

## **Bioconversion of restaurant waste into polyhydroxybutyrate (PHB) by recombinant *E. coli* through anaerobic digestion**

### **ABSTRACT**

The effect of temperature (30°C, 37°C, uncontrolled) and initial pH adjustment at pH 7 in the anaerobic digestion process was investigated to enhance the production of organic acids from restaurant waste. The highest organic acid level obtained was 39.6 g/L on the fifth day of fermentation conducted at 30°C and initial pH 7. The acids produced corresponded to 39.4% of the yield based on the initial concentration of substrate. The main organic acids produced were lactic and acetic acids. Using organic acids from fermented restaurant waste, recombinant *Escherichia coli* pNDTM2 gave PHB concentration, PHB content and PHB productivity of 9.2 g/L, 44% w/w and 0.54 g/L/h, respectively, in a pH stat fed-batch culture.

**Keyword:** Anaerobic digestion; Organic acids; Polyhydroxybutyrate; Restaurant waste