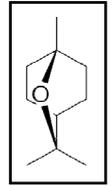




International Research News

Source of eucalyptus aroma in wine

Most species of eucalyptus trees contain essential oils in their leaves and usually the main component of the oil is the volatile compound 1,8-cineole, a cyclic ether and monoterpene, known as eucalyptol (see right). A flavouring agent and used in therapeutic products, it can also be found in red wine, where it is responsible for characters described as 'eucalypt,' 'camphor,' 'fresh' and 'minty' which can be a selling point or something to avoid. It was thought that this character was inherent to certain grape varieties whose skins had precursor compounds for 1,8-cineole, or that it was due to airborne transfer of the eucalypt essential oil volatiles from nearby eucalyptus trees.



Now Australian researchers have shown conclusively that the origin of the 1,8-cineole in the wine is simply eucalyptus leaves or bark falling from trees and blown some distance by the wind to lodge in grapevine canopies, and from there the eucalyptus containing material is picked with the harvest to eventually affect the wine. For winemakers, this presents a range of management options in terms of minimizing or maximizing 'eucalypt' characters. Wine producers may choose to ferment grapes from vines growing near eucalyptus trees separately and use this wine as a blending option; they can hand pick those rows closest to trees; or they can ensure that such leaves are not included in the harvest bins of grapes.

www.winesandvines.com/template.cfm?section=features&content=110906

Effect of weather on colour and tannin levels in Cabernet Sauvignon grapes

A four-year trial carried out in the Coonawarra wine region in Australia has highlighted the significant impact that vintage weather conditions can have on the development of colour and tannin levels in Cabernet Sauvignon grapes. Average temperature during the growing season was the most significant factor in increasing the tannin levels achieved at harvest. Soil type and clonal differences had no consistent impact on the accumulation of tannins or anthocyanins in the grapes. Warmer vintages produced higher tannin levels and lower anthocyanin levels. High colour levels in the wines were only achieved when the grapes contained comparatively high levels of both anthocyanins and tannins. Tannin concentration at 3-4 weeks before harvest was a good indicator of tannin concentration at harvest and could therefore be used to optimise picking times to achieve desired tannin levels. www.awri.com.au/information_services/enews/2013/05/07/enews-may-2013/#title5

Glucose and Ethanol Tolerant Enzymes Produced by *Pichia* (*Wickerhamomyces*) yeasts

Wine fermentations, as conducted by traditional methods (without inoculation), are not the result of the action of a single species or a single strain of yeast. Rather, the final products result from the combined actions of several yeast species. Their growth is generally limited to the first two or three days of fermentation, after which they die off. Subsequently, the most strongly fermenting and more ethanol-tolerant species of *Saccharomyces* take over the fermentation. It is believed that these short-lived low-fermentative yeasts produce some important reactions in must that improve the final flavour of wines.

Non-*Saccharomyces* yeasts, belonging to 12 different species, were isolated from Bobal musts obtained from the Utiel-Requena region of Valencia in Spain. The main genera detected were *Hanseniaspora* and *Pichia* (including *P. anomala*, recently named as *Wickerhamomyces anomalus*) (35% of each genus) and other species. *Wickerhamomyces anomalus* and *P. membranifaciens* were found to be the most interesting species as a source of enzymes for winemaking, especially as they are glycosidase enzymes which catalyze the hydrolysis of the glycosidic linkage to release smaller sugars and they showed a high degree of tolerance to high levels of glucose and ethanol. <http://dx.doi.org/10.5344/ajev.2012.12077>

Marc quality determination by near-infrared spectroscopy

Grape marc or pomace, the solid parts remaining after grape crushing and subsequent juice separation, includes skins, seeds and, in some cases, stalks. In Italy, this raw material is normally conveyed to distilleries where it is processed to produce grappa, the traditional Italian spirit. Marcs are often left on the ground for hours and then transported in open trucks. Thus the quality of such raw material, essentially in terms of potential alcohol and aromatic volatile molecules production, is hard to assess on delivery. Ethanol, reducing sugars and acetic acid content are key parameters for evaluating marc quality but their determination requires sophisticated analytical equipment and skilled operators and is time consuming.

