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STUDY OF THE APTITUDE OF *SCHIZOSACCHAROMYCES POMBE* STRAINS TO DEGRADE GLUCONIC ACID IN VERDEJO GRAPE MUST

David del Bosque Fernández¹, José M. Rodríguez Nogales¹, Encarnación Fernández Fernández¹, Violeta Ruipérez Prádanos², Josefina Vila Crespo²

¹ Dpto. Ingeniería Agrícola y Forestal, Área de Tecnología de Alimentos. ² Dpto. de Anatomía patológica, Microbiología, Medicina Preventiva y Salud Pública, Medicina Legal y Forense. Universidad de Valladolid, ETS de Ingenierías Agrarias. Palencia. España. e-mail: josefinamaria.vila@uva.es

INTRODUCTION

Schizosaccharomyces pombe is a yeast capable of fermenting at ethanol concentrations similar to *Saccharomyces cerevisiae*.

In addition, it has the ability to metabolize gluconic acid. This would make it possible to reduce or completely eliminate the gluconic acid fraction remaining in the must after enzymatic treatment with the immobilized Glucose oxidase-Catalase (GOX-CAT) system designed by our research group. View QR code.

Thus, 15 strains of *S. pombe* were studied to evaluate their ability to consume glucose and gluconic acid in Verdejo grape must.

The results showed that all *S. pombe* strains were able to consume 100 % of the glucose in the must and two of the 15 strains studied were able to degrade up to 81.7-88.4 % of the initial gluconic acid.

METHODOLOGY

15 *S. pombe* strains (named as Sp1 to Sp15) were tested for their glucose and gluconic acid consumption capacity. The assay was performed on 10 mL of Verdejo grape must spiked with 10 g/L sodium gluconate.

The experimental design (Figure 2) comprised (i) SERIES 1, consisting of each of the *S. pombe* strains inoculated individually in the must, and (ii) SERIES 2, where to study a post-fermentation strategy, each of the *S. pombe* strains was inoculated after fermentation with *S. cerevisiae*, under similar experimental conditions. Glucose and gluconic acid consumption were measured at 10, 20 and 30 days.

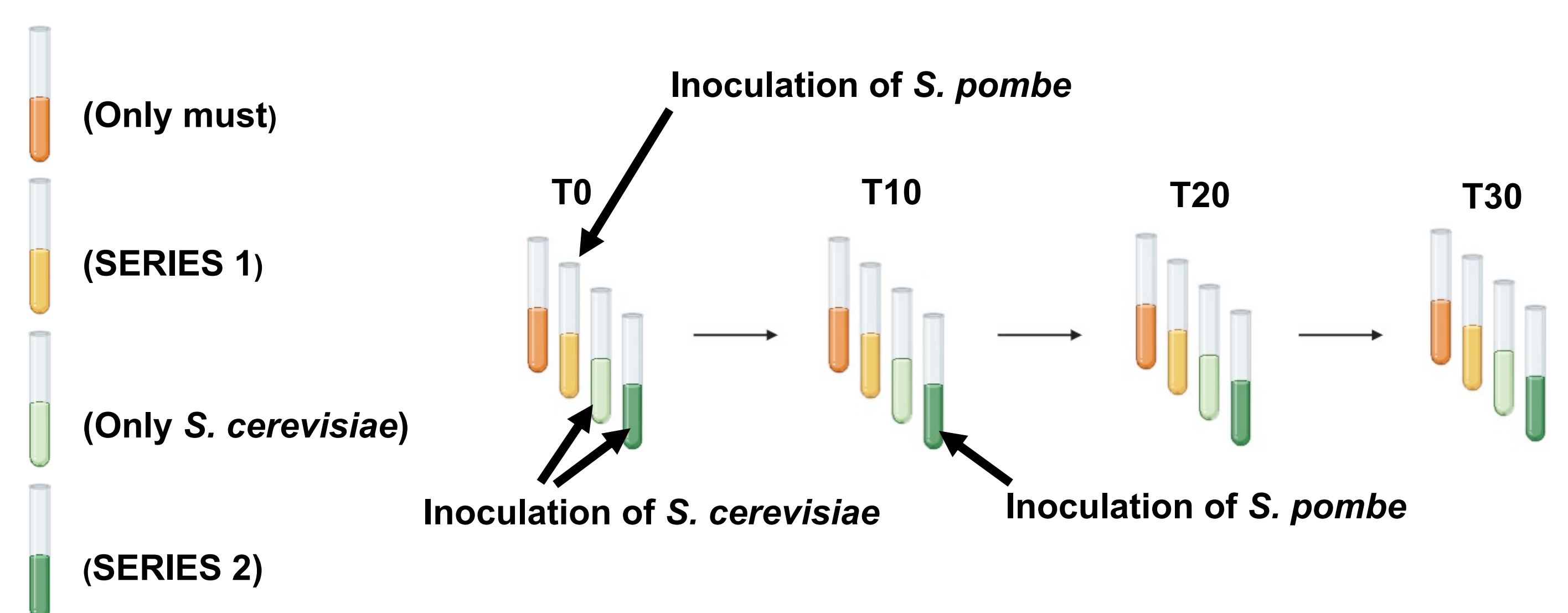


Figure 2. Experimental design.

