



SCREENING OF LACTIC ACID PRODUCTION FROM SOLID PINEAPPLE WASTE USING RHIZOPUS ORYZAE VIA SOLID STATE FERMENTATION

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ABSTRACT

Pineapple waste is one of the most abundant agricultural wastes found in tropic region. Continual recycling of the solid agricultural waste promotes sustainable biological systems while reduces the cost of managing the solid waste problem. Utilisation of solid waste for the production of value added product has been less reported compared to that of liquid wastes. This study is looking into the potential of utilising solid pineapple waste in solid state fermentation for the production of lactic acid by *Rhizopus oryzae*. A 2-level factorial design was employed to screen the effect of moisture content (60% and 80%), inoculum size (1×10^4 spores/mL and 1×10^8 spores/mL), pH (4.5 and 6.5), temperature (27°C and 40°C) and particle size (<0.5 mm and >3.15 mm) to the production of lactic acid. The maximum production of 0.2211 g/L lactic acid was predicted in SSF condition of 80% moisture at pH 6.5, added with 1×10^4 spores/mL inoculum, with waste particle of 2.0 mm, incubated at 27°C. Analysis of variance (ANOVA) showed that the model is significant with high value of predicted (0.9581) and adjusted (0.9726) R-squared, indicated to a good agreement between the predicted and actual values at each point of the experiment. Post-statistical experiment confirmed the ability of lactic acid production by *R. oryzae* at the predicted conditions with 0.2367 g/L lactic acid being produced. Finding from this study shows the potential use of solid pineapple waste for the production of value-added product and opens opportunity for further investigation.

Keywords — pineapple waste; lactic acid; solid state fermentation; 2-Level factorial; *Rhizopus oryzae*