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Impact of olfactory cues on the perception of astringency sub-qualities in Italian red wines

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Although the mechanisms of astringency perception have been partly elucidated, there is still a lack of understanding about factors and phenomena modulating this complex sensation, in relation to wine composition. In spite of their richness in tannins, some Italian grape varieties give appreciated wines with pleasant astringency. Exploiting the wide diversity of Italian red wines, we investigated if/how olfactory stimuli can modulate the perception of astringency. The sampling was made within the D-Wines (Diversity of Italian Wines) project finalized to get a wide multi-parametric dataset about Italian wines.

Fourteen wine experts evaluated 112 mono-varietal red wines (2016): 19 Sangiovese; 13 Nebbiolo; 11 Primitivo and Teroldego; 10 Aglianico, Raboso and Sagrantino; 9 Montepulciano and Cannonau; 7 Corvina; 3 Nerello Mascalese. Assessors sorted and labelled the samples according to their similarities in terms of astringency sub-qualities. Data analysis (AHC, PCA, DA, MDS) allowed the selection (within and among varieties) of wines representative of diverse astringency features: particulate, velvet, complex, drying, harsh, unripe. The selected wines were deodorized (treatment in ultrasound bath followed by rotary evaporator and VOCs elimination checked by SPME-GC-MS) and reconstituted with appropriate amounts of water and ethanol. The impact of olfactory stimuli was investigated by two approaches: 1) the sorting procedure was repeated on the deodorized-reconstituted wines and results were compared to those obtained on the corresponding whole original wines; 2) the astringency sub-qualities of the deodorized-reconstituted wines were rated without and under olfactory stimulation of assessors by Direct-GC-Sniffing of VOCs isolated from the wines. Wines were chemically analyzed.

Preliminary results suggest a significant impact of olfactory cues on the sensory perception of astringency sub-qualities. The study aims to provide further insight into factors modulating astringency perception and the outcomes will help in the management of the sensory consistency, optimal quality and attractiveness of Italian red wines.