Title: BIOPROSPECTING ENDOPHYTIC FUNGI FROM SÃO PAULO MANGROVES

Authors: Martinho, V.[1], Lacava, P.T.[2], Vasconcellos, S.P.[1]

Institution: [1]UNIFESP – Universidade Federal de São Paulo (Unidade José de Alencar – Rua São Nicolau, 210 – Centro – Diadema/SP), [2]UFSCar (Universidade Federal de São Carlos – Via Washington Luís, km 235 – São Carlos/SP)

Abstract:

The discovery or optimization of enzymes that can act and/or attend environmentally friendly processes like, second generation bioethanol production and petroleum bioremediation. About second generation bioethanol, the raw material for the process is basically composed by cellulose (40-50 %), hemicellulose (25-35 %) and lignin (15-20 %). However for its industrial production it is necessary to identify organisms or enzymes that can promote the lysis of lignocellulosic materials with a great efficiency, turning the process economically viable. Looking for the petroleum bioremediation techniques, several products can be used in contaminated areas by hydrocarbons. Herein, we can mention biosurfactants and bioemulsifiers, which can be exopolymers (EPS) produced by diverse microorganisms. In this sense, aiming to search microorganisms for these biotechnological applications, were investigating endophytic fungi, from mangroves of São Paulo state coast, that are still unexplored for this goal. The present study is evaluating the enzymatic activity of endophytic fungi that can be applied, in the future, for the production of cellulosic bioethanol, as well as, analyzing their biosurfactant abilities. Thus, 32 isolates were randomly selected from a stuff 2,000 endophytic fungi, that were collected in previous studies done by the research groups from ESALQ-USP in mangroves of Cananéia and Bertioga – São Paulo. These 32 fungi isolates were submitted to ligninolytic assays, using guaiacol agar medium as screening method. Their biosurfactant ability were screened through the drop-collapse method and quantification of emulsification indexes (E24). Across these analyzes, it was possible to select 20 strains that showed positive ligninolytic abilities. Through spectrophotometric methods, 16 strains showed lignin peroxidase, 20 of manganese peroxidase and 20 of laccase activities. In addition, fifteen (15) isolates were detected as positive for their biosurfactant activity, including nine (9) that showed good emulsification index (ranged from 55,1 to 62,8%).The next steps of this study will be the detection of cellulase and oxygenase activities, looking for the search of enzymes that can be incorporated to cellulosic bioethanol in large scale. In parallel, the selected isolates for their biosurfactant abilities will be also be investigated about optimal conditions to product the exopolymers for future application in petroleum bioremediation.

Keywords: endophytic fungi, bioremediation, second generation ethanol

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