KIMYO

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GULXAYRI (*ALTHAEA OFFICINALS L*) O‘SIMLIGINI KIMYOVIY TARKIBI, GULXAYRI MOYINI ELEMENTLAR ANALIZI VA UNING XALQ TABOBATIDAGI AXAMYATI

ХИМИЧЕСКИЙ СОСТАВ РАСТЕНИИ АЛТЕЯ (*ALTHAEA OFFICINALS L*), АНАЛИЗ ЭЛЕМЕНТОВ АЛТЕЙСКОГО МАСЛА И ЕГО ЗНАЧЕНИЕ В НАРОДНОЙ МЕДИЦИНЕ

CHEMICAL COMPOSITION OF GULKHYRI (*ALTHAEA OFFICINALS L*) PLANT, ELEMENT ANALYSIS OF GULKHYRI OIL AND ITS SIGNIFICANCE IN FOLK MEDICINE

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Annotatsiya

Ushbu maqolada gulxayri (Althaea officinalis l) o‘simligini kimyoviy tarkibi to‘liq yoritilgan va gulxayri (Althaea officinalis l) moyinig foydali kimyoviy modalarni to‘la saqlab qolish uchun “Sovuq presslash” usulidan foydalanilgan. Germaniyaning “AEN Engineering GmbH & Co.KG” kompaniyasida ishlab chiqarilgan “DD85-G” press uskunasi yordamida sanitariya talablariga mos ravishda tozalangan gulxayrining sifatli urug‘larini presslash orqali moyi ajratib olindi,makro-mikro elementlar analizi Avio200 ISP–OES Induktiv bog‘langan plazmali Optik emission spektrometr (Perkin Elmer, AQSh)da analiz qilindi. Qurilmaning aniqlik darajasi yuqori bo‘lib, eritma tarkibidagi elementlarni 10-^{9}g aniqlikkacha o‘lchash imkonini beradi .

Аннотация

В этой статье полностью объяснен химический состав растения алтея лекарственного (Althaea officinalis l) и использован метод «холодного отжима» для полного сохранения полезных химических режимов масла алтея (Althaea officinalis l). На прессовом оборудовании «DD85-G» производства немецкой компании «AEN Engineering GmbH & Co.KG» масло получено прессованием качественных семян подсолнечника, очищенных в соответствии с санитарными требованиями, макро-микроэлементный анализ Avio200 ISP- ОЭС с индуктивной связью анализировали на плазменном оптико-эмиссионном спектрометре (Perkin Elmer, США). Точность прибора высокая, он позволяет измерять элементы, содержащиеся в растворе, с точностью до 10-^{9}г.

Abstract

In this article, the chemical composition of the oil of marigold (Althaea officinalis l) is fully explained and the "Cold pressing" method is used to fully preserve the beneficial chemical modes of marigold (Althaea officinalis l) oil. Using the "DD85-G" press equipment manufactured by the German company "AEN Engineering GmbH & Co.KG", the oil was extracted by pressing the quality seeds of sunflower cleaned in accordance with sanitary requirements, macro-micro element analysis Avio200 ISP–OES Inductively coupled was analyzed in a plasma optical emission spectrometer (Perkin Elmer, USA). The accuracy of the device is high, and it allows to measure the elements contained in the solution to an accuracy of 10-^{9}g.

Kalit so‘zlar: *gulxayri, althaea officinalisl, gulxayri (Althaea officinalis l), kampesterol, p-kumar, saponin, sitosterol*

Ключевые слова: *алтей, althaea officinalisl, алтей (Althaea officinalis l), кампестерол, п-кумар, сапонин, ситостерол.*

Key words: *gulkhairi, althaea officinalisl, gulkhairi (Althaea officinalis l), campesterol, p-coumar, saponin, sitosterol*

INTRODUCTION

There are the following types of medicinal flowers. Marigold (Althaea officinalis) Armenian marigold (Althaea armenica). There are types of Althaea nudiflora. It is a perennial, rhizome, tall herbaceous plant, the roots are brown-yellow in color, it grows in clumps, the leaves alternate.

located, banded, 5-15 cm long, covered with soft hairs, grayish green, three-five lobed. Fruits are flat, divided into 15-25 individual seeds. The back of the seeds is thickly covered with stellate hairs [1].

