WAWGG Annual Meeting 2011

Tasting Room Staff Training

Thomas Henick-Kling

WSU Viticulture & Enology Program

Richard Larsen

USDA – ARS, Prosser

Research Plant Pathologist

Washington State University

World Class. Face to Face.

Wine Flavor Defects

Wikipedia.org

1 Oxidation

2 Sulfur compounds

2.1 Sulfur dioxide

2.2 Hydrogen sulfide

2.3 Mercaptans

2.4 Dimethyl sulfide

3 Environmental

3.1 Cork taint

3.2 Heat damage

3.3 Lightstrike

3.4 Ladybug taint

4 Microbiological

4.1 Brettanomyces (Dekkera)

4.2 Geosmin

4.3 Yeast & lactic acid bacteria

1.1 Acetaldehyde

1.2 Acetic acid

1.3 Ethyl acetate

- 4.3.1 Bitterness taint
- 4.3.2 Diacetyl
- 4.3.3 Geranium taint
- 4.3.4 Mannitol
- 4.3.5 Ropiness

4.4 Mousiness

4.5 Refermentation

Oxidized

Reduced

Environmental taints

Microbial

Stages of winemaking when flavor defects can occur

Grape ripening

Winemaking

harvest, transport, fermentation, aging, bottling

Wine aging

Wine flavor defects to look for in the tasting room

Oxidation

Sulfur compounds
sulfur dioxide, reduced sulfur

Cork taint

Heat damage

Light struck

Heat Damage

Accelerated aging

Cooked flavors

Leakage

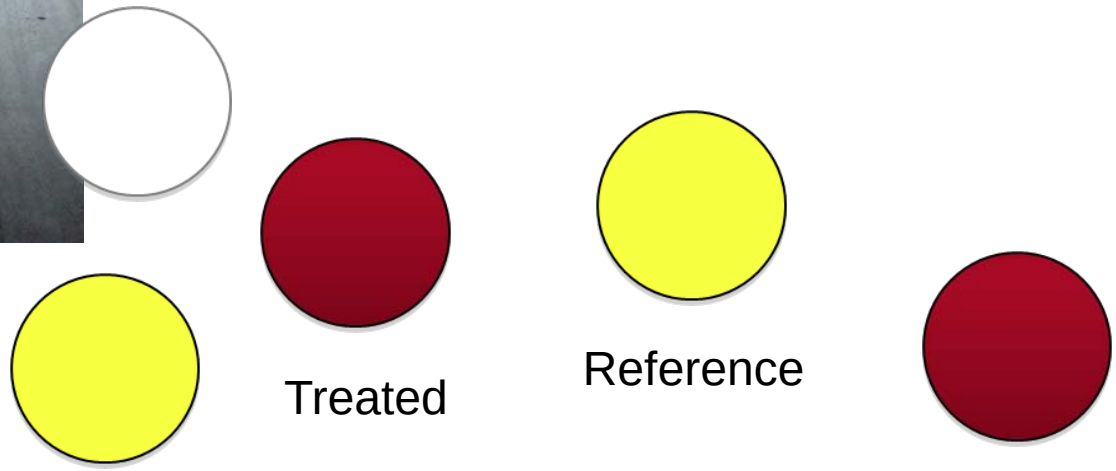
Oxidation

Light Struck

Skunky

Sulfury – struck matchsticks

Rotten eggs

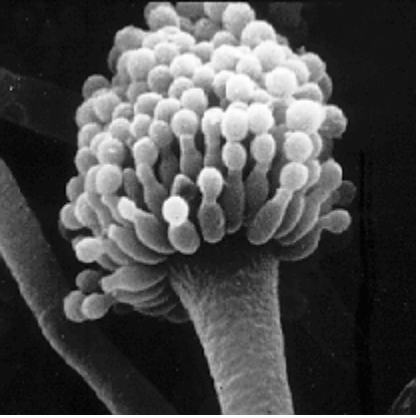


Oxidation

Loss of fruit and floral aromas

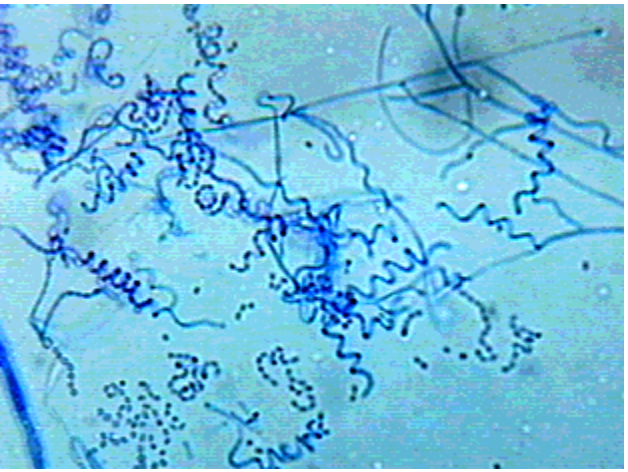
Paper, cardboard, hey, honey
Ethanol – acetaldehyde

