

Effect of pre-fermentation addition of oenological tannins on volatile composition and color characteristics of white wines

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Modern winemaking is increasingly focused on the expression of **nuances and refinement**.

Specifically for **white wines**, achieving differentiation through distinctive and complex aromatic profiles is a challenging task, especially when aiming to maintain high product stability over time. However, a recent study we conducted in collaboration with the Department of Agricultural, Forest and Food Sciences (DISAFA) at the University of Turin revealed highly interesting insights, never so clearly identified in previous industry studies: **oenological tannins** (OETs), often overlooked due to their potential impact on color, have proven effective in **protecting wine aroma compounds** while leaving **color tones unchanged**.

The properties of oenological tannins

The antioxidant and stabilizing properties of OETs have long been known. However, their ability to modulate aromas (esters, higher alcohols, norisoprenoids, terpenes, etc.—collectively referred to as **Volatile Organic Compounds** or VOCs)—still offers wide opportunities for investigation.

Our study proves how certain specific oenological tannins can transform the way aromas are preserved in wine. Analytical study of the results of tannin-variety interactions showed that the protective effect is common to all, though with different nuances.

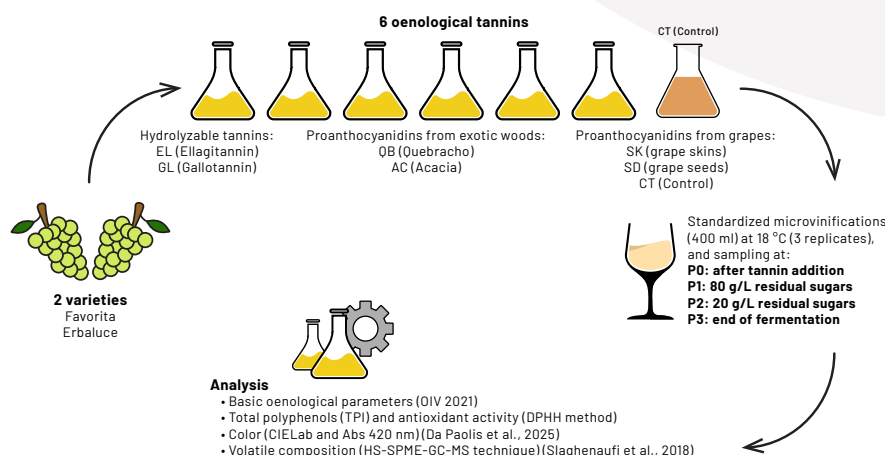
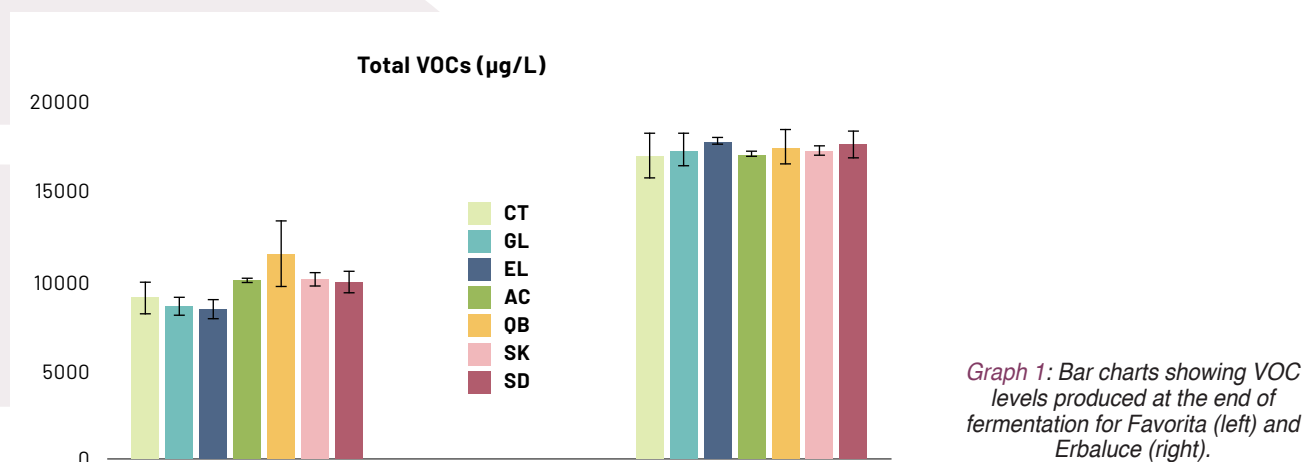


Image 1:
Experimental set-up of the study

Study Results

The outcomes of the analyses, which involved the application of our OETs (ellagic, gallic, grape skin, grape seed, quebracho, and acacia tannins) in microvinifications, were very promising. In the **Favorita** variety, the addition of quebracho in particular significantly **increased the amount of aromas** at the end of fermentation (*Graph 1*). The resulting wines **showed greater aromatic complexity and intensity**, especially preserving norisoprenoids, known for their fruity and floral notes.



The impact of OETs on the **Erbaluce** variety proved different, highlighting how the choice of specific tannins determines the success of OET application in white grape varieties.

The study also assessed the chromatic **impact of using OETs in wine**. Although some initial changes in hue and intensity were observed immediately after adding OETs, these changes leveled out by the end of fermentation. **This confirms that the use of tannins significantly affects the aromatic profile but not the color of the wine.**

Further research evaluated the residual **antioxidant capacity** of the tannins in the wines. It was noted that **grape skin and seed tannins** showed the greatest potential in this regard.

In conclusion, the study shows how **oenological tannins** enhance **aromatic expression**, offer natural protection **against oxidation**, and **maintain the color and freshness of white wines**.

Reference

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