

UNIVERSITI TEKNOLOGI MARA

**ISOLATION AND
MOLECULAR IDENTIFICATION
OF
BIOSURFACTANT
PRODUCING
SOIL BACTERIA**

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ABSTRACT

Biosurfactants are amphiphilic compound, having hydrophilic and hydrophobic moieties enabling them to reduce surface and interfacial tension at the surface. Their unique properties are applied in various industries such as foaming and wetting agents, emulsifiers, detergents and bioremediation. A total of 98 isolates showed biosurfactant activity using hemolytic assay but only 45 isolates demonstrated surfactant activity in drop collapse test and oil spreading assay. All isolates were rod-shaped, Gram positive and majority of them were non-endospore former. Then, 21 isolates were chosen based on the diameter of oil spread ranging from 4.0 mm to 20.0 mm and later tested for emulsification index. The biosurfactant produced by both isolates showed high emulsification index (E_{24}) (A1(6), 63.3% and A2(1), 46.7%) and good surfactant capacity. The biosurfactant produced by both bacterial species were identified as surfactin using Fourier Transform Infrared Spectroscopy (FTIR). Only isolates A1(6) and A2(1) showed the highest percentage of emulsification index (E_{24}) and ability to reduce surface tension were used for species identification using 16S rDNA gene sequencing. The *16S rDNA* gene was amplified and the amplicon size for both isolates was approximately 1.5 kb. Both isolates were identified as *Bacillus cereus* C7 and with *Bacillus cereus* XJU-1. Having the features of high surfactant activity and emulsification index provide the evidence that both species could be a potential biosurfactant producer with proper optimization for the production of biosurfactant.

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