What about the aroma potential of glycoside-linked compounds?
These US and German researchers used spent hops from CO₂ extraction to brew beers that only differed in the point of addition of the spent hop material (in the boil, end of fermentation, after filtration) hoping that enzyme activity would produce different amounts of different monoterpenes. Though analytical differences were not significant, the sensory data showed that each beer was significantly different. While the addition at end of fermentation yielded in stronger tropical/melon like aroma, the addition after filtration showed stronger herbal/ice tea, grassy/hay and earthy/tobacco aroma. So yes, spent hops add to your hop aroma and beer, but we have not yet quantified what it is!


How spicy are oxygenated sesquiterpenoids really?
The short answer is: pretty spicy! These Belgian researchers took the sesquiterpene hydrocarbon fraction from hops and boiled it. The resulting oxygenated sesquiterpenoids were purified and added to beer resp. pitching wort. After boiling of a sesquiterpene hydrocarbon fraction from hops in water, a high number of flavour-active oxygenated sesquiterpenoids is formed. Even though their levels decrease dramatically during fermentation, some compounds are still detected via GC-O. Sensory evaluation showed that the addition of this fraction to beer intensified the ratings for woody and hoppy/spicy. However the identification of the flavour active compounds still needs to be done.


New treasures in hop bracts?
If you think that every compound in hops is known and characterised, I have to disillusion you. Though we know most of what can be found in the lupulin glands, we are pretty clueless about the rest of the hop - but perhaps not any longer! These Japanese researchers have identified 20 compounds which so far were not reported. Most of the compounds were hydrophilic glycosylated and/or esterified analogues of abscisic acids, hydroxycinnamic acids, flavonols, lignans, hydroxybenzoic acids, or carotenoids. In addition, large amounts of highly oligomeric proanthocyanidins were found. Who knows what the potential of these compounds in a health context is!


How to produce your own hop oil!
There is nothing wrong with traditional dry hopping. It is a mess and a lot of compounds don’t get extracted, but the flavours are just great. Of course there is room for optimisation. These German researchers worked with a low pressure carrier gas distillation to extract the hop oils which were then added in the final beer. The researchers took care to work in a low temperature range in order not to transform the original hop oil components. This system is seen as an alternative for dry hopping. When adding this distillate to a base beer, all important hoppy flavours increased. However, when compared to a conventionally dry hopped beer, some intensity in spicy flavours were missing. Analysis showed that myrcene, caryophyllene and humulene, when compared to the conventionally dry hopped beer, was only present in very low concentrations.


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