

GRAIN LEGUME COLLECTION IN BULGARIA

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The information gathered for creation of the collections as well as the activities for their enrichment of the main aims was the creation of network of partners for location and protection of old local varieties, populations and wild forms. The grain legume collection are represented by pea, beans, lentil, lupin, chick pea, grasspea, cowpea, soya and faba bean.

Their study and evaluation is carried out in relation to the different breeding programmes and use in the country /Koeva R. et al. 2002/

An intensive breeding programme for bean and pea has been developed lately in Bulgaria: Sadovo, Pleven, General Toshevo. Breeding is mainly targeted toward earliness, winter and dry resistance. For some species: faba bean, chick pea and lentil, the resistance to the most common for our country diseases is principal observation. The specific climate conditions and climate changes calls for the creation of early maturing varieties of all grain legumes. Only early and middle early cultivars in Bulgaria can reveal their yield potential /; Angelova S and Tz. Stoilova, 1998; Angelova S. 2000; Angelova S., T. Georgieva. 2006/..

The three larger groups of grain legumes– pea, vetch and bean are represented *ex situ* collection by the following more important species: *Pisum sativum* ssp.*sativum*, ssp.*arvense*; *Vicia sativa* complex; *Phaseolus vulgaris*, *Ph.multiflorus*.

The composition of the Bulgarian grain legume collections is highly varied (table 1).

They includes landraces, old cultivars, local populations, all newly bred and cultivated varieties, breeding lines, forms, wild relatives etc. Predominant for pea, faba bean, chick pea, lentil, and cowpea collections are the breeding materials. Prevailing number of accessions for vetch, bean and grasspea is landraces and wild relatives.

From 2001 year the received results is:

- national inventory of the collections *ex situ*
- good coordination with stakeholders of national and regional level
- availability of passport data
- availability of characterization data for pea, faba bean and vetch
- availability of evaluation data for pea and bean

The crop progress review is presented by accessions with Bulgarian origin.

Pisum sp. – new varieties, breeding lines and basically mutant forms; (fig 1, 2)

Vicia sativa complex, *V. incisa*, *Lathyrus* sp. - wild forms;

Beans - local landraces and forms

Chick pea - varieties from abroad.

Faba bean - to collect the old local material

Soya - to characterize the base collection.

The curators for Grain legumes finished a good work with breeders from other c institutes, botanical gardens, Universities, NGOs and producers.

Dobrudja Agricultural Research Institute; Research Institute of Fodder Crops ; Institute of Plant Genetic, Agricultural University, Institute of Botany, University of Forestry, Botanical Garden and NG Os /organizations of producers/.

There are no breeding programs for *Lupinus* and *Lathyrus*. Today interest towards these crops is shown as they can increase the number of leguminous crops used for implementation of a program for development of organic agriculture in regions with acidic soils and in regions of high altitude. We are looking for partnership opportunities for elaboration a program for exploring the possibilities for growing and use of *Lupinus* in Bulgaria. *Lupinus* is not a traditional crop for Bulgaria but it has been used for a long period as a green manure source.

Similar interest is shown towards *Vigna* and especially if in regions with continuous drought periods and possibilities for irrigation. Collections of these species are maintained only in the Institute of Sadovo. They are used for scientific and experimental purposes and very limited for production.

The classification of *Pisum* sp. and *Lathyrus* sp. accessions according to the winter hardiness was carried out / % of plants successfully survived the winter period for 5 - 10 years /

<i>Winter hardiness</i> 80 – 100%	<i>Low sensitivity</i> 70 – 80%	<i>High sensitivity</i> 60 – 70%
187 samples <i>Pisum arvense</i>	350 samples <i>Pisum sativum</i>	278 samples <i>Pisum sativum hortense</i>
Old local varieties, populations, forms. Typical fodder varieties and breeding lines used for production of green mass	Newly created local and introduced varieties, breeding lines of dry pea	Green pea varieties, breeding lines. Afila forms Fascilated forms
25 samples <i>Lathyrus cicera</i>	10 samples - <i>L.cicera</i> 24 - <i>L.sativus</i> 5 - <i>L.ochrus</i>	10 samples - <i>L.sativus</i> 4 - <i>L.articulatus</i> 3 - <i>L.clemenum</i>

In collections *ex situ* *Lathyrus ssp* and *Vicia ssp.* is the only representative of the wild relatives. The habitats of wild species of *Lupinus*, *Cicer*, *Pisum* and *Lens* have been identified and they will try to protect *in situ*.

The priority in the period from 2001 to 2006 was identified and marked habitats with wild relatives in the Bulgarian flora.

In case of the crop wild relatives of grain legumes only the *in situ* conservation gives the possibility for a study in the natural plant communities in balance with the changing environment. The protection of the crop wild relatives is extremely important for breeding new cultivars. The bigger number of species and genera is, the greater are the chances to breed stress and disease resistant cultivars /*Vicia*, *Lathyrus*/. The *in situ* conservation of such species in areas to the Black Sea less damaged by human activities is of vital importance. Our efforts now are directed towards the conservation, evaluation and use of some species and habitats in the region where the area makes possible the creation of an information data base, including ecologic, geographic and taxonomic studies and also planning and collect of rare and endangered plants; economically valuable species for breeding and as a genetic resources, including *ex situ* collections and conservation in the gene bank.

Our efforts are directed towards to the recorded data:

geographic information - coordinates, altitude, slope

management - grassland (pastures, meadows); non agriculture sites

vegetation: - plant community, list of target species of grain legumes

Two habitats of *Pisum elatius* have been characterized in northern Bulgaria on the coast of the Black Sea: one on Kaliakra reserve represented by single plants and the other in Yailata, with scattered groups of plants.

Lens evroides and *Cicer monbretii* are studied in the region of Strandja Mountain, close to the villages of Kostin and Sinemoretz. These species are found as single plants only. They are not exposed to anthropogenic influence and are not endangered .

Lupinus graecus is located and described in the Eastern Rodope Mountains, near the town of Krumovgrad. The Forestry Department in this town maintains a collection of *L. graecus* for educational purposes .

On the basis of the gene pool concept the some number of wild relatives of grain legumes in the native flora of Bulgaria was estimated. The largest groups among them being genetic resources of *Vicia sativa* complex, *Lathyrus* sp. Rather limited genetic resources exists for other grain legumes. Conservation *in situ* preferably in protected areas, has priority within a conservation strategy for these resources. Including *ex situ* approaches where necessary and useful. Nature protection and gene banks have to work out joint programme to maintain and sustainability use such plant genetic resources. *Vicia* collection includes the biggest variability of species and of the origin table 2). They was introduced some accessions of *Vicia striata* and *V.amphycarpa* with very good plasticity. The forms of *V.incisa* and *V.villosa* was possessing very high cold resistance (fig.3).

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Problems :

regeneration, safety duplication and conflict of the interests with breeding institutes, botanical gardens and universities;

to find the criteria for long term conservation of breeding material and rare, endangered, endemic species

Future activities :

augmentation of the accessions quality evaluation, including European and National priority, importance of crops ;

collecting of old landraces of *Vicia faba* in the country, collecting wild relatives of *Pisum elatius*, *Vicia* sp., *Lathyrus* sp.

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