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Editorial

Aroma Compound Evolution during Fermentation

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Microorganisms involved in the fermentation process play a significant role in shaping the aromatic characteristics of the final food product. During fermentation, various precursor compounds undergo transformation into aroma-active compounds due to microbial activity. Understanding the timing, mechanisms, and reasons behind the release of these compounds is essential to ensuring the consistent development of fermentation products, such as wine or beer, with well-defined aroma profiles.

The aim of the Special Edition titled "Aroma Compound Evolution during Fermentation" was to present new investigations conducted in this field. The edition featured ten publications (nine original research papers and one review) covering diverse topics. Special mention should be given to papers focusing on the aroma profiles of non-traditional foodstuffs [1–3].

Wine-related studies included:

Badura et al. [4] investigated apiculate yeasts belonging to the *Hanseniaspora* genus in simultaneous inoculations with *Saccharomyces cerevisiae* during grape must fermentation. Aroma profiles were compared, and distinct differences were observed between the two lineages of *Hanseniaspora*, impacting the final product. The study also revealed that specific *Hanseniaspora* species esterify citronellol into citronellyl acetate, which is a significant aroma molecule.

Guittin et al. [5] implemented an online monitoring system to measure acetaldehyde during wine fermentation, emphasizing the role of temperature in the dynamic production of this critical yeast fermentation metabolite, which affects wine quality, including its aroma.

Gottardi et al. [6] compared the performance of seven *S. cerevisiae* strains on a pilot scale (0.9 hL) and highlighted significant differences among the strains. The study aimed to simulate wine fermentations more closely to real-world scenarios than small-scale laboratory experiments.

Vicente et al. [7] used two popular non-*Saccharomyces* yeasts, *Schizosaccharomyces pombe* and *Lachancea thermotolerans*, in a sequential wine fermentation with *S. cerevisiae*. The study demonstrated that these yeasts not only dramatically influenced the final aroma profile but also converted malic acid into less tart lactic acid, resulting in the expected organic acid modulation.

Agarbati et al. [8] investigated the use of another non-*Saccharomyces* yeast, *Metschnikovia pulcherrima*, in wine fermentation. The addition of this yeast altered the wine aroma and also had a meaningful impact on the biocontrol of the wild microflora population.

Beer-related study:

Roberts et al. [9] explored geraniol, an important hops-derived terpene that imparts a floral aroma to beer. The study used two different measuring techniques and demonstrated that geraniol can undergo transformation into several different compounds during beer fermentation.

Non-conventional fermentations:

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Liu et al. [2] reported on the aroma compounds that are produced during the fermentation of lamb liver paste. Hung et al. [1] showed what effect the addition of starter cultures like *Bacillus subtilis* and *S. cerevisiae* can have on the analytical and sensory composition of seaweed. With the addition of the basidiomycete *Laetiporus persicinus* to cocoa pulp, Klis et al. [3] showed that this fungus produced several interesting aromas that imparted tropical notes to the fermented product. Finally, Meneses Queral et al. [10] wrote a review discussing the aroma compounds that are present during the fermentation process of cocoa.

Overall, these studies contribute valuable insights into the evolution of aroma during fermentation, enhancing our understanding of the factors influencing the aromatic characteristics of fermented food and beverage products.

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