

TRAPPIST BEERS: EXPLORING THE CLOAK OF SECRECY BY GC×GC-TOFMS

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Among the thousand of existing types of beer are the Trappist beers. They are famous for their special taste and for their great quality. Because they are brewed in respect to ancestral monk traditions, they are often rare and difficult to find on the market, which further enhance their image of high end product. Today, only ten abbeys provide Trappist beers in the world: 6 in Belgium, 2 in the Netherlands, 1 in Austria and 1 in USA. All together, these 10 abbeys produce 29 different types of beers. Even though basic ingredients – malted barley, hops, water, yeast – involved in the preparation of the beer are the same, the typical nature of these beers arises from an historic brewing know-how used to transform raw materials in aromatic and tasty beers. Aromas in beers are known to orientate mainly from malted barley [1] (due to barley itself as well as the thermal treatment during malting), hops [2], yeast [3-4], and to develop during maturation and aging [5-6].

In the quest for a better understanding of the ancestral processes, we started to investigate the volatile organic compound (VOC) composition of this family of beers, by mean of GC×GC-TOFMS, in the hope to highlight differences and common typical patterns among samples. For the first part of this study, two Trappist abbeys were selected and the VOC profiles of their beers were characterized. The Chimay's and the Rochefort's beers were sampled by solid phase micro-extraction (SPME) and analyzed by GC×GC-TOFMS. This sample batch represented replicates of 6 different beers, 3 from each abbey. Various statistical approaches have been tested and applied to differentiate volatile makers of each beer. We hope to be able to link some selected volatile markers to specific transformation steps of raw materials, to eventually better learn from the monk's secret recipes.

References

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