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EVALUATION OF OAT HULL HEMICELLULOSIC HYDROLYSATE IN BIOPROCESSES

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ABSTRACT: The study of microbial performance during evaluation of plant biomass used as raw material in bioprocesses is very important for biofuels production technology development. In this work, fermentative performance of *Pichia stipitis* yeast was evaluated during cultivate in oat hull hemicellulosic hydrolysate (xylose 58,56g/L; glucose 11,48g/L; arabinose 8,00g/L; acetic acid 5,40g/L; total phenols 2,5 g/L), obtained from diluted acid hydrolysis. Oat hull hemicellulosic hydrolysate was submitted to the detoxification process (activated charcoal 1%) usually employed to sugarcane bagasse helicellulosic hydrolysate. Also was used hydrolysate not detoxified on experiments. Fermentative performance was evaluated in Erlenmeyer flasks (pH 5.5; 30°C; 200rpm) during 72h and analysis were determined by HPLC and spectrophotometer. According to results, establishment of appropriated conditions of lignocellulosic hydrolysates detoxification is evident in this work. The use of hydrolysate not detoxified resulted in morphological changes on yeast cells, with consequently cell death, different that observed to detoxified hydrolysate, even with partial removal of toxic compounds. The ability of this microorganism to produce ethanol was observed only in detoxified hydrolysate. However, formation of byproduct glycerol was observed in not detoxified hydrolysate. The formation of this compatible solute has been regarded as a response to the cellular stress inflicted by the toxic compound in the hydrolysate. Therefore, it is necessary to develop more efficient procedures of hydrolysis and detoxification, besides the use of cellular adaptation methods or strains resistant to toxic compounds.

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