How can yeast modulate Divona's aromatic profile?

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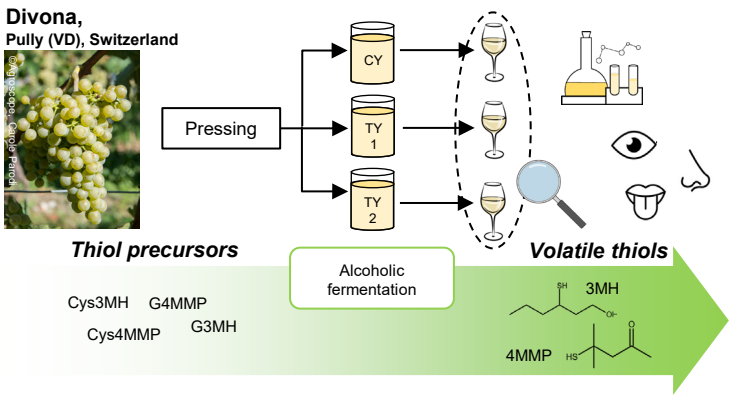
Introduction and goals

Volatile thiols are key contributors to the aromatic complexity of white wines, imparting notes of passion fruit, grapefruit, and citrus herbs [1]. These aroma compounds originate from non-volatile precursors in grapes and are released through enzymatic activity, primarily during alcoholic fermentation. Yeast strains differ in their ability to convert these precursors into volatile thiols, significantly affecting the wine's final aromatic profile [2]. Divona, a newly bred disease-resistant grape variety from Switzerland, carries several resistance loci (*Rpv10, Rpv3.3, Ren3, Ren9, Rgb1*) and shows moderate susceptibility to grey rot [3]. Known for its fresh aromatic expression—often described as grapefruit- and citrus-like, similar to Sauvignon Blanc—Divona must has been found to contain thiol precursors such as P3MH. This study investigates whether the use of selected yeast strains with enhanced thiol-releasing capacity can modulate and enrich the aromatic profile of Divona wines.



Wine analysis

	Alcohol [%Vol]	pH	Total acidity [g/l]	Malic acid [g/l]	Tartaric acid [g/l]	Acetic acid [g/l]	Glycerol [g/l]	Dry extract [g/l]
Control yeast (CY)	14.4	3.5	4.9	0.8	2.4	0.59	8.0	18.5
Thiol yeast 1 (TY1)	14.3	3.6	4.6	0.7	2.2	0.54	9.0	20.3
Thiol yeast 2 (TY2)	14.3	3.6	4.9	0.8	2.6	0.40	10.4	24.4

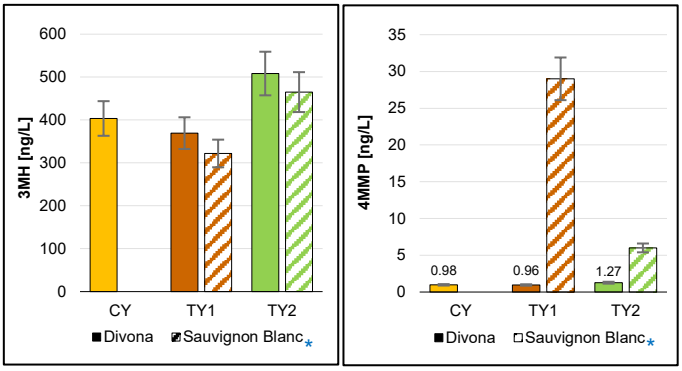
- No big difference in terms of global composition of the three modalities.

Terpene analysis

	Linalool [µg/L]	α-Terpineol [µg/L]	β-Citronellol [µg/L]	Nerol [µg/L]	Geraniol [µg/L]
Control yeast (CY)	81.0	26.6	17.8	38.5	113.2
Thiol yeast 1 (TY1)	64.9	25.6	18.3	21.6	100.9
Thiol yeast 2 (TY2)	78.7	46.1	33.3	23.6	148.5

- No Rose oxide, Furan linalool oxide or Terpinen-4-ol found in the wines.
- Linalool: Levels generally similar to those reported in Muscat wines, with a lower value observed in the wine fermented with TY1 [4].
- α-Terpineol: Higher concentration in the wine fermented with TY2.
- β-Citronellol: Also found in higher amounts in the wine with TY2.
- Nerol: Highest concentration in the control wine.
- Geraniol: Higher levels in the wine fermented with TY2, reaching concentrations comparable to those found in Riesling wines [4].

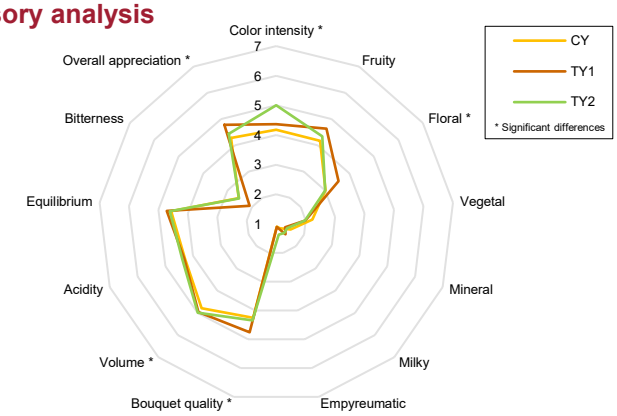
Volatile thiol analysis



** The Sauvignon Blanc wines were made with the same thiol yeasts with grappes in Wädenswil (ZH), Switzerland*

- Surprisingly, wines made with TY1 presented less 3MH than the control wines.
- Wines made with TY2 showed higher 3MH content than the control wines.
- Divona and Sauvignon Blanc wines have similar 3MH concentrations, but Divona contains almost no 4MMP (box tree odour).

Sensory analysis



- Color intensity of the TY2 modality was significantly higher.
- The use of thiol releasing yeast impacted the "floral" perception and the bouquet quality, especially in the TY1 modality.
- The wine made with TY1 received a higher overall appreciation rating, despite having lower levels of thiols and terpenes, suggesting that the wine matrix (such as acidity and other compounds) can influence sensory perception.

[1] Roland et al., *Varietal thiols in wine: discovery, analysis and applications.* Chemical reviews, 2011. **111**(11): p. 7355-7376.
[2] Swiegers et al., *The influence of yeast on the aroma of Sauvignon Blanc wine.* Food Microbiology, 2009. **26**(2): p. 204-11.
[3] Spring et al., *Divona, nouveau cépage blanc résistant aux principales maladies de la vigne sélectionné à Agroscope* Revue suisse de viticulture arboriculture horticulture, 2018. **50**(5): p. 286-296.
[4] Black et al., *Terpenoids and their role in wine flavour: recent advances.* AJGWR, 2015. 21: p. 582-600

Conclusions

- The use of thiol-releasing yeast can modulate both the composition and the sensory profile of Divona wines.
- Divona wines showed similar 3MH concentrations to that of Sauvignon Blanc wines, but nearly no 4MMP.
- No Rose oxides were found in Divona wines, but other terpene content was present, such as linalool or geraniol concentration, in similar amounts to those found in Muscat and Riesling wines, respectively [4].

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