Vinifera master thesis abstract (template 2013)

Thesis title: Comparative analysis of the formation of volatile compounds by different mixed yeast cultures

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Tribunal members (name/position):

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Date & location of the oral examination:

Confidential: ☐ **Yes** ☐ **No**

Abstract (max 300 words)

Topic position & objectives:
Wine fermentation is a composite process including numerous biochemical pathways and metabolic transformations of the complex chemical matrix of the grape juice leading to the formation of specific taste and aroma of the final product. In this scope, microorganisms, especially the yeasts play a key role in the formation of fermentation derived volatile and non-volatile metabolites directly affecting the quality of the wine and its organoleptic perception by the consumers.
The main aim of this study was to assess the possible contribution of different commercial mixed yeast products to the final bouquet of the wine by performing various sets of comparative microvinification trials.

Methods:
The experimental design included two fermentation experiments. First trial comprised a continuous analysis of the fermenting must aiming to reveal the dynamics of yeast growth in the mixed fermentations with the use of FT-IR techniques and the formation of flavour compounds during the alcoholic fermentation by GC-MS analysis. The effect of treatments as well as the comparison between different fermentation time points was assessed. Mixed culture of *Torulaspora delbrueckii* and *Saccharomyces cerevisiae* was used in this fermentation trial.
Second fermentation trial was oriented on the analysis of the aromatic compounds only at the end of fermentation. Two non-*Saccharomyces* yeast strains, *Torulaspora delbrueckii and Metschnikowia pulcherrima* used in mixed fermentations with *Saccharomyces cerevisiae* were at the scope of this experimental trial.

Results:
Results showed significant differences between treatments in both experimental trials regarding the formation of flavour compounds as well as the overall fermentation rates. Moreover in case of some aroma compounds and overall fermentation performance the multistarters had clear advantages and more prominent impact on the fermentative bouquet of the wine when comparing to pure culture fermentations.

Main conclusions:
This study has contributed to more detailed understanding of the impact that the mixed culture fermentations can have on the aromatic profile of the wine and on the winemaking process in general. Nevertheless the obtained analytical results need to be combined with other aspects including the technological factors as well as different viticulture practices.

Keywords (5): *Wine, Aroma, Saccharomyces, Torulaspora, Metschnikowia*

Corresponding contacts + emails of supervisors

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