

## BREWING POTENTIAL OF *Saccharomyces cerevisiae* ISOLATED FROM INDUSTRIAL BIOETHANOL DISTILLERIES IN BRAZIL FOR HIGH-GRAVITY-BREWING

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Yeasts isolated from bioethanol distilleries represent a potential to be exploited for high gravity brewing. These strains have shown greater tolerance to stresses as high sugar and ethanol concentrations in previous studies, so they represent a new and interesting approach for high gravity fermentations for beer production. The goal of this study was to evaluate the brewing potential of *S. cerevisiae* isolated from Brazilian ethanol distilleries for high-gravity-brewing. For this study, 24 *S. cerevisiae* ethanol strains and 3 brewing strains as reference (S-04 ale; S-33 ale and W-34/70 lager) were evaluated for growth ( $OD_{600nm}/24^{\circ}C/30h$ ) and maximum specific growth rate ( $\mu_{max}$ ) firstly in medium composed by only maltose as carbon source (2% maltose; 1% peptone; 1% yeast extract) and secondly in all malt wort with hops ( $16,5 \pm 0,5$  °P). After that, a fermentation trial was carried out in duplicate in 50 mL Corning tubes filled with 25 ml of the same hopped wort, which was initially inoculated at  $2 \times 10^6$  cels/mL and static fermented at 24°C. Fermentation was monitored in hour intervals by weight loss (CO<sub>2</sub> liberation) to estimate the strains fermentation velocity. At the end of fermentation, ethanol content, wort attenuation and cell viability were measured. Maltose is the most abundant assimilable sugar in brewing wort, so ethanol strains able to ferment this sugar could be suitable for brewing. The strains isolated from ethanol distilleries were able to grow in maltose medium and in hopped wort efficiently, with the exception of 7 strains that grew poorly and/or very slowly, so unable for brewing. The 17 suitable strains evaluated in the fermentation trial exhibited in some cases higher fermentation performance than brewing strains. Some strains showed faster fermentation than S-04, others were similar to. There were three ethanol strains that attenuated the wort better than the ale brewing strains producing higher ethanol concentrations. Most of ethanol strains showed a medium wort attenuation profile similar to S-33. The cell viabilities were higher than 90% at the end of fermentation, with the exception of three ethanol lineages, showing that these strains could be able to be recycled. Concerning the fermentation performance, most of the strains isolated from ethanol distilleries showed feasibility to be used for high gravity brewing. Future studies will be carried out to evaluate the sensorial profile of the beer fermented with these strains.

**Keywords:** beer; *Saccharomyces cerevisiae*; high-gravity-brewing, wort; attenuation.

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