



Optimization, Purification and Characterization Of Polyhydroxybutyrate (PHB) Produced By *Bacillus Cereus* Isolated From Sewage

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Abstract: Background of study: The biologically synthesized biodegradable polymers are a suitable alternative to counter the various environmental problems modelled by conventional non-biodegradable plastics. Polyhydroxybutyrate (PHB) is the simplest and commonest member of Polyhydroxyalkonates (PHA).

The present study aimed to investigate the isolating PHB producing bacteria from domestic sewage and its production with cheap sources or waste products.

Materials and Methods: Domestic sewage samples, isolated pure cultures of bacteria were screened for PHB production by Sudan Black staining. The selected isolate was identified by 16S rRNA typing. The efficiency of PHB production by fermentation was increased by optimizing the various associated process parameters and media components like incubation time, temperature, pH, carbon, nitrogen sources and an alternatively Cheap sources was substituted other than commercial salts that gives the maximum yield also were explored. PHB production was confirmed by Fourier transform infrared spectroscopy.

Results: *Bacillus cereus* gives the maximum production rate compared with the other bacterial strains. The PHB has been confirmed by FTIR with the strong peak at 1723cm^{-1} is one of the characteristic peak of Polyhydroxybutyrate along with it various other peaks also confirms the presence of PHB in the sample. Agro and fruit pulp waste was used as alternative substrate for the growth of the bacteria producing polyhydroxylbutyrate, it gave the best result of production.

Conclusion: *Bacillus cereus* sewage isolates, efficiently synthesized PHB using various cheap sources and fruit pulp proves an alternative and better way of synthesizing biodegradable bioplastic.

Keywords: Agro waste, FT-IR, PHB, Optimization, Sudan Black staining.