

***Prunus cerasifera* Ehrh. fruits are a source of biologically active substances and high-quality feedstock for Food for Specific Health Use**

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Abstract. From the Southern Coast collection of *Prunus cerasifera* Ehrh. the fruits cultivars of the Nikitsky Gardens' breeding Medovaya, Olenka, Rumyanaya Zorka and Idilliya were distinguished by their high taste qualities and the content of BAS. According to the norms of the Russian Federation, the fruits of these cultivars belong to the group of products with a high content of potassium and cuprum; satisfactory content of magnesium and ferrum, pastilles and jams from them belong to the group of products with a satisfactory content of potassium and cuprum. Cherry plum fruits, especially dark-colored ones, are a natural complex source of antioxidants, characterized by a high content of phenolic compounds and cuprum, and a satisfactory content of ascorbic acid and zinc. The content of pectin substances in the studied cultivars is comparable to that in apples. The fruits of the Idyllia cultivar with dark-colored pulp are distinguished by the maximum accumulation of pectins - 1.14%, ascorbic acid - 9.3, phenolic compounds – 441 mg/100 g, potassium – 11239, magnesium - 464, ferrum -10.81, zinc - 10.23, cuprum - 4.17, manganese - 0.228 mg/kg. Cherry plum fruits are characterized by a high content of BAS and are suitable for use in health nutrition both in fresh form and as raw materials for Food for Specific Health Use.

1 Introduction

Since 2018, Rosпотребнадзор has been implementing the project “Healthy Food is Health of the Nation” which mission is to improve the life quality and health of citizens by providing safe and high-quality food products [1]. To solve this problem, functional products (FP) - Food for Specific Health Use are developed. They differ from the common products due to the high content of biologically active substances (BAV), good taste and

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nutritional value, either preventive, therapeutic and health-improving properties, affecting the functional activity of particular organs, systems and the body as a whole, stimulating their activity [2]. Unlike dietary supplements, FPs contain a healthy ingredient in a physiological concentration right in the composition of a traditional food product.

Nature conditions make Crimea a large center for the production of Food for Specific Health Use (functional products or FP). To achieve this goal, it is necessary to use cost-effective fruit crops, when planting industrial orchards in Crimea. Their fruits not only have good taste, but are also healthy and may be used as feedstock for FP.

Prunus cerasifera Ehrh. is one of these crops, since it can grow in a wide range of soil and climatic conditions, quickly starts fruiting, produces high and stable yields [3, 4]. It is especially important that cherry plum is resistant to diseases, i.e. it does not require the use of chemical protection means [5] and therefore gives environmentally friendly fruits suitable for obtaining functional products. In addition, *Prunus cerasifera* Ehrh. fruits have long been used in folk medicine in the Caucasus, Central Asia, Belarus and Ukraine [6].

After many years of research in the Nikita Botanical Gardens, cherry plum cultivars with important consumer qualities and a high content of biologically active substances in fruits were selected from the collection. They may become a source of feedstock for FP [7, 8]. Previously, it was found out that pastila made from the cherry plum fruits with yellow pulp of the cultivars, originated in the Nikita Botanical Gardens, are superior to apricot frutilades (produced by Ltd Beloe Derevo, Novosibirsk, sold through the pharmacy network as a biologically active food additive) with black currants, with cranberries and raspberries. They exceed frutilades in magnesium content by 1.9 - 4.2 times, ferrum - 1.7 - 2.4 times, zinc - 9.4 - 23.6 times, cuprum - 1.4 - 4.42 times, manganese - 2.0 - 7.1 times [9].

The goal of the work was to study the content of biologically active substances, including essential elements in *Prunus cerasifera* Ehrh. fruits of the cultivars originated in the Nikita Botanical Gardens and their products.

“An element is considered vital (essential) if, in its absence or inadequate intake, the body stops developing, cannot go through its biological cycle, in particular, is not capable of reproduction. The intake of the missing element eliminates the signs of its deficiency and restores vitality to the body” [10]. These elements include K, Ca, Mg, Fe, Zn, Cu, and Mn.

