

## Banana Vinegar Production and Evaluation of Antioxidant and Polyphenol Activity

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### Abstract

Vinegar is one of the popular and major culinary ingredient in Sri Lanka since ancient times. The main raw material of Sri Lankan vinegar is coconut water. In Sri Lanka, the sole use of vinegar is for cooking purposes. The concept of drinking fruit vinegar that is rich in many secondary metabolites such as antioxidants, is novel to Sri Lanka. Thus, the current study was conducted to, develop a drinking fruit vinegar from the banana variety 'Ambul' that licit great post-harvest losses. In this study, we intended to test two vinegar production methods as continuous (M1) and semi- continuous (M2) fermentation at ambient temperature using a locally isolated *Acetobacter pasteurinus* strain (PP21) which was isolated from papaya (*Carica papaya*). In both M1 and M2 fermentations, the extracted banana juice was adjusted to 20° brix and fermented by adding yeast (*Saccharomyces cerevisiae*) and *Acetobacter* strain PP21. In M1 method, both yeast and acetic acid bacteria were added together at the beginning of fermentation and, in M2 method, the AAB strain was added after 03 days of ethanol fermentation and were allowed to ferment for seven days. The acetic acid yield of each method was determined. At the end of the fermentation, M1 method gave an acetic acid yield of 47.8 g/L and the M2 method yielded 33.5 g/L at the fourth and seventh day of fermentation, respectively. At the stage of peak acetic acid production, the TS content of M1 and M2 were found to be 9.78 mg/mL and 3.54 mg/mL, respectively. The EC 50 value for antioxidant activity of both M1 and M2 were found to be 6.56 and 35.19 respectively, and the total phenolic content of both vinegar types were found to be 680.43 (GAE/L), 216.67 (GAE/L), respectively. Further, successful production of mother vinegar was observed in banana vinegar developed through M1 method, which may be the main reason for higher values of bioactive products in vinegar from M1 method. Thus, as a whole, 'Ambul' banana variety can be used in production of drinking vinegar. Further analysis of the product need to be done, including sensory analysis and further development, to develop the product up to the level of consumption.

**Key words:** *Acetobacter pasteurinus*, Fermentation, Total phenolics, Vinegar mother

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