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GROWTH KINETICS OF YEAST STRAINS ISOLATED FROM THE BRAZILIAN SAVANNAH

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Abstract

Brazil is the world's largest ethanol producer via fermentation. Several strains of the yeast *Saccharomyces cerevisiae* have been industrially used for fermentation. These yeasts have been obtained by genetic modifications or by isolation in the major sugarcane mills and distilleries in the São Paulo State, Brazil. However the conditions are different in the states of the Brazilian savannah. For instance, the state presents early harvesting and higher temperatures. Moreover, it is remarkable the lack of studies on yeasts for fuel ethanol production. In this sense, the aim of this work was to compare the growth kinetics of three yeast strains isolated from a local distillery grew at different sugars (glucose and sucrose). The pre-culture was prepared by the transference of a colony of a petri dish containing the strain to a 250 ml Erlenmeyer flask with sterile mineral medium. The sugar was sterilized separately and added at a concentration of 10% (w/v). The pH was adjusted to 6.0. Growth was carried out in an orbital shaker at 30°C and 200 rpm stirring for 12 hours. An initial optical density (OD) (λ = 600 nm) of 0.1 was calculated and utilized as inoculum. The main cultures were performed in duplicate at the same conditions. Samples were taken every 30 min for pH and growth measurement. Cell growth was spectrophotometry measured (λ = 600 nm). The exponential growth phase was identified as the linear region of the plot of *ln* (OD) versus *time*. The maximum specific growth rate (μ_{max}) was determined as the slope of this straight line. Doubling time (DT) was calculated by the quotient of ln (2) and μ_{max}. The isolated strain BB2 presented the conversion the higher growth rates at both glucose (μ_{max} = 0.2989 ± 0.0012 h^{-1}) and sucrose (μ_{max} = 0.3015 ± 0.0075 h^{-1}) sugars. Maximum OD of 9.58 ± 0.00 and 2.27 ± 0.09 were obtained from glucose and sucrose, respectively. It can be suggested that this strain presents a good mechanism for sugar transport and probably a high production of the invertase enzyme. The lower biomass found during growth in sucrose suggest ethanol and/or organic acids production. In general, the isolated strains presented higher growth rates compared to the industrial strains, e.g. *Sacharomyces cerevisiae* Cat 1. It is concluded that under the studied conditions, the isolated strain BB2 is a promising candidate for ethanol production in the state.