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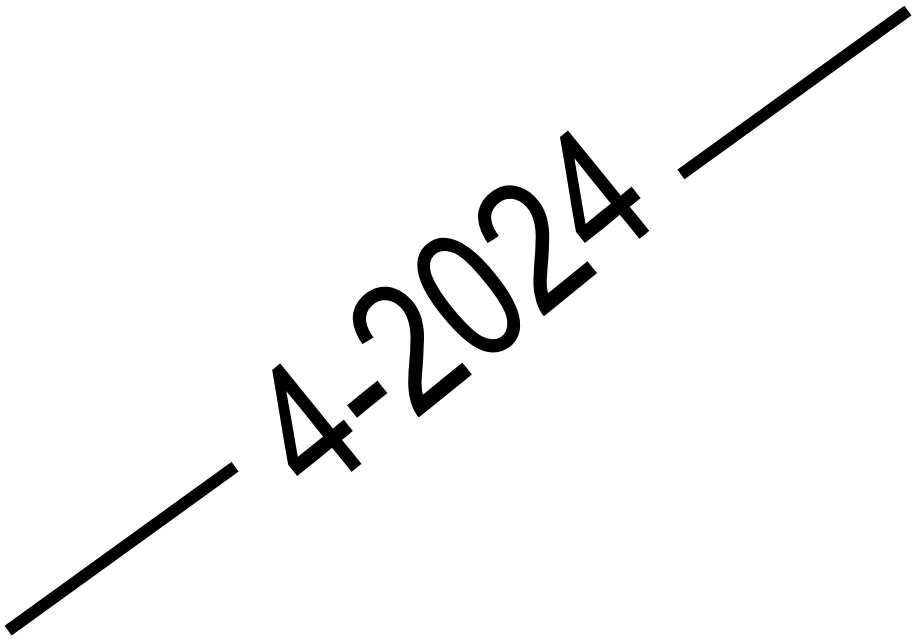

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STUDY OF THE QUANTITY OF PHENOL COMPOUNDS IN THE CONTENT OF RETAIL AND GAZANDA PLANTS

CHAKANDA VA GAZANDA O‘SIMLIGI TARKIBIDAGI FENOL BIRIKMALAR MIQDORINI O‘RGANISH

ИЗУЧЕНИЕ КОЛИЧЕСТВА ФЕНОЛЬНЫХ СОЕДИНЕНИЙ В ОБЛИПИХЕ И КРАПИВЕ

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Annotatsiya

Bugungi kunda dorivor o‘simliklar zamonaviy va an’anaviy tibbiyotda turli kasalliklarni oldini olish va davolashda muhim rol o‘ynashi hech kimga sir emas. Ushbu sohani rivojida mahalliy flora vakillari bilan bir qatorda intraduksiya qilingan o‘simliklarning ham salomoqli hissasi bor. Jumladan, yurtimizda ham bir qancha o‘simliklar iqlimlashtirilgan bo‘lib ulardan asosan, shaharlarni ko‘kalamzorlashtirish va ekoparklar yaratishda, oziq-ovqat, parfyumeriya, farmoseptika sanoatida keng ko‘lamda foydalanib kelinmoqda

Mazkur maqolada chakanda va gazanda o‘simligining shifobaxshligi, foydali tomonlari keltirilgan. chakanda va gazanda o‘simligi tarkibidagi fenol birikmalar miqdori Yuqori sifatli suyuqlik xromotografiyasida o‘rganilgan.

Аннотация

Сегодня ни для кого не секрет, что лекарственные растения играют важную роль в профилактике и лечении различных заболеваний в современной и традиционной медицинах. В развитии этого направления, наряду с представителями местной флоры, существенный вклад вносят и интродуцированные растения. В частности, в нашей стране акклиматизирован ряд растений, которые в основном используются при озеленении городов и создании экопарков, в пищевой, парфюмерной, фармацевтической промышленности.В этой статье представлены целебные и полезные свойства растений облепиха и крапива. фенольные соединения, содержащихся в растениях облепиха и крапива, изучены методом высококачественной жидкостной хроматографии.

