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Title: An Investigation on Factors Affecting Recovery of Antioxidant Phenolics and Anthocyanins from Red Grape (*Vitis vinifera* L.) Pomace Employing Water/Ethanol-Based Solutions

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Abstract: Extractions were performed using non-toxic media composed of water/ethanol mixtures and hydrochloric, acetic or tartaric acid. Recovery efficiency was assessed by monitoring the antiradical activity (A_{AR}) of extracts and several indices related to their polyphenolic composition, including total polyphenol, total flavonoid, total flavanol, total anthocyanin and condensed tannin (proanthocyanidin) content. Extracts with the highest A_{AR} values were obtained with 57% ethanol, a solvent system that was also favourable in obtaining high total polyphenol and total flavonoid yields, which amounted 7259 and 7222 mg/100 g dry weight, respectively. The highest anthocyanin yield was however achieved with 85.5% ethanol (266.2 mg/100 g dry weight). None of the acidification agents used provided extracts with increased polyphenol levels and A_{AR} . Addition of SO_2 (0.01%, w/v) to 57% ethanol, however, resulted in maximisation of A_{AR} (2.9 mM TRE/g dry weight), although anthocyanin recovery was not maximal (186.9 mg/100 g dry weight). It is suggested that efficient recovery of antioxidant phenolics and anthocyanins from by-products of red vinification can be achieved employing simple extracting media composed of ethanol, but more active, in terms of antioxidant activity, extracts can be obtained with addition of a low amount of SO_2 . Ethanol is a bio-solvent that can also be obtained from wine-industry wastes and thus the implementation of similar techniques may potentially provide the basis for a sustainable process of integrated exploitation of vinification by-products.

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