



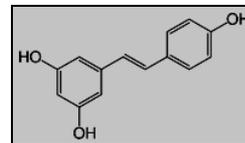
Winetech Scan

Wine Industry Network of Expertise and Technology
Netwerk van Kundigheid en Technologie vir die Wynbedryf

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Research outputs

- A review of the therapeutic potential of resveratrol (www.nature.com/nrd/journal/v5/n6/abs/nrd2060.html) notes that, since the claim was made in 1997 that resveratrol prevents cancer, the number of publications relating to this compound, which occurs in red wine, has increased from a total of about 300 to well over 1 000. Resveratrol (3,5,4'-trihydroxystilbene) is an important polyphenolic phytoalexin produced naturally by several plants. Phytoalexins are antibacterial and anti-fungal chemicals that plants produce as a defence against infection by pathogens. Resveratrol is found in the skin of red grapes and is a constituent of red wine. The amount of fermentation time a wine spends in contact with grape skins is an important determinant of its resveratrol content. Resveratrol can be produced by chemical synthesis and is sold as a nutritional supplement. A number of beneficial health effects, such as anti-cancer, antiviral, neuroprotective, anti-aging, and anti-inflammatory effects have been reported, but all of these are studies in test tubes, or in yeast, worms, fruit flies, fish, mice and rats. Nevertheless, resveratrol is under extensive investigation as a cancer chemopreventive agent. A recent study, particularly relevant because those using cardiovascular drugs may also consume red wine containing resveratrol for reducing the risk of disease, found that for four different pharmaceuticals studied, resveratrol caused a 20% increase in the concentration of one of the drugs, and for the other three there were decreases in the concentration of the pharmaceutical of between 15% and 65%. Thus a high dosage of resveratrol (or products containing it) should be used with caution while other drugs are taken. The study also found that resveratrol has higher antioxidant effects than vitamin E. <http://dx.doi.org/10.1080/09571260701660839>
- A new approach to red wine aging that uses a current passed continuously through glassy carbon electrodes in a process of electrochemical micro-oxidation has been examined. The effect of this process on a Cabernet Sauvignon wine was similar in several respects to that of oxygenation using molecular O₂. These similarities included the increase in SO₂-resistant pigments that develop as anthocyanins bind with other polyphenol components in the wine, and a greater decline in monomeric anthocyanins. There was also a similar increase in modified hue value (420/520 nm) for oxygenated and electrochemical micro-oxidation wines. On the other hand, there was a greater build-up of acetaldehyde and bound SO₂ for the conditions used in the trial, largely owing to the moderately large currents and high associated electrode potentials required at this level of oxidation. The use of higher surface area electrodes will allow a lower electrode potential to be used and more of the current will go into oxidation of polyphenols, thereby limiting production of acetaldehyde from ethanol oxidation, should that be required. The glassy carbon rods are costly. Alternative cheaper carbon electrodes could be considered in future, in which larger and more porous surface areas are in contact with the wine, but the effect of impurities in such electrodes needs to be investigated. www.ajevonline.org/cgi/content/abstract/58/4/443
- There are seven million barrels in wineries throughout the world and it is estimated that the world wine industry loses \$100 million per annum from avoidable wine spoilage, relating to contaminated barrels. A study of the application of high-power ultrasonics for barrel and plank cleaning and disinfection notes that tartrate and solid residue build-up, both on the interior surfaces and in the pores, affects oak flavour transfer, wine maturation and barrel lifecycle. The infection of the barrel with spoilage microorganisms, especially *Brettanomyces/Dekkera* yeast, can have a marked influence on whether a barrel is reused, and hence the cost effectiveness of its purchase. The study finds that high-power ultrasound for barrel cleaning and disinfection, and plank/stave cleaning has the potential to provide considerable cost savings, with an estimated saving of at least nine cents (US) per a \$15 retail bottle of wine. Avoiding wine spoilage appears to justify the ultrasonic investment in terms of both a return-on-investment and cash-flow basis. <http://winetitles.com/wij/search.asp?search=yap>



Local research results

- A survey of thirty wineries in three regions of the Western Cape regarding the disposal practices of winery solid wastes has identified as a major problem that in most wineries, filter waste is not collected in tanks as set out in guidelines, but is dumped on open land prior to collection by waste management companies. This results in some liquid leaching into the soil and creates unfavourable odours and attracts insects such as flies. The waste in question is bentonite, diatomaceous earth and perlite, used in clarifying and filtration methods. As yet there are no specific guidelines

for wineries on the management of such solid waste which would result in environmentally safe practices. www.sawislibrary.co.za/dbtextimages/FinalReport144.pdf

