

Detection of hexadecane biodegradation ability of bacteria isolated from Santos Basin estuarine samples

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Abstract:

Brazil is considered one of the leading countries in pursuit of sustainable processes, on the other hand is also among the leading nations with contamination problems with regard to waste generated. Another great Brazilian problem is in intense ship traffic along the coast, and there may be oil spills, being punctual and catastrophic events but also dispersed and daily events such as the case of ballast water release, especially of oil (COSTANZA *et al.*, 1999). Seeking solutions to change this scenario, bioremediation is becoming increasingly important for the recovery of affected sites, through the use of biological agents able to modify and degrade pollutants. Even with the notable importance of employment bioremediation techniques, as well as the use of bioproducts in oil exploration, the number of microorganisms / acquaintances is currently still scarce. In this context, this study aims to assess aerobic bacteria isolated from core samples and estuarine water, collected at Santos Basin, evaluating their ability for hydrocarbon biodegradation. The collected samples were inoculated at artificial seawater medium (ASW) and Hexadecane was adopted as model carbon source the (0.1% v/v). The assays were incubated in a rotational shaker (180 rpm) at 28 °C, during 7 days. After seven days of incubation, of the same conditions at BOD oven, the bacterial morphologically distinct colonies were isolated and cryopreserved. A rapid screening was performed for the detection of hydrocarbon biodegradation potential, using hexadecane as template compound, Bushnell Haas (BH) as mineral medium and MTT solution (1 %) [3- (4,5-dimethyl-2-thiazolyl) - 2,5-diphenyl-2H- -tetrazolium bromide] (Merck®) as chemical agent to detect the presence or absence of microbial growth through cellular respiration checking (VASCONCELLOS *et al.*, 2010). The assays were developed in 96 well microplates and all isolates were evaluated in triplicate. From a total of 42 isolates, 21 could show ability to grow in mineral medium containing hexadecane as sole carbon source. In the present moment, these 21 isolates are being evaluated about their hydrocarbon biodegradation abilities, through chromatographic analysis. The obtained results until this time, can allow the affirmation about the potential of the bacterial isolates from Santos Basin, to tolerate hexadecane as unique substrate for their growth.

Keywords: Hexadecane, ASW, MTT, Biorremediation, Hydrocarbons.

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