

Saliva esterase activity during wine oral processing: inter-individual differences, effect of wine composition and impact on wine odorant esters

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Saliva enzymes might affect the metabolism of aroma compounds during food processing impacting aroma perception and consumer's preferences. Previously, using -in vitro experiments, it has been shown that saliva esterase can hydrolyze some types of carboxylic esters. In wines, esters represent a group of compounds tightly linked to pleasant fruity aromatic notes. Till now, very little research has been done on the metabolism of aroma compounds due to the oral processing during wine consumption, and the role of esterase activity on wine aroma has not unraveling yet. Besides, wine is a hydroalcoholic solution with an acidic pH, in which polyphenols represent the large group of nonvolatile chemicals. Thus, it is not clear whether saliva esterase might have an effect on wine esters in this type of matrix.

The objective of this study, was firstly to evaluate the inter-individual differences in saliva esterase activity (SEA) in a volunteer's group (n=9) determining how SEA can be modify by wine components using saliva collected after the oral exposure to synthetic wines with different composition (pH, ethanol, polyphenols, and esters). To validate these data, two wines with very different composition and spiked with a mixture of 6 carboxylic esters differing in the length of their aliphatic chain, were also used with the 9 volunteers who performed -in vivo experiments using the Spit Off Odorant Measurement Methodology (SOOM-GCMS), in order to check the relationship between SEA and the degree of ester recovered in the expectorated wine after oral rinsing with the wines. Results showed large inter-individual differences in SEA. Moreover, the highest SEA was determined after the oral exposure to synthetic wines with low pH (3,5) and it was higher when ethanol was present at 10% than 5% (v/v), suggesting that esterase activity can be relevant at typical wine consumption conditions.