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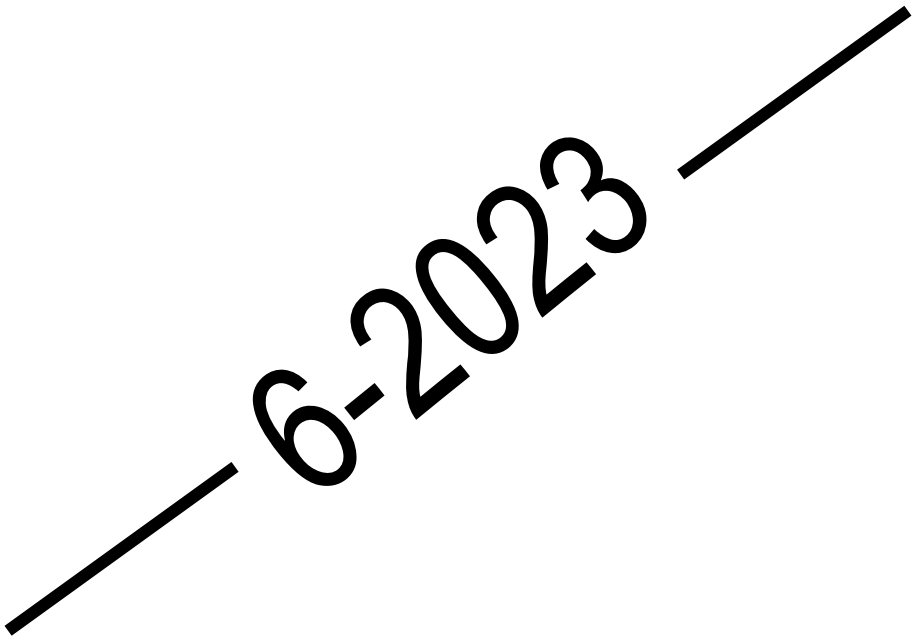

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EQUISETUM ARVENSE VA EQUISETUM RAMOSISSIMUM TARKIBIDAGI ERKIN AMINOKISLOTALAR MIQDORINI TAHLIL QILISH

АНАЛИЗ СОДЕРЖАНИЯ СВОБОДНЫХ АМИНОКИСЛОТ В ХВОЩЕ ARVENSE И ХВОЩЕ RAMOSISSIMUM

ANALYSIS OF FREE AMINO ACID CONTENT IN ARVENSE AND RAMOSISSIMUM NEEDLES

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Annotatsiya

Ushbu maqolada yovvoyi holda o‘suvchi qirqbo‘g‘im o‘simligining ikki turi - Equisetum Arvense L.– dala qirqbo‘g‘imi va Equisetum Ramosissimum D. – sershox qirqbo‘g‘imning yer ustki qismi tarkibidagi erkin aminokislotalar miqdorini aniqlash usullari ifodalangan. Natijalar jadval ko‘rinishida bayon etildi. Aminokislotalar Steven A., Cohen Daviel usulida yuqori samarali suyuqlik xromotografiyasi (YuSSX) yordamida o‘rganildi.

Аннотация

В статье описаны методы определения количества свободных аминокислот в надземной части двух видов хвоща дикого - Equisetum Arvense L. - хвощ полевой и Equisetum Ramosissimum D. - хвощ полевой. Результаты были представлены в виде таблицы. Аминокислоты изучали по методу Стивена А. Коэна Дэвиела с использованием высокоэффективной жидкостной хроматографии (ВЭЖХ).

Abstract

The article describes methods of determining the amount of free amino acids in the above-ground part of two types of wild horsetail - Equisetum Arvense L. - field horsetail and Equisetum Ramosissimum D. - field horsetail. The results were presented in tabular form. Amino acids were studied using the Steven A. Cohen Daviel method using high-performance liquid chromatography (HPLC).

