

Mixed starters *Schizosaccharomyces japonicus*/*Saccharomyces cerevisiae* as a novel tool to improve the aging stability of Sangiovese wines

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MATERIAL & METHODS

AIM

In the present work *Schizosaccharomyces japonicus* and *Saccharomyces cerevisiae* were inoculated simultaneously or in sequence in mixed fermentation trials with the aim of testing their ability to improve the overall quality of red wine, in particular of Sangiovese wine.

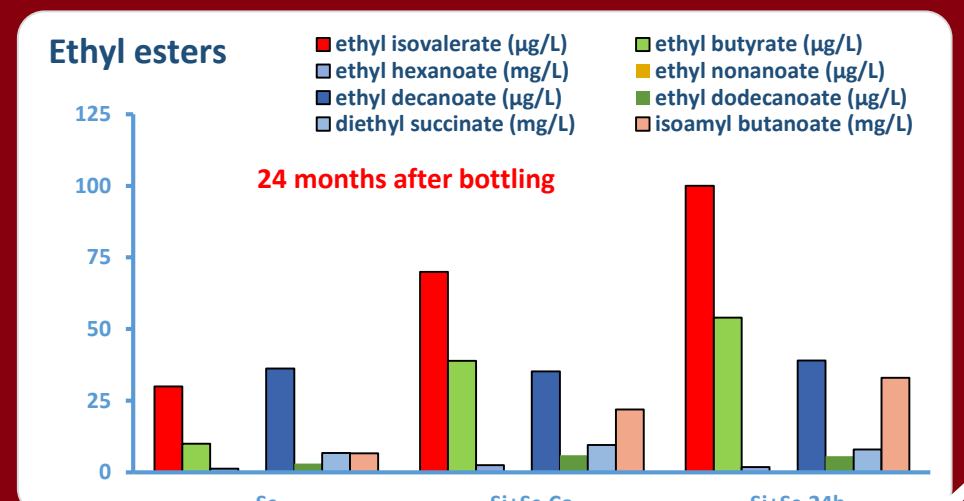
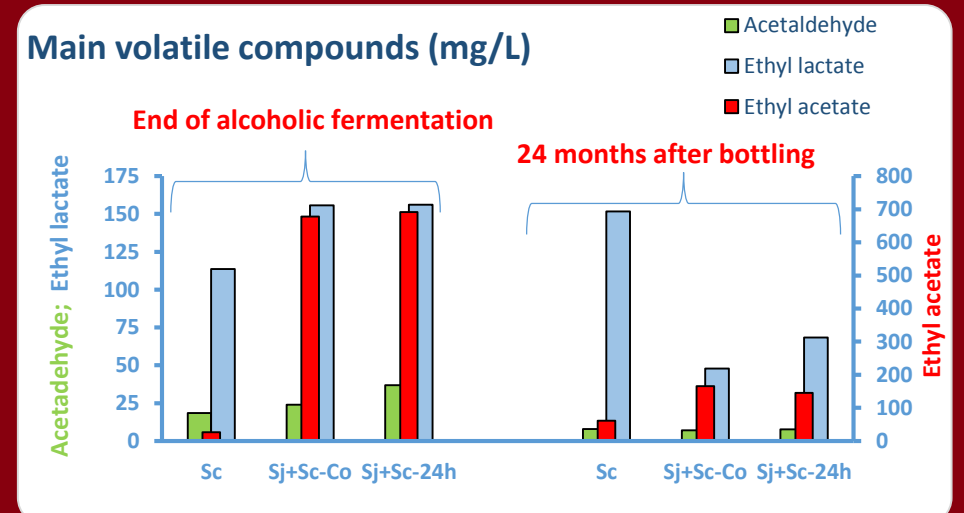
