

Yeast adaptation to early alcoholic fermentation under low pH: effects of bio-activators on fermentation performance, viability, and gene expression

Irene Dolce¹, Enrico Viola¹, Azzurra Vella¹, Vincenzo Naselli¹, Riccardo Savastano¹, Filippo Amato¹, Luca Settanni¹, Raffaele Guzzon², Concetta Maria Messina³, Nicola Francesca¹

¹ Department of Agricultural, Food and Forest Sciences (SAAF), University of Palermo, Viale delle Scienze Bldg. 5, Ent. C, 90128 Palermo, Italy

² Research and Innovation Centre, Edmund Mach Foundation, San Michele all'Adige, TN, San Michele all'Adige, 38010, Italy

³ Department of Earth and Marine Sciences DiSTeM, Laboratory of Marine Biochemistry and Ecotoxicology, University of Palermo, 91100 Trapani, Italy

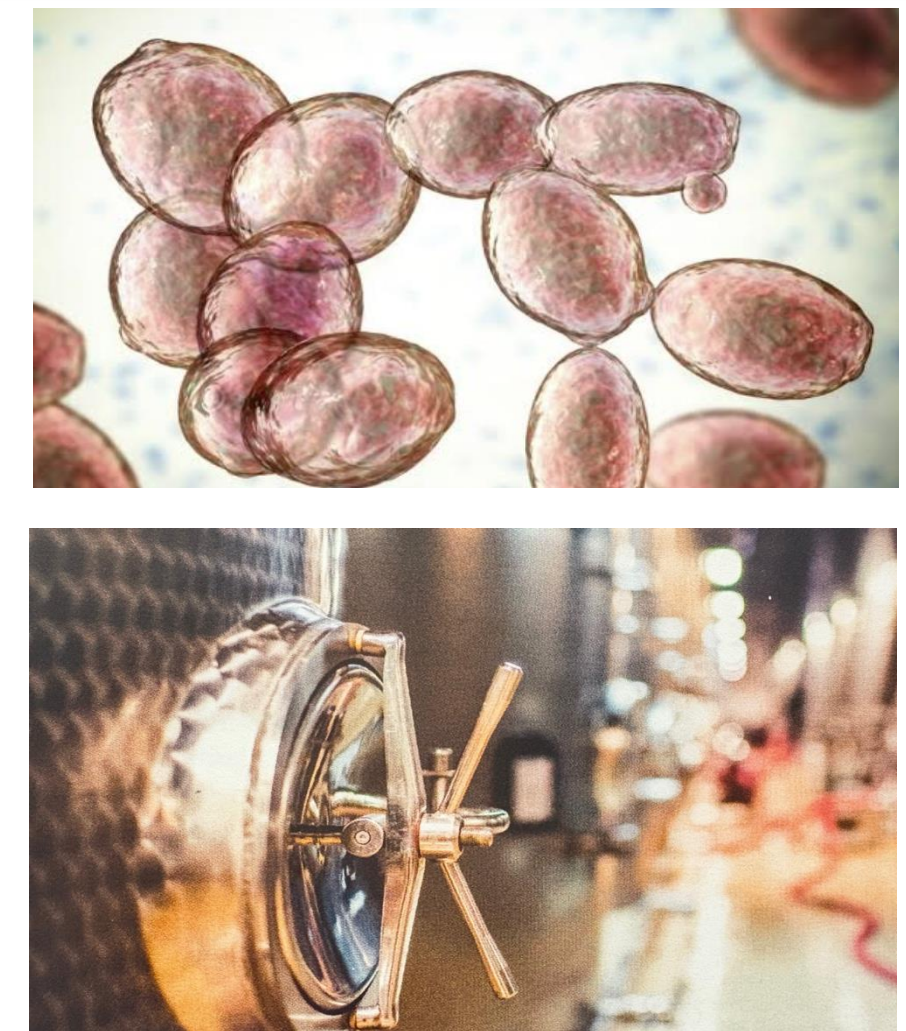
Corresponding Author: irene.dolce@unipa.it

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INTRODUCTION

Yeasts must rapidly adapt to adverse environmental conditions during the initial stages of alcoholic fermentation. Such stressors may compromise cellular viability and hinder fermentation efficiency. This study investigated the adaptive response of a commercial strain of

Saccharomyces cerevisiae under two pH conditions (3.5 and 2.9) during the first 48 hours of fermentation. The efficacy of two commercial yeast-based bioactivators, was assessed in terms of fermentation kinetics, cell viability, and the expression of stress-related genes.



