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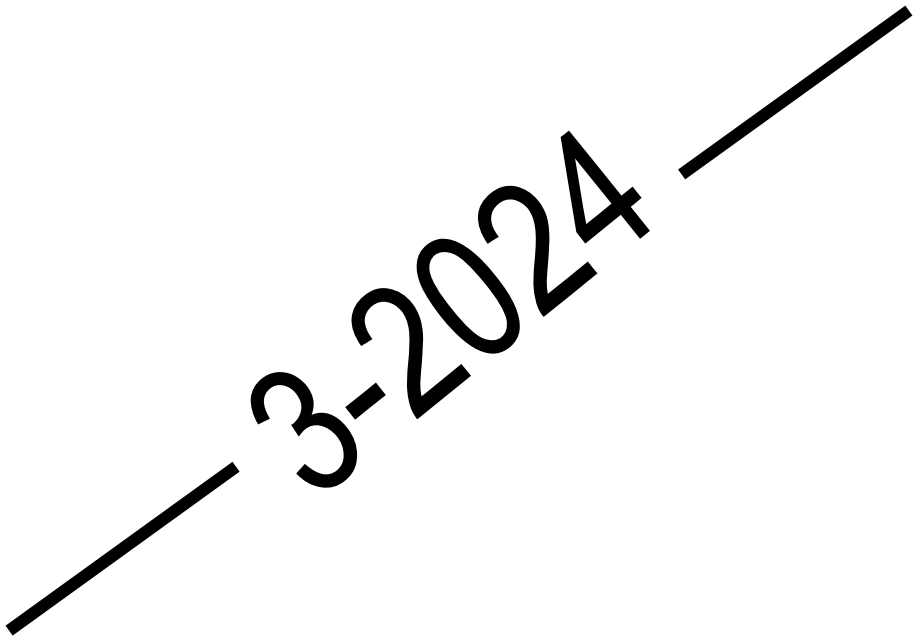

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ARPABODIYON VA KASHNICHDAN TAYYORLANGAN BIOLOGIK QO‘SHIMCHANING FLAVONOID TARKIBINI O‘RGANISH

ИЗУЧЕНИЕ ФЛАВОНОИДНОГО СОСТАВА БИОЛОГИЧЕСКОЙ ДОБАВК ИЗ АНИСА И КИНЗЫ

STUDYING THE FLAVONOID COMPOSITION OF THE BIOLOGICAL SUPPLEMENT OF ANICE AND CILORANT

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Annotatsiya

Maqolada arpabodiyon va kashnichdan tayyorlangan biologik qo‘shimcha tarkibidagi flavonoidlar yuqori samarali suyuqlik xromatografiyasi usuli bilan tadqiq qilinishi keltirilgan. Biologik qo‘shimcha tarkibida digidrokvertsitin, lyutionin, rutin, senerozid, kvertsitin, salidrozid flavonoidlari aniqlangan. Flavonoidlarning umumiy miqdori 111,85 mg/gr ni tashkil etgan. Rutin, lyuteolin va kversetin flavonoidlari yuqoriroq miqdorda aniqlangan.

Аннотация

В статье представлено исследование флавоноидов в биологической добавке из аниса и кашнича методом высокоэффективной жидкостной хроматографии. В составе биологической добавки были выявлены флавоноиды дигидрокверцетин, лютеинин, рутин, сенерозид, кверцетин и салидрозид. Общее количество флавоноидов составило 111,85 мг/г. Флавоноиды рутин, лютеолин и кверцетин обнаружены в больших количествах.

Abstract

The article presents a study of flavonoids in a biological additive from anise and coriander using high-performance liquid chromatography. The flavonoids dihydroquercetin, luteinin, rutin, seneroside, quercetin and salidroside were identified as part of the biological additive. The total amount of flavonoids was 111.85 mg/g. The flavonoids rutin, luteolin and quercetin are found in large quantities.

Kalit so‘zlar: *arpabodiyon; kashnich; biologik qo‘shimcha; yuqori samarali suyuqlik xromatografiyasi; flavonoid.*

Ключевые слова: *анис; кинза; биологические добавки; высокоэффективная жидкостная хроматография; флавоноид.*

Key words: *anise; coriander; biological additives; high performance liquid chromatography; flavonoid.*

