

The production of polyhydroxyalkanoate from anaerobically treated palm oil mill effluent by *Rhodobacter sphaeroides*

ABSTRACT

Palm oil mill effluent (POME) was first subjected to anaerobic treatment for production of organic acids, particularly acetic and propionic acids, and later used for the production of polyhydroxyalkanoate (PHA) by a photosynthetic bacterium, *Rhodobacter sphaeroides* (IFO 12203). However, no PHA was produced by *R. sphaeroides* in the POME treated anaerobically which included sludge particles. On the other hand, after removal of the sludge, the PHA was continuously produced. At a dilution rate of 0.072 d⁻¹, more than 1.0 g of PHA l⁻¹ could be obtained from anaerobically treated POME containing 5.5 gl⁻¹ of organic acids, corresponding to more than 30% of the dry cell weight. At a dilution rate of 0.024 d⁻¹, more than 2 g of PHA l⁻¹ could be obtained from POME containing 15 gl⁻¹ of organic acids, corresponding to more than 60% of the dry cell weight.

Keyword: Polyhydroxyalkanoate; PHA; *Rhodobacter sphaeroides*; Photosynthetic bacteria; Wastewater treatment; Palm oil mill effluent; Palm oil; Sludge