Abstract

Today, it is no secret that medicinal plants play an important role in the prevention and treatment of various diseases in modern and traditional medicine. In the development of this field, along with representatives of the local flora, introduced plants also have a healthy contribution. In particular, a number of plants have been acclimatized in our country, and they are mainly used in the greening of cities and creation of eco-parks, in the food, perfumery, and pharmaceutics industry.

This article presents the healing and beneficial aspects of chakanda and gazanda plants. The amount of phenolic compounds in chakanda and gazanda plants was studied by high-quality liquid chromatography.

Kalit so‘zlar: *Chakanda, gazanda, antioksidant, vitamin, xromotografiya, biologik faol modda.*

Ключевые слова*: облепиха, крапива, антиоксидант, витамин, хромотография, биологически активное вещество.*

Key words: *sea buckthorn, utrica, antioxidant, phenol compounds, chromatography, biologically active substance.*

INTRODUCTION

The nature of Uzbekistan is rich in medicinal plants. These plants contain many biologically active substances and vitamins. Many diseases can be treated by using these plants wisely. We can take as an example Sea buckthorn, one of the medicinal plants. Sea buckthorn (*hippophae rhamnoides* l) is a shrub up to 10 meters long, with 0.5-7 cm thorns on its branches. There are two types of thorns: small (up to 0.5 cm long), always found at the end of fruit branches. Hippophae rhamnoides oil contains vitamins E K. vitamins A, C, B1, B2, B6 are found in hippophae

rhamnoides fruit juice. Hippophae rhamnoides fruits also contain amino acids, such as alanine, phenylalanine, glutamine, cysteine, leucine, lysine, arginine, serine, valine, and others. In addition, fruits contain essential oils, micro- and macroelements, and 8% of oil is found in fruits.

Utrica, nettle (Utrica L.) is a group of annual herbs belonging to the family of gazandas. The leaves are serrated, divided into pieces, opposite. The leaves and stems are covered with prickly hairs. The flowers are very small, unisex, collected in spike-like inflorescences in the leaf axils. The fruit is a nut. 40-50 species are distributed less in the North, in the Southern Hemisphere and in the tropics. There is one type in Uzbekistan. Soybean grows in marshes, fields, gardens and other places. Young shoots are eaten.

This plant is used as an excellent tool for human health. Utrica plant contains tannins, vitamins, pantothenic acid, acetic acid, folic acid, gallic acid, phytoncides, flavonoids.

The amount of phenolic compounds in the extract obtained from Sea buckthorn and utrica plants in a 1/1 ratio was determined by the YUSSX method

Experience part

Used reagents and equipment. Gallic acid from "Macklin" (China), salicylic acid from "Rhydburg Pharmaceuticals" (Germany), quercetin, apigenin, kaempferols from "Regal" (China), rutin from natural sources were isolated by extraction and column chromatography methods. HPLC grade water, acetonitrile, chemically pure grade acetic acid and sodium hydroxide reagents were used. Experience part.

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The amount of polyphenols in the plant was determined using a LC-40 Nexera Lite high-performance liquid chromatograph manufactured by Shimadzu, Japan.

Preparation of standard solutions. Gallic acid (5.2 mg), salicylic acid (5.2 mg), rutin (5 mg), quercetin (5 mg), apigenin (5 mg), kaempferol (5 mg) were dissolved in 96% ethanol in an ultrasonic bath for 20 minutes. And transferred to a 50 mL flask and made up to the mark with ethanol. 200 ml of each solution was taken and mixed, and a total of 4 different solutions were prepared by diluting them. Each solution was poured into a vial and used for analysis.