Ibn Sina used a decoction made from the roots, seeds and leaves as an expectorant medicine, during cough, prostate tumors, prostatitis, hemoptysis, pleurisy, bronchial and lung inflammation, cast. He prescribed it as an emollient for nervous inflammation, and also used this decoction as a diuretic when urination became difficult and stones appeared in the bladder. [2]

Bositkhan Shoshiy in his book "Medicines and their names" describes gulkhair and says: its Greek name is khitmi, which means "many beneficial". It is a famous herb, called hubboza by Arabs, shabparak by Persians, and obim kumochi by Turks. Uzbeks say Gulkhairi and Tumbachaot. [2]



Figure.1 Gulkhairi ground



Figure. 2 Gulkhairi flower and root top of the ground root

The chemical composition of the plant - the roots of the sunflower contain up to 35%, and the upper part up to 12% of mucus, the main components of which are polysaccharides - pentosans and hexosans, which form galactose, pentoses and dextrose as a result of hydrolysis. In addition, up to 37% starch, 8% sugar, 2% asparagine, 4% betaine, 1.7% fatty oil, up to 16% pectin [9]. Cauliflower roots contain malic acid, essential oil, rubbery substance, steroids, tannins, betaine, fatty oils, vitamins C and B [3].

Gulkhairi roots also contain flavonoid glycosides, coumarins, and phenolic acids [4].

The seeds contain lauric acid, β-sitosterol, lanosterol, altehexacosanyl lactone, altekamine, altecoumarin glycoside - [5].

Gulkhairi leaves and flowers, mucilaginous, hard valerian, flavonoids, coumarins, aromatic essential oil of phenolcarboxylic, salicylic and other acids, coloring matter - [6].

Mucilage polysaccharides - 5-11.6% mucilage (depending on the vegetative period) - consists of a mixture of colloid-soluble polysaccharides (Franz, 1966), in particular,acid heteropolysaccharides of arabinanogalactans, galacturonic rhamnans, arabans and glucans (including 30,000 M/W) enters. galactose, L-rhamnose, D-glucuronic acid and D-galacturonic acid in a molar ratio of 1.2:1.0:1.0:1.0 (Capek et al., 1987) or a molar ratio of 2:3:3:3 (Tomoda et al., 1977), L-arabinans (Capek et al., 1983); D-glucans (Capek et al., 1984). The main component of the neutral mucous membrane (1→6)-α-D-glucan (Nosáÿova et al., 1992, 1993).

The following oligosaccharides were obtained as a result of partial acid hydrolysis of mucilaginous polysaccharide isolated from the roots of L.: O-a-(D galactopyranosiluronic acid)-(1→2)-L-rhamnopyranose, O-b-(D-glucopyranosiluronic acid)-(1→3)-Oa -(D-galactopyranosiluronic acid)-(1→2)-L-rhamnopyranose is composed of a repeating unit with a hexasaccharide, nonsaccharide, dodecasaccharide structure. trisaccharide through the 4-position of the D-galacturonic acid residue (Tomoda et al., 1980). 1→2) consists of L-rhamnopyranose units in a 1:1 ratio. .

Each D-galacturonic unit carries one β-D glucopyranuronic residue linked to C-3, and each L-rhamnopyranose unit carries D-galactopyranose residues as non-reducing terminals, mainly linked to C-4 (Capek et al., 1987). In addition to reducing oligosaccharides, two more non-reducing oligosaccharides: α-D-galactopyranuronic acid, β-Lrhamnopyranose1,2´:2,1´-dianhydride and 3-O-(β-D-glucopyranosyluronic acid)-α. -D galactopyranuronic acid β-L-rhamnopyranose 1,2´:2,1´-dianhydride was determined (Capek et al., 1988). In hydrolysates of mucus isolated from the roots, leaves and flowers of Althaea officinalis L. and Malva silvestris L. ssp. mauritiana (L.) However, D-

galactose, D-glucose, D-mannose, L-rhamnose, D-xylose, L-arabinose, D-galacturonic acid and D-glucuronic acid were detected (Rosik et al., 1984). [7]

Flavonoids-0.14-0.28% (Gudej, 1990) hypolatin-8-glucoside, isoscutellare

in-4'-methyl ether 8-O-b-D-glucoside-2-SO3K (Gudej, 1991), kaempferol, quercetin, isoquercetin, astragalin (Ionkova, 1992Nining), and others [8].

