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KO‘KA (*TUSSILAGO FARFARA*), KARAFS (*APIUM GRAVEOLENS*), KARTOSHKA (*SOLANUM TUBEROSUM*) O‘SIMLIKLARI TARKIBIDAGI MAKRO VA MIKRO ELEMENTLAR TAHLILI

АНАЛИЗ МАКРО И МИКРО ЭЛЕМЕНТОВ В РАСТЕНИЯХ МАТЬ-И –МАЧЕХА (*TUSSILAGO FARFARA*), СЕЛДЕРЕЙ (*APIUM GRAVEOLENS*), КАРТОФЕЛЯ (*SOLANUM TUBEROSUM*)

ANALYSIS OF MACRO- AND MICRO ELEMENTS IN PLANTS FOALFOOT (*TUSSILAGO FARFARA*), CELERY (*APIUM GRAVEOLENS*), POTATO (*SOLANUM TUBEROSUM*)

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Annotatsiya

Ushbu maqolada ko‘ka (Tussilago farfara), karafs (Apium graveolens), kartoshka (Solanum tuberosum) o‘simliklari tarkibidagi makro va mikro elementlar miqdorlari plazmalar induktiv bog’langan mass-spektrofotometrik usuli yordamida aniqlanib, ularni taqqaslash natijalari keltirilgan.

Tadqiqot qilingan barcha namunalar tarkibida kalsiy, magniy, kaliy, temir elementlariga boy bo‘lganligi uchun suyak, yurak qon tomir, kamqonlik kasalliklarini davolashda yordam beruvchi yangi oziq-ovqat qo‘shilmalarini yaratish taklif etildi.

Аннотация

В данной статье определено количество макро- и микроэлементов методом масс-спектрофотометрии с индуктивно-связанной плазмой, содержащихся в растениях мать-и-мачехи (tussilago farfara), сельдерея (Apium graveolens), картофеля (Solanum tuberosum), и представлены результаты их сравнения. Исследованные образцы были богаты элементами кальция, магния, калия, железа в своем составе, было предложено создать новые пищевые добавки, которые помогут при лечении заболеваний костей, сердечно-сосудистой системы, анемии.

Abstract

In this article, the amount of macro- and microelements contained in the plants of foalfoot (Tussilago farfara), celery (Apium graveolens), potato (Solanum tuberosum) is determined by mass spectrophotometry with inductively coupled plasma, and the results of their comparison. The studied samples were rich in elements of calcium, magnesium, potassium, iron in their composition, it was proposed to create new dietary supplements that will help in the treatment of bone diseases, cardiovascular system, anemia.

Kalit so‘zlar: *ko‘ka (Tussilago farfara), karafs (Apium graveolens), kartoshka (Solanum tuberosum), biogen elementlar.*

Ключевые слова: *мать-и –мачеха (Tussilago farfara), селдерей (Apium graveolens), картофель (Solanum tuberosum), биогенные элементы.*

Key words: *foalfoot (Tussilago farfara), celery (Apium graveolens), potato (Solanum tuberosum), biogenic elements*

INTRODUCTION

In folk medicine, in the treatment of diseases, components of plants and animals with healing properties and minerals are used.

The fact that these natural remedies do not adversely affect the human body has proven itself in experiments over long years. In the treatment of patients, the integralization of modern medicine and folk medicine, on the other hand, is important in the Prevention of many problems.

There are about 4,500 species of high plants naturally distributed in Uzbekistan, about 1,200 species of which have medicinal properties. Currently, in our Republic, 112 types of

medicinal plants are allowed to be used in official medicine, 80% of which are plants growing naturally [1].

Plants contain organic and inorganic substances that determine the therapeutic effect of the plant. Each medicinal plant has a wide spectrum of healing properties, this property of which is determined by the chemical compounds and trace elements contained in it [2].

LITERATURE ANALYSIS

It should be noted that among the chemical elements, the elements necessary for life activity (Ca, K, Na, so, Fe, Si, Mp, Mg and Zn) are involved in almost all biochemical processes. Regulates the processes of energy metabolism, primary and secondary metabolism, hormonal regulation that occur in cells [3].

An ancient method of treating diseases is folk medicine, in this method, the treatment of diseases is carried out on the basis of healing plants, animals, minerals and many other natural elements [4].

Below we found out by our side that it is preferable to carry out an element analysis of healing plants, which are used in the treatment of hernia diseases of the spine.

