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EXPANSION OF ACORUS CALAMUS L (NORMAL COW) PLANT AND ITS COMPOSITION, BIOLOGICAL PROPERTIES AND APPLICATION IN MEDICINE

A. H. Islomov*[1], A. D Matchanov[1], O. O. Gaybullaeva[2], A. S. Ishmuratova[3], D. Maxmudova[4] and Q. O. Komilov[5]

[1]Institute of Bioorganic Chemistry named after academician A.S. Sadykov of the Academy of Sciences of Uzbekistan, Tashkent, Uzbekistan 700143.

[2]Lecturer at the Department of Methods of Teaching Biology at Navoi State Pedagogical Institute.

[3]Teacher of the Department of Methods of Teaching Biology of Samarkand Medical Institute.

[4]Tashkent Institute of Road Design and Construction Operation.

[5]Tashkent Institute of Irrigation and Agricultural Mechanization Engineers.

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***Corresponding Author**
A. H. Islomov
Institute of Bioorganic Chemistry named after academician A.S. Sadykov of the Academy of Sciences of Uzbekistan, Tashkent, Uzbekistan 700143.

ABSTRACT

In this paper, we discovered methods for increasing the medicinal plant of Acorus calamus L in vitro, as well as the composition of micro and macroelements. The use of *Acorus calamus* L in the natural chemicals used in medicine and in agriculture.

KEYWORDS: *Acorus calamu*, essential oil, pinen, camphor, camphor, sesquiterpene alcohols, calamine, proazulene, acachermakmakron, shiobunon, aaron, gayne borneol.

INTRODUCTION

Today, the world is rapidly developing with the cultivation of promising plant species, the removal of high-biological substances and the creation of new drugs on their basis. Natural compounds, extracted from plants, have high biological activity, such as essential oils: pinene, camphor, camphor, borneol, sesquiterpene alcohols: calamine, proazulene,

chlorobacterone, chiobunon, acarone, guaienne, acetic and valerian acids and other compounds. calamus L separates from medicinal plants and plays a special role in medical practice and national economy.

Theoretical part

Acorus calamus L, a common cow, belongs to the Araseae family. Moldova, Ukraine, Belarus, the Baltic, South of the European part of Russia; swamp grows in grasslands and swamps. The product is mainly produced in Belarus and Ukraine, but can be harvested in the middle stream of the Kazakh and Amur rivers.[1-4]

Acorus calamus L is a perennial herbaceous plant with 1.5 m long, horizontal, reptile, branched and multicellular, with dark brown or greenish-yellow color. At the top of the rhizome is a collection of leaves. Leaves are linear or sword-like, 60-120 cm long, with straight edges and parallel veins (typical of single-stage plants). The stem (flower arrow) is green, upright, not branched, triangular, leafless, on one side, with sharp edges. At the stem there are two sexy, yellow flowers that are collected on the stem. The cone is cylindrical-cone-like, 4-12 cm long. Flower bouquet - a 50 cm long leaf-shaped leaf is visible from the stalk. The flowerpot is modest, simple, six-leafed, six-parent, three-room maternity knot. The fruit is elongated with many seeds and with a damp red fruit. The roots and leaves are odorless, the tiny roots are odorless. It blooms from late May to July. Land surface of *Acorus calamus L* Fig. 1.[1-4]

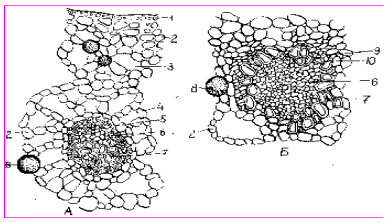
Figure 1: The surface and roots of the plant Acorus calamus L.

Acorus calamus rhizome is made in the autumn or early spring, when water is depleted. The plant is removed from the mud with rods, scrapes and other tools, and then rinsed with water. The stem, leaves and small roots are cut off and the rhizome is slightly wiped out. They are then transversely cut and cut into large pieces, 2 to 4 inches long, and then dried in an airtight place or at a dryer (25-30).

The product of the *Acorus calamus* harvest is covered with an orange brown probe, cylindrical, slightly flattened, bent and light, up to 30 cm long and 0.5 to 1.5 cm thick. At the top of the rhizome are crooked, dried stems, leafy leaves and numerous small, rounded roots at the bottom. The rootstock is flat-fractured, with holes in the inside, pale and sometimes yellowish. The product has a very pleasant aroma and aroma.

