

Impact of SO₂ addition on microbial diversity and sensory attributes in uninoculated commercial rose fermentations

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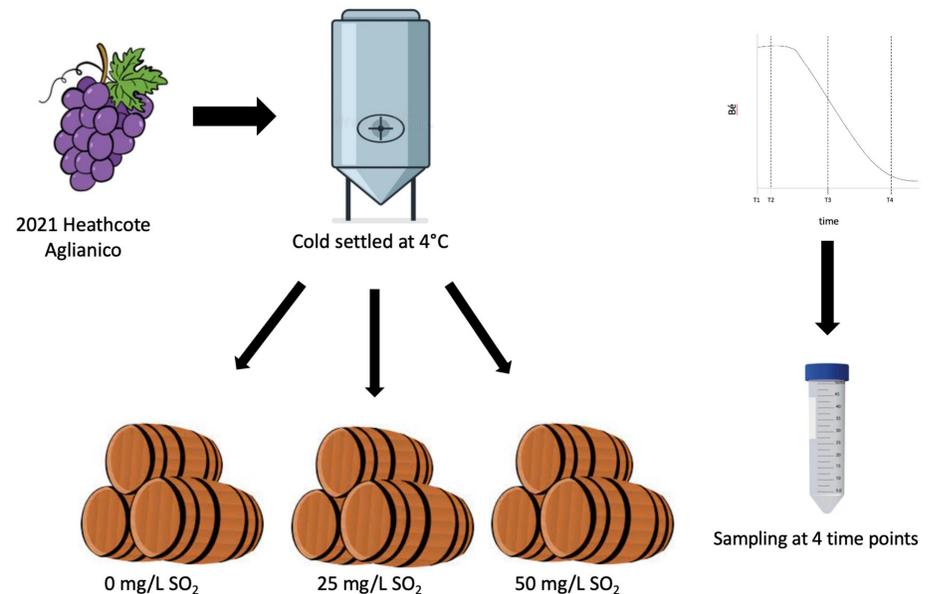
Background

- Uninoculated fermentations are growing in popularity in the wine industry
- How do winemaking practices influence the development of the indigenous microbial community?
- SO₂ is commonly added at crush as an antioxidant and antimicrobial
- Studies at a laboratory scale found SO₂ addition impacted the fungal diversity of uninoculated fermentation (Cuijvers, 2019)

Aim

- Determine the impact of pre-fermentation SO₂ addition on microbial diversity and sensory qualities of Aglianico rose fermentations

Methods



- 0 mg/L, 25 mg/L, and 50 mg/L of SO₂ investigated in triplicate (9 fermentations)
- Samples taken at 4 timepoints. DNA extracted and ITS (fungi) community profiled by AGRF (Melbourne, Australia)
- Sensory conducted on bottled wines after 12 months

Results

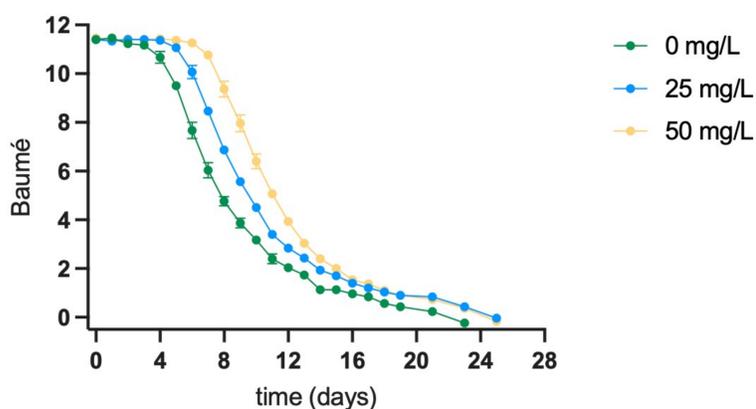


Figure 1: Fermentation kinetics for the rose wines with different SO₂ levels

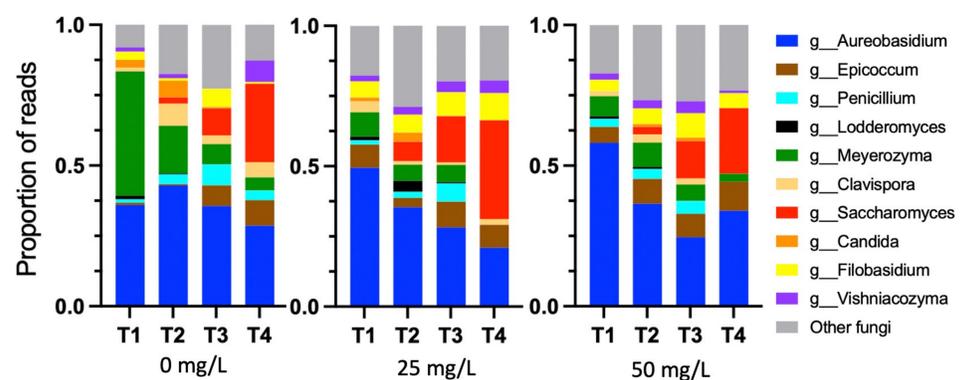


Figure 2: Fungal diversity profiles at four fermentation time points at different SO₂ levels. Bars represent the proportion of reads for each genus, where 1.0 = 100% of the reads.

Wine microbial diversity

- *Saccharomyces* (*S. cerevisiae*) increased over time
- *Aureobasidium* sp. and *Meyerozyma* sp. decreased over time
- SO₂ addition did not have a large impact on fungal community profile
- SO₂ addition increased lag phase and time to complete fermentation

Wine chemistry and sensory characteristics

- No significant differences in wine chemistry or color at the end of fermentation
- Wine sensory analysis found difference in body and flavor intensity between 25 mg/L treatment and other treatments. 50 mg/L treatment was perceived as sweeter
- Further investigation needed into the role of bacteria

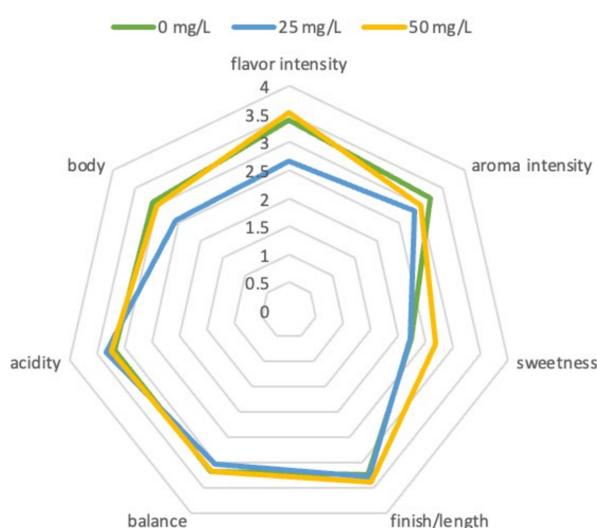


Figure 3: Sensory attribute scores for the experimental rose wines. Average values are of 3 experimental replicates, ranked on a 5-point scale.

Acknowledgements

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References

Cuijvers, K., Van Den Heuvel, S., Varela, C., Rullo, M., Solomon, M., Schmidt, S., & Borneman, A. (2020). Alterations in yeast species composition of uninoculated wine ferments by the addition of sulphur dioxide. *Fermentation*, 6(2), 62.