RESULTS

The results showed that there were significant differences in the percentage of gluconic acid consumption among SERIES 1 *S. pombe* strains as a function of incubation time. The strains that consumed the highest % of gluconic acid were Sp7 and Sp3, achieving a consumption of 62.6-71.3 % of the initial gluconic acid at 20 days of incubation and 88.4-81.7 % at 30 days of incubation, respectively (Figure 3).

SERIES 2 *S. pombe* strains barely consumed 0.0-20.0 % of the total gluconic acid, showing that inoculation of *S. pombe* strains after must fermentation with *S. cerevisiae* was not an appropriate strategy.

CONCLUSIONS

Treatment of *S. pombe* in must is more effective than in wine to reduce gluconic acid content.

There is a strain-dependent effect on gluconic acid metabolization in must, with strains 7 and 3 being more effective.

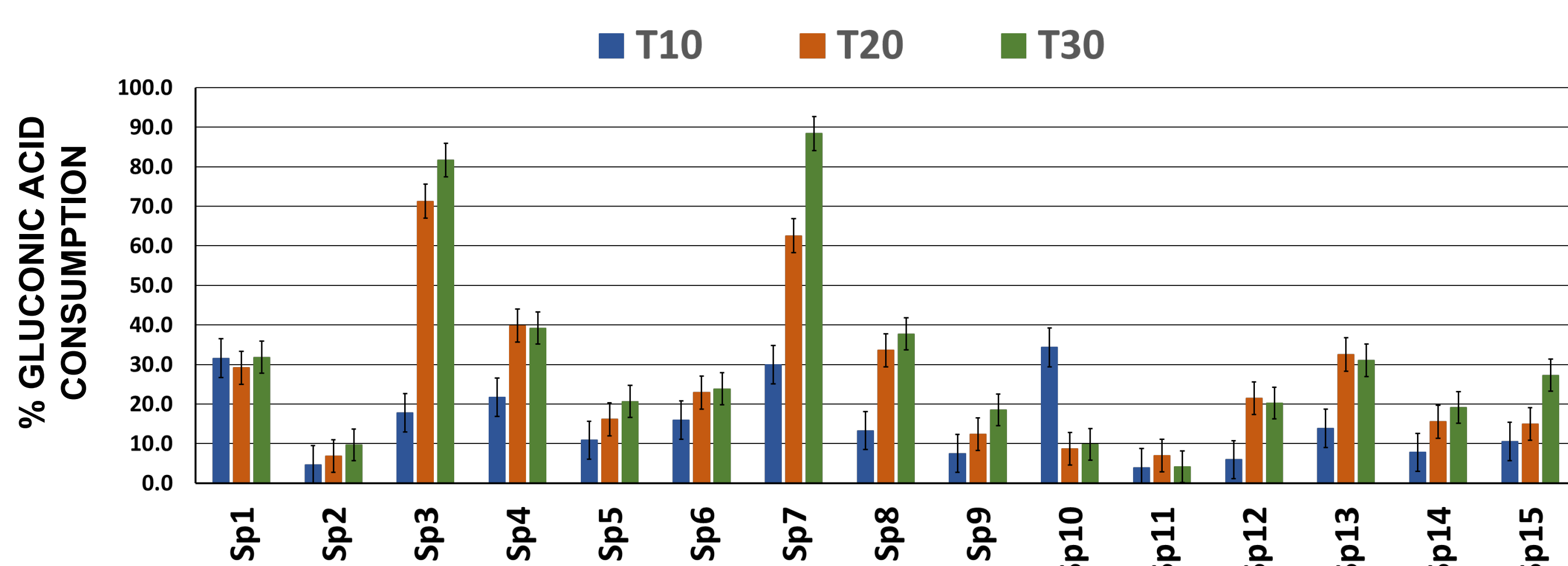


Figure 3. % Gluconic acid consumption at 10, 20 and 30 days of each of the 15 *S. pombe* strains of SERIES 1. Bars indicate the 95% confidence interval.

ACKNOWLEDGEMENTS

