Comparative Study of the Biodegrading Activity of Pseudomona sp. and Penicillium sp. in Marine and Coastal Ecosystems Contaminated with Hydrocarbons: Scale Simulator

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The high frequency of oil spills in the oceans cause nations to focus on cleaning methods. Some of the mechanisms used are expensive, toxic to marine species and take a long time. There are microorganisms like fungi and bacteria that can degrade toxic substances. Bioremediation can be a green technology for such hydrocarbon-contaminated marine ecosystems. The objective of this research was to recreate a controlled scale simulator of a marine and coastal ecosystem to identify which of the microbial species Pseudomonas sp. and Penicillium sp. presented higher hydrocarbon degrading activity. The hypothesis was: bacterium Pseudomonas sp. will present higher biodegrading activity in marine and coastal ecosystems contaminated with hydrocarbons. Two simulators were designed: Simulated oil spill cleanup in the open ocean (station 1) and coast (station 2). In station 1, five beakers of 600 mL with 350 mL of distilled water, 12.25g of NaCl, fifty drops of oil, and nutrient fertilizer were prepared. Two beakers were inoculated with Pseudomonas, two with Penicillium and 1 control. Beakers were incubated at 30 ºC and the dissolved oxygen was increased using a shaker. The same steps were repeated in station 2 but using five 200 mL beakers with less water and a layer of ½ inch of sand. Weekly qualitative analyses of the simulations were performed (appearance, color, texture of the oil and turbidity by using density indicator strips). Results were reported in qualitative data tables by date. The bacterium Pseudomonas sp. was the species with higher hydrocarbon degradation activity in both ecosystems.

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