

Production of polyhydroxybutyrate from oil palm empty fruit bunch (OPEFB) hydrolysates by *Bacillus cereus suaeda B-001*

ABSTRACT

Polyhydroxybutyrate (PHB) is a biodegradable polymer accumulated in intracellular granules by numerous bacteria. Its physical and chemical characteristics are like those of petrochemical plastics. PHB is produced mainly by gram-negative bacteria such as *Ralstonia eutropha*, which have lipopolysaccharides that co-purify with the PHB and cause immunogenic reactions, limiting their use for biomedical applications. PHB produced from gram-positive bacteria such as *Bacillus* spp. do not have lipopolysaccharides, which makes it suitable for bio-medical application. The aim of this work was to evaluate the ability of *Bacillus cereus suaeda B-001* to accumulate PHB using oil palm empty fruit bunch (OPEFB) hydrolysate as the sole carbon source, comparing it to commercial glucose as the control. OPEFB was chemically pre-treated using an acid-hydrolysed process by sulphuric acid and neutralized by a NaOH solution to obtain reducing sugars. PHB biopolyester accumulated to 43.1% of cell dry weight with glucose at 15 g/L as the sole carbon source, and PHB accumulated to 55.4% of cell dry weight using OPEFB hydrolysates at 20 g/L. The conversion of OPEFB acid hydrolysates to PHB using the gram-positive bacteria *Bacillus cereus suaeda B-001* has not been reported.

Keyword: Polyhydroxybutyrate; Oil palm empty fruit bunch; *Bacillus cereus suaeda B-001*; OPEFB acid hydrolysate