ABSTRACT

Muhammad Adam Permana Putra. 24020121140186. Optimization of Inoculant Type and Growth Conditions on the Nutraceutical Content of Fermented Salak Pondoh Fruit Juice (*Salacca zalacca* (Gaertn.) Voss). Under the guidance of Anto Budiharjo, and Toga Pangihotan Napitupulu.

Non-dairy fermented beverages made from tropical fruits such as salak pondoh have high potential as health drinks and alternative beverages for people with lactose intolerance. However, optimization of *Lactobacillus plantarum* and *Pichia kluyveri* inoculants in salak-based fermented beverages is still very limited. This study aims to investigate the optimization of inoculant types and growth conditions (pH value, sucrose concentration, fermentation time) on the nutraceutical content of fermented salak pondoh fruit juice (*Salacca zalacca* (Gaertn.) Voss). The experimental design used a Completely Randomized Design (CRD) with 3 types of inoculants (*Lactobacillus plantarum*, *Pichia kluyveri*, and their combination), as well as growth conditions (pH value, sucrose concentration, fermentation time), and was repeated 3 times. The parameters observed included pH value, microbial viability, invertase enzyme activity, and volatile compounds detected by GC-MS analysis. Statistical analysis using the Response Surface Method (RSM) showed that fermented salak pondoh fruit beverage with the combined inoculant, pH value of 4.9, sucrose concentration of 5.25%, and fermentation time of 79 hours produced the highest invertase enzyme activity, as well as a more complex and health-beneficial volatile compound profile. The interaction between bacteria and yeast (BFI) plays an important role in increasing the nutraceutical content. In conclusion, optimization of inoculant type and growth conditions (pH value, sucrose concentration, fermentation time) significantly affects ($p \leq 0.05$) the nutraceutical content of fermented salak pondoh fruit drinks.

Keywords : Lactobacillus plantarum, Pichia kluyveri, invertase enzyme activity, response surface method, GC-MS