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Study of the Biochemical Composition of Tropical Bulbs during Storage

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Annotation

The article presents the results of experiments on the dependence of the biochemical composition of Jerusalem artichoke tubers during storage, including changes in carbohydrate content depending on the duration and method of storage.

Enter. The production of healthy food products is now an important branch of the development of the food industry. Increasing the assortment of products that not only provide the necessary energy to the daily diet of the population, but also those that strengthen their health and support the immune system is one of the urgent tasks facing the producers today. Therefore, the composition of the products is enriched with functional additives such as dietary fiber, vitamins, antioxidants, unsaturated fatty acids, pro and prebiotics [1].

Prebiotics are a functional food additive that ensures the quality of the development process in the human body, increases immunity, improves the digestive system, and inulin and fructooligosaccharides are the most effective of them. Jerusalem artichoke tubers are the main natural source of these substances, and its cultivation is convenient in the conditions of Uzbekistan. It is only necessary to solve a number of technological problems in order to reprocess them and start the production of products at a modern level. Therefore, it is necessary to improve the processing technology of Jerusalem artichokes and to establish their use as raw materials in the preparation of functional food products. 3 Jerusalem artichokes as a research object “Fayz-baraka”, “Mo‘jiza” and “E’tirof”the production technology of new products and food products was selected. The subject of the research is the indicators that express the characteristics of Jerusalem artichoke as a raw material, their evaluation criteria, the changes in its biochemical composition, the initial processing and packaging of Jerusalem artichoke bulbs before storage [2].

Research materials and style. The quantity and quality of carbohydrates in Jerusalem artichokes are of great importance in the production of products rich in inulin, and depending on the level of these indicators, the efficiency of processing and production of raw materials is determined. According to the analysis of the studied literature and conducted researches, the carbohydrate content of Jerusalem artichokes depends on the variety, growing conditions, harvesting period and post-harvest storage

conditions.

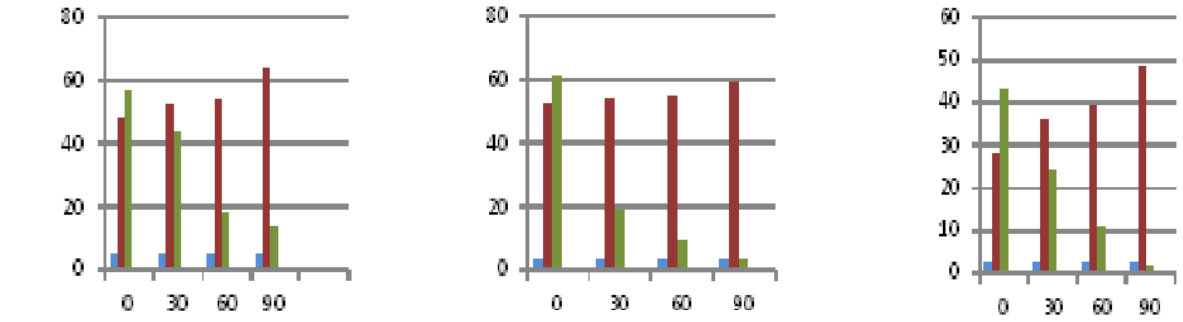
Torinambrun in the conditions of Samarkand region “Fayz-baraka” It was observed that all indicators were higher in the variety compared to other varieties. It is known that after harvesting, it is necessary to store them for a certain period before processing. From this point of view, studies of the carbohydrate content of Jerusalem artichoke tubers as raw material during storage were carried out [3].

Results and their analysis. Selected for experiments “Fayz-baraka”, “M o‘jiza” ва “E’tirof” The average yield of varieties is 250-300 ts/ha, and it is usually ready in the first half of autumn. The experiments were carried out under 2 different conditions: the first one was stored in refrigerators at a temperature of +2±2°C for 3 months, and the second one was stored for 3 months in a normal storage warehouse at a temperature of +20±2°C [4].

