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# Study Reveals Key Compounds Behind Flint Aroma in Chardonnay Wines

Research highlights the role of phenylmethanethiol and 2-furylmethanethiol in achieving desired wine aromas, with implications for winemaking techniques.

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The aroma of flint in Chardonnay wines is a sought-after characteristic in certain wine styles, especially those from cooler climates like Chablis in Burgundy and Australian Chardonnay aged in barrels. This aroma is linked to phenylmethanethiol, a sulfur-containing volatile compound. However, research on this sensory note is limited. An Australian study by AWRI researchers analyzed over 70 commercially available white

wines, mainly Chardonnay, to understand the variability of phenylmethanethiol. A sensory panel evaluated these wines to determine if the flint aroma could shift to a less pleasant sulfurous or burnt smell.

Interestingly, another sulfur-containing compound, 2-furylmethanethiol, was found in high concentrations in wines with a pronounced flint aroma. Previous studies showed that 2-furylmethanethiol forms during barrel fermentation from furfural released by toasted oak staves reacting with hydrogen sulfide from yeast. This research indicates that both phenylmethanethiol and 2-furylmethanethiol contribute to the flint aroma, but higher levels of 2-furylmethanethiol can lead to sulfurous or burnt notes.

The study also explored the effects of winemaking techniques and additives on phenylmethanethiol formation. Model fermentations investigated potential precursors like benzaldehyde and hydrogen sulfide. Yeast strains producing high hydrogen sulfide levels also resulted in higher phenylmethanethiol concentrations during synthetic grape must fermentation. Additionally, increasing ammonia concentrations favored phenylmethanethiol formation by yeast during fermentation.

These findings suggest that various winemaking parameters can be adjusted to modulate phenylmethanethiol concentrations in wine. Understanding these factors can help winemakers achieve the desired flint aroma without crossing into less desirable sulfurous notes.