

Pistacia Germplasm Collection of the National Fruit Germplasm Centre(NFGC) management through microsatellite markers.

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The CREA- Research center for Olive, Fruit and Citrus Crops in Rome hosts the National Fruit Germplasm Centre (NFGC) that maintains, the largest Italian fruit germplasm collection composed of more than 5.000 accessions belonging to 40 different fruit species and their wild relatives. The *Pistacia* genus, belonging to the Anacardiaceae family, consists of at least eleven species with dioecious plants (Zohary, 1952). Among *Pistacia*, only *P. vera* L. has commercial importance for its edible nuts, while the other species are mainly used as rootstocks (*P. integerrima*, *P. mutica*, *P. terebinthus* and *P. atlantica*) or as pollinators (*P. terebinthus*). The NFGC *Pistacia* collection was established in the 2006 and it is composed of 120 accessions, 24 belonging to *P. vera*, 13 accessions to *P. integerrima* and four to *P. terebinthus*. The aim of the present work is to evaluate the genetic diversity within the collection and to identify and resolve synonymies and homonymies.

A set of 26 polymorphic EST-SSR markers, transferable between different *Pistacia* species, was selected and used for the molecular characterization of genotypes from *Pistacia vera* and related species among which *P. atlantica*, *P. integerrima*, *P. terebinthus* and interspecific hybrids. This set of markers allowed to clearly genetically distinguish all the accessions of the *Pistacia* collection and to identify putative errors in plant labeling or occurred during the propagation of the material. These events are physiological in germplasm collections, .

Molecular analyses allowed to determine the genetic structure of the collection, resulting in 3 separated subpopulations: the first includes most of the non-Italian accessions, while the remaining two comprise the traditional Italian cultivars and two modern varieties which are known to be related to Bronte accessions. The male genotypes are dispersed in all three populations.

The phylogenetic tree grouped the accessions based on their geographic origin, highlighting sampling or labeling errors, as in the case of cv Rashti which, despite being of Iranian origin, grouped with the Italian material. The genotype with the higher diversity index is Chico, an interspecific hybrid between *P. vera* and? and for that expected to be more variable. The results obtained also allow to infer the identity of some unknown samples, in particular one of the males clusters with the M-502 accessions, while the unknown females cluster respectively with cv Tignusa and cv Insolia.

Concerning the genotypes used as rootstocks present in the collection (*P. terebinthus* and *P. Integerrima*), they are clearly distinguished from the *Pistacia vera* genotypes as they are characterized by unique alleles, Thus enabling the distinction of the different species belonging to the *Pistacia* genus even for those samples that are not phenological and morphological evaluable.

The marker set and associated protocols will be a valid tool for future breeding programs and for varietal certification for the *Pistacia* genus