

ABSTRACT

Aurelia Oktavianty. 24020222120008. **Optimization of Isoamyl Acetate (Banana Bioflavor) Production Media by *Pichia kluyveri* InaCC Y1460 Using Response Surface Methodology** under the guidance of Siti Nur Jannah and Haniyya.

Isoamyl acetate is a banana-flavored ester compound widely used as a bioflavor in the food and beverage industry. The production of isoamyl acetate using yeast is a more environmentally friendly alternative compared to chemical synthesis. This study aims to determine the best local yeast strain for isoamyl acetate production and optimize defined production media using Response Surface Methodology (RSM) with a Box-Behnken Design (BBD) of 15 experimental designs. Strain selection was carried out qualitatively using Headspace Gas Chromatography (HS-GC) on 10 yeast strains, namely *Williopsis saturnus* InaCC Y762, *Williopsis saturnus* InaCC Y917, *Pichia kluyveri* InaCC Y1093, *Pichia kluyveri* InaCC Y1460, *Pichia fermentans*, *Torulaspora delbrueckii* InaCC Y1248, *Pichia kudriavzevii* InaCC Y650, *Kluyveromyces marxianus* InaCC 119, *Saccharomyces kluyveri* Y97, and *Saccharomyces* sp. The results of this study showed that *Pichia kluyveri* InaCC Y1460 produced the highest isoamyl acetate peak area so it was selected for the production media optimization stage. Optimization was carried out on three variables, namely the concentration of isoamyl alcohol, $(\text{NH}_4)_2\text{SO}_4$, and MgSO_4 , with the response being the production of isoamyl acetate. The optimization results showed that the best conditions were obtained at a concentration of isoamyl alcohol of 0.5 g/L, $(\text{NH}_4)_2\text{SO}_4$ 3 g/L, and MgSO_4 1.21 mg/L with an isoamyl acetate production of 0.216 g/g DCW . This value increased by 2.32 times compared to the conditions before optimization, namely at a concentration of isoamyl alcohol of 0.5 g/L, $(\text{NH}_4)_2\text{SO}_4$ 3 g/L, and MgSO_4 0.41 mg/L with a production of 0.093 g/g DCW . These results indicate that media optimization using RSM is able to increase the production of isoamyl acetate by *Pichia kluyveri* InaCC Y1460.

Keywords : *Isoamyl acetate, Response Surface Methodology, Yeast*