

ANALYSIS OF THE ELEMENTAL COMPOSITION OF MOLDOVAN WINES

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The increase in the competitiveness of wines from the Republic of Moldova is extremely current. In order to provide the domestic wine industry with a base on foreign markets, its production must reach an internationally accepted quality level. The production of wines with protected geographical indication (PGI) and protected origin (PDO) presents such an opportunity.

Mineral composition of wine is of great interest for wine consumers and producers, since it can provide determinant criteria for wine price, guarantees of quality, identification of wine geographical origin. The main objective of this paper was to apply inductively coupled plasma atomic emission spectroscopy (ICP-AES) for determination of major and trace elements in wines and to determine the relationship between geographical regions and technological factors. The ICP-AES measurements were carried out on a ICPE-9000 spectrometer (ICP-AES, Shimadzu Co., Japan).

Two high sensitivity multi-elemental techniques for used to determine concentration of eight elements in 22 red and white wine samples. Potassium (K) is the most abundant of the inorganic constituents of the wines (about 75% of the total cation content of wines). K concentration in the studied samples ranged from 276 to 768 mg/L. The concentration of sodium (Na) was approximately 20 fold lower in comparison with potassium content. The Na content was found to be between 9 and 30 mg/L. Calcium (Ca) is a natural constituent of musts and wines, necessary for the normal course of alcoholic fermentation. Ca sources for wines include the soil, the treatment of the musts with Ca salts and, ion exchange treatment. In studied wines Ca concentration was between 38-90 mg/L. Magnesium (Mg) concentration in studied wines was between 42.2-108 mg/L. The concentrations of aluminium (Al) in studied wines were in the range 0.9-2.5 mg/L and do not exceed the recommended value for Al, which should be not upper than 3 mg/L. Iron (Fe) content in wines is an important parameter controlling their quality and stability, the main problem that appears in wines is their instability to Fe concentrations greater than 10 mg/L. In present study Fe content in wines varied from 0.5 to 7.9 mg/L. Low zinc (Zn) concentrations in wines play a vital role during fermentation, whereas high concentrations influence badly its organoleptic properties. Data obtained for Zn do not exceed value recommended by OIV and average out at 0.3 -1.2 mg/L

The concentrations of eight studied elements in Moldovan wines are in the good agreement with the literature data. Concentration of Zn and Na do not exceed permissible levels. Mg and Al concentration permit to divide wines in two groups, supporting their different geographical origin. Moderate wine consumption contributes for the daily nutritional requirements of essential metals.

Keywords: elemental content, ICP-AES, metal level, wines.

Acknowledgments for by State Project 20.80009.5107.09 “Improving of food quality and safety through biotechnology and food engineering”, running at Technical University of Moldova.