

TITLE: BEER DEVELOPMENT FROM HYBRID CULTURE: KOMBUCHA AND BEER CULTURE

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ABSTRACT:

Kombucha is a beverage produced by fermenting sugary *Camellia sinensis* tea using a symbiotic culture of bacteria and yeast. Kombucha consumption has been associated with some health effects. The use of unconventional yeasts can be an interesting source of biodiversity for the development of fermented beverages, including beer. The study aimed to produce beer using a combination of kombucha starter culture and commercial beer yeast. Three trials were carried out to develop the malt wort drink. The control (C) only had the presence of the commercial yeast *Saccharomyces cerevisiae* as starter culture, the KL medium was composed of *S. cerevisiae* and kombucha culture, while the K medium was composed only of kombucha culture. The pH and density parameters of the must were evaluated every 48h along the fermentation time. The microbial count (total yeasts and bacteria) of the assays was carried out, in the initial and final time of fermentation. Monitoring of carbohydrates (glucose, fructose, maltose and maltotriose), alcohol (ethanol) and organic acids (acetic acid, lactic acid, malic acid, succinic acid, citric acid) were performed during fermentation, using high-performance liquid chromatography (HPLC). The content of total phenolic compounds and the antioxidant capacity in the final beverages were evaluated. The results showed that the fermentation of malt substrate by kombucha culture under anaerobic conditions is able to efficiently metabolize monosaccharides (glucose and fructose), and more slowly maltose and maltotriose into alcohol and organic acids. The kombucha culture assay produced lower ethanol (ABV 2.0%) concentration than the Control assay (ABV 5.5%), in addition to producing smaller amounts of acetic acid compared to the usual kombucha fermentation found in the literature. Higher concentrations of lactic acid were observed in kombucha assay than in the control fermentation, suggesting that the fermentation in closed bottles, using kombucha as inoculum, can be related to the presence of heterofermentative lactic bacteria. All beverages showed similar content of total phenolic compounds and antioxidant activity. These results show that it is possible to produce beer using kombucha culture, however, more evaluations are needed to adjust the fermentation parameters and evaluate the acceptance of the final product by the consumers.

Keywords: Craft beer; Fermentation; Organic acids; Phenolic compounds; Kombucha

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