

## **ABSTRACT**

### **BIODEGRADATION OPTIMIZATION OF SODIUM DODECYL SULFATE (SDS) USING LOCAL BACTERIA ISOLATE AND DETERGENT BIOREMEDIAL CAPABILITY TEST**

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The extensively use of detergents by community and the waste disposal directly causes pollution of the aquatic environment. Bioremediation efforts are carried out to overcome these problems. In this study, SDS biodegradation optimization was conducted by using four consortiums from four local bacterial isolates obtained from previous studies. SDS biodegradation was analyzed by using the AS-MB method; the method was the best method obtained from the comparing between AS-MB and MB-AS methods. Based on the SDS degradation capability of four consortiums (A, B, C and D), and selected the best two consortiums (B and C) showed capability to degrade SDS at 96.4% and 98.3% respectively. The main ability of the consortium B and C was played by SB-2-1 and SB-3-3 isolates which were able to degrade SDS at 85.5%. The application of the best consortium (B and C) is bioremediation which for municipal waste that containing detergent, both were able to degrade surfactants at only 33.2% and 37.3% in 6 days. It better than native biodegradation without bacterial isolates which are only able to degrade around to 4.9%.

**Key words :** SDS, AS-MB, MB-AS, bacterial isolates, consortium, biodegradation, bioremediation.

## **ABSTRAK**

### **OPTIMASI BIODEGRADASI *Sodium Dodecyl Sulfate* (SDS) MENGGUNAKAN ISOLAT BAKTERI LOKAL DAN UJI KEMAMPUAN BIOREMEDIASI LIMBAH DETERGEN**

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Banyaknya penggunaan detergen di masyarakat dan pembuangan limbah secara langsung menyebabkan pencemaran lingkungan perairan. Upaya bioremediasi dilakukan untuk mengatasi permasalahan tersebut. Pada penelitian ini dilakukan optimasi biodegradasi SDS menggunakan empat konsorsium dari empat isolat bakteri lokal yang didapat dari penelitian sebelumnya. Analisis biodegradasi SDS dilakukan menggunakan metode AS-MB; metode tersebut merupakan metode terbaik yang didapat dari hasil pembandingan metode analisis antara AS-MB dan MB-AS. Berdasarkan kemampuan degradasi SDS oleh empat konsorsium (A, B, C dan D) diperoleh dua konsorsium (B dan C) yang memiliki kemampuan degradasi SDS secara berturut-turut sebesar 96,4 % dan 98,3 %. Kemampuan utama degradasi SDS konsorsium B dan C terletak pada isolat SB-2-1 dan SB-3-3 yang mampu mendegradasi SDS sebesar 85,5 %. Aplikasi konsorsium terbaik (B dan C) untuk bioremediasi limbah detergen, terbukti keduanya mampu mendegradasi surfaktan sebesar 33,2 % dan 37,3 % dalam waktu 6 hari; hasil ini jauh lebih baik jika dibandingkan dengan biodegradasi alamiah tanpa isolat bakteri yang hanya mampu mendegradasi sebesar 4,9 %.

**Kata Kunci :** SDS, detergen, AS-MB, MB-AS, isolat bakteri, konsorsium, biodegradasi, bioremediasi.