In Vino Analytica Scientia, 2015

The 9th In Vino Analytica Scientia (IVAS) conference was held in Trento, Italy, from 14 to 17 July this year. The actual venue was Mezzocorona in Trentino, a 30-minute trip from the city of Trento where many of the participants were accommodated. This meant that we travelled each day by bus between the towering cliffs of the Dolomites, a UNESCO world heritage site. Those of us who were able to keep our eyes open at 7:45 am, the bus departure time, could contemplate the sheer majesty of the region on our way to the meeting.

The IVAS meetings have always had a considerable emphasis on the chemistry and measurement of phenolic compounds and this was continued at this meeting. The opening plenary lecture by Victor de Freitas from the University of Porto addressed the ABC of polyphenols in wine in relation to sensory aspects. Victor identified the complex mechanisms that are involved in A(stringency), B(itterness) and C(olour), stressing that there is now increasing evidence for the role played by specific compounds in each of these sensory aspects. For example, the presence of the catechol group as in (–)-epicatechin and the galloyl group as in pentagalloylglucose seem to be important in stimulating the taste receptors for bitterness (TAS2Rs). The stability of anthocyanins, responsible for colour, may well be modulated by polysaccharides and the binding constant for the interaction between malvidin-3-glucoside and salivary proteins has been measured.

Regarding astringency, Susana Soares, also from the University of Porto, described a series of *in vivo* experiments that examined the interaction of salivary proteins and wine tannins in a model system. While there is a general theory that wine tannins interact with and precipitate salivary proteins, especially proline-rich proteins (PRPs), this work showed that the tannins interact first with acidic PRPs and statherin, followed by glycosylated PRPs and then basic PRPs. Statherin and related peptides are now receiving more attention in discussions on wine astringency. It is clear from the work of the research group in Porto that a greater understanding of specific chemical composition of salivary proteins and tannin molecular structure is needed to formulate a detailed mechanism of astringency. There is obviously a lot here to contemplate next time you partake of a glass of red wine!

A different perspective on phenolic compounds was presented in the keynote lecture by Begoña Bartolomé from the Institute of Food Science Research in Madrid. Here the emphasis was on the interaction between phenolic compounds in wine and gut microbiota. The concept behind this research is that the two-way interaction may lead to the growth of beneficial bacteria while inhibiting pathogenic ones. Perhaps I can suggest somewhat tongue-in-cheek that this concept is not new as one finds in the Bible an exhortation from St Paul to Timothy to 'use a little wine for thy stomach's sake'. But maybe that is more a comment about the quality of the water in those days. The researcher in this wine health field now has access to techniques for monitoring bacterial communities as well as tracking the fate of the phenolic compounds and their metabolites. The research is complex and requires a large number of participants, which in turn suggests the need for a well-funded research budget.

The other main conference theme was metabolomics and I will need a follow-up column to address this in the depth that it deserves. One paper, however, deserves mention here as it relates to the wine of the region. Fulvio Mattivi and colleagues from the Research and Innovation Centre of the Fondazione Edmund Mach in San Michele all'Adige presented the results of a study on the sparkling wines of the Trento (Trento DOC) and Franciacorta regions. The analytical approach used solid phase micro-extraction with two-dimensional GC and time-of-flight mass spectrometric analysis. Some 1600 compounds were found by this untargeted metabolomic approach, with the Trento DOC wines showing good concentrations of terpenes including linalool and rose oxide as well as hexanol and hexenols.

The meeting was a great success, both scientifically and socially. There were 250 registered participants from 30 countries with a significant number being young researchers. There were three contributed papers by Australians: Joanna Gambetta (University of Adelaide), Andrew Clark (Charles Sturt University) and Sigfredo Fuentes (University of Melbourne). The poster prizes were restricted to researchers under 32 and this required the Scientific Committee to evaluate 83 posters for the three prizes – a rather difficult challenge. Much to my surprise, my poster was classified as 'under 32' and when I raised this little problem, I was asked to wear a cap back-to-front, so then 'no-one would realise'!

One of the pleasures of a conference in Europe is lunch: good food and the opportunity to taste a range of wines from, in this case, the Trento region. Fortunately, we were not tested on the wines to see how our aroma perception matched the metabolomic study described above. As I mentioned in my November column, the first day concluded with opera and a wine tasting. Day 2 finished with a visit to a winery and the gala dinner ended the third day. This banquet was held in Castel Katzenzungen in the Sud Tyrol region. A beautiful venue with a four-course meal with matching wines.

If you are keen to try something different this festive season, track down some of the sparkling Trento DOC wines. Made from Chardonnay and Pinot Noir, they challenge the best wines from Champagne in quality. I was fortunate to be presented with a magnum of 2006 Ferrari and a 2009 Rotari Alpe-Regis, both absolutely amazing wines.

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