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P416. Brewers' spent grain as substrates for production of cellulolytic and hemicellulolytic enzymes by different Aspergillus species

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Brewers' spent grain (BSG) is the major by-product of the brewing industry, representing around 85% of the total by-products generated. It is a lignocellulosic material containing about 38% cellulose, 29% hemicellulose, chiefly arabinoxylans, and 13% lignin. The production of cellulolytic and hemicellulolytic enzymes using this material as substrate represent an eco-friendly strategy for the lignocellulosic biomass hydrolysis, generating fermentable sugars that can be converted into high- added value products, such as bioethanol, lactic acid, xylitol and others. Thus, this work aimed to evaluate the potential of cellulolytic and hemicellulolytic enzymes production by some *Aspergillus* species cultivated in BSG. Fungi were grown in minimum media, pH 6.5, with 1% BSG and inoculum was done with 107spores/mL, cultivated at 30°C, 120 rpm, for 5 days. Every 24 hours 2 mL of the samples were collected. The enzymatic activity was performed after the incubation of the crude extract with 1% Linear arabinan, Xylan from beechwood, Xyloglucan, Locust bean gum and CMC, at 50°C for 60 minutes and the reducing sugars were determined using dinitrosalicylic acid (DNS). Synthetic substrates (2 mM of PNP-α-L-arabinofuranoside, PNP-β-D-xylopyranoside, PNP-β-D-glucopyranoside and PNP-β-D-cellobioside) were also used at the same conditions. The extract from A. niveus showed the best arabinanase (0.284 U/mL) and β-glucosidase (0.126 U/mL) activities after 48 and 96 hours of cultivation, respectively. On the other hand, the extract from A. brasiliensis presented the best activities of α-L-arabinofuranosidase (0.129 U/mL), β-xylosidase (0.265 U/mL) and xylanase (2.15 U/mL) when cultivated for 48 hours. After 72 hours, this fungus also showed the best activities for xyloglucanase (1.06 U/mL), mannanase (0.617 U/mL) and endoglucanase (0.254 U/mL). The extract produced by *A. flavus* presented the best cellobiohydrolase activity with 0.113 U/mL after 120 hours of cultivation. It is important to mention that *A. awamori*, *A. clavatus* and *A. terreus* also showed good levels of different enzymes produced but they were not the best producers. These data suggest the great potential of different cellulolytic and hemicellulolytic enzymes production using BSG as substrate, which represents an eco-friendly destination for the residues and can generate high-added value products with great biotechnological application.

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