wjert, 2025, Vol. 11 Issue 4, 201-206. Review Article ISSN 2454-695X

World Journal of Engineering Research and Technology
WJERT
www.wjert.org
SJIF Impact Factor: 7.029

DEVELOPMENT OF A TECHNOLOGY FOR THE PRODUCTION OF FUNCTIONAL LIQUEUR FROM WILD AND CULTIVATED VARIETIES OF BLUEBERRIES

Naira Mamardashvili[1]*, Sofo Bezhanidze[2], Ketevan Makhashvili[3] and Maya Kiladze[4]

[1]Doctor of Technical Sciences, Assistant Professor, Departament of Food Technology, Georgian Technical University, Georgia.

[2]Master's student, Departament of Food Tecnology, Georgian Technical University.

[3]Doctor of Chemistry, Professor, Departament of Food Technology, Georgian Technical University.

[4]Doctor of Engineering, Professor, Departament of Food Technology, Georgian Technical University.

Article Received on 12/02/2025 **Article Revised on 03/03/2025** **Article Accepted on 23/03/2025**

***Corresponding Author**
Naira Mamardashvili
Doctor of Technical Sciences, Assistant Professor, Departament of Food Technology, Georgian Technical University, Georgia.

ABSTRACT

Fruit and berry products, especially alcoholic beverages, occupy leading positions in the international and Georgian markets. In Georgia, the development of technology for the production of liqueurs using fruit and berry raw materials has gained popularity in the last decade, which is an interesting challenge for the Georgian food industry. The article presents the development of technology for a functional liqueur from wild and cultivated varieties of blueberries. Optimal parameters and physicochemical indicators have been established. Research has shown that the types of blueberries used are rich in both coloring and biologically active compounds, which allows for a wider use of wild and cultivated varieties of blueberries for the production of various types of alcoholic beverages.

KEYWORDS: Alcoholic beverages, wild cranberries, blueberries, technology.

INTRODUCTION

Products from fruit and berry crops, especially alcoholic beverages, occupy leading positions in the international and Georgian markets. In Georgia, in the last decade, the development of a technology for the production of liqueurs using fruit and berry raw materials has gained popularity, which is an interesting challenge for the Georgian food industry.

Moderate consumption of alcoholic beverages is good for health, and alcoholic beverages made from healthy plants are doubly useful, as they combine the unique properties of both products. The benefits of plants are determined by their unique chemical composition, biologically active substances, vitamins, etc.

Special attention should be paid to Blueberries (*Vaccinium*), which have a healing effect.

The production of cranberry liqueur is another step forward in the liquor industry, which is due to both its organoleptic properties and beneficial properties.

Blueberries (*Vaccinium*) have an excellent taste, high nutritional and dietary properties, and are beneficial to human health. The antioxidants contained in them bind free radicals that cause dangerous diseases, and this is what makes blueberries unique.

Our article presents the development of a technology for a functional liqueur from wild and cultivated varieties of blueberries.

Today, many varieties of blueberries are grown all over the world.

The berries contain the coloring agent myrtilin, which gives cranberry juice a dark color. The main uniqueness of blueberries is that they contain tannins, which have medicinal properties. Blueberries contain sugars (glucose, fructose, sucrose), organic acids (citric, malic, tartaric, benzoic, oxalic, ascorbic), as well as pectin substances - anthocyanidins, vaccinin, glycosides, arbutin. There are relatively fewer free amino acids. The chemical composition of both wild and cultivated blueberries varies depending on cultivation and variety, as well as location and environmental conditions (Table 1). The stage of maturity, harvest time and subsequent storage conditions are also important. The cultivation factor affects the level of anthocyanin concentration in blueberries of both types.

Table 1: Chemical composition of wild and cultivated varieties of blueberries.

Name	Blueberry	Wild blueberries
Proteins	1 g	0.74 g
Fat	0.5 g	0.33 g
Carbohydrates	8.2 g	14.49 g
Water	88.2 g	87 g
Cellulose	1.2 mg	2.4 mg
Ash	0.3 mg	0.4 mg
Vitamin A	0.29 mg	3 mg
Vitamin B_1	0.02 mg	0.037 mg
Vitamin C	16 – 20 mg	9.7 mg
Vitamin K	19.3 mcg	19.3 mcg
Vitamin PP	0.28 mg	0.42 mg

RESEARCH OBJECTIVES

Preparation of semi-finished products (mors) from wild (*Vaccinium myrtillus*) and cultivated blueberries (*Vaccinium uliginosum*); Study of its physicochemical properties. Development of a process flow chart for the production of dessert liqueur from semi-finished products; Preparation of dessert liqueur.

