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Divisione di Spettrometria di Massa

FONDAZIONE EDMUND MACH

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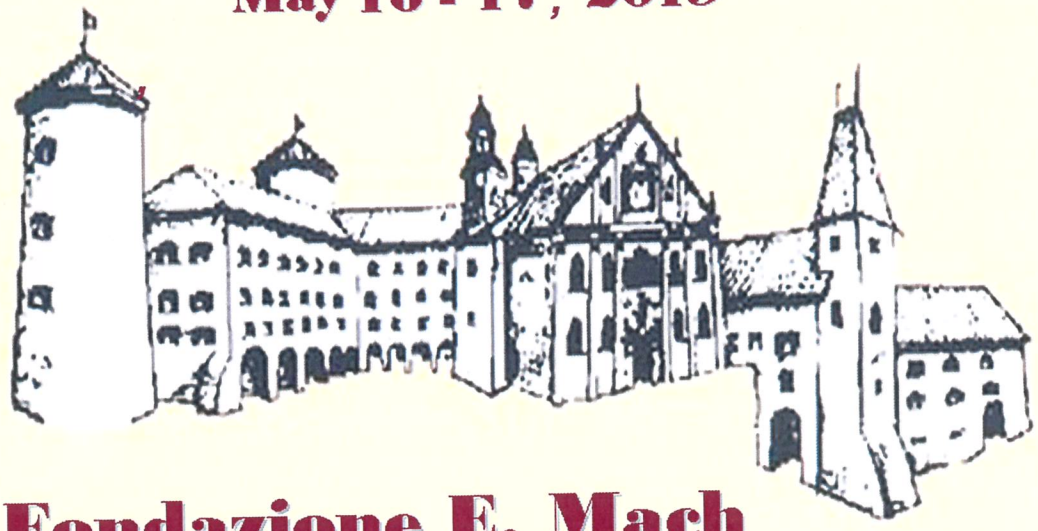

Fondazione E. Mach

San Michele all'Adige (Trento)

Mass Spectrometry & Grapes, Wines, Spirits

CONFERENCE PROCEEDINGS

Unravelling the effect of harvest date on Shiraz wine volatile composition by two dimensional gas chromatography and wine sensory analyses

Carlin S.[1, 2,#], Šuklje K.[3, #], Blackman J. W. [3,4], Stanstrup J.[1], Antalick G.[3], Meeks C.[3], Deloire A.[3], Vrhovsek U.[1], Schmidtke L. M. [3,4]

[1] *Fondazione Edmund Mach, Research and Innovation Centre, Department of Food Quality and Nutrition, San Michele all'Adige (TN), Italy*

[2] *Department of Agricultural, Food, Environmental and Animal Sciences, University of Udine, Via delle Scienze 208, 33100 Udine, Italy*

[3] *National Wine and Grape Industry Centre, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia*

[4] *School of Agricultural and Wine Science, Charles Sturt University, Locked Bag 588, Wagga Wagga, NSW 2678, Australia*

[#] *these authors contributed equally to the work*

An investigation of Shiraz wine volatile composition from four vineyards located in the Riverina region of Australia was performed by accessing wines made from sequentially harvested grapes. Vines were drip irrigated with average yields from 10.2-18.5 kg/vine in the four vineyards. Shiraz wines were vinified from 60 kg grape triplicates. Following a berry ripening model [1], the first harvest (H1) was 12 days from the plateau of berry sugar accumulation and the second harvest (H2), 24 days after the plateau.

Data acquired by HS-SPME-GC×GC-TOFMS were deconvoluted and aligned with LECO ChromaTOF Version 4.22 software at a signal to noise ratio of 100. A total of 1240 putative compounds were detected by HS-SPME-GC×GC-TOFMS in at least one of the samples. A comparison of vineyards revealed that approximately 200 of compounds were found to be at significantly different levels in at least one of the harvest dates. Principal component analyses illustrated a separation of samples based on harvest date. C5, C6 and C9 compounds, known as green leaf volatiles, were typically found in higher levels in H1 wines. Modifications of yeast metabolism of the sulfur-containing amino acid, methionine, were noticed. Methionol, methional and ethyl 3-(methylthio)-propionate were significantly lower in H2 wines whereas 2-(methylthio)-ethanol was increased. Several higher alcohol acetates were also measured at higher levels in H2 wines. Sensory evaluation revealed significant differences in wines based on the harvest date determined by berry ripening model. Wines from grapes harvested at H1 were perceived by panellists to be higher in red fruit attributes whereas wines from H2 were perceived higher in dark fruit and plum characters. These results indicate significant modulation of wine volatiles as a consequence of harvest dates, by altering lipoxygenase derived compounds and yeast metabolism, irrespective of vineyard cultural practices, within the same warm to hot climatic region.

Acknowledgments

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References

[1] Deloire, A. 15th Australian Wine Technical conference 2013, 47-50.