

## Phenotypic and Molecular Characterization and Rapid Evaluation of Oil-Degrading Native Bacteria Isolated from Different Habitats in UAE

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Despite the beneficial value of crude oil and its derivatives to the country's economy, it could have a huge adverse impact on the environment specifically when accidentally spilled to the water and soil; thus, makes it as an environmental catastrophe. This study addresses the role of identified microorganisms as hydrocarbon degraders to be used as an eco-friendly solution in oil spill bioremediation. Successfully, 19 bacterial isolates were recovered from different habitats including crude oil wells, soil treated with diesel, oil contaminated seawater and surface hydrocarbon sediment. The isolates were assessed for degradation of different hydrocarbon compounds by agar hole-plate diffusion method. Results indicated the recovery of 9 isolates namely (2A, 1D, SO1, S1A, S3, KF1, SO2, AJ1 and 2B) which were identified as positive degraders for one or more of the tested hydrocarbon compounds including diesel, pentane, hexane, heptane and tetradecane. These isolates were identified biochemically using VITEK 2 microbiology system as 2A (*Pseudomonas stutzeri* 97%), 1D (*Kocuriakristinae* 92%), SO1 (*Staphylococcus aureus* 93%), S1A (*Leuconostocmesenteroides ssp. Cremoris* 90%), KF1 (*Rhizobium radiobacter* 99%), and S3 (*Staphylococcus hominis* 96%). Almost all of these isolates were able to utilize heptane as a sole carbon source for their survival with the isolates SO2, S1A and S3 being the most potent ones observed by their growth around the agar hole-plate. PCR analysis of the positive hydrocarbon degrading isolates for the presence of *alkB* gene showed two groups with different band size products; group 1 (G1) (~330 bp) and group 2 (G2) (multiple of 330 pb). This may imply that *alkB* gene can be found in multiple homologues as shown in G2 and each one may cover degradation of specific carbon number range in the tested hydrocarbon compound. Rapid evaluation of hydrocarbon compounds degradation by the native microbial communities was shown to be successful with considerable biodegradation role exploited by the recovered isolates.

### Biography:

Prof. Saadoun, completed his Ph.D. in Microbiology from Auburn University, Alabama-USA in 1995. He is a member of the American Society for Microbiology (ASM) from 1992-2009, Jordan Society for Scientific Research (JSSR), and a Fellow of Society of Biology/UK. Prof. Saadoun has published several scientific papers through different research proposals granted as principal and associate investigator, in different abstracted, refereed and indexed Journals. Most of these papers were in the area of inhibitory/metabolites-producing *Streptomyces* spp. and their genetic determinants. In 2000, he has been awarded Abdel-Hameed Shuman Award for Arabian Young Researchers for Biological Sciences.

Prof. Saadoun has been appointed as chair for the Dept. of Biotechnology and Genetic Engineering at Jordan University of Science & Technology/Irbid-Jordan from 2000 to 2001 and from 2003 to 2005. Also, he has been appointed as a chairman for the Dept. of Biotechnology and Genetic Engineering at Philadelphia University/Amman-Jordan from 2001 to 2002, and for the Dept. of Applied Biology at University of Sharjah, United Arab Emirates from 2009 to 2014 where he acted during this period as the Biotechnology Program Coordinator with the University of Sheffield/UK. Currently he is the Vice Dean of College of Sciences.