



Master's Thesis Title:

Student name:	Fatih Yalçın Güneş YENER
Institution/Company involved:	Hochschule Geisenheim University

Jury members (name/position):

Names and emails of supervisors:

Dr. Christian Von Wallbrunn	christian.wallbrunn@hs-gm.de
Prof. Antonia Morata	antonia.morata@upm.es

Date and location of the oral examination (if known):

Confidential: Yes No

Abstract (max 300 words):

Topic position and objectives: To examine Ethanol, SO₂, Fru-Glu tolerance of several *Z. bailii* and *Z. rouxii* strains and monitor their genetic relatedness with the use of RAPD and FT-IR.

Methods: The abilities of *Z. bailii* and *Z.rouxii* strains were tested by using glucose-fructose, ethanol and total SO₂ tolerance tests. The strains were also discriminated by RAPD -PCR and FT-IR spectrometer.

Results: All strains of *Z. bailii* and *Z. rouxii* have a strong resistance against 20% (v/v) ethanol, with the exception of one *Z. bailii* strain which did not grow well compared to the other strains. One strain of *Z. bailii*, and two strains of *Z. rouxii* tolerated up to 600 mg/L of total SO₂ at pH 3.1. On the other hand, all cultures developed well in 600mg/L of total SO₂ at pH 7.0. At sugar content of 350 g/L glucose and fructose, the most developed culture was *Z. bailii*. One of the *Z. rouxii* strains exhibited a good tolerance at 350 g/L of fructose, unlike one strain of *Z. rouxii* tolerated up to 350 g/L of glucose. With this study, the resistance of *Zygosaccharomyces* to sulphur dioxide, pH value, alcohol and high sugar concentrations was confirmed again. These results prove how active these strains at wine pH and different stress conditions are. In addition, the Random Amplified Polymorphic DNA (RAPD) assay, using selected 10-mer oligonucleotides, allowed discrimination between all species tested. Moreover, the strains of these two species were also discriminated at the strain level by Fourier transform infrared spectroscopy (FT-IR).

Main conclusions: There is a growing interest in non-*Saccharomyces* so as to increase the aromatic complexity of a wine. These results show that there is potential use of these strains for the future studies. The inherent characteristics found make the two species studied worth considering for different oenological uses.

Keywords (5): *Zygosaccharomyces*, SO₂, Ethanol, Fructose& Glucose, RAPD, FT-IR