

Smelling by minispectrometer provides fast determination of wine origin

Barcelona, March 2011 – Wine fraud is a growing problem, with experts estimating that up to 10% of the wines offered to consumers in some European countries are of a lesser quality than the label claims. It's an issue that affects everyone from expert collectors to average consumers, and is such a concern in some countries that drastic measures have been taken: the Italian Carabinieri Corps, for instance, has educated 25 of their officers as sommeliers.

This only addresses part of the problem, though. Wine fraud is difficult to detect because of a variety of considerations: the sheer time it takes to train a wine 'nose', for example, coupled with the challenge of ensuring these 'noses' are in the right place at the right time – not to mention the fact that even top sommeliers aren't fool-proof when it comes to detailed identification.

Now though, in collaboration with the University of Córdoba, IBEC researchers have made steps towards combating the problem with their development of a reliable, cheap and quick detector to classify white wines according to their Certified Brands of Origin that could be used in variety of environments.

The scientists used a technique called ion mobility



spectrometry (IMS) to analyze wine aromas. IMS ionizes volatile organic compounds with an ultraviolet lamp and separates them according their mobility in an electric field at atmospheric pressure. Coupled with a gas phase separator to enhance aroma extraction and automate the process, the IMS system proved to give immediate results that held their own against those from less convenient methods. "This is the first time IMS has been used to classify wine," explains Santiago Marco, group leader of IBEC's Artificial Olfaction group, which contributed the data processing to the study. "It's an established method for security and law enforcement purposes, such as detecting drugs and explosives, but only very recently has it been applied to food analysis."

The detector overcomes some of the main failings of other non-human methods, such as gas chromatography or mass spectrometry. "These conventional techniques are precise, selective and sensitive, but they require elaborate sample preparation before analysis and have a much lower throughput," explains Santiago. "Our system provides fast and cheap results; it requires little or no sample preparation and has the potential to be miniaturized in a handheld instrument for *in situ* evaluation. In addition, it provides a qualitative response which is easy for untrained personnel to understand."

With some wine fraud displaying a more serious side – the addition of wood alcohol, for example – the detector offers not just a more affordable and convenient method of classification, but could also offer a step in the right direction to combat a growing public health issue. "It would be interesting to develop the system to be able to detect toxic substances or those which deteriorate the wine," comments Santiago. ■

Source article: R. Garrido-Delgado, L. Arce, A.V. Guaman, A. Pardo, S. Marco & M. Valcárcel (2011). "Direct coupling of a gas-liquid separator to an Ion Mobility Spectrometer for the classification of different white wines using chemometrics tools". *Talanta*, 84 (2), 471-479

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