DETERMINATION OF WATER-SOLUBLE VITAMINS IN THE ROOTS OF INULA HELENIUM L PLANT

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Annotation:*This article provides information on the determination of water-soluble vitamins in the root of Inula helenium L growing in Khatirchi district of Navoi region by high-performance liquid chromatography method and its use in medicine.*

Keywords: *Inula helenium L.; Inula grandis, inulin, alantolactone, isoalantolactone, antiseptic, expectorant, anthelmintic.*

INTRODUCTION

Today, the effective use of the achievements of folk medicine in the creation of new drugs based on local raw materials on a global scale will definitely bring positive results. 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. Since their products contain the same compounds, they are used in medicine to treat the same diseases. Therefore, products of Inula species are prepared together.

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. It blooms from May-July to September, the fruit ripens in July-October.[1-5]

The finished product of Inula helenium consists of long, thick roots and short, thick and multi-headed rhizomes of various shapes. The root and rhizome are 2-20 cm long, 1-3 cm thick, covered with wrinkled gray-brown bark. The inside of the product is yellowish-white. There are shiny brown spots where the essential oil is. The product is fragile and does not break flat. The root and rhizome have a unique aromatic strong smell and a more bitter and pungent taste.

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 is due to the presence of active substances similar to santonin - alantolactones. The medicinal preparation allanton is obtained from the rhizome and root of black andis. Allanthone is a combination of sesquiterpenes of the product, which has anti-inflammatory, vasoconstricting and antiseptic effects and accelerates wound healing in peptic ulcer disease. [1-2]

Vitamins have the following properties: - they are not synthesized in the human body; - does not participate in the formation of structures; - when they are not enough in the body, the metabolism is disturbed and causes specific diseases; - vitamins consumed with food affect biochemical processes in the body as coenzymes. [2].

DISCUSSION OF RESULTS

The water-soluble vitamins contained in the root of Inula helenium L plant were determined using a high-performance liquid chromatography (HPLC) device. For this, 5-10 g of the root of the Inula helenium L plant is taken on an analytical scale and placed in a 300 ml flat flask. 50 ml of 40% ethanol solution is added to it. The mixture was heated under vigorous stirring for 1 h, equipped with a magnetic stirrer, reflux condenser, and then stirred at room temperature for 2 h. The mixture is cooled and filtered. 25 ml of 40 percent ethanol was added to the remaining part and re-extracted 2 times. The filtrates were combined and filled to the mark with 40% ethanol (5-10%) in a 100 ml volumetric flask. The resulting solution is spun in a centrifuge at a speed of 7000 rpm for 10 minutes. The resulting solution was taken from the upper part for analysis. Working solutions of water-soluble vitamins with a concentration of 1 mg/ml were prepared. For this purpose, 50.0 mg

of each vitamin standard is taken on an analytical balance and dissolved in 40% ethanol in a 50 ml volumetric flask and filled to the mark. [3-4]

Acetate buffer system and acetonitrile were used as an eluent for the determination of water-soluble vitamins in the root of Inula helenium L plant with YuSSX. Chromatography conditions:-Chromatograph Agilent-1200 (equipped with an autodoser);-Column Exlipse XDB C 18 (obraschenno-faznyy), 5 µm, 4.6 x 250 mm; -Diode matrix detector (DAD), 250 nm identified; - Flow rate 0.8 ml/min; - Eluent acetate buffer: acetate buffer: acetonitrile: 0-5 min 96:4, 6-8 min 90:10, 9-15 min 80:20, 15-17 min 96:4, thermostat temperature 25 0C, -5 µl amount entered. First, a working standard solution was prepared in the chromatograph (Fig. 1), then a solution prepared from the root of the Inula helenium L plant was introduced (Fig. 2), and the amount of vitamins was determined by comparison.