Karafs or celery. (celery paxuchium) apium graveolens L, Petroselinum sativum hoffm L. In nature, wild celery is distributed in Western Europe, Asia, India, North and South America, Australia, New Zealand, RF - mainly in the south of the European part. The plant is grown almost all over the world. And in Uzbekistan it grows in irrigated lands of Tashkent, Samarkand, Namangan, Andijan, Fergana, Kashkadarya, Surkhandarya, canal, ditches, puddle water edges, wet areas [1,5].

It blooms in July and ripens in August-September. Perennial herbaceous plant up to 50 cm tall.. The stem is erect-growing, hollow inside, branching from the middle. The stem took root, and the leaves of the lower part of the stem are long-banded, patchily separated. The upper parts of the stem are three-lobed, wrinkled, arranged in series. The leaf segments are elongated or lanceolate [6].

The flowers are small, white, clustered in a complex umbrella. The fruit is a round-shaped pistachio. When it blooms, the Leaf is picked and cool erdagurited. The top of the Earth is harvested when the fruit begins to ripen. The root is dug up in the fall, cleaned of soil, washed with water and dried in the open ground. The fruit contains essential oil, flavanoids, oils, essential oil in the Leaf, carotene, vitamin C, V, apinin glycoside and other flavonoids. In the first year it forms its leaves and root, in the second year it blooms [7].

The plant is moisture-loving and frost - resistant, the seeds germinate at 3°C (optimal-15°C), the seedlings can tolerate frost up to -5°C. Essential oil contains limonene, selenium, sedinolide, as well as phenols that stand close in composition to guayanol. Furocumarins and a significant amount of fatty oil were found in their fruits [8].

The leaves contain carotene, vitamins, etc., a glycoside called apinin. In Central Asian folk medicine, carafs is used to treat pneumonia, bronchial asthma, hepatitis, abdominal rest, hiccups, back pain, as well as in the Millet, a remedy that drives urine, grass and el, stops vomiting, revitalizes the work of the central nervous system.

Celery roots contain 10 to 20% dry matter, including 2-4% sugar, 1-2.5% raw protein,potassium, calcium, phosphorus; leaves contain 10 to 18% dry matter, including about 1% sugar, 2-3% raw protein [9]. Both roots and leaves are rich in ascorbic acid (up to 110 mg% of this vitamin in leaves), carotene (provitamin A), vitamins V1, V2, vitamin PP, potassium, calcium, phosphorus salts [10].

All parts of celery are added to first and second courses, salads, drinks, sauces, spices. The rhizome is also used dried. It is recommended to use the stems instead of salt in diseases of the kidneys, gallbladder, osteoporosis, osteochondrosis [11].

Celery contains biogenic elements and biologically active substances that have a positive effect on metabolism, the condition of hair and skin. Antioxidants in the plant slow down aging, essential oils help the intestines work and have an antibacterial effect.

The ratio of minerals (macro and micro elements) in celery is given in Table 1.

1-tabel

Mineral composition of celery

Mineral name	Quantity at 100 g (mkg)	Daily need (%)
Calcium-Ca	40,0	4
Ferrum-Fe	0,2	2
Magnesium-Mg	11,0	2.8
Phosphorus-P	24,0	3.4
Potassium-K	260,0	5.5
Sodium Na	80,0	6.2
Zinc-Zn	0,1	1.2
Copper-Cu	0,01	3.9
Manganese-Mn	0,1	4.5
Selenium-Se	0,4	0.7
Fluorine	4,0	0.1

Karafs. Celery. (celery paxuchium) apium graveolens L, Petroselinum sativum hoffm L. In osteochondrosis diseases, it is necessary to consume 2 teaspoons of root juice 3 times a day. Put two glasses of boiling water on a tablespoon of the root and let it rest for 4 hours. Drink 3 times a day from 50 ml half an hour before meals [4].

Potatoes. Salanum tuberosum L. Potatoes are a perennial herbaceous tuberous plant that can reach up to 80 cm in height. The leaves are arranged alternately, odd-pubescent. Flowers are white, light pink, pink-blue. The fruits are large-large, spherical, greenish in color. Blooms in June-August [12].

The homeland of potatoes is South America, from this place it is brought to Europe. In Uzbekistan, early ones (late February— March) and evening kartosh kalar (late may—June) are planted. Potatoes began to be planted in Russia at the beginning of the 18th century, and in Uzbekistan in the first half of the 19 th century. An underground potato nodule is eaten. This plant is planted everywhere, mainly for nodules that are used for food. There are many varieties and nodules are used [13].

