Journal of Chemistry of Goods and Traditional Medicine

J Chem Good Trad Med, Volume 5, Issue 2, 2026 Traditional Medicine

ANALYSIS OF THE CHEMICAL COMPOSITION OF THE UNDERGROUND PARTS OF THE PLANT - HYPECOUM PARVIFLORUM.

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DOI: https://doi.org/10.55475/jcgtm/vol5.iss2.2026.640

Keywords: флаваноиды, кверцетин, апигенин, витамины, рибофлавин, цианокоболамин, фолиевая кислота

Annotation

This article discusses the functions and importance of vitamins and flavanoids necessary for life in a living organism, as well as the characteristics of each vitamin and flavanoid. The analysis of flavanoids and water-soluble vitamins contained in the roots of the hypecoum parviflorum plant, as well as their fields of application in medicine, is highlighted.

How to Cite

Nurmatova, I., & Khojaev, V. U. ANALYSIS OF THE CHEMICAL COMPOSITION OF THE UNDERGROUND PARTS OF THE PLANT - HYPECOUM PARVIFLORUM. Journal of Chemistry of Goods and Traditional Medicine, 5(2). https://doi.org/10.55475/jcgtm/vol5.iss2.2026.640

Introduction. Since ancient times, humans have used the plant world, which is considered a gift of nature, for their own purposes. Some of these are considered food sources, while others are used for medicinal purposes. A variety of plants with various healing properties are widespread in the borders of Uzbekistan. The study of the chemical structure and physiological activity of plant substances contributes to the development of bioorganic chemistry, the emergence of new directions in it, and is the basis for the creation and application of modern effective medicinal agents in medical practice. Each substance found in medicinal plants is beneficial to the body. Plants have such a complex structure that they synthesize biologically active substances in their composition. The quantity and quality of biologically active substances in plants are the most important factors in determining their medicinal properties. Most of the drugs used in practice today are synthetic drugs and antibiotics, and their long-term use leads to a decrease in immunity, allergies, and disruption of the microflora in the body. The unique feature of natural remedies made from plant materials used to treat various diseases is that, unlike synthetic drugs, they do not have a negative effect on the body. Flavonoids (or bioflavonoids, derived from the latin word flavus meaning yellow) belong to a class of polyphenolic secondary metabolites found in plants, and are widely consumed in the diet of humans. Flavonoids are organic substances that belong to a group of naturally occurring phenolic compounds found in plants, which are characterized by their biological activity, especially their antioxidant properties. The molecular structure of these substances usually consists of two aromatic rings and a third, oxygen atom-containing ring located between them. Flavonoids serve as a protective agent, pigment, and growth regulatory component in plants. They are found in many fruits, vegetables, tea, cocoa, grapes, onions, apples, and citrus fruits, and have many beneficial properties for human health. Flavonoids are natural bioactive compounds that have many beneficial effects on the body. They are powerful natural remedies for fighting cardiovascular diseases, cancer, diabetes, inflammation, aging, and nervous system

problems. Incorporating them into your daily diet through natural foods is of great importance in promoting health. In the future, new drugs, dietary supplements and curative products based on flavonoids are expected to be developed. Therefore, the deep study of flavonoids and the full use of their capabilities are becoming an integral part of modern medicine and a healthy lifestyle. [1,3,8]

Vitamins perform a number of important functions in our body, and this has led to their classification and comprehensive study. They affect many aspects of health from vision to immunity. For example, vitamin A is essential for maintaining healthy eyes and the immune system, while vitamin D plays a key role in regulating calcium and phosphorus levels, which are essential for maintaining strong bones. B vitamins, such as thiamine (B1), riboflavin (B2), niacin (B3), and others, are essential for converting food into energy and supporting energy metabolism. The chemical structure of more than 30 vitamins has now been fully studied, and many have been synthesized.[3,9]

