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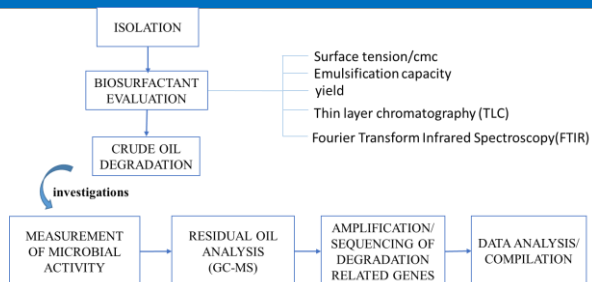
Introduction

- Bioremediation of crude oil is of significant importance as chemical dispersants are highly toxic.
- Crude oil is mainly composed of hydrocarbons, which cause environmental pollution
- Bioremediation has been considered as one of the most promising methods owing to its low cost, environmental friendliness and ability to degrade contaminants sufficiently.

Objectives

- Isolate and identify crude-oil degrading bacteria from polluted sediment samples
- use the micro-organism to biodegrade petroleum pollutants.

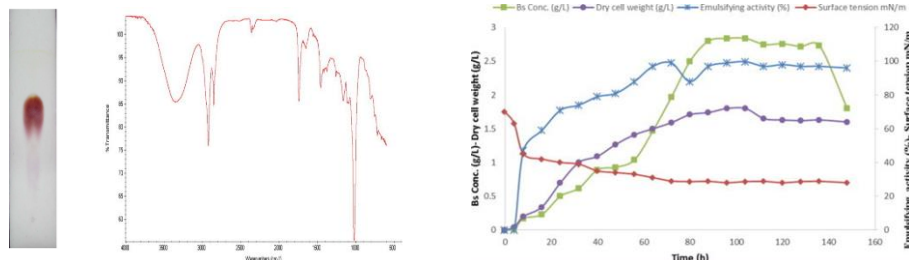
Experimental design



Materials and methods

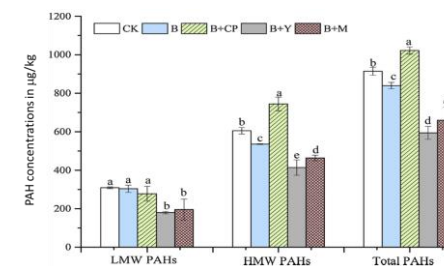
- *Staphylococcus aureus* was isolated prior to the experiment from an oil-contaminated coastal sediment obtained from Zhoushan, Zhejiang Province, China.
- Biosurfactant (BS) extraction was done using the rotary shaker
- BS characterization was done using surface tension, thin layer chromatography (TLC) and Fourier transform infrared spectroscopy (FTIR)
- Determination of TPH and aliphatic and aromatic
- Hydrocarbons first analyzed by gas
- chromatography–mass spectrometry (GC–MS) and then quantified gravimetrically.
- Statistical analysis: all data were mean values of the three replicates. To test for significant differences in hydrocarbon removal efficiency between different treatments, least significant difference (LSD) test was employed by using SPSS 19.0 software.

Results



Characterization of BS (a) TLC (b) FTIR (c) Emulsification activity, surface tension

Results



Bars marked with different letters are significantly different among different treatments according to LSD test (mean ± SD, n=3)

Conclusion

- Results on the hydrocarbon degrading properties of this organism suggests its potential application for *in situ* bioremediation of petroleum hydrocarbon polluted sites as well as management of oil spills either terrestrial or marine.

References

- Alvarez PJJ, Illman WA (2006) Bioremediation and natural attenuation: process fundamentals and mathematical models. Wiley, Hoboken.
- Das N, Chandran P (2011) Microbial degradation of petroleum hydrocarbon contaminants: an overview. Biotechnol ResInt. doi:10.4061/2011/941810