

DETERMINATION OF FLAVONOIDS IN THE ROOTS OF INULA HELENIUM L PLANT.

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Annotation: *In this article, the flavonoids contained in the roots of Inula helenium L growing in Khatirchi district of Navoi region were determined by high-performance liquid chromatography and information about their use in medicine is presented.*

Keywords: *Inula helenium L.; Inula grandis, inulin, rutin, quercitin. salidroside, alantolactone, isoalantolactone, dihydroalantolactone, antiseptic.*

INTRODUCTION

Today, on a global scale, large-scale research is being conducted on the creation of new effective drugs based on local raw materials. In this regard, it is of urgent importance to create a base of primary raw materials for the preparation of cheap and high-quality drugs that can replace imports by extracting natural medicines from local raw materials. In this sense, Inula helenium L., widely distributed in Uzbekistan; Inula grandis Schrenk. It belongs to the asteraceae (Compositae) family and is found in the Caucasus, Central Asia, Moldova, Ukraine, Belarus, in the desert and forest-desert zone of the European part of Russia, as well as in Farb Siberia, Krasnodar and Stavropol o It grows in the regions of Kazakhstan and Uzbekistan in wet lands,

near water, in meadows and among bushes. *Inula* species are very similar in appearance and contain the same compounds, so they are used in medicine to treat the same diseases. That's why the products of Andiz species are prepared together. Medicinal preparations of the plant *Inula helenium* L. Allanton (in the form of tablets), as well as extracts of the root and rhizome, which are used for cough and expectoration, are included in teas.

THEORETICAL PART:

Inula helenium L plant species is a perennial herb 100-150 cm tall with one or more stems, erect, erect, branched at the top. The root leaf is long-banded, large (the leaf plate is up to 50 cm), elliptic or oblong-ovate, with a sharp tip, narrowing towards the base. The leaves on the stem are smaller, oblong-ovate, and become smaller as they reach the top of the stem. The leaf plate has a serrated edge, the upper side is sparse and hard hairy, and the lower side is soft and hard. The leaves on the upper part of the stem are unbanded, and the lower leaves are arranged in a row on the stem with a short band. The flowers are golden in color and gathered in a basket. Baskets form a shield-shaped or shingle-shaped flower cluster at the top of the stems and branches. The folded leaves of the basket are arranged like cherepitsa. The leaves are ovate, curved and covered with many hairs. The flowers on the edge of the basket are yellow, tongue-shaped, and those in the middle are also yellow, fluffy, tubular. The calyx leaves of the flowers are turned into tufts, the corolla and paternity are 5, the maternal node is one-digit, located below. The fruit is an elongated, four-sided, brown or brown pistachio.

The chemical composition of the *Inula helenium* plant contains 1-3% essential oil, up to 44% inulin and other carbohydrates, a small amount of alkaloids, acetic and benzoic acids, and saponins in the root and rhizome. has a unique smell and taste. The crystalline part of the essential oil - gelenin consists of a mixture of three sesquiterpene lactones (alantholactone, isoalantolactone and dihydroalantholactone). In addition to gelenin, the essential oil also contains a small amount of alantol and proazulene. The above-ground part of the plant contains up to 3% essential oil, and the leaves contain a bitter substance called alantopicrine.

Medicinal use of the plant *Inula helenium* L. Andis species is used as an expectorant and for stomach and intestinal diseases. The essential oil has an antiseptic, anthelmintic and anti-inflammatory effect. Its anthelmintic property depends on the presence of santonin-like active substances - allantolactones. Allanton medicinal preparation is obtained from the rhizome and root of black andis. Allanton is the sum of sesquiterpenes of the product, it has anti-inflammatory, vasoconstricting and antiseptic effects and soothes the wound

adhesion in peptic ulcer disease. [1-2]

Flavonoids are widespread in nature and can be found in almost all higher plants. Pure flavonoids (glycosides and aglycones) isolated from plants are colorless or golden and yellow crystalline substances. Glycosides of flavonoids are well soluble in alcohol and poorly soluble in cold water. It is insoluble in ether, chloroform and other organic solvents, and its aglycones are soluble in alcohol, ether and acetone. Flavonoids dissolve well in boiling water and redeposit after cooling. The color of anthocyanins and their aglycones - anthocyanidins depends on the pH of the solution (or cell sap). Usually, this group of compounds is red, pink, golden in acidic conditions, and purple, blue, and blue in alkaline conditions.

