

## MOLECULAR CHARACTERIZATION OF ITALIAN OLIVE CULTIVARS BY MICROSATELLITE MARKERS

I. MUZZALUPO, N. LOMBARDO, A. SALIMONTI, M. PELLEGRINO, E. PERRI

C.R.A. - Istituto Sperimentale per l'Olivicoltura, C.da Li Rocchi, I-87036 Rende (CS), Italy

*Olea europaea*, DNA, molecular markers, SSR, genetic diversity

Olive (*Olea europaea* L.) is a very important oil-producing crop in the Mediterranean area. Despite the long cultivation history and the great social-economic interest of the olive tree, its germplasm is today poorly characterized on the whole. Indeed, elaiographical and biometrical studies are surprisingly insufficient to well address its management and preservation. In addition, reliable molecular standardized methods in order to elucidate the potential occurrence of homonyms (one denomination for several genotypes) or synonyms (one genotype with several denominations) are needed to eliminate ambiguities in variety identification.

Genetic diversity studies using microsatellite analysis were carried out in a set of 100 Italian olive (*Olea europaea* L.) cultivars (14 cvs from Abruzzo region, 9 cvs from Basilicata, 7 cvs from Calabria, 2 cvs from Campania, 4 cvs from Lazio, 1 cv from Liguria, 12 cvs from Molise, 12 cvs from Apulia, 29 cvs from Sicilia and 10 cvs from Toscana region). Samples of olive leaves were harvested from plants growing in the olive germplasm collection of the *Consiglio per la Ricerca e Sperimentazione in Agricoltura (C.R.A.) – Istituto Sperimentale per l'Olivicoltura (ISOL)* of Rende (CS), Italy.

All microsatellites were polymorphic. A total of 52 alleles over nine loci were observed, ranging from 2.0 at UDO01 to 11.0 alleles at UDO39, with a mean of 5.8 alleles per locus. The expected heterozygosity ranged from 0.39 at UDO01 to 0.79 at UDO39 and the discrimination power varied from 0.40 at UDO01 to 0.89 GAPU103A.

The results of alleles identification were then used to create a qualitative data matrix of presence (1) and absence (0) that was processed using NTSYS-PC software. Pairwise similarities between cultivars were calculated using Dice coefficient for qualitative data. The resulting similarity matrix was used to construct a dendrogram by means of the UPGMA (unweighted pair-group method with arithmetical averages) algorithm.

The following three presumable synonyms were detected: 1- 'Filare' and 'Grossa di Venafro', 2- 'Giarraffa' and 'Pizzo di Corvo' 3- 'Frantoio' and 'Ogliarola barese'. Therefore, synonyms characterisation is very important to avoid genotype redundancy in order to maximise genetic diversity in Italian olive germplasm collection.

This study showed that the use of molecular markers like SSRs is very useful to build a data base available for variety analysis and for olive germplasm collection management.

*Acknowledgments.* This research was supported by Forestry and Agricultural Policy Ministry of Italy, C.R.A. as Ordinary research and Project RIOM 'Ricerca ed Innovazione per l'Olivicoltura Meridionale'.