Effects of Temperature on Oil Spill Bioremediation

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Through this project, we intended to see the effects of higher temperatures on oil eating microbes efficiency to clean up oil spills, as evaluated through CO2 emissions. The intended usage is to combat rising temperatures due to climate change and find an efficient method to cleaning up oil spills that's easily accessible. We used motor oil and microbes slathered using a 1:1 ratio on ceramic tiles, placed into plastic files with a CO2 sensor to measure the microbes efficiency. We placed three different trials under water baths, all at varying stable temperatures using sous vides, and measured their CO2 emissions over 3 days. We found that the higher the temperature, the more efficient the microbes were at cleaning up oil. The highest temperature, at around 45 degrees Celsius, cleaned up the oil at a much higher rate than the other temperatures at 18 degrees Celsius and 22 degrees Celsius. The CO2 emissions of the 45 degree Celsius microbes were over 10 times as efficient as the room temperature water. Hopefully, in the future, this easily accessible and highly efficient microbe will be able to be used all around the world in oceans to efficiently clean up oil spills, without uncertainties about its efficiency due to rising temperatures.

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