Rotting Grapes to Perfection

Impact of microorganisms on wine quality

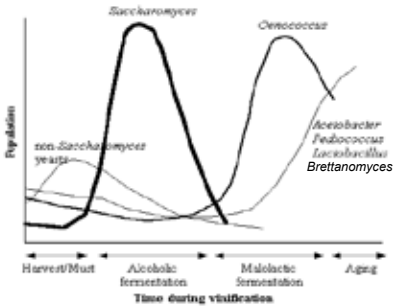
James Osborne
Associate Professor - Enology

Enology Program

- Associate Professor in Food Sci and Tech Dept
- Research
  - Wine microbiology and the fermentation process
- Teaching
  - Wine Production
  - Wine analysis and sensory evaluation
- Extension
  - provide education, information, outreach, and integrated research to the wine industry

Research program – microbial ecology of wine

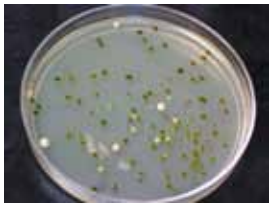
- Wine production is dynamic microbial process involving successive growth of different microbial populations



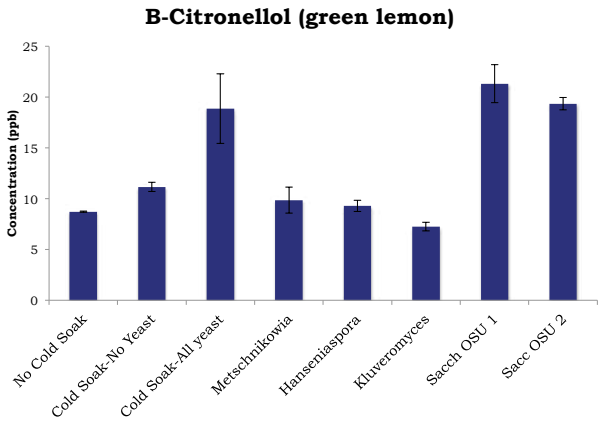
- What impact, for better or worse, do various microbes make?

Contribution of yeast present on grapes entering winery

- Many species apart from *Saccharomyces* present during early stages of fermentation – contribution to final aroma and flavor of wine?
- Contribution of yeast to aroma and flavor changes caused by cold soaking
  - Many species of yeast survive and grow during cold soak (8-9 °C)
  - Varied production of esters, higher alcohols, and release of bound terpene compounds – glycosidase activity

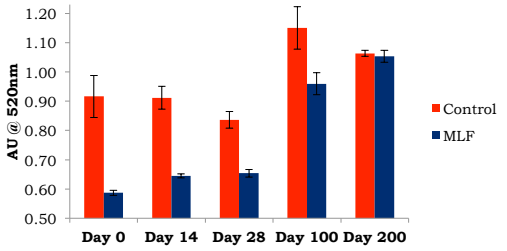


Yeast with glycosidase activity



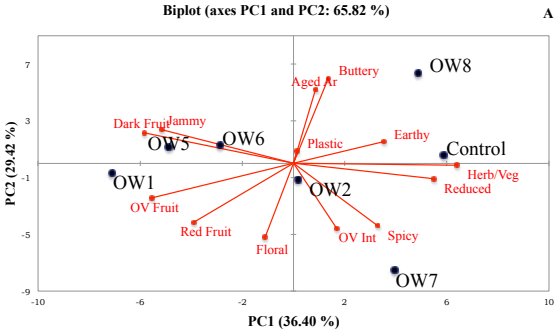
Wine lactic acid bacteria

- Positive contributions
  - Improving reliability of Malolactic fermentation
  - Mitigating color loss due to MLF
  - ➢ Delayed MLF treatments minimized loss of polymeric pigment in Pinot noir



Wine lactic acid bacteria

- Understanding impact of *Pediococcus* on red wine
  - ➢ Large variability between species and strains in production of various spoilage products – varied sensory impacts



Wine lactic acid bacteria and *Brettanomyces*

- Lactic acid bacteria and *Brettanomyces* interactions
  - How does growth of *Oenococcus*, *Pediococcus*, *Lactobacillus* influence growth of *Brettanomyces* and production of volatile phenols?
  - ➢ Growth of *Pediococcus* may be beneficial to *Brettanomyces*
  - ➢ Growth of certain bacteria impacted concentration of pre-cursor compounds that Brett converts to volatile phenols (4-ethyl phenol, 4-ethyl guaicol)