Title: POTENTIAL PRODUCTION OF LIGNINOLYTIC ENZYMES FROM FILAMENTOUS FUNGI

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Abstract:

Ligninolytic enzymes have a large potential for biotechnological use with wide and broad scope of application, especially when produced from microorganisms, in particular fungi; therefore they secrete extracellular enzymes involved in the oxidation of complex phenolic compounds such as lignin. Among these, the best known and studied enzymes are manganese peroxidase (MnP), lignin peroxidase (LiP) and laccase (LaC). In this context, this work had as its central focus filamentous fungi, selection from mycology collection of Labisisbio/UFPA, which presented potential production of extracellular ligninolytic enzymes and the activity involved was centered on peroxidases. After this selection, the fungi that showed high peroxidase activity were selected in semi-solid medium containing 0.05%(w/v) remazol brilliant blue R dye (RBBR). The total or partial degradation of the dye was indicative for the presence of the enzyme, taking 10 days cultivation at 28°C. The selected strains were cultivated in shake flasks at 28°C and 120 rpm for 7 days and evaluated the potential production of the enzymes LiP, MnP and LaC, as well as the total protein. In this work, 85 strains of filamentous fungi were studied, and only 10 strains had decolorized totally or partially the dye RBBR. Among the evaluated strains, 5 had LiP activity ranging from 23.87 U/L to 24.35 U/L. For other enzymes, strains showed activities up 115.46 U/L for MnP and up 223.33 U/L for laccase. The amount of total protein ranged from 20.33 mg/L to 79.16 mg/L. For all filamentous fungi that have been selected, we observed that all strains showed a satisfactory expression for at least one of ligninolytic enzymes investigated. The selection of fungi with extracellular enzymes production with high catalytic potential is important in processe biotechnology, especially in biotransformation reactions with prospects for technology use.

Keywords: fungi, enzymes ligninolytic, peroxidase.

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