



Laccase production by macro-basidiomycetes using *Jatropha curcas* seed cake as substrate under solid state cultivation

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Macro-basidiomycetes produce a wide range of natural products, and play a relevant environmental role, as they are highly degrading lignocellulosic residues by extracellular enzymes such as laccase and other oxidases. The objective of the present work was to evaluate the production of laccase and total soluble proteins by different basidiomycetes during solid-state cultivation (SSC) of *Jatropha curcas* seed cake (JCSC). Thus, it was used 17 macro-basidiomycetes from collection of microorganisms and microalgae applied to the biorefinery of Embrapa Agroenergia, Brasília, DF. All fungi were inoculated into JCSC with moisture adjusted to 65% and incubated at 28° C until complete colonization of the substrate. The extracts were obtained by solubilization of the total colonized substrate in 2% TritonX-100. Then, laccase and protein content were analyzed by ABTS and BCA methods, respectively. Most fungi reached complete colonization of JCSC within 15 days. Higher laccase activities were observed in CC028 (23407.82 U/mL), CC416 (21708.64 U/mL) and EF88 (21543.89 U/mL) cultures, which have values higher than those reported in this work. Significant concentrations were observed for total soluble protein; however, it did not present a direct relation with laccase activity by Pearson correlation analysis. The control sample showed that a great content of plant proteins from JCSC is also solubilized in the extracts. Conclusively, macrofungi are excellent producers of extracellular laccase when cultivated in JCSC under SSC. The great values of laccase activity suggest that these microorganisms can be used for degradation of lignolytic material and/or for the production of commercial laccase using JCSC residues.

Keywords: cell wall degrading enzymes, macrofungi, biodiesel cake, by-products