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# ANALYSIS OF MORPHOMETRIC AND PHYSICOCHEMICAL PROPERTIES OF CHERRY VARIETIES AND SELECTION OF VARIETIES SUITABLE FOR FREEZING.

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**Annattosia:** in this article, it was observed that the amount of monosaccharides in the fruits of all studied cherry varieties increased significantly during the rapid freezing of cherry fruits during their initial technological treatment and subsequent processes. It was found that the high content of saccharides (%) in the fruit of cherry varieties differed among the cherry varieties. It was noted that it was 5.6% in the Lyubskaya 15 variety, 6.1% in the Shpanka chernaya variety, 5.8% in the Samarkandskaya variety, and 5.9% in the Podbelskaya variety.

**Key words**: cherry, fruit, freezing, storage, temperature, polyethylene bag, monosaccharide, disaccharide, ascorbic acid,

**Introduction:** Nowadays, the demand for seasonal fruits rich in natural vitamins, micro- and macroelements is increasing year by year. At the same time, reforms are being carried out to increase the productivity of the development of freezing technology, one of the technological processes that determines the unique taste of fruits along with natural mono- and disaccharides, and preserves organic compounds in the norm.

The purpose of the study is to determine the duration of the freezing process of cherry fruits and the development of a technology for storing products using a cooling agent.

**The objectives of the study are:**

to select cherry varieties suitable for freezing;

to identify factors affecting the quality of cherry fruits during storage;

The varieties Lyubskaya 15, Shpanka chernaya, Samarkandskaya Podbelskaya were selected as the object of the study.

**The subject of the study** is to study the effect of freezing cherry samples, processing them with sugar syrup (solution), and determining the chemical and organoleptic properties of fruits during storage.

Experimental results: cherry fruits are of great importance in the fruit industry. These fruits contain vitamins, organic acids, sugars, and antioxidants, which determine the quality value of the fruits. Freezing cherry fruits allows you to ensure the demand for these products throughout the year. Therefore, in our experiments, we analyzed the various parameters of the fruits of different varieties of cherries and their resistance to freezing.

Sugars, organic acids, and antioxidants in cherry fruits provide their high nutritional value. Freezing them allows you to preserve the quality of the product for a long time and use it in the

processing industry throughout the year. In conducting preliminary experiments, the morphometric parameters of the fruits of cherry varieties were analyzed among varieties.

It should be said that in our experiments, 4 varieties of cherry "Lyubskaya 15", "Podbelskaya", "Samarkandskaya", "Shpanka chernaya" were selected as a sample of 100 pieces, a total of 400 pieces. The selected samples were divided into 4 groups of 100 samples, 25 each, into 16 groups in total.

The fruit weight of each cherry variety in the samples of the isolated group was measured on a laboratory scale. The average weight of the samples of all the groups, i.e. the cherry fruits, was determined and the cherry varieties were compared.

In this experiment, when the weight indicators of 1 piece of cherry fruit were determined and analyzed among varieties, it was found that the average weight indicator of one fruit of "Lyubskaya 15" variety was 5.0 g, the fruit of "Podbelskaya" variety was 4.8 g, the fruit of "Samarkandskaya" variety was 3.8 g, and the fruit of "Shpanka chernaya" variety was 4.8 g.

In our experiments, the diameter of the fruit of cherry varieties was also studied. It was observed that the diameter of the fruit of the "Lyubskaya 15" variety was 20.2 mm, the diameter of the fruit of the "Podbelskaya" variety was 19.3 mm, the diameter of the fruit of the "Samarkandskaya" variety was 18.7 mm, and the diameter of the fruit of the "Shpanka chernaya" variety was 20.1 mm. During the experiments, it was found that the highest indicators of cherry fruit diameter were found in the fruits of the cherry varieties "Lyubskaya 15" and "Shpanka chernaya" (see Figure 3.1).


a)


b)

Figure 3.1 a) diameter indicators of cherry fruits

b) cherry fruits

In our experiments, it was observed that when the thickness of the fruit skin (exocarp) of the cherry varieties was determined and the varieties were compared, the same result was recorded. It was found that the thickness of the pulp of the "Lyubskaya 15" variety was 0.9 mm, the thickness of the pulp of the "Podbelskaya" variety was 0.7 mm, the thickness of the pulp of the "Samarkandskaya" variety was 0.6 mm, and the thickness of the pulp of the "Shpanka chernaya" variety was 0.8 mm.

