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AMINO ACID COMPOSITION OF SOME MEDICINAL PLANTS

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Abstract

The amino acid composition of the rhizomes of calamus, hawthorn and St. John's wort, included in the food additive Ac-GAM, has been studied. Compared to other plants, it has been found that calamus is rich in amino acids, and hawthorn has a high concentration of the amino acid alanine.

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Introduction. Today, interest in traditional medicine is growing worldwide. Herbal medicines are widely used due to fewer complications and lower toxicity compared to synthetic drugs [1]. Worldwide, 80-85% of the planet's population uses medicinal plants as a source of medicinal substances [2]. Medicinal plants are used in the treatment of many diseases, including about 800-1200 plants used in the treatment of diabetes [3]. Traditional medicine has been treating diabetes for thousands of years, and important experience and valuable information have been accumulated in this regard.

Bioactive metabolites are mainly concentrated in its leaves and flowers. Some flavonols and xanthones in St. John's wort, including rutin, hyperoside, isoquercitrin, and quercitrin, are acetylcholinesterase inhibitors [4; 5].

The antihyperglycemic activity of St. John's wort extract is associated with its ability to reduce the activity of α-glucosidase and α-amylase enzymes [6]. Quercetin and kaempferol derivatives contained in St. John's wort are inhibitors of α-amylase and α-glycosidase enzymes and are considered to be very important in reducing hyperglycemia [7].

In the treatment of diabetes mellitus The content of amino acids in the composition of medicinal plants is of great importance. Therefore, we have determined the amino acids in plants containing the food supplement Ac-GAM.

Experimental part. Precipitation of proteins and peptides from aqueous extracts of samples was carried out in centrifuge cups. For this purpose, 1 ml (exact volume) of 20% UHSC was added to 1 ml of the studied sample. After 10 minutes, the sediment was separated by centrifugation at 8000 rpm for 15 minutes. 0.1 ml of the supernatant was separated and lyophilized. The hydrolysate was evaporated, the dry residue was dissolved in a mixture of triethylamine-acetonitrile-water (1:7:1) and dried again. This process was repeated twice to neutralize the acid. As a result of the reaction with phenylthioisocyanate, phenylthiocarbamyl derivatives of amino acids were obtained according to the method of Steven A., Cohen D. [Steven A., 1988]. Amino acids were determined using the HPLC method.

Chromatographic conditions:

- Agilent Technologies 1200 chromatograph

-Diode matrix detector

-Column 75x4.6 mm Discovery HS C18.
- Solution A: 0.14 M CN3SOONa + 0.05% TEA rN 6.4, V:CH3CN.
- Flow rate 1.2 ml/min.
- Wavelength 269 nm.
- Gradient % B/min: 1-6%/0 - 2.5 minutes; 6-30%/2.51 – 40 minutes; 30-60%/40.1 - 45 minutes; 60-60%/45.1 - 50 minutes; 60-0%/50.1 - 55 minutes.

The results of the study showed that the amount of amino acids in the extracts of calamus rhizomes, hawthorn fruits, and St. John's wort stems and leaves are in different proportions and differ from each other (Table 1).

Table 1

Amino acid composition of plant extracts of the food supplement As-Gam

Name of amino acids	Hawthorn	Calamus	St. John's Wort
	Concentration mg/g		
Aspartate	0.244904	0.069928	0.095235
Glutamate	0.669294	0.226671	0.349580
Serene	1,265625	1,020727	1.153014
Glycine	0,190071	0.163448	0.168521
Asparagine	0.372429	0.414524	0.446952
Glutamine	0.237384	0.994024	0.723526
Cysteine	1,547541	1,676503	1,498614
Threonine	0.373412	0.13783	0,195321
Arginine	0.287526	0.161583	0.182545
Alanine	2.132172	0.276162	0.423659
Proline	0.630185	1,719329	0.739512
Tyrosine	0.321883	2,919847	0.981279
Valin	0,190331	0.411371	0.426854
Methionine	0.252378	0,216706	0.256678
Histidine	0,206939	0.401487	0.519850
Isoleucine	1,332562	1,313801	1,203159
Leucine	0.583467	0.584754	0.459820
Tryptophan	0.074572	0.047066	0.095461
Phenylalanine	0.070995	0.03843	0.045129
Lysine	0,207615	0,02004	0,015937
Total	**11.19129**	**12,81418**	**9.980646**

Conclusion. According to the results obtained, the most common amino acid in hawthorn fruit extract is alanine, which makes up 19% of the total amino acid content. Next comes the share of amino acids cysteine, isoleucine and serine - 13.76%; makes up 11.88% and 11.26%. The least common amino acids were phenylalanine and tryptophan.

It is noted that the amount of amino acids in the extract of St. John's wort flowers is 1.28 and 1.12 times less than the amino acids of hawthorn root and hawthorn fruits. The most common amino acids in it are cysteine, isoleucine and serine, which make up 14.93% of the total amount of amino acids; This is 12% and 11.5%.

It has been established that the calamus root extract contains 1.14 and 1.28 times more amino acids than hawthorn and St. John's wort. The most common amino acid in its composition is tyrosine, which accounts for 22.7% of the total amount of amino acids. Amino acids proline, cysteine, isoleucine and serine 13.34%; 13%; Its share is 10.22% and 7.96%. Compared to other amino acids, the amino acids tryptophan, phenylalanine and lysine are contained in the smallest quantities.

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