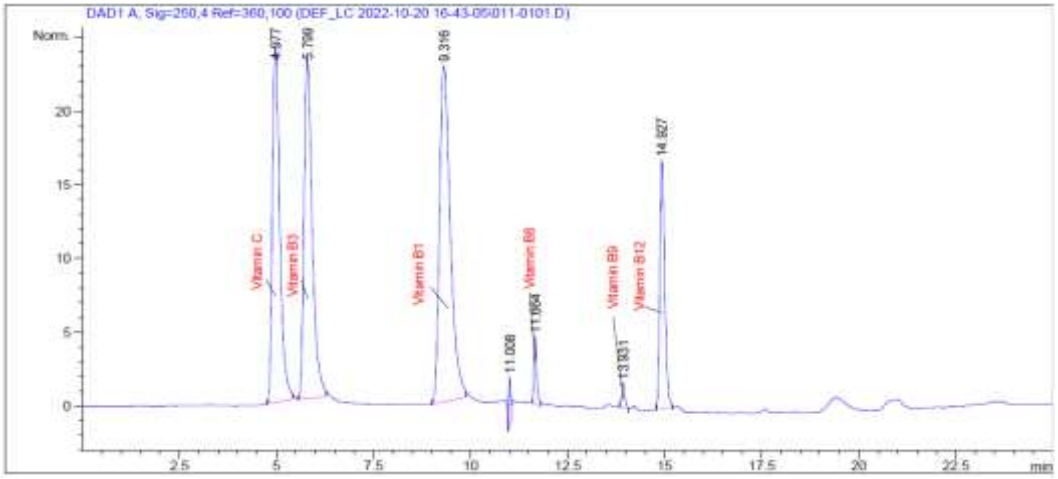

Figure 1. Chromatography of the working standard solution to determine the amount of vitamins in the root of Inula helenium L.

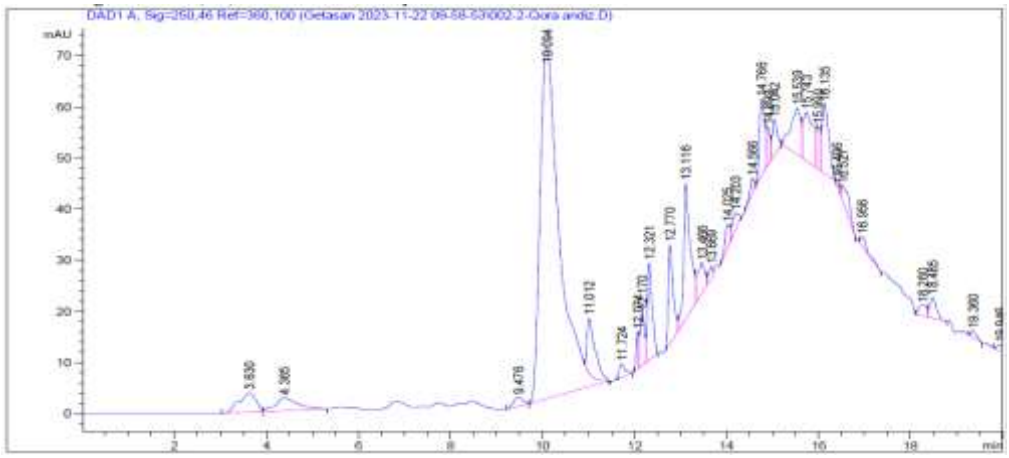

Figure 2.Chromatography of a solution prepared from the root of Inula helenium L to determine the amount of vitamins in the root of Inula helenium L.

Water-soluble vitamins in the root of Inula helenium L plant were determined using the high-performance liquid chromatography (HPLC) method. B1=0.031896 mg., B2=0.950895 mg., B6= 0.621359 mg. , B9= 1.868852 mg Vitamin C=0.249851 mg amount of vitamins were found.

CONCLUSION: It was found that the root of Inula helenium L contains vitamins B1, B2, B6, B9, and C.

REFERENCES USED:

1.H.Kholmatov, O'.Ahmedov //Pharmacognosia// Publishing house named after Abu Ali ibn Sina. Tashkent 1997.

2. Kh. Kh. Kholmatov, O. A. Ahmedov, //Pharmakognosia darslik,// Tashkent, Ibn Sina publishing house NMB, 1995.

3. Islamov A. Kh., Zaripova R. Sh., Murodova T. M., Gaibullaeva O. O. // Propagation of inula helenium l plant and determination of elements content and biological characteristics // ISSN(Online): 2776-0960. Volume-5, Issue-4, Published |04-2024.-P. 15-20.

4. Gaybullayeva O.O., Saidova A.Kh. Abdugafurova D.G., Mahmudov L.U., Torakulov A.U.//Inula helenium l. study of the acute toxicity of the extract of the root of the plant from sunflower oil //International Scientific and Practical Conference "Abu Ali ibn Sino and innovations in modern pharmaceutics". Tashkent. March 18, 2024