

YEAST BASED BIO-ACTIVATORS ENHANCE WINE ALCOHOLIC FERMENTATION PERFORMANCE IN LOW pH ENVIRONMENT

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INTRODUCTION

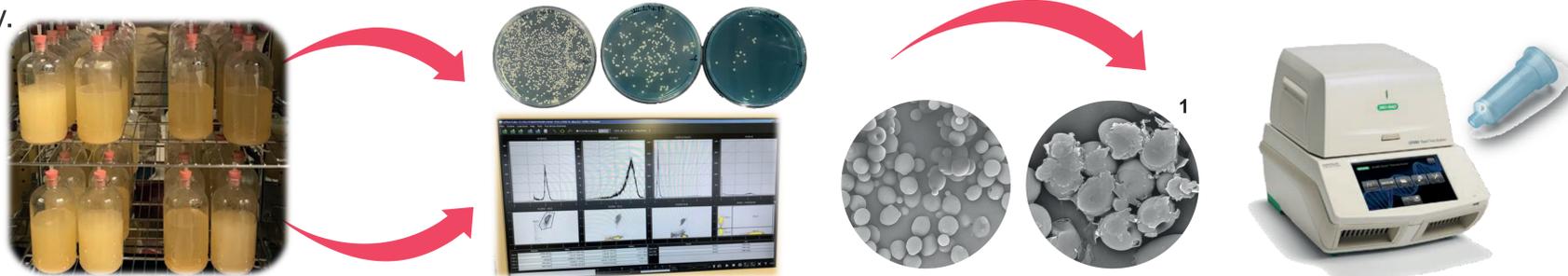
The early phases of alcoholic fermentation are very vulnerable to environmental factors. *Saccharomyces cerevisiae* strains frequently face unfavourable circumstances when making wine, such as osmotic stress brought on by high sugar concentrations and low pH levels (Auesukaree, 2017). Performance of a wine yeast depends on its ability to survive in the difficult

conditions associated with must fermentation. In this study, the impact of adding two commercial bio-activators on fermentation performance and yeast cell response was investigated during the initial 48 hours of alcoholic fermentation. Additionally, the influence of a low pH condition (2.9) on the analysed parameters was also evaluated.



METHODOLOGY

- Yeast levels were monitored through plate counts and flow cytometry throughout the first 48 hours after inoculum.
- Flow cytometry (FC) also permitted to assess yeast cell viability.
- Yeast RNA was isolated and converted into cDNA. A RT-qPCR was performed to evaluate gene expression. The results were normalized using reference genes.

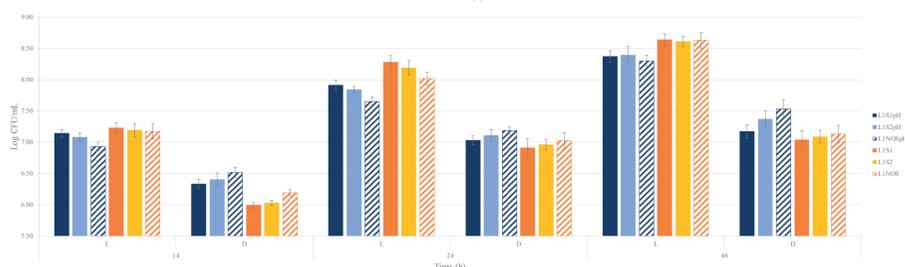
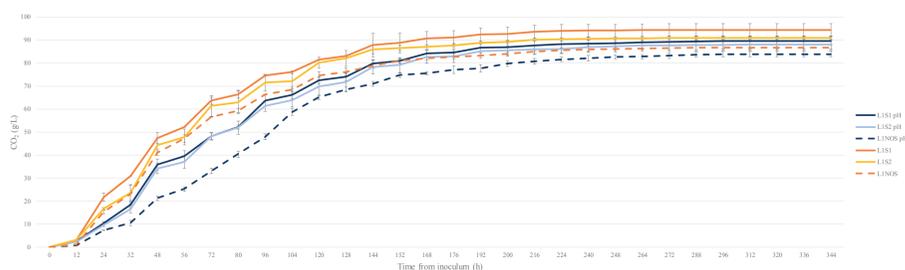


RESULTS

Yeast levels were highest for treatments involving bio-activators. These ones resulted also in a higher viability

The presence of the bio-activators resulted in a higher fermentation rate

The examination of gene expression patterns revealed significant differences in treatment responses



Fermentation kinetics (upper figure); viability evaluation by FC (lower figure)

CONCLUSIONS

The presence of bio-activators improved the fermentation performances in comparison to the control treatments

Low pH environment affected the performances of the strain.

The results indicate that yeast cells adapt their responses during the initial stages of fermentation in challenging environments.

Auesukaree, C. (2017). <https://doi.org/10.1016/j.jbiosc.2017.03.009>
 1. Zeng, et al. <https://doi.org/10.1007/s11274-021-03222-z>

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