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GENETIC DIVERSITY OF ALMOND CULTIVARS AND CHARACTERIZATION OF SELF-INCOMPATIBILITY ALLELES

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In Sardinia there is a considerable number of local varieties of almond *(Prunus amygdalus)*. A collection of 43 varieties has been recently characterized both by phenotypic traits and SSR markers. The opportunity to know the genetic diversity of cultivars and different populations may be essential in breeding programs, germplasm management and to optimize the biodiversity valorization.

The Sardinian collection was compared to another collection of genotypes sampled in Southern Italy, mostly from Apulia, and to some international commercial varieties.

Moreover we started to study the self incompatibility (SI) of Sardinian cultivars, in order to enrich their characterization. Cross incompatibility (a well known phenomenon in almond) imposes severe difficulties on commercial production. Until now, 31 SI RNase alleles have been identified in almond.

The 11 SSR markers produced a mean number of 14.5, 11.9, 5.6 alleles per locus for Sardinian, Southern Italy and commercial varieties respectively. Mean expected Heterozygosity (*He,* Nei's, 1973) was 0.86, 0.81 and 0.67 for Sardinian, Southern Italy and commercial varieties respectively. The genetic structure of the populations was studied both by model and distance based approaches. Genetic distance analysis (TREECON) almost coincided with model based analysis (STRUCTURE). Sardinian group, Southern Italy group and commercial cultivars were clearly distinguished, although some exchange occurred: Truoito B and Pititcchedda (Sardinia) resulted closer to the commercial group, whereas Pizzuta d'Avola (Southern Italy) and Picantili (commercial) resulted closer to Sardinian group.

As to self incompatibility, we carried out both the amplification of Sardinian cultivar S-genotypes with allele-specific primers (Tamura M. et al., 2000) and the set up of techniques to amplify the 1st and 2nd intron regions of S-RNase gene, using degenerate primers (Halasz J. et al., 2008). Sequence analysis of amplicons is in progress, and preliminary results are discussed.