

CURRENT RESEARCH AND DEVELOPMENT IN BIOTECHNOLOGY ENGINEERING AT IIUM

VOLUME I

Editors:

Suleyman Aremu Muyibi
Mohammed Saedi Jami
Zaki Zainudin



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CHAPTER 18

ISOLATION AND SCREENING OF POTENTIAL MICROORGANISM FOR BIOREMEDIATION OF HYDROCARBON CONTAMINATED SITES

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ABSTRACT

Biosurfactants are surface-active substances synthesized by living cells. The use of chemicals for the treatment of a hydrocarbon polluted site may contaminate the environment with their by-products, whereas biological treatment may efficiently destroy pollutants, while being biodegradable themselves. Biosurfactants enhance the emulsification of hydrocarbons, have the potential to solubilise hydrocarbon contaminants and increase their availability for microbial degradation. Hence, biosurfactant producing microorganisms may play an important role in the accelerated bioremediation of hydrocarbon contaminated sites. This study will look upon the potential microbial biosurfactant producer that can be isolated from palm oil mill effluent (POME).

Keywords: biosurfactant, palm oil mill effluent, isolation, hydrocarbon

INTRODUCTION

The demand of surfactants in industry is growing. Surfactants possess both hydrophilic and hydrophobic structural moieties, which exhibit many unusual properties, including an ability to lower the surface tension. The commercial importance of surfactants is apparent from the increasing trends in their production and the number of industrial applications (Desai and Desai, 1993). Their environmental uses are related mainly to the bioremediation of petroleum hydrocarbons in groundwater and soil and in the degradation of hazardous compounds. In the oil industry, they are used in microbial-enhanced oil recovery, in the cleaning of contaminated vessels and to facilitate transportation of heavy crude oil by pipeline (Ghurye et al., 1994). Biosurfactants have been attracting recent attention as natural and promising surfactants because they offer several advantages over chemical surfactants, such as their lower toxicity, their biodegradable nature, and their ecological acceptability. In spite of the advantages, the economics of biosurfactant production have not received attention, but economic strategies must be devised if they are to compete with chemical surfactants.