Production of Novel Beverages by Fermentation of Wort by Edible Basidiomycetes

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The per capita consumption of beer has declined in Germany in recent years from 141 L in 1991 to 105 L in 2009 [1]. Breweries are thus eagerly searching for innovations to broaden their product portfolio and to stop this negative trend. Sought-after are especially alcohol-free and clean-label refreshments.

In an industry-academia partnership fungi of the class of basidiomycetes were employed for the fermentation of wort. Based on their unique biochemical potential, their non-toxicity, their aerobic growth, and their ability to form complex flavor mixtures, edible mushrooms represent ideal candidates for the development of novel fermentation concepts [2, 3].

In a broad screening, numerous preselected basidiomycetes were cultured in wort for up to 25 h at 24 °C and 150 rpm. Every few hours samples were taken and evaluated sensory. The favored cultures were liquid-liquid extracted, and the aroma compounds were analyzed by gas chromatography/olfactometry (GC/O). The formed flavors were identified by means of GC-mass spectrometry, and their identity was confirmed by comparison with authentic standards.

The cultivation of basidiomycetes in wort generated highly interesting novel beverages with fruity, green and bloomy flavors. Completed may the beverages be by a co-cultivation with pro-biotic bacteria, which add a sour note to the beverage by formation of lactic acid.

[1] Statistisches Bundesamt: *Arbeitsunterlagen zu den Verbrauchsteuerstatistiken-Zeitreihe für die Berichtsjahre 1991 bis 2009.* In: *Finanzen und Steuern.* Wiesbaden 11. Juni 2010, 4.

[2] Abraham, B. G.; Berger, R. G. Higher Fungi for Generating Aroma Components through Novel Biotechnologies. J. Agric. Food Chem. 1994, 42, 2344–2348.

[3] Berger, R. Biotechnology of flavours—the next generation. Biotechnology Letters 2009, 31, 1651–1659