2 Materials and Methods

The studies have been made in the Nikita Botanical Gardens from 2017 to 2020. The object of the studies was the fruits of four cherry plum cultivars originated in the Nikita Botanical Gardens - *Medovaya*, *Olenka*, *Rumyanaya Zorka* - with yellow pulp and *Idilliya* - with dark red pulp, collected at the stage of commercial maturity, as well as their processed products: pastila and jams. The products were made from fruits of a particular cultivar, jams – according to GOST [11], and sugar free pastila was produced by drying the chopped pulp on baking sheets in a drying cabinet at t 60°C.

Prunus cerasifera Ehrh. trees grow on the collection plot in the Nikita Botanical Gardens, located on the southern coast of Crimea (SCC), under the uniform soil, microclimatic and agrotechnical conditions, so that the difference in the chemical composition of their fruits is due to the cultivar characteristics. The experimental plot is located at an altitude of 195-200 m above sea level on terraces with brown, slightly carbonate soils. The SCC is characterized by an arid subtropical climate of the Mediterranean type with a predominance of precipitation in the autumn-winter period and dry summer [12].

To assess the amount of biologically active substances, the common methods were used. The dry matter content was determined gravimetrically [13]; free organic acids - by titration with 0.1 N sodium hydroxide [14]; leuco-anthocyanins and anthocyanins amount -

by photometric method (cuvette thickness 5 mm, red filter (540 nm)); ascorbic acid - by titration with potassium iodate, the amount of mono- and disaccharides - by the Bertrand method; pectin substances - colorimetrically, with values conversion to galacturonic acid [15].

The analysis of the fruit mineral composition was carried out by the method of dry ashing [16]. In the obtained hydrochloric acid solution using an atomic absorption spectrophotometer Kvant 2MT, the content of seven essential elements was determined: calcium, magnesium, ferrum, cuprum, manganese, and zinc - in the absorption mode, potassium - in the mode emissions [17]. The data obtained were compared with the approved dietary norms of daily macro- and microelements consumption, presented from the minimum necessary (min norms of daily intake) to the maximum allowable (max norms of daily intake) [10] and with the same indicators of the most popular jams, produced commercially [18].

Data were processed with "Excel.2010" software.

3 Results and Discussion

In the South Coast collection of *Prunus cerasifera* Ehrh. in the Nikita Botanical Gardens, fruits of the cultivars originated in the Nikita Botanical Gardens - *Idillia*, *Medovaya*, *Olenka* and *Rumyanaya Zorka* were selected due to their good taste and high amount of pectin substances. These qualities enabled jam and pastila production - environmentally friendly, natural products, since the cherry plum trees grow far from roads and they are not treated.

The fruits of the studied cherry plum cultivars bred in the Nikita Botanical Gardens are characterized by a high potassium content: from 2.8 max norms of daily intake in the cherry plum cultivar *Rumyanaya Zorka* to 3.7 max norms of daily intake in the cultivar *Idilliya* (Fig. 1). When compared with the sources of potassium accepted by dietetics, the cherry plum fruits of the NBG originated cultivars are second only to apricots, while they contain this essential element 1.3-1.7 times more than figs and up to 1.4 times more than feijoa and raisins.

In pastila produced only from the pulp of a particular cultivar, the minimum potassium content was: 0.69 max norms of daily intake – in the cultivar *Rumyanaya Zorka*, the maximum was 0.98 max norms of daily intake - in the cultivar *Idilliya* while in pastila from the other two cultivars it was almost the same - 0.91 max norms of daily intake. This is slightly less than in the commercial prune fruitlade (0.95 max norms of daily intake), which includes potassium sorbate, indicated on the package. Thus, commercial prune fruitlade contains more potassium than the cherry plum pastila made of yellow pulp fruits, but less than the cherry plum pastila made of dark red pulp fruits.

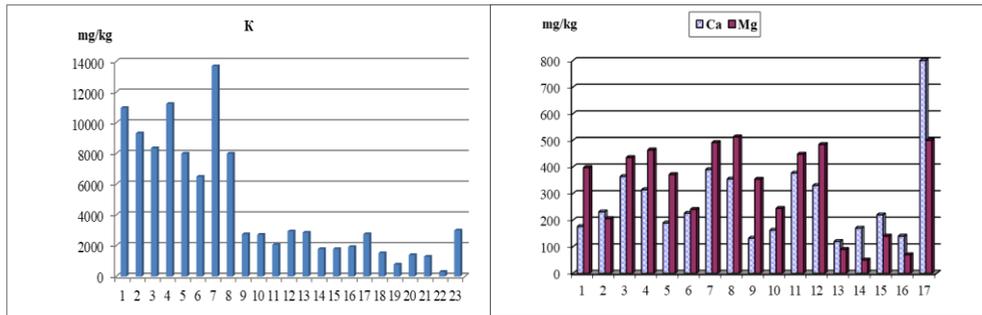


Fig. 1. Potassium content in fruits and some foods.

