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Chemo-sensory approach for the identification of chemical compounds driving green character in red wines

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Abstract

The present work seeks to define the “green character” of red wines and characterise the groups of molecules potentially involved in that perception. Fifty-four wines were screened by wine experts for different levels of green character. Six different phenolic fractions were obtained by liquid chromatography (LC) and further submitted to sensory and chemical characterisation. The volatile fraction was screened by semipreparative LC, Gas Chromatography-Olfactometry (GC-O) and quantitative analysis. The green character was linked to vegetal aroma, astringency, green and dry tannins according to experts of the Somontano region. Non-volatile fractions containing tannins with mean degree of polymerisation of ten and smaller anthocyanin-derivative pigments (<tetramers) imparted astringency-related sensations such as stickiness and dryness, respectively. No specific aroma compounds were identified in the GC-O study of green wines, however the wines contained significantly higher levels of fusel alcohols. The interaction between isoamyl alcohol and the anthocyanin-derivative fraction and/or tannins is suggested to be involved in the formation of green character in red wines.

Key words: green character; sensory analysis; tannins; anthocyanins; aroma; isoamyl alcohol

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