

**Title** Differential stilbene induction susceptibility of seven red wine grape varieties upon post-harvest UV-C irradiation

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### Abstract

The stilbene induction capacity of the red wine grape varieties 'Tempranillo' (TEM), 'Cabernet Sauvignon' (CAS), 'Merlot' (MER), 'Syrah' (SYR), 'Monastrell' (MON), 'Garnacha' (GAR) and 'Cariñena' (CAR) exposed to post-harvest UV-C irradiation is reported for the first time. The induction of *trans*-piceatannol, *trans*-resveratrol and viniferins, among other stilbenes, was characterized using high-performance liquid chromatograph with diode-array and mass spectrometric detection (HPLC-DAD-MS-MS). All the wine grape varieties increased their resveratrol, piceatannol and viniferin content after UV-C treatment with the exception of the variety MON in which only piceatannol was induced. Other stilbenes such as astringin (piceatannol glucoside) or piceid (resveratrol glucoside) were induced to a lesser extent and only in some varieties. The stilbene induction capacity of grapes submitted to UV-C irradiation did not necessarily match the final corresponding maximum stilbene content reached in each variety. The total stilbene induction capacity of the grapes ranged from 2.4-fold (in MER) to 10.9-fold (in both CAS and CAR) with respect to untreated grapes (control). The total stilbene content (mg stilbene/100 g fresh weight, fw) after UV-C irradiation ranged from 1.16 in MON to 3.5 in MER. In general, the maximum induction of specific stilbenes in all the varieties followed the sequence: resveratrol > piceatannol >  $\square_1$ -viniferin > piceid. This maximum induction was 22.7-fold for resveratrol in CAS, 6.4-fold for piceatannol in CAR, 3.8-fold for piceid in TEM and 8.4-fold for  $\square_1$ -viniferin in both CAS and CAR with respect to the control. The maximum concentration of the specific stilbenes reached after UV-C irradiation was 2.5 (mg stilbene/100 g fresh grape weight) for resveratrol in MER, 0.42 for piceatannol in MER, 0.16 for piceid in MON and 0.39 for  $\square_1$ -viniferin in CAR. The screening of stilbene induction capacity in red wine grapes treated with UV-C irradiation could be useful for selecting the most suitable variety to produce stilbene-enriched red wines with potentially increased health-promoting properties.