ABSTRACT

"OENOMETRICS AS A HELP FOR TASTING.
Ageing of Wine, the Influence of Microorganisms and Clonal Material"  
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1. TDN- formation during ageing of Riesling wines

1,1,6 Trimethyl-1,2-dihydronaphthalin (TDN) is known as one of the components responsible for the aging flavor of Riesling wines. Lutein and other carotinoids are supposed to be the precursors for the so called petrol- or kerosine taint.

The four Geisenheim Riesling clones 64, 110, 198 and 239 from the vintages 1980-1992, as also the crossbreedings Arnsburger (Riesling Gm 88 x Riesling gm 64) and Gm 7012-1 (Arnsburger x Riesling 239 Gm) from the vintages 1985-1992 were examined.

All wines came from the same field and were fermented by the Saccharomyces cerevisiae yeast strain Epernay (Geisenheim). The wines were analyzed after extraction, by gas chromatography-mass spectroscopy with naphthalene as internal standard and identified by the mass spectrum in comparison with the spectrum of the pure TDN.

The wines showed 0.2-8.7 ng/l of TDN never reaching the postulated odor threshold of 20 ng/l. These results could be verified by tasting.

The analyzed clonal material showed significant differences. Clones 64 and 198 showed lower amounts than the clones 110 and 239. But no significant differences could be found between these results and the tastings. In tasting and TDN amounts clone 64 showed the best results, low TDN and high quality rating. But clone 198 with the overall same analytical results was judged lowest in taste. Clone 239 with the highest TDN amounts was judged nearly as good as the clone 64.

Comparable judgment of the analytical and organoleptical results shows, that the "aging substance" TDN plays an unimportant role in aging of "Rheingau Riesling" wines.

TDN was also found in the Riesling crossbreedings. Arnsburger showed no increase in TDN content by ageing, but this was found again in its cross with clone 239 Gm, 7012-1.

Caused by the overall low amounts of TDN in "Rheingau Riesling" wines, the influence of different pure yeast cultures on the formation of TDN up to now could not be shown to be significant. The influence of the winemaking process showed clearly lower amounts in wines made from pasteurized musts. This may be dependent from inactivation of must born enzymes. All these wines were judged higher.

Artificial ageing of wines showed, that the amount of precursors for TDN formation in "Rheingau Riesling" wines is often higher than in wines from warmer regions. In difference to these wines releasing TDN within 1-3 years in high amounts causing severe aging flavor, this is not released in the wines from Geisenheim Riesling clones fermented with S.c. Epernay Geisenheim. Up to this time the reason why is unknown. Because of the discussed different precursors, this may be possible.

2. Influence of microorganisms on the unspecific early aging of wines.

Unspecific early ageing is an increasing problem in some varieties as Müller-Thurgau and Kerner in German wine growing areas. One substance responsible for this off-flavor is 2- aminoaacetophenone known as one of the most important substances for the hybrid character of European- American interspecific crossbreedings. The more often occuring of this substance in German wines leads to the question of the formation and of the responsible precursors.

Different aging patterns in wines from one must fermented with different pure yeast cultures leads to a microbial genesis.

Yeasts of the Genus Saccharomyces cerevisiae form 2-Aminoaacetophenone in detectable amounts in must and malt medium in presence of Tryptophane. Also the most abundant wild yeast on grapes, Metschnikowia pulcherrima forms this substance.

The formation from Kynurenin was detected with Leuconostoc oenos. A well known spoiling strain of Lactobacillus brevis formed 2- Aminoaacetophenone without any additional precursor in musts.

This shows clearly that the formation of the substance causing this new detected off-flavor can be microbial. Some microorganisms do not need a special precursor. The question why this off-flavors are as abundant in the last years is still unknown.