

**Title: BACTERIAL ISOLATION OF *Remirea maritima* RHIZOSPHERE: EVALUATION OF PETROLEUM HYDROCARBONS TOLERANCE**

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**Abstract:**

Bioremediation stands out as a technique for contaminants elimination in the environment and offers less risk to human health. Oil is a major source of energy worldwide and also in Brazil, and frequently, environments have been contaminated by this pollutant. The sand dune is an overlooked ecosystem vulnerable to contamination by petroleum hydrocarbons, both by leaking in marine environment and damage in ducts which often pass through these ecosystems. Bioremediation uses plants and microorganisms capable of degrading the contaminating compounds. In this context, our work is based in the potential bacterial resistance to toluene and xylene. Bacteria was isolated from the rhizosphere of *Remirea maritima*, a native plant of sand dune frontal formation, Massambaba, Arraial do Cabo, RJ. For isolation of bacterias, the *R. maritima* rhizosphere was extracted, vortexed and the inoculum obtained was suspended in 0.9% saline solution. The rhizosphere bacterias were transferred to solid medium (Luria Bertani (LB) + 2% agar) and incubated for 24h or 48h in BOD at 25°C. Eight types of bacterial colonies were identified. For the experiment we used a bacterial colony that has white color and consigning layer, features already assigned to biorremediation. From the culture, the bacteria were subjected to growth in glass tubes with screw cap, containing xylene and toluene hydrocarbons in liquid LB culture medium. The following concentrations were used: 1.25 µL/mL, 2.5 µL/ml, 5.0 µL/ml, and 10 µL/mL in triplicates. The tubes were placed horizontally on an orbital shaker set to 250 rpm rotation and these were maintained in a BOD incubator at 25 °C. The bacterial growth was analyzed by optical density (OD) after 24 to 48 hours after inoculum, using a spectrophotometer UV / V-1600, 600nm. The results showed that in increasing concentrations, bacterial growth decreases in the presence of toluene and xylene. Toluene bacterial resistance was not observed. However, with respect to xylene, rhizosphere bacteria tolerance seems to be directly related to increasing concentrations of the hydrocarbon (5µL/mL and 10µL/mL). Our goal is to identify each single bacterial colony isolated and to verify the xylene tolerance potential in the white bacteria colony tested using a broad temporal course.

**Keywords:** Bacteria, hydrocarbon, *Remirea maritima*, rhizosphere

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