

Accepted Manuscript

Title: POTENTIAL OF *BREVIBACILLUS* SP. AVN 13
ISOLATED FROM CRUDE OIL CONTAMINATED SOIL
FOR BIOSURFACTANT PRODUCTION AND ITS
OPTIMIZATION STUDIES

Authors: C. Vigneshwaran, V. Sivasubramanian, K.
Vasantharaj, N. Krishnanand, M. Jerold

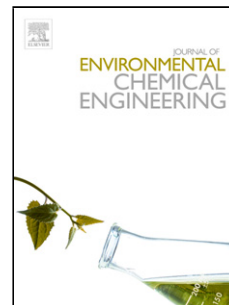
PII: S2213-3437(18)30344-0
DOI: <https://doi.org/10.1016/j.jece.2018.06.036>
Reference: JECE 2461

To appear in:

Received date: 13-3-2018
Revised date: 14-5-2018
Accepted date: 14-6-2018

Please cite this article as: Vigneshwaran C, Sivasubramanian V, Vasantharaj K, Krishnanand N, Jerold M, POTENTIAL OF *BREVIBACILLUS* SP. AVN 13 ISOLATED FROM CRUDE OIL CONTAMINATED SOIL FOR BIOSURFACTANT PRODUCTION AND ITS OPTIMIZATION STUDIES, *Journal of Environmental Chemical Engineering* (2018), <https://doi.org/10.1016/j.jece.2018.06.036>

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.



POTENTIAL OF *BREVIBACILLUS* SP. AVN 13 ISOLATED FROM CRUDE OIL CONTAMINATED SOIL FOR BIOSURFACTANT PRODUCTION AND ITS OPTIMIZATION STUDIES

C.Vigneshwaran^a, V.Sivasubramanian^{a*}, K.Vasantharaj^a, N.Krishnanand^b, M.Jerold^a

^aDepartment of Chemical Engineering,
National Institute of Technology Calicut, Kozhikode 673 601, Kerala, India.

^bDepartment of Pharmaceutical Technology,
Anna University, BIT Campus, Trichy 620 024, Tamilnadu, India.

*siva@nitc.ac.in

Abstract

In this study, a hydrocarbon degrading organism *Brevibacillus* sp. AVN 13 was isolated and utilized for biosurfactant production. A total of twenty four isolates were obtained from crude oil spilled soil and screened for biosurfactant production using different methods such as blood agar test, cetyl trimethylammonium bromide methylene blue agar test, hydrocarbon overlay agar test, emulsification test and surface tension. Among the different biosurfactant producers, the isolate AVN13 was noted as high yielding strain which reduced the surface tension up to 36mN/m with 72% emulsification activity. By 16S rRNA analysis, the high yielding isolate was identified as *Brevibacillus* sp. AVN13. The effect of pH, temperature, carbon source and nitrogen source on biosurfactant production by *Brevibacillus* sp. AVN13 was investigated. It was observed that the optimum pH and temperature for biosurfactant production were 7 and 40°C respectively. Similarly, used engine oil and potassium nitrate were found to be the preferred carbon and nitrogen sources at a concentration of 1% v/v and 0.5% w/v respectively. The kinetics of biosurfactant production was studied which clearly indicated that the biosurfactant production was associated with biomass growth. Furthermore, the produced biosurfactant was undergone stability analysis of pH and temperature and reported. The antimicrobial properties of biosurfactant produced were also analyzed. The biosurfactant produced was characterized using FTIR (Fourier transform infrared spectroscopy) and found to be lipopeptide type of biosurfactant. These results suggested that *Brevibacillus* sp. AVN 13 could be effectively employed for biosurfactant production.

Keywords: Biosurfactant, Emulsification, Surface tension, *Brevibacillus* sp.

1. Introduction

Download English Version:

<https://daneshyari.com/en/article/6663885>

Download Persian Version:

<https://daneshyari.com/article/6663885>

[Daneshyari.com](https://daneshyari.com)