Agrobiodiversity in Bulgarian home gardens

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Abstract. The native plant resources are subject to taste preferences as part of the cultural heritage of each nation, as well as for their disease resistance, and for their greater flexibility and better adaptability to the conditions they have been traditionally grown, or are still grown in.. The main places where local species diversity may still be found *in vivo* are the home gardens. Bulgarian home gardens can be defined as micro systems with a high degree of plant species diversity of vegetables, grain legumes, fruit species, some medicinal and aromatic plants, vines, alfalfa, flowers, spices, etc. encountered in different combinations in various parts of the country. Maintenance and preservation in time of the old varieties and shapes are very closely linked to their traditional use, habits, dialects, sentiments, family celebrations, religious traditions and rituals.

Key words: Agrobiodiversity, expedition, home garden, maintenance, preservation

Introduction

Protection of old varieties, populations and forms created by selection by local people at national and regional level is important (Angelova, Stoilova, 2009).

Home gardens are part of the landscape of an area in which they are located. Modern landscape reflects interaction between the people and environment across the centuries. In recent years, the greatest diversity of old varieties and local forms has been found for faba beans, beans, spices and pumpkins (Krusteva & al. 2002, 2007).

The seeds are usually inherited within the families, or transmitted or received from neighbours, friends and colleagues from the same village or from adjacent locations at regional level. Some types of vegetables (tomatoes, peppers, watermelons, melons, onions, garlic, etc.) that are still grown have a more limited presence of varieties of Bulgarian origin. Very often imported varieties and hybrids are used, but still some varieties exist which have passed from hand to hand or were created by local people (Angelova 2002, Kalapchieva & Angelova 2010)

The purpose of this publication is to present a picture of the current state of the existing agrobiodiversity in the home gardens and to identify the opportunities for its preservation and conservation according to the Bulgarian traditions and taste preferences.

Material and methods

The research was carried out in two steps:

Step 1. Analysis of the information collected from publications, notes and implemented national and international projects in the period of 2000–2013.

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(Krasteva & al. 2007, Angelova & al. 2012). There were carried out specialized expeditions for observation, listing and collection of native plant resources: primitive varieties, forms and populations grown mainly in the home gardens and small farms in different regions of the country. A database created during this period includes location, producer, and type of material (FAO/IPGRI,2001).

Step 2. Target investigation by a voluntary team visiting places, districts and farms, where a large number of varieties and species of Bulgarian origin have been identified. Surveys and interviews with the listed local private farmers, small holders, farmers, agronomists, mayors, etc. were carried out. The generalized and systematized information on the traditional agricultural practices and local plant resources is now available.

Results and discussion

The Bulgarian home garden can be defined as a microsystem with a high degree of diversity of plant species: vegetable crops, fruits, grain beans, some medicinal and aromatic plants, vines, alfalfa, flowers, spices, etc. grown in different combinations in various parts of the country (Figs. 1, 2)

Maintenance and preservation in time of the old varieties and forms is very closely connected with their traditional use, habits, dialects, sentiments, family celebrations, religious ceremonies, both at regional and national level. These varieties are the core part of agrobiodiversity, indicating the interaction of environment and people for productive use. As an example, one could take beans. Numerous local and foreign varieties grown centuries ago by the Bulgarian gardeners are fully acclimatized and deeply intertwined with the Bulgarian tradition and customs. The local forms of Smilyanski, Raykin, Rogach, Mastilen, Bebridzha beans are distributed and still grown in home gardens in many areas of the country.

In this diversity of each culture, there are visible modern hybrids, direct and very old varieties, populations, as well as traditional local forms, inherited, maintained and transmitted in time. Most endangered are the old local forms, populations and species. On the other hand, the seed-supported local plant genetic resources (PGR) in the gardens can be defined as the most diverse phenotype of taste quality. They are specifically adapted to the conditions of the areas where they are grown. Very often they have low, but stable yield across the years.

Interweaving of agricultural heritage allows each village and district to leave their specific traits which are occasionally unique. The old forms often contain valuable quality characteristics, necessary for the process of selection for development of new farming systems and for creation of various agricultural products.

