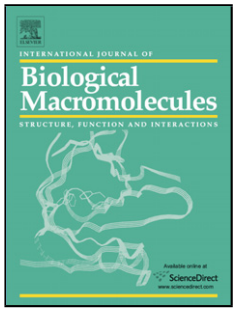

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Author: Mariam Hassan Tamer Essam Aymen S. Yassin Aisha Salama

PII: S0141-8130(15)00672-8
DOI: http://dx.doi.org/doi:10.1016/j.ijbiomac.2015.09.057
Reference: BIOMAC 5393

To appear in: *International Journal of Biological Macromolecules*

Received date: 18-7-2015
Revised date: 2-9-2015
Accepted date: 27-9-2015

Please cite this article as: M. Hassan, T. Essam, A.S. Yassin, A. Salama, Optimization of rhamnolipid production by biodegrading bacterial isolates using Plackett-Burman design, *International Journal of Biological Macromolecules* (2015), http://dx.doi.org/10.1016/j.ijbiomac.2015.09.057

Optimization of rhamnolipid production by biodegrading bacterial isolates using Plackett-Burman design

Mariam Hassan[1,2], Tamer Essam[1,2], Aymen S. Yassin[1,2*] and Aisha Salama[1]

[1]Department of Microbiology and Immunology, Faculty of Pharmacy, Cairo University, Cairo, 11562, Egypt.
[2]Biotechnology Center, Faculty of Pharmacy, Cairo University, Cairo, 11562, Egypt.
*Corresponding author.
Corresponding author mailing address, phone number and email:
Dr. Aymen Samir Yassin
Faculty of Pharmacy, Cairo University,
Department of Microbiology and Immunology.
Kasr Eleini St.
Cairo, 11562, Egypt.
Phone number: 2-02-25353100/200/300/400
Mobile: 2-0100-9610341
Email: aymen.yassin@pharma.cu.edu.eg

Abstract
Biosurfactants are biological surfactants produced by microorganisms. *Pseudomonas* species are well known for the production of the rhamnolipid biosurfactant. In this work, the production of rhamnolipid biosurfactant by *Pseudomonas* spp. was investigated and further optimized. Two Plackett-Burman designs to study the effect of carbon source, nitrogen source, C/N ratio, iron concentration, magnesium concentration, phenol toxicity, pH, temperature, agitation and sampling time were tested. The first design revealed an optimization that increased biosurfactant productivity by almost two to five folds for the tested isolates. However, using the second design showed no remarkable increase in biosurfactant productivity. An additional validation run was adopted using the predicted optimal medium with predicted optimal conditions. The validation run showed remarkable increase in the productivity of the tested isolates.
The use of microorganisms with biodegradation ability coupled with optimization of the parameters affecting productivity provide an efficient strategy for biosurfactant production.

Keywords: Multifactorial; Plackett-Burman; Rhamnolipid

1. Introduction

Biosurfactants are biological surfactants produced by different microorganisms as bacteria, yeasts and fungi. They are totally or partially extracellular amphipathic polymers containing polar and non-polar moieties. This amphipathic property allow