

## ORAL PRESENTATION 2

### Optimization of Parameters Affecting Bioethanol Production from Oil Palm Frond Juice by *Saccharomyces cerevisiae*

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Oil palm frond (OPF) juice has been identified as a good candidate to replace commercial sugars for the production of value-added products such as poly(3-hydroxybutyrate), P(3HB) and bioethanol. The aim of this research was to investigate the effect of sterilization, temperature, initial pH medium and agitation speed on the production of bioethanol in shake flasks experiments using *Saccharomyces cerevisiae* Kyokai No. 7. One-factor-at-time (OFAT) method was employed to screen the best condition of parameters which affecting the production of bioethanol. This was followed by optimization of fermentation process of bioethanol production by using response surface methodology (RSM) to explore the response pattern. A five-level-three-factor central composite design (CCD) was employed in this study and the central point of each process variable was chosen based on the best condition obtained from the OFAT method. The optimum condition for bioethanol production from OPF juice was achieved at pH 7.77, temperature of 33.3°C and agitation speed of 91 rpm. Based on the validation experiment, the optimum bioethanol yield obtained was 76.30% and this value was in close agreement with the model prediction, with a difference of only 1.04%. Under the optimal conditions, the bioethanol yield obtained was 15.54% higher compared to non-optimized condition. The promising yield obtained in this study suggested that OPF juice can be used as a fermentation feedstock for bioethanol production.

**Keywords:** Oil Palm Frond Juice; One-Factor-At-Time; Bioethanol; Response Surface Methodology; Central composite design