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METHODOLOGY

❖ Micro-fermentations

Standard (pH 3.5) and low pH (2.9) of grape must and YPD.

❖ Microbiological monitoring

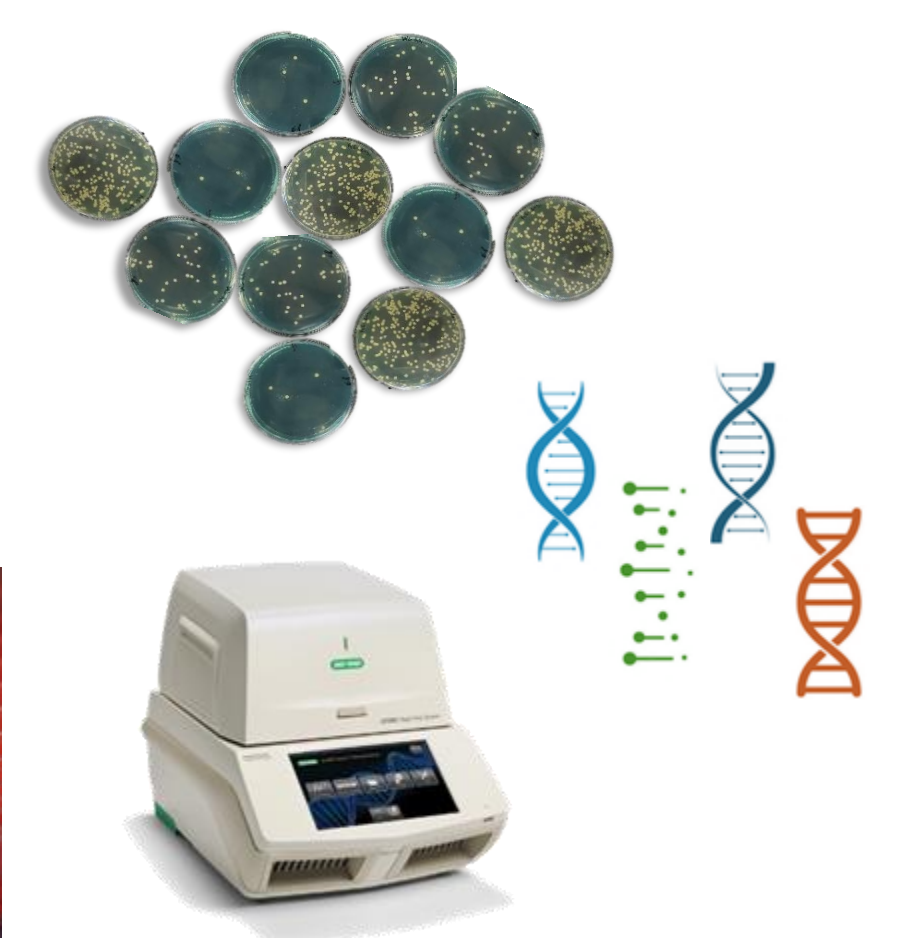
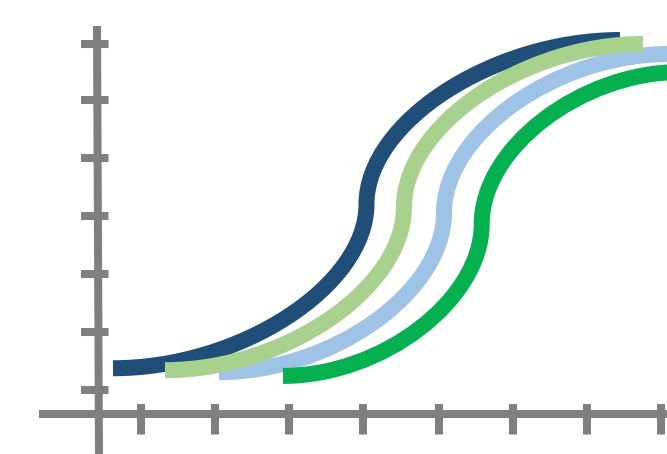
Plate counts and Flow cytometry.

