

What causes apricot aroma in white wines? Unravelling the contribution of multiple volatile compounds



Damian Espinase Nandorfy, Tracey Siebert, Eleanor Bilogrevic, Lisa Pisaniello, Desiree Likos, Leigh Francis

The Australian Wine Research Institute, PO Box 197, Glen Osmond (Adelaide) SA 5064, Australia

Corresponding author's email: damian.espinasenandorfy@awri.com.au

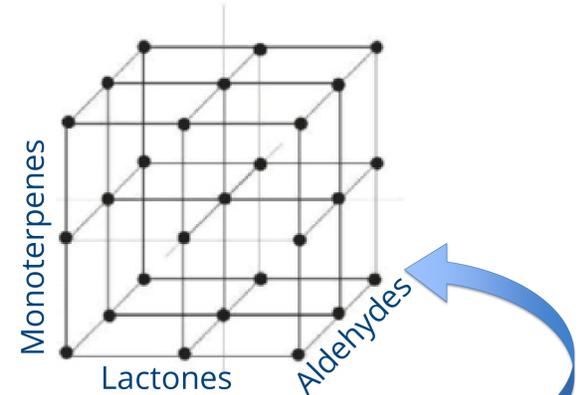
Background

- The subtle 'apricot' note in white wines, especially Viognier, is a desirable indicator of varietal typicity.
- Previous studies at the AWRI identified that a mixture of monoterpenes play an important role in causing this flavour; not a single compound.

The knowledge gap

- Do lactones, potent stone fruit-smelling compounds common to both apricots and wines, also play a role despite their low concentrations?

This study's main objective was to measure the importance of lactones in the presence of other volatile odour compounds in causing 'apricot' aroma

