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Bioremidation and Oilspill Management

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Editorial

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Editorial

Catastrophes like oil spills have the potential to harm society, the economy, and the environment. They are the discharge of petroleum products from offshore platforms, tankers, rigs, and drilling operations, whether they are unprocessed or refined. These spills can occur on land, but they often occur more frequently in maritime environments. They can be expensive and have negative consequences on the adjacent ecosystems because to the oil loss and accompanying costs of clean-up. Any process referred to as "bioremediation" uses the enzymes or decomposers found in plants to clean up contaminated environments. Oil spills in the ocean can be cleaned up by using microorganisms through a process called bioremediation. One sort of specialist contamination that can be bioremediated using certain microbes is hydrocarbons, which are present in oil and petrol.

The ability of bacteria that degrade hydrocarbons to clean up oil spills is facilitated by their metabolic system, which uses petroleum as a source of carbon and energy. Bacteria that degrade hydrocarbons do not require them to survive. Crude oil was completely broken down and decomposed in an environmentally acceptable manner thanks to the use of wheat bran and marine bacterial consortia immobilised on inexpensive, non-toxic agro-residues. It was demonstrated that they were more effective at destroying oil spills in their immobilised state than they were as a free bacterial cell, in addition to being more flexible and tolerant to harsh conditions.

Bacterial cells that were immobilised have greater ability to break down oil than those that were free. They were able to get rid of 84% of the oils in just 10 days. Only 60% of the crude oil could be broken down by free bacterial cells under optimal circumstances. Ananda Mohan Chakrabarty invented *Pseudomonas putida*, also referred to as oil guzzlers, which is a saprophytic, rod-shaped, gram -negative bacteria that were granted a patent for its ability to biodegrade oil. *P. putida* can effectively transform styrene in oil into biodegradable plastic that can be recycled into polystyrene foam in the plastics sector.

The geological characteristics of polluted sites, such as soil, pollutant kind and depth, human habitation site, and performance of each bioremediation strategy, should be taken into consideration while choosing the most effective bioremediation method to successfully repair polluted sites. According to the findings, adopting non-toxic clean-up approaches to address unintentional bulk oil discharge into the maritime environment is successful.