Production of fungal lipases for biodiesel production


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Lipases (EC 3.1.1.3, triacylglycerol ester hydrolase), due the higher versatility, have been used in the hydrolysis process followed by esterification and alcoholysis reactions for the biodiesel production. The present studies focus in create a low-cost biocatalysts processes to obtain biodiesel by solid state fermentation using different substrates as wheat bran, soybean bran and sugar cane bagasse. The strains of fungal 1, 13, 42, 47, 48, 64, 110, 127, 129 e 162 isolated from soil, plants, water and foods were used in the present investigation. The fermentations conditions carried out on solid supports and water 1:0.8 (weight) at 30°C for 96h with all strains and for until 192 h with the strain and medium culture select. After that time, 50 mL of water was added and the filtrate used for lipase activity. Lipase activity was performed with olive oil and arabic gum as described by Lopes et al. (2011). The best results in the first experiment were with the strain 01 in wheat bran (15.0 U/mL of lipase) and in soybean bran (14.4 U/mL of lipase). The others strains presents lowest lipase activities than strain 01. It wasn’t observed fungal growing and lipase activity in the culture medium composed for sugar cane bagasse. In the production of lipase in different times by strain 01 in soybean bran was observed 13.3 U/mL of lipase after 168 h of fermentation; while the same fungi produced 15.7 U/mL of lipase in wheat bran after 192 h. So, it was obtained lipase from strain 01 approximately 7.0 times highest than enzymatic extract of Penicillium E20 studied in 2010 for Roveda et al. and 4.0 times highest when compared with the lipase activity of Rhizopus arrhizus MTCC 2233 studied by Rajendran and Thangavelu (2009).

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