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Fractionation of grape anthocyanins through centrifugal partition chromatography (CPC) and evaluation of their sensory properties

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Anthocyanins from grapes skins are known for their impact on red wine color, whereas their involvement in mouth-feel properties, such as astringency, and bitterness perception has been considered less relevant in red wine. However, previous results suggested their involvement in wine sensory properties [1], as well as the reactivity towards protein, such as bovine serum albumin (BSA) and salivary protein [2,3].

In this study, anthocyanin grape skin extracts from cv Nebbiolo and Barbera were fractionated using Centrifugal Partition Chromatography (CPC) in three fractions, i.e. glucoside (FG), acetylated (FA) and coumaroylated (FC) anthocyanins. Investigation of sensory properties was carried out for the extract and fractions throughout chemical analyses as reactivity towards BSA and salivary protein, and tasting sessions performed by a trained panel. The CPC condition allowed fractionation of 2.5 g of skin extract in two hours and a satisfactory level of purity for FG, whereas the purification of FA and FC required a further step on preparative HPLC.

The concentration of anthocyanin extract in wine-like solution showed a decrease after treatment with salivary protein, especially the glucoside and coumaroylated anthocyanins were significantly reduced, whereas no significant interaction was found towards BSA. Fractions analysis showed a decrease in anthocyanins when treated with protein, in particular FG and FA for salivary protein, and FG for both BSA and salivary protein. Tasting sessions in model wine solution confirmed the involvement of anthocyanins at wine-scale range in astringency sensation and bitterness perception.

References

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