It is worth mentioning that when the thickness of the skin of the cherry fruits was analyzed, it was found that the skin of the cherry "Lyubskaya 15" 0.9 mm and "Shpanka chernaya" 0.8 mm is partially thicker than the skin of other cherry varieties.

During these experiments, the seed content of cherry fruits was also analyzed among varieties in order to determine various morphometric parameters of cherry fruits. It was observed that the seed content of the fruits of the “Lyubskaya 15” variety was 7%, the seed content of the

fruits of the "Podbelskaya" variety was 9%, the seed content of the fruits of the "Samarkandskaya" variety was 10%, and the seed content of the fruits of the "Shpanka chernaya" variety was 8% (see Table 3.1).

**Table 1**

**Analysis of morphometric indicators of cherry varieties, (2023-2025 year)**

| The name of cherry varieties | Average weight of fruits, g | fruit diameter, mm | thickness of fruit peel, mm | grain share, % |
|---|---|---|---|---|
| Lyubskaya 15, | 5,0 | 20,2 | 0,9 | 7 |
| "Podbelskaya" | 4,7 | 19,3 | 0,7 | 9 |
| "Samarkandskaya " | 3,8 | 18,7 | 0,6 | 10 |
| "Shpanka chernaya" | 4,8 | 20,1 | 0,8 | 8 |
| EKF $_{05}$ | | | | |
| Sx= | | | | |

In the analysis of these results, the results obtained on the morphometric parameters of the fruits of each variety of cherry were compared and statistically reliable differences were determined.

It should be said that taking into account that cherry fruits are considered one of the most important fruits for food and processing industry in agriculture, when evaluating cherry varieties, the morphometric indicators of fruit length, diameter, circumference, weight indicators, as well as parameters such as the length and width of the grain (pig) were analyzed by comparing cherry varieties.

It is known that cherry varieties are important in determining economic value, marketability and suitability for processing. In the course of our research, it was found that the average fruit diameter of different varieties of cherry varies from 18.7 mm to 20.2 mm, the diameter varies from 24 to 35 mm, and the weight varies from 3.8 g to 50.0 g. It was observed that the fruit weight depends on the characteristics of the variety and agrotechnical conditions.

Large-fruited cherry varieties are generally highly marketable and meet market demand. The morphometric parameters of cherry fruit kernels also became important in evaluating the biological characteristics of the varieties. The grain length is 0.9-15 mm and the width is 5-9 mm, and its ratio to the fruit mass is also analyzed among the varieties. Cherry fruit varieties with a small percentage of seeds are considered preferable for consumption, and the storability of these varieties was analyzed in further experiments.

The results of the morphometric analysis of cherry fruits show that, along with genetic characteristics, differences between cherry varieties are also observed to depend on climatic conditions, soil fertility and the level of agrotechnical methods of their cultivation. As a result of a comprehensive analysis of the morphometric indicators of cherry fruits, the suitability of these varieties for storage of their fruits was determined. Taking into account the biological characteristics of the fruits of cherry varieties, technological parameters and the duration of the studied processes, the changes that occurred in plant tissues were assessed. At the same time, changes in the composition of carbohydrates, mono- and disaccharides, and pectin substances in the fruits of cherry varieties were studied.

It is known from scientific sources that the increase in monosaccharides in the composition of cherry fruits occurs due to the hydrolysis of disaccharides (sucrose) under the influence of the sucrase enzyme. In addition, in order to reduce cryodamage in cherry fruits during freezing, it would be advisable to use a protective mechanism for accumulating sugars.

The decrease in the content of monosaccharides in cherry fruits depends on the biological characteristics of the variety. The content of soluble carbohydrates in the fruits was observed to be from 89.8% (Shpanka chernaya) to 88.6% (Samarkandskaya).

Along with mono- and disaccharides, organic acids in cherry fruits are the most important quality indicators, which provide the sourness of the fruits, and their accumulation during storage leads to an increase in oxidation processes.

Organic acids in cherry fruits are important indicators, which determine the specific taste of cherry fruits and indicate that their general composition depends on the characteristics of the variety.

Depending on the cherry variety, citric, malic, oxalic and succinic acids, as well as malonic and fumaric acids, predominate among organic acids.

