Aims to isolate oil degrading bacteria from soil and to test the degrading ability of the isolated bacteria on different types of oils.

The current study aims to isolate oil degrading bacteria from soil and to test the degrading ability of the isolated bacteria on different types of oils. Bioremediation is the most effective process to eliminate the crude oil contaminations from the area of spill. In this process, the affected area is dumped with microorganisms that feed on hydrocarbons, thus clearing up the oil from the site of spill. Microbes, particularly bacteria such as Pseudomonas sp., Arthrobacter sp. etc. consume or break the complex hydrocarbons, of which oil is generally made of, into simpler molecules that can be assimilated by the marine lives. Many bacteria have been isolated, that have the ability to degrade hydrocarbons in the marine oil spills (Lies I S, 2007). Bacteria such as Pseudomonas aeruginosa, Klebsiella pneumonia, Bacillus cereus etc. isolated from various sources have been reported to degrade the hydrocarbons in the sea.

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Materials and Methods:

Sample collection: From a nearby motor garage, oil soaked soil samples were collected from the depth of 2 inch and 4 inch from the surface and brought to laboratory. Serially diluted samples were cultured and screened for isolation of different types of bacteria.

Screening of bacteria: P. aeruginosa was isolated by using above method and furthered maintained on the Blood Agar Medium.

Oil Samples: Different oil samples that were obtained from local sources:

- Burned Engine oil
- Fresh Diesel
- Nurani oil
- Fresh vegetable oil

Inoculation: P. aeruginosa was inoculated in different percentages of oils samples (2%, 4%, 6%, 8% and 10%) in test tubes and a control which contained oil with only media (no culture) with final volume being 2 ml.

Incubation: The test tubes were incubated at 37°C and observed after 24 hours, 48 hours, 72 hours, 5 days, 10 days and 15 days. Consumption of oil layer was monitored and compared with control.

Result and Discussions:
The bacteria obtained on the Blood Agar Medium was inoculated into the different types of oil samples, was found to have the ability to degrade not only diesel and Engine oil, but also vegetable oil and nurani oil that are used for household purposes.

Figure 1 shows the extent of degradation of Diesel at different concentrations (2%, 4%, 6%, 8% and 10%). The sub-part ‘A’ of every figure shows the level of oil at the time of inoculation and part ‘B’ shows the oil level on 15th day. Figure 2, 3 and 4 show the degradation of vegetable oil, nurani oil and engine oil respectively. After 15 days, the oil degradation is clearly observed.

Further, genetic level studies need to be done to identify the isolated bacteria and also identify and purify the gene(s) responsible for the degradation of hydrocarbons.
Conclusion:
Oil spills have devastating impact on all the living being that come into the range of the affected area. A number of oil degrading microbes are found in diverse habitats. These microbes can be helpful in rapid elimination of the hydrocarbons. This study aims at investigating the ability of the bacteria isolated from various sources to degrade various types of oils. The bacteria isolated from different sources were exposed to different oil samples. After duration of 15 days, degradation of oils was clearly visible in all the inoculated test tubes. Thus, it can be concluded that the bacteria isolated from different soil samples can successfully degrade any kind of oil and can be used bioremediation process after few more detailed studies.

References: