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HOP SCIENCE

KNOWLEDGE FOR YOUR SUCCESS

Searching the world of hops and brewing to bring you the latest news and research ... so you don't have to!

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LITTLES HELPERS FROM THE WORLD OF MICROORGANISMS

The production of alcohol free-beer is becoming more important with consumers very consciously choosing their food for a healthier lifestyle. Alcohol-free beer should be part of it, but it needs to be flavourful. This Chinese research team investigated the suitability of the yeast strain *Pichia kluyveri* var *kluyveri* for alcohol-free beer production. They found very positive sensory results if the parameters are well chosen, such as the amount of original gravity (12°P), fermentation Temperature (20,4°C) and pitching rate. This fermentation produced beers full-bodied beers with fruity aromas. I could imagine that what might still be missing here in terms of flavour could be delivered by hops and dry hopping....

X. Zhao, T. Liu, Q. Fu, S. Zhang and L. Cheng, Optimization of alcohol-free beer prepared from fermented wort by *Pichia kluyveri* var *kluyveri*: *BrewingScience*, 73 (September/October 2020), pp. 103-110

A CONTRIBUTION TO THE COMPLEXITY OF HOP FLAVOUR

A very comprehensive review about the complexity of hop aroma was written by these UK Researchers. It summarizes the state of today's knowledge and very rightly complains that "Sensory analysis has largely been neglected and only during the last two decades have researchers attempted to systematically combine sensory and instrumental methods". They found that ethanol and carbonation levels affect polarity and volatile retention or partitioning and consequently the delivery of volatiles in the breath. In addition, hop acids have been found to modify perceived aroma and flavour characteristics and intensities of the sensations imparted by hop oil volatiles. In turn, hop oil compounds also affect the perception of bitterness intensity, quality, and persistence. Moreover, the co-existence of hop derived volatiles and bitter extracts at specific ratios caused the perception of mouthfeel and trigeminal-type sensations. So yes, there is still so much to discover in hops, thankfully!

Dietz, Ch. et al: The multisensory perception of hop essential oil: a review, *Journal of the Institute of Brewing*, (wileyonlinelibrary.com) DOI 10.1002/jib.622

HOPS AND LACTIC ACID BACTERIA - ANYTHING BETWEEN FRIENDS AND ENEMIES

It is widely known that hop acids prevent certain micro-organisms from growing. This is the number one reason why hops have been used in beverages (water, wine

and today also beer) since the 12th Century (at least). This German research team now took a closer look at the effect of different hop acids on certain lactic acid bacteria. They were able to show that there is a strong inhibition of growth of all spoilage bacteria at 25 mg/L of tetrahydro-iso- α -acids closely followed by α -acids as the second most inhibitory substance. The results also showed a high resistance of *L. brevis* to all hop compounds as well as an inhibition of *L. coryniformis* and *L. buchneri* at low concentrations of most hop components. *L. lindneri* even showed increased growth in the presence of some hop compounds (rho-iso- α -acids, xanthohumol, iso-xanthohumol, humulinones). It is like in the real world, either you love hops, or you are simply not strong enough.

Michel, M. et al.: The impact of different hop compounds on the growth of selected beer spoilage bacteria in beer, *Journal of Institute of Brewing* 11 September 2020 <https://doi.org/10.1002/jib.624>



We look forward to welcoming you back to BarthHaas-Campus in 2021. The following courses can be booked as of now:

- Feb 25th, CampusArt - Brewing with Barth Haas 1
- March 4th, Bootcamp Kettle Hopping 1
- March 11th, Bootcamp Kettle Hopping 2
- March 18th, Bootcamp Kettle Hopping 3
- March 25th, CampusArt - Brewing with Barth Haas 2

For more information please visit:
<https://www.barthhaas.com/en/academy>

Do you have any questions or would you like to book your course? Please send a mail to Susanne:
susanne.hortolani@barthhaas.de

We hope that you are all safe and healthy, have a very merry Christmas 2020.

