Effect of ozone application for low-input postharvest dehydration of wine grapes

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Abstract

The postharvest dehydration of grapes is a traditional practice to obtain wines with unique traits (e.g. sweet, dry/reinforced). The modern facilities (dehydrating rooms) used for this purpose are equipped with systems for artificially controlling the inside environment parameters, to obtain the desired dehydration kinetic and preserve the grapes from grey mold (Botrytis cinerea) infection, However, the conditioning systems are extremely energy-demanding and the identification and practical applications of solutions effective in controlling/reducing the postharvest decay would reduce the costs of the operation of the dehydration facilities. To this end, we explored the potential of ozone-based treatments on harvested grapes and preliminarily tested if the treatment could impact the normal behavior and metabolism of grapes during the traditionally slow dehydration practice. Harvested grapes of Corvina and Sangiovese cultivars were treated with ozone (gas or ozonated water) and partially dehydrated in a dedicated room equipped with a system for the control of internal temperature and humidity. Weak differences regarding the dehydration kinetics and the main technological parameter dynamics were detected between treated and untreated grapes. Analyses of phenolic and other non-volatile metabolites, as well as of the expression of key genes governing the grape berry postharvest metabolism are underway. Overall, the results will shed light on grape physiological response to ozone during the postharvest dehydration process. Sanitizing grapes using ozone will highly increase the capacity of grapes to withstand conditions of higher temperature and humidity reducing spoilage and production losses.

Keywords: Vitis vinifera, postharvest dehydration, ozone, grape berry, metabolism.