International Journal of PharmTech Research
CODEN (USA): IJPRIF, ISSN: 0974-4304, ISSN(Online): 2455-9563
Vol.9, No.5, pp 284-291, 2016

# PCR-Based Investigation of Oxygenase Among Crude Oil Degrading Bacteria in Hilla City, Iraq

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**Abstract :** Forty five oil-contaminated soil samples were collected from fuel station in Hilla city-Iraq. All soil samples were cultivated on special medium (Bushnell and Hass mineral salts (BHMS) medium) to recover bacterial isolates with Biosurfactant activity.
According to cultural characteristics, morphological and biochemical tests 10 isolates with biosurfactant activity were recovered, 9 of them belong to *Pseudomonas aeruginosa* and one isolates belong to *Bacillus spp*. All isolates were subjected to conventional biosurfactant screening tests. Oil spreading test, emulsification Index ($E_{24}$), hemolysis activity and lipolytic activity. The detection of genes of the two important enzymes; phenol monooxygenase and xylene monooxygenase; were performed by PCR using specific primer pairs. All isolates positive for hemolysis activity( $\beta$ -hemolysis) and positive for oil spreading assay except ps1, ps2 and ps7 isolates . All isolates produce lipase enzyme and have emulsification capcity ($E_{24}$) that ranged from 52.6 to 42.85. Polymerase chain reaction results revealed that all isolates were negative for toluene dioxygenase gene while 2 isolates of *Pseudomonas aeruginosa* (ps2 and ps9) were positive for phenol monooxygenase gene.
This study conclude the ability of isolated bacteria to degrade crude oil in enriched media and the ability of these isolates to produce biosurfactant.
**Keywords:** Oil-Contaminated soil, Biosurfactant, Pseudomonas aeruginosa, phenol monooxygenase.



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