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Effects of Lactic Acid Fermentation on the Physicochemical Properties of Watery Rose Apple (*Syzygium aqueum*) Juice

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Structured Abstract

Background: The watery rose apple (*Syzygium aqueum*) plant is a local fruit that has anti-inflammatory, antimicrobial and antioxidant properties; its tree bark and leaves often used in traditional medicine, with little research about the properties of the fruit itself. Although its year-round season and high-water content of the fruit can be advantageous, it is easily perishable and contribute to domestic food waste. To overcome this, lactic acid fermentation which is a method employing use of lactic acid bacteria (*Lactobacillus plantarum*) may help in reducing loss of a potential valuable local produce and increases bioavailability of the fruit juices' beneficial properties. The purpose of this study is to investigate the suitability of watery rose apple juice as substrate for *L. plantarum* in lactic acid fermentation, and its prospect as a new dairy-free probiotic drink while contributing to sustainability.

Methods: The procedures involved blending, straining and pasteurisation of watery rose apple juice, followed by addition of freeze-dried *Lactobacillus plantarum* powder in three different amounts. The juice undergoes fermentation for 72 hours at 37°C.

Results: This study shows that lactic acid fermentation of watery rose apple juice using *L. plantarum* is suitable as it increases the fruit juices' antioxidant properties when compared to unfermented control throughout 4 weeks storage. Additionally, all fermented juice proved to be viable as probiotic due to colony count of 10^7 log cfu/mL from day 0 to day 28 of keeping time. Colour of fermented juice also saw change after fermentation and during storage period, with increase in redness and luminosity. The LAB fermented watery rose apple juice undergoes decrease in pH and reducing sugar content due to metabolisation of sugar into lactic acid.

Conclusion: In conclusion, the findings of this study indicated that there is considerable potential in developing lactic acid fermented juice using watery rose apple, offering new dairy-free probiotic drink to satisfy demands of consumers affected by dietary restrictions.

Keywords: Lactic Acid Fermentation, Watery Rose Apple (*Syzygium aqueum*), Dairy-free probiotic drink, *Lactobacillus plantarum*

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