

Title : Microbial production of prebiotic syrup from longan

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ABSTRACT

Common syrups are typically made from glucose and fructose, which are high-calorie sweeteners. Consuming these syrups often raises blood sugar levels, increasing the risk of health problems. Developing sweeteners that retain sweetness but provide lower energy is therefore an interesting area of study. Neokestose, a short-chain prebiotic fructooligosaccharide, is a sweetener that offers certain advantages over commercial kestose, such as stability under varying temperatures and pH levels in the digestive system. Neokestose can be synthesized from sucrose through the activity of 6G-fructofuranosidase or by fermentation using the yeast *Xanthophyllomyces dendrorhous*. Fresh longan is a suitable raw material as it primarily contains sucrose, making it ideal for producing low-energy, prebiotic fructooligosaccharide sweeteners. This research aimed to produce a prebiotic syrup containing neokestose from longan using a fermentation method. Longan juice was extracted and analyzed for its sugar content using high-performance liquid chromatography. The results showed that the longan juice contained 199.52 g/L sucrose, 22.13 g/L fructose, and 22.40 g/L glucose. The extracted longan juice was directly fermented with the yeast *X. dendrorhous* TISTR 5730 at 20°C for 24 hours, resulting in a fermented syrup with the following sugar composition (in g/L): 160.30 g/L neokestose, 29.65 g/L fructose, and 30.11 g/L glucose. The optimal temperature for syrup preparation was studied using vacuum evaporation to achieve a syrup with a total solid content of at least 90% of the total weight. It was found that a temperature of 50°C was ideal for syrup preparation, as it preserved the yield of neo-kestose (1,418.47 g/L). Using higher temperatures resulted in a loss of neo-kestose yield. The syrup's color was measured using the CIELAB system, with the following results: $L^* = 60.79$, $a^* = 25.14$, and $b^* = 65.74$. The viscosity of the syrup was measured at 27,535.6 centipoise.

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