

Microbial Remediation of Crude Oil Contaminated Soil using Animal Waste (Chicken Droppings and Cow Dung) with Degrading Potentials

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The microbiological and physiological analysis of crude oil contaminated soil amended with animal wastes (Chicken droppings and Cow dung) were investigated using standard cultural techniques and different concentrations of nutrients amendments (10%, 30% and 50%). The present study was aimed to isolate and identify microorganisms from animal wastes with the potential of degrading/utilization of crude oil as a sole carbon source. Result obtained revealed increased soil organic matter and reduced soil nitrate and phosphorus, thus imposing a condition that impaired oil degradation in the soil. Treatment of the soil with 50% of cow dung resulted in the highest oil degradation rate of 85.78%. The bacterial isolates with crude oil degrading potentials were *Pseudomonas sp.* (88%), *Micrococcus sp.* (75%) *Bacillus sp.* (100%) *Klebsiella* and *Serratia sp.* Had the lowest percentage occurrence of 35% and 25% respectively. Animal waste can therefore be an option for crude oil pollution remediation.

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Introduction

Incorporation of amended materials into soil samples

G#BC	7CB8-H-CB	89G7F-6H-CB'C : 7CB8-HCB
PC1	Chicken dropping added @10%	100 g of pollution soil+10 g of chicken droppings
PC2	Chicken dropping added @30%	100 g of pollution soil+30 g of chicken droppings
PC3	Chicken added 10%	100 g of pollution soil+50 g of chicken droppings
PC4	Cow dung added @10%	100 g of pollution soil+10 g of cow droppings
PC5	Cow dung added @30%	100 g of pollution soil+30 g of cow droppings
PC6	Cow dung added @50%	100 g of pollution soil+50 g of cow Droppings

Total Nitrogen%	2.29	10.94
Available phosphorus (mg/kg)	0.27	0.06
Exchangeable Ca (Cmol/Kg)	29.99	3.00
Exchangeable Mg (Cmol/Kg)	2.82	2.46
Exchangeable Na (Cmol/Kg)	1.20	0.98
Exchangeable k	0.05	0.04
Exchange acidity	0.08	0.06
Effective Cation	1.03	2.66
Exchange Capacity (Cmol/kg)		
Base saturation	6.81	4.58
Particles size analysis	60.94	77.51
Sand%	66.40	66.40
Silt%	19.10	19.75
Clay%	14.50	15.02
HY IhifU''7'Ugg	GUbXm''cUa'gc]	GUbXm''cUa'gc]
A]WfcV]c'c[]WU'' 5bU'mg]g		
6UWhYf]U''Dcd i'Uh]cbg		
Total Heterotrophs (10 ⁸ cfu/g)	4.8	3.2
Petroleum Hydrocarbon utilizers(10 ⁴ cfu/g)	0.6	1.8