CHEMICAL COMPOSITION OF THE PLANT THERAPEUTIC *SCUTELLARIA COMOSA JUZ*

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Abstract. *The article describes the results of the study of the botanical properties and chemical composition of the medicinal blueberry (Scutellaria comosa Juz.) growing in the conditions of light gray soils. Also, the amount of elements accumulated in the upper part of the moldy blueberry plant was studied using the method of neutron activation analysis.*
Keywords: *scutellaria, macroelement, microelement, medicinal, stem, leaf, flower, neutron activation, element.*

Introduction: Scutellaria comosa Juz. - blueberry is a herbaceous plant that reaches 15-40 cm in height. The stem is woody from the base, covered with glandular hairs. The leaves are triangular, oblong or triangular-ovate. The tip of the leaf is sharp or blunt, the edge is serrated. The upper veins of the leaf are twisted, thickly hairy, dull dark green, the underside is gray, with short bands. The petals are egg-shaped, the tip is sharply pointed, thickly hairy. The flowers are 2-4 cm long, many-flowered, thickly arranged in a long, elongated peduncle with fruits, during the fruiting period, the unopened flowers at the tip of the peduncle extend up to 10 cm. Floral leaves are 0.7-1.2 cm long, 2.5-4.5 mm wide, lanceolate or ovate-lanceolate, boat-shaped, with long tips gradually narrowing upwards, gray-green due to glandless thick fine felt hairs , often purple. Petal 2-2.5 mm long, pubescent hairy, upper lip oval, concave thyroid gland 1.5-1.8 mm long, sparsely adherent hairy. Petal 1.2-3 cm, tuber 1.5-2 cm long, throat diameter 5-6 mm, finely curved, upper lip 6-7 mm, orange color, lower lip 5 -6 mm, yellow-brown speckled, outside serrate, downy hairy, fruit triangular nut, almost ovoid, 15 mm long, downy hairy. It blooms in May-June and seeds in June-July [1, 2].

Research on the chemical composition of this species is somewhat more numerous than research in other directions. Currently, the chemical composition of more than 65 species of the *Scutellaria* genus has been studied in the world, and more than 330 phenolic substances have been isolated from them. Y.Imoto, H.Kizu, T.Namba, N.Joshee, Y.Y.Zhang, C.R.Yang, Z.H.Zhoy from foreign scientists on researching the chemical structure of flavonoids of this plant, determining their pharmacological properties and creating new effective medicines based on them J.Miao, T.Tomimori, S.Shibata, Y.Kikuchi, Y.Miaichi, I.I. Chemesova, N.K.Chirikova, V.I.Litvinenko, T.P.Popova, M.Iinuma, A.L.Budansev and others conducted scientific research. Baicalin, baicalein, wogonin and other substances extracted from Scutellaria plants have antiviral and antibacterial properties and have been found to be effective drugs against inflammation, AIDS, cancer and seizures [3].

The moldy blueberry plant is rich in biologically active substances and is widely used in folk medicine to treat diseases such as seizures, allergies, neurosis, and high blood pressure. Researching the chemical composition and pharmacological properties of this plant growing in Uzbekistan will allow the creation of medicines in the future. In recent years, a number of studies have been conducted on the chemical composition of the blueberry plant and its use in the pharmaceutical industry. This allows to provide the local population with cheap medicines [4].
As we know, the scientific study of the chemical composition of *Scutellaria* species began in 1910. Initially, scientists obtained flavanoids from S. altissima species [5]. It should be noted that

representatives of the group were widely used in local medicine thousands of years ago [6]. The chemical composition of species of the category consists of various components, and so far, flavanoids, phenylpropanoids, iridoids, diterpenoids, steroids, triterpenes, lignans, alkaloids, polysaccharides, tannins, essential oils and several other substances have been obtained from them [7] .

V.M.Malikov, E.Kh.Botirov, Sh.V.Abdullaev, M.P.Yuldashev, R.Muradov, F.D.Nasrullaev, A.M.Karimov, K.A.Eshbekova and others conducted research in this direction in our country. These scientists isolated many new and known flavonoids from plants belonging to the family Scutellaria L., the structure of the obtained substances was scientifically proven, and their pharmacological activity was determined. The fact that many flavonoid substances have been isolated from Scutellaria (Ko'kamaron) plants that have been studied so far, and that there is a large reserve of plants belonging to this category and that there are enough chemically unexplored species, it is necessary to perform in this field It would not be wrong to say that carrying out scientific-research works, isolating new and effective biologically active substances, studying the composition of macro and microelements is one of the issues that should be researched. In this regard, studying the element composition of medicinal plants belonging to the natural flora widely used in folk medicine and official medicine, determining the amount of biomicroelements in plant organs, researching their medicinal and biogeochemical properties is one of the important scientific and practical issues. is considered

Research method and methods. The elemental analysis of the plant was carried out by the neutron-activation method in the "Ecology and Biotechnology" laboratory of the Research Institute of Nuclear Physics of the UzAS. The samples taken for analysis were mainly taken during the flowering phase of plant vegetation. The obtained samples were dried at room temperature and 50 and 100 mg were taken. The samples were wrapped in acetone-cleaned film bags and then placed in aluminum foils in the reactor. In this case, the samples are 5*1013 neutrons/cm2 sec in the atomic reactor. irradiated with a neutron stream, and their amounts were found based on the half-life periods of chemical elements.

Mathematical-statistical processing of the obtained results was carried out based on the computer program of R.Koziyev, G.Yuldashev, I.Akramov created based on the method of B.A.Dospekhov [8].

