Tropical fruit flavour in Chardonnay wines

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Introduction

Wines made from Chardonnay grapes can have diverse flavour characteristics. Of the many volatile compounds contributing to wine flavour, several very potent polyfunctional thiols compounds are key compounds for Sauvignon Blanc, but it is not known how important they are to Chardonnay.

A similar thiol, benzyl mercaptan or BM, can provide a ‘struck match’, ‘gun-flint’ character to some wines, but it has been little studied.

Polyfunctional thiols are well above sensory threshold in many Australian Chardonnays

- Thiols were determined in a set of 106 Chardonnay wines from multiple regions, a wide range of vintages, oaked and unoaked, from $3 to $120 retail (median $19).
- 3-MH and 3-MHA were above sensory detection threshold in all the wines
- Tasmanian wines generally had higher levels of the ‘flint’ benzyl mercaptan, and 3-MHA
- Western Australian wines had higher median 3-MH concentration

Thiols contribute to ‘citrus’, ‘tropical fruit’, ‘flint’ and ‘green’ flavour in unwooded Chardonnay

- 16 juices were sourced from across Australia
- hand-harvested grapes picked at similar Brix
- identical winemaking
- no oak

Sensory descriptive analysis
Volatile aroma compounds quantified

Most consumers preferred wines with higher thiols

- Using the method of partial least squares regression to relate the sensory properties of the wines with the chemical composition:
  - Citrus and passionfruit attributes were most associated with 3-MHA and 3-MH concentration
  - Flint and pungent attributes related to BM and the other thiols
  - All 16 wines had above sensory threshold concentration of 3-MH and BM
  - Most were above threshold in 3-MHA

Conclusions

- Concentration of the polyfunctional thiols (in-particular 3-MH) in Chardonnay wine is much higher than previously thought
- Thiols can be major contributors to Chardonnay wine flavour
- Unwooded wines with elevated thiols/tropical fruit flavour are well accepted by a majority of consumers
- Benzyl mercaptan is a target for achieving optimal ‘flint’/‘struck match’ character

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