

THE LANGUAGE OF HOPS - PRACTICAL APPLICATIONS OF A TASTING SCHEME FOR HOP FLAVOUR

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Why Do We Need A Uniform Tasting Scheme?

Hops are the soul of beer. In the last 10 years, hop usage in the brewing industry has changed tremendously. Until then, a subtle to moderate hop aroma achieved with kettle additions was standard. Now with the importance of dry hopping and very high additions for hop aroma in the brewing process, the need for a sensory hop language is obvious. With the help of flavourists and beer sommeliers, we have developed a uniform tasting scheme specifically for hops and hoppy beers that works with 12 aroma categories as well as specific aroma attributes. This tasting scheme's result is a defined and comparable aroma profile for the relevant hop variety or beer. This tasting scheme is meant to be a standard language in the brewing industry for hops so that an easier comparison of hop varieties and hoppy beers in a sensory context is possible.

Definition: What is Aroma and Flavour?

Aroma refers to all volatile components of a food or beverage, which are in interaction with our olfactory system (especially *Bulbus olfactorius*). The aroma and flavour perception is complemented by retronasal aroma release in the oral cavity. The processing of sensory data is highly complex. The stimuli forwarded to our brain influence various regions in the brain.¹

Aroma Classification

Aroma components produce sensory impressions which are referred to as aroma. Not only the relevant stimuli but also these sensations can be classified. Both of these factors make it difficult because of the pure abundance of aromas, which is why attempts have so far been unsatisfactory. One of the early formulations was completed by Linnaeus (1756) with a classification according to the names of plants. All formulations have been working with 4 to 44 categories. In 1968, Harper established a characterizing system for the food industry based on 44 different categories. Later on, industry and institutes have selected about 160 descriptors that were used more frequently out of a pool of 800. The Harper's Scale was published in 1985 in the Atlas of Odor Character Profiles and is today seen as the standard.²

Aroma Categories and Examples of the Relevant Hop Varieties

FLORAL	CITRUS	SWEET FRUITS	GREEN FRUITS
ELLA™	MANDARINA BAVARIA	MOSAIC®	HALLERTAU BLANC
RED BERRIES	CREAM CARAMEL	WOODY AROMATIC	MENTHOL
MONROE	TRISKEL	RELAX	POLARIS
HERBAL	SPICY	GREEN GRASSY	VEGETAL
SAAZ	TAURUS	HERKULES	SUMMIT®

Barth-Haas Tasting Scheme

CATEGORY	SPECIFIC ATTRIBUTES	INTENSITY (1-10)	FOR BEER	RATING
FLORAL	Elderflower, camomile blossom, lily of the valley, jasmine, apple blossom, rose, geranium, carnation, lily, lilac, lavender		AROMA INTENSITY (1-10)	
CITRUS	Grapefruit, orange, lemon, lime, bergamot, lemon grass, ginger, tangerine		AROMA QUALITY (1-10)	
SWEET FRUITS	Banana, watermelon, honeydew melon, peach, apricot, passion fruit, lychee, dried fruit, plum, pineapple, cherry, kiwi, mango, guava		BITTER INTENSITY (1-10)	
GREEN FRUITS	Pear, apple, quince, gooseberry, white wine grape		BITTER QUALITY (1-10)	
RED BERRIES	Cassis, blueberry, raspberry, blackberry, strawberry, red currant, black currant, wild strawberry, cranberry		HARMONY (1-10)	
CREAM CARAMEL	Butter, chocolate, yoghurt, honey, cream, caramel, toffee, coffee, tonka bean, vanilla		BODY AND MOUTHFEEL (1-10)	
WOODY AROMATIC	Tobacco, cognac, barrique, leather, woodruff, incense, myrrh, resin, cedar, pine, earth		PREFERENCE	
MENTHOL	Mint, balm, camphor, menthol, wine yeast		ESTIMATED BITTERNESS (IBU)	
HERBAL	Lovage, marjoram, tarragon, dill, parsley, basil, fennel, coriander, rosemary, thyme, green tea, black tea, mate tea, sage			
SPICY	Pepper, chilli, curry, juniper, aniseed, liquorice, fennel seeds, clove, cinnamon, gingerbread, coriander seeds, nutmeg			
GREEN GRASSY	Green grassy, tomato leaves, green pepper, fresh cut grass, hay, nettle, cucumber			
VEGETAL	Celery root, celery stock, leek, onion, artichoke, garlic, wild garlic			



Descriptors and Further Attributes

The main descriptors already help us to define the main aroma and flavour of hop varieties. For a more detailed description, it is necessary to take a closer look at further attributes present in the flavour. At first glance, there are some attributes that don't remind someone of hops, however, all of these were found in one or more hop varieties available. Intensities of these attributes are to be rated on a scale of 1 to 10. For beer evaluation, additionally other specified attributes, the overall intensity of aroma and bitterness, bitterness units, bitterness quality, harmony, and body & mouthfeel can be useful information to describe the overall quality of a hop variety.