fruit: 1 – *Medovaya*, 2 – *Olenka*, 3 – *Rumyanaya Zorka*, 4 – *Idilliya*; 5 – feijoa, 6 – figs, 7 – dried apricots, 8 – raisins; pastille: 9 – *Medovaya*, 10 – *Olenka*, 11 – *Rumyanaya Zorka*, 12 – *Idilliya*, 13 – from prunes; jam: 14 – *Medovaya*, 15 – *Olenka*, 16 – *Rumyanaya Zorka*, 17 – *Idilliya*, 18 – apricot, 19 – tangerine, 20 – blackcurrant, 21 – apple; 22 – min norms of daily intake of the element, 23 – max norms of daily intake of the element

Fig. 2. The content of calcium and magnesium in fruits and some foods.

fruit: 1 – *Medovaya*, 2 – *Olenka*, 3 – *Rumyanaya Zorka*, 4 – *Idilliya*; pastille: 5 – *Medovaya*, 6 – *Olenka*, 7 – *Rumyanaya Zorka*, 8 – *Idilliya*; jam: 9 – *Medovaya*, 10 – *Olenka*, 11 – *Rumyanaya Zorka*, 12 – *Idilliya*, 13 – apricot, 14 – tangerine, 15 – blackcurrant, 16 – apple; 17 – min norms of daily intake of the element, 18 – max norms of daily intake of the element

Jams made from cherry plum fruits of the Nikita Botanical Gardens cultivars contain from 0.59 to 0.92 max norms of daily intake of potassium, and surpass the commercially produced ones in this indicator: apricot jams by 1.2-1.8 times, blackcurrant jams by 1.3-2.0 times, tangerine jam by 2.3-3.5 times, apple jam by 1.4-2.1 times (Fig. 1).

Thus, the fruits of cherry plum cultivars originated in the NBG - *Medovaya*, *Olenka*, *Rumyanaya Zorka*, and *Idilliya*, according to the standards of the Russian Federation [17], belong to the group of products with a high potassium content (more than 10% of the daily requirement of the body in 100 g of product), and pastila and jams made of these cultivars' fruits - to a group of products with a satisfactory potassium content (from 5 to 10% of the daily requirement of the body in 100 g of the product).

Potassium is one of the most important macronutrients for the cardiovascular system, as it forms a "potassium-sodium pump" together with sodium. It is necessary for the cell nutrition, the activity of muscles, including the myocardium, maintenance of the water-salt balance, and the work of the neuroendocrine system. Potassium deficiency reduces performance, slows down wound healing, and leads to impaired neuromuscular conduction and reproductive function [10]. In this regard, plants rich in potassium are of great interest as feedstock for functional products and human health improvement.

The content of calcium in the cherry plum fruits of the cultivars originated in the NBG and their products is low: from 0.16 min norms of daily intake in jam, 0.22 min norms of daily intake in fruits and 0.23 min norms of daily intake in pastila from the cherry plum cultivar *Medovaya* to 0.46 min norms of daily intake in fruits, 0.47 min norms of daily intake in jam and 0.49 in cherry plum pastila from the cultivar *Rumyanaya Zorka* (Fig. 2). At the same time, the content of calcium in all jams made from cherry plum cultivars originated in the NBG is higher than in apricot commercial products, and in cherry plum jam from the cultivar *Idilliya* it is 1.5-2.75 times higher than in 4 types of commercial products (Fig. 2).

Based on magnesium content, the fruits of the studied cherry plum cultivars can be referred to products with a satisfactory content of this essential element according to the standards of the Russian Federation [18]. Among the four studied cherry plum cultivars, the

maximum amount of magnesium is in *Idilliya* fruits - 0.62 max norms of daily intake, the minimum – in *Olenka* fruits - 0.27 max norms of daily intake (Fig. 2).