INTRODUCTION

Fennel is an annual, thin and short hairy plant. The root is thin, spindle-shaped, rhizome. The stem is up to 60 cm tall, upright, round, grooved, branched at the top. The main and lower stem leaves are long, rounded entire, truncately toothed or lobed, or consisting of three round heart-shaped leaves, two short, the last in a longer band. The middle leaves are inverted wedge-shaped, often with two-lobed lateral leaves and three-lobed leaflets, with long bands. The flowers are small, five-membered, inconspicuous, collected in complex umbels with a diameter of 2.5-6 cm at the ends of the branches, with 7-15 short, scattered, excretory rays. Petals white, about 1.5 mm long, ciliate on the edges and with short pubescent hairs on the back, tip bent inward, hairy on the outside. There are five dusters; seed pod with lower two cells and two peduncles. It blooms in June-July. The fruit is greenish-gray, two-seeded, broadly ovate, ovoid or pear-shaped, brownish-gray, 3-5 mm long, slightly compressed laterally, the back ribs are slightly protruding. Fruits with a

pleasant smell and sweet-sour taste. Hemifruits have five ribs, two secretory tubules on the flat side, and numerous small tubules on the convex side[1-3]. The weight of 1000 "seeds" (half fruits) is 2-3.6 g [4]. Fruits in August. Coriander is an annual plant with strong roots. The stem of coriander is erect, bare, 40-70 cm high, branched at the top. Basal leaves broadly lobed, trilobed, lobed, with broad lobes and long petioles, toothed along the edges; the lower stem is short-stemmed, divided twice feathery, the middle and upper stem is tufted, the sheath stem is cut into linear pieces. The flowers are small, white or pink in color, located in complex umbels at the ends of the stems, forming 3-5 rays. The length of marginal flowers is 3-4 mm. The fruit is an ovoid-spherical indestructible berry, hard, with 10 curved and 12 straight ribs. It blooms in June-July, fruits ripen in July in the south, and in August-September in the northern regions [5-6].

EXPERIMENTAL PART

The herbal mixture was prepared by adding 1 part fennel and 3 parts coriander. The flavonoids contained in the plant mixture sample were determined using the liquid chromatography method. 10 g of the sample was weighed on an analytical balance and placed in a 300 ml flat flask. 50 ml of 70% ethanol solution was added to it. The mixture was heated at 70-800C with intensive stirring for 1 hour, equipped with a magnetic stirrer, reflux condenser, and then stirred at room temperature for 2 hours. The mixture was cooled and filtered. 25 ml of 70% ethanol is poured into the remaining part and re-extracted 2 times. The filtrates were combined and made up to the mark with 70% ethanol in a 100 mL volumetric flask. The resulting solution was spun in a centrifuge at a speed of 6000-8000 rpm for 30 minutes. The resulting solution was taken from the upper part for analysis. We used a phosphate buffer system and acetonitrile as an eluent for the determination of flavonoids by USSX. Chromatograph Agilent-1200 (equipped with an autodoser); column Exlipse XDB C 18, 5 µm, 4.6 x250mm; diode array detector (DAD), 254 nm, 272 nm were identified. YuSSX chromatography conditions: 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 300C; 10 µl input amount (vkol). First, working standard solutions and then prepared working solutions were introduced into the chromatograph.

DISCUSSION

In the qualitative determination of flavonoids in the prepared biological supplement by high-performance liquid chromatography, dihydroquercitin, luteinin, rutin, seneroside, salidroside, salidroside were determined by comparing the retention time of standard samples (Figures 1 and 2). Quantitative analysis was performed by calculating the area of the corresponding peaks (table). From the HSL chromatogram, it can be seen that the retention time of 7.733 minutes is routin; quercetin with a retention time of 10.988 minutes; retention time of 12.879 minutes for lutein; 13.640 minutes of retention is the retention time in minutes; A retention time of 6.029 minutes is indicative of salidroside and a retention time of 10.348 minutes is indicative of dehydroquercetin.