Acorus calamus herbaceous product consists of 1-7 mm rhizome sections of various shapes. According to XI DF the moisture content of the product is 14%, total ash 6%, dark rhizome slices 5%, well-rotted slices 5%, root slices less than 2 cm, organic compounds 1% and mineral mixtures. Not more than 2%. Minimum 10% particles through the cutter diameter of 10 mm, 10% of the sieve diameter, 10% moisture in the powder product, the sieve diameter 0.310 mm. large portions should not exceed 5%.[5-11]

Microscopic structure of the *Acorus calamus* plant. The cross-section of the rhizome, which is softened in a mixture of glycerol and alcohol, is first seen in a small lens of the microscope and then in a large lens using a solution of chloral hydrate (Fig.). Beneath the epidermis is the parenchyma of the aerenchy bark. At the place where aerenchyme is formed, there are cells with ether. The permeable connective tissue joints are collateral type and surrounded by wooden fibers. Crystal cells are sometimes found in the fibers. The connective tissue links in the root of the rhizome are composed of concentric (xylem centered phloem), surrounded by small parenchyma cells. There is an endoderm ring consisting of thin-walled elongated cells within the bark and woody sections of the rootstock. The cells of the parenchyma contain starch.



A- part of the bark; B - The root part. 1st epidermis; 2- parenchyma of bark; 3 - airways (cavity); 5- crystals; 6th phloem; 7- water pipes; 8- essential oil cells; May 9 - cellular parenchyma; 10- endoderm.

Acorus calamus plant root chemical. Contains up to 5% of essential oil, bitter chord glycoside, excipients, resin and up to 25.5% starch. Leaves of the *Acorus calamus* plant

contain essential oil, up to 150 mg% of vitamin C and supplements. *According* to XI DF, the whole rhizome should not contain 2% of the essential oils and less than 1.5% of the powder and powder product. Essential oil is yellow, dark liquid with a density of 0,9491-0,9547, refraction number 1,4990-1,5065, angle of polarized light + 8- + 18,70. Essential oil contains 1% pinene, 7% camphor, Contains 8.7% camphor, 3% borneol, 17% sesquiterpene alcohol, 10% calamine, proazulene, chloramphenicol, shiobunon, acarone, guaien, acetic and valerian acids and other compounds.

Acorus calamus herbs are used in medicine as a flavoring agent to improve appetite and digestion. Previously it has been used to treat kidney, liver and gall bladder diseases. Acorus calamus rhizome is also used in the perfumery and food (liqueur) industry.

Medicinal herbs of Acorus calamus. Do not boil. The rootstock is a part of tea, which is used for the treatment of bitterness, bitterness, and appetite. The essential oil of *Acorus calamus* rhizome is a drug "Olimetin" used for the treatment and prevention of kidney and biliary stone disease, rhizome powder - "Vikalin" and "Vikair" drugs used for gastric and duodenal ulcers.[5-11]

President of Uzbekistan Sh. Mirziyoev pays great attention to the cultural reproduction of medicinal plants in the Republic, the introduction of new species, their acclimatization and the establishment of large-scale plantations, the preparation of raw materials, and the further development of the pharmaceutical industry. The Decree of the President of the Republic of Uzbekistan dated March 20, 2018 No PP 36/17 was signed. The Decree sets out a number of objectives for the sustainable use of natural resources of medicinal plants in flora of the Republic of Uzbekistan, including the organization of plantations of certain medicinal plants and increasing the volume and export of their raw materials.

DISCUSSION OF RESULTS

In our Republic many scholars have been conducting their research works on propagation and increasing the output biology of medicinal plants in our Republic with scientists from the Institute of Bioorganic Chemistry named after academician O.S.Sodikov of the Academy of Sciences of the Republic of Uzbekistan together with the scholars from Gulistan State University at the “experimental” biology laboratory. They carry out their research on *Acorus calamus* which is being grown in the “*in vitro*” condition.

For introduction, in vitro, Acorus calamus is taken as the primary material for the cultivation of intensive green shoots or ripe cuttings for cultivation. 70% ethanol without touching the three parts of the green bud, then sterilized and then washed and put into a biodegradable nutrient medium, with intensive green shoots or ripe cuttings. At 0 C and late at 20-22 0 C. Depending on the shoots, the shoots sprout from the green shoots for 8–10 days and the shoots for 40–60 days. If there is insufficient primary material for introduction, the plant grown in the test tube is cut into single buds and re-planted, and the in vitro plant is planted in the greenhouse substrate. The substrate consists of two layers of sand and timber. The top of the substrate is a simple substrate, with a wooden crust on the surface layer. In hydroponics, large river sand or diorite is used when substrate is used. The plant should not be exposed to direct sunlight for 12-13 days, and the film should be covered with a film 30-60 cm above the substrate to increase moisture. Once a day the film is removed and ventilated for several minutes. (At this time the leaf leaves should be wet). Irrigation is carried out 1-2 times a day depending on the temperature. If the greenhouse is equipped with artificial fog, there is no need to cover the plant with film. In the first 30-60 days, the root system develops in the upper layer of the substrate. Depending on the biological nature of the variety and the timing of planting, the ripe branches of the greenhouse reach 0.4-0.5m. In the autumn, the seedlings are dug out of the greenhouse and planted in the open field.[12-15]

