Optimize Rosé with Pre-fermentation Yeast

– *Lachancea thermotolerans* and *Pichia kluyveri*

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Introduction

The rosé market has been increasing over the last few years, and with it the demand for more variety and complexity in rosé styles. We want to give winemakers more flexibility in their ability to be creative with rosé. Pre-fermentation yeast can enable winemakers to make more complex, fruity, and fresh wines in a natural way while decreasing their sulfur usage in must, as they have the ability to protect the must from oxidation and discolouring.

Lachancea thermotolerans History

Lachancea thermotolerans is a very unique yeast species able to produce lactic acid under wine fermentation conditions. In 2011 the first pure strain of *Lachancea thermotolerans* (*Kluyveromyces thermotolerans*) was launched my Chr. Hansen.

This strain is ideal for increasing acidity and freshness in warm climate red wines (Benito et al. 2015). A pH drop of 0,1 can be achieved and a significant increase in lactic acid (fig. 1). A decrease in pH enables use of less SO_2, as the SO_2 will be more efficient.

It is also seen in the metagenomic analysis (fig 2) that Concerto™ has a high level of dominance in the wine and works in a symbiosis with Saccharomyces. Furthermore, Concerto™ increase the red berry notes in the final wine (fig. 6 and Rubio-Bréton et al. 2018).

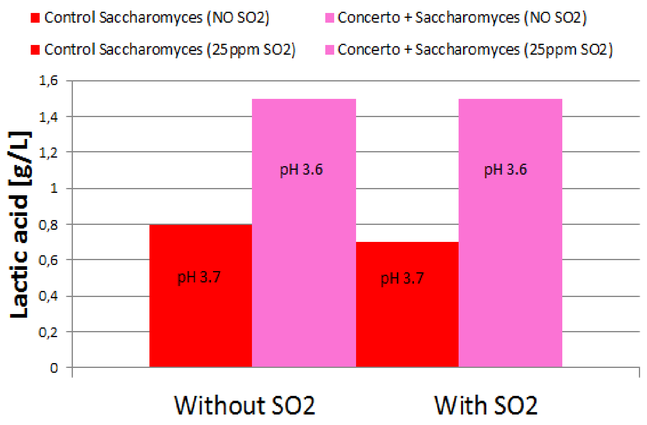


Fig. 1 Effect of Concerto™ on Lactic acid and pH in a organic Merlot with and with-out added SO_2

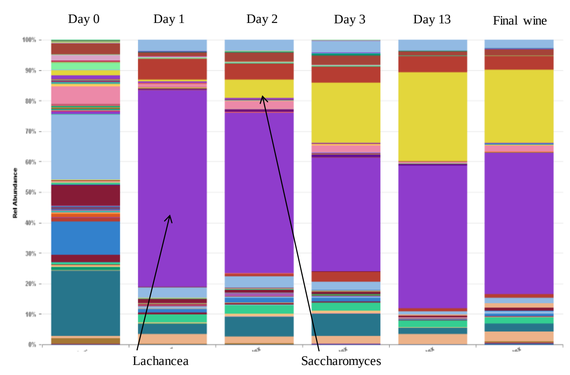


Fig. 2 Metagenomic analysis of fungal population throughout AF. Concerto™ inoculated after day 0 sampling and Saccharomyces on day 2

Screening for more Lactic Acid Production – for Rosé

Screening for a new strain of *L. thermotolerans* for higher lactic acid production, especially suited for Rosé to increase acidity.

We started with 27 strains of Lachancea species isolated from wine, and this was then narrowed down to 10 strains (fig. 3) which where tested in Rosé juice. This lead to selection of two strains with high lactic acid production, after further testing one was found to have preferred sensory properties over the other and this strain (New LT) was chosen.

