ISSN (ONLINE) : 2395-695X
ISSN (PRINT) : 2395-695X
Available online at www.ijarbest.com

International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST)
Vol. 2, Special Issue 8, February 2016 in association with
KAMARAJ COLLEGE OF ENGINEERING AND TECHNOLOGY, VIRUDHUNAGAR
DEPARTMENT OF BIOTECHNOLOGY
ORGANIZES
DBT, NEW DELHI SPONSORED NATIONAL LEVEL CONFERENCE ON CONTEMPORARY TRENDS IN BIOENERGY AND GREEN TECHNOLOGY: CHALLENGES AND OPPORTUNITIES [ORA-2016]
(25-26TH FEBRUARY 2016)

PRODUCTION AND CHARECTERIZATION OF POLYHYDROXY ALKANOATES BY PSEUDOMONAS AERUGINOSA

A.B.Sathya[1]., Chitra Sebastian[2]., Aswani.E[3]., R.Sivashankar[4]., A.Santhiagu[5].,V.Sivasubramanian*
[1,5] National Institute of Technology Calicut, Kerala-673601
[2,4] MET'S School of Engineering, Mala,Thrissur, Kerala-680735
[3] RVS College of Arts and Science, Trichy road, Sulur, Coimbatore-641402
*Corresponding author email: siva@nitc.ac.in

Abstract

There has been a considerable interest in the development of biodegradable plastics since last few decades due to the problem and harmful effects of conventional plastics on the environment. This study focuses on the Polyhydroxy alkanoates (PHAs) production using microbial species and applications of PHAs which elucidates the gaining importance in today's industrial world. PHAs are microbial polyesters, having properties similar to synthetic plastics and in addition are biodegradable and biocompatible. Bacterial culture *Pseudomonas aeruginosa* was procured from National Collection of Industrial Microorganisms (NCIM) and cultured in nutrient broth. After reaching exponential phase, the cells were transferred to nitrogen limited mineral salts medium. Polymer granules were extracted using sodium hypochlorite and chloroform. The maximum production was obtained at optimal pH of 7, at 30ºC and at low nitrogen concentration (1 g/L). Optimization of variables provides information on their significant effect and also their interaction during their growth. Response Surface Methodology (RSM) is employed to analyze the response on different variables for achieving optimum response. The dairy waste (cheese whey) serves as low cost substrates for the production of biopolymers thereby making it more resource efficient and sustainable, which is vital for its competitiveness. PHAs was obtained at a yield of 4.5–5.2 g/l from the fermentation of whey. Several analytical techniques have been used to quantify PHA content in dry cells such as Gas chromatography (GC), High Performance Liquid Chromatography (HPLC), and Nuclear Magnetic Resonance (NMR) spectroscopy. We intend to integrate the production of biopolymers and wastewater treatment. Thus, this project will be a solution to two problems: reducing plastic pollution by producing biopolymer and treating wastewater. The ongoing commercialization activities in several countries are expected to make PHA available for applications in various areas.

Keywords: Polyhydroxy alkanoates; Biodegradable; Biocompatible.