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Assessment of diesel oil degradation by fungi

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Campos basin is where 85% of Brazilian oil is produced. It has attracted investments such as Porto do Açu [Açu Port], some years ago, in São João da Barra municipality: more precisely in the Iquipari/Açu restinga complex. Presently, the port handles more than a million oil barrels a day, what arises the need for anticipation regarding biodegradation of oil products and leads to the assessment of microorganisms from this restinga that may eventually be used for affected areas bioremediation. The aim of this paper was to select restinga fungi species which are potentially effective for oil diesel degradation *in vitro* to use them in plant-oil-fungi *in vivo* studies. Different fungi species were grown in liquid medium containing salts and 2% diesel oil as the only carbon source. After ten days of growth, 2 ml of the medium were pipetted for petroderivative biological oxidation assessment by adding 100 µL aliquots of 0.05% redox indicator DCPIP solution (2.6 dichlorophenol-indophenol). Indicators turning from blue to colorless point to the occurrence of fungal-mediated diesel degradation reactions, enabling the selection of promising isolates grown in liquid medium. For soil residual toxicity assessment, 2% diesel oil solutions and spore and selected fungi mycelium suspensions were applied in 300 g portions of washed and previously sterilized beach sand. After 30 days of rest, seedlings of *Ipomoea pes-caprae*, a species from the restinga beach environment commonly used in plant restoration, and generally referred to as *Batateira-da-praia*, were planted. Plant growth and development assessments were carried out 30 days after planting. Positive reactions for DCPIP allowed the selection of fungi *Cladosporium* sp., *Fusarium* sp., *Talaromyces* sp. and *Trichoderma* sp. as capable of using diesel oil as their only carbon source, producing less toxic compounds. *In vivo* evaluations carried out by development measurements, both of the aerial part and of the root systems of the plants, allow us to suggest the use of these restinga microorganisms as a viable biological alternative for oil diesel contaminated environments remediation.

Keywords: Bioremediation. Pollutants. Degraded areas.

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