



## International Research News

### Bentonite treatment of must and wine

Italian Chambave Muscat aromatic grapes yield a bright, light yellow wine. The impact of bentonite fining, both on the must and on the final wine, was studied. The trials were performed on two vintages (2006 and 2007) and the effect of fining on proteins and terpenols was studied. Proteins are undesirable as they can cause a haze in the final wine, while terpenols are desirable as they are responsible for the floral notes common to Muscat, Malvasia and Gewurztraminer wines. Four different treatments were compared: bentonite addition to must only (100 g/hL in both vintages), bentonite fining of wine only (100 g/hL in both vintages), bentonite treatment on both must and wine (200 and 150 g/hL in 2006 and in 2007, respectively), and no treatment (control). The results demonstrated that the treatment which best removed proteins was the addition of bentonite to must only. A lower removal of free terpenols was observed in bentonite treatment on both must and wine compared with wines fined with bentonite only after alcoholic fermentation. <http://dx.doi.org/10.1111/j.1365-2621.2011.02800.x>

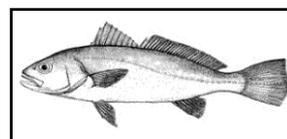
### Grape pomace – a review

Grape pomace (GP) is a by-product of the wine industry, consisting mainly of skins, seeds and stems, and accounts for 20 to 25% of the weight of the grape crushed for wine production. Grape seed is rich in extractable phenolic antioxidants such as phenolic acid, flavonoids, procyanidins and resveratrol, while grape skins contain abundant anthocyanins. GPs also contain significant amount of lipid, proteins, non-digestible fibre and minerals. The health benefits of GP polyphenols are of great interest to researchers, and the food and nutraceutical industries.

A review summarises studies on the major components of GP, their properties and their possible applications. The polyphenol profile of GP and their biological, antioxidant and antimicrobial activities, the stability of GP polyphenols in food systems, the interaction between GP polyphenols and other food ingredients, as well as the functionalities of grape seed oil and GP fibre are covered. The review finds that the polyphenol composition of GP has been well characterised and the biological and functional properties have also been intensively studied. The mechanisms of chemoprevention, anticardiovascular disease and other disease prevention activities of grape polyphenols have been gradually revealed by researchers. It is concluded that GP has great potential to serve as a source of functional food ingredient, but more studies are needed to set the proper dose of grape polyphenols, to characterise the properties of other GP components, and to evaluate the sensory quality and consumer acceptance of food products developed from GP. <http://dx.doi.org/10.1111/j.1365-2621.2012.03197.x>

### Grape skins and fish sausages

Meagre (*Argyrosomus regius*) is a fish (right) from the Southern European area whose excellent biological characteristics and high rates of growth, feed conversion and fertility have promoted its aquaculture production in recent years. Meagre meat quality is considered to be very good, due to its very high content of polyunsaturated fatty acids. But small-sized meagre pose marketing difficulties since the fish has a large head, large bones, little flesh and is not very tasty. Hence the development of alternative products for this raw material would be advantageous. Dietary fibre (DF) is frequently used in the development of functional foods and its importance in nutrition and health is well known. The incorporation of DF in fish products is a new research field with promising results.



Two groups of farmed meagre sausages were studied regarding quality changes and antioxidant capacity during a 98-day storage experiment at 2°C. Control sausages contained 3.9% (w/w) of inner pea dietary fibre (IPDF) and the other group contained 0.9% (w/w) IPDF plus 3.0% (w/w) of antioxidant grape dietary fibre (AGDF). The AGDF was prepared from the skins of Portuguese Arinto white grapes. The skins were frozen, milled, sieved, washed with water for sugar removal and dried to produce the AGDF. Both types of sausages presented a high nutritional value, given their low caloric content, fatty acid profile, amino acid composition and high DF content. Both products were remarkably stable over storage time. The AGDF had an effective antioxidant capacity, proven not only by a higher radical scavenging activity and greater reducing power but also by lower thiobarbituric acid reactive species values. AGDF also seemed to present antimicrobial effect, since on the 63rd day (beginning of significant microbial growth), the control sausages contained significantly more microorganisms than did the AGDF sausages. The sensory assessment pointed to some loss of textural quality, more accentuated in the AGDF sausages. <http://dx.doi.org/10.1111/j.1365-2621.2012.03151.x>

### Multi-toxin evaluation in wine and cider with cork stoppers

An investigation into mycotoxins (toxic chemical products produced by fungi) in wine and cider collected randomly from retail outlets in the Netherlands found no mycotoxins in the cider or in cork stoppers of the ground and compressed type. 54 wines, 24 ciders and 72 stoppers were examined for 28 mycotoxins. The wines came from seven different countries (including 11 reds from South Africa). The toxins detected were *Alternaria* (ATs: alternariol (AOH) and alternariol methyl (AME)) and *Penicillium/Aspergillus* (ochratoxin A (OTA) and penicillic acid (PAC)).