In the first option, the stages of sorting, washing and drying in the open air were carried out from each variety, and a sample of 10 kg was taken and stored in refrigerators at a temperature of +2±2°C. Samples were analyzed every 30 days (Figure 1).

In the second option, 10 kg of samples were taken from each variety and stored in unwashed boxes at a temperature of +20±2°C in a normal storage warehouse. Again, samples were analyzed every 30 days (Figure 2).

The mass fraction of inulin, reduced and total sugar was determined. The analysis showed that the amount of reducing sugar did not change much during storage. The amount of total sugar in tubers stored in refrigerators at a temperature of +2±2°C increased during storage. Including total sugar content before storage“Fayz-baraka” навида 48%, “M o‘jiza” 52%, “E’tirof” while it was 28% in the original, after 90 years of storage, this indicator was 63, 59 and 48%, respectively. As a result, the total amount of sugar in Jerusalem artichoke nodules increases during storage. It was also confirmed that the amount of inulin decreases during storage.



l Figure 1. Changes in the amount of total sugar and inulin during the storage of Jerusalem artichoke bulbs in the temperature regime of +2±2°C (2020-2022)*а) “Fayz-baraka”, б) “M o‘jiza” , с)“E’tirof”*

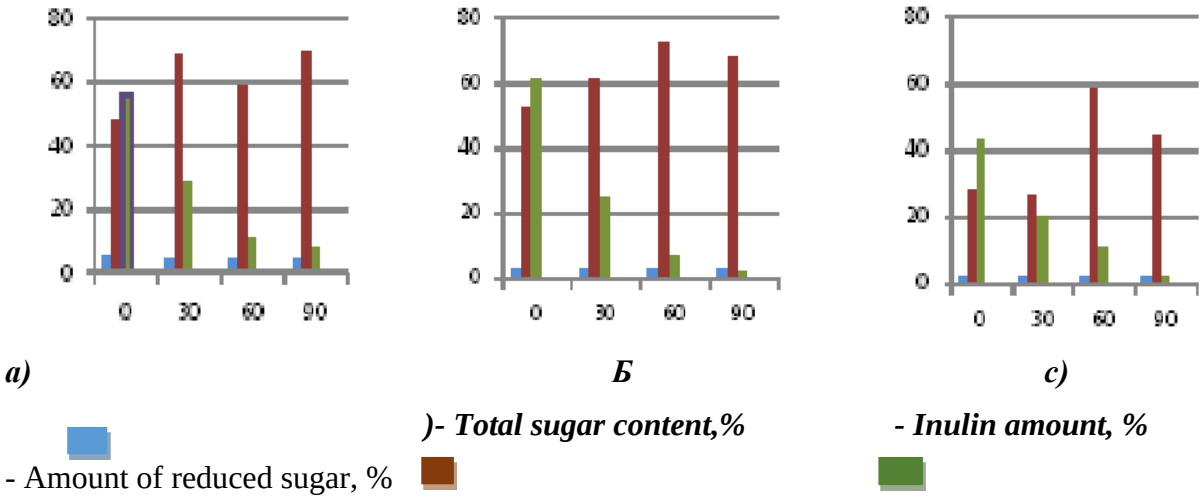


Figure 2. Changes in the amount of total sugar and inulin during storage of Jerusalem artichoke tubers at a temperature of +20±2°C (2020-2022): *a) "Fayz-baraka", б) "M o'jiza" , "E'tirof"*

For example, when we kept the "Fayz-baraka" buds in a cold state, 56% of them were in new buds, but after 30 days, this indicator dropped to 43%. After 60 days of storage, it decreased sharply and decreased by 18%, and after 90 days, 14% of inulin content was recorded.

The above-mentioned feature was the same in all varieties studied.

