Vinifera master thesis abstract (template 2013)

Thesis title: **Studies on the incidence of *Dekkera bruxellensis* in Turkish wines and effect of low temperatures on 4-ethylphenol production**

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Tribunal members (name/position):

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Confidential: ☐ **Yes** ☒ **No**

Abstract (max 300 words)

Brettanomyces/Dekkera bruxellensis has the ability to produce significant amounts of 4-ethylphenol (4-EP) and cause important organoleptic defects in affected wines. In this work we investigated the incidence of *B. bruxellensis* and of 4-ethylphenol in Turkish red wines randomly collected at winery facilities. Among 40 samples, this species was only recovered from one sample aged in oak barrels. In 4 samples, culturable population was not found but the 4-EP concentration indicated previous *Dekkera bruxellensis* activity. Thus, following potential Brettanomyces-sourced aroma impacts in wine using 4-Ethylphenol and 4-Ethylguaiacol concentrations as proxies should only be considered reliable at analyte levels >100 µg/l (Rayne and Eggers, 2007). Furthermore, we studied the influence of storage temperature on the production of 4-EP by wild of *D. bruxellensis* in 3 different Portuguese red wines. Temperatures of 10 °C and 15°C were not effective in preventive the increase of 4-EP over 600 µg/l during 90 days. At 3 °C one sample showed similar 4-EP increase while in two other samples its concentration was kept unchanged. Production of 4-EP at 3°C and 10°C was confirmed when the strain TR 26 was incubated in red wine for 49 days. However, the total amount of 4-EP produced was below 150 µg/l while at 15°C and 20°C the values reached 1600 µg/l. Therefore, the effect of low temperatures acts by delaying microbial growth which results in lower concentrations of 4-EP but once temperature increases 4-EP production is readily stimulated.

Keywords (5): *Brettanomyces/Dekkera*, storage conditions, temperature, horse-sweat taint, 4-ethylphenol, Turkish wine.

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