

Alvin Oktaviana Puspitasari, 2015, Efektivitas Kultur Bakteri Penghasil Biosurfaktan Dengan Variasi Suhu Inkubasi Terhadap Kelarutan Lumpur Minyak, Skripsi ini di bawah bimbingan Dr. Ni'matuzahroh dan Drs. Salamun, M.Kes Departemen Biologi, Fakultas Sains dan Teknologi, Universitas Airlangga, Surabaya.

ABSTRAK

Penelitian ini bertujuan untuk mengetahui efektivitas kultur bakteri penghasil biosurfaktan dengan suhu inkubasi terhadap kelarutan lumpur minyak (%) menggunakan metode agitasi. Penelitian ini merupakan penelitian yang bersifat eksperimental menggunakan rancangan acak lengkap dengan tiga kali ulangan. Perlakuan terdiri dari dua belas kombinasi menggunakan empat jenis bakteri (*Acinetobacter* sp. P2(1), *Pseudomonas putida* T1(8), *Bacillus subtilis* 3Kp dan *Micrococcus* sp. LII 61) dengan variasi tiga suhu inkubasi (40°C, 50°C dan 60°C), kontrol positif berupa surfaktan sintetis (Tween-20) dan kontrol negatif molase. Perlakuan kombinasi kultur bakteri dan suhu diinkubasi selama 7 hari. Media kultur berisi 30 mL campuran media AMS (komposisi Pruthi dan Comeotra, 1997) dan molase 2% dengan konsentrasi bakteri 4% + 1g lumpur minyak. Variabel yang diamati berupa persentase kelarutan lumpur minyak (%). Data persentase kelarutan lumpur minyak di analisis menggunakan uji *Two-Way Analisis of Varians Univariate* ($\alpha = 0,05$) dan dilanjutkan uji *Games-Howell*. Hasil uji kombinasi kultur bakteri penghasil biosurfaktan dengan variasi suhu inkubasi memberikan pengaruh terhadap kelarutan lumpur minyak (%). Kultur bakteri *Micrococcus* sp. LII 61 dengan suhu 60°C efektif melarutkan lumpur minyak dengan nilai efektivitasnya sebesar 146,83%. Sehingga, kombinasi kultur bakteri *Micrococcus* sp. LII 61 dengan suhu 60°C prospektif diusulkan sebagai pengganti surfaktan sintetis dalam membantu menagani permasalahan limbah lumpur minyak yang menggerak di dasar tangki perminyakan atau di dalam pipa-pipa penyaluran minyak.

Kata kunci: Kultur Bakteri Penghasil Biosurfaktan, Suhu Inkubasi, Kelarutan, Lumpur Minyak, Agitasi (*shaking*).

Alvin Oktaviana Puspitasari, 2015, Effectiveness of Biosurfactant Producing Bacterias with Variation of Incubation Temperature towards Oil Sludge Solubility. This script is under supervision of Dr. Ni'matuzahroh and Drs. Salamun, M.Kes. Department of Biology, Faculty of Science and Technology, Airlangga University.

ABSTRACT

This study was aimed to determine culture effectiveness of biosurfactant producing bacteria with incubation temperature towards *oil sludge* solubility (%) use agitation method. This study was designed as complete randomized design experiment, with three times repetitions. Treatments conducted in this study comprised of twelve combinations of four bacterias species (*Acinetobacter sp.* P2(1), *Pseudomonas putida* T1(8), *Bacillus subtilis* 3Kp and *Micrococcus sp.* LII 61) with three variety of incubation temperatures (40°C, 50°C, and 60°C), Tween was used as positive control and molasses was used as negative control. Treatment combination of bacteria culture and temperature were incubated for 7 days. Culture medium used was 30 mL mixture of AMS medium (Pruthi and Comeotra composition, 1997) and 2% molasses with 4% bacteria concentration + 1 gram *oil sludge*. Variable observed were *oil sludge* solubility percentage (%). Percentage of *oil sludge* solubility was analyzed using *Two-Way Analisis of Varians Univariate* ($\alpha = 0.05$), and continued with *Games-Howell* test ($\alpha = 0.05$). The results of the combination bacteria culture with incubation temperature variety effected to *oil sludge* solubility. Bacteria culture *Micrococcus sp.* LII 61 at 60°C incubation temperature, effected to *oil sludge* solubility with effectiveness value is 146,83%. So, the *Micrococcus sp.* LII 61 culture at 60°C temperature is prospective to be proposed as substitute of synthetic surfactant on overpassing *oil sludge* which crusted in the bottom of oil tanks or inside of oil pipes.

Keywords: Biosurfactant-producing Bacteria Culture, Incubation Temperature, Solubility, *Oil Sludge*, Agitation (*shaking*).