

## IDENTIFICATION OF BOTANICAL ORIGIN OF SUGAR/ETHANOL IN WINE BY APPLICATION OF NUCLEAR MAGNETIC RESONANCE OF DEUTERIUM

<sup>1</sup>Gorincioi Elena, <sup>2</sup>Sturza Rodica, <sup>1</sup>Barba Alic

<sup>1</sup>Institute of Chemistry, Academy of Sciences of Moldova – Chişinău, Moldova

<sup>2</sup>National Center for Quality Testing of Alcoholic Beverages – Chişinău, Moldova

Along with the multiple useful applications in medicine, chemistry, petroleum industry and other fields, NMR spectroscopy offers a powerful approach for studies related to food science.

Present communication is aimed at highlighting some of the most remarkable opportunities of using the NMR panoply in the analyses of wine products and spirits, covering the last date literature data.

Significance of site-specific natural isotope fractionation (SNIF-NMR) that is the first officially adopted stable isotope method in the European Union for elucidation the botanical origin of ethanol/sugar will be demonstrated, which prove invaluable for product authentication. SNIF-NMR implications in identifying the provenance of European wines, establishment the geographical origin of the sample, obtaining the information about the chemical pathways of biosynthesis will be discussed [1].

The use of high-resolution (HR) NMR and high-resolution diffusion-ordered spectroscopy (DOSY) for the characterization of wine samples of different ages enable metabolic profiling of wines, *i.e.* identification of the contained compounds, including minor components such as some medium-chain alcohols, aminoacids and organic acids [2-4].

The possibilities of employing conventional HR 1D and 2D NMR experiments (<sup>1</sup>H, <sup>13</sup>C, DEPT, COSY, HSQC, HMBC, TOCSY and NOESY) for determination the botanical origin of sugar/ethanol of wine, monitoring the fermentative process in musts and wine ageing and other processes will be presented. Particularly, the data obtained from metabolomic studies on geographical grapes and their wines using <sup>1</sup>H NMR analysis coupled with multivariate statistics will be discussed, which allow visualization of the correlation patterns amongst metabolites of grapes and wines from different regions.

### References:

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