Potatoes contain proteins 2 %, carbohydrates, fats, citric and malic acids, vitamin B, B1, PP, C and other substances. Compared to other plants, potatoes contain more -17.5% starch than everyone else. When many nodules remain long in the light, they develop a toxic steroid alkaloid called solanine. The leaves of potatoes with niches have also been found to contain 6 different glycoalkaloids.

The amount of mineral substances contained in potatoes is given in Table 2 below.

Table 2.

Mineral composition of potatoes

Mineral name	Quantity at 100 g (mkg)	Daily need (%)
Potassium-K	568	23
Calcium-Ca	10	1
Magnesium-Mg	23	6
Phosphorus-P	58	6
Sodium Na	5	0.1
Ferrum-Fe	0.9	6
Iodine J	5	3
Zinc-Zn	0.36	3
Selenium-Se	0.3	1
Copper-Cu	140	14
Sulfur S	32	3

Fluorine	30	1
Chromium Cr	10	20
Manganese-Mn	0.17	9

Toussilago farfara L. The shrub is a perennial herb growing up to 5-25 cm tall. In early spring, several unbranched stems grow from the rhizome, forming flowers. The stem has red-brown thong-shaped leaves covered with biloan, with a cluster of flowers at the tip. The stem dries up after the fruit is ripe. Then the long-banded rhizome leaves sprout [16].

The root ballburgs are round or wide ovoid, with an unevenly carved toothed edge and a long band, the lower side of the leaf plate is serrated, and the upper side of the whitish, green, hairless. The flowers are colored golden yellow and collected in baskets. Fruit-flying pistachios. Blooms in April-may. The fruit ripens in may-June [18].

The leaf is cut off from half of the leaf band during the summer months. The collected flowers and leaves are thinly spread on cool ground and dried.the plant contains tuscilyagin and other bitter glycosides, saponins, carotene, vitamin C, organic acids, essential oil, mucus, enhancers and other substances [17].

It is common in grassland areas, ditches and river banks on sycamore land. Cabbage, juice and aphids made from its leaf are used in the treatment of various diseases: cough, colds, tuberculosis. When squeezing the breath, its dried leaves are smoked like papyros, it gives a very good result. In the preparation of the drug, the herbal leaf is included in the composition of tea, which is used in the production of galenic drugs. This plant is rich in various substances.

It contains 5 — 12% tannide, glucoside, saponin, tusilagin, phytostrin, inulin, starch, carotenoid substances, as well as vitamin C. Also, its flower contains 0.08-0.12% essential oil, tanide and the dye substance taraxanthin [18].

Magnesium reduces the level of irritability of the nervous system, normalizes the activity of the heart muscle and its blood supply.

Elements of calcium, magnesium, phosphorus are contained in large quantities in bones. The amount of potassium in the muscles, brain, kidney is higher than it. Sodium concentration in plasma is about 20 times higher than potassium, whereas the cell has a higher potassium content [3].

Iron. This element is inextricably linked with the important functions of the body and is an important component of hemoglabin and myoglabin. The iron substance is included in the composition of red blood cells. It is involved in the exchange of gases in cells and the oxidation process of substances by attaching oxygen [14].

Potassium. Its compounds improve the work of the heart muscle. Controls the work of muscle tissue in the body. Violation of potassium metabolism is primarily caused by a violation of the work of the heart tissue. This leads to cardiac colic, fatigue, dizziness, heart rate disorders, edema [3].

Sodium is a necessary element for life and is involved in mineral exchange in the human and animal body. It is found in blood erythrocytes, red blood cells, whey and gastric juice, and plays an important role in water –salt almshination and acid-base administration. Sodium ensures that blood pressure is at one norm, the buffering of the blood is at the prescribed level [14].

EXPERIENCE PART

Determination of macro and microelements by the plasma inductively coupled mass spectrometry method (ISP-MS). This method was used in the determination of the element calcium, phosphorus, magnesium, iron and iodine in food products. to do this, 0.0500 - 0.500 g of the substance under investigation is measured on an analytical scale and placed in a Teflon container of autoclaf, then a corresponding amount of purified concentrated mineral acids is poured over it (nitric acid and hydrogen peroxide). The autoclave is closed and installed in a Berghof programmed (MWS-3+) microwave shredder.

Depending on the type of substance to be examined, the corresponding program is determined. After the breakdown of the substances placed in the autoclave, a 50 or 100 ml meter is placed in flasks and carried with 0.5% nitric acid to the desired mark. The detection of

substances was carried out on an argon plasma emission spectrometer bound in ISPMS or similar inductive state.

