

Supplementary Information

Table S1. Physicochemical properties of the collected soil sample

Parameters	Value	Parameters	Value
Moisture (%)	13.67	Total Potassium (%)	0.28
pH	7.09	Sandy (%)	90.84
Total soluble salts (%)	0.297	Limon (%)	5
Porosity (%)	51.57	Clay (%)	5.16
Total organic matter (OM) (%)	1.62	Polycyclic Aromatic	0.19
Total nitrogen (%)	0.08	Hydrocarbons (PAHs) (mg/kg)	
Total phosphorus (%)	0.05	Chlorobenzen (mg/kg)	0.27
Total sulfur (%)	< LOQ = 0,05	Total petroleum hydrocarbons (TPH) (mg/kg)	3,754

**LOQ: Limit of quantification*

Table S2. GC-MS quantification of long-chain n-alkanes (C₂₁-C₃₆) during biodegradation of a mixed oil by *Pseudomonas veronii* KHB2.9.

Compound	Carbon no.	Abiotic control (mg L ⁻¹)	KHB2.9 (mg L ⁻¹ , mean ± SD)	Degradation (%)
n-Heneicosane	C ₂₁	84.98	19.69 ± 1.10	76.8
n-Docosane	C ₂₂	91.56	28.23 ± 2.47	69.2
n-Tricosane	C ₂₃	56.76	19.10 ± 1.42	66.4
n-Tetracosane	C ₂₄	57.64	22.62 ± 1.21	60.8
n-Pentacosane	C ₂₅	32.22	9.39 ± 0.42	70.9
n-Hexacosane	C ₂₆	35.49	15.38 ± 0.64	56.7
n-Heptacosane	C ₂₇	19.47	16.54 ± 0.71	15.0
n-Octacosane	C ₂₈	16.56	20.82 ± 1.88	—
n-Nonacosane	C ₂₉	10.67	14.55 ± 0.79	—
n-Triacontane	C ₃₀	7.41	12.32 ± 0.92	—
n-Hentriacontane	C ₃₁	3.85	5.99 ± 0.52	—
n-Dotriacontane	C ₃₂	4.32	7.88 ± 0.37	—
n-Tritriacontane	C ₃₃	1.44	4.26 ± 0.35	—
n-Tetratriacontane	C ₃₄	115.15	171.79 ± 7.90	—
n-Hexatriacontane	C ₃₆	126.98	43.35 ± 2.95	65.9

* **Notes:** Apparent enrichment of C₂₈-C₃₆ fractions reflects preferential degradation of lower-molecular-weight hydrocarbons rather than de novo synthesis. Similar patterns have been reported during aerobic biodegradation of petroleum hydrocarbons.

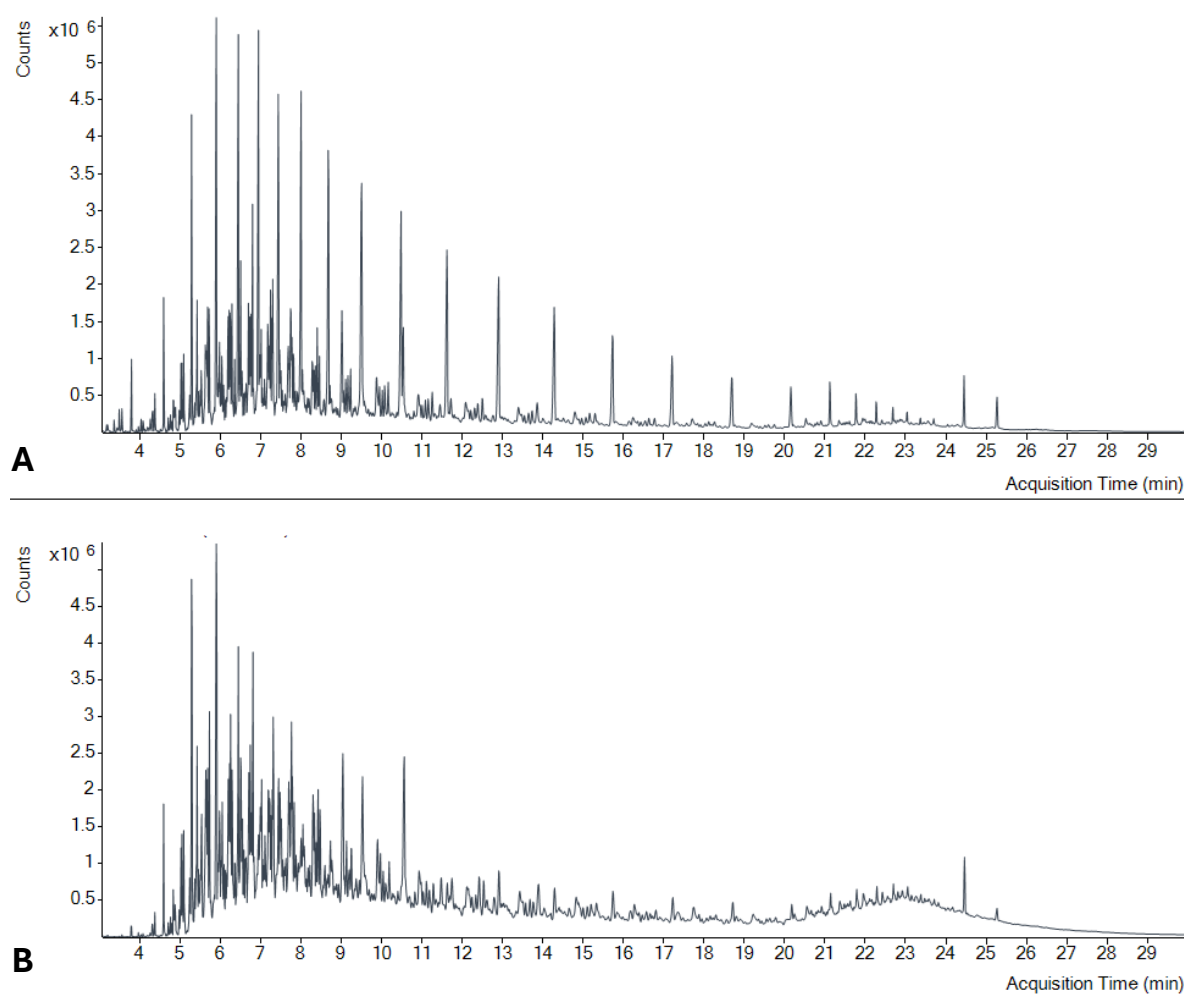


Figure S1. GC-MS chromatograms indicated an evident decrease in n-alkane signals in the KHB2.9-inoculated sample (A) relative to the abiotic control T0 (B).