Preparation of plant extract. For the extraction of phenolic compounds, 1 g of the test sample was weighed with an accuracy of 0.01 g on a NV222 scale manufactured by the OHAUS company (USA), placed in a 50 ml conical flask, and 25 ml of 96% ethanol was added. The mixture was extracted in an ultrasonic bath of GT SONIC-D3 (China) at a temperature of 60 oC for 20 minutes. Then the mixture was cooled, filtered and made up to 25 ml with ethanol in a volumetric flask. 1.5 ml of the extract was centrifuged at 7000 rpm in a Mini-7 (BIOBASE, China) centrifuge and filtered through a 0.45 mm syringe filter and used for analysis.

Chromatographic conditions.

Determination of phenolic compounds. Standard solution, sample extract Shim pack GIST C18 (150 × 4.6 mm; 5 µm, Shimadzu, Japan) reversed-phase column and a gradient mobile phase consisting of acetonitrile (A) and 0.5% acetic acid in water (B) (Table 1) was used. The injection volume was set at 10 µl, the flow rate at 0.5 ml/min, and the column thermostat at 40 oC. The analytical signal (peak area) of phenolic compounds was recorded at 300 nm (Fig. 1).

Table 1. Mobile phase gradient software.

Time	Acetonitrile (A), %	0.5% acetic acid (B), %
0	5	95
5	5	95
17	40	60
22	40	60
22,1	5	95
40	Termination	

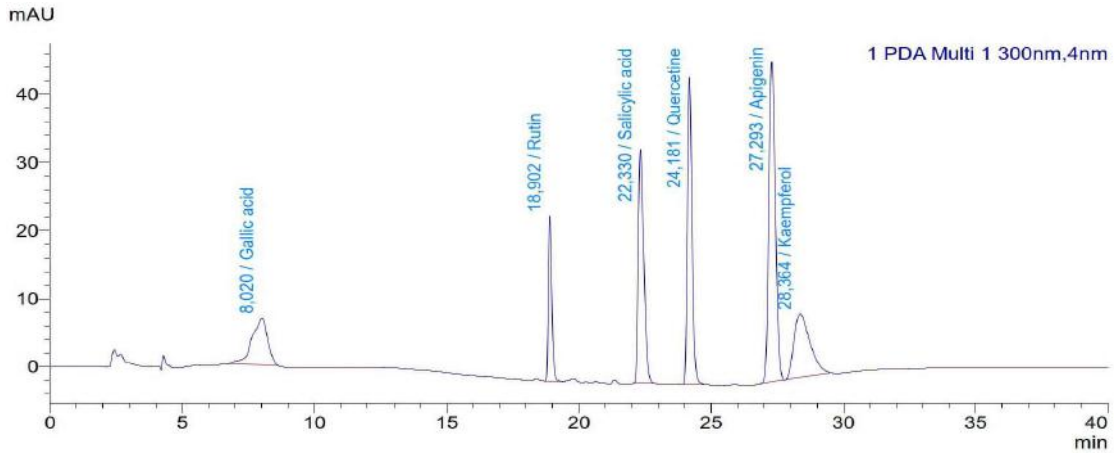

Figure 1. Chromatogram of standards at 300 nm

The results obtained.

Determining the amount of phenolic compounds in nettle and hippophae rhamnoides (1:1) extract. A chromatogram of the sample extract weighing 1 g was obtained (Fig. 2) and based on the results, the amount of phenolic compounds in 100 g of the sample was calculated using the following formula and presented in Table 3.

$$X = \frac{C_{phen} \cdot V_{extract}}{m_{sample}} \cdot 100\ g$$

Here:

X-is the amount of phenol compounds in 100 grams of fruit, mg;

C_{phen} - the concentration of the phenol compound in the extract determined by the YuSSX method, mg/l;

$V_{extract}$ – volume of sample extract, l;

m_{sample} - sample mass taken for extract preparation.

