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A novel technology for medicinal mushrooms production based on enzyme profile

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Basidiomycetes are fungus able to grow and produce fruiting bodies on lignocellulose substrates due to their ability to produce hydrolytic and oxidative enzymes, which are excreted to the extracellular environment. As a result they degrade lignocellulose and produce mycelial biomass. Monitoring degradation and biomass production may provide important information on the efficiency of lignocellulose bioconversion into fungal biomass. Our objectives were to identify the lignocellulosic enzymes of *Agaricus subrufescens* on different substrate conditions of a traditional (composted) and alternative axenic systems (non-composted). The dynamic of enzymatic activity, biomass production and lignocellulose degradation were evaluated as well as the analysis of Klason lignin, infrared spectroscopy (FTIR), pH and C/N ratio. *A. brasiliensis* produced as lignocellulolytic enzymes, laccase, manganese peroxidase, ß-glycosidase and xylanase, in both substrates. Laccase activity was higher when compared to Mn peroxidase, particularly in the non-composted substrate. Xylanase was mostly active on the composted substrate. The traditional system, composted substrate yielded higher fungal biomass. Laccase and protein were correlated to biomass on the traditional cultivation system. In relation to the changes in the substrate an increase on relative lignin concentration occurred on the axenic system whereas the value was reduced on the traditional system. The FTIR spectra evidenced a higher consumption of polysaccharides (1110 cm-1) in the traditional system. The pH changes showed a decrease in both substrates. C/N ratio was reduced in the traditional system but increased in the axenic substrate suggesting that the species has higher ability to produce higher biomass on pre-fermented substrates nevertheless growth is possible in both substrates. Strategy of lignocellulosic degradation is different depending on the type of substrate produced indicating the effective use of a new production strategy for this specie.

Biography

Alexandre Antunes Brum has done his Bachelor's degree in Biological Sciences in 2001 from the Federal University, Brazil. He has done his Master's in Biotechnology (Federal University from Santa Catarina, 2005). He is a Professor at Anhanguera Faculty (Plínio Leite University Center), where he is also a Coordinator of Biological Sciences Graduation Course. He is a Doctoral student at Biotechnological Post-graduate Section of Federal University from Pelotas, Brazil..

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