

Post-harvest UV-B treatment of White Sultanina grapevine berries

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The grapevine berries are an important source of phenolic compounds. In this study, White Sultanina berries were treated with UV radiation and followed quantitative change of these secondary metabolites. In the skin of cv. White Sultanina table grapes, a phenolic acid and several mono-glycosylated flavonols were identified by HPLC-DAD. The aim of this work was to alter this profile, to improve antioxidant properties. Resveratrol contents of berry skins have already been successfully increased using UV-C or UV-B radiation (Cantos et al. 2000) in another variety (cv. Napoleon). In this study, we report a UV-B-inducible increase in flavonoid-glycosides observed 2 h after 30 min exposure to 11.5 W/m² radiation flux (physical dose) from a narrow band source (VL-215M centred at 312 nm, Vilbert Lourmat, France). This was accompanied by higher antioxidant capacities of berry skin extracts, in accordance with the observed strong antioxidant capacities of quercetin-glycosides in vitro (Csepregi et al. 2016, Csepregi and Hideg 2018). Differences between UV-B-treated berries and untreated controls were less pronounced when assayed after a longer storage period following irradiation at 20 °C under low fluxes (60 μmol m⁻²s⁻¹) of photosynthetically active radiation. Berry skin photosynthesis, measured as photochemical yield using imaging PAM (Heinz Walz GmbH, Effeltrich, Germany) temporary increased after the UV-B treatment, then declined, suggesting a possible metabolic source of increased flavonol biosynthesis. These experiments suggest that UV-B irradiation of table grapes can be beneficial in terms of increasing the content of potentially health-promoting flavonol derivatives.

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