environments

SUPPORTING INFORMATION

Evaluating Indigenous and Commercial Microbial Consortia for Remediation of Aged Crude Oil–Contaminated Sandy Soil

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Table S1. Replicate-level TPH-HEM values (% dry wt.) over time across treatment groups.

Group	Replicate	Inoculum	0	15	30	45	60	75	90	100	115	140	Final Reduction %
Group A	EXP-1	Indigenous	2.38	2.53	2.37	2.35	2.19	2.12	1.93	1.31	1.17%	0.94	60.5
	EXP-2		2.55	2.49	2.40	2.13	2.11	1.88	1.44	1.35	1.25%	0.85	66.7
	EXP-3		2.55	2.49	2.45	2.15	2.13	1.85	1.45	1.34	1.20%	0.91	64.3
	Mean		2.49	2.50	2.41	2.21	2.14	1.95	1.61	1.33	1.21%	0.90	63.83
	STD		0.10	0.02	0.04	0.12	0.04	0.15	0.28	0.02	0.04%	0.05	3.11
Group B	EXP -4	Indigenous	3.66	3.52	3.35	3.14	2.47	2.41	2.39	2.20	2.16%	1.96	46.4
	EXP -5		3.50	3.87	3.49	3.37	2.83	2.33	2.25	2.16	2.00%	1.74	50.3
	EXP -6		3.35	2.35	2.03	2.00	1.86	1.72	1.70	1.68	1.52%	1.42	57.6
	Mean		3.50	3.25	2.96	2.84	2.39	2.15	2.11	2.01	1.89%	1.71	51.45
	STD		0.16	0.80	0.81	0.73	0.49	0.38	0.36	0.29	0.33%	0.27	5.67
Group C	EXP -7	Indigenous	4.59	4.24	4.20	3.84	3.71	2.42	2.31	2.38	2.37%	1.93	58.0
Group D	EXP -8	Commercial	2.84	2.96	2.83	2.67	2.67	2.60	2.42	2.41	2.25%	2.20	22.5
	EXP -9		3.06	3.15	2.96	2.78	2.08	1.76	1.93	2.08	2.39%	2.46	19.6
	EXP -10		2.01	1.74	1.47	1.45	1.41%	1.38	1.39	1.41	1.32%	1.29	35.8
	Mean		2.64	2.62	2.42	2.30	2.05	1.91	1.91	1.97	1.99%	1.98	25.99
	STD		0.55	0.77	0.83	0.74	0.63	0.62	0.52	0.51	0.58%	0.61	8.64
Group E	CONT-1	Natural Attenuation	4.53	4.65	4.47	4.35	4.48	4.47	4.43	4.41	4.24%	4.39	3.1
	CONT-2		5.03	4.78	4.77	4.67	4.63	4.61	4.49	4.40	4.63%	4.68	7.0
	Mean		4.78	4.72	4.62	4.51	4.56	4.54	4.46	4.41	4.44%	4.54	5.02
	STD		0.35	0.09	0.21	0.23	0.11	0.10	0.04	0.01	0.28%	0.21	2.73

Table S2. Replicate-level SARA hydrocarbon fractions (mg kg⁻¹ dry wt.) for selected treatment groups at days 0, 60, and 100.

Group	Replicate ID	Day											
		0				60				100			
		Saturates	Aromatics	Resins	Asphaltenes	Saturates	Aromatics	Resins	Asphaltenes	Saturates	Aromatics	Resins	Asphaltenes
Group A	EXP-1	4940	1970	10740	1940	3100	1450	10100	1870	2100	950	9600	1800
	EXP-2	15710	3410	15890	2590	9900	2600	14800	2430	7200	1800	13900	2300
	EXP-3	4930	2710	6120	800	3100	1900	5600	720	2100	1300	5200	680
Group B	EXP-4	2680	12600	4820	1250	1600	8200	4450	1180	1100	5200	4200	1120
	EXP-5	9530	2140	26850	6030	6200	1500	24800	5600	4200	980	23200	5200
	EXP-6	12800	5100	4650	1400	8200	3400	4300	1320	5300	2100	4000	1240
Group D	EXP-8	2890	4590	4740	1110	2200	3600	4520	1080	1700	2800	4300	1040
	EXP-9	11960	7400	23250	2530	9100	5600	21900	2400	6800	4200	20600	2300
	EXP-10	4180	8810	24000	5380	3000	6100	22900	5200	2100	4500	21800	5100

Table S3. Mean SARA hydrocarbon fractions (% dry wt.) for selected treatment groups at days 0, 60, and 100.

Group	Day											
	0				60				100			
	Saturates %	Aromatics %	Resins %	Asphaltenes %	Saturates %	Aromatic %	Resins %	Asphaltenes %	Saturates %	Aromatics %	Resins %	Asphaltenes %
Group A	0.85	0.27	1.09	0.18	0.54	0.20	1.02	0.17	0.38	0.14	0.96	0.16
Group B	0.83	0.66	1.21	0.29	0.53	0.44	1.12	0.27	0.35	0.28	1.05	0.25
Group D	0.63	0.69	1.73	0.30	0.48	0.51	1.64	0.29	0.35	0.38	1.56	0.28

Table S4. One-way and Two-way ANOVA (Mean % ±SD).

Day	Group A	Group B	Group D	Group E	P value
0	2.49 ± 0.098^{c}	3.50 ± 0.155^{b}	2.64 ± 0.554^{c}	4.78 ± 0.354^{a}	<.001
15	2.50 ± 0.023^{b}	3.25 ± 0.796^{b}	2.62 ± 0.765^{b}	4.72 ± 0.092^{a}	0.018
30	2.41 ± 0.04^{b}	2.96 ± 0.806^{b}	2.42 ± 0.825^{b}	4.62 ± 0.212^{a}	0.021
45	2.21 ± 0.122^{b}	2.84 ± 0.734^{b}	2.30 ± 0.738^{b}	4.51 ± 0.226^{a}	0.012
60	2.14 ± 0.042^{b}	2.39 ± 0.49^{b}	2.05 ± 0.63^{b}	4.56 ± 0.106^{a}	0.001
75	1.95 ± 0.148^{b}	2.15 ± 0.377^{b}	1.91 ± 0.624^{b}	4.54 ± 0.099^{a}	<.001
90	1.61 ± 0.28^{b}	2.11 ± 0.365^{b}	1.91 ± 0.515^{b}	4.46 ± 0.042^{a}	<.001
100	1.33 ± 0.021^{c}	2.01 ± 0.289^{b}	1.97 ± 0.51^{bc}	4.41 ± 0.007^{a}	<.001
115	1.21 ± 0.04^{b}	1.89 ± 0.333^{b}	1.99 ± 0.582^{b}	4.44 ± 0.276^{a}	<.001
140	0.90 ± 0.046^{c}	1.71 ± 0.272^{b}	1.98 ± 0.614^{b}	4.54 ± 0.205^{a}	<.001
One-way ANOVA Repeated measure analysis	df = 1.046(2.092), F = 81.335, P = 0.01	df = 1.130 (2.259), F = 16.589, P = 0.045	df = 1.313 (2.626), F = 4.346, P = 0.144	df = 1 (1), F = 2.283, P = 0.372	
Two-way ANOVA Repeated measure analysis time × group interaction	df=2.286(6.858), F= 37.954, P<0.001				