

Isolation, molecular identification and biodegradation capacities of indigenous hydrocarbon-degrading bacteria from tarball at Terengganu Beach, Malaysia

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Abstract

In this study, we isolated four indigenous hydrocarbon-degrading bacteria from tarball found in Rhu Sepuluh beach, Terengganu, Malaysia. These bacteria were identified based on their physiological characteristic and 16S rRNA gene sequence analysis, and they showed 99% similarity with *Pseudomonas stutzeri* strain A1501, *Pseudomonas balearica* strain SP1402, *Cellulosimicrobium cellulans* DSM 43879 and *Acinetobacter baumannii* ATCC 19606 respectively. Their hydrocarbon-degrading capabilities were tested using diesel-oil as sole carbon source. Results analysed using GC-MS, showed diesel-oil alkanes were degraded an average 30.5%, 16.4%, 64.4% and 58.1% with medium optical density reaching 1.172, 1.503, 0.967 and 1.515 by *Pseudomonas stutzeri*, *Pseudomonas balearica*, *Cellulosimicrobium cellulans* and *Acinetobacter baumannii* respectively in minimal salt media at 32°C for 10 days. Individual diesel-oil alkanes were degraded between 19.7% - 49.2% (*P. stutzeri*), 2.5% to 27.5% (*P. balearica*), 10% - 95.4% (*C. cellulans*) and 0.2% - 95.9% (*A. baumannii*). All strains utilized diesel-oil for growth. The study suggests all strains are part of indigenous hydrocarbon-degrading bacteria in tarball with potential for bioremediation of oil-polluted marine environment.

Keywords: Bacteria, biodegradation, bioremediation, diesel, hydrocarbon, tarballs.

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