Planting of faba bean starts in early spring in the Danubian Plain, Strandzha-Sakar Mts and part of the Western Rhodopes and other regions. Specific cultures for early spring are also the green onion, lettuce, saltbush and dock, followed by beans and peas for green seeds. Lettuce and green peas are represented mainly by commercial varieties. There are still gardens with Cherna Gyumyurdzhinska old lettuce and the old variety of Ran 1 bean. In almost all areas with suitable climate the farmers plant tomatoes, peppers, cucumbers, seldom zucchini, squash, sweet corn and popcorn. A wide range of spices is typical of the Strandzha region, especially near the Black Sea town of Tsarevo, Rezovo.

Dill (fennel), lovage, fenugreek, basil, mint, and oregano are among them. The most popular spice – parsley – is grown entirely from seeds bought from the market, while the seeds of other spices are taken directly from nature. This tradition is kept to the present in some parts of the Rhodope Mountains and in Sliven region, especially the Samardala spice (*Nectaroscordum siculum ssp. bulgaricum*).

Most families involved in home garden growing do not mass-trade their produce. They grow mainly vegetables and edible crops for their own consumption and proffer them to guest houses for tourists, if there are such in the area.

The most common vegetables in home gardens and on the Bulgarian table are tomatoes and peppers. These two crops are basically grown in farms as medium-early produce, so the abundance of local and old varieties is the greatest. The local forms of tomatoes are the Big Pink, Big Red, Buffalo Heart and the old varieties Ideal, Trapezitsa, Milyana, Yana, Madara, Bella, which are carefully collected, stored and transmitted across the years. In spite of their diversity, imported and Bulgarian hybrids and direct varieties bought from the market are most numerous and often displace completely the other varieties.

Fig. 1. Home gardens in Bulgaria.

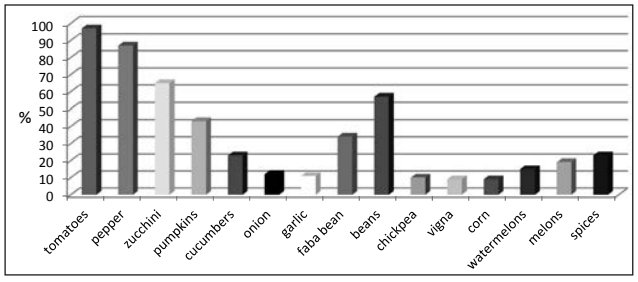

Fig. 2. Structure of crops in the home garden.

The local pepper varieties, created at the end of the 19th century as Kalinkov, Syvria, Gorogled, Dzhulyunska, White Briar, Goathorn, and Bulgarian Ratund in the beginning of the 20th century, are still existing and present in the life of Bulgarian people (Bachvarov 1986, Zhecheva 1958).

In large-scale farming ranging from 1 ha to 10 ha, usually commercial varieties of tomatoes, peppers, cabbage, and gherkins are planted, and taste is not always the main priority for production (Plovdiv, Pazardzhik, Haskovo). These productive varieties are fully covered in their early and late maturity. In single places, one can still find: tomatoes – Balkan, Maritza 25, Trapezitsa; pepper – Kurtovska Kapia; cabbage – Kiose (for late production); melon – Medena Rosa and Vidinski Koravtsi. A most preferred variety by the Bulgarian consumer is the Gergana cucumber, planted directly in many gardens without supporting constructions (Bachvarov 1986, Zhecheva 1958).

A revival of many old varieties of tomatoes and peppers, preferred because of their exceptional taste has been noticed in the typical local gardens in the last 2–3 years. A need for rapid implementation, lack of good storage and lower yields are the major obstacles for their introduction in the mass market.

Along with the cultivation of a wide range of varieties of native species, the farmers apply a lot of good care for their maintenance. They timely collected the seeds, dried and stored at a room temperature, usually in jars, which ensures good germination. Special care is applied to beans, in order to avoid their destruction by weevils. They are placed in sachets for a month in a refrigerating chamber. Thus stored, the seeds are used next year and are often exchanged with other farmers from the neighboring settlements.

In our survey, varieties of Bulgarian origin with the greatest diversity of culture have been identified in the following areas (Fig. 3):

1. Svishtov, Lyaskovets, Kilifarevo, Rezovo (spices), Byala Slatina, Tran, Kyustendil, etc.;
2. Plovdiv and Pazardzhik;
3. Western and Central Rhodopes, Panagyurishte, Troyan;
4. Sakar – Hlyabovo, Balgarin, Topolovgrad, Bolyarovo.