Pectins-11% (Blumenthal et al., 2000)

Starch-25-35% (Blumenthal et al., 2000)

Mono-, Di-saccharides-sucrose 10% (Gudej, 1991); raw slimes contain 5% glucose in spring and 20% glucose in winter (Franz, 1966) [8].

Phenolic acids-caffeic, p-coumar, ferulic, p-hydroxybenzoic, salicylic, syringic, p-hydroxyphenylacetic, vanillic acid (Guddej, 1991) [9]

Coumarins-scopoletin (Gudej, 1991; Ionkova, 1992) scopoletin-O-b-D-glucopyranosyl-L-rhamnopyranoside (Böker, 2013) [10]

Other compounds are phytosterols (Wichtl, 1994), calcium oxalate(Blumenthal et al., 2000), fats, tannins (Bradley, 1992), amino acids (Rosik et al., 1984; Böker et al., 2012), 2% asparagine (Bradley et al.)(1992), glycine betaine (Boker et al., 2012)[10].

Gulkhairi roots contain many salts of K, Ca, Mg, Fe, Mn, Cu, Co [3].

Although some chemical elements are present in small amounts, they play an important role in metabolic processes and are necessary for human health [4]. Microelements are present in the structure of enzymes and affect the biochemical activity of cells [5]. Elements such as sodium, potassium, magnesium, and manganese are present in mg/g levels, while chromium, iron, copper, zinc, and cadmium are present in less than µg/g. In addition, some rare elements were recorded at ng/g and lower levels [6].

The presence of essential elements affects the geochemical properties of the soil and its ability to assimilate these elements. The solubility of these compounds in water is very high due to their ionic structure, so they are quickly absorbed through the plant roots, which is the main organ that absorbs these compounds. Leaf plates are other sources for absorption of these elements by precipitation, atmospheric dust, plant protection agents and fertilizers [5].

Heavy metals are one of the most well-known environmental pollutants that cause various health problems. They are toxic in specific concentrations for living organisms, including humans [7]. These elements have low mobility in the soil and do not transfer to the layers below them [8]. Unlike organic pollutants, heavy metals are non-exchangeable, non-degradable and stable in soil. These elements are naturally present in the soil, but due to human activities, additional amounts are also introduced into the environment [9].

The parts of Gulkhairini have different effects chemically as follows.

Anti-inflammatory and immunostimulating activity

Aqueous extracts of the roots stimulated phagocytosis and release of oxygen radicals and leukotrienes from human neutrophils in vitro. Also, the aqueous extract induced the release of cytokines, interleukin-6 and tumor necrosis factor from human monocytes in vitro, thus showing anti-inflammatory and immune stimulatory activity (Scheffer, 1991). [11]

Antitussive activity- The polysaccharide fraction of A. officinalis mimics the intensity and frequency of cough with the aqueous extract of its root. Antitussive activity is more effective than prenoxydiazine (Nosalova, 1992) [12]

Free radical scavenging activity of the dried whole plantethanol-water (1:1) extract produced weak activity against superoxide anion when evaluated by neotetrazolium method at a concentration of 5.0µg/ml (Masaki, 1995) [13]

Pharmacological activity of pectin - Pharmacological effects of pectins include immune-stimulating, anti-metastatic activity, anti-ulcer activity, anti-nephrosis activity and cholesterol-lowering activity. It can also be used to deliver drugs for the typhoid fever vaccine (Yamada, 1996). [14]

Pharmacological Activity of Scopoletin- Antithyroid, Antioxidant and Antihyperglycemic Activity of Scopoletin Scopoletin (7-hydroxy-6-methoxy coumarin) has been evaluated therapeutically for hyperthyroidism, lipid peroxidation and hyperglycemia in rats. Scopoletin (1.00 mg/kg, po) administered daily for 7 days decreased serum thyroid hormone and glucose levels, as

well as hepatic glucose-6-phosphatase activity. Scopoletin also mimics hepatic lipid peroxidation and stimulates the activity of antioxidants, superoxide dismutase, and catalase. This suggests that scopoletin produces hyperglycemia without antithyroid activity and hepatotoxicity (Panda, 2006). [15]

Immunomodulatory effect of scopoletin on tumor and normal lymphocytes- Scopoletin has a dual effect on tumor lymphocytes, it has a cytostatic and cytotoxic effect on cell incubation, and also induces apoptosis. Increased normal T-lymphocytes due to interaction with protein kinase C (PKC). This suggests that scopoletin may be a potential antitumor compound used therapeutically in the treatment of cancer. [16]

