

SENSORY AND PHYSICO-CHEMICAL IMPACT OF PROANTHOCYANIDIC TANNINS ON RED WINE FRUITY AROMA

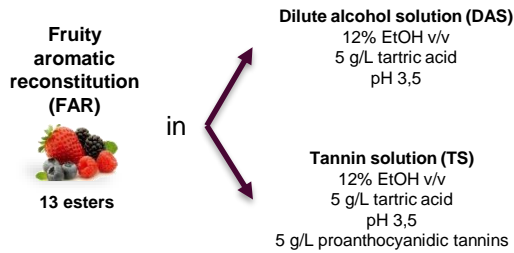
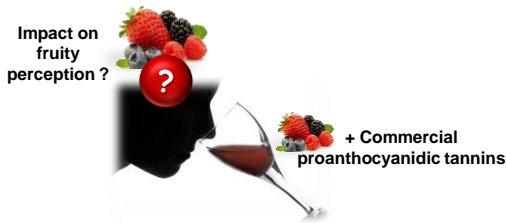
Introduction

More than a thousand volatiles have been identified in wine. To be perceived, these aroma compounds need to be first volatilized from the matrix to the headspace in order to reach the olfactory epithelium. From a physico-chemical point of view, a compound release may be explained by its partition coefficient, which represents the ratio of aroma concentration between gas and liquid phases.

In red wine, previous research on the fruity character of red wines highlighted the role of esters, mainly substituted and present at concentrations below their olfactory thresholds. A part, at least, of the fruity aroma is the consequence of perceptive interactions between various aromatic compounds thanks to synergistic and/or masking effects, thus modulating this fruity expression [1]. Literature provides evidence that, besides these volatiles, other compounds that are not necessarily volatiles may have an important impact on wine perception, but also on odorant compounds volatility [2][3]. Recently, a new method coupling the low-pressure and static headspace gas chromatography to a mass spectrometry (LP-HS-GC-MS) was developed in order to calculate simultaneously main esters partition coefficients, and that, at their wine concentrations [4].

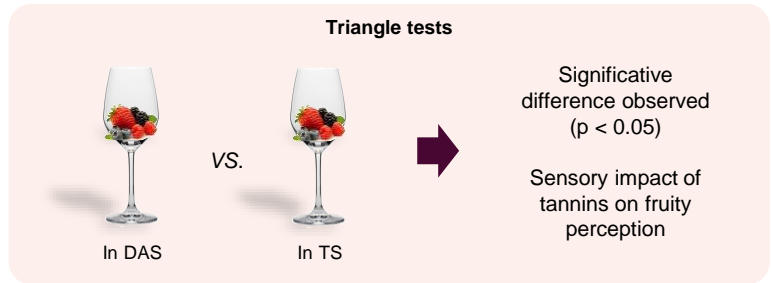
This work propose to assess the olfactory consequences of a mixture between esters and proanthocyanidic tannins, through sensory and physico-chemical approaches.

Sensory Impact of Proanthocyanidic Tannins on Fruity Aromatic Expression

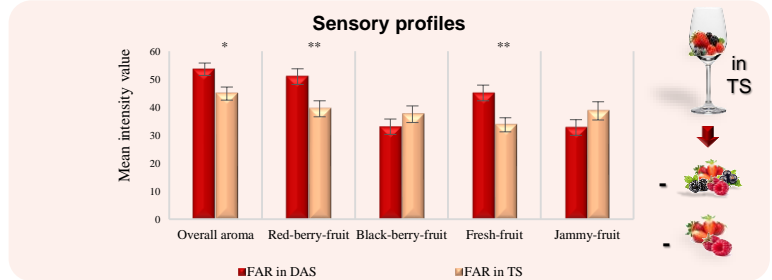


Results

Triangle tests



Sensory profiles

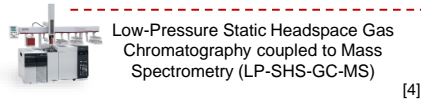


Pre-sensory Effects Evaluation

Perceptive interactions origins

Sensory interactions
Olfactory receptor
Central/Cognitive level

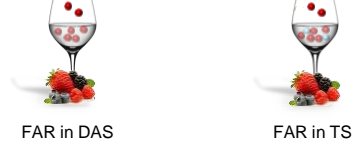
Pre-sensory interactions
Physico-chemicals effects in the matrix



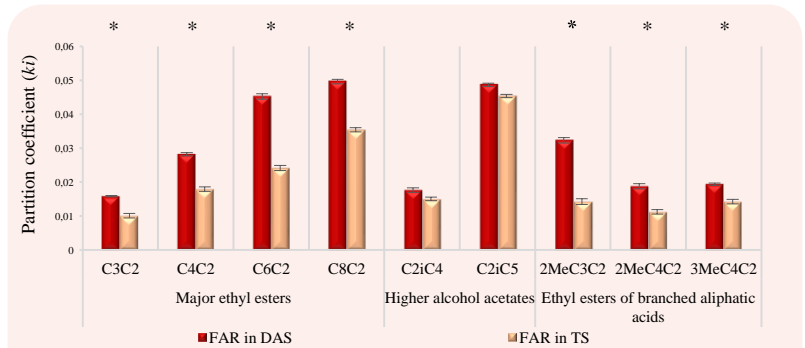
$$k_l = \frac{C_{gas}}{C_{liquid}}$$

Pre-sensory effect investigation by HS-LP-GC-MS using partition coefficient (k_l) determination

Esters partition coefficients evaluation



Results



Decrease in release of esters in headspace

Esters partition coefficients changes

Analytical data in correlation with sensory analyses results

Existence of pre-sensory interactions

Conclusions

Changes in perception of fruity notes even if molecules were added when non volatile molecules were added in the matrix

Masking effects

Decrease in esters release in headspace

Aromas release modifications in the headspace in agreement with sensory analyses

Importance of non-volatiles on red wine fruity perception