



Thesis title: Enological approaches for the prevention of the light-struck taste in white wines.

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Abstract (max 300 words)

Topic position & objectives:
The light-struck off-flavor is a defect that is manifested in white wines that are bottled in clear glass and that are exposed to light for a considerable amount of time. The objectives of this research have been to confirm that the yeast *Saccharomyces cerevisiae* produces riboflavin, to study riboflavin degradation kinetic, to remove riboflavin from wine by physicochemical means (using clarifying agents and adjuvants) and to add other substances, such as tannins, to potentially protect the light against light irradiation.

Methods:
Lab-scale fermentations were performed, in triplicate, using 15 different yeast strains. Three additional fermentations have been performed to test two different fermentation nutrients to determine if these enhance riboflavin production. The method used for riboflavin detection has been an UHPLC method with UV detection. The amino acid content has been determined using an HPLC method with fluorescence detection. The clarifying agents used have been bentonite, enological carbon, zeolite, PVPP, kaolin, silica and egg albumin. All these have been tested both in model solution and wine. Gallic and ellagic tannins, glutathione, SO₂, ascorbic acid and phenylalanine have been used to protect the wine from light. These have also been tested in model solution and wine.

Results:
The production of riboflavin has been confirmed and it depends on the yeast strain used. Carbon was the adjuvant that performed better on riboflavin removal both in model solution and wine followed by bentonite and zeolite. The substances that better performed protecting the wine from the off-flavor were ascorbic acid and oak tannins mixed with SO₂.

Main conclusions:
Different enological strategies have been proposed and its been proved that the prevention of the light-struck off-flavor is possible. The fermentation is a key stage of the winemaking process as the yeast produces riboflavin. The reduction of the riboflavin concentration is possible using enological carbon or bentonite at moderate dosages.

Keywords (5):
Riboflavin
Methionine
Light-struck taste
Light
Clarification