

The effect of pre-ferment glutathione addition on Chardonnay and Riesling wine characteristics



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Background

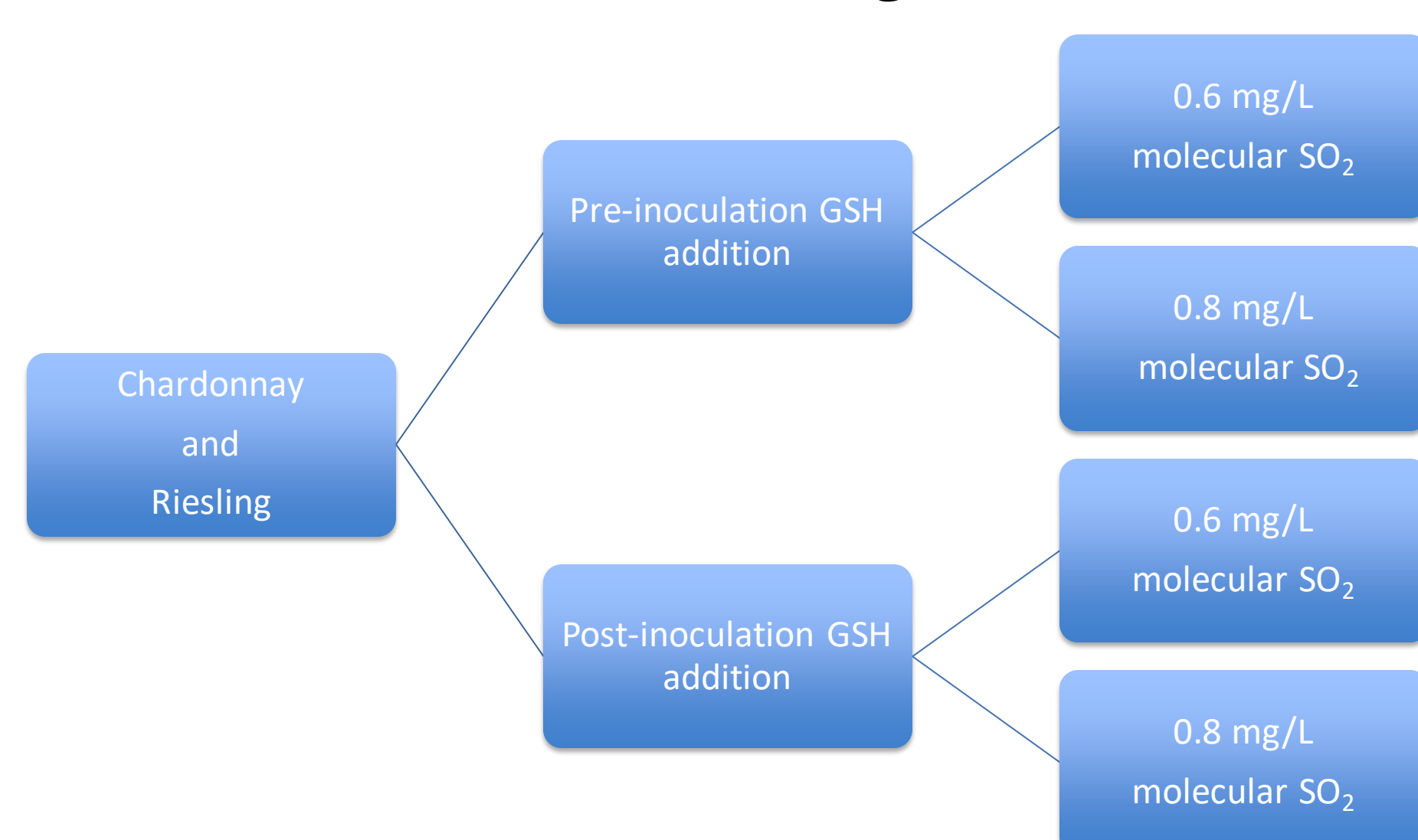
Glutathione (GSH) is a natural product which can participate in redox reactions and act as a precursor to a range of aroma compounds. The OIV has posted guidelines on the addition of GSH to musts or prior to bottling to protect against oxidation phenomena. However, questions remain about the fate of GSH under different addition scenarios and what the impacts might be in varieties other than Sauvignon Blanc.

Aims

1. Determine the effects of GSH addition during fermentation on the organoleptic qualities of finished Chardonnay and Riesling wine.
2. Evaluate interactions with SO₂ in evolution of wine chemistry.
3. Determine the persistence of GSH during wine maturation.