Experimental part: The alkaloid composition of the plant Hypecoum parviflorum has been well studied, but other aspects require further study. [2,7,8] The flavonoid composition of the roots of Hypecoum parviflorum, collected from the slopes of the mountains around the village of Chodak, Namangan region, was studied for the first time, and the results obtained are presented below. Chemical analysis of flavonoids present in Hypecoum parviflorum was performed using high-performance liquid chromatography (HPLC) on an Agilent Technologies 1260 instrument. The analytical method involved isocratic elution using a diode array detector, ensuring the accuracy and reliability of the data obtained. The mobile phase consisted of a mixture of acetonitrile and buffer solution, with a ratio of 35:75, adjusted to a pH of 2.92. The analysis time lasted from 15 to 20 minutes, which allowed for optimal separation of the components. The injection volume was set to 5 ml and the mobile phase flow rate to 0.75 ml/min, which is crucial for achieving the required sensitivity and accuracy. The chromatographic column used in this study is an XDB-C18 column with a size of 4.6 × 250 mm and a particle size of 5.0 microns. Detection was performed at wavelengths of 254, 320, and 381 nm, which allowed for the collection of spectral data in the 200–400 nm range. Analysis of the flavonoid composition of the roots of Hypecoum parviflorum shows that flavonoids such as rutin, hyperazide, and rabinin may be shifted flavonoids. The relatively high presence of flavonoids quercetin and resveratrol increases interest in studying this plant. Quercetin is a natural biochemical substance belonging to the flavonoid group, a group of P vitamins, which is a component of a number of biologically active supplements and is widely used in alternative medicine.

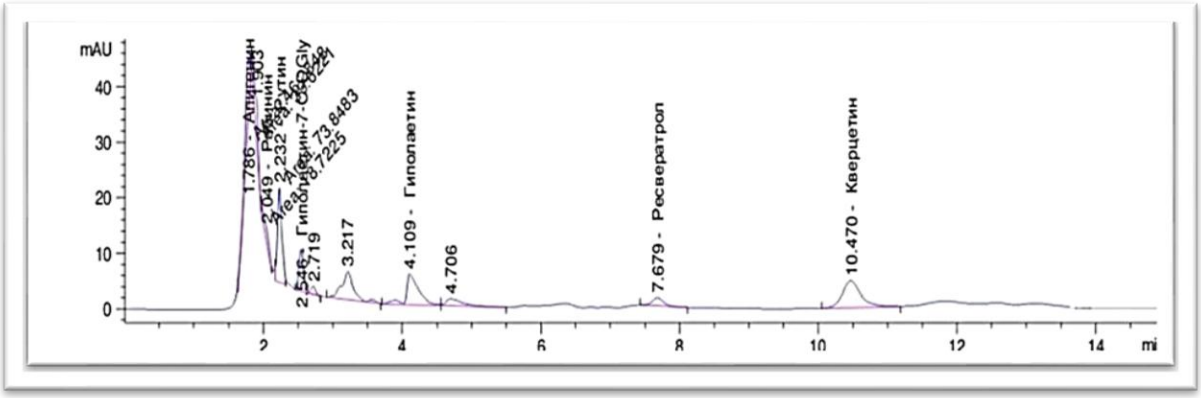


Figure 1. Chromatogram of the root of Hypecoum parviflorum (Papaveraceae).

The root of the Hypecoum parviflorum plant was first examined and 7 different phenolic compounds, namely flavonoids, were isolated from it.

Table 1. Hypecoum parviflorum is a flavonoid identified in the root.

