

Beyond phenolic bitterness : tryptophol-bisulfites identified as a potential new class of bitter compounds in white wine

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Background and research question

- Bitterness is an unacceptable taste in white wine commonly attributed to phenolic compounds.
- The concentration of phenolic compounds only partly explains the bitterness of white wines.
- **So, what non-phenolic compounds might contribute to bitterness in white wine?**

Methods

- A two-stage sensory-directed approach was used to identify potentially bitter compounds in white wine (Figure 1).

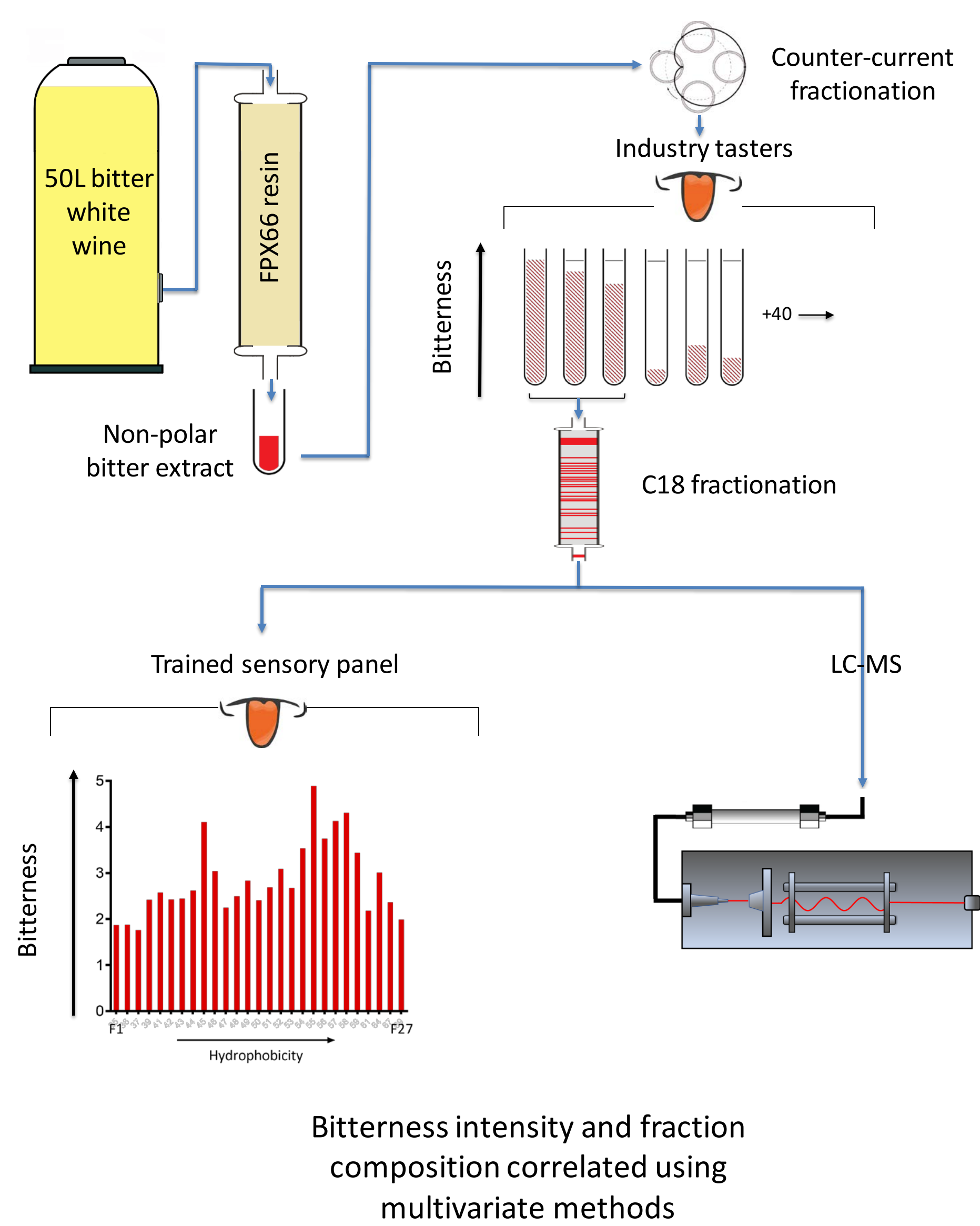
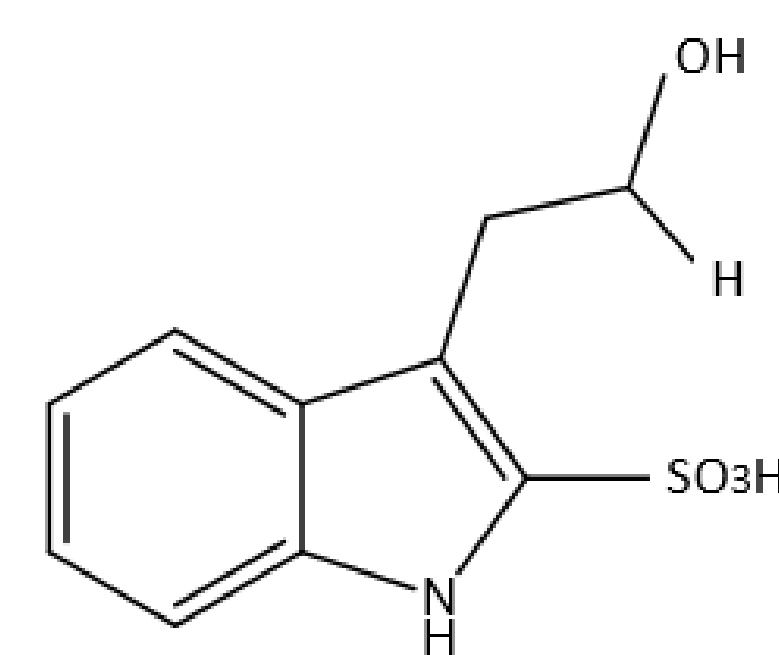


Figure 1. Schematic of the sensory-directed method used to find potentially bitter compounds in white wine

- The compound most strongly associated with bitterness intensity was synthesised.
- The taste and mouth-feel of the compound was compared to bitter compounds and other sensory standards using perceptual mapping ('napping').

