

Selection of the best *Saccharomyces* strain partner for vinification under mixed cultures with *Hanseniaspora vineae* Hv 205. Nutrient effects.

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Introduction

Apiculate yeasts like *Hanseniaspora vineae* has been applied at winery scale with successful results, producing aroma compounds that expand the diversity of wine color and flavor. The implementation of a mixed culture with *Saccharomyces cerevisiae* in a controlled way would be useful to obtain complete fermentations of mature grapes and increase flavor complexity.

Our work focuses on the selection of commercial *S. cerevisiae* strains that better improve growth and complete fermentation under mixed culture with *H. vineae* 205. Some nutrient additives were tested to obtain a complete fermentation.

Growth: Four nutrient supplements for growth were studied for *S. cerevisiae* sequentially inoculated after *H. vineae*. For that, *H. vineae* Hv205 was grown in the simil-grape synthetic medium for 24 hours, then cells were removed and the *Sc* strain inoculated after each treated medium was supplemented in triplicates with amino acids, yeast extract, di-ammonium phosphate, the additive Natuferm® or thiamine. As a control the growth of the *S. cerevisiae* in pure culture was done. Growth was measured at 620 nm by a microplate reader.

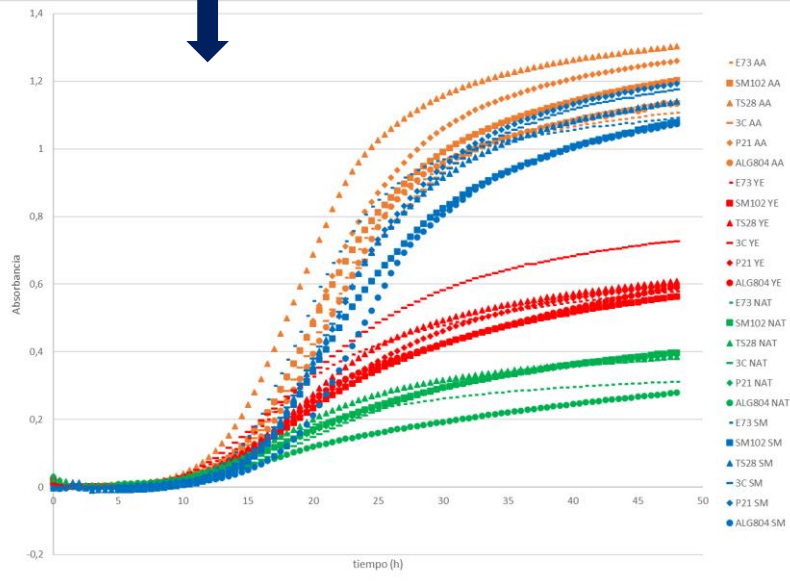


Figure 1. Growth of *S. cerevisiae* strains with the addition of different nutrients.

Supplementation with amino acids significantly favored the growth of the *S. cerevisiae* strains studied compared to the addition of yeast extract and Natuferm. Di-ammonium phosphate had a moderate effect but did not present significant differences with the addition of amino acids.

Microvinifications: were at 20°C in the same synthetic medium in triplicates with Hv205. After 72 hours it was inoculated with six different strains of *Sc* and the medium was supplemented with Natuferm and thiamine. The wines were evaluated by sensory analysis by an expert panel of 5 members.

Table 1. Comparison of acetates production by pure culture fermentations.

	<i>H. vineae</i>	Average <i>S. cerevisiae</i>
Phenylethyl acetate (ug/L)	13341,78 ± 3320,84	48,82 ± 5,62
Phenylethyl alcohol (ug/L)	11550,52 ± 1045,36	14408,37 ± 861,55
Tyrosol acetate (ug/L)	6080,84 ± 507,43	3,03 ± 0,70
Tyrosol (ug/L)	988,58 ± 146,34	1997,43 ± 362,23
Tryptophol acetate (ug/L)	8071,17 ± 1415,46	5,70 ± 4,37
Tryptophol (ug/L)	36,11 ± 1,95	603,37 ± 117,82

Acetates from the three aromatic alcohols are increased by fermentation with *H. vineae*, confirming a potent acetyl transferase activity compared to *S. cerevisiae*.

Conclusions

The amino acids addition as a source of nitrogen improves growth of *Saccharomyces* yeasts after *H. vineae* have removed nutrients during 24 hours. Results of fermentations and sensory analysis under mixed culture with *S. cerevisiae* strains 3C and E73 were considered the best in terms of wine quality. Intense fruity and floral aroma were described compared to other mixed culture fermentations.

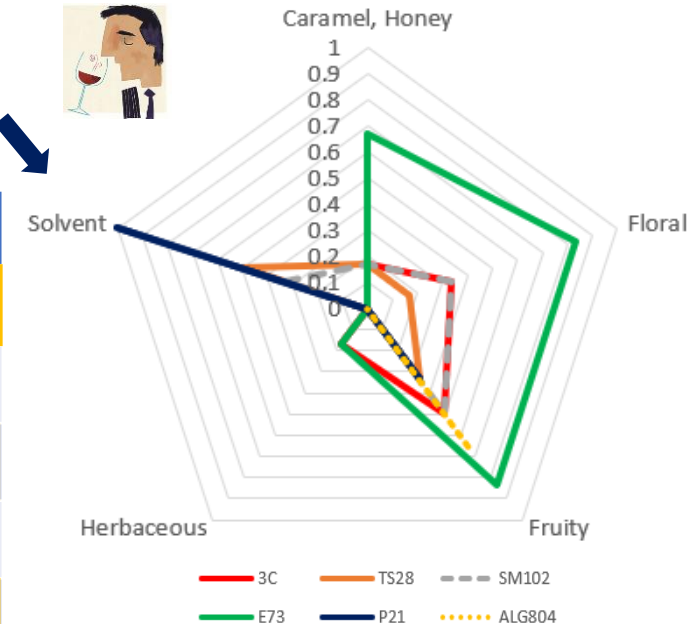


Figure 2. Descriptive sensory analysis.

Floral, fruity aromas and honey were perceived. No sensory defects were detected in fermentations with *Sc* E73 and 3C strains.