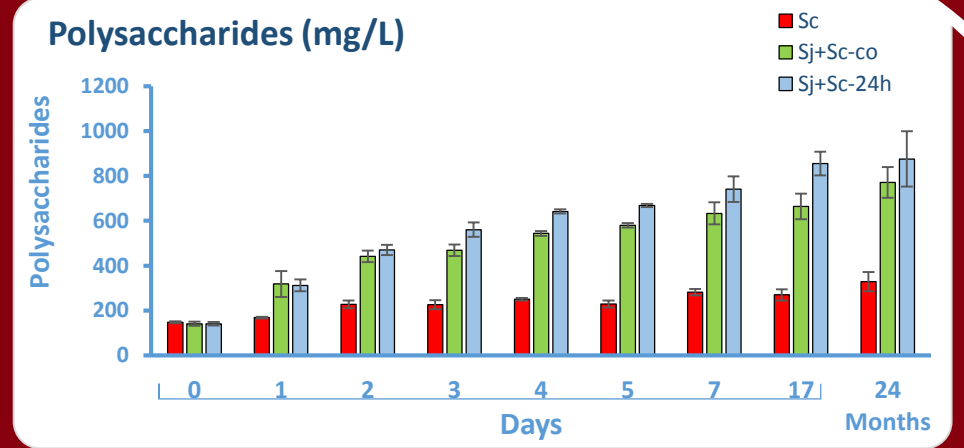
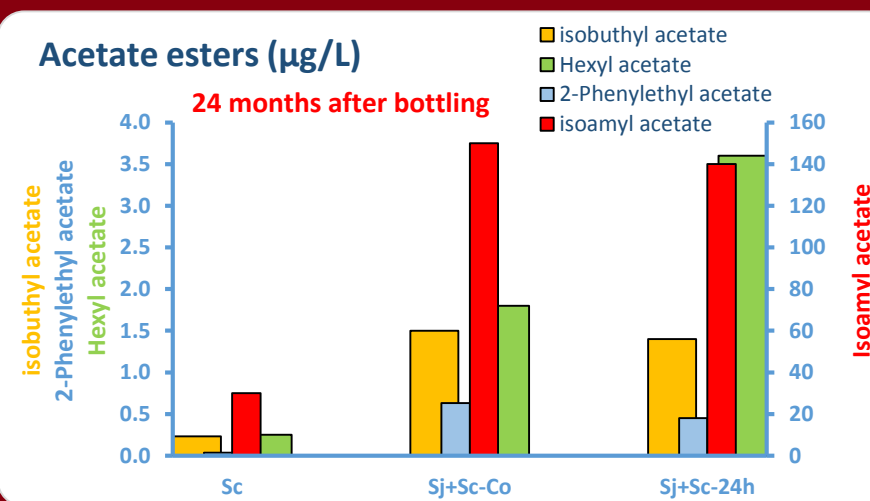
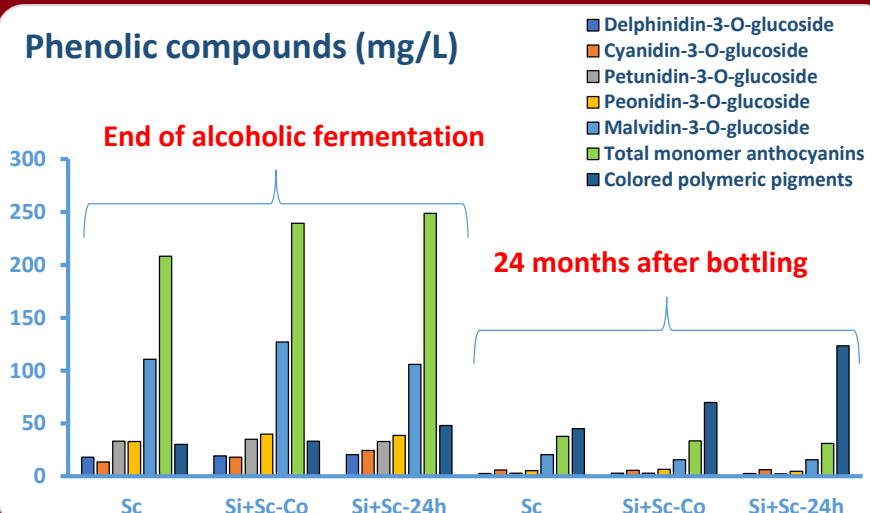
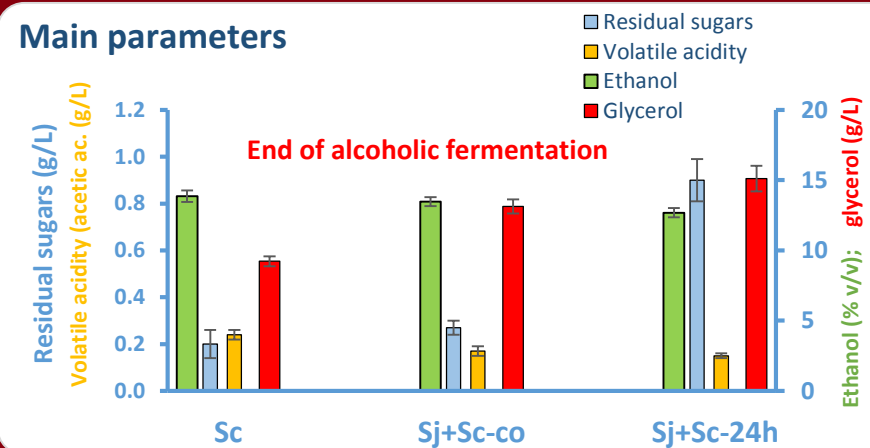
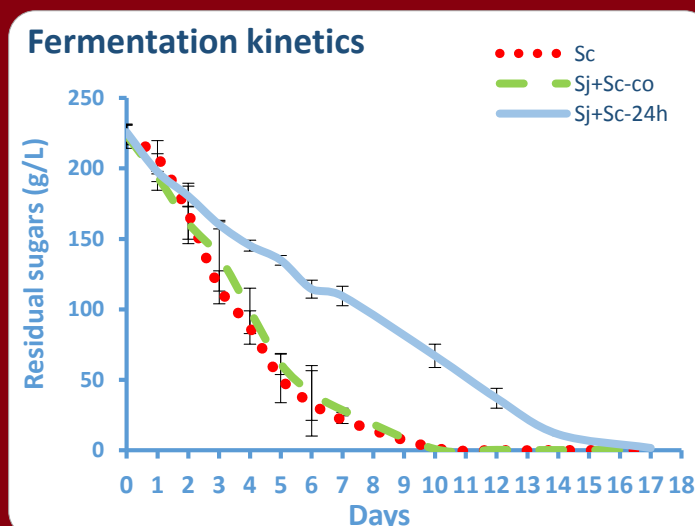
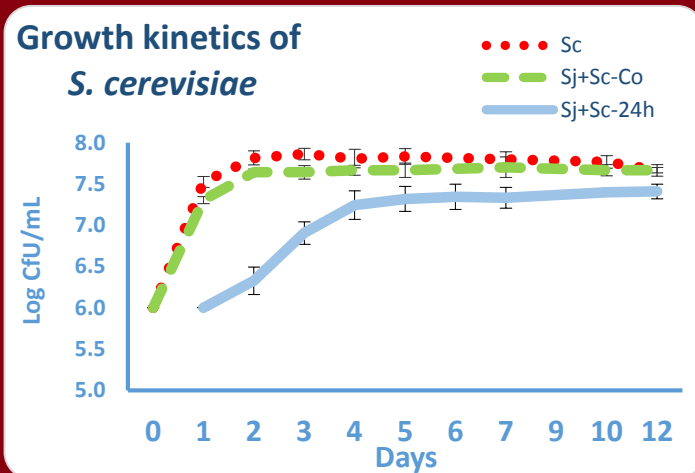
Experimental scheme of the fermentation conditions used

