Ability of oral microbiota to release free volatiles from wine odorless glycosidic aroma precursors

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Although the composition of wine aroma and its impact on orthonasal aroma release has been extensively studied, the mechanisms involved on retronasal aroma release during wine consumption and its impact on aroma perception has received very little attention. The release process during wine consumption might be very dependent on the individual parameters of the human’s mouth cavity. In spite that wine is a liquid matrix, therefore, with a relatively short resident time within the mouth, the interaction of some wine matrix components with oral mucosa and the interactions between matrix components and wine aroma compounds (1,2) might increase the resident time, making these aroma compounds more susceptible to oral parameters. Among these oral parameters, mouth microbiota, has been recently associated with a delayed perception of some thiols produced from Cysteine-S-Conjugates during the consumption of some fruits and vegetables (3).

Grape aroma precursors are odorless glycosides and represent a natural reservoir of odorant molecules in wines which can be naturally and slowly released during wine aging, or intentionally released by using oenological enzymes during winemaking. In addition, these compounds might be transformed by oral microbiota during wine consumption, therefore influencing wine aroma perception.

Therefore, the objective of this work has been to evaluate the role of some oral bacteria on the transformation of wine aroma precursors isolated from musts and grape pomaces. To do so, representative oral cavity bacteria (Staphylococcus sp., Enterococcus sp. Fusobacterium sp., etc) have been grown in specific culture broth containing the aroma precursors. Odorant aglycones have been isolated from the cultures and analysed by HS-SPME-GCMS. Preliminary results show the ability of some of these microorganisms to hydrolyse grape aroma precursors releasing the corresponding terpenes, norisoprenoids, benzenic compounds and lipid derivatives among others, which might influence retronasal aroma perception during wine consumption.

References :