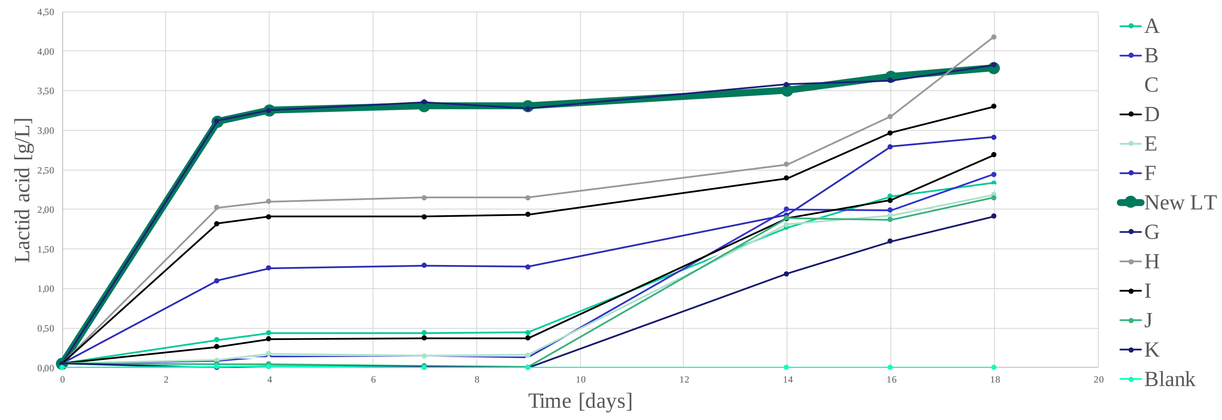
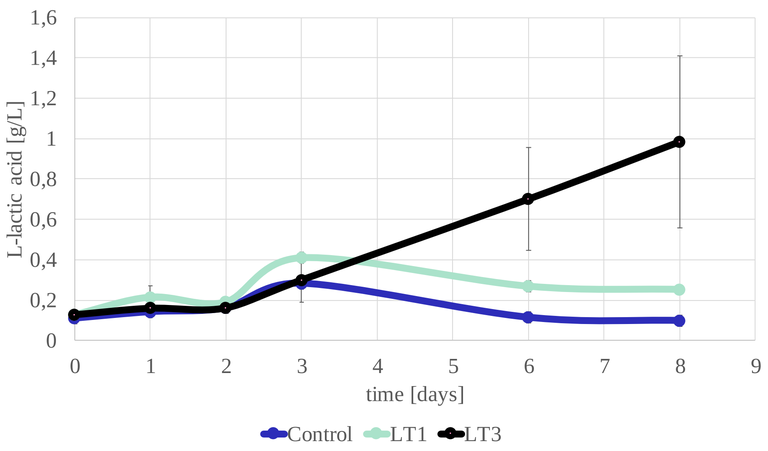


Fig. 3 Lactic acid over time in Rosé juice, testing 10 selected strains of Lachancea against Viniflora Concerto™, Viniflora Jazz™ (Saccharomyces) and a blank

Rose with New Strain of *Lachancea thermotolerans*

Pilot scale testing of the selected *L. thermotolerans* strain in Grampians Rosé (Shiraz, 2019). Apart from the fermentation parameters we also followed the lactic, malic and acetic acid during the alcoholic fermentation. This showed than when doing sequential inoculation of the *L. termotolerans* (3 days between *L. termotolerans* and Saccharomyces) there was an increase in lactic acid (1g/L) and a decrease in pH to 3.51 (Fig. 4 and Table 1). Malic acid was similar to the control (data not shown). The sensory comments were more strawberry notes and more balanced wines, when the *L. thermotolerans* was used (both LT1 and LT3). Next steps are further optimization of the application in field trials with various Rosé styles.



	pH
Control	3,65
LT1	3,59
LT3	3,51

Fig. 4 and Table 1: L-lactic acid over time and pH after alcoholic fermentation in Grampian Rosé, Shiraz, 2019. Control (Sacc.), LT1 (L. thermotolerans + Sacc. 1 day between) and LT3 (L. thermotolerans + Sacc. 3 days between)

Pichia kluyveri oxygen scavenger & aroma in Rose

FrootZen™ is a *Pichia kluyveri* strain for winemaking. It is an eager oxygen consumer, leaving the must less exposed to the action of oxidation and conferring brighter colour to Rosé wines (fig. 5), when comparing to other yeast.

Furthermore, FrootZen™ releases a high amount of thiols compared to other yeast and is a high producer of esters. Giving a overall more fruity Rosé wine (fig. 6).

Fig. 5 Brighter colour, less browning and less turbidity when FrootZen™ was inoculated in Grenache Gris Rosé from Provence, end of fermentation

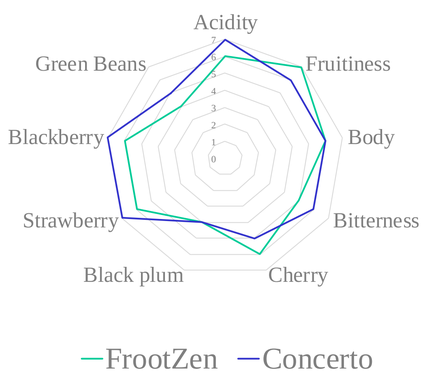


Fig. 6 Sensory results from Spanish Bobal made with Frootzen™ and Concerto™ as pre-fermentation yeast followed by sequential inoculation of Sacc.

References

Benito, A., Calderon, F., Palomero, F. and Benito, S. (2015): *Combine Use of Selected Schizosaccharomyces pombe and Lachancea thermotolerans Yeast Strains as an Alternative to the Traditional Malolactic Fermentation in Red Wine Production*, Molecules, Vol. 20, pp. 9510-9523

Rubio-Bréton, P., Gonzalo-Diago, A., Iribarren, M., Garde-Cerdan, T., Perez-Alvarez, E. P. (2018): Bioprotection as a tool to free additives winemaking: Effect on sensorial,anthocyanic and aromatic profile of young red wines, Food Science & Technology, vol. 98, pp. 458-464

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