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A RESEARCH ON THE COMPOSITION OF MADŽUN (grape molasses) PRODUCED FROM TABLE GRAPE VARIETIES

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INTRODUCTION

Grape molasses is one of the popular and traditional food in North Macedonia for the last 10 years. It is produced in the traditional way and is represented on the market as Grape honey and popularly Madžun. According to legends, the name Madžun comes from the Turkish word meaning boiled fruit with a certain density. Grape production which occupies the most important place in every period of Macedonian history, grape molasses which is made with grapes, and many other products are required to be made in conformity with the standards and quality. In North Macedonia, Madžun is produced mainly from the Vranec red wine variety, but also from the table varieties Cardinal, Muscat hamburg, Afuz Ali (Dattier de Beyrouth), etc. Grape molasses (Madžun) is produced traditional and industrial technique of different flavor, structure and appearance in North Macedonia.

MATERIALS AND METHODS

4 samples, 2 each of the Afus ali and Cardinal varieties.
The total sugar content of grape molasses samples was determined according to official method 929.09 (AOAC 2005).
Identification and quantification of sugars separated: glucose, fructose, sucrose and maltose in molasses samples were determined using High Performance Liquid Chromatography (HPLC), version 1, SOP 728 (Harmonized Methods of the International Honey Commission, 2009).
The HMF (hydroxymethyl furfural) was determined according to the official method 890.23 (AOAC 2005), based on the colorimetric reaction between barbituric acid, p toluidine and HMF, which forms a red-colored complex. The intensity of the red color was measured at 550 nm using a UV-Vis-NIR-5000 spectrophotometer.
Sensory analysis of the samples was carried out by a committee consisting of 7 members.
The following sensory characteristics and maximum number of points were evaluated: color (2), smell (2), flavor (4), sweetness (2) sourness (2), texture (4) and aftertaste (4). The maximum number of sensory evaluation points that the sample can get are 20.
The procedure was performed according to methods described in ISO 6564, ISO 8587 and ISO 11036.

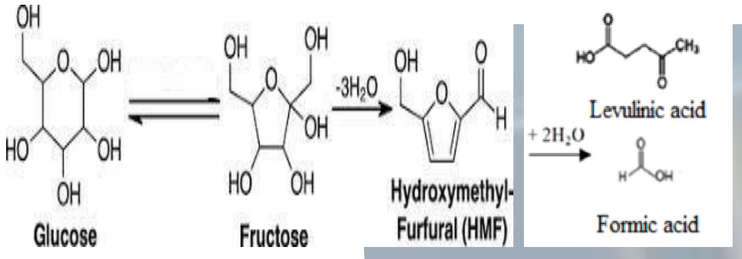
RESULTS

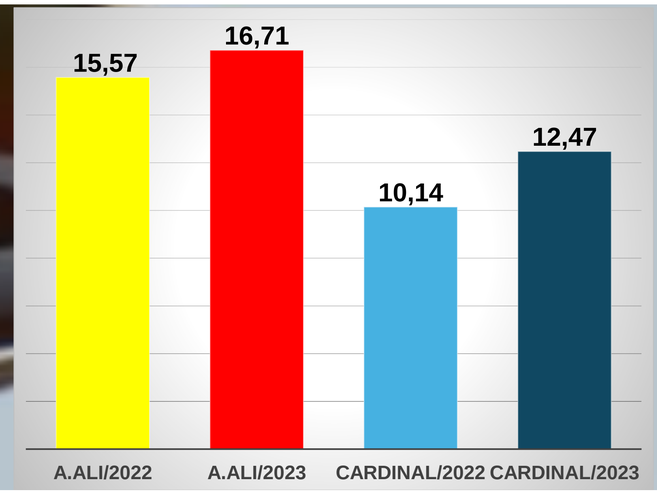
Table 1 Content of total sugars content and simple forms of carbohydrates in samples (%)

Sample	Fructose	Glucose	F/G	Sucrose	Maltose	Total sugar
Afus ali/2022	29.96	30.90	0.97	0.10	0.20	61.16±2.64
Afus ali /2023	33.67	25.40	1.32	<0.1	0.31	59.38±2.57
Cardinal/2022	39.47	37.45	1.05	0.15	0.32	77.39±3.35
Cardinal/2023	30.64	28.41	1.08	<0.1	0.15	59.05±2.55

Table 2 Content of HMF (hydroxymethyl furfural) in samples

Sample	HMF (mg/L)	EU regulation	MKD regulation
Afus ali/2022	730.28±58.42	**75 mg/L**	**honey**
Afus ali /2023	710.20±56.81		
Cardinal/2022	**875.30±70.02**		40-80 mg/L
Cardinal/2023	730.48±58.43		





Graph 1 The total points from sensory evaluation of molasses samples (Madžun)

CONCLUSIONS

►The present study represents the first attempt at national level to characterized the chemical properties of grape molasses sample from Afus ali and Cardinal grape varieties.

►In all samples, the sucrose content is below the detection threshold (<0.1), which confirms that no sugar (additionally) has been added.

►The high content of HMF is due the use of traditional methods for production of grape molasses, significantly effects on the quality of the molasses resulting with decreased quality