

Grape UV-C irradiation in the postharvest period as a tool to improve sensorial quality and anthocyanin profile in ‘Cabernet Sauvignon’ wine

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Abstract

Anthocyanins are important compounds in grapes and wine and significantly influence their characteristics. Ultraviolet light-C (UV-C) can be used as a tool to induce secondary metabolism, and in this study, it was used in ‘Cabernet Sauvignon’ grapes in the postharvest period to improve the anthocyanin profile and sensory attributes in wine produced with irradiated grapes. Grapes in the postharvest period were exposed to 0, 2, or 3 kJ m⁻² UV-C radiation. After winemaking and storage time (6 months), physicochemical and color analyses, anthocyanin quantification and identification (HPLC–PDA-MS/MS), and sensory analyses were carried out. ‘Cabernet Sauvignon’ wine produced with grapes irradiated with 3 kJ m⁻² UV-C showed increased spectrophotometric color, which is likely due to a 22.5% increase in total anthocyanin monomers, 59.3% of pyranoanthocyanins, 92.3% of direct condensation products, and 62.8% of acetaldehyde-mediated condensation products. In addition, this irradiated dose presented higher perception scores for visual color, aroma, taste, and was preferred by the tasters over the wine produced with non-irradiated grapes. This study is the first of its kind to show that the UV-C radiation treatment of grapes in the postharvest period can be a promising tool to improve the anthocyanin profile and sensorial quality of ‘Cabernet Sauvignon’ wine.