

## **MORPHOLOGICAL, GENETIC AND METABOLIC CHARACTERIZATION OF THE POMELLA GENOVESE (MALUS DOMESTICA BORKH.) AN ANCIENT APPLE VARIETY OF THE OLTREPÒ PAVESE**

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*Pomella genovese, agrobiodiversity, genetic characterisation, metabolic characterisation, in situ and ex situ conservation*

Pomella genovese is an old apple variety cultivated for centuries in the Staffora Valley in the Oltrepò Pavese (Lombardy) as proved by historical documents.

The fruit is medium-small (114 g on average), flattened (H/D ratio = 0,79) and very resistant to handling. The skin colour is yellow-green with an intense red overcolour on 10-50% of the surface, smooth with inconspicuous lenticels, frequent and medium-extensive is the peri-peduncular rustiness. The flesh is firm, crunchy, with a well-balanced sweet-acid taste, quite aromatic and of good taste. At harvesting, the fruit has an average flesh firmness of 9 kg, 12.7 °Brix of soluble sugars and 12.7 g/l of titratable acidity. After 4 months of cold storage in Normal Atmosphere, these parameters show values of 6.7 kg for firmness of pulp, 13 °Brix for soluble sugars and 1.23 g/l for titratable acidity. In addition, the content of total polyphenols averaged 101.5 mg GAE/100g p.f. at harvest and 99.2 mg GAE/100g p.f. after cold storage. When compared in the same environment with Golden delicious fruits, Pomella genovese fruits tend to have a higher content of total polyphenols, both at harvest and after storage.

One of the interesting agronomic characteristics of the variety is its resistance to scab requiring few phytosanitary treatments.

Pomella genovese is still grown in situ on farms and maintained ex situ in germplasm collections throughout the region.

Surveys carried out both in the region and in the collections have made it possible to recover 53 Pomella geneovese accessions and 14 accessions of the Rustajo variety (considered synonymous of Pomella genovese).

In order to analyse the identity of the recovered accessions and clarify the synonymy with Rustajo, each accession was characterised at a genetic level using 13 SSR markers.

Analysis of the profiles showed that not all the samples analysed had the same genetic profile. Within the samples, 47 out of 67 presented an identical genetic profile with all the SSR markers used and they were considered the reference for Pomella genovese. Genetic analysis shows that the Pomella has a triploid genetic constitution, this triploidy situation is confirmed by other studies. Some samples called Rustajo showed identical genetic profiles to Pomella genovese, confirming the synonymy between the two varieties.

It is important to emphasise that the different profiles found are not necessarily associated with the two different names (Pomella and Rustajo) and may be a consequence of clonal variations, cases of homonymy or incorrect varietal attribution.

Finally, some samples of Pomella genovese were selected for metabolic analysis. Analyses were carried out on samples from two farms at different altitudes, and on the fresh and stored product, showing that the metabolic profile changes with: the growing environment, as it differs between farms, and the state of storage, as it differs between fresh and stored product.