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Comparison of remediation strategies for decreasing 'reductive' characters in Shiraz wines

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Abstract:

Background and Aims: Winemakers utilize various remediation strategies for decreasing 'reductive' characters in wine. Remediation strategies, such as the addition of diammonium phosphate (DAP) during fermentation, copper fining, the addition of fresh lees or lees products to wine, and aeration of the must during and after fermentation, are commonly employed in an effort to prevent the formation or to remove undesirable volatile sulfur compounds. In this study, the relative effectiveness of five strategies for remediation of 'reductive' aroma was compared in a Shiraz wine.

Methods and Results: At the onset of the development of 'reductive' aromas during Shiraz fermentation, each ferment was treated with a unique remediation strategy: DAP addition; macro-oxygenation; copper fining; a combination of macro-oxygenation and copper-fining; or the addition of fresh lees from a donor wine. While a relatively small difference in volatile sulfur compounds was found between treatments, copper fining, lees and DAP addition produced wines with elevated 'reductive' characters at certain time-points post -bottling; while macro-oxygenation with copper produced wines with a low sensory score for 'reduction'-related attributes.

Conclusion: Macro-oxygenation during fermentation was the most effective remediation strategy. Lees addition, and to a lesser extent, copper fining and DAP addition, diminished fruit attributes and produced wines with noticeable 'reductive' characters.

Significance of the Study: Macro-oxygenation during fermentation produced wines with the lowest 'reduction'-related attributes while enhancing 'fruity' attributes. This work also highlighted the compositional effects of each type of remediation treatment.

Keywords: copper fining, hydrogen sulfide, metals, oxygen treatment, reductive aromas, sensory descriptive analysis, volatile sulfur, compounds, winemaking