- An investigation into characterising different red grape cultivars in terms of certain wine parameters has found that there were differences in these parameters between selected clones from the same cultivar grown in the same block and on the same rootstock. Standard winemaking techniques were used for the red cultivars (Pinotage, Shiraz, Cabernet Sauvignon, Merlot, Cabernet Franc and Pinot Noir). Analysis showed that there were differences regarding TA, malic acid, alpha amino acids and ammonia between the clones at harvest. Merlot, Cab franc, and Cabernet Sauvignon clones showed the largest differences regarding total anthocyanins per berry. For tannin concentrations Merlot, Cab Sauvignon and Shiraz clones showed the largest differences, with certain clones having much lower total tannin concentrations than others. In certain cases lower or higher concentrations of grape anthocyanins and grape tannins were reflected in the corresponding wines as well, especially in the Cabernet Sauvignon and Shiraz wines. There was not always a direct correlation between the phenolic composition and the grapes and that of the wine. www.sawislibrary.co.za/dbtextimages/FinalReport129.pdf
- Previous studies of South African terroir have sought to distinguish and authenticate quality wines of origin by virtue of their chemistry. This study (<http://dx.doi.org/10.1080/09571260701660862>) sought to differentiate wine-producing territories by hedonic (pleasurable) quality. Using a database of paired sighted and blind tastings of popular cultivars (cabernet, chardonnay, chenin blanc, merlot, pinotage, pinot noir, sauvignon blanc and shiraz) over the period 2000 to 2006, models were developed to explain quality ratings from the perspective of terroir. It was found that certain wine appellations produce a particular and predictably consistent level of wine quality, while others do not. While blind tastings were stunted by limited statistical significance and a crude level of ward differentiation, the sighted versions revealed a far clearer, richer and more finely calibrated suite of terroir. The sighted approach is, however, flawed by a neurological bias fuelled by the prior knowledge of each ward-of-origin and a number of other extrinsic cues proxied by the sighted quality metric. These findings are consistent with earlier work by the author that place of origin is a significant cue confounding one's appreciation of a wine's intrinsic merit.



Closures

- For the same weight of material, screwcaps produce 4.27 times the carbon footprint that corks do, according to research ratified by the French Environmental Agency (www.vinoline.net/wine-france-152.html). The carbon footprint is the measure of the amount of CO₂ (a greenhouse gas) released into the atmosphere by transportation of the raw materials and the manufacturing process. A composite closure (DIAM) had 1.7 times the carbon footprint of cork. (Even taking into account that a single cork weighs about twice as much as a screw cap, the difference is significant. Ed.) The Portuguese Cork Association notes that the world's cork forests cover an area of 2.2 million hectares and act as a global carbon storehouse with a capacity 14 million tons annually, thus contributing to the inhibition of climate change. www.wine.co.za/News/news.aspx?NEWSID=10850
- Nomacorc, producer of synthetic wine closures, has initiated a comprehensive, multi-year research project with the UC Davis department of viticulture and enology, INRA Montpellier, France and the Australian Wine Research Institute. The study will focus on how oxygen transfer through closures influences the evolution of wine after bottling. A initial study found that each closure type (low, medium or high oxygen transfer rates (OTR)) led to differences in wine development. Sauvignon Blanc, with a low OTR closure, had the highest degree of fruit preservation but this was accompanied by the presence of reduced characteristics. The bottle with higher OTR was less fruity but free of reduced character defect. Shiraz with a low OTR closure had both bitter and astringent characteristics. The medium OTR closure was the best balanced and least bitter and also had rounder tannins. The wine with the high OTR was found to have more bitterness yet had the lowest astringency. <http://wine.appellationamerica.com/wine-review/532/Nomacorc-research.htm>

Technology and Marketing

- A new top-of-the-range restaurant, the Adour in New York's St. Regis hotel, is possibly the first in the world to put wine on an equal footing with food, and to use innovative technology and design to enhance the pleasure of wine-drinking. There is a list of wine categories projected along the bar's surface, and holding one's finger over a selection produces a trail of pixie dust that serves as a virtual click on the options available. Want something by the glass? Red or white? From which wine-growing region? Each choice produces a visually pleasing rosette of light reading about the varietal, the country of origin, and the vineyard. The \$250 000 system uses high-end projectors, computers, a web-based database, and vision-sensing devices. www.martiniboys.com/NYC/Adour-review.html and www.businessweek.com/innovate/content/jan2008/id20080125_679652.htm

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