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Unravelling the effects of interindividual variability of human saliva on aroma compounds

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In the last 20 years a lot of research has been devoted to understanding the intra-oral release of aroma compounds, and particularly, about the role of saliva on this process1. During eating, aroma compounds are released from the food matrix and dissolved in saliva, where they can be submitted to different effects (e.g. retention, salting-out, metabolization). These effects might determine the rate of aroma compounds available to reach the olfactory receptors. In spite of the well-known variability of salivary parameters (flow and composition) among individuals, its effects on aroma compounds have been poorly studied (in particular in specific populations, such as elderlies). Therefore the main objective of this work has been to elucidate the role of human saliva on aroma compounds taking into account interindividual variability.

For this purpose, in vivo aroma release was monitored using PTR-ToF-MS in elderlies (n=73; mean age=74,0 y/o), who were asked to drink an aromatic solution. Aroma release data were submitted to multiple regression analyses in order to relate individual physiological and salivary parameters with aroma release over time. Results showed that interindividual differences on aroma release were mostly correlated with salivary composition parameters (positively with total protein content and negatively with total antioxidant capacity) and with the body mass index of the individuals (negatively). Additionally, differences among aroma compounds were observed. Some compounds (linalool, 2-pentanone, 2-nonanone) were more persistent in the breath than others (2,3-hexanedione, octanal). Ex vivo experiments allowed to ascertain that metabolites were formed from the less persistent compounds after their incubation with saliva, which suggests a role of metabolization by saliva of specific aroma compounds. These results show the importance of considering interindividual differences in human saliva composition to gain a deeper understanding on food aroma perception. 1.Ployon, Morzel & Canon. (2017). Food Chem., 226;212-220.

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