Green to Clean: Algae - A Novel Method for Oil Spill Remediation

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Oil spills are a daunting threat all around the world and the current forms of remediation are costly, inefficient and toxic. Oil spills, therefore, are economically burdening and have a devastating impact on marine ecosystems. Hence, as a response to a lack of modern technologies to deal with this issue, a novel experiment using algae to remediate an oil spill was conducted. An oil spill was simulated in a petri dish. On top of the oil, different amounts and strains of algae (Chlorella vulgaris, Scenedesmus obliquus, Volvox aureus) were added with ferromagnetic nanoparticles to magnetize the algae, so that the algae could later be removed. The mixture was then placed in an incubator for several hours with an overhead light to ensure the survival and growth of the algae. Subsequently, a neodymium magnet was used to separate the algae from the oil and water so that the amount of oil remediated each hour could be quantified. 25 trials were conducted for each strain of algae and for four different volumes of it, with a constant measurement of ferromagnetic nanoparticles, oil and water, adding up to 300 trials plus 25 controls. This experiment was conducted on both crude oil and on vegetable oil. It was established that the Scenedesmus obliquus strain was the most effective in degrading the crude oil, as the most effective trial degraded 81.6% of the oil and the algae adsorbed a whopping 28.79 times its mass on average. Though this research is still at an early stage, this method has strong potential to be the future of oil spill remediation as it is significantly cheaper, less toxic and much faster than conventional methods, plus does not damage the environment and actually removes the oil from marine ecosystems rather than just dispersing it.

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