Color loss - browning



Cork taints

- Development of fungi such as *Aspergillus* sp, *Penicillium* sp, *Botrytis cinerea,* Actinomycetes, *Rhizobium* sp, *Streptomyces*
- **Guaiacol, geosmin, 2-methylisoborneol (MIB), octen-3-ol and octen-3-one; 2,4,6 trichloroanisole (TCA)**



- ***At low concentrations***: reduces varietal aromatic characteristics, ***at higher concentrations***: contributes musty, moldy, earthy, dank cellar off-flavors
- Very low flavor threshold of 1.4 ng/l, good teaspoon full of pure TCA to spoil all the wine that is made in the USA

TCA cork taint incident

Estimated 0.5 to 2% in Europe, 1 to 5.5% in Australia
Recent experience at WinePress NorthWest tasting 2.3%

Can be less than 1% to over 20%

Soleas et al 2002: 51% of corky wines contained TCA at elevated conc (2+ ng/L), in 49% of the corky wines the taint was attributed to other compounds

Cork Taint

TCA and TBA

Trichloroanisole, tribromoanisole

Geosmin

2-methylisoborneol (MIB), octen-3-ol and octen-3-one

MDMP EDMP

2-methoxy-3,5-dimethylpyrazine, 2-ethyl-3 (5 or 6) dimethyl pyrazine

R Jung, V Schaefer. Reducing cork taint in wine. In: Managing wine quality. Vol. 2: Oenology and wine quality. AG Reynolds (ed), Woodhead Publishing Limited, 2010.

Geosmin

Trans-1,10-dimethyl-trans-9-decalol

Fresh soil, red beet aroma

Produced by actinomycetes – bacteria living in soil and water and fungi (mushrooms)

Taint in water and various foods

Threshold in wine 60 to 95 ng/L
often in bunch rot affected grapes

Spike in Chardonnay: low conc 30 ppt, high conc 300 ppt

2-methoxy-3,5-dimethlypyrazine MDMP

Earthy

Formed by microorganisms (*Rhizobium sp,* possibly *Pseudomonas* sp*, Aspergillus* sp*)* cork taint like aroma (Duncan 1995)

Detection threshold similar to TCA: 2-5 ppt

We have 2 ethyl-3 (5 or 6) dimethyl pyrazine (EDMP)

Spike in Chardonnay: low conc 4 ppt, high conc. 40 ppt

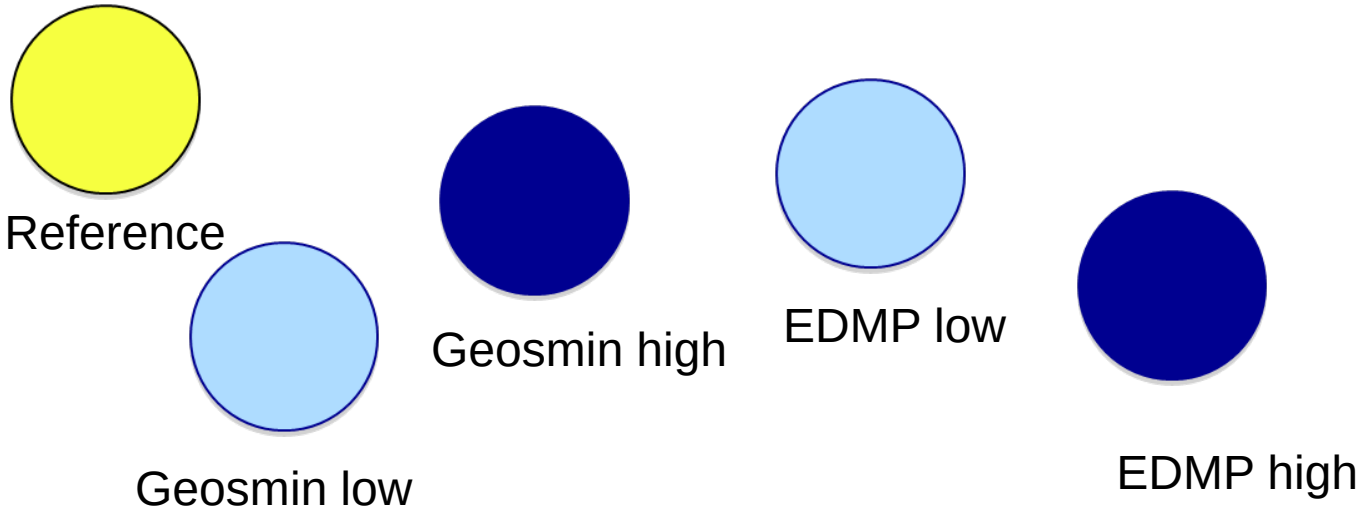
Musty, Earthy

Geosmin

Spike in Chardonnay: low conc. 60 ppt, high conc. 300 ppt

2 ethyl-3 (5 or 6) dimethyl pyrazine (EDMP)