№	Flavonoids name	quantity mg / 100g
1	Apigenin	5,621 2
2	Rabinin	0,852

3	Rutin	87,521
4	Hypolaetin 7-O-D-Glucose	0.389
5	Hypolaetin	0.988
6	Resveratrol	0.108
7	Quercetin	9.932

Quercetin is widely used in modern medicine and plays an important role in the human body. It has the ability to lower blood pressure and has anti-inflammatory properties. When used with quercetin, Kemferon has an effective anti-cancer effect and exhibits activity against the hepatitis virus. Another important flavonoid is rutin. It is important for the treatment of diseases such as hypovitaminosis, increased vascular permeability, hemorrhagic diathesis, capillyarotoxicosis, radiation sickness, septic endocarditis, rheumatism, arterial hypertension, allergic diseases, measles, scarlet fever, typhoid, bleeding in the retina of the eye.[3,4,6] In our previous article, we described the macro- and microelement analysis of the plant Hypecoum parviflorum, the chemical composition of which is being studied. [5-7] The water-soluble vitamins of the sample obtained during the ongoing study of the chemical composition of the roots of Hypecoum parviflorum were determined. The amount of water-soluble vitamins was analyzed using high-performance liquid chromatography (HPLC) based on gradient elution mode. A buffer solution with acetonitrile as the mobile phase was used. The identification was studied in the UV range from 200 to 400 nm. Chromatographic conditions: Chromatograph - Agilent Technologies 1260. Mobile phase (gradient re-press) - buffer-acetonitrile-pH= 2.92. (4% : 96%) 0-6 minutes, (10% : 90%) 6-9 minutes, (20% : 80%) 9-15 minutes, (4%: 96%) 15-20 minutes, injection volume – 5 ml. Mobile phase flow rate 0.75 ml/min. Chromatographic column - Exlipse XDB C18 (reverse phase), 5 µm, 4.6 × 250 mm. On the analytical scales, 0,500 g of crushed root part was pulled. The samples were placed in a flat tube with a volume of 300 ml, and 50ml of 3% acetic acid was added . Then it was mixed in a magnetic stirrer for 6 hours. At the end of the procedure, the mixture was cooled and filtered. After that, 100 ml aliquots were taken from this solution, diluted with eluent to 1 ml, and chromatographic analysis was performed.

Figure 2. Chromatogram of water-soluble vitamins of the root of the plant Hypecoum Parviflorum

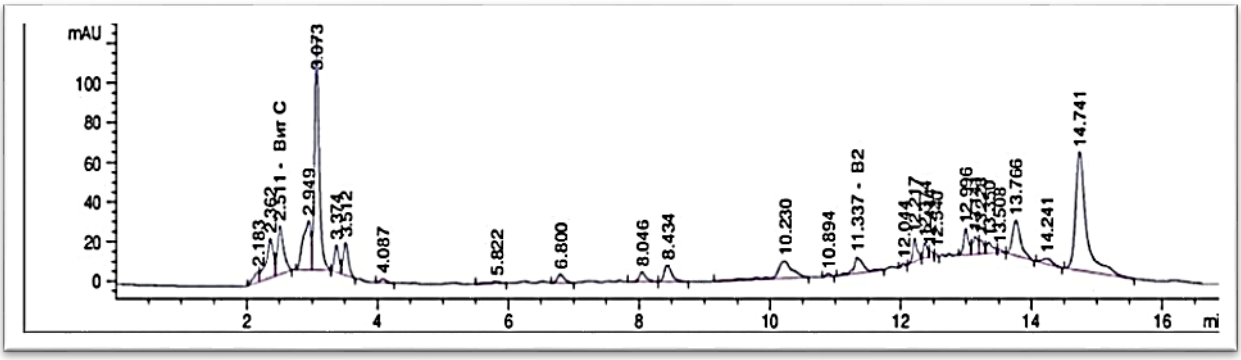


Table 2. Results of quantitative analysis of water-soluble vitamins in the roots of Hypecoum parviflorum plant

№	Name of vitamins	Amount mg/100g
1	Vitamin B1	-
2	Vitamin B6	-
3	Vitamin B9	-
4	Vitamin PP	-
5	Vitamin C	38,647
6	Vitamin B2	2,948

7	Vitamin B12	-

Research has shown that the root of the Hypecoum Parviflorum plant is a rich source of vitamin C and can be used to prevent and treat a number of diseases.

Conclusion: Hypecoum Parviflorum, a member of the Papaveraceae family, is a rich source of chemical components in terms of its composition. It grows in the mountainous regions of the Pop district of the Namangan region. During the study, the flavonoids and water-soluble vitamins of this plant were studied. The aim of the study was to use the plant's medicinal properties in folk medicine.

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