Results and discussion. In the above information, it can be seen that much attention is paid to the study of the organic composition of the blueberry plant, which is used as a medicine. It is known from many conducted studies that the study of biologically active substances included in the composition of medicinal plants, as well as the study of chemical elements under the influence of environmental factors, is of great scientific and practical importance. In addition, ecological monitoring of the amount of heavy metals in medicinal plants and special attention to the issue of hygienic major work are required. we aim to learn.

We have determined the amount of macro and microelements in the above-ground part (stem, leaf, flower) of blueberry with mold using the neutron-activation method. According to the obtained results, it was noted that the examined sample contained 34 elements (Table 1). These elements were divided into three groups: macroelements, microelements and toxic elements.

Potassium, calcium, sodium are among the main macroelements in the composition of the upper part of the moldy blueberry plant; trace elements include zinc, rubidium, strontium, molybdenum, manganese, chromium, nickel, cobalt, and iron. Among the toxic elements, only barium, mercury, antimony, and uranium were detected in the above-ground part of the plant.

Table 1.

Elemental composition of medicinal blueberry (Scutellaria comosa Juz.), µg/g (n-3)

№	Element name	Item symbol	Amount of macro and micronutrients, µg/g (stem, leaf, flower)	№	Element name	Item symbol	Amount of macro and micronutrients, µg/g (stem, leaf, flower)
1	Nary	Na	780	18	Seleniu m	Se	0.017
2	Potassiu m	K	11900	19	Mercury	Hg	0.03
3	Mangan ese	Mn	29	20	Educatio n	Tb	0.0069
4	Samarit an	Sm	0.041	21	Thorium	Th	0.83
5	Rheniu m	Re	<0.001	22	Chrome	Cr	0.14
6	Molybd enum	Mo	0.19	23	Gafnium	Hf	0.078
7	Lutetius	Lu	0.0052	24	Barium	Ba	14.2
8	Uranus	U	0.011	25	Strontiu m	Sr	64
9	Itterbi	Yb	<0.001	26	Cesium	Cs	0.094
10	Gold	Au	0.00098	27	Nickel	Ni	0.06
11	Neodym ium	Nd	0.3	28	Scandiu m	Sc	0.058
12	Arsenic	As	<0.1	29	Rubidiu m	Rb	33
13	Tungste n	W	0.02	30	Spirit	Zn	26
14	Bromine	Br	9.3	31	Cobalt	Co	0.47
15	Calcium	Ca	4180	32	Tantalu m	Ta	< 0.01
16	Lanthan um	La	0.68	33	Iron	Fe	184
17	Serial	Ce	0.91	34	Do not slide	Sb	0.07

The composition of macroelements in plants decreases in the order of K > Ca > Na, and the content of microelements decreases in the order of Fe > Mn > Zn > Br > Co > Mo > Cr > Ni. It can be seen from the table that macroelements are found in large quantities in the organs of the studied plant. Including: K-11900 µg/g, Ca-4180 µg/g, Na-780 µg/g. The highest amount of element K was observed in the above-ground part of moldy blueberry plant, its value was 11900 µg/g.

Among the microelements, iron is the element with the highest value in the composition of the upper part of the blueberry plant, its amount is equal to 184.1 μg/g. The amount of the remaining trace elements is Mn-29.2 μg/g, Zn-26.3 μg/g, Br-9.3 μg/g, Co-0.47 μg/g, Mo-0.19 μg/g, Cr-0.14 μg/g, Ni-0.06 μg/g, Se-0.017 μg/g. The above-ground part of the plant has the lowest value among trace elements of samarium, lutetium, ytterbium, gold, tungsten, mercury, europium, antimony, terbium and tantalum. Common trace elements such as boron, fluorine, phosphorus, and silicon were not detected in this plant. It is determined that mercury, antimony, and uranium are accumulated in very small quantities in the above-ground part of the plant.

According to the obtained results, the blueberry plant is a natural source of elements necessary for the vital activity of the organism, such as K, Ca, Fe, Na, Sr, Zn and Mn.

It is known that the consumed food should provide the human body with all nutrients necessary for optimal growth and development, as well as vitamins, macro- and microelements, and energy considered important for the body [9, 10]. Biochemical processes in the human body are not carried out correctly if there is no appropriate ratio between macro and microelements, which are considered important for the body. These elements are necessary for the absorption of vitamins, amino acids and unsaturated fatty acids [11]. Therefore, the analysis of the composition and proportions of macro and microelements in various organs of medicinal plants is of great importance in the prevention and treatment of various diseases in the human body. The data on the study of macro- and microelements contained in this medicinal plant allows the preparation of raw materials for the creation of new products with additional functional properties adapted to the daily needs of a person.

In conclusion, it can be said that in the course of long evolution, medicinal plants have acquired the ability to synthesize certain substances and absorb one or more elements in accordance with their systematic place, biological characteristics, and soil-climatic conditions.
Abiotic and anthropogenic factors in the growth environment of this plant also affect the fact that plants absorb a certain element or elements in different proportions in their organs. The amount of biomicroelements in the studied medicinal plants has a positive comparative-geographical correlation.

The study of correlations between the elemental composition of plants and the elemental composition of the soil in which they grow is one of the most important researches for use in folk medicine, phytobars, modern medicine and pharmaceutical industry. It is possible to use moldy blueberry as a raw material for the modern human lifestyle, a decrease in the level of immunity of the body, environmental damage, increasing the quality and safety of the product, and creating new products with functional properties.

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