



**Thesis title:** Effect of non-Saccharomyces yeasts in second fermentation and aging for sparkling wine production.

<b>Student name:</b>	Nedret Neslihan IVIT
<b>Institution/ company involved:</b>	Universidad Politécnica de Madrid ETSI Agrónomos

**Jury members (name/position):**

Antonio MORATA / Universidad Politécnica de Madrid, ETSI Agrónomos
Santiago BENITO/ Universidad Politécnica de Madrid, ETSI Agrónomos
Felipe PALOMERO / Universidad Politécnica de Madrid, ETSI Agrónomos
Wendu TEFAYE / Universidad Politécnica de Madrid, ETSI Agrónomos
Piergiorgio COMUZZO / Università degli Studi di Udine, Dipartimento di Scienze degli Alimenti

**Names & emails of supervisors:**

<b>Antonio MORATA</b>	<b>antonio.morata@upm.es</b>
<b>Santiago BENITO</b>	<b>santiago.benito@upm.es</b>

**Date & location of the oral examination:** 16.07.2015, 12:00, Madrid.

**Confidential:**  Yes  No

**Abstract (max 300 words)**

**Topic position & objectives:** Observe and compare the different chemical and organoleptic characteristics of the sparkling wines, as a consequence of usage of the non-*Saccharomyces* for the second fermentation in bottle which is followed by aging over-lees.

**Methods:** Yeast biomass production, yeast inoculation, second fermentation in bottle, over-lees aging, liquid chromatography with refractive index detection, enzymatic auto analyzer, Fourier Transform Infrared technology, HPLC with photodiode array detection, spectrophotometer, gas chromatograph with an integrated flame ionization detector, UHPLC chromatograph equipped with a fluorescence detector, sensorial analysis.

**Results:**

- None of the studied yeasts had problems to finish the second fermentation in bottle to increase 1 % alcohol content.
- No significant differences were detected concerning the overall quality of the final products, among the three studied yeasts.
- Total amino acid content in non-*Saccharomyces* yeasts was found to be higher.
- The studied non-*Saccharomyces* yeasts showed lower final values in biogenic amines in red samples.
- *Schizosaccharomyces pombe* showed lower total acidity as a result of its maloalcoholic fermentation, but in the sensory evaluation it was not perceived.
- In red samples, *Schizosaccharomyces pombe* showed lower total anthocyanin content.

However in pyranoanthocyanins, which are more color stable compounds, it showed higher amounts. Moreover, higher color intensity was detected.

- *Schizosaccharomyces pombe* showed higher perception of buttery and yeasty aromas which are desirable in sparkling wines.

- *Saccharomyces ludwigii* produced higher amounts of some undesirable such as ethyl acetate and acetic acid. However non faults were detected in the sensory analysis.

**Main conclusions:** The studied non-*Saccharomyces* yeasts are found to be suitable for second fermentation in bottle since they were successful to finish the added sugar and form effervescence. Moreover, they showed interesting results in aroma and color characteristics of the final product.

**Keywords (5):** Sparkling wine, *Saccharomyces cerevisiae*, *Saccharomyces ludwigii*, *Schizosaccharomyces pombe*, over-lees aging