PET Degradation by Ideonella sakaiensis: A Hypothetical Model

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The purpose of my project is to help find a solution to pollution. An estimated 14 billion pounds of trash, much of it plastic, is dumped in the world's oceans annually, which is tragic. The plastic is damaging wild life and the environment. If Ideonella sakainesis survives on polyethylene terephthalate (PET) then can this be the solution to riding my oceans of PET. To test this hypothesis and to see how long this could possibly take, I had to find an approximation of the amount of PET in the ocean. Although much of the garbage in the ocean is composed of PET plastic does not mean there are non-plastic substances also harming the ocean life, but I focused specifically on the plastic since it still does a great amount of damage. After finding an approximation to the amount of PET in the ocean I researched how fast this bacterium can dissolve a specific amount of PET plastic. Then multiplied that time with how much PET there was to get an estimated time of how long this process could take. I hypothesized that it could take around a year to degrade the PET in the ocean due to the current volume and the monthly additions. In conclusion Ideonella sakainesis could drastically help improve the PET pollution in my oceans.

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