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EFFECT OF POST-HARVEST OZONE TREATMENTS ON THE SKIN PHENOLIC COMPOSITION AND EXTRACTABILITY OF RED WINEGRAPES CV NEBBIOLO AND BARBERA

Wine industry is looking forward for innovative, safe and eco-friendly antimicrobial products allowing the reduction of chemical treatments in the grape defense and the winemaking process that can affect negatively the quality of the product. Ozone has been tested in food industry giving good results in preventing fungi and bacteria growth on a wide spectrum of vegetables and fruits, due to its oxidant activity and ability to attack numerous cellular constituents. Ozone leaves no chemical residues on the food surface, decomposing itself rapidly in oxygen. Gaseous ozone has been already tested for table grapes storage and on wine grapes during withering. In particular, ozone has been suggested as phenolic compounds elicitor, stimulating chemical defense mechanisms such as the synthesis of polyphenols, and as enhancer of cellular membrane and cell walls degradation phenomena. Phenolic compounds are strongly linked to the red wine quality, and their extraction depends on the grape variety, winemaking technique and cell wall degradation. In this work, Vitis vinifera L. cv Nebbiolo and Barbera, chosen for their different anthocyanin profiles, were post-harvest treated for 24 and 72 hours with gaseous ozone (30 µL/L). Untreated samples were used as control with the aim of investigating possible indirect physico-chemical effects of this sanitizing treatment on berry skin phenolic composition. Skin phenolic extractability was assessed during maceration (6, 24, 48, 96, 168 and 240 hours) using a wine-like solution, particularly for total anthocyanins (TA), proanthocyanidins (PRO) and flavanols reactive to vanillin (FRV), and anthocyanin profiles were also determined. Ozone did not affect significantly the final extraction yield of TA, PRO and FRV in Barbera; although anthocyanin extractability was higher in control rather than in ozone-treated samples during the first stages of maceration. Otherwise, Nebbiolo was positively influenced by the treatment because ozone increased significantly TA extraction (68.6, 64.2 and 59.9% for 24 hours ozone-treated berries, 72 hours ozone-treated berries and control samples, respectively). PRO and FRV extractability also showed an increase in both ozone-treated samples compared to the control (+8.6-9.1% for PRO and +7.3-11.7% for FRV). No significant differences were found among treatments for individual anthocyanins, whereas the variety and maceration time strongly affected the anthocyanin profile. In our experimental conditions, ozone enhanced phenolic compounds extractability in Nebbiolo grapes while it did not show significant effects on Barbera. Therefore, the use of ozone as sanitizing agent in the red varieties winemaking process can be considered because it did not negatively affect the extractability of skin anthocyanins and flavanols.

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