



Thesis title: "Use of Non Saccharomyces yeast strains coupled with ultrasound treatments as a novel technique to accelerate aging over lees of red wines and its repercussion in sensorial parameters."

Student name:	Priyanka Kulkarni
Institution/company involved:	Universidad Politécnica de Madrid Escuela Técnica Superior de Ingenieros Agrónomos (Departamento de Tecnología de Alimentos) Instituto Superior de Agronomia, Universidade de Lisboa

Jury members (name/position):

Prof. Jorge M. Ricardo-Da-Silva
Prof. Antonio Morata Barrado
Prof. Felipe Palomero
Prof. Wenduyé Tesfaye
Prof. Manuel Malfeito-Ferreira

Names & emails of supervisors:

Prof. Antonio Morata Barrado	antonio.morata@upm.es
Prof^a. Olga Laureano	olgalaureano@isa.utl.pt

Date & location of the oral examination (if known) : 19th September 2014, Instituto Superior de Agronomia, Lisbon

Confidential: Yes No

Abstract (max 300 words)

Topic position & objectives:

The aim of the present work was to evaluate the effects of two novel techniques; use of non Saccharomyces and ultrasounds coupled with abrasive addition on the autolysis of yeast and to see the possible use of these yeasts in the acceleration of aging over-lees, and to study the effect of ultrasounds on the polysaccharide release and on the stability of the anthocyanin monomer content in red wine.

Methods:

In this study two novel techniques: use of non Saccharomyces and ultrasounds coupled with abrasive addition were applied to accelerate and improve the traditional aging over lees in model wine medium. Release of polysaccharides was analyzed by HPLC-RI. Yeasts strains with higher release of polysaccharide content were selected to study their effects on aging over lees with ultrasonic treatment on red wine. Anthocyanin and aroma compounds were analyzed weekly using HPLC-PDAD/ESI-MS, GC-FID respectively. Color and total polyphenol index were recorded along the experiment. Sensorial analysis were performed by a tasting panel.

Results:

The results showed that, ultrasonic treatment coupled with abrasive addition significantly increased the polysaccharide release. Furthermore the non Saccharomyces strains of *Schizosaccharomyces pombe*, *Saccharomyces ludwigii* and *Brettanomyces* showed better results with regards to the amount of polysaccharide release compared to the control Saccharomyces strains. Ultrasonic treatment coupled with aging over lees resulted in reduction of anthocyanin content of the wine and also effected the aroma compounds. Ultrasonic treatment improved the oxidation in wine and played a complementary role to reductive lees ageing process

Main conclusions:

In conclusion this study illustrated the use of Ultrasounds and Non Saccharomyces strains as novel techniques for aging over lees; use of ultrasounds along with the non Saccharomyces strains can positively increase the polysaccharide release and achieve the effects of aging over lees in around 4-5 weeks as compared to the conventional aging over lees which can last for several months, however more research in this field is required to study the clear effects on ultrasounds on the chemical composition of wine before replicating the application on a large scale production.

Keywords (5):

Ultrasounds, Polysaccharides, Non Saccharomyces, aging over lees.

Please send a copy of this page to the Vinifera Secretariat, Montpellier