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Thesis title: Evaluating the impact of *T. delbrueckii* on malolactic fermentation and wine aroma

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Abstract (max 300 words)

The overall objectives of these trials were to assess the impact of *Torulaspota delbrueckii* on wine aroma, as well as impact on the malolactic fermentation (MLF).

Alcoholic fermentations was performed either by using a mixed yeast starter culture of *Saccharomyces cerevisiae* and *T. delbrueckii* (2TD), or by *S. cerevisiae* as a monoculture. Different inoculation timings of lactic acid bacteria (LAB) were performed using *Oenococcus oeni* (*O. oeni*) and *Lactobacillus plantarum* (*L. plantarum*). Fermentations were performed under standard winemaking condition without pasteurization or the use of anti microbiological chemicals.

Simultaneous inoculation with yeasts and *O. oeni* significantly reduced the MLF time. *T. delbrueckii* had no negative impact on the growth of inoculated *O. oeni* or the indigenous LAB flora, nor on the malic acid degradation. Trials showed the vitality of the tested *L. plantarum* strain was too weak for wine environment, and therefore not suitable for use as a starter culture.

Co-inoculation of *O. oeni* with *S. cerevisiae* or 2TD led to an increased concentration of acetic acid, but within an acceptable limit. No negative impact from volatile aroma compounds was found when co-inoculating with *O. oeni*. Mixed culture fermentations with 2TD led to changes in the volatile composition in the wine. Fermentations with 2TD had a significant higher concentration of acetic acid, ethyl acetate, and isobutyric acid which could result in a negative impact on wine aroma. Furthermore 2TD gave a significant lower concentration of fruity esters: isoamyl acetate, ethyl hexanoate, and ethyl octanoate. On the other hand 2TD led to a significantly lower concentration of isoamyl alcohol, isobutanol, and hexanoic and octanoic acid, which could reduce the negative aroma impression of the final wine. Sensorial evaluation generally scored wines inoculated with 2TD lower than wines inoculated with *S. cerevisiae*.

Keywords (5) : wine, aroma, co-inoculation, *T. delbrueckii*, *O. oeni*.

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