TITLE: BIOPROSPECTING ENDOPHYTIC FUNGI OF THE SEMI-ARID BRAZILIAN ECOSYSTEM FOR THE PRODUCTION OF CELLULASE

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ABSTRACT:

The enzymatic hydrolysis of cellulose is an important industrial activity, but it is often a difficult and slow process. The generation of biofuel such as sugarcane ethanol of second generation is a promising activity once the sugarcane bagasse, which is a rich lignocellulosic raw material, can also provide significant amounts of sugar in order to enhance production. Therefore, the discovery and characterization of new cellulolytic enzymes can significantly contribute for industrial process development. This work aims to bioprospecting plants from the Chapada Diamantina Ecosystem as new sources of cellulolytic enzymes through the association with endophytic fungi. The congo-dye red test was used for screening potential endophytic cellulase producers and the 3,5-dinitrosalicylic acid (DNS) assay was applied to quantify enzymatic activity. The result showed that several plants of Chapada Diamantina Ecosystem showed association with cellulolytic fungi. This work reports the isolation of 16 fugal isolates with high cellulolitic activity. The isolates 6, 9 and 12 were further tested for the best incubating time for harvesting cellulase and the calculation of enzyme activity (1U=1μMproduct/min) using carboxymethylcellulose (CMC) as substrate. The best culturing day for harvesting cellulose for the strains 6, 9 and 12 were at 7th, 9th and 3rd day, respectively. The enzymatic activity assessed with CMC was of 3.5, 25.4 and 25 U for strains 6, 9 and 12, respectively. Endophytic fungal strains may therefore constitute a valuable source of biological material that deserves to be studied and explored for the production of cellulolytic and hemicellulolytic enzymes. In this context, the present work concerns the selection of endophytic fungi as producers of hemicellulases and related enzymes with different enzymatic profiles, for use in the deconstruction of lignocellulosic biomass.

Keywords: endophytic fungi, cellulase, DNS, CMC

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