TITLE: EVALUATION OF BASIC RESPIRATION KINETICS OF PENICILLIUM SIMPLICISSIMUM ASSOCIATED WITH THE MICROBIAL SOIL COMMUNITY

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ABSTRACT:

Petroleum hydrocarbons can contaminate the environment from accidental spills at all stages of the oil chain, but also due to the incorrect disposal of wastes generated by their derivatives. All types of pollutants pose a danger to the environment and living organisms. There are several strategies aimed at recovering aquatic and terrestrial environments contaminated with petroderivatives. Among biological techniques, bioremediation is highlighted by the use of biological organisms to clean chemical pollution, exploring the systems of biological agents, especially fungi. Filamentous fungi deserve prominence due to one of their mechanisms of action, the enzymatic secretion. The genus Penicillium is well known and reported in the literature for its high capacity of hydrocarbon use as an energy source. Therefore, the objective of this study was to evaluate the biological activity of the microbial community of a soil contaminated with bioaccumulated hydrocarbon residue with Penicillium simplicissimum fungus. For this purpose, the amount of Carbon (C) released within the microcosms containing 100 g of soil, 250 µL of used lubricating oil residue, pH and moisture corrected for 60 days. To evaluate the CO2 demanded, small containers containing 30 ml of NaOH were placed in the vials. During the incubation period, the contents of the containers were regularly replaced and, after the addition of 10 ml of BaCl2 and 2 drops of phenolphthalein, titrated in HCl, to determine CO2 concentrations. At the end of the experimental period, it was observed that in the first week there was a low rate of respiration, increasing exponentially in the second, but in the following weeks there was a stabilization of the rates with decay in the last week evaluated. Results that suggest the impact of the new conditions to the microbial community at first, however after a short period of adaptation the microorganisms are able to reestablish their metabolic activities, being able to even use the intermediates of degradation of the contaminant as carbon source. These evidences show that environments contaminated with hydrocarbons have an initial impact on their microbiota, but it is able to reorganize and adapt to the new reality, using its particular mechanisms to do so.

Keywords: Basal Respiration, Filamentous Fungi, Hydrocarbons

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