

## Evaluating the Potential of Using *Lactobacillus plantarum* for Non-alcoholic Kombucha Production with Ceylon Tea

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The health benefits of tea could be improved by processing it into a functional beverage like kombucha. Traditionally kombucha is produced using a symbiotic culture of bacteria and yeast. The current study was conducted to determine the potential of using an improved method for developing a non-alcoholic kombucha product. New kombucha was developed with selected Ceylon tea using *Lactobacillus plantarum* freeze-dried culture, with a nutrient substrate, and sugar. A range of kombucha was developed using Ceylon black tea high-grown (BTHG), black tea low-grown (BTLG), green tea (GT), and herbal tea (Ginger, moringa, rampe, and lemongrass). Preliminary trials were conducted to identify the correct formulation and process conditions with the best sensory profile for the modified method of kombucha production. All samples and 2 market available Kombucha samples (controls) were analyzed for pH (an electronic pH meter), total titratable acidity (potentiometric titration), total soluble solids (TSS; refractometer), alcohol (ebulliometer), and color parameters (colorimeter). The sensory properties (color, aroma, sweetness, mouthfeel, sourness, and overall acceptability) of kombucha were evaluated using a 7-point hedonic scale with 30 semi-trained panelists. BTHG - dust, BTLG- pekoe, GT- gun powder one (GP1), and lemongrass had the highest acidity among each tea type (range 0.24 - 0.51% w/v lactic acid). The market kombucha samples had significantly lower ( $P < 0.005$ ) TSS (range 3.90 - 4.20 °Brix) compared to all developed samples. BTHG-Flowery Broken Orange Pekoe, BTLG-dust, GT-GP1, moringa, and lemongrass teas had the highest Brix values (range 5.00-5.90 °Brix). No alcohol was detected in the developed kombucha samples. BTHG and BTLG-Broken Orange Pekoe, GT-Sencha, and Ginger kombucha had the highest preference based on overall acceptability. Future studies should focus on the changes in the major chemical components of kombucha during the fermentation process and the functional properties of the product developed with this modified method.

**Keywords:** Fermented tea, Kombucha, *Lactobacillus plantarum*, Non-alcoholic beverage

*The support received from the Aletek International (Pvt) Ltd. is greatly acknowledged*

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