Proceedings of the LXII SIGA Annual Congress
Verona, Italy – 25/28 September, 2018
ISBN **978-88-904570-8-1**

Poster Communication Abstract – 6.35

ACTIVE XYLOGLUCAN AND PECTIN REARRANGEMENTS COME AFTER A DEHYDRATION PHASE DURING THE POSTHARVEST WITHERING IN GRAPE BERRY SKIN

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Vitis vinifera, postharvest withering process, FTIR spectroscopy, cell wall, polymer dynamics

Grapes postharvest dehydration is a worldwide practice used to produce several premium wines. In dehydrating berries, solute concentration increases and many organoleptic and quality traits are affected due to molecular changes occurring over the process, in a cultivar-specific manner. The variety Corvina, used to produce the famous Amarone wine, has a slow dehydration kinetic and it is characterized by large and thick skin berries with compact layers. A direct relation between dehydration kinetics and berry size and skin texture was evidenced in several varieties. However, the effects of the withering process on the berry skin cell wall metabolism are poorly understood. In this work, we analyzed cell wall polymers dynamics in the internal and external sides of Corvina drying berry skins by combining ATR-FTIR spectroscopy, immunohistochemistry and gene expression analysis of cell wall-related genes. We firstly revealed a gradual polymers concentration due to water loss over withering and a deep polymers rearrangement during the last month of the process. We also highlighted that hemicellulose and pectin dynamics prevailed at the internal skin side whereas cuticle thinning and polymers degradation characterized the external side. Finally, homogalacturonans, with a low degree of methyl esterification, have a different distribution in each skin surfaces. Overall, we showed that drying berries skin features divergent cell wall polymers dynamics, in terms of timing rearrangement and different surfaces distribution. A detailed understanding of molecular changes during postharvest withering could improve the comprehension of this technological practice of interest for biologists and winemakers.