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# Evaluation of sugarcane bagasse hydrolysis by the cellulolytic crude extracts from the thermophilic fungus *Myceliophthora heterothallica* F. 2.1.4.

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The enzymatic degradation of cellulose requires synergistic action of three types of cellulases: endoglucanases (E.C. 3.2.1.4), exoglucanases (cellobiohydrolases; E.C. 3.2.1.74) and β -glucosidases (E.C. 3.2.1.21). Micro organisms can produce cellulolytic enzymes that provide cellulosic biomass degradation for second generation ethanol, and they should display some properties for use in a biorefinery such as significant catalytic efficiency on cellulosic substrates, high thermal and pH stability, and tolerance to inhibition by the final products. This study investigated the functional aspects of the cellulolytic complex (at least six endoglucanases and two beta-glucosidases) produced by a thermophilic fungus, *Myceliophthora heterothallica* F.2.1.4, analyzing the biochemical and physical-chemical properties of the enzymes obtained by submerged fermentation at 45ºC in the crude extract and its application in the sugar cane bagasse hydrolysis. The enzyme showed optimum activity at pH 5.5 and 65ºC, being stable in a wide pH scale (3.0-9.0 per 24 h) and temperature range (40-55ºC for 1 h). The physicochemical properties of an enzyme are essential for potential applications in industrial processes. In order to improve the saccharification process some nonionic surfactants were added to the reaction volume, individually: Tween 20 (0.5 to 2%), Tween 80 (0.5 and 2%) and Polyethylene glycol 3350 (1 and 10 mM). In the hydrolysis, the best treatments were: Tween 20 at concentrations of 0.5 and 2% respectively, producing an increase in average reducing sugars around 36.7 and 112 mg/g of sugar cane bagasse, displaying promising results in the saccharification of lignocellulosic biomass.

## Biography

Bonilla-Rodriguez G O is Associate Professor of Biochemistry at the State University of São Paulo (UNESP), working with hydrolytic enzymes (beta-glucosidases, endoglucanases, pectinases, proteases, lipases) from fungi and plants that could, potentially, be included in biotechnological or industrial processes. Previously he studied animal hemoglobins, especially from fishes and reptiles. He was a postdoctoral fellow at Washington University and Saint Louis University (St. Louis, MO, USA), and during his PhD spent 14 months at the Duke Marine Laboratory (Beaufort, NC, USA).

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