Magnesium is a macronutrient that is extremely important for the psychological balance of a person. Under a lack of magnesium in the body, lethargy, irritability, muscle cramps, immunodeficiency are observed, and attention deficit disorder develops [10]. The consumption of foods high in magnesium is especially important at the present time, since during the COVID-19 pandemic, stress reactions of the population increased, the level of anxiety and depression among students increased significantly [19-21]. In 53% of cases, respondents reported a moderate or severe psychological impact of a pandemic [22].

Jams made from cherry plum fruits of the NBG breeding contain this element, which is extremely important, especially for a growing organism, 3.9-9.7 times more than commercial jams. And in the cherry plum pastila, the magnesium content is even higher (Fig. 2), 2.8-10.2 times more than in apricot frutilades with black currant, with cranberries and raspberries produced by Ltd "Beloe Derevo", Novosibirsk, sold through the pharmacy network as a biologically active dietary supplement.

Another vital element is ferrum. It significantly affects human health and performance, being a key micronutrient for blood formation. Ferrum deficiency causes anemia, changes in the heart and skeletal muscles, as well as immunodeficiency states, which is extremely dangerous in a pandemic [10].

In terms of ferrum content in cherry plum fruits, *Idilliya* cultivar is out from the four studied ones, as it has been revealed that its fruits contain 1.1 min norms of daily intake, and in pastila and jam it is - 0.7 and 0.8 max norms of daily intake, respectively. Thus, it enables to classify them as foods with a high content of this essential element [18]. Cherry plum fruits, pastila and jam from *Rumyanaya Zorka* cultivar, containing ferrum 0.69, 0.72 and 0.71 min norms of daily intake, respectively, have been referred to products with a satisfactory ferrum amount [18].

Pastila from cherry plum cultivars originated in the NBG contains 1.8 - 7.1 times more ferrum than pharmacy apricot frutilades with black currant and with cranberries and raspberries (Fig. 3). And in jam from *Idilliya* cherry plum fruits, the ferrum content is 1.3 times higher than in apple jam, 1.7 times higher than in apricot jam and 3.3 times higher than in black currant jam (Fig. 3).

Zinc is involved in over 300 enzymatic reactions (more than any other element). Due to the main role of zinc in such a number of enzymes, a decrease in its amount affects almost all body systems, including the central nervous and reproductive systems [10, 23]. Zinc is of great importance in the formation of immunity. Low zinc content in the body results in a great chance of pneumonia and upper respiratory tract infections [24].

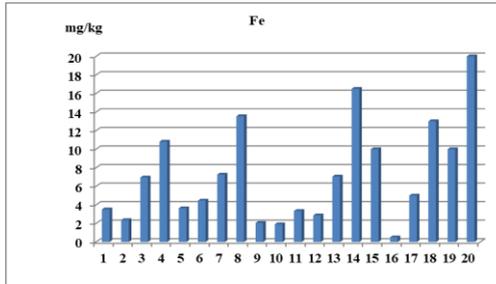


Fig. 3. The content of ferrum in cherry plum fruits and some foods.

fruit: 1 – *Medovaya*, 2 – *Olenka*, 3 – *Rumyanaya Zorka*, 4 – *Idilliya*; pastille: 5 – *Medovaya*, 6 – *Olenka*, 7 – *Rumyanaya Zorka*, 8 – *Idilliya*, 9 – black currant, 10 – cranberries and raspberries; jam: 11 – *Medovaya*, 12 – *Olenka*, 13 – *Rumyanaya Zorka*, 14 – *Idilliya*, 15 – apricot, 16 – tangerine, 17 – blackcurrant, 18 – apple; 19 – min norms of daily intake of the element, 20 – max norms of daily intake of the element

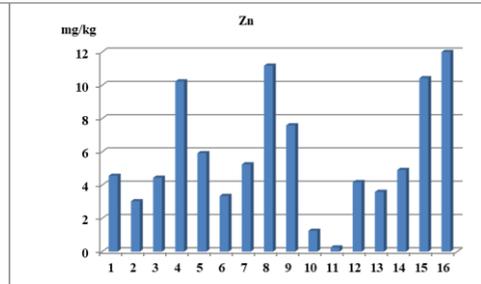


Fig. 4. The content of zinc in cherry plum fruits and some foods.

