

AperTO - Archivio Istituzionale Open Access dell'Università di Torino

## Grape texture characteristics are linked to one major QTL

### **This is the author's manuscript**

*Original Citation:*

*Availability:*

This version is available <http://hdl.handle.net/2318/1805629> since 2021-10-11T20:43:45Z

*Publisher:*

IVES – International Viticulture and Enology Society

*Terms of use:*

Open Access

Anyone can freely access the full text of works made available as "Open Access". Works made available under a Creative Commons license can be used according to the terms and conditions of said license. Use of all other works requires consent of the right holder (author or publisher) if not exempted from copyright protection by the applicable law.

(Article begins on next page)

## Grape texture characteristics are linked to one major qtl

**AIM:** Berry texture and berry skin mechanical properties have high agronomic importance, related to quality and marketing requirements of wine, table and raisin grapes. Despite the efforts already made to detect molecular markers and candidate genes associated with berry texture, different QTLs were proposed until now, showing low contribution rates to the trait, likely due to difficulty in phenotyping. Searching for QTLs linked to berry texture, an F<sub>1</sub> population of 154 individuals and their parents ('Raboso Veronese' and 'Sultanina') were used in this study. **METHODS:** Density sorting by flotation was applied to reduce sample variability. One density class was selected achieving berries with a similar ripening stage. Mechanical properties were measured and normalized on berry diameter, surface, and volume. Hundred and ninety SSR molecular markers were used to produce a genetic map using JoinMap. MapQTL was applied searching for QTLs associated with berry texture traits. VviAGL11 expression profiling and co-expression analysis during grape ripening was evaluated using available transcriptomic datasets. **RESULTS:** A major QTL was found on LG 18, with high LOD scores (from 25.07 to 31.92) and high phenotypic variance explained (from 53.2 to 63.5%) for all measured texture traits. Surprisingly, this major QTL showed association with SSR markers linked to VviAGL11, the main gene leading to stenospermocarpy. Data available on VviAGL11 expression and co-expression profiling during grape ripening strongly suggested that this gene may act on the traits of a ripe berry through the activation of some target genes involved in lipid and hormone metabolism, transport and in gene expression regulation. **CONCLUSIONS:** Previous studies showed how difficult is determining the genetic control of berry texture. Our results clearly underline the major role played by a QTL located on LG18 and characterized by the presence of the well-known MADS-box gene VviAGL11.

**Authors:** Manna Crespan – CREA Research Centre of Viticulture and Enology, Conegliano, Italy, Daniele Migliaro, CREA Research Centre of Viticulture and Enology, Conegliano, Italy Silvia Vezzulli, Fondazione Edmund Mach, S. Michele a/Adige, Trento, Italy Sara Zenoni, University of Verona, Italy Giovanni Battista Tornielli, University of Verona, Italy Simone Giacosa, University of Torino, Italy Maria Alessandra Paissoni, University of Torino, Italy Susana Río Segade, University of Torino, Italy Luca Rolle, University of Torino, Italy

**Email:** [manna.crespan@crea.gov.it](mailto:manna.crespan@crea.gov.it) (mailto:manna.crespan@crea.gov.it)

**Keywords:** *Vitis vinifera* L., fruit quality, flotation, lg18, vviagl11, mads box genes



( <https://ives-openscience.eu/ives-conference-series/macrowine-2021/>)



(<https://ives-openscience.eu/ives-conference-series/>)