

Developmental and genetic mechanisms underlying seedlessness in grapevine somatic variants

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Abstract

Seedless table grapes are greatly appreciated for fresh and dry consumption. There is also some interest in seedless winegrapes, because the combination of lower fruit set, smaller berries with higher skin/pulp ratio and looser bunches with the absence of seeds in crushed berries, a possible source of astringent tannins, might also have favorable effects on wine quality.

The gene *VviAGL11* has been shown to play a central role in stenospemocarpy in Sultanina, but the molecular bases of other sources of stenospemocarpy as well as of parthenocarpy have not been clarified yet. To help fill this gap, a genetic and phenotypic characterization of seedless somatic variants from other cultivars has been undertaken, with special emphasis on a parthenocarpic Sangiovese mutant known as Corinto Nero.

In vitro pollen germination tests, *in vivo* pollination trials, histological observation of female gametophyte development, and genetic analysis of seedlings have shown that Corinto Nero is incapable of forming seeds probably due to meiotic anomalies.

In addition to a pairwise transcriptomic comparison between the mutant and the seeded wild-type, we present here a comparative genomic analysis between Corinto Nero and 10 seeded clones of Sangiovese based on short-read resequencing to identify sequence and structural variation that may reveal candidate genes for parthenocarpy in Corinto Nero.

Keywords: somatic variation, clones, seedlessness, reproductive development, genomic structural variation.