Preparation of mors from wild and cultivated blueberries, determination of its physicochemical properties, and then preparation of the liqueur is of interest from the point of view of studying alcoholic beverages.

Mors is widely used in different countries of the world. A number of methods have been developed for their production. It has been established that certain types of raw materials require the selection of individual optimal modes taking into account their chemical composition.

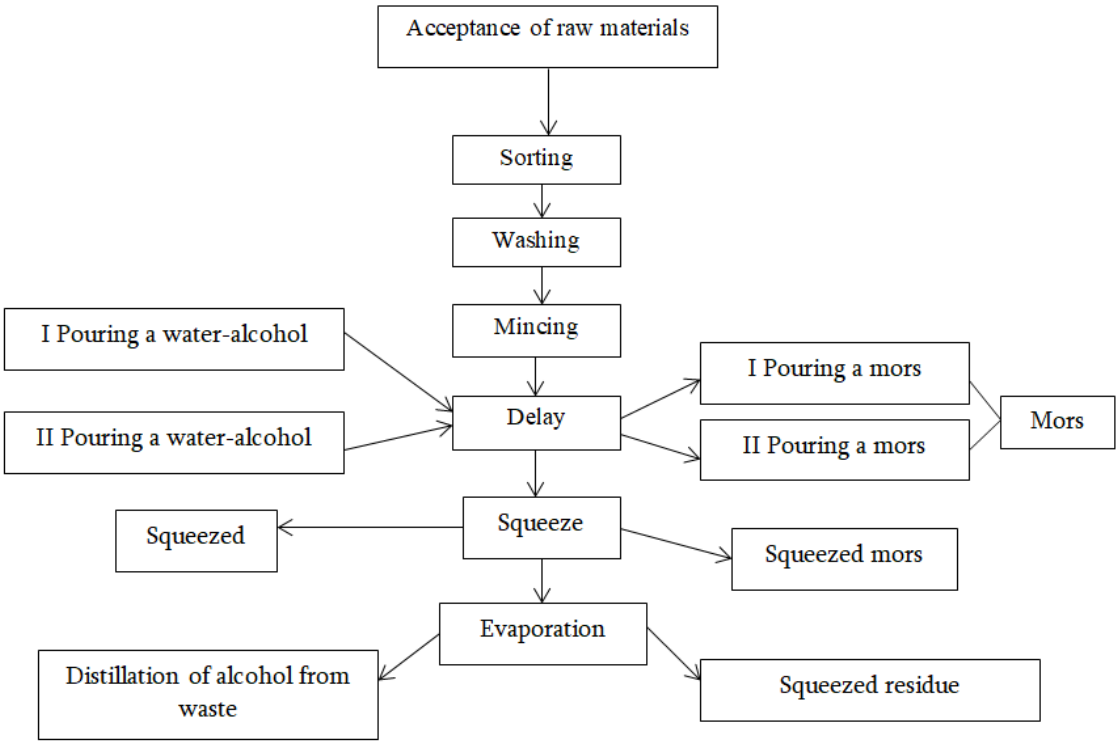
We prepared mors based on crushed raw berries with the addition of a water-alcohol solution to extract extractive substances.

Optimal parameters for obtaining mors (semi-finished products) have been developed: ethanol concentration, degree of grinding, extraction temperature, holding time, extraction module.

The yield of extractive substances was controlled by the content of dry matter in the extract. At the maximum yield, we determined the optimal extraction time to be 15– 20 days, the

ethanol concentration to be 40% (vol.), and the extraction module to be 1:1. The experiments were conducted at room temperature.

The diagram for making fruit drinks is shown in the figure.



