Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://omicron.ch.tuiasi.ro/EEMJ/

"Gheorghe Asachi" Technical University of Iasi, Romania

OPTIMIZATION OF WASTEWATER BASED MEDIA FOR BIOPOLYMERS PRODUCTION BY *RHIZOBIUM LEGUMINOSARUM*

Mohamed Sellami, Fakher Frikha, Achraf Aribi, Imen Taktak, Nabil Miled, Faouzi Ben Rebah*

Laboratoire de Biochimie et de Génie Enzymatique des Lipases, ENIS, Université de Sfax, Sfax- Tunisia

Abstract

The present work aimed to optimize a new economic medium for biopolymers production by *Rhizobium leguminosarum*. Biopolymers were poly-β-hydroxybutyrate and exopolysaccharide (EPS and PHB). They were extensively used in various industrial sectors. Statistical experimental designs and response surface methodology were employed to optimize the medium components. A central composite design was applied to increase the production yield and predict the optimal values of the selected factors. An optimal medium, for PHB and EPS production of about 75.12 ± 5.87 mg/l and 9.2 ± 0.66 g/l, respectively, was found to be composed of 10 g/l of sucrose and 3 g/l of yeast extract added to the wastewater based medium. These two components were added to the wastewater to accurate the nutrient composition of the medium growth. This work shows for the first time the feasibility of using rhizobial strains growing in industrial wastewater to coproduce EPS and PHB.

Key words: agro-industrial wastewater, exopolysaccharide, poly-β-hydroxybutyrate, *Rhizobium leguminosarum*

Received: April, 2014; Revised final: July, 2014; Accepted: August, 2014

*Author to whom all correspondence should be addressed: e-mail: benrebahf@yahoo.fr, Phone/ Fax: + 21674675055