PRODUCTION AND CHARACTERIZATION OF XYLANASE AND CMCASE OF A NEW STRAIN OF *Trichoderma* sp. USING AGRO-INDUSTRIAL RESIDUES


1Centro de Ciências Médicas e Farmacêuticas – Universidade Estadual do Oeste do Paraná, Paraná, Brasil;
2Divisão de Áreas Protegidas - MARP.CD e Divisão de Reservatório - MARR.CD, Itaipu Binacional, Paraná, Brasil;
3Depto de Biologia – Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto – USP, São Paulo, Brasil.

The xylanases and cellulases are enzymes of great biotechnological interest due to the ability to convert the lignocellulosic biomass into fermentable sugars by yeast to be used in ethanol production. These enzymes can be applied in various sectors such as industries of detergents, drinks (fruit juices and wines), food, textile, animal feed, pulp and paper industry. The aim of this study was to investigate the production and characterization of extracellular CMCase (carboxymethylcellulase) and xylanase by a Brazilian strain of *Trichoderma* sp. under liquid culture using agro-industrial waste. The fungus *Trichoderma* sp. was isolated recently from Atlantic Forest biome of Parana-Brazil and it was developed in Czapek mineral medium supplemented with 1.5% brewery barley bagasse or corn straw or wheat bran as carbon sources under static condition and incubated at 28°C for 5 days. Xylanase and CMCase activities were assayed by measuring the reducing sugar released from xylan and carboxymethylcellulose, respectively. Among these carbon sources tested, the brewery barley bagasse was the best inducer for the production CMCase (0.76 U/ml) and for xylanase (84.36 U/ml). The high activity of xylanase was obtained in pH 5.0 and it was stable in a pH range of 3.5-7.0 for 168h. The optimum temperature was 60°C, and the half-life of this xylanase was for 30 min, whereas, the optimal pH and temperature of CMCase activity were 4.0 and 55°C, respectively. Furthermore, the CMCase was stable in a high temperature of 60°C, with a lost activity of only 44% after 90 min. Thus, this new isolate of *Trichoderma* sp. was able to produce xylanase and CMCase using a cheap source and the enzymes showed relevant properties with potential for biotechnological applications.

Keywords: xylanase, CMCase, agro-residues

Supported by MCT/CNPq/Fundação Araucária