When performing the above analyzes, the following equipment was used. ISPMS NEXION-2000 or similar mass spectrometer, microwave separators (Germany) or similar Teflon autoclaff: flasks of different sizes. Used reagents: Standard No. 3 with multielement (29 elements for MS). The standards are mercury, nitrogen acid, hydrogen peroxide, bidistillated water, and argon (gas purity 99.995%).

RESULTS DISCUSSION

This table presents a macro- and microelement analysis of the flora of cocca (tussilago farfara), carafa (apium graveolens), potato (solanum tuberosum) (red scarlet variety).

3-table

The amount of biogenic elements contained in samples from the analysis result

№	Name of elements	(tussilago farfara)	semen of (*apium graveolens*)	(solanum tuberosum) red scarlet	Leaf of (*apium graveolens*)
			mg / kg		
1.	Lithium	5,759	7,885	4,771	3,864
2.	Beryllium	1,125	1,515	0,974	0,704
3.	Borum	98,798	49,787	13,958	12,943
4.	Sodium	5567,833	7696,909	4471,366	3512,106
5.	Magnesium	7263,450	4190,606	354,458	1207,662
6.	Aluminium	554,667	308,072	31,388	349,776
7.	Silicon	507,361	714,670	464,948	345,962
8.	Phosphorus	962,435	1959,484	514,271	663,105
9.	Sulfur	564,070	806,453	527,453	394,393
10.	Potassium	6239,638	7041,953	4357,350	3571,074
11.	Calcium	4596,258	6606,747	4320,737	3248,513
12.	Titanium	-667,471	-944,463	-574,452	-367,165
13.	Vannady	115,625	139,274	83,795	59,499
14.	Chromium	79,958	142,493	56,982	44,254
15.	Manganese	197,762	125,658	53,122	68,204
16.	Iron	3565,287	4836,392	2986,200	2354,057
17	Cobalt	21,918	27,204	17,642	14,309
18	Nickel	6,937	8,095	4,745	4,048
19	copper	311,216	417,611	296,060	223,034
20	Zinc	35,764	55,179	7,534	14,065
21	Gallium	3,797	4,667	2,439	2,113
22	Germanium	-0,816	-0,782	-0,403	-0,545
23	Arsenicum	23,506	24,595	9,905	8,407
24	Selenium	-8,564	16,198	-2,378	3,378
25	Rubidium	58,900	48,964	27,436	22,241
26	Strontium	348,432	120,491	12,761	34,441
27	Zirconium	0,636	0,795	0,631	0,435
28	Niobium	0,384	0,568	0,328	0,293
29	Molybdenum	7,063	6,211	2,789	2,683
30	Argentum	6,401	8,938	6,234	4,504
31	Cadmium	-0,390	-0,558	-0,496	-0,558
32	Indium	1,830	3,029	1,980	1,316
33	Tin	12,346	16,444	12,907	9,349
34	Stibium	0,594	0,707	0,444	0,434
35	Cesium	7,784	11,089	7,537	5,838
36	Barium	49,444	25,978	6,574	14,861

37	Tantalum	0,043	0,023	0,026	0,027
38	Tungsten	0,193	0,193	0,055	0,151
39	Rhenium	0,069	0,037	0,054	0,103
40	Hydrargyrum	0,000	-0,024	-0,024	0,024
41	Thallium	8,235	6,672	5,814	4,580
42	Plumbum	4,942	4,682	2,756	2,561
43	Bismuth	0,366	0,364	0,227	0,250
44	Uranium	0,067	0,176	0,032	0,160

When the results from the study were studied, it was found that all samples contained more than 44 macro and micro elements. It was determined that the amount of elements in the sample structure increases based on the following sequence.

1. Sodium - seeds of apium graveolens › tussilago farfara, potato› celery leaves.
2. Magnesium - tussilago farfara› seeds of apium graveolens› celery leaves› potato.
3. Potassium seeds of apium graveolens ›tussilago farfara› potato›celery leaves.
4. Calcium - seeds of apium graveolens › tussilago farfara › potato› celery leaves.
5. Iron - seeds of apium graveolens ›tussilago farfara› potato› celery leaves.
6. Copper- seeds of apium graveolens› tussilago farfara› potato› celery leaves.
7. Zinc- seeds of apium graveolens›tussilago farfara› celery leaves› potato

CONCLUSION

Since medicinal plants of tussilago farfara, apium graveolens are rich in elements of calcium, magnesium, potassium, iron in their composition, it was proposed to create new dietary supplements that provide relief in the treatment of diseases of bones, heart vessels, anemia.

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