

## ITALIAN MAIZE GERMPLASM ENRICHMENT AND INNOVATION THROUGH ITALY – BOLIVIA COOPERATION PROJECT AND EVA EUROPEAN MAIZE NETWORK

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Italy is characterized by many different climatic and orographic environments, which produced a wide set of maize landraces, showing flint or semi-flint kernels, a higher flour yield and being particularly adapted to food production. Italian maize germplasm is one of the largest in Europe for original inputs and differentiation of local forms.

The Genebank of the CREA Research Centre for Cereal and Industrial Crops in Bergamo (Italy) contains the largest Italian maize collection: more than 5700 accessions are maintained ex-situ at 7°C and periodically regenerated in field trials by nursery (controlled pollinations).

In the framework of the different national and international research programs, CREA is involved in the conservation, use and valorisation of maize genetic resources from Italy and other countries.

The cooperative Project between Italy and Bolivia “P.S.G.O. Bolivia km 0” Piccoli Semi Grandi Opportunità – agro ecologia campesina familiare e filiere a km 0 in Bolivia”, funded by the Italian Agency for Cooperation and Development AID 011.457 (2018-2021), offered the opportunity to develop innovative maize pigmented genotypes. Some Italian maize local varieties stored at the CREA Genebank (Bergamo) were crossed with germplasm of Bolivian type “Morado” and Mexico type ‘Azul’ at CREA Experimental Farm, Bergamo (45°68’N;9°64’E) and selected during cycles from 2015 to 2021. The materials derived from field trials were manually harvested at the end of each season, ears were dried at 40°C for 7 days up to 14 % relative humidity; then were shelled and kernels stored at 4°C until research

analyses. Two pigmented landraces, violet and blue, rich in anthocyanins and functional molecules with antioxidant properties were already described (Suriano et al., 2021). About 50 g of each sample were ground and analyzed in duplicate by Near Infrared Spectroscopy in the range 680 – 2,600 nm. Proximate composition (protein, lipid, starch, fiber, ash) were determined as % d.m. A set of new Italian maize pigmented genotypes developed in this research will be presented and described; the materials enriched in bioactive compounds represent genetic resources suitable to be introduced into advanced breeding programs aimed to enhance and valorize maize biodiversity potential.

CREA Bergamo is also involved in EVA European maize –network (2020-2023) that involves Research Centers, Genebanks, and Seed Companies with the aim of exchange, genotype and evaluate about 500 accessions (principally landraces) in 20 experimental sites. Phenotyping data will be stored in EURISCO database. The exchange of materials and data allows to enrich genetic resources available for breeding programs in every country involved. Samples received by CREA, were analyzed with NIR spectroscopy to determinate chemical composition of grain.

Suriano S. et. al 2021, LWT 144: 111257.

<https://www.ecpgr.cgiar.org/european-evaluation-network-eva>