Kalit so‘zlar: *Qirqbo‘g‘im, Herba Equiseti Arvensis, Equisetum Ramosissimum, Cohen Daviel usuli, aminokislotalar, yuqori samarali suyuqlik xromotografiyasi.*

Ключевые слова: *хвощ полевой, Herba Equiseti Arvensis, Equisetum Ramosissimum, метод Коэна-Дэвиеля, аминокислоты, высокоэффективная жидкостная хроматография.*

Key words: *field horsetail, Herba Equiseti Arvensis, Equisetum Ramosissimum, Cohen-Daviel method, amino acid, highly effective liquid chromatography.*

INTRODUCTION

Medicinal plants have been known to mankind since ancient times. Plants were widely used not only for food, but also as a source of biologically active substances. Medicinal plants have been reported to have been used for medicinal purposes in the Sumerian civilization as far back as 5000 years ago. Medicinal plants have long been the only source of medicines [1].

The territory of Uzbekistan is rich in various medicinal trees, shrubs and herbs. Human life is inextricably connected with the world of plants, because they served man food and medicine [2].

Equisetum Arvense L. - Equisetum Horsetail - Equisetum - Equisetaceae - Equisetaceae is a tenuous perennial herb with a length of 15-60 cm. The plant within a year gives two types of stems - spring and summer.

The spring stem is brown or reddish, soft, 15-20 cm high, with a sporulating spine at the end. After the spores mature and dissipate, the spring stem dries. Then the summer stalks grow back. These stems are solid, articular, 6-18-sided, from compounds grow numerous branches. The leaves are underdeveloped, coin-shaped, located in the joints of the stems. Spores ripen in April-

May. The Sea of the Field grows everywhere except in desert and semi-desert areas, along streams, in sandy meadows, among shrubs, in forests and fields [3].

Equisetum ramosissimum D. - Equisetum ramosissimum D. - Equisetum ramosissimum can be found along streams, ditches and rivers. It is an ordinary, perennial herb with a long rhizome. It reaches a height of 30 cm to 100 cm. The stalks do not winter. The branches are ribbed, green-gray, their number is up to 10. The leaves are funnel-shaped, the central part is bordered white. Spores are formed in May and July. It occupies a much larger area of land when breeding. This species is considered a medicinal plant and is used in folk medicine as diuretic, hemostatic and lung tuberculosis [4-6].

MATERIALS AND METHODS

For the preparation of biologically active additives from sediment in the middle of the summer months, soils are collected in summer, non-smoking stems and dry the seeds on the ground.

The surface portion of field horsetail contains up to 5% saponins, alkaloids, flavonoids (apigenin, luleoline, quercetin, kempferol and their glycosides, ecvisetrin, naringenin), up to 190 mg% of vitamin C, carotene, oxalate up to 2.5. There are silicate (water soluble) and other acids, astringent, bitter substances[3-7].

Equisetum Ramosissimum D. contains 10.4% water, 22.4% fiber, 4.2% protein, 5% fat and 46.8% nitrogen-free [4-6].

Studies of these species in the Russian Federation show that the sediment contains characteristic biologically active compounds - essential and replaceable amino acid species [8].

In the human body, 9 out of 20 amino acids - alanine, aspartic acid, glycine, glutamic acid, proline, serine, cysteine, asparagine, glutamine - are synthesized from carbohydrate and lipid exchange products and are replaceable amino acids. Arginine, tyrosine and histidine are semireplaceable amino acids formed from essential amino acids that are introduced into the body with food. The remaining 8 amino acids - valine, isoleucine, leucine, threonine, lysine, methionine, tryptophan, phenylalanine - do not have biochemical mechanisms of synthesis in the body, so are considered indispensable or indispensable amino acids. In the absence of essential amino acid in the food there is the development of negative nitrogen balance, decreased body weight, stunted growth and nervous system disorders [9].

The amino acid phenylalanine is converted into tyrosine under the action of the hydrolase enzyme in the body and later forms adrenaline. The amino acid histidine contains an imidazole ring. It forms histamine in the body as a result of a decarboxylation reaction. Histamine is involved in controlling a number of physiological processes in the human body and activating the immune system [10].

Aspartic acid is one of the endogenous amino acids. It was first isolated from asparagus juice in 1827. It is produced in the body independently or comes with food, as well as food additives. This amino acid is found in the body in protein or in a free form. It accumulates in brain cells. Glutamic acid was first isolated in 1866 by the German chemist Karl Heinrich Ritthausen, who described its properties and named it «gluten». Glutamine is very common in nature and can be synthesized in sufficient quantities in humans. Its concentration in the blood is 500-900 μmol/l, higher than other amino acids [11.12].