fruit: 1 – *Medovaya*, 2 – *Olenka*, 3 – *Rumyanaya Zorka*, 4 – *Idilliya*; pastille: 5 – *Medovaya*, 6 – *Olenka*, 7 – *Rumyanaya Zorka*, 8 – *Idilliya*, 9 – from prunes, 10 – black currant, 11 – cranberries and raspberries; jam: 12 – *Medovaya*, 13 – *Olenka*, 14 – *Rumyanaya Zorka*, 15 – *Idilliya*; 16 – tangerine, – min norms of daily intake of the element, 17 – max norms of daily intake of the element

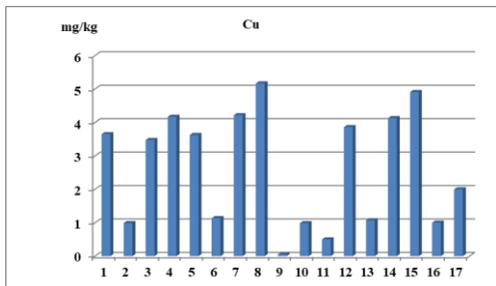


Fig. 5. The content of cuprum in cherry plum fruits and some foods.

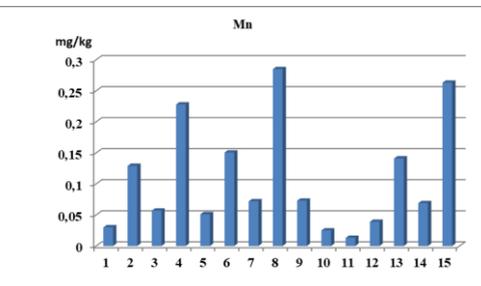


Fig. 6. The content of manganese in cherry plum fruits and some foods.

The highest zinc amount is in the cherry plum fruits with red pulp of the cultivar *Idilliya* - 0.85 min norms of daily intake, and their processed products: pastila - 0.93 and jam - 0.87 min norms of daily intake (Fig. 4) that let us to classify them as products with a satisfactory content of this essential element, according to the standards of the Russian Federation [18]. The cherry plum fruits of the cultivar *Olenka* contain less zinc than all the other studied cultivars - 0.25 min norms of daily intake and cuprum - 1 min norms of daily intake, as well as their processed products: pastila - 0.30 min norms of Zn and 1.1 min norms Cu and jam - 0.28 min norms of daily intake Zn, and 1.1 min norms of daily intake Cu. At the same time, in general, cherry plum fruits and their products are characterized by a high content of cuprum: up to 2.5 max norms of daily intake (Fig. 5), which makes classified as products with a high content of this essential element [18]. Threshold limit value (TLV) of cuprum in vegetables, berries, fruits and their products is 5 mg/kg [25].

Cuprum has a strong anti-inflammatory effect and is an essential component for the normal functioning of the nervous and immune systems. This essential trace element stimulates the synthesis of thyroxine, the main thyroid hormone; necessary for the formation of connective tissue, cartilage, ligaments, vascular walls, myelination of nerves [10]. Since cuprum is essential for the body to absorb ferrum, it is very common for cuprum deficiency to cause low hemoglobin.

Previously, it has been confirmed that cherry plum jam, with high cuprum content, positively affects the stability of the nervous system of adolescents [26].

Manganese (Mn) also demonstrates a pronounced anti-inflammatory effect, is an activator of enzymes involved in carbohydrate and protein metabolism, improves bone strength, improves reproductive function and normalizes the functioning of the central nervous system [10].

The content of manganese in the studied samples varies greatly: from 0.015 min norms of daily intake in fruits of *Medovaya* cherry plum to 0.14 min norms of daily intake in *Idilliya* cherry plum pastila. In general, the manganese content in all 12 samples is low, however, in fruits and products from the cultivar *Olenka*, there is several times more manganese, and in the *Idilliya* cultivar - order more, than in fruits and products from the cultivars *Medovaya* and *Rumyanaya Zorka* (Fig. 6). Comparison of the pastila from the NBG cherry plum with the frutilads, revealed that in the prune frutilade, there is the same amount of manganese as in the cherry plum pastila from *Rumyanaya Zorka* fruits and 1.4 times more than in the cherry plum pastila from *Medovaya* cultivar. At the same time, it is 2.1 and 3.9 times less than in cherry plum pastila from *Olenka* and *Idilliya* cultivars, respectively. Despite the fact that manganese sulfate is added to the frutilads, as indicated on the package, in the cherry plum pastila from 4 cultivars originated in the NBG, the content of this microelement is 2.1-21.9 times higher than in frutilads with black currant and with cranberries and raspberries (fig. 6).

