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Section D: Development of Biotechnological Process

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Three Carbon Sources for the Production of Polyhydroxyalcanoates (PHAs) by The Native *Bacillus cereus*

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Abstract. PHA has properties similar to synthetic plastics and are bio-compatible making it a sustainable and environmental-friendly biomaterial. *Bacillus cereus* PHA-4 was isolated from garden soil in Mexico, inoculated in nutritive broth supplemented with 0.5% w/v of three differents carbon sources in order to study PHA production. The polymer was extracted from the cells using the sodium hypochlorite and chloroform method. Biomass and PHA content were estimated by gravimetric techniques. The production of PHA ranged between 0.0474 – 0.17 g/L. The higher production was observed with sugar as carbon source. Other materials, such as citric acid, glucose, glycerol, succinic acid, valerate, sucrose have been reported to be used by *Bacillus sp* for PHA production. To date, there are no studies about a *Bacillus cereus* strain using methanol and sunflower oil as carbon source for PHA production. The FTIR results showed typical bands and signals of polyhydroxybutyrate (1730, 2960, and 1230–1050 cm^{-1}). The native *Bacillus cereus* PHA-4, can use sugar and alcohols as unique carbon source for PHA production. The isolation and study of new strains capable of utilizing wide range of carbon source is essential for the biomaterials industries.

Keywords: polyhydroxyalcanoates, *Bacillus cereus*, biodegradable polymer, biomaterials

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