ORIGINAL PAPERS

CONSERVATION AND SUSTAINABLE USE OF ALBANIAN INDIGENOUS LEGUMES

Faslia Ndoc, Jani Sokrat, Canko Agim, Hyso Milto

Key words: *exploration, collecting, conservation, indigenous legumes, genetic erosion.*

INTRODUCTION

Albania is well-known for its diverse environment (a wide range of climates, soils and altitude zones) and for high variability in cultivated plants. During the long history of Albanian agriculture, local farmers carefully selected plants and seeds for planting and developed numerous farmer-selected varieties, which are well-adapted to local conditions. So, it is a country with a wide diversity of plant genetic resources. There are a lot of primitive cultivars and indigenous landraces, and wild species as well, especially of legume plants. Primitive cultivars and indigenous landraces are cultivated especially in farmers' orchards, even in the most remote rural villages (Faslia et al 2007).

Since 1963, the collecting, evaluation and conservation of legume crops has been organized by the Agricultural Research Institute (ARI) of Lushnja, with a clear plan to select and produce the commercial seeds for daily needs of agricultural cooperatives. Until the end of '80s of last century 180 accessions of dry beans *(Phaseolus vulgaris* L.*)* were collected, 53 of them are landraces and old cultivars. During 1990-2000 another project has been accomplished, where several collecting missions took place, especially in the south-eastern regions of the country (Hyso and Canko, 2001; Canko et al, 2006; Jani and Canko, 2010). After this period collecting missions have been reduced, due to lack of financial funds.

The process of agricultural diversity reduction, which was observed globally in the end of 20-th century, affected Albanian agriculture severely. This phenomenon has not only reduced the plant diversity, but also the level of utilization of the indigenous crops.

In order to give our modest contribution to the preserving of indigenous populations of legume plants, an exploration and collecting mission was conducted in the County Berat.

Main causes of agro biodiversity loss in Albania

The Albanian agricultural sector was developed during the communist period, in the form of state and collective farms. This specialization had a negative impact on indigenous crop varieties. In a period of 40 years, introduced varieties predominated in these farms while endemic, rare and threatened varieties were restricted mainly to family plots and agricultural research centers. Consequently, information about local varieties became restricted to the technical staff of research centers and the few families that kept indigenous crop varieties (Canko et al, 2010).

The process of agro-biodiversity loss became more intensive after the collapse of the communist state, with the beginning of democratic processes, in the '90s, because a lot of people started to leave their native land in rural zones and settled in new places, especially in urban zones, in order to have better possibilities of life. This movement of rural people was more emphatic in the mountain zones. The Central Albanian zone, which is distinguished for legume plants variations, was also part of this movement. It was consequently associated with the loss of possibility to cultivate landraces of legume plants in the future (Jani et al 2010).

MATERIAL AND METHODS

Based on this situation during 2011-2012 years the exploration and collecting missions of legume plant in the Central Albania were organized. In order to complete this project, a working plan was designed, and exploration and collecting missions were undertaken for legume plants such as common bean *(Phaseolus vulgaris),* lentil *(Lens culinaris),* chickpea *(Cicer arietinum),* etc.

All this process has been conducted by project staff and ATTC, with the cooperation of the Agricultural Regional Services. Guidelines were followed referring to these main fields: consulting and gathering of the information about the villages where we could be able to get the best variation of legume plants; exploration and collection through missions in the field; characterization and evaluation of the collected populations based on the minimum descriptors list; recording the local information about species growing and traditional knowledge for the production practices and traditional utilization by interviewing farmers, and other persons. Seed

samples were only collected when farmers declared their materials have been cultivated for ages in their families without exchanging seed or buying it on the market (Negri, 2009).

The principal method was the gathering of bulk samples from many plants (at least 50 of them, if possible). Seeds were collected from as many mature plants as possible, and information on site habitat, plant morphology, and phenology recorded. Digital photographs were taken at all sites.

All sites were located using GPS. Ecological conditions were noted, together with geographical data, and then recorded into the collection database.

Seeds were processed and inventoried by personnel at the Albanian Gen Bank, and information was sent for entered into the National Plant Germplasm System.

RESULTS AND DISCUSSION

The project has achieved some considerable successes. Notably, important landraces have been identified, collected, and morphologically characterized and demonstration plot has been established. In the end of this project 27 samples of common bean altogether were collected; 24 of them in the Skrapar district, two in Berat district and the last one in Lushnja district (Fig 1). There were also found 2 samples of vetchlings (*Lathyrus* spp.) and one sample of chickpea *(Cicer arietinum)*. So, the total number of collected samples is 30. All of the 24 samples (common bean landraces) that were collected in the Skrapar district were obtained from 9 villages. Ten samples were taken only in the Liqeth village (Table 1).

