

# Effect of pretreatments on sugarcane bagasse saccharification by

## *Myceliophthora* sp F214 enzymatic extract

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In the last years, scientific research have been focused on sugarcane bagasse saccharification with the aim of converting sugars in second generation ethanol by fermenting microorganisms. Enzymatic saccharification is a promising technology since it does not generate side products that can inhibit these microorganisms metabolism. To overcome bagasse recalcitrance and facilitate enzymes action several pretreatments have been employed. In this work, we evaluated the influence of three kinds of pretreatment on sugarcane bagasse saccharification by the enzymatic extract produced by the thermophilic fungus *Myceliophthora* sp F214. Saccharification experiments were firstly performed using *in natura* bagasse, under 150 rpm, at 50°C, until 72 hours (endoglucanase, xylanase and  $\beta$ -glucosidase at 580.0, 1,503 and 160.0 U/g of dry bagasse, respectively). The highest amounts of reducing sugar (45.5-49.0 mg/g of dry bagasse) were obtained at 48-72 hours. When the amount of enzymes was increased two folds an increasing on reducing sugars releasing was not observed. Based on this data, another saccharification experiment were performed, for 24 hours, using pretreated bagasse (endoglucanase, xylanase and  $\beta$ -glucosidase at 250.0, 818.0 and 6.8 U/g of dry bagasse, respectively). The organosolv pretreatment was the best one to improve enzymatic saccharification, yielding 55.9 mg of reducing sugar/g of dry bagasse, which represents an increasing of 317.0% when compared to sugar releasing from *in natura* bagasse. The pretreatments using microwaves/glycerol or steam explosion improved reducing sugars releasing in 85.15 and 70.75%, respectively. From these data we can conclude that the evaluated pretreatments

are efficient to facilitate sugarcane bagasse saccharification using *Mycelyophthora* sp F214 enzymatic extracts and further experiments will be performed to optimize sugars releasing.

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Key words: sugarcane bagasse, enzymatic saccharification, *Mycelyophthora* sp, steam explosion, glycerol, organosolv

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