Mycoremediation of Oil Spill using Hair as Absorbent Material

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Today oil pollution is a global threat, and to deal with it we have come up with a new combining technology scheme, which is not only environmentally friendly but also economically beneficial. Here in we are using human hairs as an absorbent material which is otherwise sent as a waste to be dumped, and the mycoremediation technique, i.e. using organisms from the class fungi from the treatment of the complex hydrocarbons. As crude oil and other motor oils have high density and also a complex bond to breakdown, which take years and years to be degraded. But using of this technique will make our work of degradation possible in just 12 weeks. And this project not only foresees the ecological benefits but also reaps in the future in the form of mushroom production and gaining economical benefits.

**Key words:** Crude oil, human hairs, boom, fungi (mushroom), oil pollution, marine environment.

**INTRODUCTION**

Oil spill has become one of the major concerns due to the reason it has greater impact on marine ecosystem. The oil spillage is of an accidental cause but cost up to a lot of worth both in terms of environmental costing and monetary terms. The oil after spillage also forms emulsified globules which possess a threat to the deep water organisms. The greater delay in cleanup of spilled oil, greater is the harm caused to the environment. The attention here is drawn towards the solution of the oil pollution being more feasible than the existing techniques. The conventional ones only thought of cleaning the spill without thinking of the after effects. The consequences of open burning lead to air pollution, where as spraying of chemical adsorbents/absorbents made that portion of ecosystem dead. Physical booms used as the material for collection of oil were not apt for emulsified oil and also if once their lifetime was over they were literally thrown away as waste. The modification we have done is the change the materials of the boom and their supporting medium. Material is substituted by ‘human hairs’ which have a greater efficiency to collect oil from water even the emulsified one. The advantage of using hair is that they probably degrade within a span of 2 years. And hair is the probably the greatest producing organic material and never ending one. According to the survey done by us we have found that almost 70% of the hairs go straight towards dumping. So why waste such a benefactor and not use it in a socio-environmental cause. Centre of attraction of this project is the mycoremediation of the spilled oil. Mycoremediation is the term defining the bioremediation of the oil by fungi (mushroom). ‘Myco’ is adapted from the Greek word meaning fungus; and the other word ‘remediation’ refers the method of rejuvenating the environment from pollution using biological methods. As the oil collected over here is through human hairs which provide supporting material, likewise oil will also be the good substrate for the mushroom growth. Thus the collected oil is there by used by the mushroom for its growth.

**AIM**

The aim behind this project is to clean up the oil spill in a more biological method possible rather than existing chemo-physical methods. The idea of using mushroom is to consume all the oils in order to leave behind no toxicity in the environment. To biodegrade the heavy crude oil which was once spilled there in the marine environment, and give it back to the nature in the form of mushrooms. Actually what we borrow from nature eventually return back to it in a more eligible form.

**OBJECTIVE**

The objective of our work is to analyze our method and see its effectiveness in terms of how much quantity of oil can be absorbed by a given quantity of hair, from water. Since hair has greater affinity towards oil rather the water when in emulsion, so there is a possibility of great absorption through our chosen material.

The time period required for the growth of the mushroom on a different substrate like this of human hair is challenging. To study the growth pattern of the oil eating mushroom the hair- oil based substrate and resulting characteristics of the mushroom.

**MATERIALS AND METHODOLOGY**

**MATERIALS:** The materials used for the formation of boom structure gives the efficiency of the oil collection and the durability to withstand ocean currents. The various materials used by us to perform the experiment were:

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