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## Peculiarities of Making Fruit Alcoholic Dry Beverages from Armenian Apricot Varieties of “Yerevani (Shalakh)” and “Aghdjanabad”

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### ABSTRACT

The potential of making low alcoholic beverages (wine type) from the less common stone fruits as a raw material have been investigated during the experiments. In particular, Armenian apricot varieties “Yerevani (Shalakh)” and “Aghdjanabad” were used. In order to regulate the low content of carbohydrates in the fruit raw material, the inverted syrup was used. Moreover, to ensure fast and complete breakdown of pectin compounds, the pectolytic enzyme was added to the fruit juice. In terms of quality and organoleptic characteristics, the samples of fruit alcoholic beverages (wine type) were prepared according to the proposed technology in consistent to the general technical requirements for fruit alcoholic beverages (wine type).

### Introduction

The production of alcoholic beverages has its unique place in overall food industry. There is a very strong competition in this area worldwide. Searching for the new markets for export of alcoholic beverages, as well as replenishing existing markets with the new types of drinks is one of the most crucial issues for any alcohol-exporting country. Armenia also participates in this competition thanks to the unique taste and variety of its wines, brandies (cognac) and sparkling wines.

Armenian winemaking is mainly based on wine production from different grape varieties. In addition, various types of fruits and berries are also used for the production of fruit low-alcoholic beverages (wine). Those fruits contain sufficient amount of carbohydrates, which enable to utilize them as a basic raw material for the above mentioned productions (Kazumov, 2013).

One of the peculiarities of fruit-based winemaking is the diversity of cultivated and wild fruit and berry varieties. This allows expanding the range of alcoholic and non-alcoholic products by ensuring the release of competitive products (Kishkovsky, 1984).

Fruit-based winemaking is a young branch of winemaking industry in Armenia. Production of fruit low-alcoholic beverages

(wine) in Armenia started at the beginning of the previous century (Kazumov, 2013).

Taking into account the role of fruit and berry wines with their taste and high health values, we find it relevant to develop new technical and technological solutions that will improve the well-known production processes.

### Materials and methods

The aim of the given research was to dedicate our trials to the issue of making fruit low-alcoholic dry beverage (wine type) from apricot fruit. Particularly, Armenian varieties of apricot “Yerevani (Shalakh)” and “Aghdjanabad” grown in Ararat region were used as raw materials for the trials. It should be noted that the same technological processes were applied to both varieties.

The chain of technological processes of apricot low-alcoholic dry beverage production is described as follows: received raw material was subjected to sorting, washing and sterilization. Afterwards, the basic physical and chemical parameters of the apricots (table 1) were determined.

Table 1. The analytical analysis of apricot varieties used in the trials.

Indicators name	Unit	Name of the fruit	
		Yerevani (Shalakh)	Aghdjanabad
Weight of one fresh fruit	g	62,5	32,35
Inner stone weight		2,3	2,09
Total acidity	g/l	4,68	5,04
Volatile acidity	g/l	0,06	0,05
pH	-	4,10	3,80
Sugars	g/l	140	161
Total phenolic content	mg/l	270	192,8

Subsequently, the fruits were moved for further processing. Initially, the apricot fruits were destoned by special destoner equipment. The machine made a complete separation of the pulp from the inner stone of apricot and at the same time exerted a crushing of the fruit, by releasing a fruit mash suitable for further processing. Additionally, the juice was pressed out from the fruit mash. During the process the output of the juice was 61-63 % (depending on apricot variety) of the total mass. After the pressing the juice (must) was filed into the stainless steel tank. Due to the high amount of pectin compounds in the juice the pectolytic enzyme was added (10-40 ml/1000 l) into the mass, which ensured fast and complete breakdown of pectin (Ribereau-Gayon, 2006).

Moreover, gelatine (20-30 g/100 l) was added for juice clarification and potassium metabisulfite (MBSK) was used against oxidation processes. Clarification continued for 16-18 hours at the temperature of 15-17°C. The clarified juice was raked from the sediment.

In general, fruit and berries are characterized by the low content of nitrogen compounds, which can essentially affect the normal functioning of the yeast (Ribereau-Gayon, 2006). For this purpose, the nutritional supplement "Vitamin Combi" (diammonium phosphate, thiamine, vitamin B1) of German "Erbslöh" company (30-50 g / 100 l dose) was added to the juice.

The addition of ammonium sulphate, in combination with thiamine and biotin, has a positive effect on the dynamics of the fermentation process. In addition, in order to regulate the low content of carbohydrates in the fruit raw material and then to obtain the required amount of ethyl alcohol (11-12 %), prior to the fermentation inverted syrup was added to the mass.

In order to start the fermentation process active dry yeasts "Oenoferm Belle Arome" (Erbslöh) were added to the mass in dosage of 30-40 g / 100 l. The fermentation was carried out at 18-20° C temperature. The fermentation continued till dryness with 4 g/l and less residual sugar content. After the fermentation the wine was raked from the lees. Then, the young wine was sent for storage and maturation. During the period provided by the technological directive the wine was stabilized, filtered and in order to maintain the amount of free SO<sub>2</sub> in the range of 18-22 mg / l, potassium metabisulphite (K<sub>2</sub>S<sub>2</sub>O<sub>5</sub>) was added regularly.

### Results and discussions.

Organoleptic characteristics as well as physical and chemical parameters of the young fruit low-alcoholic beverages (wine type) obtained as a result of the trials are presented accordingly in Table 2 and 3.

Table 2. Organoleptic characteristics of apricot low-alcoholic beverage

Indicator name	Characteristics
Appearance of beverage	Clear, transparent, without sediment
Color	Light straw-color to rich golden
Taste and bouquet	Dry, harmonious, with expressed apricot aromas

It should be mentioned, that samples without addition of inverted syrup and nutritional supplement for yeasts "Vitamin Combi" were used as control samples during the trials. Due to the absence of those technological procedures the stuck fermentation of

control samples was noted. Later on, this will cause the spoilage of wines. Therefore, in fruit based winemaking addition of inverted syrup and nutritional supplement for yeasts is desirable and advantageous.

Table 3. Chemical and physical analysis of apricot low-alcoholic beverages

Indicators name	Unit	Name of the beverage			
		"Yerevani (Shalakh)" wine	Control "Yerevani (Shalakh)" wine	"Aghdjanabad" wine	Control "Aghdjanabad" wine
Alcohol	% vol.	11.3	5.4	12.1	6.1
Total acidity	g/l	4.01	4.35	4.78	4.90
Volatile acidity	g/l	0.61	0.81	0.7	0.9
pH	-	4.15	4.15	4.00	3.90
Sugars	g/l	<4	49.28	<5	58.52
Free SO <sub>2</sub>	mg/l	7.44	-	5.95	-
Total SO <sub>2</sub>	mg/l	101.2	-	82.58	-
Total phenolic content	mg/l	251	-	176	-

## Conclusion

The obtained results prove that selected apricot varieties have shown promising results as a raw material for production of fruit based low-alcoholic beverages. The beverages obtained from "Yerevani (Shalakh)" and "Aghdjanabad" varieties and made by recommended technology fully correspond to the standards (GOST 33806-2016) of general technical parameters of fruit-berry based wines.

The abovementioned technology can be considered as a new direction of processing of apricots, which will provide new opportunities and economic profit for apricot growers and processors. The technology discussed in the article with some modifications can be applied to preparation of low-alcoholic beverages from other types of stone fruits.

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