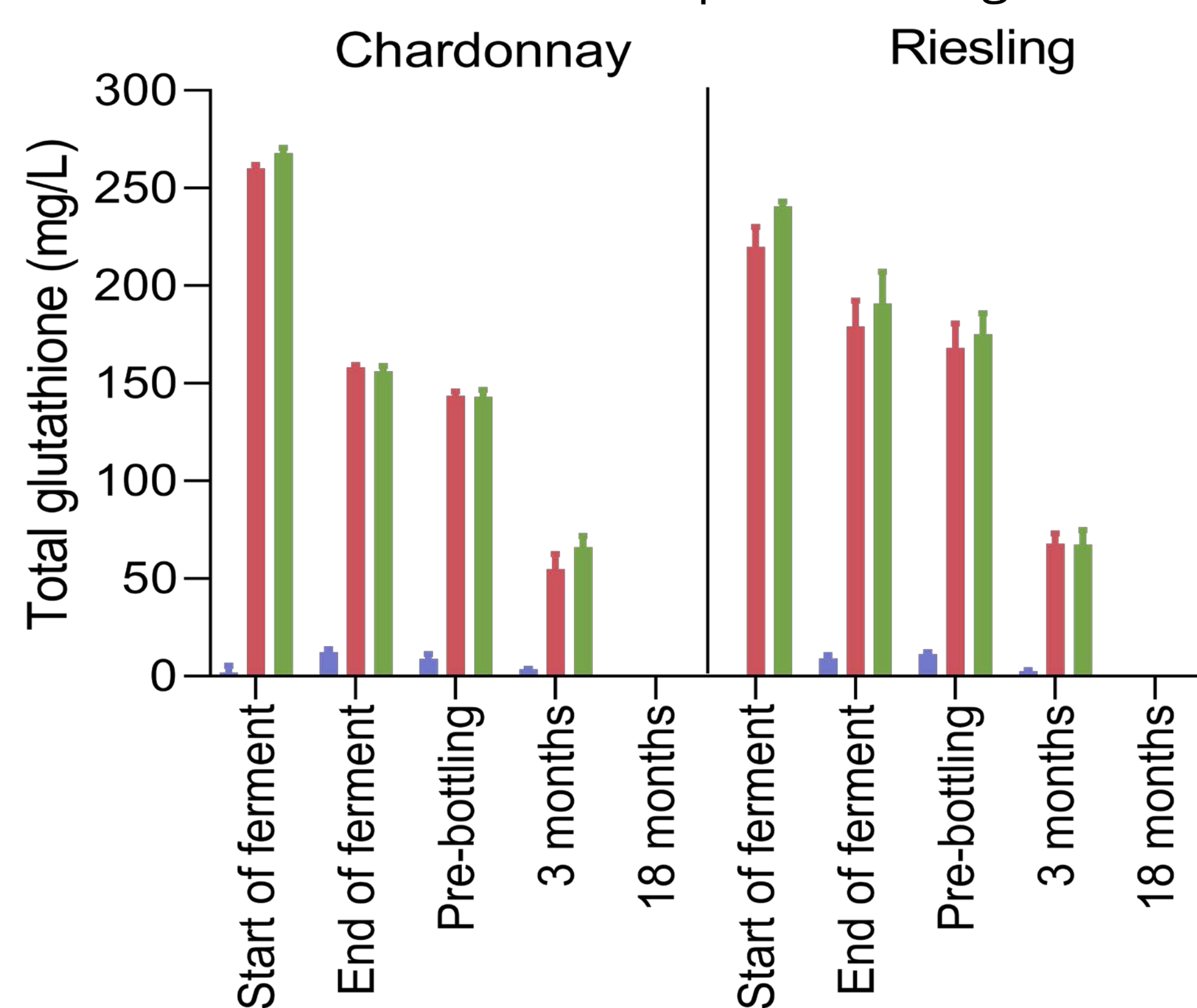
Winemaking

Pilot-scale Chardonnay and Riesling wines were made with the following treatments:



Analysis

Finished wine was analysed by a trained descriptive sensory panel 3 months post-bottling. Chemical analyses were performed at 3 months, 18 months and 22 months post-bottling.



A) Evolution of GSH concentration in Chardonnay and Riesling during fermentation and wine ageing

Reference

Resolution OIV-OENO 445-2015 addition of glutathione to must.

Conclusions

- Glutathione loss during fermentation was 60–100 mg/L (Figure A).
- No differences in GSH loss between pre- and post-ferment additions were observed (Figure A).
- GSH addition during fermentation had a significant impact on wine flavour profiles:
 - GSH was associated with 'flint' and 'cheesy' descriptors in Chardonnay (Figure B).
 - GSH was associated with 'flint' and 'box hedge/cat pee' descriptors in Riesling (Figure D).
- During bottle ageing, a large amount of hydrogen sulfide (H₂S) was released (Figures C and E).
 - In-bottle H₂S development was more pronounced in wines bottled with low SO₂ regimes.
 - In-bottle H₂S development was more pronounced in Chardonnay.

