

1

Supplementary Data

2

Table 1. Experimental central composite design (CCD) runs in design Design-Expert 7.1 and

3

corresponding response (results).

Run	Factor 1 Crude oil (%)	Factor 2 Inoculation load Log CFU	Factor 3 Temperature	Factor 4 pH	Response Rhamnolipid production (RE mg/ml)
1	1	5	20	5	0.6
2	2	6.5	42.5	6.5	1.5
3	1	8	35	8	1.5
4	4	6.5	27.5	6.5	2.4
5	2	3.5	27.5	6.5	1.4
6	2	6.5	27.5	6.5	2
7	2	6.5	27.5	6.5	2
8	3	5	20	5	2
9	3	8	35	5	2.2
10	0	6.5	27.5	6.5	0
11	3	8	35	8	2.4
12	1	5	20	8	0.6
13	2	9.5	27.5	6.5	2.2
14	3	5	20	8	1.9
15	2	6.5	27.5	6.5	1.9
16	1	5	35	5	0.8
17	1	8	20	5	1.6
18	2	6.5	27.5	6.5	2
19	2	6.5	27.5	9.5	1.5
20	3	5	35	5	2
21	2	6.5	27.5	6.5	2
22	2	6.5	27.5	6.5	2.2
23	3	8	20	5	2.1
24	3	8	20	8	2.1
25	1	5	35	8	0.9
26	1	8	20	8	1.6
27	2	6.5	27.5	3.5	1.4
28	1	8	35	5	1.6
29	3	5	35	8	2.2
30	2	6.5	12.5	6.5	1.4

4

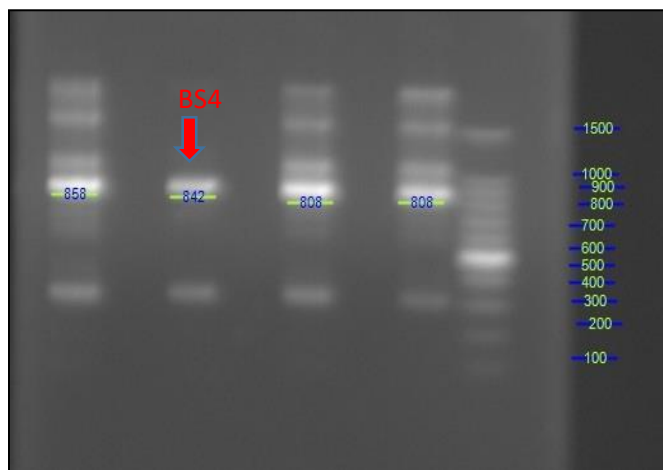


Figure S1. Screening of the RhlAB gene with lane 3 representing the strain BS4. Amplification of 842 bp fragment was observed using the primers *rhlABf* and *rhlABr*. From right Lane 1: Molecular marker, Lane 2: LBS2, Lane 3:BS2, Lane 4: BS4, Lane 5: BS24



Figure S2. Photograph of 15-day-old red pepper seedlings under different treatments (no germination was observed in crude oil-contaminated soil with no amendments, and the seeds had a normal 97% germination rate under normal conditions). From right to left, plants are arranged as CS+NS, TS+NS, CS+NS+RPB, CS+RPB, TS+RPB, and TS+NS+RPB. CS refers to contaminated soil, NS normal soil, TS rhamnolipid-treated soil and RPB rhamnolipid-producing bacteria (*Shewanella* sp. BS4).