



Local Research News

The spoilage yeast *Zygosaccharomyces*

Microbiological problems of the spoilage yeast *Zygosaccharomyces* became an industry concern following an increase in quality defects such as re-fermentations, swollen bags and turbidity. A cause could be the phase-out of the use of natamycin (a naturally occurring antifungal agent) in winemaking and the ineffectiveness of alternative preservatives against these spoilage yeasts. *Zygosaccharomyces* can flourish in the winemaking environment due to its high alcohol and SO₂ tolerance.

A detailed investigation concluded that the problems could not be attributed to *Zygosaccharomyces* alone. A general concern was raised regarding the implementation of standard hygienic practices in cellars, as well as questions regarding the effectiveness of sterile filtration on the microbial spores. There were significant shortfalls in several areas. These were: quality control procedures, cellar hygiene, filtration practices, wine preservation, tanker hygiene practices, pasteurization of concentrate and head-space management of concentrate. www.sawislibrary.co.za/dbtextimages/OelofseA3.pdf

Consumer preferences and the chemical and sensory attributes of South African Chenin blanc wines

A very detailed study of the chemical and sensory attributes of more than 220 SA Chenin blanc wines and consumer preferences regarding these wines has been carried out. 30 Chenin blanc wine experts and 220 non-expert consumers participated in sensory profiling and style sorting tasks. Some 270 consumers who attended wine shows in Johannesburg and the Western Cape, were interviewed on their perceptions of Chenin styles. The results contributed to a much better understanding of current SA Chenin blanc wine and its individual styles. The valuable insights gained regarding style designations, consumer perception and drivers of 'liking' were transferred to the industry. www.sawislibrary.co.za/dbtextimages/NieuwoudtHH5.pdf See also www.wineland.co.za/technical/novel-sensory-tools-for-wine-characterisation

International Research News

Pressure Change Technology

The EU-funded PreserveWine project is investigating Pressure Change Technology (PCT), which is a non-thermal preservation method for extending liquid food shelf life. In the case of wine, the process should allow the amount of sulphite additive commonly used to inactivate yeasts and other microbial matter to be decreased. PCT dissolves an inert (non-reactive) gas such as nitrogen or argon in wine by applying pressure. This is followed by depressurisation, which damages microbial cells. The main advantages of this technology are that the heat-labile components, colour and taste remain unchanged and the amount of oxygen in wine is significantly reduced, thus avoiding oxidation. The effect of various process parameters (gas type, pressure, temperature, retention time) on the physicochemical and sensory quality of red and white wines are to be extensively validated. www.preservewine.fraunhofer.eu

Oral hygiene and red wine

Cavities, periodontal disease and tooth loss affect an estimated 60 to 90% of the global population. The problems start when certain bacteria in the mouth get together and form biofilms, which are then difficult to get rid of. They form plaque and produce acid, which starts damaging teeth. Furthermore, the emergence of antibiotic resistance by some oral bacteria biofilm species presents a worldwide problem, and thus new strategies are required. The use of natural antimicrobials may contribute to controlling the disordered growth of oral microbiota.

The antimicrobial effects of red wine and its inherent components on oral microbiota were studied by using a 5-species biofilm model of the supragingival plaque that includes *Actinomyces oris*, *Fusobacterium nucleatum*, *Streptococcus oralis*, *Streptococcus mutans* and *Veillonella dispar*. Microbiological analysis of the biofilms after the application of red wine, dealcoholized red wine, and red wine extract solutions spiked or not with grape seed and inactive dry yeast extracts showed that the solutions spiked with seed extract were effective against *F. nucleatum*, *S. oralis* and *A. oris*. Also, red wine and dealcoholized wine had an antimicrobial effect against *F. nucleatum* and *S. oralis*. Thus red wine with or without alcohol, and wine with grape seed extract were the most effective at getting rid of the bacteria. <http://dx.doi.org/10.1021/jf501768p>

Perception of flavour finish.

Wine finish is influenced by flavour, an important parameter of a wine sensory profile that can dictate wine quality and/or consumer acceptance. A study performed a time-intensity trained-panel evaluation of flavour finish in model white wines. Four flavour compounds representing fruity, floral, coconut, and mushroom flavours were added to a model white wine in single-, two- and four-compound combinations. For the single and two-compound model wines, fruity flavour finished earlier than coconut, mushroom and floral flavours. In the four-compound model wine, only fruity flavour finished earlier than floral flavour. In the single and two-compounds model wines mushroom was perceived as significantly more intense than fruity flavour. This

difference was not apparent in the four-compound model wine, most likely due to the complexity of the model wine. Results also showed interactions among flavour compounds. For perceived intensity, the compound most influenced by the presence of other flavour compounds was coconut. The length of finish also varied among flavour compounds, with mushroom and coconut flavours being particularly affected. <http://dx.doi.org/10.1016/j.foodqual.2014.02.012>

Wine quality improvement through yeast hulls and mixed starter cultures.

