Does in-canopy misting mitigate the intensity of smoke taint in grapes and wine?

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Background

- Smoke taint refers to smoky, burnt aromas and flavours in wines derived from grapevine exposure to bushfire smoke
- Smoke-derived compounds can be absorbed by both the leaves and the fruit; however translocation does not occur between them[1]
- Current smoke taint amelioration strategies have limited efficacy

Analysis

- **Chemical analysis:** Concentrations of free volatile phenols and their glycosylated forms were measured in grapes and wines using GC-MS[2] and HPLC-MS/MS[3], respectively
- **Sensory analysis:** Wines were analysed for characteristic smoke taint attributes using RATA[4]

Key question

Can water be administered through in-canopy misters to limit initial smoke uptake by grapevines, thereby reducing the intensity of smoke taint in wines made from those grapes?

Conclusions

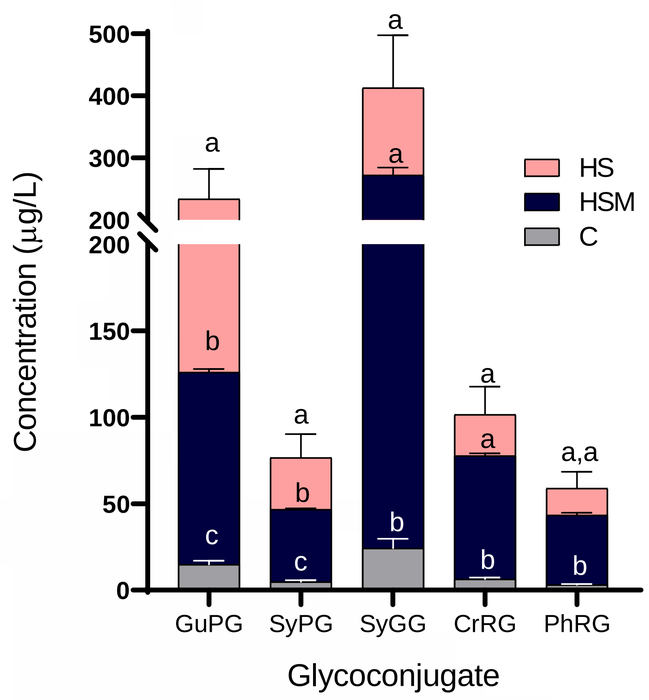
Misting is a viable smoke taint mitigation strategy as reflected in chemical data; however, sensory data suggests that optimisation of misting parameters (e.g. droplet size, nozzle configuration) is required to improve efficacy

Experimental design

- Straw-derived smoke was applied to Cabernet Sauvignon grapevines using a purpose-built tent for 1 hour at 7 days post-véraison
- 3 treatments:
  - Smoke exposure, no misting (HS)
  - Smoke exposure, with misting (HSM)
  - No smoke, no misting (C)

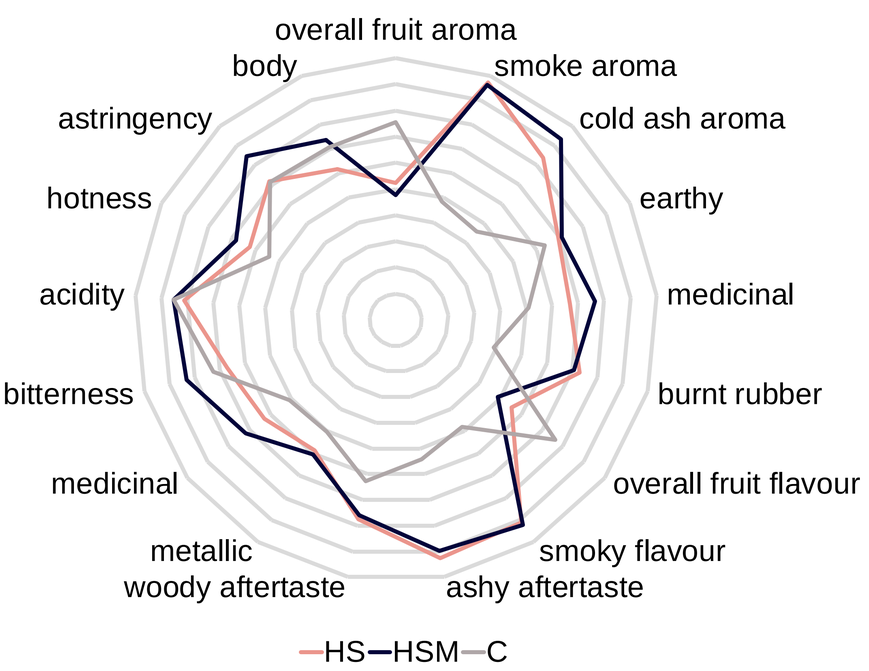
Results

Effects of mist application to grapes on the most abundant volatile phenol glycoconjugates in wine



- Volatile phenol glycoconjugates in HSM grapes and wines (relative to HS treatment) were reduced by 35% (averaged across glycoconjugates)
- Some free volatile phenols in HSM grapes and wines (relative to HS treatment) were reduced by up to 20%, including guaiacol, 4-methylguaiacol, and phenol

Effects of mist application on smoke taint sensory attributes in wine



- Characteristic smoke taint attributes including smoke, cold ash, medicinal, and burnt rubber aromas, smoky flavour, and ashy aftertaste were not significantly different between HSM and HS wines
- Astringency, body, and bitterness were higher in HSM wines compared to HS wines

FOR MORE INFORMATION

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