



Thesis title:

**Evaluate the potentialities of a new  $\beta$ -lyase enzyme in the release of S-volatile aromatic compounds in White and Red Wines**

Student name: **Dor Amsalem**

Institution/company involved: **Instituto Superior de Agronomia**

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

- Doutor Carlos Manuel Antunes Lopes, Professor Associado com agregação do Instituto Superior de Agronomia da Universidade de Lisboa;
- Doutor Jorge Manuel Rodrigues Ricardo da Silva, Professor Catedrático do Instituto Superior de Agronomia da Universidade de Lisboa, orientador;
- Doutora Doris Rauht, Professor da Universidade de Geisenheim, Hochschule Geisenheim University (DE), co-orientador;
- Doutora Sofia Cristina Gomes Catarino, Professora Auxiliar Convidada do Instituto Superior de Agronomia da Universidade de Lisboa.

Date & location of the oral examination:

**23-07-15 10:00 AM at the Instituto Superior de Agronomia**

Confidential:  Yes  No

**Abstract (max 300 words)**

In the past twenty years a rapid growing interest in thiols can be seen as a function of the amount of papers and research done on this topic, with the aim of understanding the biosynthesis of the main varietal thiols, as well as the desire to develop methods and ways to increase their concentration in wine. (Roland et al., 2011b). Though the varietal thiols are often associated with Sauvignon Blanc grape variety, many other varieties have been shown to possess these compounds, especially 3-mercaptohexan-1-ol (3MH), 3-mercaptohexyl acetate (3MHA), 4-mercapto-4-methylpentan-2-one (4MMP) and to a less extent, Mercapto-4-methylpentan-2-ol (4MMP-OH) (Roland et al, 2012; Coetzee et al., 2012), all of which may contribute to the positive aromas of the wine giving it odors of Box tree, blackcurrant, grape fruit, passion fruit as well as other fruity aromas.

Thiols are the product of yeasts during fermentation, and are originating from different precursors coming from the grapes, such as S-3-(hexan-1-ol)-L-cysteine (Cys-3MH), or S-4-(4-methylpentan-2-one)-glutathione (Glut-4MMP).

As to now, the turnover of this precursors via the action of the yeast's  $\beta$ -lyase enzyme is very low comparing it to the total pool of precursors found in the must. The conversion of Cys-3MH is only between 0.1- 12% according to Coetzee et al., (2012). In this Master's thesis, a  $\beta$ -lyase enzyme was added to the wine's must during fermentation as an enological additive, with the aim to develop a protocol to increase the varietal thiols in the final wines. The experiment was done under enological conditions in Instituto Superior de Agronomia's (ISA) vineyards and cellar using two red varieties (Syrah and Touriga Nacional) and four white varieties (Alvarinho, Arinto, Encruzado and Viosinho). The wines were compared in their sensorial impressions by a panel of 10 experienced tasters with the focus on tropical notes as interest

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