

# **Biodiesel Production from Waste Palm Cooking Oil Using Immobilized *Candida rugosa* Lipase**

## **ABSTRACT**

Biodiesel production from Waste Palm Cooking Oil (WPCO) is of interest to substitute fossil derived diesel fuel, due to its renewable nature, cleaner emissions, and non-toxic properties. Thus, in this study, biodiesel production through transesterification process was optimized using immobilized lipase from *Candida rugosa* and WPCO collected from the faculty's cafeteria as a feedstock. Interaction between five operating factors: molar ratio of ethanol to oil, water content, lipase loading, reaction temperature and time on the biodiesel yield were investigated. It was observed that, with the optimal conditions of 10:1 molar ratio of ethanol to oil, 1 g water, temperature 40 °C, 0.8 g immobilized lipase and 32 h reaction time, a yield of 85.72% of biodiesel could be achieved. Thus, this study shows that WPCO, an environmental waste, can be utilized as a promising feedstock for biodiesel production using environmentally friendly biocatalysts such as immobilized lipase.