

The Effect of White Sugar, Palm Sugar and Stevia on Characteristics of Kombucha

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Structured Abstract

Background: Kombucha, a fermented tea drink known for its health benefits, is generally made with white sugar as the sweetener. However, the effects of other sweeteners, such as palm sugar and stevia on kombucha's physicochemical and sensory qualities have yet to be investigated. The beverage was produced by fermenting sweetened tea with a symbiotic bacterium and yeast culture (SCOBY). The fermentation process produces organic acids and probiotics give kombucha its acidic flavour.

Methods: This study examines the impact of various sweeteners on kombucha by measuring pH, total soluble solids, colour, acidity, phenolic and flavonoid content, antioxidant activity, and sensory acceptance throughout a 10-day fermentation period. The experimental approach entails creating kombucha with three different formulations: white sugar (KWS), palm sugar (KPS), and stevia (KS). Measurements were taken at regular intervals (days 0, 3, 7 and 10) to monitor changes throughout fermentation. Statistical analyses were used to compare changes between sweeteners and fermentation intervals.

Results: Results show that the type of sweetener significantly ($p < 0.05$) affects kombucha fermentation and properties. White sugar resulting in a balanced flavour and significant pH drops (3.42), and taste qualities. Palm sugar adds nutrients, increases phenolic (34.01 mg GAE/mL) and flavonoid content (764.67 μ g QE/mL), and gives a caramelised flavour, but with slower acid production (8.21 g/L). Stevia, a non-fermentable sweetener, delays fermentation and produces low-calorie kombucha. Antioxidant activity decreased across all formulations, with stevia initially showing the highest activity (94.85%). Volatile compound profiles and sensory preferences highlight the role of sweeteners in customising kombucha to meet diverse customer preferences and health benefits.

Conclusion: In conclusion, the study analysed the physicochemical features of kombucha made with white sugar, palm sugar, and stevia, revealing that the type of sweetener significantly impacts the fermentation process. White sugar produces a mild kombucha, while palm sugar increases mineral content and offers a complete nutritional profile. Stevia produces low alcohol concentration and acidity, appealing to health-conscious consumers. The sensory qualities of kombucha were also influenced by the sweetener used, with palm sugar being the most preferred and fermentation time being 7 days.

Keywords: Fermented Tea, Palm Sugar, Stevia, Sweetener, White Sugar

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