D-Xylose assimilation by new yeasts strains isolated from Brazilian biodiversity aiming second-generation ethanol production

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The major challenge in establishing an integrated platform for lignocellulosic ethanol production is the whole use of cellulose and hemicellulose fractions of the biomass. The search for yeasts with ability to assimilate pentoses still is a limiting factor in establishing an efficient fermentation process. Currently, only a small number of yeasts exhibit the ability to ferment D-xylose to ethanol. They represent only about 1.5% of yeast already characterized. Thus, it is extremely important to search new species able to assimilate pentoses and convert them into ethanol. In this context, this study aimed to evaluate new yeasts strains isolated from Brazilian biodiversity in relation of their ability to produce ethanol from D-xylose. They were isolated from *Vriesia* sp., *Euterpe* sp. and wild mushroom and identified as *Candida* spp. Fermentation tests were performed on sugar cane bagasse hemicellulosic hydrolyzate previously treated by overliming and active charcoal using four new D-xylose fermenting yeasts strains selected. The tests were conducted under controlled conditions at 30°C and 200rpm. According to results, it was observed that the selected strains were able to grow efficiently in the sugar cane bagasse hydrolyzed and they consumed about 95% of the D-xylose. Under these experimental conditions, there was a significant biomass formation (about 4.0 $g.L^{-1}$) and a significant ethanol production (about 4.0 $g.L^{-1}$) in not optimized conditions. According to the results, we could confirm the discovery of new yeasts strains with potential to be exploited in fermentation studies of D-xylose to ethanol and therefore an advance in the search for a viable technology for the second-generation bioethanol production.

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