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PHB Production from Dairy Industry Soil Isolates using Whey as Carbon Source

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Abstract: *PHB producing bacterium was isolated from dairy industry soil. Identification was performed by Sudan black B and Nile blue A staining. PHB production was performed by using whey as sole carbon source with minimal medium. Comparative production using pure sugars as carbon source was also carried out. Molecular characterization of most efficient producer was done by 16S rRNA sequencing. The strain was identified as Bacillus cereus (NCBI Accession number- MZ605040). Effect of different parameters on production was also carried out and it was found that maximum production (54%) takes place with 3% of whey at pH 7 and temperature 35°C after 48 hours. On comparison with pure sugars, efficient production was observed with whey. The formed PHB was initially confirmed by UV-VIS spectrophotometry with maximum absorbance at 235nm confirmed by FTIR, GCMS, LCMS, HPLC, DSC, 13C- NMR, 1H-NMR. Biodegradation studies of produced polymer were also carried out and the polymer was found to be completely biodegradable in both in vivo and in vitro conditions. The present investigation aims to isolate and identify potent PHB producers on a cheap and easily available carbon source that is whey.*

Keywords: PHB, 16S rRNA Sequencing, Bacillus cereus, FTIR, GCMS, LCMS, DSC, ^{13}C- NMR, ^{1}H-NMR.

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