The conservation of all the collected populations is interesting for the future because of their special characteristics, displaying a good variation among them. Now we can demonstrate the variation of the seed (kernel) descriptors, especially for their shape, size, color and type of seed coat. We realized that people of the mountain zones prefer colored common bean. So, from the 24 populations of collected common bean, only 9 of them have white seed (37.5 %). The biggest part populations (26 of which) of common bean are used as dry seed (kernel) and only one of them is used as fresh pod. According to the method of growing, 16 populations needed to be support by the stick (they are climbing plant type) and 11 populations are cultivated without it (bush type).

All the samples of the legume populations collected and their field information were deposited and landraces seed are preserved at the Albanian Gen Bank. In addition, seeds maintained in collections will be regularly renewed on the seed's multiplication plot.

The use of landraces with their ability to produce good harvests without need for expensive chemical inputs, and their tolerance to drought, plant pests and diseases has significantly reduced the farmers' exposure to risk. Investment is low and the crops ideally suit to the growing conditions. Most of the farmers use local varieties for their own consumption (Jani and Miho, 2008; Canko et al, 2010). The reintroduction of the landraces has also improved the nutritional intake of farmers with the addition of a greater range of pulses. Local farmers appear to prefer the landraces for their subsistence needs. Although yields are lower for the landraces, they attract a higher price.

The project collected and documented the traditional knowledge on the uses of indigenous crops. A recipe book is published and widely distributed to raise consumer awareness. In addition, dishes prepared from local varieties have been promoted through food tasting events and media. As a result, demand for indigenous varieties is increasing at the local market.

CONCLUSIONS

As mentioned above, the project did not imply the protection of the entire spectrum of plants important to agriculture that are threatened by extinction. Otherwise, the project approach was the development of a replicable model of agricultural biodiversity protection for a group of the selected local varieties (legumes) in one region of Albania, which could be used as a strategy in other regions or for other crops.

Two years of project implementation have shown that the sustainable use of plant biodiversity requires community-driven in situ and on-farm initiatives supported through knowledge dissemination, marketing efforts, publicity, and cooperation with research and governmental structures. The approaches and instruments developed by the project will be tested in other regions of Albania.

ABSTRACT

The diversity of indigenous legumes in Albania is being seriously eroded as a result of the multiplicity of environmental, political and socio-economic factors. This paper discusses the developments related to the identification, collection, evaluation and preservation of indigenous forms of leguminous crops (common beans, chickpea and *Lathyrus* spp.) that are threatened by extinction in the Central Albania; as well as the traditional knowledge on the production and their use for own consumption of the farmers in villages. The paper also suggests that the sustainable use of plant biodiversity requires community-driven in situ and on-farm initiatives supported through knowledge dissemination, marketing efforts, publicity, and cooperation with research and governmental structures.

REFERENCES

1. CANKO A., JANI S., and HYSO M., 2010 - Evaluation of some growth characters in common bean (*Phaseolus vulgaris* L.). Scientific Studies and Researches-Biology. 18: 70-75;
2. CANKO A., CELAMI A., KASHTA F., GJONDEDA F., 2006 - Koleksionimi dhe studimi i germoplazmes autoktone të fasules [Collecting, characterization and evaluation of autochthon accessions on common bean]. Buletini i Shkencave Bujqësore 1: 17-22;
3. FASLIA N., CANKO A., JANI S., and MIHO L., 2007 - Current status of the national grain legumes collection in Albania. *Fourth meeting of the ECPGR Grain Legumes Working Group, Lisbon, Portugal Republic, on November 16-17, 2007*;
4. HYSO M. and CANKO A. 2001 - Koleksionimi dhe studimi i popullatave të fasules. Studime Biologjike 5-6: 370-373;
5. JANI S., and CANKO A., 2010 - Review on genetic resources of grain legumes in Albania. Field and Vegetable Crops Research-Buletin. 47(2): 617- 622;
6. JANI S., and MIHO L., 2008 - The autochthon french bean cultivation technology. *National Workshop on technology transfer of techniques related to the use of Plant Genetic Resources for Food and Agriculture (PGRFA). Tirana, on November 13-14, 2008*;
7. NEGRI V., 2009 - Fagiolina (*Vigna unguiculata* subsp. *Unguiculata* (L.) Walp.) from Trasimeno Lake (Umbria Region, Italy). European landraces: on-farm conservation, management and use. *Bioversity Technical Bulletin* No 15: 177-183.