The study of amino acids in plants as a biologically active source helps to determine the nutritional value of plants Herba equiseti arvensis and Equisetum ramosissimum and allows their use as food additives [13-14].

The amino acids found in the above-ground portion of the horsetail species Equisetum Arvense L. and Equisetum Ramosissimum D., have been studied and analyzed by high-performance liquid chromatography (HPLC) and compared to each other.

RESULTS AND DISCUSSION

Amino acid content in the above-ground part of wild sediment species growing in the Fergana Valley, and their number were studied using the method of Stephen A., Cohen Daviel by high-performance liquid chromatography [15].

Proteins and peptides from the aqueous extract were centrifuged to separate free amino acids from the sample. For this purpose, 20% of trichloroacetate (THA) was added to 1 ml of the

test specimen in an exact volume (1 ml). After 10 minutes, the sediment was centrifuged at 8,000 rev/min for 15 minutes. The separated 0.1 ml supernatant was lyophilized. The hydrolysate was boiled dry and the dry residue dissolved in the triethylamine-acetonitrile-water mixture (1:7:1)[16].

This experiment was repeated twice to neutralize the acid. The amino acids were then reacted with phenylthiosiocyanate by Steven A. Cohen Daviel and produced phenylthiocarbamalic (FTC) amino acid derivatives. The analysis of amino acid derivatives was carried out using high-performance liquid chromatography (HPLC).

Agilent Technologies 1200 chromatography in the following modes: diode matrix detector (DAD), Discovery HS C18 75X4.6 mm cartridge, solvent A: 0,14M CN3SONa + 0,05% TEA 6.4, V:CH3CN, 1,2 min flow rate. , длина волны 269 нм, градиент %B/мин: 1-6%/0-2,5 мин; 6-30%/2,51-40мин; 30-60%/40,1-45 мин; 60-60%/45,1-50мин; 60-0%/50,1-55мин. было проведено[17].

The results are presented in the table below. ***Table 1***

Amino acid composition Equisetum Arvense L. and Equisetum Ramosissimum D

№	Amino Acid Name	Concentration mg/g	
		Horsetail Arwens L	**Equisetum Ramosissimum D.**
	Essential amino acids		
1	Valine	0,505929	0,436911
2.	Isoleucine	0,047289	0,300437
3.	Leucine	0,08588	0,160823
4.	Threonine	0,384816	0,284457
5.	Lysine	0,971343	0,284369
6.	Methionine	1,108502	0,61088
7.	Tryptophan	0,131724	0,17665
8.	Phenylalanine	0,033172	0,067557
	Total:	**3,268655**	**2,322084**
	Semi Amino Acids		
9.	Arginine	0,581395	0,530051
10.	Tyrosine	0,122561	0,616624
11.	Histidine	0,542751	0,225527
	Total:	**1,246707**	**1,372202**
	Interchangeable amino acids		
12.	Alanine	0,126108	0,155186
13.	Aspartic acid	0,445908	0,331765
14.	Glycine	0,02892	0,08162
15.	Glutamic acid	0,289407	0,652585
16.	Proline	0,142983	0,178288
17.	Serine	0,324936	0,169324
18.	Cysteine	3,050273	0,344262
19.	Asparagin	0,099936	0,243895
20.	Glutamine	1,283533	0,457835
	Total:	***5,792004***	***2,61476***
	Total:	**10,30736**	**6,309046**

CONCLUSION

The results show that the total amount of amino acids in 1 gram of the Equiseti Ramosissimum D. sample contains 2,322084 mg of essential amino acids, 1,372202 mg of semi-replaceable amino acids and 2 mg of metabolic amino acids, which is 61,476 mg. Equiseti Arvensis L. contains 3,268655 mg of essential amino acids, 1,246707 mg of semi-replaceable amino acids and 5,792004 mg of replaceable amino acids. it turned out.

Equiseti Arvensis L. has been found to contain 1,41 times more amino acids than Equiseti Ramosissimum D. and 2,2 times more amino acids to replace. Equiseti Ramosissimum D. contains a large amount of semi-replaceable amino acids.

The results show that both sorghum species contain essential amino acids, especially glutamine, methionine and lysine, in much greater quantities than other amino acids. This indicates that Herba Equiseti Arvensis L. and Equiseti Ramosissimum D can be used as biologically active additives.

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