Results

- The compound most strongly associated with bitterness was found to be a sulfonated tryptophol.



- Perceptual mapping showed that sulfonated tryptophol was perceived as more similar to known bitter compounds than to known astringent or acidic compounds.

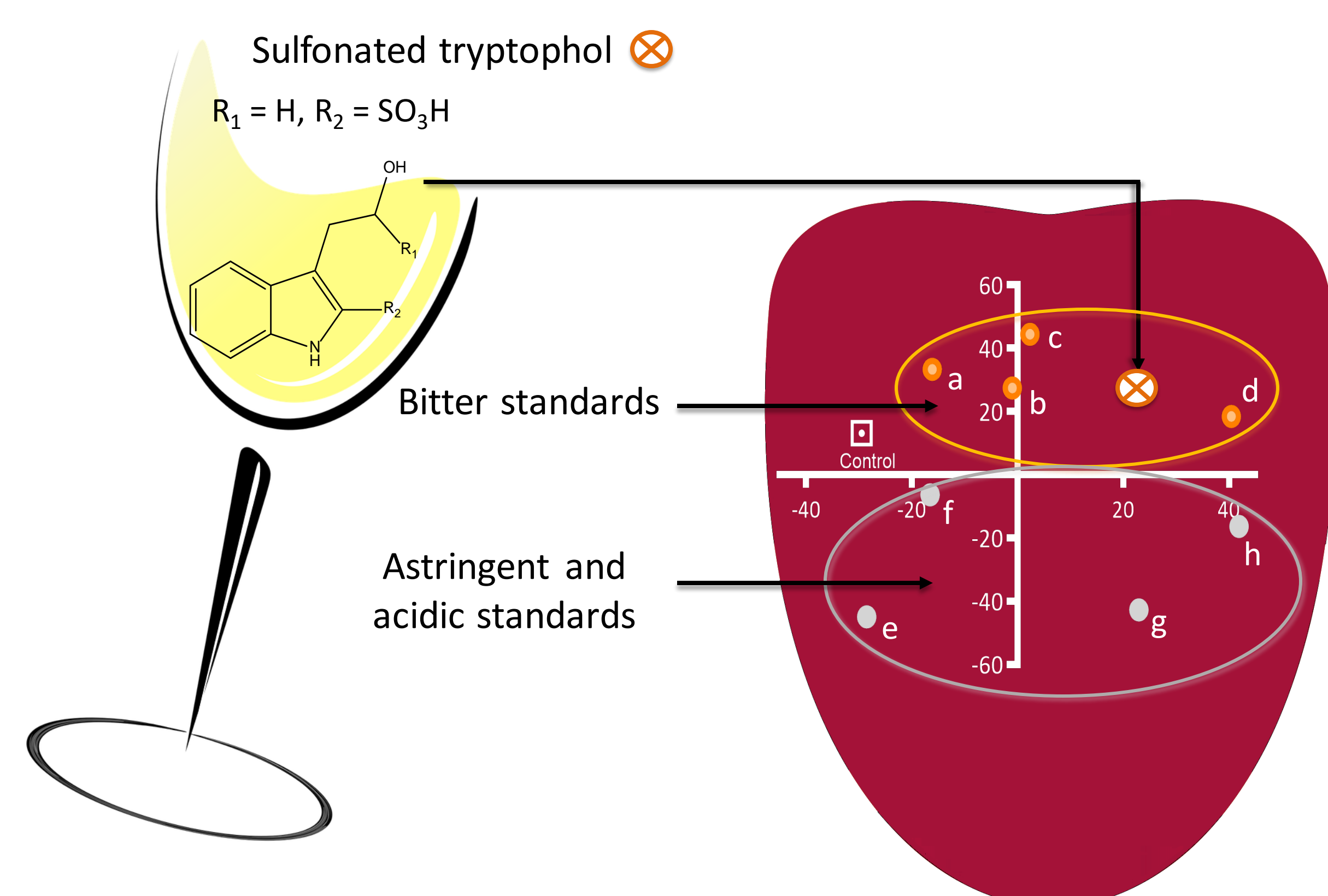


Figure 2. Perceptual map of sulfonated tryptophol (200 mg/L), compared to known bitter, acidic and astringent standards

Control – model wine (10% v/v ethanol, pH 3.5)

- | | |
|---------------------------------------|--------------------------------------|
| a: MW + epicatechin 100 mg/L (bitter) | b: MW + epicatechin 50 mg/L (bitter) |
| c: MW + quinine sulfate (bitter) | d: MW + ethanol (hot, bitter) |
| e: MW + malic acid (acidic) | f: MW + alum (astringent) |
| g: MW + tannin (astringent) | h: MW + tryptophol |

Conclusion

- Sulfonated tryptophol is a potential contributor to bitterness in white wines.