Development and reproduction of Acorus calamus planting technology In the fields, where moisture is specially allocated for the Acorus calamus plant, in early autumn, 500 kg of organic fertilizers, superphosphate per hectare, are pumped to the soil at a depth of 27-30 cm. If the plant is cultivated on low-water soils, it is desirable to provide 20 kg of nitrogen and potassium fertilizer per hectare.[16]

The plant *Acorus calamus* seed and an increase in rhizome cuttings. Before planting the seed permanganate potassium and copper vitriol 0.002% solution of the mixture for 12 hours soak then be planted. In the early spring plots are cultivated by boron, porridge and cultivation. When the soil temperature is 10-12 ° C in the middle of March, 13-15 kg of seeds are used per hectare. It should be at least 4-5 cm deep. The seed capacity should not be less than 75-80%. Seeds sprout within 10–12 days if the soil temperature is normal and the humidity is sufficient. If the rhizome is grown from cuttings, its yield capacity should be at least 80-90%. Roots should be sown in early spring at a depth of 8–10 cm. An average of 10-12 centners per hectare is spent on rhizomes. The density of the plant is 10-15 units per 1 meter. When

the seed and pencil are sown in the range of 60 cm, in the second and subsequent years the plant will develop well and allow for full coverage of the soil surface.[16]

The plant *Acorus calamus* is irrigated 6–7 times in the first year, and in subsequent years the number of irrigation is reduced. In the first year, the plant is softened and removed from impurities.

The first fertilization is carried out in May and in June with 15 kg of nitrogen per hectare and 10 kg of potassium fertilizer per hectare. The second feeding will be completed in August by giving 15 kg of nitrogen and 10 kg of superphosphate fertilizer. The plant feeding is done before irrigation. During the second and third years of the dyeing rhubarb, the first fruits are harvested when they turn dark and do not let them fall apart. In late autumn or early spring, the roots and rhizomes can be removed from the soil with a plug of 30–35 cm, washed with water and dried at 45–50 ° C.

The plant *Acorus calamus* training seeds or mechanisms will be collected by hand. It can be harvested an average of 70 to 90 kg of seeds and 12 to 13 centners of dry roots per hectare.[16]

The amount of macro and microelements in the root of the plant *Acorus calamus* has been performed using the Optima emission spectrometer Optima-2100DV with inductively coupled argon plasma. Sample solutions for this have been delivered to the wells in the autosporter, and final processing is performed by the Win-Lab (offline) apparatus. The device automatically calculates the noise, the form of the solution at the specified locations of the studied elements. The obtained results and spectrum analysis were performed automatically by "multispectral analysis". The results of these studies are presented in the Table 1.

Table 1: The amount of macro and micro elements in the root of the plant *Acorus calamus*.

No	Items of elements	The amount of macro and micro elements in the root of the plant	No	Items of elements	The amount of macro and micro elements in the root of the plant
1	Al	1127,461	23	S	-87,728
2	Ba	112,811	24	Ti	48,355
3	Bi	0,109	25	Gr	7,019
4	Ca	46792,231	26	Co	1,029
5	Fe	2433,533	27	Cu	41,009
6	K	24174,433	28	Ga	3,990
7	Li	1,202	29	Ge	0,018
8	Mg	3363,596	30	As	0,632
9	Na	5238,032	31	Zr	1,370
10	Mn	98,248	32	Nb	0,090
11	Rb	9,539	33	Mo	2,270
12	Se	0,233	34	Ag	0,036
13	Sr	274,031	35	Cd	-0,019
14	V	2,045	36	In	-0,033
15	Zn	42,156	37	Cs	-0,030
16	P	7992,102	38	Ta	0,404
17	Pb	2,472	39	W	0,309
18	Ni	10,906	40	Re	-0,001
19	Be	-0,007	41	Hg	0,133
20	B	36,354	42	TI	-0,255
21	Si	1227,461	43	U	0,204
22	Sn	9,790	44	Sb	0,124

The data in the table show that 44 element heavy metals, macro- and micro-element quantities in the root of the Acorus calamus L. plant were identified. We can also see that the root contents of the plant contain more than Ca (46792,231 mg/g), K (24174,433 mg/g), P (7992,102 mg/g), Na (5238,032 mg/g), Mg (3363,596 mg/g), Fe (2433,533 mg/g), and other elements.