Near Infrared Spectroscopy (NIRS) is an indirect and appealing analytical technique for non-invasive and low cost analysis of food products. It does not require sample preparation, allows simultaneous determination of several traits, and is cheaper than other conventional laboratory techniques. The suitability of this technique for determining ethanol, reducing sugars and acetic acid content as indicators of the quality and suitability of marc for the production of grappa, was investigated by placing a fibre-optic probe directly in contact with marc using the visible near infrared (Vis-NIRS) spectral range from 350 to 1800 nm. Analytical determination of sugar, ethanol and acetic acid concentration was done following standard laboratory methods. The best prediction models of marc quality were developed using absorbance spectra for ethanol and sugar content, while a

medium predictive model was obtained for acetic acid. The results show that NIRS can be used for rapid quality assessment of marcs on their arrival at the distillery. <http://dx.doi.org/10.5344/ajev.2013.12133>

Unintended consequences - the harlequin ladybird

The harlequin ladybird *Harmonia axyridis* (a native species in central Asia) has been introduced into many countries as a biological control agent against aphids and other insect pests, but is now causing severe problems as it has become highly invasive in many regions because it successfully outcompetes native ladybird species. In late summer, harlequin ladybirds damage ripe fruit. They are particularly fond of grapes, and wineries are finding large numbers of them in the grape harvest. They are difficult to separate from the grapes before pressing, and their defensive chemicals (known as reflex blood) taint the wine. www.harlequin-survey.org/factfile/concern.htm



Researchers have now found why this species should so readily outcompete native ladybirds. Harlequin beetles have parasitic microsporidia (intracellular, sporeforming fungal parasites) within their hemolymph, which are fatal to other ladybird beetles that prey on harlequin beetle eggs and larvae. Harlequin beetles thus have an innate advantage over indigenous ladybird species that are otherwise equivalent in their abilities. <http://dx.doi.org/10.1126/science.1238998>

Biogenic amines in Abruzzo wines

An important quality and safety parameter in wines is the level of amines as they are considered to be among the most important causes for intolerance to wine, with symptoms such as nausea, cardiac palpitations, headaches, flushing, or variation in blood pressure. Sixty-five commercial wines were collected from 10 wineries in the Abruzzo region of Italy. Nine biogenic amines were detected, identified and quantified. Total biogenic amines content was significantly higher in red wines at about 19 mg/l, than in rosé (9 mg/l) and white (8 mg/l) The red wines contained relatively high amounts of putrescine as well as the biologically active histamine and tyramine. The variability of the amine distribution in the red, rose and white wines was 'remarkable' and could be attributed to the numerous variables affecting amine formation by bacteria during vinification and wine storage. A significant factor was the effect of the winery, regardless of its geographic location, with some of the wineries having a predominance of decarboxylating positive microbiota. There was no influence of vintage on the occurrence of amines. The levels of amines found in Abruzzo wines were not considered 'alarming'. <http://dx.doi.org/10.1016/j.foodchem.2013.01.008>

Osmotic distillation to reduce the alcohol content of wine

There is an increasing consumer demand low alcoholic strength beverages. Osmotic distillation (OD) is a promising technique for reducing the ethanol content in beverages. OD is carried out at room temperature and atmospheric pressure so that thermal damage to aroma volatile compounds is avoided and energy consumption is kept low.

A study has been carried out to evaluate the effect of total dealcoholisation by means of OD on the main properties of Aglianico red wine. A totally dealcoholised wine (0.19 vol %) was obtained by the OD method. The effect of the dealcoholisation on the wine was negligible for the main chemical and physical properties investigated (total phenols, flavonols, tartaric esters, organic acids). However the colour intensity and tonality of wine samples changed significantly. Volatile compounds in wine decreased by more than 98%. It was concluded that to prepare a pleasurable and delicious non-alcoholic beverage with properties similar to the Aglianico wine would require flavour enrichment to compensate for the loss of volatiles <http://dx.doi.org/10.1016/j.foodchem.2013.02.059>

Other news

Vegan wine

Dietary vegans (or strict vegetarians) refrain from consuming animal products, not only meat and fish, but also eggs, dairy products and other animal-derived substances, such as honey. Many wines are not strictly vegan because animal-derived products are used for fining or filtering. Common filter/fining materials including isinglass (fish derived), gelatine, egg whites or milk protein caseins, and even if only trace amounts remain in the finished beverage, such wines are not appropriate for the vegan lifestyle. Now a Californian winery is offering guaranteed vegan wine. Bentonite (clay) and diatomaceous earth (fossilised algae) are fine for vegans. Other materials that are acceptable include carbon, limestone, kaolin clay, plant casein, silica gel and vegetable plaques. www.winesandvines.com/template.cfm?section=news&content=116772

A surprise contributor to greenhouse emission reduction

Grape marc or pomace, the leftover skins and seeds from winemaking, is high in tannin content. When fed as a dietary supplement to cattle or other ruminant animals it has been shown to reduce their methane emissions. The reduction in methane generated may be linked to an increase in liveweight gain. The Australian Wine Research Institute (AWRI) is working towards characterising different types of grape marc and assessing its performance and suitability as a methane reducing feed supplement. It is also investigating if there are any potential risks associated with agrichemical residues within grape marc. The project will use digestion simulation methods to quantify the methane suppression and productivity enhancing properties of different tannin types. www.awri.com.au/information_services/enews/2013/05/07/enews-may-2013/#title10

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To subscribe please email Gerard Martin: marting@winetech.co.za