

Editorial

Aroma in Fermented Beverages: The Role of Non-Conventional Yeasts

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Received: August 30, 2017; **Accepted:** August 31, 2017; **Published:** September 4, 2017

Copyright: © 2017 Gamero A Aroma in Fermented Beverages: The Role of Non-Conventional Yeasts. Int J Food Sci Res; 1(1): 1-2.

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The aroma of alcoholic beverages is a key factor for product quality assessment and its acceptance by the consumers. The global aroma of fermented beverages is the result of the interaction of many different aroma compounds, either present above or below their sensory thresholds. Aromas below their sensory thresholds can sometimes be perceived due to the additive, enhancing or synergistic effects [1]. In this way, it is important not only to pay attention to the individual aromas but also to the multitude of interactions between them.

Another remarkable characteristic of the aroma of alcoholic beverages is the presence of an “aromatic buffer”, which refers to the demonstrated resistance of a particular aroma mixture to change through elimination or addition of aroma compounds [2,3]. This does not mean that such a base always bears the same aroma and has the same composition. This composition is affected by several factors, such as sugar concentration, the degree of anaerobiosis during fermentation or the yeast strain(s) carrying out the process [1].

Despite the presence of the above mentioned aromatic buffer, there are some aroma compounds or combinations of compounds that when present at certain concentration can break the buffer and give the beverage their specific aroma. This breakage can be achieved by a so called “impact compound”, a group of aroma compounds belonging to the same chemical family or an association of aroma compounds sharing a generic descriptor (such as ‘fruity’ or ‘floral’) [1].

As commented above, one of the most important factors determining the global aroma of a particular fermented beverage is the yeast strain(s) carrying out the process. Nowadays, most of the commercial alcoholic beverages are produced through the action of the species *Saccharomyces cerevisiae*. However, there are hundreds of other different species participating in spontaneous fermentations and presenting an enormous potential to be isolated and characterized in order to be used to develop new products [4]. These are the so called “non-conventional yeasts”.

The non-conventional yeasts play a crucial role in the aroma development of a great deal of fermented beverages such as wine, beer, cider, sake or other traditional products. Some examples of these yeasts are the genera *Candida*, *Debaryomyces*, *Hanseniaspora*, *Hansenula*, *Kloeckera*, *Metschnikowia*, *Pichia*, *Kluyveromyces*, *Schizosaccharomyces*, *Torulaspora*, *Zygosaccharomyces*, *Rhodotorula* and *Saccharomycodes* [6].

Yeasts can either produce or release multitude of different aromas belonging to different chemical families: higher alcohols, acetate esters, ethyl esters, aldehydes, ketones, organic acids, volatile phenols, sulfur compounds, monoterpenes and volatile thiols [5,6]. In this way, besides *de novo* synthesis, sometimes this aroma enrichment is achieved through the conversion of non-volatile aroma precursors. For example, certain yeasts can release glycosylated monoterpenes through the action of glycosidases and/or release cysteinylated thiols employing cysteine lyases. Thanks to the action of these enzymes the compounds become volatile and their aroma can be perceived, making the aroma more complex and full of different aromatic nuances [7,8].

There is a huge quantity of research works regarding the influence of yeast in beverages such as wine, beer or cider. However, in the case of other traditional alcoholic beverages the literature is scarce and difficult to access. There are works that describe the yeast isolated or the aromas found, however very few analyze the specific role of each species in this sense. So more research is necessary in this regard. The detailed study of the pairing yeast-aroma could have its application in the industrialization of beverages currently limited to local market. This would lead to process control and the possibility of economic development in certain developing regions. Furthermore, the knowledge of the aromatic potential of alternative yeast species could have an application in the

biotechnological innovation in terms of the development of new products presenting innovative aromas.

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