The second method of storage, i.e., the changes in the content of carbohydrates in tubers during 90 days were also analyzed when they were stored in ordinary storage warehouses at a temperature of +20±2°C. In this method, the amount of reduced sugar remained almost unchanged. And the amount of total sugar was constantly increasing. The reason for this was the acceleration of the rate of evaporation due to relatively high temperature in the stored product and the increase of the amount of dry matter. Because the total mass of the product has also decreased. However, a sharp decrease in the mass fraction of inulin was observed. For example, at the initial stage of storage, "Fayz-baraka" variety had 56%, "M'jiza" variety had 61%, and "Itirof" variety had 43%, after 90 days of storage, these indicators were 8, 2, and 2%, respectively. organized.

Hydrolysis of polysaccharides occurred when tuganaks were stored in this mode. It was also observed that the level of damage caused by microorganisms has increased.

During the storage of Jerusalem artichokes, its biochemical composition was also analyzed (Fig 3).

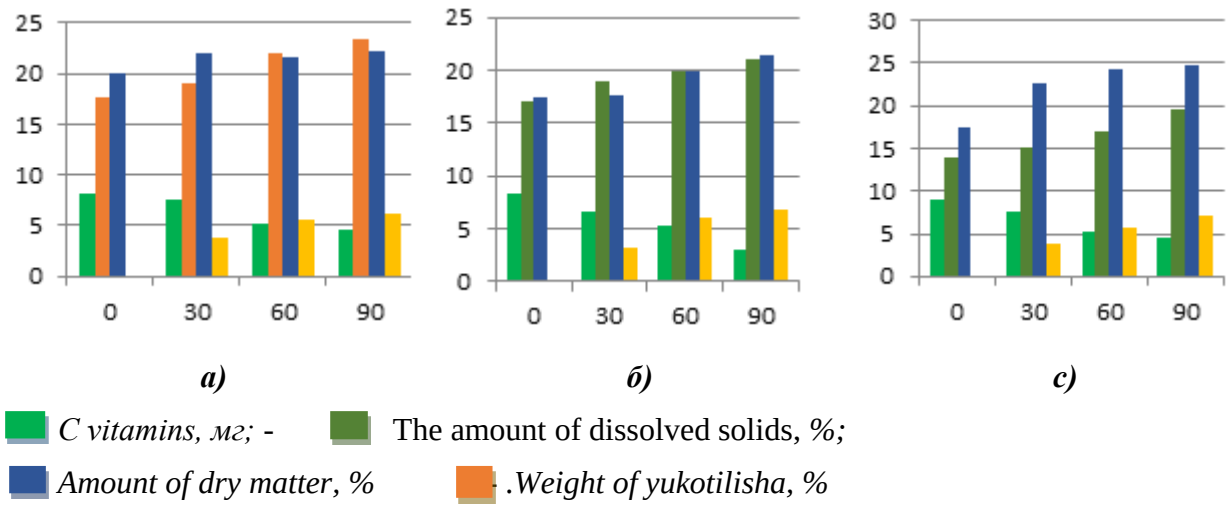


Figure 3. Changes in physical and chemical parameters during storage of Jerusalem artichoke tubers at +2±2°C temperature regime (2020-2022): *a) "Fayz-baraka", б) "M o'jiza" , "E'tirof"*

Indicators such as vitamin C, total and soluble dry matter content, natural reduction amount in Jerusalem artichokes are the most important quality indicators.

Vitamin C is the most common component in plant products, and ascorbic acid is an important substance that actively participates in enzymatic processes in the body. Often, during storage, the amount of vitamin C is lost more in vegetables than in fruits.

This law was also observed in the experiments. For example, the amount of vitamin C in «Fayz-baraka» variety was 8.2 mg/% initially, but after 90 days of storage, this indicator was 4.68 mg/%. It was observed that the amount of total and soluble dry matter increases.

Summary. 1. Based on the above-mentioned indicators, it can be concluded that the total amount of sugar in Jerusalem artichoke tubers increases during cold storage.

2. Inulin substance, on the contrary, decreases more and more. Also, when stored in a simple way, the amount of inulin decreases dramatically.

3. Therefore, in the production of functional products, it is advisable to keep the raw materials cold and process them as quickly as possible.

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