

## CHARACTERIZATION OF FLAVOR AND AROMA COMPOUNDS PRESENT IN LAMBIC (GUEUZE) BEER

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Lambic beer is one of the oldest beer styles still being brewed in the Western world today and the only beer that is still brewed through spontaneous fermentation. Lambic beers are only produced within a 500 km radius of Brussels because of the natural microflora found within the air. Little is known about the chemical composition of lambic beers. The objective of this research were (1) to compare SPME (solid-phase microextraction) and SAFE (solvent-assisted flavor extraction) for the isolation of flavor and aroma compounds, (2) determine the volatile composition of commercially available lambic gueuze using SPME/GC-MS (Gas Chromatography- Mass Spectrometry) and HPLC, and (3) determine the major aroma compounds of aging lambic beer using GC-O. In comparing the two extraction methods both SPME and SAFE were able to identify a similar number of chemical compounds however with the use of SAFE

a greater number of acid compounds were identified. A total of 50 compounds were identified within the nine commercial brands of lambic beer. HPLC (High Performance Liquid Chromatography) was used in the identification and quantification of acetic and lactic acid. The concentration of acetic acid for the commercial brands ranged from 723 mg/L-1624 mg/L while lactic acid ranged 995-2557 mg/L. GC-O (Gas Chromatography-Olfactometry) was used in the analysis of lambic beer samples aged 3, 6, 9, 12 and 28 months. As the samples increased in age the number of aroma compounds detected by the panelists increased as well. Panelists were only able to detect 9 aroma compounds in the three month old sample, while 17 compounds were detected in the twenty eight month old sample.

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