Journal of Chemical, Biological and Physical Sciences

An International Peer Review E-3 Journal of Sciences

*Available online at*www.jcbsc.org

Section D: Development of Biotechnological Process

CODEN (USA): JCBPAT Research Abstracts

Potential use of Mezcal Yeasts Isolates for Wine Fermentation

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Abstract: The fermentation performance was assessed for three mezcal *S. cerevisiae* strains in mixed cultures with three mezcal non-*Saccharomyces* strains (belonging to *Kluyveromyces marxianus*, *Torulaspora delbrueckii* or *Zygosaccharomyces bailii* species) and the commercial strain Fermichamp was used as a control. Experiments were carried out in 30 mL of pasteurized red grape juice in 50 mL mini-bioreactors tubes (Corning Science, México) at 30°C and 75 rpm inoculated an initial level of $3x10^6$ cells/mL and the mixed fermentations at a ratio of 9:1 of non-*Saccharomyces*: *S. cerevisiae*. Fermentations were monitored by CO_2 release. Primary metabolites production was measured by HPLC and volatiles by GC. Cell populations were determined by OD_{600nm} and yeast viability was determined by plate counting in nutrient and differential WL agar. The fermentation rate varied markedly depending on the yeast combination used. The evolution of biomass in pure and mixed cultures of non-*Saccharomyces* and *S. cerevisiae* revealed that cell populations and fermentation metabolites were similar in all cases except with acetic acid. The diverse metabolic capabilities of the different yeasts analyzed allowed us to select and classify our strains as potential wine producers due to their desirable technological features for its high production of ethanol and low acetic acid concentration.

Keywords: Yeast, mezcal, wine fermentation, mixed culture

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