The influence of fermentation on the varietal differences between Shiraz and Cabernet Sauvignon wines

ANTALICK Guillaume1, SUKLJE Katja1, BLACKMAN John1,3, MEEKS Campbell1, CHITARRINI Giulia2, VRHOVEK Urska2, DELOIRE Alain1 and SCHMIDTKE Leigh1,3

1National Wine and Grape Industry Centre, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia
2Fondazione Edmund Mach, Research and Innovation Centre, Department of Food Quality and Nutrition, San Michele all’Adige (TN), Italy
3School of Agricultural and Wine Sciences, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia

INTRODUCTION

Are there any varietal differences between red cultivars that influence yeast metabolism?

Aim of the study: to investigate potential varietal differences in the fermentative component of Shiraz and Cabernet Sauvignon wine aroma

C6-alcohols

C6-alcohols are known to contribute to green/stalky and fresh fruit character in red wines. They are derived from C6-aldehydes generated by the degradation of unsaturated fatty acids in grapes, during crushing and fermentation.

RESULTS

Esters

Esters are key markers of fruity aroma in wines. They are mainly synthesised by yeast during alcoholic fermentation. Three major groups of esters are found in wines: ethyl esters of fatty acids, higher alcohol acetates and ethyl ester of branched acids.

Do varietal differences in ester composition exist between Shiraz and Cabernet Sauvignon wines?

Higher alcohol acetates (HAAs) concentrations were higher in Shiraz than Cabernet Sauvignon wines, especially at the late maturity stage (H3). Concentrations of HAAs increased with grape maturity in Shiraz wines whereas no significant trend was observed for Cabernet Sauvignon.

Concentrations of hexyl acetate also increased with maturity. This observation was not consistent with the evolution of its substrates (C6-alcohols and C6-aldehydes). Varietal differences in grape/must composition over ripening differently impacted the regulation of HAAs synthesis by yeast.

Ethyl esters of branched acids

Ethyl isobutyrate and ethyl leucate concentrations decreased with grape maturity in Shiraz wines whereas their levels overall tended to increase in Cabernet Sauvignon wines. These esters have been reported to be related to nitrogen and yeast redox metabolism [2].

Conclusions

1. Varietal differences in grape/must composition between Shiraz and Cabernet Sauvignon affect yeast metabolism
2. The varietal differences measured on yeast-derived compounds also depend on grape maturity
3. The variations measured could potentially influence wine style

REFERENCES