AUTHORS' ADDRESS

NDOC FASLIA - National coordinator of ECPGR, Tirana, Albania;

SOKRAT JANI - Agricultural Technologies Transfer Center (ATTC), Lushnja, Albania, e-mail: socratjani@yahoo.com;

AGIM CANKO - Agricultural Technologies Transfer Center (ATTC), Fushe Kruja, Albania;

MILTO HYSO - Independent expert on plant genetic resources, Tirana, Albania.

Table 1. District and villages and bean landraces collected

District	Villages	Nr landraces collected	Dry bean or fresh pod		Plant type	
			Dry bean	Fresh	Climbing	Bush
Berat	Lapardha	2	2	-	1	1
Skrapar	Gjerbes	5	5	-	4	1
	Gjergjove	1	1	-	-	1
	Kovacanj	1	1	-	-	1
	Liqeth	10	9	1	7	3
	Luadh	1	1	-	-	1
	Nishove	1	1	-	-	1
	Potom	2	2	-	2	-
	Strore	2	2	-	2	-
	Trebel	1	1	-	-	1
Lushnje	Hajdaraj	1	1	-	-	1
3	11	27	26	1	16	11

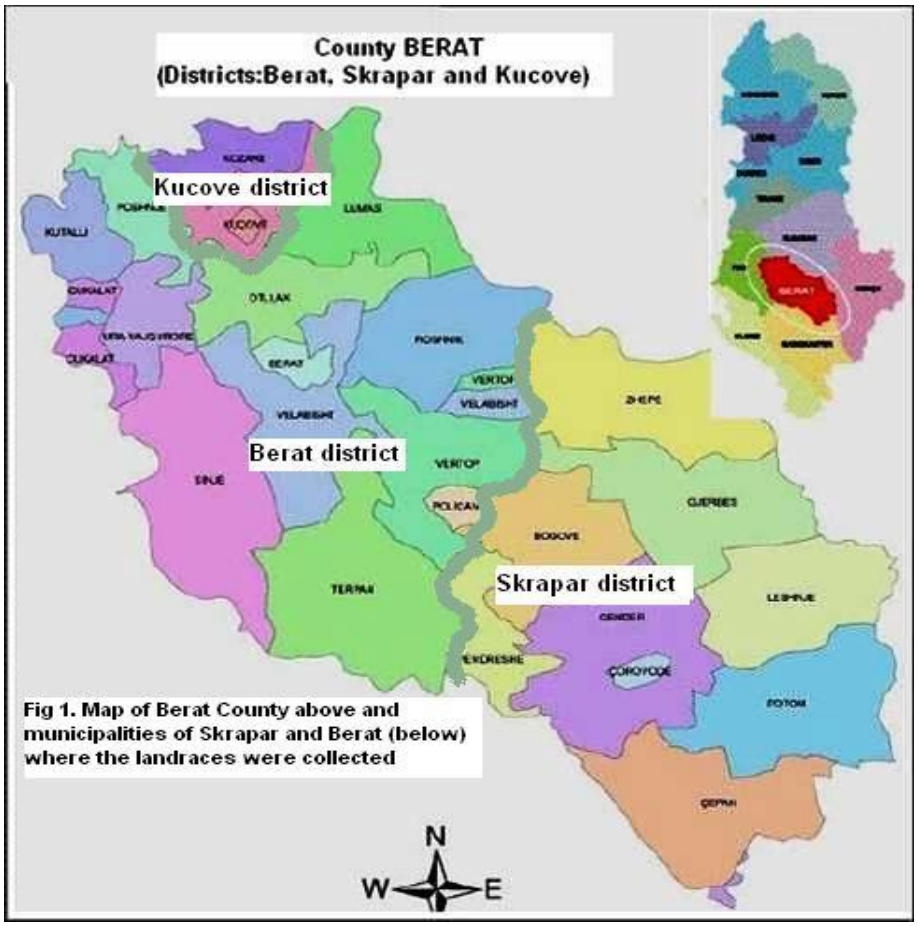

Fig 1. Map of Berat County above and municipalities of Skrapar and Berat (below) where the landraces were collected

Fig. 1. County Berat and municipalities of Skrapar and Berat

Fig. 2. Exploration visit in a family plot, Potom, Skrapar

Fig. 3.Collecting mission gathering and recording the local information by the interview of farmers

Fig. 4. Preparing of bean populations for preservation (ATTC-Lushnja, Albania)

Fig 5. Fresh pod bean of Liqeth (Skrapar)

Fig 6. Common bean for dry kernel of Liqeth (Skrapar)

Fig 6. An other Common bean for dry kernel of Liqeth (Skrapar)

Fig 7. Common bean for dry kernel of Stror (Skrapar)

Fig 8. Common bean for dry kernel of Kovacan - Zhepe (Skrapar)

Fig 9. Common bean for dry kernel of Nishov - Polican (Skrapar)