**Microscopic Organisms Clean Up Oil Spills**

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**Abstract**

Scientist are on Nature’s side with disaster clean ups that are earth friendly. With the resources that we have today becoming more advanced and increasing in use, pressure to make them without hurting the earth is increasing as well. The last huge oil spill in two thousand and ten caused a large amount of stress on our environment. Scientist are now using something natural to help clean up, without using more harmful things to these communities effected by large industry disasters. Bacteria can now be used to clean up oil in almost any environment while using natural resources, and saving energy. Its important to stay up on technologies in the oil and gas sector so they can continue as responsible as possible in the future. Microbiologist are discovering a way to utilize bacteria that will compliment the fossil fuels bad side. The latest strategy is finding nitrate-reducing bacteria and getting them in these communities that oil is emerging. Many oil companies are not favored in the communities that are effected by the downfalls they can sometime create. Adding something that comes to us naturally, helps the oil company, and the community effected could be a game changer.

**Introduction**

We can probably all recall the oil spill in the Gulf of Mexico. Cleaning this up was as much of a disaster as the actual spill was. The microbes use oil as food and other resources making them a great clean up crew. The cells do not degrade the environment and multiply quickly so there is no worrying about having to put more out. The way microbes do this is through eating hydrocarbons similar to those on the sea floor and keep dispersing until there is almost none left. There was not just one species of bacteria doing this job. Bacteria that ate ethane, aromatics, alkane, oil, methane, and more were amongst the mix. The earth is consuming oil every day, almost seventy spills happen everyday. Instead of burning it off or putting things on the spill that have potential to hurt something else, microbes can just be emitted into the area that is harmed. Around one hundred sextillions of them were used for the large oil spill in the gulf [1]. This process was discovered by what was around the areas of oil in the ocean that was emerging from the sea floor, this was their chosen ecosystem. Scientist are now considering having them help us clean up our plastic mess. As well as using a green way to help fight the sulfate produced in fossil fuels is another step microbiologist are working towards. So much progress is happening from this discovery and how useful something is that we already have access to. The revenge of the microbes.

**Discussion**

Due to the apparent harm our environment and wildlife endures from gas and oil. Having something that cleans without harming more is so helpful. The environment has been degrading quickly from all the things used everyday that are harming the ozone the more imputed into the air. Hydrocarbons are a released into the environment causing pollution. Since the oil spills in the ocean are on the surface if reacted quickly enough the microbes can do their job so none of the wild life is harshly effected. Sometimes the communities are still poisoned or suffocated depending on the spill. When changing the structure for the spill sometimes the bacteria becomes the dominate species. Different bacteria have been tested all over depending on the location of the spill, some are used everywhere and some have specific different species for where they were isolated at. Alkanes are degraded the fastest and aromatics are the slowest due to their molecular weights [1]. Engineering a new way to sustain fossil fuel energy is something that is competitively changing and the bacteria that is ecofriendly might be the best one yet. Microbes play such a large role now in any natural disturbance to the environment. The chemicals emitted by the fuels have such a long term effect when a disaster occurs that bioremediation is a true wonder to stopping the spread of hydrocarbons and hydrophobic compounds [1]. In oil spills the bacteria must be in close contact with the oil, when this happens the oil are bound to the cell membranes and metabolized into the microorganism. This used to not be possible but with change in the molecular weight of the selected microbes results in a more susceptible attack. Having different bacteria in the mix is a must due to all the things that oil usually consist of in massive quantities.

The next pollutant that the labs are working towards mitigating are plastics. Right now it is mainly focused in the marine environments since this is quite difficult to remove ourselves. Pollution in our oceans is a major problem that continues to harm more and more ecosystems everyday. “Approximately 13 million tons enters the oceans every year” [2]. A lot of this is washed ashore, but the most of it sinks to the seafloor getting broken down and eventually eaten. Bioremediation is what is being proposed, the use of fungi and bacteria to degrade plastics and use them for their own fuel [2]. There are two groups that their materials can be broken down by, a natural process that takes the plastics and makes the renewable for the microorganism or a synthetic way that is non-renewable and creates a new biomass. Both are better than having floating plastic in the marine areas. The plastics go through three process to break down themselves; photo-degradation, thermo-degradation, and biodegradation. These each are pretty explanatory. Light, heat, and microbes; these are earth friendly ways to clean and remove any and all contaminants from this environment. The microbes break down what is on the surface, seafloor and ashore getting all complex polymers that can hurt plants and animals in these communities.

As communities continue to increase the toxins we put out into the ozone, fighting back with something that is already there is a great option. Project Guru has many ideas and projects that are going to improve our habitat. Both of their articles on bioremediation for oil and plastic seem so much similar than using things that just take more oil and fuel to do the work instead of using what is already unwanted as food. The story of how scientist cleaned up our gulf coast is amazing, even though it took a few years’ microbes that worked double time to clean this area deserve a lot of credit and people didn’t even seem to ask how this got cleaned up. Petroleum companies don’t usually plan for these things but having bacteria around these wells and pumps to control any small leaks or messes that can occur is always a smart option. It takes a very large army of microbes to eat all the hydrocarbons dispersed in an oil spill and hopefully before they dissolve into the water. Oceans help the microbes by their constant movement allowing the bacteria to continue the reproduce and turn millions into billions [3]. This is sustainable by how they replicate so quickly and their desire to grow and eat all available nutrients. The microbes needed help after BP’s oil spill due to its massive amount that the sunlight transformed the oil into another reusable fuel for something else, this is truly nature using its recycle skills. In another article they mock the performance of microbes by comparing them to teenagers [3]. Saying how they can do something you ask of them, but the job isn’t going to be done as good as you want. This can also be true but they tried right? Five years after the disaster created by BP the effects from the spill are still there but the real recovery was just beginning, thanks to microorganisms.

**References**

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