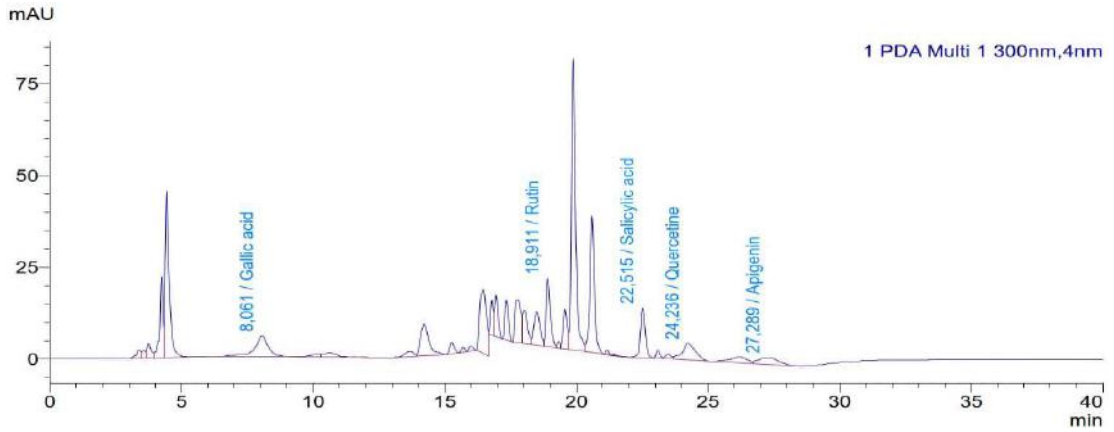

Figure 2. Chromatogram for the determination of polyphenols in the sample extract.

Table 2. Amount and retention times of polyphenols in the extract.

Phenol compound name	Holding time, sec	Concentration, mg/l	Amount in 100 g sample, mg
Gallic acid	8,061	9,844	24,610
Rutin	18,911	15,597	38,993

KIMYO

Salicylic acid	22,515	6,033	15,083
Quercetine	24,236	4,597	11,493
Arigenin	27,289	2,011	5,028
Kaempferol	Not identified	0	0,000

The conducted research shows that in 100 g of the sample, the amount of gallic acid was 24 mg, rutin 38.99 mg, salicylic acid 15.083 mg, quarecin 11.493 mg, and arginine 5.028 mg. In this experiment, it was found that the content of gallic acid, rutin, salicylic acid is high. The concentration of rutin is much higher than all of them.

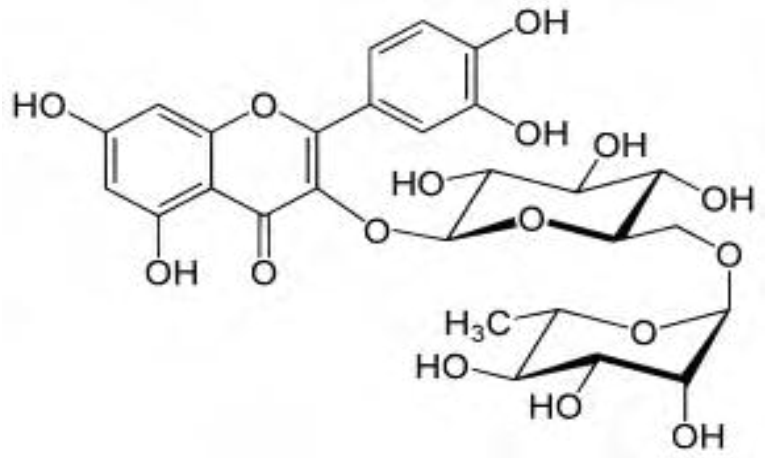

Figure 3. The structure of the rutin molecule

It is known that rutin protects against the destruction of the hyaluronic acid molecule. Increases synovial fluid production and activates collagen synthesis. Along with other flavonoids, rutin perfectly strengthens the walls of blood vessels, increases their elasticity, which is important for improving the permeability of blood vessels and accelerating blood flow.

Conclusion

The amount of phenolic compounds in the extract obtained from hippophae rhamnoides and utrica plants in a ratio of 1/1 was determined to be rich in flavonoids by the YuSSX method. According to the results of the conducted research, we have come to the conclusion that it is recommended to take new natural medicinal food supplements that replace drugs containing rutin.

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