Anti-inflammatory effects of scopoletin- Scopoletin exerts anti-inflammatory effects on croton oil-induced mouse ear swelling (Ding, 2009). [17]

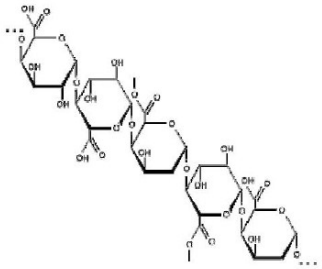


Figure 3. Structure of pectin

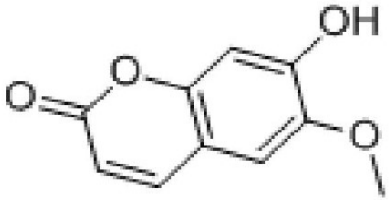


Figure 4. Scopoletin (7-hydroxy-6-methoxy coumarin)

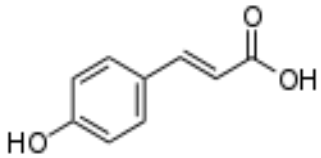


Figure 5. Para-coumaric acid

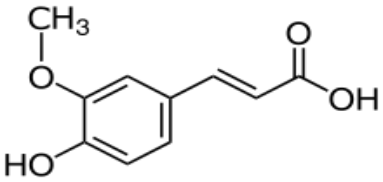


Figure 6. Ferulic acid

Experimental part - "Cold pressing" method was used in order to fully preserve the useful chemical modes contained in cauliflower (Althaea officinalis L.). For this purpose, the oil was extracted by pressing the quality seeds of black sedan, cleaned in accordance with sanitary requirements, using the press machine "DD85-G" manufactured by the German company "AEN Engineering GmbH & Co.KG". The amount of oil obtained by the cold pressing method used 35% humidity and maximum temperature below 45oC guarantee the high quality of the obtained product. It was observed that sunflower seed oil content is less than 5%.

Fully dried marigold (althaea officinalis L.) oil was taken in an analytical balance (FA220 4N) in the amount of 200 mg to mineralize the sample, i.e. to turn it into a clear solution. A mineralization device (MILESTONE Ethos Easy, Italy) was used to mineralize the sample. For this, a sample (200 mg), 6 ml of distilled nitric acid (HNO3), i.e. acid distilled in an infrared acid purifier (Distillacid BSB-939-IR) and 2 ml of hydrogen peroxide (H2O2) as an oxidant, are placed in the test tube of the device. 20 min. during 180ºC all the mixture was mineralized.

After the mineralization process was completed, the mixture in the test tube was diluted with distilled water (BIOSAN, Latvia) to 40 ml in a separate conical volumetric flask.

The solution in the flask is put into special test tubes in the Autosampling Department and placed for analysis. The prepared sample was analyzed in an Avio200 ISP–OES Inductively Coupled Plasma Optical Emission Spectrometer (Perkin Elmer, USA). The accuracy of the device is high, and it allows to measure the elements contained in the solution to an accuracy of 10^{9}-g.

The data obtained as a result of the analysis are as follows:

1-table

№	Elements in Gulkhairi	Amount(mg/100g)
1	Phosphorus-P	135.93
2	Calcium-Ca	112.88
3	Potassium-K	82.936
4	Sodium Na	47.996
5	Sulfur-S	42.65
6	Magnesium-Mg	39.07
7	Aluminum-Al	6.976
8	Strontium-Sr	5.23
9	Ferrum-Fe	4.499
10	Lithium-Li	0.615
11	Selenium-Se	0.568
12	Chrome-Cr	0.544
13	Zinc-Zn	0.532
14	Manganese-Mn	0.552
15	Lead-Pb	0.204
16	Tin-Sn	0.106
17	Copper-Cu	0.079
18	Tellurium-Te	0.066
19	Molybdenum-Mo	0.008
20	Nickel-Ni	0.000
21	Antimony-Sb	0.000
22	Bor-B	0.000
23	Cadmium-Cd	0.000
24	Silver-Ag	0.000
25	Mercury-Hg	0.000
26	Cobolt-Co	0.000

CONCLUSION

Thus, in order to fully preserve the useful chemical modes contained in saffron (Althaea officinalis L.), the oil obtained on the basis of "Cold pressing" using the press equipment "DD85-G" manufactured by the German company "AEN Engineering GmbH & Co.KG" chemical composition and some profiles were organized. Fully dried marigold (althaea officinalis L.) oil was taken in an analytical balance (FA220 4N) in the amount of 200 mg to mineralize the sample, i.e. to turn it into a clear solution. A mineralization device (MILESTONE Ethos Easy, Italy) was used to mineralize the sample. The solution in the flask is put into special test tubes in the Autosampling Department and placed for analysis. The prepared sample was analyzed in an Avio200 ISP - OES Inductively Coupled Plasma Optical Emission Spectrometer (Perkin Elmer, USA).

