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UNRAVELLING REGIONAL TYPICALITY OF AUSTRALIAN PREMIUM SHIRAZ THROUGH AN UNTARGETED METABOLOMICS APPROACH

Leigh SCHMIDTKE
Sijing Li, Urska Vrhovsek, Silvia Carlin, John Blackman

National Wine and Grape Industry Centre, Charles Sturt University, NSW 2678, Locked Bag 588 , Wagga Wagga New South Wales, 2678 , AUSTRALIA
Foundazione Edmund Mach, Research and Innovation Centre, Department of Food Quality and Nutrition, San Michele all'Adige, Italy

Email: lschmidtke@csu.edu.au

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The association of agricultural products to a provenance or specific region (terroir) that imparts a typical and unique sensorial profile is an important concept for providores of high value products, especially in the wine industry. Shiraz is one of the most widely planted grape varieties in Australia, considered as an icon for a number of wine regions. The current project seeks to characterise the complex wine volatile composition through an untargeted metabolomics approach, to uncover the underlying patterns that distinguish premium Shiraz wines from different regions.

Twenty two wines were chosen from 6 different regions across Australia. Volatile fractions were extracted in triplicate, using a solid phase extraction protocol. The extracts were analysed with a gas chromatography quadrupole time-of-flight mass spectrometry (GC-qTOF MS) operated in the scan mode. The collected data files were processed with a suite of open-source R packages, including xcms and metaMS. Over 10,000 features (ion – retention time pairs) were extracted and important features were identified using statistical analyses. These features were then grouped into pseudo-spectra, some of which could be identified by comparing with spectra of pure standards measured with the same system. Preliminary results showed a clear separation of Hunter Valley from other Australian regions. Furthermore, some separation based on producer was also evident within regions. Combining with sensory evaluation and climate data, results from current project will help unravel the underlying factors that define the premium Shiraz wines from different Australian regions.