebank includes: seed control analyzes and preparation of samples for storage, checks the status of the seeds, keeping the exchange collection and organization of free exchange, identify the variety in methods of ISTA and UPOV. Storage in the Botanical garden. The Botanical garden is a specialised unit of the Programme of Plant Genetic Resources of IPGR – Sadovo. It was established in 2002 with its main goal being the preservation of local resources through in vivo and in garden conservation. Rare, endemic, and endangered plants are kept there belonging to 54 families. Out of their total number, 8 are Balkan endemics – *Achillea lutea*, *Allioides bulgaricum*, *Knautia macedonica*, *Chamaecitissus janke*, *Iris reichenbachii*, *Iris suaveolens*, *Aegilops cylindrica*, *Haberleia rhodopensis*, which is also rare; 5 are

Bulgarian endemics - *Allium rhodopaeum*, *Sedum album*, *Vicia incisa*, *Aegilops neglecta*, *Soldanella rhodopaea*; 4 are endangered plants - *Leucocyma aestivum*, *Artemisia pedemontana*, *Anemone sylvestris*, *Pyracantha coccinea*; 11 are rare plants - *Meum thamanticum*, *Artemisia lurchiana*, *Artemisia pontica*, *Leontopodium alpinum*, *Leucanthemum vulgare*, *Andrachne telephoides*, *Aegilops triuncialis*, *Koeleria brevis*, *Secale cereale* var. *perene*, *Clematis alpina*, *Paeonia tenuifolia*. The medical plant collection that is kept in the botanical garden comprises 51 species. The specimens in the Botanical Garden are divided thematically as follows: essential –oil plants; grasses; forage crops; ornamental plants; rare and endangered plants; crop wild relatives; introduced plant species. Demonstrative collections in the botanical garden are made of species that include crop wild relatives, old varieties and ecotypes: *Beta maritima*, *Trigonella coerulea*, *Luffa acutangula*; old pea varieties as well as introduced plant species- *Physalis peruviana*, *Cynarascolymus*, *Cynaracardunculus*. Herbarium collection. Enriched with samples from expeditions, a herbarium collection was created at the IPGR - Sadovo, including rare, endangered and endemic species: *Dracunculus vulgaris* – endangered; *Artemisia chamaemelifolia*; *Centaurea parilica* – rare, Balkan endemic plant; *Ligularia sibirica* – endangered; *Anthemisancti-johannis* – rare, Bulgarian endemic plant; *Onosmarhodopaea* – endangered, Balkan endemic plant; *Trachelium rumelianum* – rare, Balkan endemic plant; *Astragalus physocalix* – Balkan endemic plant; *Gentiana punctata* – endangered; *Lilium rhodopaeum* – rare, Balkan endemic plant; *Geum rhodopaeum* – rare, Bulgarian endemic plant; *Origanum vulgare*. Use of PGR. Exchange collection and use of the germplasm. It comprises 2930 accessions, and 1000 of them, stored for more than 5 years, are tested for vitality. Selection of starting material – 26 new varieties were created in the IPGR for 35- year period. Educational work – rare and endemic plants, crop wild relatives, old varieties as well as introduced varieties, medical and spice plants, divided in thematically collections are maintained in connection with different educational projects.

## CONCLUSION

Priorities for future activities within the PGR Programme in the IPGR – Sadovo should be closer interaction with the scientific and educational centres in Bulgaria; collection of the existing old varieties and populations of vegetables, grain legumes, cereals, forage, ornamental and other crops; establishment of new territories and producers for in situ and on farm conservation; creation of demonstrative collections and trials for educational and practical purposes (with wild species, very old varieties, plants interesting for cultivation, etc.); creation of seed plots with wild forage, medical, oil and other plant species for reintroduction or improvement of areas of high natural value; preparation of a plan for interaction between biodiversity, agriculture and good practices. Modern agriculture is based on a limited range of varieties and a few species. Generations before us have used countless local forms with large genetic variation, even within one country and region. The conservation and use of old plant material provides researchers, now and in the future, with valuable germplasm resistant to biotic and abiotic factors, many of

which are stored only in the gene bank of PGRI - Sadovo.

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