Fingerprinting of hop oil constituents and sensory evaluation of the essential oil of hop pellets from pure hop varieties and single-hop beers derived thereof

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Hops impart both bitterness and hoppy aroma to beer. In respect of hoppy aroma, late- and dry-hopping techniques are applied to prepare beers with a pronounced, varietal dependent hop aromatic character. The characteristics hoppy odour/ aroma of the final beer prepared via late- and dry-hopping is mainly determined by the hop variety used and is caused by the volatiles originally present in, or derived from, hop essential oil. In this study, we aimed at analytical and sensory characterisation of pellets from three distinctly different commercial hop varieties and six single-hop beers aromatised with these particular varieties. For each hop variety, two beers, i.e. late-hopped beer with and without an additional dry-hopping step, were brewed on a 40 hL scale.

ANALYTICAL AND SENSORY ASSESSMENT OF HOP AROMA

INTRODUCTION

Hops impart both bitterness and hoppy aroma to beer. In respect of hoppy aroma, late- and dry-hopping techniques are applied to prepare beers with a pronounced, varietal dependent hop aromatic character. The characteristics hoppy odour/aroma of the final beer prepared via late- and dry-hopping is mainly determined by the hop variety used and is caused by the volatiles originally present in, or derived from, hop essential oil. In this study, we aimed at analytical and sensory characterisation of pellets from three distinctly different commercial hop varieties and six single-hop beers aromatised with these particular varieties. For each hop variety, two beers, i.e. late-hopped beer with and without an additional dry-hopping step, were brewed on a 40 hL scale. The presented results are part of a research project of which the main objectives are (1) to find sensory and analytical correlations between hops as raw material and the beers derived thereof, (2) accurate analytical measurement of hoppy aroma of beer, (3) determination of flavour-impact compounds for hop aroma and hoppy aroma of beer, and (4) study of the stability of hoppy aroma.

CONCLUSION

All beers showed typical odour/aroma profiles which reflect the sensory characteristics of the hop essential oils. Beers hopped with VAR A or VAR B have pleasant and pronounced citrus (grapefruit) or citrus (orange)/fruity scents, respectively. The hoppy aromatic character of beers brewed with VAR C was less pronounced in terms of ‘citrus’ or fruity and was described using many descriptors (floral, hoppy, green/herbal, woody).