Interactions between different yeast species used as starters may lead to inconsistent results in mixed fermentations. A study has assessed the influence of different nutrients on the association between a wine strain of the yeast *Candida zemplinina* (CDZ1) and a commercial wine strain of *Saccharomyces cerevisiae* (EC1118). Laboratory-scale fermentations of Bovale (a red wine grape) were carried with CDZ1 and EC1118, with the simultaneous addition of either diammonium phosphate, or yeast hulls, or ergosterol and oleic acid, or not. Yeast hulls are widely used to improve fermentation, the sensory characteristics of wines, as well as to prevent stuck fermentations. It is postulated that their action is due to their large surface area that and thus a high capacity to bind or adsorb toxic compounds produced during fermentation. The addition of yeast hulls resulted in a higher cell population of CDZ1 and in a higher glycerol concentration, and improved the fermentative performance of the mixed yeast starters CDZ1/EC1118. The high glycerol content increased the softness and body of the wine. <http://dx.doi.org/10.1111/ajgw.12078>

The antimicrobial activity of the yeast *Metschnikowia pulcherrima* on wine yeasts.

Undesirable or 'spoilage' yeast can form films on the surface of wine, negatively influence the wine profile by producing 'animal/farmyard/mousy' taints, or can compromise the initial stage of fermentation through their high levels of acetic acid and ethyl acetate production. So-called 'killer' yeasts have the potential to control the proliferation of such spoilage microorganisms. Researchers have investigated the antagonistic behaviour of the yeast *Metschnikowia pulcherrima*, as a biocontrol agent, against the main wine yeast species involved in the winemaking process. Seven strains of *M. pulcherrima* were evaluated for the antimicrobial activity against 114 yeast strains belonging to *Pichia*, *Candida*, *Hanseniaspora*, *Kluyveromyces*, *Saccharomycodes*, *Torulaspora*, *Brettanomyces* and *Saccharomyces* genera. Very importantly, the antimicrobial activity of *M. pulcherrima* did not have any influence on the growth of *Saccharomyces cerevisiae*. However, *M. pulcherrima* displayed a broad and effective antimicrobial action on undesirable wild spoilage yeasts, such as *Brettanomyces/Dekkera*, *Hanseniaspora* and *Pichia* genera. Fermentation trials carried out in synthetic grape must confirmed this antimicrobial activity. The antimicrobial activity of *M. pulcherrima* seems to be due to pulcherriminic acid (the precursor of pulcherrimin pigment) that depletes iron present in the medium, making it unavailable to the other yeasts. <http://dx.doi.org/10.1111/jam.12446>

Other news

The age of olfactory communications begins

Harvard scientists have successfully 'transferred' the first scent from Paris to New York via an iPhone app. The new technology, expected to go on sale by the end of the year, enables users to mix and match a variety of scent options to allow users to not only see, but smell, a message sent to them. The oPhone or olfactory phone (right) features two cylindrical gadgets that work in tandem to deliver bursts of scents. Each oPhone is equipped with oChips, little cartridges that contain all of the scent information that disperse odours when air is spun over them. After taking a picture, a users tags the image with any of the 32 scents available, which will initially focus on food and coffee aromas. These scents can be combined into more than 300 000 different smells. Sending the picture allows the recipient to smell the image via the oPhone. Practical applications could include exchanging information about wine aromas. www.onotes.com



France objects to .wine and .vin Internet addresses

The Internet Corporation for Assigned Names and Numbers (Icann) has been rolling out new custom web names including .wine and .vin. Many are concerned that the plethora of new domain names will make it much harder to protect brand names online. The French Secretary of State for Digital Affairs, Axelle Lemaire, has expressed concern that the new domain names could weaken French wine brand identity, and she went on to say, 'The lack of adequate redress mechanisms and, above all, the lack of accountability demonstrate the need for significant reform of Icann.' www.bbc.com/news/technology-27974293

Investment in wine outperforms artworks, stamps and bonds

An investigation of 36 271 wine prices has found that over the period 1900–2012, wine provided a real return on investment of 4.1% per annum. The comparative returns for artworks were 2.4% and for stamps 2.8%. Equities (5.2%) outperformed wine while government bonds (1.5%) were the worst performers. The report may be downloaded here: www.winecoreports.com/upload/internet/DIMSON_ROUSSEAU_SPAENJERS_The-Price-of-Wine.pdf

MACROWINE 2014 in Stellenbosch

The 5th International Macrowine Conference on macromolecules and secondary metabolites of grapevine and wine takes place in Stellenbosch from 7 to 10 September. This is the first time the meeting will be held outside Europe since the inaugural conference in France in 2006. www.macrowine2014.org

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