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Bioremediation of Hydrocarbons

The purpose of this experiment is to determine the optimal concentration of nutrients for the digestion of hydrocarbons by the bacteria *Pseudomonas putida*. The bacteria need nutrients such as phosphorus and nitrogen to digest the hydrocarbons, and there the amount of nutrients in the water affects the rate of digestion of the oil. The optimum concentration was determined by depositing equal amounts of oil and bacteria into jars of water containing different concentrations of dissolved fertilizer, which served as the nutrients for the bacteria. The amount of bacteria, oil, and water were held constant as well as the temperature and pH of the water. The results showed that the optimum concentration of fertilizer, which supplied the nutrients for the bacteria, was 2 g/L. The nutrients allow the bacteria to reproduce and digest the oil more efficiently, but 3 g/L was too high of a concentration, most likely because the bacteria reproduced too quickly and depleted the oxygen in the water, slowing the rates of reproduction and digestion. The results were determined by change in mass, due to the evaporated methanol, which revealed that the jar with the nutrient concentration of 2 g/L had the least amount of oil remaining after the twelve-day period. The results of this experiment give insight into possible methods for improving modern bioremediation practices.