

Relationship Between Trehalose Production and Fermentative Capacity in Ethanol Production Yeasts Strains in Media Containing Complex Nitrogen Sources

Miranda Jr, M.¹, Ernandes, J.R.¹

¹Departamento de Bioquímica e Tecnologia Química, Instituto de Química, Universidade Estadual Paulista, São Paulo, Brazil.

Sucrose fermentation, main carbohydrate in ethanol fuel must, by industrial yeasts strains were strongly affected by the structural complexity of the nitrogen source, and this fermentative capacity can be correlated with the levels of trehalose production, a disaccharide related with the cellular protection. In this study four *Saccharomyces cerevisiae* Ethanol RED[®], Danstil BG, Danstil CAT and Danstil SA industrial strains were grown in synthetic medium containing sucrose 22% (w/v) supplemented with the nitrogen source varying from the single ammonium salt (ammonium sulfate) to free amino acids (casamino acids) and peptides (peptone), under aerobic and anaerobic conditions. In all experiments, for all strains, the supplementation with peptone always induced higher biomass accumulation, high trehalose production and sugar consumption. The levels of trehalose varied among strains and with fermentation conditions, apparently affecting fermentation performance and yeast viability. In experiments without agitation, there was lower biomass accumulation for all nitrogen sources for all strains, and viability was also higher when compared with fermentations under agitation, and higher trehalose production. In general, Ethanol RED[®] and Danstil SA were considered the best fermenting strains, always inducing efficient fermentation, with high levels of trehalose accumulation associated with preservation of yeast viability. The results shown in this work have industrial relevance since indicate that minor genetic and physiological differences among strains may have a strong effect in yeast metabolism, and that trehalose production could be a criterion for selecting ethanol producing strain.

Key words: *Saccharomyces cerevisiae*, trehalose, fermentation, ethanol, nitrogen sources.

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