

PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE: THE FAGIO.LO PROJECT

GHIDOLI M.*, GIUPPONI L.**, LEONI V.**, PEDRALI D.**, ZUCCOLO M.**,
BERTAGNON G.*, BORGONOVİ S. M.***, COLOMBO F.*, SANGIORGIO S.*, GIORGI
A.**, SCARAFONI A.***, PILU R.*

*) Department of Agricultural and Environmental Sciences - Production,
Landscape, Agroenergy, University of Milano, Via Celoria 2, 20133 Milan,
Italy

**) Centre of Applied Studies for the Sustainable Management and Protection
of Mountain Areas-CRC Ge.S.Di.Mont., University of Milan, Via Morino 8,
25048 Edolo, Italy

***) Department of Food, Environmental and Nutritional Sciences (DeFENS),
University of Milan, Via Celoria 2, 20133 Milan, Italy

bean, PGRFA, genetic analyses, mountain environment

Biodiversity conservation is one of the most debated issues in recent years from the local to the global level. The loss of biodiversity does not only concern wild species but also species, varieties and races of agricultural and food interest (agrobiodiversity), which have been subjected to processes of domestication and selection since the birth of agriculture.

This loss affects the food and traditions that identify the territories, where the added value in terms of economic and historical-cultural wealth is decreasing more and more.

Bean (*Phaseolus spp.*) is one of the most cultivated legumes for direct human consumption, due to the protein content (about 20%), starch with a low glycemic index (about 38%), B vitamins, molecules with antioxidant power, minerals, lipids (about 3%, mainly made up of polyunsaturated fatty acids). However, some varieties have a non-negligible content of anti-nutritional factors (phytates, inhibitors of digestive enzymes and hemagglutinins) which are reduced by pre-cooking treatments (such as soaking in water) and cooking.

Beans are traditionally consumed as a source of protein instead of meat in countries in poorer rural and marginal areas. The bean has been for centuries one of the fundamental foods of the peasant world, including that of the Lombardy region (Northern Italy). With the industrial development, the consumption of beans has undergone a contraction. The demand for legumes has varied due to the change in food styles, the smaller number of small-sized farms (those traditionally dedicated to these productions) and the overall decrease in land for crops. Nowadays, there has been a renewed interest in beans from consumers residing in Northern Italy. It was mainly the local and traditional varieties (landraces) that attracted the attention of consumers.

In this work, 30 different bean landraces cultivated in some mountain areas of Lombardy were collected and studied for promotion and conservation of plant biodiversity on the farm as it is aimed at the study and enhancement of little or no-known bean cultivars (not present on the market) now grown/preserved by a few farmers, therefore a risk of extinction.

An initial molecular characterization was made on the landraces using molecular markers (SSRs) to assess the genetic structure.

The different genotypes were evaluated and compared in open field under study using quality parameters for DUS examination (CPVO Technical Protocols).

Furthermore, the seed quality of all accessions has been investigated by using biochemical, chemical and enzymatic methodologies.

Merging the genetic, agronomic and biochemical data we selected the best varieties for further investigations.

This study will contribute to the research, characterization, promotion and conservation of PGRFA (Plant Genetic Resources for Food and Agriculture).