During freezing and storage of cherry fruits, the titratable acidity increases in the fruits of all cherry varieties. The value of this indicator varies in the fruits, but the increase in the amount of organic acids depends on the cherry variety. Our experiments have shown that when cherry fruits are rapidly frozen, the maximum increase in acidity after 12 months of storage is 28-30% of the organic acids in the freshly picked fruits (Table 1).

**Table 1**

**Indicators of changes in the content of ascorbic acid in fruits during rapid freezing and storage of cherry varieties (2024-2025)**

| № | Cherry varieties | Amount of ascorbic acid, mg/100 g | | | | | | Storage of ascorbic acid, % |
|---|---|---|---|---|---|---|---|---|
| | | fresh fruits | after freezing | Indicators in months | | | | |
| | | | | 3 | 6 | 9 | 12 | |
| 1 | Lyubskaya 15, | 96,6 | 92,4 | 82,5 | 73,3 | 65,2 | 58,6 | 60,4 |
| 2 | Shpanka is black, | 96,2 | 91,8 | 81,7 | 72,6 | 66,3 | 56,5 | 59,3 |
| 3 | Samarkandskaya | 96,8 | 92,6 | 82,5 | 72,5 | 66,4 | 59,4 | 59,6 |
| 4 | Podbelskaya | 95,9 | 91,7 | 81,6 | 72,6 | 66,2 | 59,5 | 59,7 |
| EKF$_{05}$ | | 0,4 | 0,5 | | | | | 0,4 |
| Sx= | | 0,012 | 0,014 | | | | | 0,011 |

Organic acids in cherry fruit are important indicators that determine the specific taste of cherry fruit and indicate that their general composition depends on the characteristics of the variety.

Depending on the cherry variety, citric, malic, oxalic and succinic acids, as well as malonic and fumaric acids, predominate among organic acids.

Conclusion: During the freezing and storage of cherry fruits, the titratable acidity increases in the fruits of all cherry varieties. The value of this indicator varies in the fruits, but the increase in the amount of organic acids depends on the cherry variety. When cherry fruits were quickly frozen and stored for 12 months, the maximum increase in acidity was 28-30% of the organic acids in the composition of freshly picked fruits.

**REFERENCES**

1.Арипов М.М., Маматов Ш.М., Мелибоев М.Ф., Қодиров У.Р. Экспериментальное изучение технология быстро замораживание черешня. Нам ДУ илмий ахборотномаси - Научный вестник Нам ГУ 2020 йил 4-сон. Тошкент - 2020 –С. 54-60

2. IS Yaxshibekovich, N.B Sheraliyevich. “Limon mevalarini sovutkichli omborxonalarda saqlash” Innovative developments and research in education 4 (37), 89-92 2025

3. I.S Yaxshibekovich, N.B Sheraliyevich. “Limon o ‘simligininig novdalarini past haroratga chidamliligini oshirishda turli-xil bioo ‘g ‘itlar bilan oziqlantirishning ta’siri” Innovative developments and research in education 4 (37), 85-88 2025

4. Арипов М.М., Қодиров У.Р., Маматов Ш.М., Туробжонов С.М. Экспериментальные исследования сублимационной сушки. Universum: Технические науки: Научный журнал. – Москва, 2019. –№9(66). –С. 36-38.

4.Nortojiyev B, .Daminova Limon mevalarini saqlash jarayonida biokimyoviy tarkibini va oziqaviy moddalar miqdorining o‘zgarish “O‘zbekiston agrar xabarnomasi” jurnali. № 62 (20). Toshkent, 2025 – B. 136-138

5. N.B Sheralievich, D.D Djambulovna “Analysis of various changes in the composition of cherry fruits (Prunus serasus L.) during quick freezing and storage”
American journal of education and learning 3 (6), 1109-1112

6. Хакимов Р.Х., Шарипов С.Я., Хакимова М.Б., Пекин карамини замонавий совуткичли омборларда сақлаш технологияси Progress Annals: Journal of Progressive Research Volume 2, Issue 6, June 2024 ISSN (E): 2810-6466 Website: https://academiaone.org/index.php/8

7. Xakimov R.X., Xakimova M.B. Impact of packaging materials on the preservation of beijing cabbage GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ) ISSN (E): 2347-6915 Vol. 12, Issue 6 June (2024)

8.https://m.olx.uz/d/obyavlenie/olchani-muzlatish-hizmati-usluga-zamarozhki-vishni-olchalarni-35c-ar-ID43SVC.html.

9.https://rostok-pitomnik.ru/agrotekhnika/opisanie-tovarov/vishnya-shpanka