❖ Growth measurement

Microplate reader and monitoring through weight loss.

❖ Gene expression

RT-qPCR to quantify the relative mRNA levels of target genes.



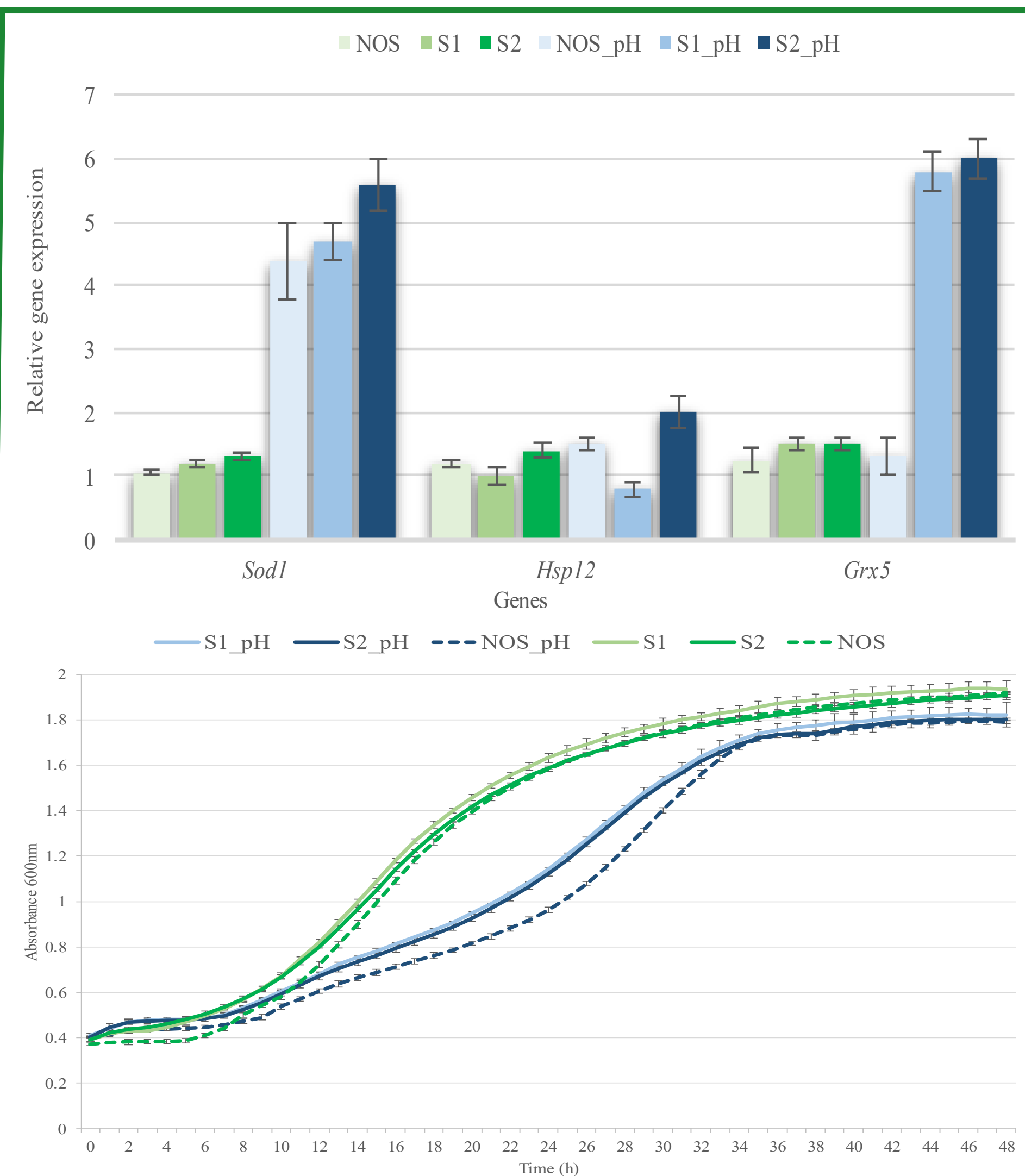
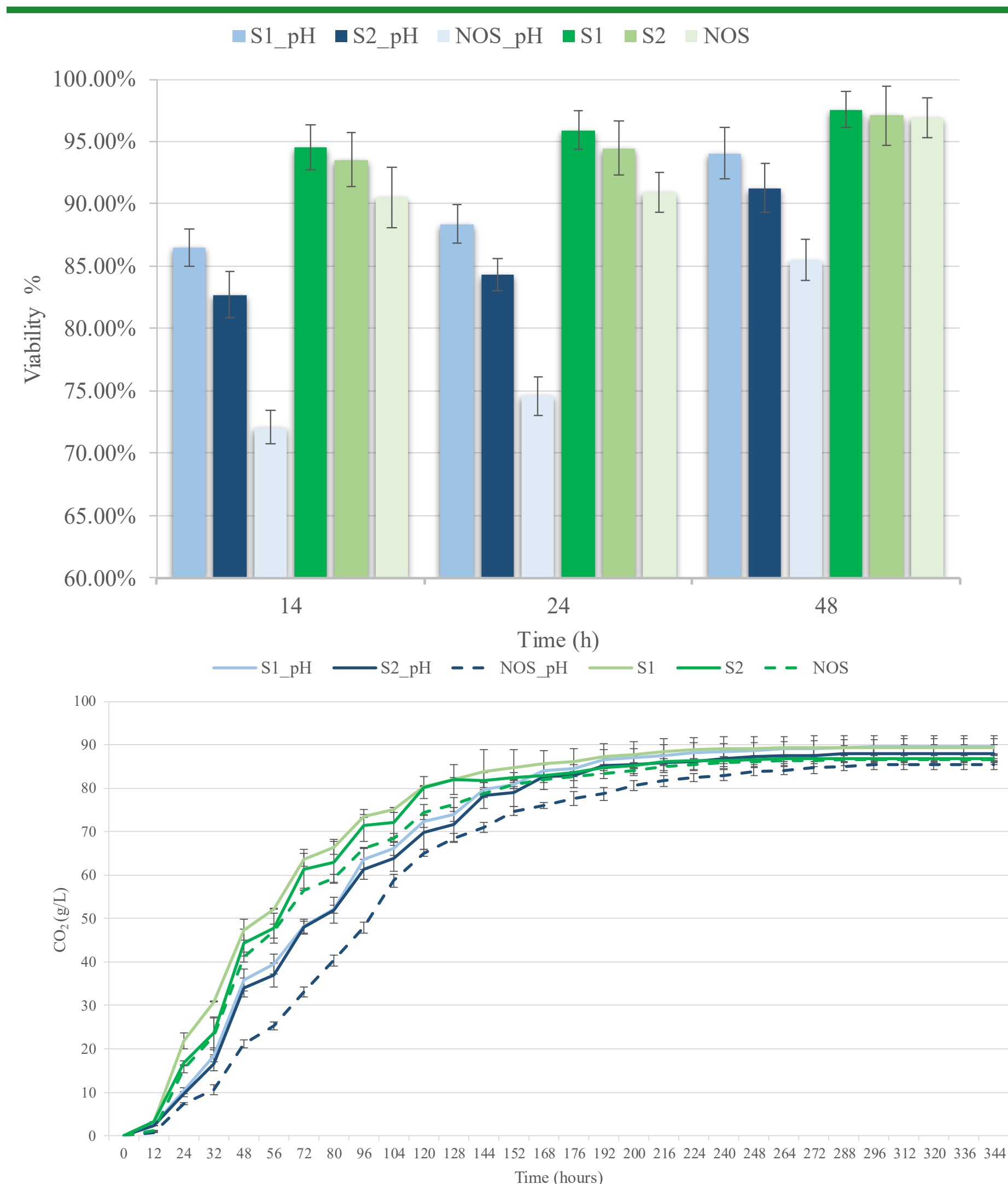
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RESULTS

❖ Bioactivators enhanced yeast adaptation and growth in both in YPD and grape must.

❖ Overexpression of key stress-related genes.

❖ Fermentation kinetics were significantly improved under low pH conditions when bioactivators were applied.



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ACKNOWLEDGEMENTS