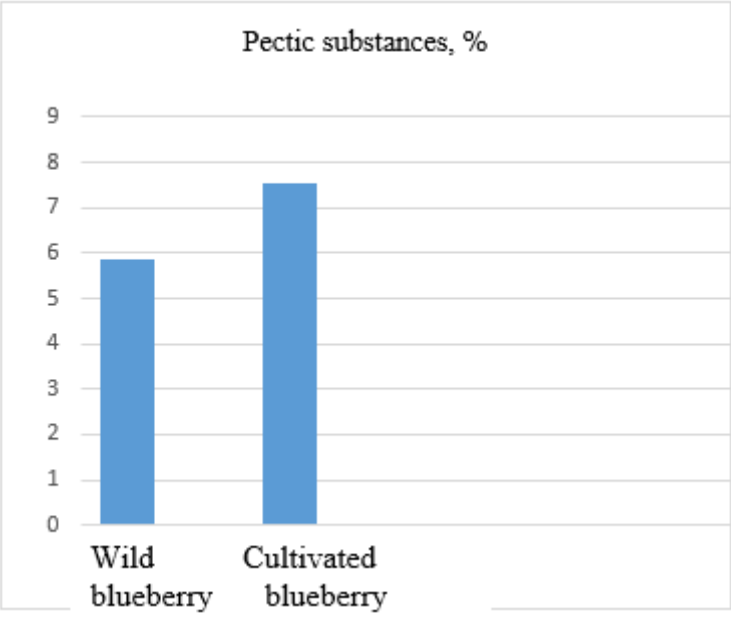
Schematic diagram of the production of fruit drink

The chemical composition of the mors was studied. The data are presented in Table 2.

Table 2: Chemical data of the prepared mors.

Object	Soluble Dry Substance (g/100g)	Total Sugar (g/100g)	pH	Titratable Acidity	Organoleptic Indicator
Wild blueberry	12.7	7.1	3.3	0.90	Dark blue color, characteristic taste, smell and aroma
Cultivated blueberry	12.2	8.2	4.1	0.85	Blue color, characteristic sour taste and aroma

The obtained fruit drink samples were analyzed for the content of pectin substances (diagram), flavonoids, anthocyanins and phenolic acids (Tables 3 and 4).



Wild Cultivated

Blueberry blueberry

Table 3: Flavonoid content in wild and cultivated blueberries.

Name	Flavonoids, mg/kg	Catechins, mg/kg	Leucoanthocyanins, mg/kg
Wild Blueberry	835.13	63.02	122.87
Cultivated Blueberry	795.51	60.35	115.07

As can be seen from the data in Table 3, the content of flavonoids in fruit drinks made from wild blueberries is relatively higher than in cultivated blueberries.

Table 4: Content of anthocyanins and phenolic acids in mors.

Name	Anthocyanins, mg/kg	Phenolic acids
Wild Blueberry	4508.02	1495.07
Cultivated Blueberry	3482.57	1388.14

Anthocyanin pigments are the most common phenolic compounds in blueberries, up to 50% of which are preserved during processing.

CONCLUSION

Thus, a principle scheme for obtaining morse, optimal parameters, and physicochemical indicators have been developed.

The conducted studies have shown that the blueberry species used in the study are rich in both coloring and biologically active compounds, which allows the mentioned wild-growing

cranberries and cultivated cranberries to be more widely used for the production of various types of alcoholic beverages.

REFERENCES

1. Ahiakwo Ogbo, Innovation and Modern Techniques of Alcoholic Beverage Production. J Food Microbial Saf Hyg, 2003; 8(8): 1000258.
2. Postolova M. A., Popov A. M., Gurin V. V. Wild fruits and berries for the production of medicinal and prophylactic drinks. // Beer and drinks. #, 2004; 1: 52-53, 91.
3. V. I. Deineka, E. Yu. Oleynits, Ya. Yu. Kulchenko, I. P. Blinova, L. A. Control of the selectivity of separation and determination of anthocyanins of fruits of plants of the vaccinium family using eluents of the composition acetonitrile-formic acid-water // Journal of Analytical Chemistry, 2020; 75(11): 1021-1029.
4. Sellappan S., Akoh C.C., Krewer G. / J. Agric. Food Chem., 2002; 50(8): 2432 – 2438.
5. Hager, A., L.R. Howard, R.L. Prior, and C. Brownmiller Processing and Storage Effects on Monomeric Anthocyanins, Percent Polymeric Color, and Antioxidant Capacity of Processed Black Raspberry Products. J. Food Sci., 2008; 73: H134-H140.
6. Hilz, H., E.J. Bakx, H.A. Schols, and A.G.J. Voragen, Cell wall polysaccharides in black currants and bilberries—characterisation in berries, juice, and press cake. Carbohyd. Polym., 2005; 59: 477-48.
7. Gelovani N., Gvelesian I., Lomaia L., Pataridze G., Goderdzishvili I., Tsikarishvili Kh., Determination of the total amount of flavonoids in the fruits of crataegus oxyacantha L (FAMILY: ROSACEAE). World Journal of Pharmaceutical ResearchSJIF Impact Factor 8.084, 2023; 12(3): 1259- 1267. Research Article ISSN 2277– 7105.