The most common elements in Gulhair oil and their functions.

P-phosphorus is involved in the activity of the nervous system, in the biosynthesis of proteins in the body. Water-insoluble calcium and magnesium phosphates enter the bone component and ensure its hardness. It supports phosphorus homeostasis and regulates its exchange. It ensures a high level of reabsorption in the kidneys. mineral metabolism takes place in tissues.

Ca-calcium-Bone strength, normal functioning of the nervous system, activator of hormones, blood clotting. Brittle bones and pain in them are one of the obvious signs of calcium deficiency. Nails, brittle hair, dental diseases (crushing, cracks in the enamel) also indicate calcium deficiency in the body. If you enjoy playing sports, watch out for frequent cramping as a sign of calcium deficiency. Vascular weakness, hypertension, facial paralysis, and even premature graying of hair can be symptoms of calcium deficiency.The appearance of calcium deficiency at a young age will undoubtedly lead to diseases such as multiple sclerosis. Calcium deficiency in children causes disorders in the formation of bones and teeth, pathological changes in the eyeball, disorders in the

nervous system, sensitivity, and blood vessels. One of the most dangerous conditions caused by calcium deficiency in children is poor blood clotting.

K-potassium improves the work of heart tissue. A lack of potassium in the body causes blood vessels to constrict, heart rate to increase, muscle pain, and difficulty breathing.

Na-sodium maintains the acid-base balance in the gastric juice. It activates the work of the liver, nervous system, digestive enzymes. Sodium chloride-Isotonic solution. It fills up the lack of liquid in a dehydrated body. Sodium and chlorine ions are the main inorganic components of the extracellular fluid and maintain the osmotic pressure of blood plasma and extracellular fluid.

S-Sulphur - takes part in protein synthesis and liver production. Prevents arthritis, myositis, and allergic diseases.

Mg-magnesium- Lack of vitamins and minerals in the body can cause various diseases. One of the most important components is magnesium. It is very important for internal organs, especially the heart and blood vessels. To compensate for the lack of this element, it is recommended to take the drug "Magnesium B6". Magnesium is very for everyoneis an essential element. It takes part in the processes that take place continuously in the body, in particular, it has its place in such cases as: protein production, stabilization of cell growth, nervous system, maintenance of normal blood cholesterol level and prevention of myocardial disorders.

Al-aluminium- Although the toxicity level of aluminum and its compounds is very low, it is possible that it will have a harmful effect on human and animal body tissues as a result of long-term effects on the body. Aluminum enters the body mainly through drinking water. Aluminum chlorides, nitrates and acetates have relatively stronger toxic effects. The toxic effect of aluminum is primarily related to the nervous system. Aluminum that enters the body with drinking water is usually excreted again with urine. About 15 mg of aluminum is excreted in the urine of a middle-aged person per day. Therefore, the toxic effects of aluminum are more pronounced in patients with impaired urinary function. [18].

Sr-strontium accumulates in bone tissue and blood-forming organs. Strontium light therapy devices are used in defetoscopes, polymer screens and gauzes to eliminate static electricity. [18].

Fe-ferrum - Use of fertilizers, maintenance of soil fertility, increase of iron content. The mobility and availability of less consumed elements such as iron decreased due to the formation of stable complexes with insoluble organic compounds [15] In the human body, it affects the cardiovascular, respiratory, liver, gastric juice, and nervous system. [19]. Anemia-anemia occurs when the body lacks iron.

Li-lithium-Lithium salts have normotonic and other healing properties. That is why they are used in medicine. [19]. Strengthens the nervous system. When the body lacks lithium, confusion occurs and memory decreases.

In addition, when we compared our oil with the hygiene regulations of the Ministry of Health of the Republic of Uzbekistan for food products, toxic and heavy metal salts arsenic-As, mercury-Hg, cadmium-Cd were not detected.

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