The benefits of consuming fruits are often justified with their high antioxidant content. A wide range of antioxidant activity is determined by polyphenols in fruits. These include, but are not limited to: flavonoids (catechins, leuco-anthocyanins), flavonols and anthocyanins [27]. A lot of studies confirm the successful use of polyphenols for the treatment and prevention of a number of diseases, including cardiovascular and cancer [28-30].

Since anthocyanins are pigment substances that determine the red color of fruits, their maximum amount is in cherry plum with red pulp – the cultivar *Idilliya* (Table 1). Among the yellow-pulp cultivars, the *Olenka* cultivar stands out; in its fruits there are 4.2 times less anthocyanins (Table 1).

Table 1. Chemical composition of fresh cherry plum fruits (% fresh mass).

Cultivar	Dry matter, %	Monosaccharides, %	Total saccharides, %	Ascorbic acid, mg/100g	Flavonols, mg/100g	Titrateable acidity, %	Leuko-anthocyanins, mg/100g	Anthocyanins, mg/100g	Total phenolic compounds, mg/100g	Total pectin substances, %
Medovaya	18.7 ± 0.61	4.38 ± 0.54	11.41 ± 1.89	5.96 ± 0.79	4.8 ± 0.6	1.31 ± 0.2	184 ± 12.00	0,00	247.5 ± 22.5	0.55 ± 0.11
Olenka	14.67 ± 0.13	5.86 ± 1.02	9.33 ± 1.67	6.91 ± 0.31	17.55 ± 1.9	1.44 ± 0.21	64.00 ± 8.06	102.5 ± 7.51	151.5 ± 8.50	0.62 ± 0.13
Rumyanaya Zorka	14.35 ± 1.15	5.06 ± 0.99	9.08 ± 1.93	6.9 ± 0.34	3.25 ± 0.46	1.98 ± 0.03	134.5 ± 23.5	0.00	164 ± 14.00	0.72 ± 0.21
Idilliya	15.7 ± 1.15	4.7 ± 1.22	11.3 ± 1.53	9.3 ± 1.16	28.45 ± 12.45	1.9 ± 0.37	243.3 ± 29.31	429 ± 33.87	470.00 ± 43.41	0.78 ± 0.24

Note: X – mean ± SE.

Leuko-anthocyanins, being the precursors of catechins, contribute to the effective assimilation of vitamin C. In terms of leuko-anthocyanins content, the cultivar *Idilliya* with dark-colored fruits surpasses cherry plum cultivars with yellow pulp, particularly, in *Olenka* cultivar fruits, this indicator is 3.8 times lower (Table 1).

Leuko-anthocyanins and anthocyanins belong to the group of phenolic compounds. One of the main their feature is a decrease in the permeability and fragility of the blood capillaries walls [31]. In addition to the fact that phenolic compounds are the most important natural antioxidants, they have radioprotective, antitumor, anti-inflammatory, antispasmodic, hypotensive and bactericidal activity. [32].

In terms of the flavonols content and the phenolic compounds amount, the cultivar *Idilliya* with dark-colored fruits significantly surpasses the cherry plum cultivars with yellow pulp (Table 1). Phenolic compounds are more effective in the presence of ascorbic acid, which in turn protect from oxidation.

Ascorbic acid (AA) is involved in the redox processes in the human body, stimulating the brain activity, regulating metabolism, including lipid one, affecting the state of the blood. AA stimulates growth, improves appetite, raises the general tone of the body, and enhances the production of interferon, which provides human immune protection [33]. The content of AA in fruits of all studied cultivars is low, from a minimum of 5.96 mg/100g in cherry plum cultivar *Medovaya* to a maximum of 9.3 mg/100g in the cultivar *Idilliya* fruits (Table 1). Comparing jams from cherry plum cultivars originated in the Nikita Botanical Gardens with commercial products (data by I.M. Skurikhin. (2002)) it should be noted that the content of ascorbic acid (AA) in the studied cherry plum cultivars is lower than in blackcurrant jam (40 mg/100g) and tangerine jam (10 mg/100g), the same or higher than in strawberry jam (4 mg/100g) and higher than in raspberry (3 mg/100g), apricot (2.4 mg/100g) and apple jam (0.5 mg/100g) (Table 2).

