TITLE: PROSPECTING MICROORGANISMS WITH POTENTIAL FOR BIOREMEDIATION OF AREAS IMPACTED BY PETROLEUM HYDROCARBONS

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ABSTRACT:

The spillage of petroleum hydrocarbons into the environment causes significant damage to ecosystems and the accumulation of these pollutants in the tissues of animals and plants can cause genetic and functional alterations in the affected organisms. Recurring accidents during the exploration, production, refining, transport and storage of oil and its derivatives demand efficient methodologies to mitigate the impacts of these compounds that remain in the environment for decades. Among the strategies adopted for the recovery of areas contaminated by hydrocarbons, bioremediation stands out for being a low-cost alternative compared to other traditional methodologies that allow the removal of hazardous compounds. In this sense, the intentional use of microorganisms in the contaminant biodegradation process is one of the most effective and adopted strategies for bioremediation of contaminated environments. Therefore, the present study aimed to isolate strains of bacteria and fungi autochthonous to areas contaminated by fuels and select isolates that degrade hydrocarbons, aiming to employ consortia of microorganisms in bioremediation processes. The samples used in this study were collected at the experimental farm of the Núcleo Ressacada de Pesquisas em Meio Ambiente (REMA), located in the city of Florianópolis - SC, Brazil. A total of 30 isolates were obtained from soil samples collected at a depth of 1.5 m in two experimental areas contaminated with diesel oil. The growth of the isolates was evaluated in a minimal mineral medium containing 1% and 5% of diesel oil as the only carbon source, in order to select hydrocarbon degrading isolates. Of the 30 isolates evaluated, only 19 showed viable cells after the stages of enrichment in minimal medium, which were morphologically characterized as 12 bacteria and 7 fungi. With these results, it was possible to select hydrocarbon degrading isolates for future analysis regarding their potential use in bioremediation processes. The selected species will be identified by sequencing partial regions of the *16S* rRNA and *ITS* genes. After identifying the isolates, consortia of microorganisms will be formulated. The potential use of microbial consortia in bioremediation processes will be evaluated through testing in a microcosm of soil contaminated with diesel oil.

Keywords: bioremediation, biodegradation, petroleum hydrocarbons

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