The answer to the question: "Why do some families grow old varieties and primitive forms, despite the advantages of the newly created?" – is ambiguous:

1. Respect for traditions in the family and sentimental feelings for the meals, prepared from these crops;
2. Taste qualities highly appreciated by the farmers;
3. Plant materials adapted to the environmental conditions: poor soil, high temperature amplitudes, water logging, and acidity;
4. A healthy diet kept by the family.

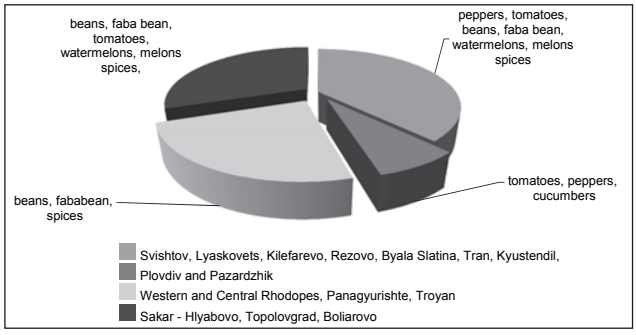

Fig. 3. Agrobiodiversity in different regions.

Conclusion

Our study has shown that RGP of Bulgarian origin are grown and maintained in different regions of Bulgaria. They are present more often in some places with limited farming or breeding areas for the specific forms not found elsewhere. Local RPG have greater plasticity, disease resistance and good adaptability to the conditions of their traditional growing.

Things necessary for the protection of traditionally grown local varieties and populations of different culture varieties are:

– Active participation of all stakeholders, especially the inclusion of students and young people at regional level – district, city district, etc.;

– Development of target projects and establishment of a network of partners and united teams;

– Documentation of all information and provision of regional repository of seeds;

– Searching for opportunities to restore the traditional varieties in districts where there is an interest in them.

References

Angelova, S. 2002. Maintenance, enrichment and preservation of grain collections in Bulgaria. – Report of a Working Group on Grain Legumes, Newsletter, IPGRI, Rome: 55-60.

Angelova, S. & Sabeva, M. 2008. Characterization of plant genetic resources of peas depending on the utilization, ecology and health. – Proc. 7th Scientific and Technical Conference with Int. Participation: 153-159.

Angelova, S. & Stoilova, T. 2009. Maintenance, enrichment and utilization of grain legume collections in Bulgaria. – Acta Horticulture, Proc. 4th Balkan Symposium on Vegetable and Potatoes, **2**: 695-700.

Angelova, S., Sabeva, M., Petrova, S. & Guteva, Y. 2012. Local Plant Genetic Resources of *Vicia faba:* tradition and heritage. Publ. by Plovdiv University, Smolyan Dept., v. III: 242-247 (in Bulgarian).

Bachvarov, S. 1986. Bulgarian Gardening. Historical Notes, Zemizdat. (in Bulgarian).

FAO/IPGRI. 2001. Multi-Crop Passport Descriptors [MCPD]. www.ecpgr.cgiar.org/fileadmin/templates/.../EURISCO_ Descriptors.pdf

Kalapchieva, S. & Angelova, S. 2010. Evaluation of local and introduced pea cultivars. – Journal for the Improvement of Animal Husbandry, Biotechnology in Animal Husbandry, **26** (spec. issue): 135-141.

Krasteva, L., Angelova, S., Guteva, Y. & Angelova, K. 2007. Management and sustainable use of plant genetic resources. – International Scientific Conference "Plant gene pool – the basis of modern agriculture", Sadovo, I: 43-48 (in Bulgarian).

Krasteva, L., Sevov, V., Kicheva, P., Shamov, D., Sabeva, M., Neykov, S., Popova, Z. & Lozanov, I. 2002. The local genetic resources in Bulgaria – on farm storage. – In: Jubilee session "120 Years of Agricultural Science in Sadovo", I: 57-63 (in Bulgarian).

Zhecheva, G. 1958. Breeding and seed production of vegetable crops. Zemizdat (in Bulgarian).