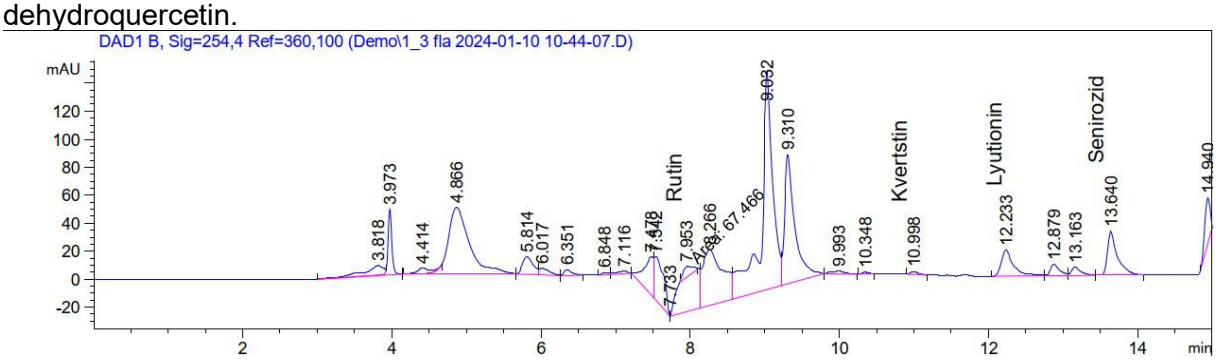

Figure 1. Figure 2. HSL chromatogram of biologic supplement

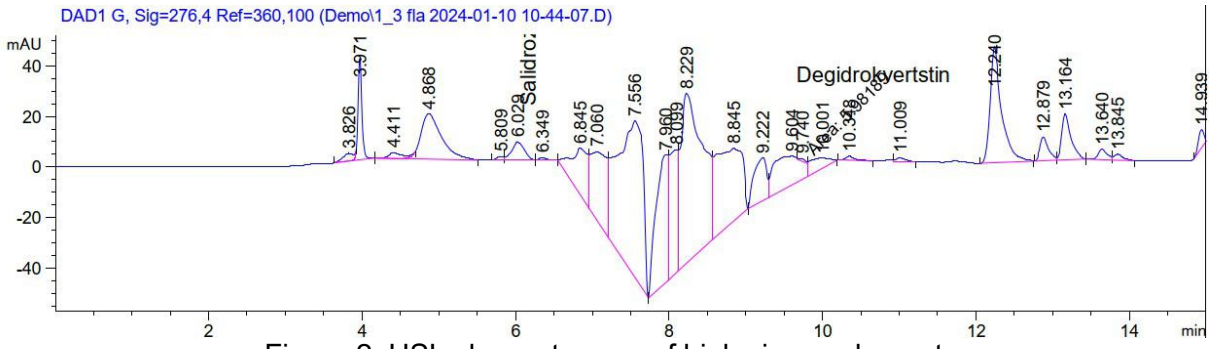

Figure 2. HSL chromatogram of biologic supplement

It can be seen from the table that the amount of rutin, luteolin, quercetin, seneroside in the biological supplement consisting of 1 part of fennel and 3 parts of coriander is relatively higher, and these flavonoids are pharmacologically active. The amount of total flavonoids was 111.85 mg/g. This showed that the prepared biological supplement is rich in flavonoids. It is known from the literature that flavonoids naringin, apigenin, luteolin, rutin and quercetin derivatives have been identified in fennel[7,8]. The only flavonoids of coriander present in all extracts are rutin, luteolin and amentoflavone, while quercetin and apigenin are present only in the whole fruit [9]. According to the obtained experimental data, the flavonoids dihydroquercitin, salidroside, seneroside, which were not previously found in dill and coriander, were detected in the biological supplement for the first time.

Table 1.

The amount of flavonoids found in the biological supplement

Flavonoids	**Mixture(1-3)**
	Concentration, mg/g
Dihydroquercitin	9,85
Luthionine	24,01
Routine	29,12
Seneroside	19,41
Quercitin	22,51
Salidroside	6,95

It should be noted that fennel fruits are used for medicinal purposes. They are harvested when they are ripe, when the fruits of the first umbels turn brown and the fruits of the remaining umbels are still green. The harvested plant is dried in the shade. After drying, they are crushed and the fruits are separated from the mixture in wind machines. Fennel helps inflammation of the kidneys and bladder, removes sand from the urinary tract. It is used for abdominal swelling and to stimulate the secretory function of the liver and pancreas. Anise preparations, including medicinal preparations, as well as anacid, are recommended for gastritis, flatulence and other dysfunctions of the gastrointestinal tract. For nursing mothers, it is useful to increase the amount of milk, to separate sputum during coughing, and also to drink fennel tea in the stomach. In folk medicine, cilantro fruits were used in diseases of the gastrointestinal tract and angelmint as a remedy; their tincture was used as an appetite stimulant, pain reliever, and anti-cold. Fruit powder or tincture was used as an expectorant.

CONCLUSIONS

The content of flavonoids in the biological supplement prepared by adding 1 part of fennel and 3 parts of coriander was analyzed by high-performance liquid chromatography. According to qualitative analysis and quantitative calculations, dihydroquercitin, luteinin, rutin, seneroside, salidroside, salidroside flavonoids were found in the biological supplement. The amount of rutin, luteolin, quercetin, and seneroside in the biological supplement is relatively high, and these flavonoids are pharmacologically active. The biological supplement can be used in the treatment of various diseases in folk medicine.

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