

ANALYSIS OF THE CONTRIBUTION OF MESOAMERICAN AND ANDEAN GENE POOLS TO EUROPEAN COMMON BEAN (*PHASEOLUS VULGARIS* L.) GERMPLASM

G. LOGOZZO*, R. DONNOLI**, M. DILUCA**, R. PAPA***, P. SPAGNOLETTI ZEULI**

*) Centro Interdipartimentale per la Salvaguardia delle Risorse Genetiche Vegetali, Università degli Studi della Basilicata, Viale dell'Ateneo Lucano 10, 85100 Potenza, Italy - logozzo@unibas.it

**) Dipartimento di Biologia, Difesa e Biotecnologie Agro-Forestali, Università degli Studi della Basilicata, Viale dell'Ateneo Lucano 10, 85100 Potenza, Italy - spagnoletti@unibas.it

***) Dipartimento di Scienze degli Alimenti, Facoltà di Agraria, Università Politecnica delle Marche, Via Breccie Bianche, I-60131 Ancona, Italy - r.papa@univpm.it

Phaseolus vulgaris, phaseolin, European gene pool, genetic resources, SDS-PAGE

The genus *Phaseolus* has contributed crop plants to agriculture in both the New and the Old Worlds. *Phaseolus* beans are valued grain legumes or pulse crops in many tropical countries usually consumed as dry beans whereas, in temperate countries, varieties for fresh pod consumption and for processing as frozen vegetables have also been developed. Archaeo-morphological, biochemical and molecular evidence suggest that common bean (*Phaseolus vulgaris* L.) was independently domesticated in Andean and Mesoamerican centres of origin. As showed by a consisted set of observations based on morphology, hybrid inviability, biochemical and molecular markers domestication occurred independently in Mesoamerica and the Andes leading to two different domesticated gene pools. Compared to the Mesoamerican gene pool the Andean gene pool is characterized by larger seeds and by two major phaseolin types ('T' and 'C') while the 'S' type is the prevalent one in Mesoamerica. Due to adaptation to new ecological and man-made conditions, a large diversity evolved in European germplasm that is a particular interest for plant breeding. Because of the distinct evolutionary histories, genetic differences are expected to be larger between accessions that originated from the two different American gene pools.

In this study, the distribution of Andean and Mesoamerican gene pools within European germplasm collection (n=544) has been studied, including for the first time accessions from almost all European countries (n=24), on the base of phaseolin electrophoretic (SDS-PAGE) patterns and seven seed characters (three quantitative and four qualitative).

Results showed that the Andean phaseolin types 'T' (45.6%) and 'C' (30.7%) prevailed on the Mesoamerican 'S' (23.7%), and accessions with cuboid seed shape (34.9%), maroon seed coat darker colour (44.3%), uniform seed colour (69.6%) were the most frequent. European accessions with phaseoline 'S' showed on average significantly larger seed size compared to those from America in the same phaseolin class while those presenting 'T' and 'C' phaseoline did not. This suggests that, during crop expansion in Europe, sampling or selection favoured the large seeds races within the Mesoamerican 'S' gene pool or, possibly, introgression from Andean germplasm did occur.