

Comparative study of amino acid composition of Choloretic Polyherbal tea "TRIFLOS" and dry extract "GEPAFLOX»

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Summary. The qualitative and quantitative content of free amino acids in the choloretic polyherbal tea "Triflos" and dry extract "Gepaflox" was studied. 20 amino acids were identified in various ratios, including 8 essential and 2 conditionally essential amino acids. The content of glycine, which is part of bile acids, has been determined.

Keywords: choloretic activity, choloretic polyherbal tea, bile acids, dry extract, amino acid composition.

Introduction. One of the conditions for the introduction into medical practice of new drugs based on medicinal plants is a comprehensive study of their chemical composition. The presence of amino acids in plants and their high biological activity contribute to the effective action on the body of drugs obtained from medicinal raw materials. Amino acids give other biologically active substances an easily digestible form, while simultaneously potentiating their pharmacological effect [1].

Amino acids are involved in the biosynthesis of specific tissue proteins, enzymes, hormones, and other physiologically active compounds [2]. Amino acids are products of primary metabolism; therefore, they are included in the composition of plants and, in this regard, pass into aqueous extracts and phytopreparations [3-13].

In the pharmacotherapy of diseases of the hepatobiliary system, a number of drugs are used. These are anti-inflammatory agents, adaptogenic drugs, detoxification therapy agents, amino acids, protein hydrolysates, immunomodulators, vitamins, as well as choloretic agents and hepatoprotectors [14].

All choloretic drugs can be roughly divided into choloretics - drugs that enhance the production of bile by the liver, and cholekinetics - drugs that increase the contraction of the gallbladder and accelerate the evacuation of bile from it into the duodenum.

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In connection with the above, the employees of the Tashkent Pharmaceutical Institute developed a choleric polyherbal tea "Triflos" based on the herb of yarrow, chamomile flowers and tansy yarrow, and on its basis a dry extract "Hepaflox" was obtained.

About 200 natural amino acids are known, of which only 20 are found in proteins. These amino acids are called proteinogenic - building proteins. In the human body, along with proteinogenic amino acids, you can find others, which play a different role, such as ornithine, β -alanine, taurine, etc. Many of the proteinogenic amino acids in the human body perform important independent functions, for example, glycine, glutamic and aspartic acids are biologically active compounds, phenylalanine, tyrosine and tryptophan serve as a source of biogenic amines and other bioregulators, glycine and taurine are part of bile acids.

It is known that the synthesis of primary bile acids (BAs) - cholic and chenodeoxycholic acids occur in the liver from cholesterol. It is provided by the enzyme 7α -hydroxylase, which is one of the forms of cytochrome P450 (P450 7A1 or CYP7A1). In the process of conjugation - the attachment of ionized glycine or taurine molecules to the carboxyl group of BAs - glycine and taurine conjugates of BAs are formed. Excretion of BAs into bile capillaries mainly occurs with the help of a transport protein, designated as a bile salt export pump. