BIOETHANOL PRODUCTION VIA FERMENTATION OF PINEAPPLE CROWN WITH *SACCHAROMYCES CEREVISIAE*

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Final Year Project Report Submitted in Partial Fulfilment of the Requirement for the Bachelor of Science (Hons.) Chemistry With Management in the Faculty of Applied Sciences Universiti Teknologi Mara

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This Final Year Project Report entitled "**Bioethanol Production via Fermentation of Pineapple Crown with *Saccharomyces Cerevisiae***" was submitted by Nor Eirina Binti Mohd Zulkernain in partial fulfilment of the requirements for the Degree of Bachelor of Science (Hons.) Chemistry with Management, in the Faculty of Applied Sciences, and was approved by

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ABSTRACT

Bioethanol Production via Fermentation of Pineapple Crown with *Saccharomyces Cerevisiae*

The growing demand for sustainable energy has sparked interest in bioethanol production from renewable resources. This study investigates the potential of an agricultural waste product, pineapple crown as a substrate for bioethanol production via fermentation using *Saccharomyces cerevisiae*. The pineapple crown's composition, rich in fermentable sugars, makes it a promising raw material. Pretreatment processes using acidic solution were employed to enhance sugar availability by breaking down complex structures within the substrate. This step was followed by enzymatic hydrolysis to further degrade the substrate into simpler sugar. The fermentation was then carried out under optimized conditions with fermentation time chosen as the key parameter influencing yield of the process. The bioethanol yield was quantified using Ultraviolet-Visible Spectroscopy (UV-VIS), while Fourier Transform Infrared Spectroscopy (FTIR) was used for analyse structural composition. Finding indicates at 48 hours, the bioethanol yield reaches its peak, yielding 899 mg/L bioethanol. Then beyond 48 hours, bioethanol yield was declined. This finding also indicates that pineapple crowns can serve as an effective and cost-efficient substrate, contributing to renewable energy generation and waste valorisation. Additionally, this study highlights the dual advantages of reducing agricultural waste and advancing bioethanol production as a cleaner energy alternative.