

Medicinal Properties and Photochemical Composition of Fennel (*Huperisum perforatum l.*)

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Abstract: Today, the interest in natural medicines has increased significantly in the world. For example, in Germany, 80% of doctors of all specialties regularly use plants in their practice, more than 80% of patients in all countries of the world have been treated with phytopreparations at least once. Therefore, the inventory of common medicinal plants, registration of their reserves, and the search for ways of their sustainable use is a very urgent problem. For this purpose, the medicinal properties and chemical composition of dalchoi (*huperisum perforatum l.*) cultivated in the conditions of Samarkand region were studied.

Key words: Hyperecin, rutin, protopseudohypericin, pseudohyperecin, quercetin, quercitrin, essential oils, flavonoids, additives, organic acids, ascorbic acid, heperoside.

Relevance of the topic. Decree of the President of the Republic of Uzbekistan No. PQ-2911 of April 20, 2017 "On measures to create favorable conditions for the rapid development of the pharmaceutical industry of the Republic", No. PQ-4670 of April 10, 2020 "Protection of wild medicinal plants, cultural "On measures for cultivation, processing and rational use of available resources" and PQ-4901 dated November 26, 2020 "On measures to expand the scope of scientific research on the cultivation and processing of medicinal plants, development of their seed production" done

Therefore, it is one of the urgent problems to develop the ways of correct and effective use of medicinal plants, to protect the environments where they grow, to preserve them by reducing the negative impact of humans on their natural reproduction, and to create the possibility of wide use for human needs.

The purpose of the study. It is to study the morpho-biological characteristics of *H. perforatum* cultivated in the conditions of Samarkand region and to determine its chemical composition.

Research materials and methods. The researches were conducted on the gray soil site of the "Sherzod, Sherkozi, Jamshid Roziyevich" farm located in the Urgut district.

The chemical composition of dalachoe was determined in 2019 at the Flavonoids Laboratory of the Institute of Plant Substances Chemistry of the Russian Federation by methods described in the XII edition of the State Pharmacopoeia.

Research results and their analysis. *H. perforatum* is one of the plants widely used in folk medicine and scientific medicine. *H. perforatum* is often used as a medicinal raw material. leafy and flowering branches are used from the upper part of It is recommended to prepare the raw material from the top 25-30 cm of the plant when it is flowering and the fruit is not yet ripe.

Spread. In the Commonwealth of Independent States, Dalachoy is a southern boreal Eurasian species, which is quite widespread on Earth. Dalachoy is found in the middle part of Europe, Central and Asia Minor, North Africa, Iran, Mongolia, Japan, China and North America. Dalachoy is often widespread in dry, bright areas, and it can be found in mountainous regions up to 2300 m altitude, as well as in forest-steppe and forest regions. Its growth area in nature is very small and often occupies small areas.

Botanical description. *H. perforatum*. is a perennial herb, its height reaches 30-100 cm. The stem grows upright, the upper part is branched, and has a cylindrical shape. The leaves are opposite to each other on the stem, oval and elliptic in shape, on an unbranched stem. The leaves have a small amount of shiny black glandular hairs. The flower organs are free actinomorph, the calyx has five members without shedding, the sepals are also five, the sepals are light yellow in color, there are many stamens, often their number is up to 50-60 pieces. Based on pollinators, they are united in three sets. The node is egg-shaped and its length reaches 3-5 mm. A large number of flowers are combined into a panicle-shaped inflorescence. The fruit is an elongated ovoid capsule, up to 6 mm long and 5 mm wide. A large number of seeds are placed in a very small fruit

Medicinal properties. In addition to being rich in biologically active substances, it also contains sodium, calcium, potassium, manganese, iron, zinc, copper, lead, mercury and similar minerals necessary for the body. Antiviral properties of hypericin should be taken into account. Because this substance has biological activity, it is used in the fight against cytomegalovirus, human papilloma viruses, influenza, hepatitis V, AIDS and similar diseases.

Hyperforin contained in dalachoe has an antimicrobial effect and has antibacterial activity, so it gives effective results in the fight against golden staphylococci. Almost 88% of hypericin and 51% of flavonoids are found in flowers. This means that it is much more than in other organs of the field.