The wines were contaminated by OTA, AOH and AME. OTA was detected in forty-one wine samples (out of 54), with levels ranging from 0.01 to 0.86 µg/L, all below EU legislation levels. AOH was detected in 33 wines and AME was detected in 8 wines, at levels from 0.2 to 13.3 µg/L. 5 of the 11 South African wines had mycotoxins present. No contamination was detected in the ciders. 57 of the cork stoppers examined were made of regular cork, while the rest (15) were made of ground and compressed cork. 5 of the regular corks contained mycotoxins, and no mycotoxins were found in the compressed corks. The cork stoppers toxins detected were AOH, AME and PAC. Corks of red wines from different countries had levels of OAH and AME ranging from 5.0 to 101.0 and 2.5 to 5 µg/L respectively. The study concluded that it is necessary to pay more attention to corks as they can be good fungi substrates and recontamination can occur during winery processes and maturation, enabling mycotoxin transfer to the bottled wine. <http://dx.doi.org/10.1111/j.1365-2621.2012.03163.x>

## Local Research News

### The spatial distribution of microbial communities

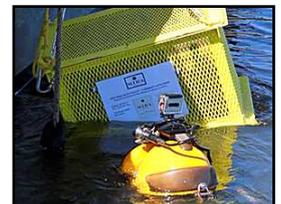
Differences in the microbes present on grapes in different parts of the same vineyard may contribute to flavour fluctuations in samples of grapes from different tanks. A study has investigated the spatial distribution of microbial communities within and between individual vineyard management units. Grapes were sampled from different vines in three well-established commercial vineyards located in the Polkadraai region in Stellenbosch. They had been carefully selected to allow conclusive assessment of the impact of farming practices on both intra- and inter-vineyard microbial biodiversity. The vineyards are positioned on the same slope and aspect, and were all established in the same period. All the vineyards also use the same trellising system, row width and vine interspacing width. However, each vineyard used a different farming system - organic, traditional or biodynamic - to cultivate the grapes.

For the first time in such a study, the Theory of Sampling was applied to sample the grapes. Cultivation-based and molecular data sets were generated to capture the spatial heterogeneity in microbial populations within and between vineyards and analysed with novel mixed-model networks, which combine sample correlations and microbial community distribution probabilities. The data demonstrated that farming systems have a significant impact on fungal diversity, but more importantly, that there is significant species heterogeneity between samples in the same vineyard. Cultivation-based methods confirmed that while the same oxidative yeast species dominated in all vineyards, the least treated vineyard displayed significantly higher species richness, including many yeasts with bio-control potential. The cultivatable yeast population was not fully representative of the more complex populations seen with molecular methods, and only the molecular data allowed discrimination amongst farming practices with multivariate and network analysis methods. Importantly, yeast species distribution is subject to significant intra-vineyard spatial fluctuations and the frequently reported heterogeneity of tank samples of grapes harvested from single vineyards at the same stage of ripeness might therefore, at least in part, be due to the differing microbiota in different sections of the vineyard. <http://dx.doi.org/10.1371/journal.pone.0052609>

## Other news

### Wine from the sea

There are a limited number of factors that influence wine fermentation and aging, namely temperature, pressure, humidity, movement, light and oxygen. Now a winery in the US has placed 48 bottles of 2009 Cabernet Sauvignon on the sea floor for three months. The ocean provides a unique environment with cold temperatures, constant pressure, little-to-no light and constant motion. The winery wants to understand the difference between bottles stored on the ocean floor, and bottles aged in the warehouse, where they are away from natural light and are kept at 15°C. The bottles were placed in specially designed steel mesh cases (right) to protect them, but otherwise they are directly exposed to the sea-water environment. The impact of underwater pressure on the corks, the durability of the cages, and the underwater temperature in comparison with surface temperature will all be monitored. [www.charlestonmercury.com/articles/2013/02/07/news/doc5113c7bb49701110663607.txt](http://www.charlestonmercury.com/articles/2013/02/07/news/doc5113c7bb49701110663607.txt)



### New grapevine virus - Red Blotch Disease

A grapevine virus called 'Red Blotch Disease' or 'grapevine red blotch-associated virus' or GRBaV has been discovered in California and has now been identified among both young and mature grape vineyards throughout the US. The symptoms of infection generally start appearing in late August through September as irregular blotches on leaf blades on basal portions of shoots. The secondary and tertiary veins turn partly or fully red. Occasionally, the reddening of leaf blade in the inter-veinal zones between secondary veins resembles those of leafroll diseases, but the leaf margins are not seen rolling downward. The most important symptom of this disease appears to be a reduction of the Brix levels of infected vines. It is not yet known if the disease has any effect on fruit yield or vine longevity. The disease symptoms have been noticed in vineyards planted with red grape varieties such as Cabernet Franc, Cabernet Sauvignon, Merlot, Petite Sirah, Petit Verdot and Zinfandel. GRBaV does not appear to be of recent origin as the disease has up to now escaped the attention of vineyard managers because of leafroll-like symptoms. This also means that diagnosis based on the leaf symptoms can be challenging. A molecular assay, DNA-based PCR, is currently available and the virus can be detected in the petioles of basal leaves, much before the onset of symptoms, and also in dormant canes. [http://iv.ucdavis.edu/Viticultural\\_Information/?uid=284&ds=351](http://iv.ucdavis.edu/Viticultural_Information/?uid=284&ds=351)

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