

Investigating Acetaldehyde-Induced Condensation of Wine Tannins and Anthocyanins

II. Abstract

Tannins in red wine contribute to the mouthfeel and color of the finished wine and are therefore important to overall quality. Many changes in tannin structure during processing and storage are due to oxidation reactions. These include reaction with acetaldehyde, a compound found in wine that has been shown to play a significant role in beneficial tannin modifications. Acetaldehyde-induced condensation reactions between tannins and anthocyanins decrease the sensation of drying called astringency and increase the color stability of red wines. While winemakers use controlled oxygenation to promote these reactions, this work is among the first to focus on exogenous acetaldehyde addition to wine. The proposed study will investigate acetaldehyde consumption in a model wine system. Malvidin-3-glucoside will be isolated from grapes to be used as the model anthocyanin in these experiments in combination with grape seed extract containing oligomeric tannins. Acetaldehyde and anthocyanin loss will be compared to the resulting effects on color stability and astringency. Matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) mass spectrometry will then be used to characterize the modified tannins. This work will provide a better understanding of the role of acetaldehyde in tannin modifications and will be the first to characterize acetaldehyde and anthocyanin incorporation in oligomeric grape tannins with MALDI-TOF.