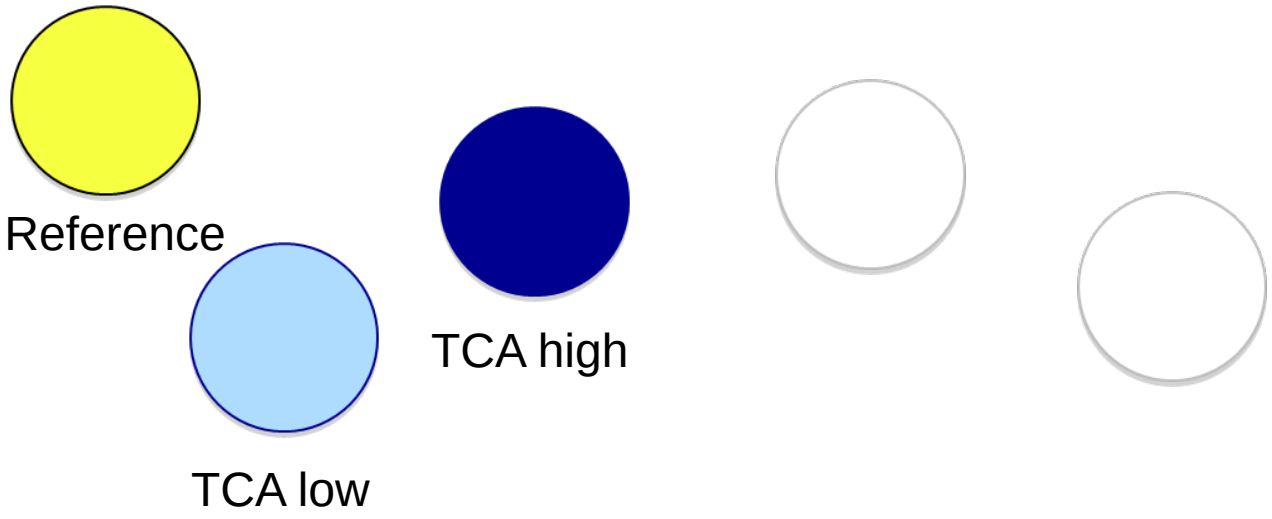
Spike in Chardonnay: low conc. 4 ppt, high conc. 40 ppt



Corky

TCA

Spike in Chardonnay: low conc. 2 ppt, high conc. 20 ppt



Tribromoanisole TBA

smells the same as TCA

tribromophenol is also used as a wood preservative after PCP had been banned

TBP methylated to TBA
musty taint in foods, polyethylene packaging, plastic wine stoppers, bottle cap liners, filter pads, cardboard boxes, wooden pallets

Perception threshold 3.4 to 7.9 ng/L

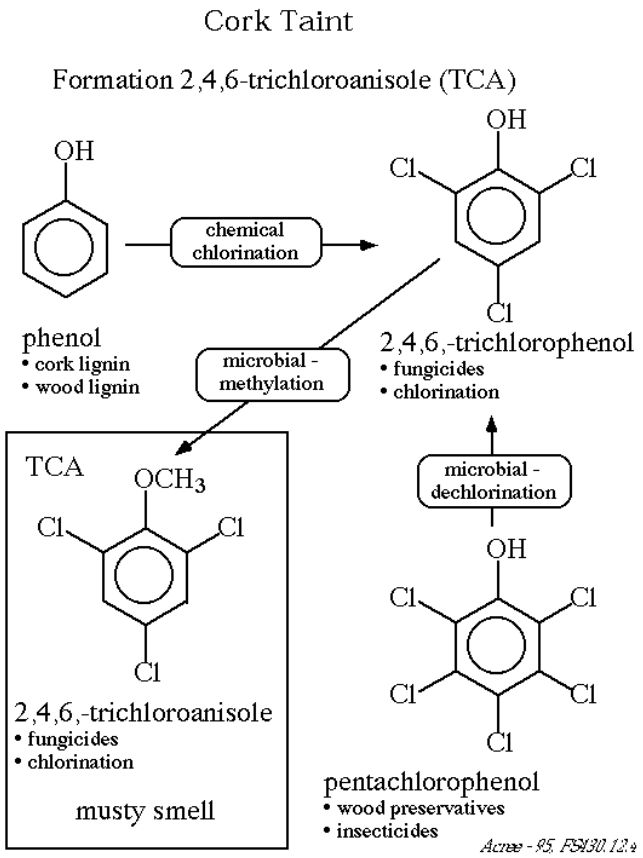
TCA cork taint

Tanner et al 1981, Buser et al 1982

Caused by molds

and *Streptomycetes* bacteria

TCA and moldy, musty, earthy aromas



molds

Hypochlorite + lignins → chlorinated phenols → TriChloroAnisole