Study of genetic features responsible for enhanced stress resistance in an industrial yeast strain

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Fuel-ethanol fermentation process includes a reutilization of the yeast biomass, in which yeast cells are exposed to stress conditions as high temperature, increasing alcohol concentration and low pH values. This enviroment may cause a significant delay in fermentation and drop in cell viability. The aim of this work is to study genetic features associated with cell resistance to sustained stress in an industrial yeast strain isolated from a distillery. The yeast strain was isolated from fermented sugar cane must and confirmed as *Saccharomyces cerevisiae* using PCR. Following that, the yeast strain was induced to sporulation, the ascospores were dissected in order to generate homozygous derivatives and twenty-eight of them were ramdomly selected for further phenotype analysis. The generated strains were screened for growth at 39, 40, 41 and 42°C on plates containing 10% (v/v) ethanol and cell viability was assayed after cultivation under several concentrations of ethanol (0, 5, 7, 8 e 10%) at 25 and 37°C. Three of these demonstrated optimal responses to the high temperature and alcohol concentration stresses and were comparable to other well established commercial yeast strains. To gain insight of the cellular mechanisms of resistance to these stresses, global gene expression analysis of the selected strains will be performed.

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