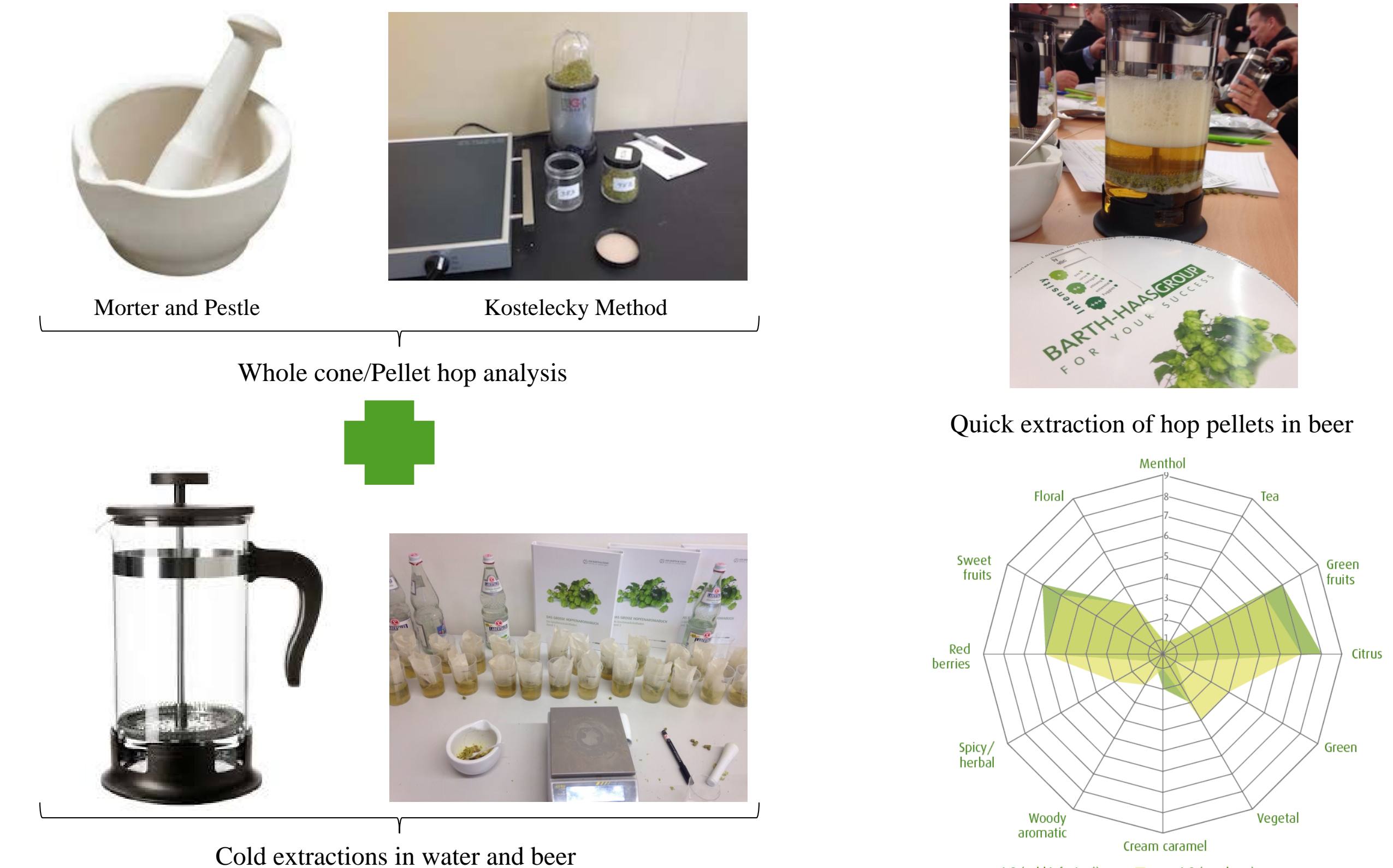
How to Implement this Tasting Scheme?

Implementing a new tasting scheme takes time to train for hop flavour based on these twelve categories. The tasting panel should be able to recognize different aromas based on the different descriptors and attributes. Many tools could be used to help train for each category including practicing with standards and also using real examples of the attributes, i.e. lemons for citrus.

This tasting scheme can be used in many different situations in the brewery. For customers, this can be used to clarify the aroma spectrum in hops. For sensory panels, this scheme should be used for profiling hops and beers. Aroma and taste is encompassed into one intensity rating ranging from 1-10. When tasting hops, 1 should be contain no aroma and 10 should be very intense amongst hop varieties. When tasting beer, intensity should be based on the corresponding beer style, i.e. American Lager should not be compared to American IPA. Furthermore, additional ratings for beer should also be rated in intensity. These include hop aroma intensity, hop aroma quality, bitter intensity, bitter quality, harmony, body and mouthfeel, preference between beers in flight and finally estimated perceived bitterness.

Methods for Profiling Hops

Whole cone and pellet hops are the first step in familiarizing a tasting panel with different hop varieties. This requires rubbing whole cone hops or using a pestle and mortar for pellets in releasing the aroma effectively. Another effective method is called "The Kostecky Method" and can be found on the John I. Haas website.³ For quick evaluations on hop aroma in dry hopped beers, a cold extraction (tea) should be created. This simulates dry hopping and is completed by dosing 2 g of hops in 200 ml of water at 20°C for a 30 minute extraction time. This can be completed using tea bags and/or a French press. The next stage is adding the same amount of hops to a base beer to achieve a quick impression of how the hops will taste in the beer matrix. These three methods can be completed in a short amount of time and are effective for training purposes.



Conclusions

The importance of using this tasting scheme is so that everyone uses the same vocabulary when talking about hops. The process to this point has taken a long time to develop and many hop varieties have been categorized according to this tasting scheme. Three different methods are presented here that can quickly be implemented to characterize hops when using whole cone and pellet hops in their original form. Furthermore, hop aroma can be evaluated in water or in beer to predict how the hop aroma will result in the final beer.

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