Flavonoids mainly have the effect of vitamin P, reducing the permeability and fragility of blood vessels. The sum of flavonoids of some plants has laxative and diuretic properties. Pure flavonoids and preparations of their sum, as well as medicinal preparations made from plants and products containing flavonoids, are used for the treatment of other diseases caused by vitamin P deficiency and vascular permeability disorders, as well as for lowering blood pressure, calming, heart (cardiotonic)) and is used as a cure for some cancers and as a laxative and diuretic. [2]

DISCUSSION OF RESULTS

The amount of flavonoids in the root of *Inula helenium* L was determined using the high-performance liquid chromatography (HPLC) method. 5-10 g of the roots of *Inula helenium* L are taken on an analytical scale and placed in a 300 ml flat flask. 50 ml of 70% ethanol solution is added to it. The mixture was heated at 70-80 °C with intensive stirring for 1 hour, equipped with a magnetic stirrer, reflux condenser, and then stirred at room temperature for 2 hours. The mixture is cooled and filtered. 25 ml of 70% ethanol is added to the remaining part and re-extracted 2 times. The filtrates were combined and filled to the mark with 70% ethanol in a 100 ml volumetric flask. The resulting solution is spun in a centrifuge at a speed of 6000-8000 rpm for 20-30 minutes. The resulting solution was taken from the upper part for analysis. Working solutions of flavonoids with a concentration of 1 mg/ml were prepared. For this purpose, 50.0 mg of each flavonoid standard was withdrawn on an analytical balance and dissolved in 70% ethanol in a 50 mL volumetric flask and filled to the mark. [3]

Acetate buffer system and acetonitrile were used as an eluent to determine the amount of flavonoids contained in the root of *Inula helenium* L by YuSSX. Chromatography conditions:-Chromatograph Agilent-1200 (equipped with an autodoser);-Column Exlipse XDB C 18 (obraschenno-faznyy), 5 μm, 4.6

x250mm; -Diode matrix detector (DAD), 254 nm, 272 nm, 276 nm identified; - Flow rate 0.8 ml/min; - Eluent phosphate buffer: acetonitrile: 0-5 min 95:5, 6-12 min 70:30, 12-13 min 50:50, 13-15 min 95:5, thermostat temperature 30 0C, 10 µl injected amount.

First, a working standard solution was prepared in the chromatograph (Fig. 2), then a solution prepared from the root of *Inula helenium* L was introduced into the chromatograph (Fig. 3), and the amount of flavonoids was determined by comparison..

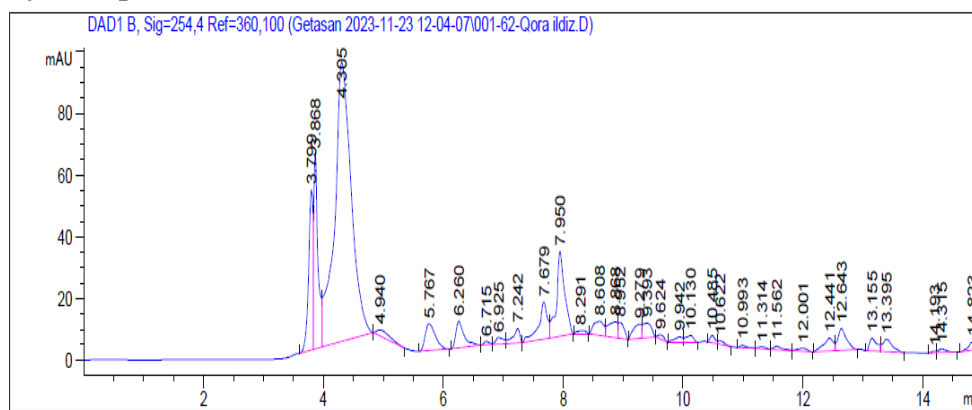


Figure 2. Chromatography of working standard solution to determine the amount of flavonoids in the root of *Inula helenium* L

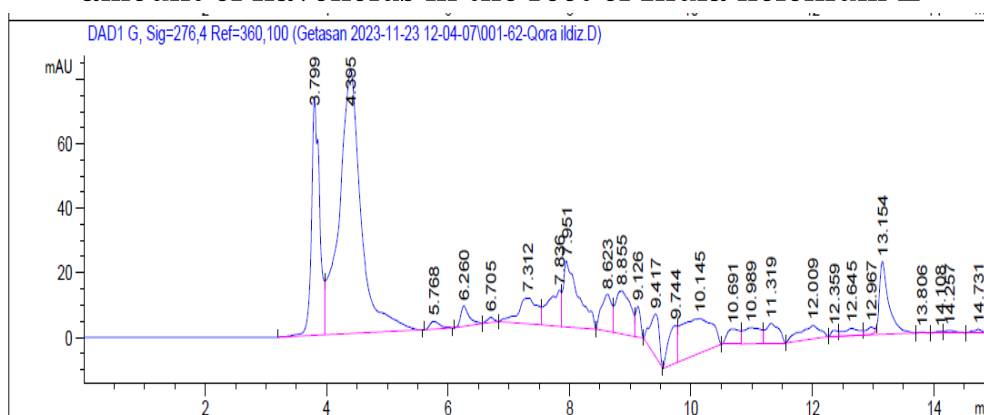


Figure 3. To determine the amount of flavonoids in the root of *Inula helenium* L plant, solution chromatography prepared from the root of *Inula helenium* L plant

When the amount of flavonoids in the root of *Inula helenium* L was determined by the method of high-performance liquid chromatography (HPLC), the root of *Inula helenium* L contained Luthionine = 0.28 mg., Dihydroquercetin = 3.25 mg., Rutin = 7.28 mg. ., Quercitin = 0.15 mg. It was found that seneroside = 2.43 mg.

CONCLUSION: The root of *Inula helenium* L. was found to contain Digidro quercitin., Luthionin., Rutin., Quercitin., Salidroside.

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