Code	Yeast	Inoculum concentration	Inoculum modality
Sc	<i>S. cerevisiae</i>	10 ⁶ cell/mL	Pure culture
Sj+Sc - co	<i>Sch. japonicus</i> <i>S. cerevisiae</i>	5 x10 ⁶ cell/mL 5 x10 ⁶ cell/mL	Co-inoculum
Sj+Sc - 24h	<i>Sch. japonicus</i> <i>S. cerevisiae</i>	5 x10 ⁶ cell/mL 5 x10 ⁶ cell/mL	Sequential inoculum (24 hours)

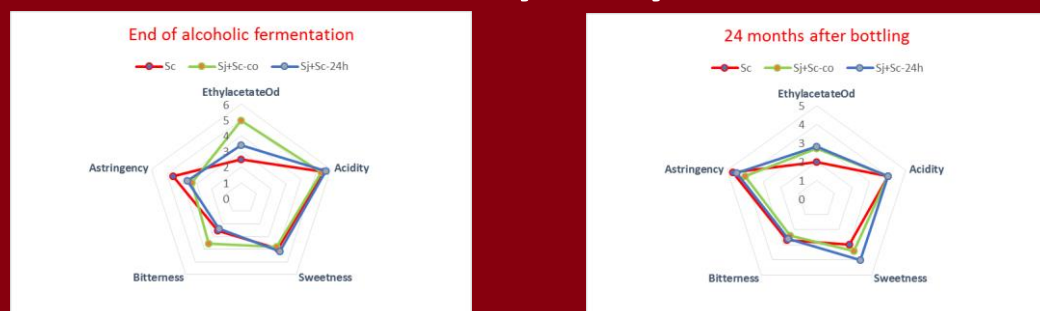
Operations	Conditions
Processing	10 liters fermenters filled with 7 kg of grapes; cap punching (2 per day); fermentation temperature 25°C
I Racking & Pressing	Racking after 17th day of alcoholic fermentation Malolactic bacteria inoculum after pressing
II Racking	Racking after malolactic fermentation SO ₂ addition
Bottling	SO ₂ addition and bottling

RESULTS

Growth kinetics & Fermentation patterns



Sensory analysis



Sensory analyses were carried out by a panel of 17 trained judges (11 males and 6 females), following the Quantitative Descriptive Analysis (QDA) method.

CONCLUSIONS

Based on the evidence that after 2 years of aging, mixed fermentation wines presented an increase in color stability and in the concentration of fruity aroma compounds and a decrease in astringency, the combined utilization of *Sch. japonicus* and *S. cerevisiae* might represent an innovation for the improvement of the aging stability of Sangiovese wine. Further studies need to evaluate the *Sch. japonicus*-to-*S. cerevisiae* ratio in mixed fermentations and the timing of inoculation of *S. cerevisiae* in sequential fermentation.

DISCUSSION

- Sch japonicus* yeast modulated the concentration of some of the most important wine volatile compounds.
- At the end of the alcoholic fermentation, ethyl acetate was significantly higher in the mixed fermentation wines in respect to the level acceptable for a young red wine. However, ethyl acetate underwent considerable hydrolysis during the two-years aging in bottle, with a marked decrease in its concentration.
- Hydrolysis-esterification equilibrium in mixed fermentation wines caused an increase of acetate esters compounds responsible for fruity aroma. These ester compounds reached significantly higher concentrations in both mixed fermentation wines than in the control wine inoculated with *S. cerevisiae*.
- Mixed fermentation wines as compared to the control wines showed no significant differences for the ethyl acetate perception evaluated by sensory analysis carried out 24 months after bottling.
- At the end of the alcoholic fermentation, all mixed fermentation wines were perceived as having lower mouthfeel sensation of astringency compared to those obtained with *S. cerevisiae*, possibly due to the higher polysaccharides content. After 2 years of aging, the sweetness perception was significantly higher in mixed fermentation wines.