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# HOP SCIENCE

KNOWLEDGE FOR YOUR SUCCESS

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## HOW TO ASSESS HOP AROMA?

With the increased scientific interest in hop aroma, different sensory approaches for the evaluation have been published. This talk gave an overview of the history of aroma categorization and presented a class of 12 descriptors established specifically to assess hop varieties and hoppy beers in comparison to other tasting schemes currently available. Examples of hop varieties were given to show how this tasting form is able to characterize the uniqueness of hop varieties. Also the differences of a trained and an untrained taste panels were pointed out.<sup>1</sup>

## SO WHAT IS THE DIFFERENCE BETWEEN SEEDED AND UNSEEDED HOPS?

Most of the hops available today are unseeded. However in the UK you will still find male hop plants in the hop gardens. Brewers would like to know if the presence of seeds in hops has an impact on brewing characteristics (for the good or bad). This German team of researchers have now found that neither foam characteristics nor the hop oil composition was affected in brewing trials comparing seeded and unseeded hops, but what proved to be different was the beta-glucosidase activity (higher with unseeded hops). This might eventually have an impact on the aroma development overtime with the release of bound aroma compounds in the finished beers...<sup>2</sup>

## WHAT HAPPENS TO HOP AROMA COMPOUNDS DURING BEER AGING?

In summary: a lot! However we do not know much about it so far! These German researchers analyzed hop aroma compounds of an extensive number of beer samples and came to the following conclusions: S-linalool concentration increases, also the total amount of linalool can increase. Depending on storage, a different behavior can be seen. For example an increase of alpha-terpineol and beta-damascenone and a decrease of sesquiterpenes and sesquiterpenoids along with ambient temperatures were found. The next step should be to combine these analytical findings with sensory evaluations to see if we can actually taste these differences...<sup>3</sup>

## MORE ABOUT THE HARD RESINS

We learned last month that the composition of the hard resins might contain a good portion of prenylated hop flavonoids. This article now explains how to brew with it! The authors found that both varietal dependencies and hopping regimes have an influence. Should we ever run into another shortage on alpha, we will have the hard resins to count on!<sup>4</sup>

### REFERENCES:

1. Wiesen, E.: Hop varieties and their impact on aroma differences, oral presentation at EBC congress, May 2015, <https://www.dropbox.com/sh/h9vwu3pf6bystjv/AACZrIUAlFVmLnwmlGSEpRGaa?dl=0>
2. Zarnkow, M.: Seeded and unseeded hops – a quality comparison, oral presentation at EBC congress, May 2015, <https://www.dropbox.com/sh/h9vwu3pf6bystjv/AACZrIUAlFVmLnwmlGSEpRGaa?dl=0>
3. Forster, A.: Behaviour of hop aroma substances during beer aging. <https://www.dropbox.com/sh/h9vwu3pf6bystjv/AACZrIUAlFVmLnwmlGSEpRGaa?dl=0>
4. Almaguer, C.: Comparative Study of the Contribution of Hop (*Humulus lupulus* L.) Hard Resins Extracted from Different Hop Varieties to Beer Quality Parameters, *J. Am. Soc. Brew. Chem.* 73(2):115-123, 2015, <http://www.asbcnet.org/publications/journal/vol/2015/Pages/ASBCJ-2015-0327-01.aspx>

## EVENTS



### Happy Hoppy Day

August 4th, Paddock Wood, UK

### Yakima Hops Academy & Harvest

August 26th & 27th, Yakima USA

More information and register online here:

<http://www.barthhaasgroup.com/hopsacademy/en/dates>