



## SOME CHEMICAL COMPOUNDS OF RED BEET AND THEIR SIGNIFICANCE

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### Abstract

The article provides information about some of the chemical compounds in red beet and their biological significance. Beetroot is rich in compounds that are very useful for human health, it contains vitamins, minerals, phenolic compounds, carotenoids, nitrates, ascorbic acid, betalain pigments and many other biologically active compounds. This article discusses the carbohydrates, amino acids, vitamins, minerals in plants and their functions in the body.

**Keywords:** red beets, vitamins, trace elements, betalain, biological activity.

### INTRODUCTION

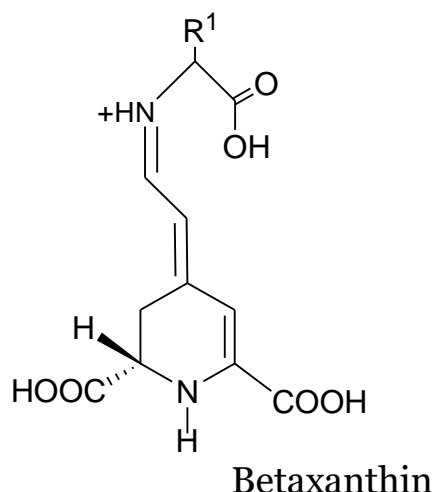
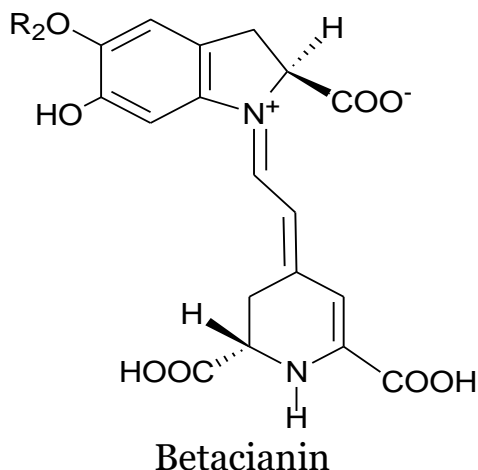
Today, the use of synthetic drugs and food additives is gaining popularity in the world due to the safety of synthetic drugs. This is due to the fact that food supplements based on plants, animals and minerals with medicinal properties do not form harmful metabolites in the body and undergo complete biodegradation. Therefore, large-scale work is being carried out by scientists around the world to find, study and implement natural sources that contain biologically active substances that have medicinal properties [1,2].

One of the medicinal plants rich in such useful compounds and widely used today in the food industry, pharmaceutical industry and folk medicine is the red beet plant [3]. Red beets are rich in compounds that are very useful for human health, including vitamins, minerals, phenolic compounds, carotenoids, nitrates, ascorbic acid, betalain pigments and many other biologically active compounds. The high content of betalain pigments in red beets compared to other plants has led to its widespread use in the food industry as a source of safe and environmentally friendly food dyes [4.].





Betalain pigments belong to the class of nitrogen-retaining pigments and are highly soluble in water. These pigments are known to have two main groups known as betacyanins, which range in color from red to reddish ink, and beta-xanthines, which are yellow in color.



These pigments in red beets not only give color to this plant, but also exhibit certain biological activities. For example, these compounds exhibit antioxidant properties and inhibit the formation of free radicals in the body.

The chemical composition of this plant is directly related to its growing region, species, genetics and harvest times.

### EXPERIMENTAL PART

Studies show that 100 g of red beets contain 9.96 g of carbohydrates such as starch, fructose, sucrose, glucose, dietary fiber, 1.68 g of protein, 0.18 g of fat [5].

Many representatives of amino acids are found in red beet root (Table 1) [6].



**Table 1 Amino acids in red beets  
(Amount per 100 g of root)**

No	Name of amino acid	Quantity (g)
1	Tryptophan	0,019
2	Cystine	0,017
3	Prolin	0,042
4	Treonin	0,047
5	Serin	0,059
6	Asparagin	0,116
7	Glutamine	0,428
8	Glycine	0,031
9	Alanin	0,06
10	Valin	0,056
11	Methionine	0,018
12	Isolate	0,048
13	Leytsin	0,068
14	Tyrosine	0,038
15	Phenylalanine	0,046
16	Lysine	0,058
17	Gistidin	0,021
18	Arginine	0,042

The content of saturated fatty acids in red beets is 0.027 g per 100 g of root, 0.032 g of monounsaturated fatty acids, the total amount of polyunsaturated fatty acids is 0.06 g. Also, the total amount of phytosterols in this plant is 25 mg.

Red beet leaves and roots are a rich source of trace elements and vitamins, further enhancing its healing properties.(2-3 table) [7].

**Table 2 Vitamins in red beets  
(Amount per 100 g of product)**

No	The name of the vitamin	Quantity (mg)
1	Vitamin A	0,02
2	Thiamine	0,31
3	Riboflavin	0,27
4	Niacin	0,331
5	Pantothenic acid	0,145
6	Vitamin V6	0,067
7	Ascorbic acid	3,6
8	Folic acid	80
9	Vitamin K	28



**Table 3 Micronutrients in red beets  
(Amount per 100 g of product)**

Nº	The name of the microelement	Quantity (mg)
1	Sodium	77
2	Calcium	16
3	Phosphorus	38
4	Potassium	305
5	Magnesium	23
6	Zinc	0,35
7	Iron	16,9

Niacin and pantogenic acids in red beets improve the activity of the pituitary gland and are actively involved in ensuring that the body does not age prematurely. Therefore, it is very beneficial to consume more juice made from the root of this plant. The roots of the plant are rich in potassium, sodium and magnesium trace elements, which are important in the elimination of hypertension, atherosclerosis and other similar diseases in the human body, which are cardiovascular diseases. The root of this plant is also rich in iron, which is one of the main factors in the formation of blood in the body [8].

In addition to the biologically active compounds mentioned above, red beets also contain compounds such as polyphenols, flavanoids, carotenoids, saponins [9]. For example, several representatives of phenolic compounds have been found in this plant.

**Table 4 Phenolic compounds in red beets  
(Amount per 100 g of product)**

Nº	The name of the association	Quantity (mg)
1	Cyanide	37,1
2	Catexin	37,7
3	Quartzetin	7,9
4	Luteolin	108,2
5	Cesamine	8,5
6	Ferul acid	34,1
7	Resveratrol	5,7
8	Tyrosol	

Polyphenols are beneficial for the body as they exhibit strong antioxidant properties.



## CONCLUSION

In short, since red beets are chemically rich in biologically active compounds that are beneficial to the human body, one of the important tasks is to create new types of food additives based on the components of this plant and introduce them into folk medicine and modern medical practice. Especially at the height of the current pandemic, the consumption of beetroot supplements and beet juice, which are rich in unique chemical elements, is one of the most effective ways to boost the body's immunity.

We are conducting research on the creation of new food additives based on betalain pigments and other biologically active compounds in red beets to enhance the human body's immunity in the Research Laboratory of commodity Chemistry of Andijan State University and Cibus in Andijan.

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