



**ICGBG**

XII International Conference on  
GRAPEVINE BREEDING and GENETICS

July 15-20, 2018  
Bordeaux FRANCE

**ABSTRACT BOOK**  
**GBG 2018 – Bordeaux, France**  
**15 – 20 July**



## Genetic variation for grapevine reproductive development

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Reproductive development has been targeted during domestication and subsequent breeding of crop species to improve the production and suitability of fruits and seeds for human profit. In cultivated grapevine, variation in flower induction and initiation, inflorescence and flower development, flower sex, or gamete and seed development have direct implications on production traits such as fertility, cluster weight or berry weight but also on quality traits such as cluster compactness, berry skin to pulp ratio or seedlessness. At the same time, functional sexual reproduction has not been under positive selection in grapevine due to the extensive vegetative multiplication of cultivars, which has both positive and negative consequences for the crop. Mutations that would not be transmitted through sexual generations in a natural environment can provide interesting quality traits to grapevine cultivars. In this way, genetic variation in gamete viability can lead to decreased seed number and berry size as well as reduced cluster compactness, current goals in clonal selection of wine cultivars. Nevertheless, this trait can also have negative consequences on yield and quality depending on environmental conditions. Complete lack of gamete viability can be behind some forms of parthenocarpic development and it is indeed in the origin of Corinto raisins. Genetic variation affecting ovule and seed development is behind stenospermocarpic seedlessness, a main quality trait in table grape breeding. All these examples point out how understanding grapevine reproductive development and particularly the existent genetic variation for these processes can help developing more suitable and adapted cultivars for both wine and table grape production.

**Keywords:** fruit set, gamete viability, genetic variation, reproductive development, seedlessness, yield