

# Effects of six commercial *Oenococcus oeni* cultures on volatile smoke-taint compounds during Malolactic Fermentation



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## Introduction

The phenolic compounds responsible for smoke taint in wine move from odorless glycosides to unbound volatile forms during vinification processes. Little scientific data exists however on how malolactic fermentation (MLF) contributes to this. Previous work found Viniflora<sup>®</sup> CH16 did not release free taint compounds from bound glycosides<sup>1</sup> while anecdotal recommendations are to avoid spontaneous MLF and strains with a high degree of glycosidic activity<sup>2</sup>. This work set out to determine the effect of six commercial strains of *Oenococcus oeni*, by measuring the concentration of seven unbound taint compounds in three affected wines, before and after MLF.

## Methodology

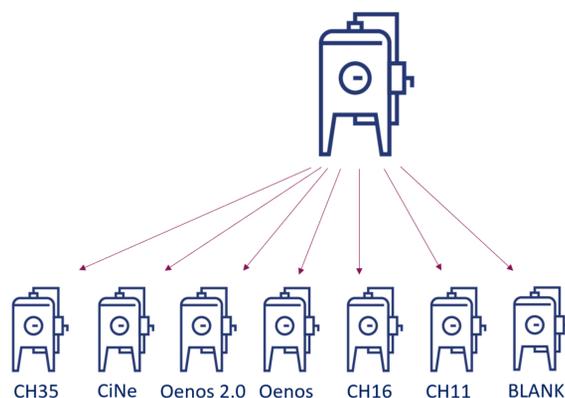
### 1. Three smoke-affected wines, pre-MLF, were obtained

Pinot Noir Rosé  
12.5% alc.  
pH 3.49  
5.3g/l L-malic acid

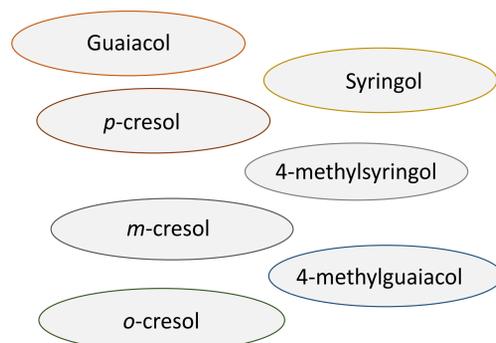
Tempranillo  
13.5% alc.  
pH 3.32  
2.0g/l L-malic acid

Cabernet Sauvignon  
13.3% alc.  
pH 3.37  
2.1g/l L-malic acid

### 2. Each wine was put through MLF with each of six different MLF starters

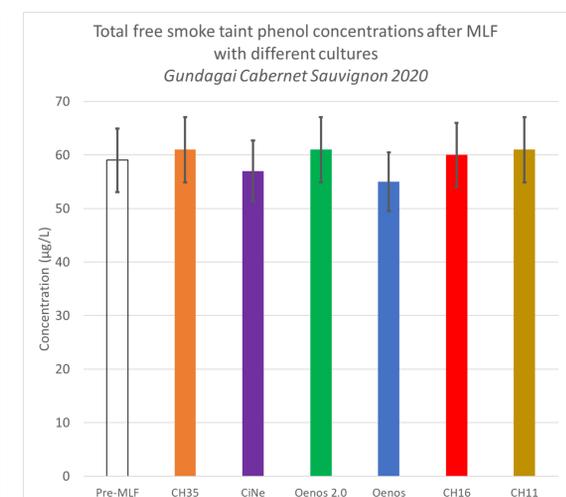
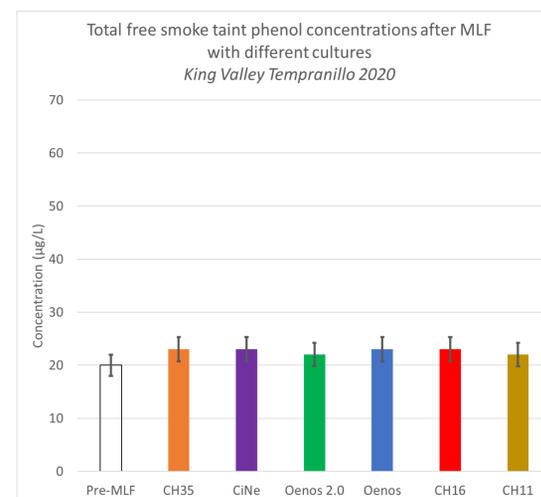
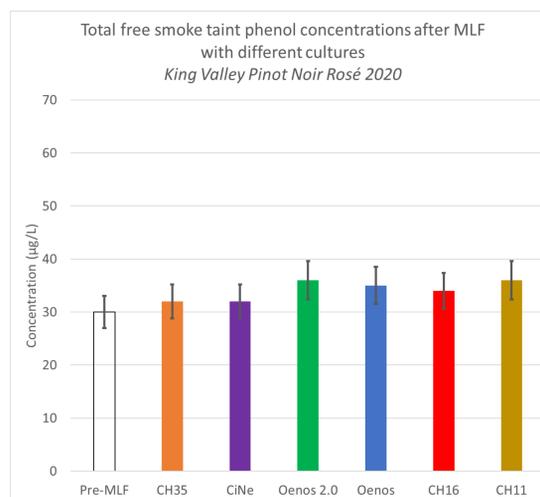


### 3. The resultant wines, and a sample pre-MLF, were analyzed for their concentrations of seven free phenols, responsible for smoke taint



## Results

No significant increase in the sum concentration of seven unbound taint phenols was seen in any of the three wines when put through MLF with each of the *Oenococcus oeni* cultures



Figures 1-3: Concentrations of seven taint phenols before and after MLF

The concentration of seven unbound taint phenols (guaiacol, p-cresol, syringol, 4-methylsyringol, m-cresol, 4-methylguaiacol and o-cresol) was measured using GC-MS, after a solvent extraction<sup>3</sup>. The sum of the seven phenols is shown before and after MLF. Each graph represents a different wine, and the total phenol concentration prior to MLF is represented by the far-left bar. The total concentration after MLF with each individual culture is represented by the colored bars.

## Conclusions

- None of the six commercial cultures used in the experiment caused a significant increase in the total concentration of free taint phenols during MLF
- This adds to the body of knowledge around handling smoke-affected fruit and can aid decision making when vinifying the resultant wines
- Such knowledge can be allied to other remedial techniques that are used to diminish the effects of smoke-taint such as carbon fining, adjustments to pressing and maceration time, and appropriate yeast selection