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ABSTRACTS BOOK

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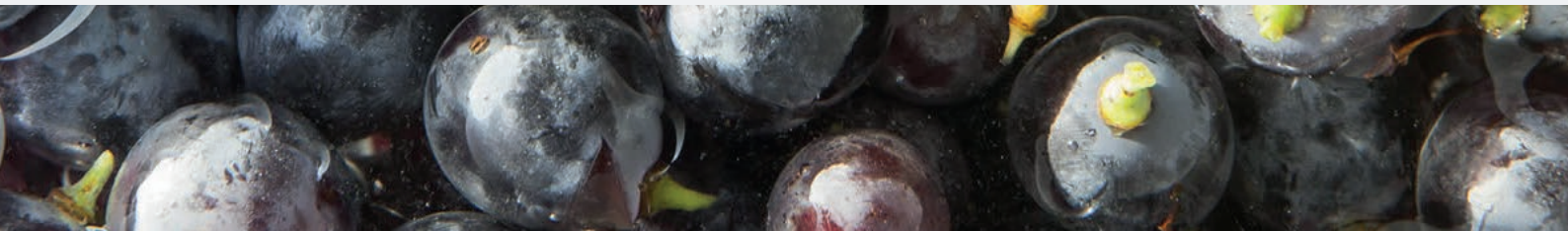

Genetic and phenotypic characterization of grapevine natural variants for seed and fruit development

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Parthenocarpy and stenospermocarpy have been described as the two main mechanisms involved in the formation of seedless berries in *Vitis vinifera* L. Fruit development is usually induced by ovule fertilization, which triggers the growth and differentiation of the ovary and seed development synchronously[(1,2)]. In parthenocarpic conditions the ovary develops in the absence of fertilization yielding small berries that completely lack seeds, while in stenospermocarpy seed development aborts at an early stage after fertilization. Most cultivated seedless grapes exhibit the Sultanina-derived stenospermocarpy, which was recently associated to a missense mutation in *VvAGL11* gene[(3)], whereas other different sources of seedlessness have been less investigated[(4-6)]. Fruit set in the absence of fertilization ensures a good yield in unfavorable environmental conditions and in sterile genotypes, reasons why seedlessness is a key objective in genetic improvement programs of crops.

Our study focuses on several somatic variants for seed content discovered within grapevine germplasm collections and identified by SSR and SNP genotyping. Aiming to provide new insights into the mechanisms underlying seed and fruit development we evaluated fruit and seed set in open-pollinated, self-pollinated and emasculated conditions. The analysis of the ploidy level of seedlings obtained from occasional seeds of a seedless mutant and the microscopic observation of the gametophytes suggest the formation of unreduced gametes along with non-functional pollen grains and aberrant development of the embryo sac. RNA-Seq-based variant calling applied to the transcriptomic comparison of Sangiovese/Corinto Nero[(7)] allowed the identification of SNPs that were further confirmed in five cases. These polymorphisms may be applied for clone identification and are functional candidates for the seedless phenotype.

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