



**Thesis title:** Aromatic Characterization of Two Sicilian Varieties  
Catarratto and Grillo, and the Effects of Air and CO<sub>2</sub> on  
Thiol Precursors

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**Confidential:**  Yes  No

**Abstract (max 300 words)**

**Topic position & objectives:**

Aromatic Thiols have been a big focus of research in the past years. The research has mainly been conducted on Sauvignon Blanc, a strong international variety, but there are many other varieties which have thiols. Two autochthonous Sicilian varieties, Catarratto Bianco and Grillo, have been noted to have thiol like aromas, but this has never been analytically confirmed. We characterized these two varieties, and also studied the effect of air and CO<sub>2</sub> on thiol precursors.

**Methods:**

Berries were harvested, pressed and transferred to tanks filled with air or CO<sub>2</sub> for a 36 hour maceration on lees. Pump overs were done with no aeration every 12 hours, then the musts were inoculated.

For lab analysis we analyzed the glutathione, thiol precursors and thiols. Glutathione was analyzed through HPLC-UV (303 nm). Thiol precursors were analyzed with UPLC High Resolution MS full scan and data dependent tandem MS analysis. Thiols were analyzed through HPLC-MS. For both thiol precursor and thiol quantification, monodeuterated internal standards of d1-GSH-3MH and d1-3MH were synthesized.

**Results:**

Both fermentations went to completion; with the air-exposed must finishing first for Catarratto and Grillo. The glutathione increased throughout fermentation, but the rate of increase was greater in the air-exposed musts. Thiol precursors were slightly higher in the CO<sub>2</sub>-protected must for Catarratto but slightly higher in the air-exposed must for Grillo. The wines made from the air-exposed must had higher thiol concentrations for both Catarratto and Grillo. A triangle test was conducted to see if there was a sensory difference between the wines made from the different treatments. There was no significant difference found.

**Main conclusions:**

The varieties Catarratto Bianco and Grillo are now confirmed to have thiols and thiol precursors in their wines. We saw that the air exposure for the must did not have an effect on the thiol precursors, but did have a positive effect on the fermentation time, the glutathione synthesis rate and the final concentration of thiols in the wine.

**Keywords (5):**

**Thiols**

**Thiol Precursors**

**Glutathione**

**Catarratto Bianco**

**Grillo**