Table 2. Chemical composition of the cherry plum fruit products (% fresh mass).

Cultivar	Dry matter, %	Soluble dry substances, %	Titrateable acidity, %	Ascorbic acid, mg/100g	Flavonols, mg/100g	Total phenolic compounds, mg/100g
<i>pastila</i>						
Medovaya	84.60 ± 4.06	85.20± 5.11	2.36± 0.33	6.60± 0.94	1.00± 0.19	201.00± 19.7
Olenka	74.00 ± 3.01	74.20± 3.27	1.49± 0.26	3.52± 0.58	1.63± 0.21	117.00± 9.6
Rumyanaya Zorka	85.40 ± 4.15	84.80± 4.94	4.60± 0.56	5.28± 0.89	5.20± 0.49	282.03± 23.4
Idilliya	87.20 ± 5.13	87.40± 5.24	4.22± 0.49	5.72± 0.88	8.45± 0.71	470.00± 37.8
<i>jam</i>						
Medovaya	52.00± 2.07	53.90± 2.25	1.29± 0.14	3.52± 0.16	1.30± 0.14	63.00± 6.57
Olenka	57.10± 3.01	60.20± 2.99	1.09± 0.11	4.13± 0.19	1.63± 0.18	49.00± 5.14
Rumyanaya Zorka	51.20± 2.19	65.50± 3.56	1.64± 0.18	4.84± 0.22	2.60± 0.34	128.00± 8.61
Idilliya	60.1± 3.65	61.50± 3.07	0.72± 0.09	5.1± 0.29	1.03± 0.12	156.0± 10.04

As well as phenolic compounds and AA, antioxidants also include trace elements Zn, Cu, Mn. Cherry plum fruits, especially dark-colored ones, are a natural complex source of antioxidants, characterized by a high content of phenolic compounds and cuprum, and a satisfactory content of AA and zinc.

In 2013, the European Association of Urology recommended antioxidants for the treatment of idiopathic infertility. And Russian specialists in the treatment of reproductive disorders in men rightfully consider antioxidants to be a component of pathogenetic therapy [23].

Due to the ecological situation deterioration, fruits rich in pectin substances are of a special interest. In various literature sources the therapeutic and prophylactic effect of pectins on the human body, their antitumor and radioprotective activity, antitoxic, anti-sclerotic, anti-inflammatory and analgesic effects have been described [33-35].

The content of pectin substances in fruits of all studied cultivars is rather high, from the minimum 0.55% in the *Medovaya* cherry plum cultivar to the maximum 1.14% in the *Idilliya* cultivar fruits (Table 1). This is comparable to the amount of pectins in their most popular source - apples (0.42-1.15%) [36].

It should be noted that the cherry plum fruits, in addition to the high content of biologically active substances, are characterized by good transportability. Ripening of cherry plum fruits in June - early July, before apricot and peach ones, allows them to be used fresh at the beginning of summer in health resorts and children's institutions, and in the canning industry - as high-quality feedstock for functional products.

4 Conclusion

According to the norms of the Russian Federation, the fruits of the cherry plum cultivars originated in the NBG *Idilliya*, *Medovaya*, *Olenka* and *Rumyanaya Zorka* belong to the group of products with a high content of potassium and cuprum, and a satisfactory content of magnesium and ferrum, as pastila and jams from them belong to the group of products with a satisfactory content of potassium and cuprum.

Cherry plum fruits, especially dark-colored ones, are a natural complex source of antioxidants, characterized by a high content of phenolic compounds and a satisfactory content of ascorbic acid and zinc.

The amount of pectin substances in all studied cultivars is comparable to that in apples. Fruits of the cultivar *Idyllia* with dark-colored pulp are characterized by the maximum accumulation of pectins - 1.14%, ascorbic acid - 9.3 mg/100 g, phenolic compounds - 441 mg/100 g, potassium - 11239 mg/kg, magnesium - 464 mg/kg, ferrum - 10.81 mg/kg, zinc - 10.23 mg/kg, cuprum - 4.17 mg/kg, manganese - 0.228 mg/kg.

The fruits of *Prunus cerasifera* Ehrh. cultivars originated in the Nikita Botanical Gardens are characterized by a high content of biologically active substances and are suitable for use in diet food both fresh and as feedstock for functional products.

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