

CA39: Anthocyanin and flavonol fingerprints of three red grapes grown in Galicia (N.W. Spain)

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Galicia (N.W. Spain) is an interesting Spanish winemaking region having five Denominations of Origin. The aim of this work is to provide data about the anthocyanin and flavonol profiles of the skin and the flesh of three red *Vitis vinifera* L. cultivars cultivated in Galicia (N.W. Spain): the native 'Brancellao' and 'Mouratón', and 'Gran Negro' (the local name of the well known teinturier Morrastrrel Bouschet).

High-performance liquid chromatography coupled to diode array (HPLC-DAD) and to mass spectrometry (HPLC-MS) provides a useful tool for polyphenolic analysis in red cultivars [1], [2]. Fifteen anthocyanins, located in the berry skin and responsible for the red colour, were detected in all studied cultivars. The 3-O-glucosides of malvidin, petunidin, cyanidin, peonidin and delphinidin was the main group followed by coumaroyl glucosides > acetyl glucosides and caffeoyl glucosides. Fourteen flavonols, located in the berry skin and berry flesh and responsible for bitter taste of red wine, were also detected in these cultivars. The main flavonols found include the 3-glucosides, 3-glucuronides and rutinosides of quercetin, myricetin, kaempferol, laricitrin, isorhamnetin and syringetin.

Principal component analysis (PCA) was used, separately, to differentiate the selected cultivars according to their anthocyanin and flavonol profiles. For anthocyanin profiles, PCA suggested that Gran Negro (Morrastrrel Bouschet) could be characterized by peonidin; Mouratón by petunidin and delphinidin, and Brancellao by cyanidin. For flavonol profiles, PCA suggested that Gran Negro (Morrastrrel Bouschet) could be characterized by isorhamnetin and syringetin; Mouratón by kaempferol and laricitrin and Brancellao by quercetin. Then, these profiles can be used as an effective tool in differentiating cultivars.

Finally, the ratios related with three key enzymatic activities were computed [3]. A highly significant correlation was found between the enzymatic activities ratios which implies that the biosynthesis of flavonols is closely related to that of anthocyanins. In Gran Negro (Morrastrrel Bouschet), a substantial presence of malvidin and peonidin derivatives indicated a correspondence to greater amount of syringetin and isorhamnetin forms, respectively, in this cultivar. The higher values of petunidin and delphinidin derivatives in Mouratón berries were corresponded to high levels of laricitrin and myricetin forms. Finally, the higher values of cyanidin derivatives in Brancellao berries were corresponded to high levels of quercetin forms.

[1] N. Castillo-Muñoz, S. Gomez-Alonso, E. García-Romero, I. Hermosín-Gutiérrez, J. Agric. Food Chem. 55 (2007) 992.

[2] V. Núñez, M. Monagas, M.C. Gómez-Cordovés, B. Bartolomé, Postharvest Biol. Technol. 31 (2004) 69.

[3] F. Mattivi, R. Guzzon, U. Vrhovsek, M. Stefanini, R. Velasco, J. Agric. Food Chem. 54 (2006) 7692.