

BBEST – Poster Abstract

Washing water from steam exploded bagasse to lactic acid production by two different strains

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Lactic acid is an important chemical that can be used in food, textile, pharmaceutical and polymers industry. Lactic acid can be obtained biotechnologically from renewable resources such as biomass. Many strains have the ability to produce lactic acid, however only a few can use pentose in this process with high yield and withstand the inhibitors present in lignocellulose hydrolysate. Steam explosion process releases mainly xylose present in the hemicellulose fraction, that we aimed in this study to produce lactic acid by fermentation. The strains *Bacillus coagulans* 162 and *Lactobacillus pentosus* ATCC 8041 were tested in relation to their ability to use the hemicellulose sugars, in their metabolism to produce lactic acid. Soluble fraction from steam exploded bagasse was obtained by extraction with distilled water. The moisture (10%, dry mass) was stirred at 300 rpm, 50°C for 2 hours and filtered. The liquid fraction was used as main sugar source and contained approximately 3 gram per liter of total sugars. Fermentation medium was enriched with MRS medium salts and the processes were realized in bioreactors with 2L capacity. Both fermentations were carried out at 150 rpm and optimal temperature growth of each strain. NaOH 20% was used to maintain pH 6.0. *Bacillus coagulans* 162, cultivated at 52°C, presented essentially homolactic conversion, reaching yield ($Y_{p/s}$) of 0,85 g/g after 10 hours. *Lactobacillus pentosus* ATCC 8041, cultivated at 30°C, presented heterolactic conversion of sugars reaching $Y_{p/s}$ of 0,67 and 0,28 g/g to lactic acid and acetic acid, respectively, after 27 hours. In this study, it was possible to verify that the main hemicellulose sugars from bagasse (xylose and glucose) can be metabolized by some strains to produce chemicals and building blocks with commercial relevance, such as lactic acid. Moreover, to environmental aspect, raw materials released from agriculture are important carbon renewable sources.

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