

## **Biohydrogen production by *Clostridium butyricum* EB6 from palm oil mill effluent**

### **ABSTRACT**

A hydrogen producer was successfully isolated from anaerobic digested palm oil mill effluent (POME) sludge. The strain, designated as *Clostridium butyricum* EB6, efficiently produced hydrogen concurrently with cell growth. A controlled study was done on a synthetic medium at an initial pH value of 6.0 with 10 g/L glucose with the maximum hydrogen production at 948 mL H<sub>2</sub>/L-medium and the volumetric hydrogen production rate at 172 mL H<sub>2</sub>/L-medium/h. The supplementation of yeast extract was shown to have a significant effect with a maximum hydrogen production of 992 mL H<sub>2</sub>/L-medium at 4 g/L of yeast extract added. The effect of pH on hydrogen production from POME was investigated. Experimental results showed that the optimum hydrogen production ability occurred at pH 5.5. The maximum hydrogen production and maximum volumetric hydrogen production rate were at 3195 mL H<sub>2</sub>/L-medium and 1034 mL H<sub>2</sub>/L-medium/h, respectively. The hydrogen content in the biogas produced was in the range of 60-70%.

**Keyword:** Biohydrogen; *Clostridium butyricum* EB6; Palm oil mill effluent (POME)