Experimental section

1 *Acorus calamus* is taken as the primary material for the production of intensive green sprigs or ripe cuttings for in vitro cultivation. Sterilized in 70% ethanol 30 seconds without touching the three parts of the green shoot, then washed 3-4 times for 10 min and put into the biodegradable nutrient medium for intensive green growth shoots or ripe cuttings. / l; NH_4NO_3-412 mg / l; $MgSO_47H_2O$-185mg / l; $CaCl_2$ $2H_2O$-440 mg / l; KH_2PO_4-68mg / l; Fe - ellate, trace elements, mesoinositis 50 mg / l; thiamin HCl-0.2 mg / l; nicotinic acid -0.2 mg / l; pyridoxine HCl-0.2 mg / l; indolyl acetic acid 0.5 mg / g; ferrous acid 1 mg / l; sucrose 10 g

/ l, agar-agar 7.5 g / l; pH 5.8. The plant was planted into the test tube, and the temperature was maintained at 25-28 ° C in the daytime, and at 20-22 0C in the light conditions for 16 hours. has grown over the years. If there is insufficient primary inputs, the plant grown in the test tube will be cut and re-planted, the nutrient content will be the same, and the amount of indole acetic acid (0.2 mg / l) will be reduced. The plant from in vitro was planted on the substrate in the greenhouse. The substrate consists of two layers of sand and wood bark. The top of the substrate is a simple substrate, with a 4-5 cm thick layer of wood chips. (wood chips evaporate for 1 hour before insertion). In hydroponics, large river sand or diorite is used when substrate is used. The plant is extracted from the test tube and washed and watered. Avoid direct sunlight for 12-13 days, cover the film 30-60 cm above the substrate to increase moisture. Once a day the film is removed and ventilated for several minutes. (At this time the leaf leaves should be wet). Depending on the temperature, irrigation 1-2 times a day. If the greenhouse is equipped with artificial fog, there is no need to cover the plant with film. In the first 30-60 days, the root system develops in the upper layer of the substrate. Depending on the biological characteristics of the variety and the timing of sowing, the ripening branches of the plant in the greenhouse reach 0.4-0.5 m. In the autumn, the seedlings are dug out of the greenhouse and planted in the open field.

2. Acorus calamus plant roots in the structure of the macro and micro elements amount of inductive link argon plasma optical emission spectrometry method has been determined and studied on the basis of Optima 2100DV (USA) office and Avtodozator S-200, Perkin Elmer device . *Acorus calamus*. The root of the plant sample was thoroughly ground; 0.1 g of sample was weighed at ±1 mg using analytical scales. The sample was placed in an autoclave made of Teflon and injected with 2 ml of nitric acid and 1 mL of hydrogen peroxide after the autoclave was thoroughly sealed and placed in a microwave breaker BERGHOF with Speebwave TM MWS-3 (the amount of autoclaves is 12). Being heated them for a minute at 25-40 ° C to grind then cool down and again heat them to 25-40 ° C. After completion of decomposition, Sample Solution Autoclave 5–10 ml of anionized LaboStar PRO UV 4, 1.5 l / min, rinsed in 50 ml measuring tube 3 times with water extracted from Evoqua (SG Wasser) and dehydrated in water until the volume was 50 ml. filled with vacuum solution (2% nitric acid). After receiving data from the device, the final processing is done by the Win-Lab (offline). The device automatically calculates the noise, the form of the solution at the specified locations of the studied elements. The standard uses a multi-element standard solution. The analysis is repeated 5 times and is an arithmetic mean. The RSD for each item

should be between 0.01 and 1.0%. S-200 used in Perkin Elmer Avtodozator system, generator power - 1500 W, pump peristalysis speed - 1.2 ml / min, argon flow 12-15 l / min, plasma observation point - 0.8 l / min.

CONCLUSION

1. Developed in vitro methods for the introduction of the *Acorus calamus* plant, which in the future will produce high quality export-oriented products. In addition, it will help to create a raw material base and increase the workforce in the national economy and medicine.
2. Macro and micro elements in the root of the *Acorus calamus*. plant studied by the Optima-2100DV (US) apparatus on the basis of the optical emission spectrometry method "Inductively coupled argon plasma" contains 44 macro and micro elements. and the amount was quoted. It has been found that calcium, potassium, phosphorus, sodium, magnesium, and iron are high in comparison to other elements.

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