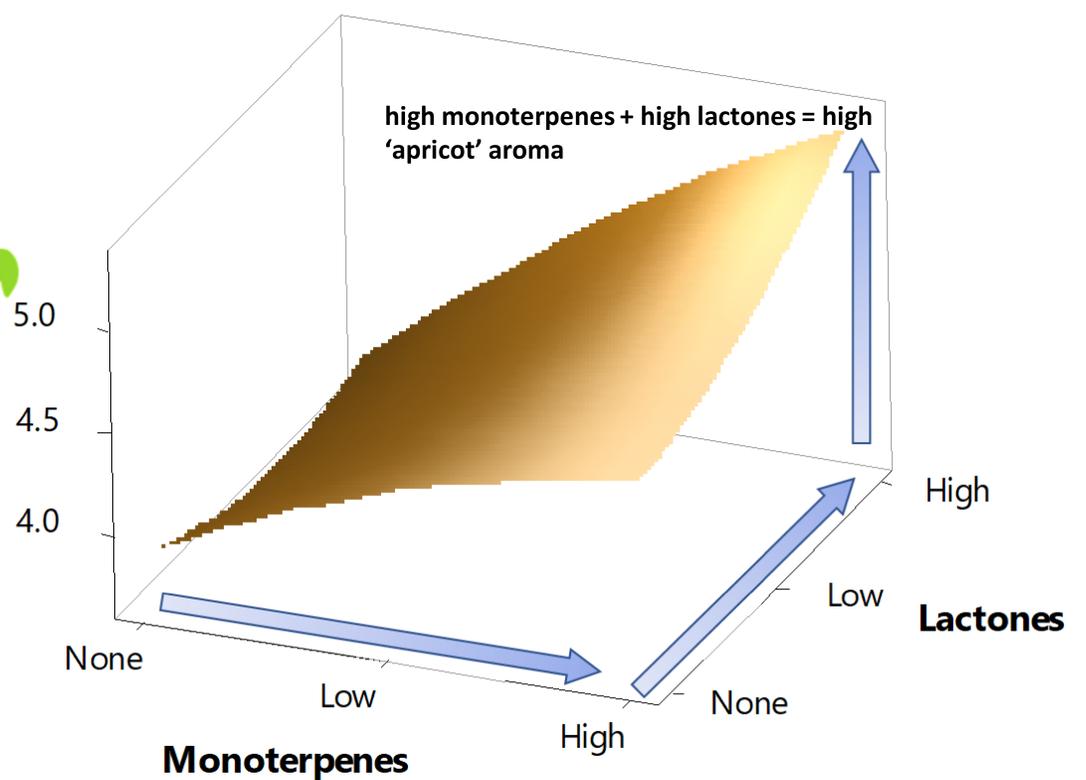
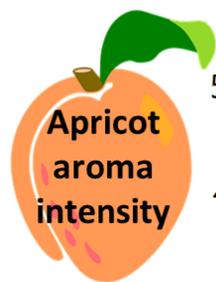
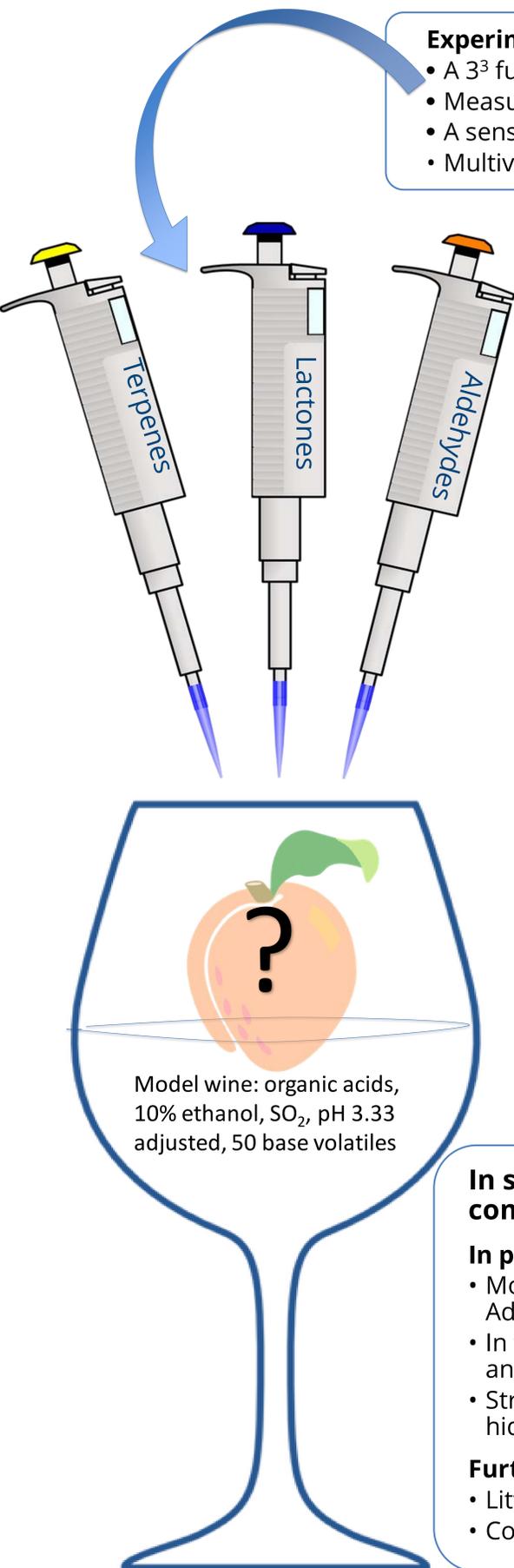


Experimental design

- A 3³ full factorial experimental design approach was used (absent, low, high^{Monoterpenes, lactones, aldehydes}).
- Measured volatile data from high 'apricot' Viognier wines was used to reconstruct the model wines and factors.
- A sensory descriptive analysis panel (n=12) rated the aromas of 27 model wines in duplicate.
- Multivariate statistics were used to model and measure the relative importance of each aroma family.

So what were the significant results?

- Five ('fruity', 'citrus' and 'floral') monoterpenes combined were confirmed as the **major impact family** giving this varietal 'apricot' note (F=44.8***)
- Six lactones **enhanced** the 'apricot' intensity when combined with the monoterpenes but did not give stone fruit-like odours alone (F=6.5*)
- 'Apricot' odour was strongly **suppressed** in the presence of aldehyde compounds (F=16.7***)



In summary, for 'apricot' aroma in white wine, monoterpenes were genuine impact compounds, lactones enhanced intensity, while aldehydes acted as strong suppressors

In practice

- Monoterpenes can be increased viticulturally by increased fruit exposure and selection of cooler vineyards. Additional research on clonal vine selection is currently investigating other factors in Australian vineyards.
- In the winery, fermentation temperature, skin contact, pH and yeast enzymes can all influence the concentration and release of free monoterpenes in a wine.
- Structured and sensory-directed blending practices may provide winemakers with a tool for uncovering the hidden varietal flavours in their blending components.

Further research

- Little is known about fermentation-derived lactones in wine.
- Cognitive effects of aroma mixtures are highly complex and not well understood in a wine context.



The Australian Wine Research Institute

Wine Australia

The AWRI is a member of the Wine Innovation Cluster.