Dalachoy has strong adaptogenic properties. That is, it invigorates the body and increases immunity, just like Jen-shen. As a result of Dalachoy effect, physical and mental vitality of organisms increases. It is resistant to infectious diseases. It is used to treat severe colds. It has been proven that it can be used against ureters and parasitic worms.

Chemical composition. The information about the chemical composition of the field growing under natural conditions is sufficiently covered in the scientific literature. However, the chemical composition of cultured fields has not been studied in our Republic. Hyperecin, pseudohyperecin, protopseudohyperecin, quercetin, rutin, quercitrin, essential oils and similar substances were found in the upper part of the field.

L.M. Belenovskaya, A.L. Budantsevlar (2004) *H. perforatum* in conditions of Uzbekistan. conducted research on the products of secondary metabolism of the plant and their biological activity [10,13]. As a result, it was observed that the above-ground part of the plant contains 10-12% nutrients, 1% organic substances, 0.9-2% flavonoids, quercetin, quercitrin, hyperoside, rutin, anthocyanins and up to 0.22% essential oils (Table 1).

Table 1
Chemical composition of naturally grown *H. Perforatum*

Accumulation of substances in organs	Biologically active substances, composition %			
	Additives	Organic acids	Flavonoids	Ascorbic acid
Flowering	10-12	1	0,9-2	0,1-0,4

The analysis of the chemical elements in the field mainly covers the above-ground part of the field and in some cases its composition in the flowering phase. As we know, accumulation of chemical elements in plants also depends on vegetative organs. In addition, the chemical composition of the root system of this plant has not been studied. We set ourselves the goal of analyzing the state of formation of chemical elements in the budding and flowering phases of the field and in the root of the vegetative organ. Our observations in this area were carried out in the Laboratory of Flavonoids together with the staff of the Institute of Chemistry of Plant Substances. All chemical analyzes were carried out by the methods described in the XII edition of the State Pharmacopoeia

In the process of analysis, the amount of nutrients, organic acids, flavonoids and ascorbic acid in the budding, flowering and roots of the plant was determined (Table 2).

Table 2
Chemical composition of cultured *H. Perforatum*

Органларда моддаларни тўпланиши	Биологик актив моддалар, таркиби %				
	Намлик	Ошловчи моддалар	Органик кислоталар	Флаво- ноидлар	Аскорбин кислота
Ғунчалаш	6,34	7,55	1,28	3,40	0,012 (12,8мг/100г)
Гуллаш	5,72	9,79	1,46	0,47	0,010 (10,2мг/100г)
Илдиз	7,51	7,65	1,15	0,49	0,0078 (7,83мг/100г)

From the analysis, it was clear that the highest amount of additives was observed in the flowering phase, which was 9.79%. This indicator was equal to 7.55% and 7.65% in the root of the field. The relatively high amount of organic acids was 1.46% during the flowering period. When studying the composition of flavonoids, the highest amount of these substances was observed in the budding phase, equal to 3.40%. This indicator was

0.47% in the flowering phase and 0.49% in the root composition. A relatively high level of ascorbic acid was observed in the budding phase and was equal to 0.012 (12.8 mg/ 100 g). It was found that ascorbic acid was 0.010 (10.2 mg/100 g) in the flowering phase of field bean, and the lowest amount was observed in the root, equal to 0.0078 (7.83 mg/100 g). So, from the results of the above analysis, it is clear that it is appropriate to use mainly the flowering phase of dalchoi in order to obtain additives, and to use it when it enters the budding phase for the extraction of ascorbic acid and flavonoids.

Conclusion. It is written in the literature that it is recommended to prepare raw material from the field plant at the time of flowering and the time when the fruit is not yet ripe, the top 25-30 cm of the plant. Based on our conclusions, we recommend taking this plant raw in the gross budding and flowering phase. It should also be noted that under the conditions of introduction, it is possible to use the partially cultured field root to obtain the chemical elements necessary for the pharmaceutical industry.

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