Production of Cellulases and Hemicellulases by *Aspergillus japonicus, Penicillium citrinum* and *Penicillium chrysogenum*

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The world-wide interest for the biofuel is increasing in virtue of a bigger concern with the development of renewed and cleaner energy sources. Therefore, cellulases and hemicellulases, that catalyze hydrolysis of lignocellulosic biomass, have been studied for biomass saccharification and production of second generation ethanol. In this work FPases, endoglucanases, celobiases, a-glucosidases, a-galactosidases, β-xylosidases and xylanases activities from *Aspergillus japonicus, Penicillium citrinum* and *P. chrysogenum* cultivated in submerged culture containing wheat bran as carbon source and in solid state fermentation using sugar cane bagasse, were determined. Higher production of the enzymes occurred when the fungi were grown in submerged culture with wheat bran. Highest *A. japonicus* xylanase activity in submerged culture was 1.14 U/ml; β-glucosidase and celobiase were 1.11 and 0.35 U/ml, respectively. Xylanase production was 0.33 U/ml in solid state. P citrinum in submerged culture produced highest xylanase activity, 2.0 U/ml; β-glucosidase, FPase, celobiase, endoglucanase and a-galactosidase were 1.56, 0.33, 0.11, 0.16 and 1.48 U/ml, respectively. P. chrysogenum cultivated in submerged culture produced xylanase, β-glucosidase, celobiase, endoglucanase, FPase and a-galactosidase, with maxima activities 1.03, 1.57, 0.47, 0.10, 0.14, and 1.90 U/ml. Production of xylanase in solid state was 0.30 U/ml). The fungi showed ability to grown in wheat bran and sugar cane bagasse as carbon sources, to produce cellulases and hemicellulases, which are important for biomass degradation.

Financial support: FAPEMIG and CNPq.
Key words: Aspergillus japonicus, *Penicillium citrinum, Penicillium chrysogenum,* biomass, bioethanol.