INDO GLOBAL JOURNAL OF PHARMACEUTICAL SCIENCES
ISSN 2249- 1023

Exploitation of a Local Isolate, *Brevibacillus Invocatus* MTCC 9039 for Production of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) co-polymer

Indu Singh Sankhla [1*], Akhilesh Kumar Singh [2], Nirupama Mallick [3]

[1] *Department of Botany, University of Rajasthan, Jaipur-302004, Rajasthan, India*

[2] *Amity Institute of Biotechnology, Amity University, Uttar Pradesh, Lucknow-226010, India*

[3] *Agricultural & Food Engineering Department, Indian Institute of Technology Kharagpur-721302, West Bengal, India*

Address for Correspondence: Indu Singh Sankhla; induiitkgp@gmail.com

ABSTRACT: A local isolate, identified as *Brevibacillus invocatus* with an accession number MTCC 9039 at Microbial Type Culture Collection (MTCC), Institute of Microbial Technology, Chandigarh, India, was validated as the producer of a poly(3-hydroxybutyrate-co-3-hydroxyvalerate) [P(3HB-*co*-3HV)] co-polymer. Synthesis of P(3HB-*co*-3HV) co-polymer under batch mode was investigated under supplementation of glucose, acetate and propionate. Under controlled condition, *B. invocatus* MTCC 9039 cells harvested at the stationary phase of growth registered maximum production of poly-3-hydroxybutyrate (PHB), i.e., 3% of dry cell weight (dcw) at pH 7.0 and temperature 30°C at 48 hours of incubation. The PHB synthesis was boosted up to 52% (dcw) with the supplementation of 3% glucose and 1% acetate. P(3HB-*co*-3HV) co-polymer production was stimulated under propionate supplementation. This production was boosted up to 45% under 3% glucose with 1% propionate supplementation. Optimization of process parameters by response surface methodology (RSM) further boosted the co-polymer production up to 65% (dcw) at 2.08% glucose, 1.62% acetate, 0.75% propionate and 2.15 gl^{-1} KH_2PO_4 concentrations. This co-polymer not only depicted comparable material properties with the commercial P(3HB-*co*-3HV) co-polymers but also displayed the elasticity, which was immensely high and could be comparable with polypropylene, therefore advocating its potential applications in various fields. Hence, *B. invocatus* MTCC 9039 is emerging as an attention-grabbing organism that could be further exploited for P(3HB-*co*-3HV) co-polymer production.

Conference Proceedings: International Conference on Life Sciences, Informatics, Food and Environment; August 29- 30, 2014

Indo Global Journal of Pharmaceutical Sciences(ISSN 2249 1023 ; CODEN- IGJPAI; NLM ID: 101610675) indexed and abstracted in EMBASE(Elsevier), SCIRUS(Elsevier),CABI, CAB Abstracts, Chemical Abstract Services(CAS), American Chemical Society(ACS), Index Copernicus, EBSCO, DOAJ, Google Scholar and many more. For further details, visit http://iglobaljournal.com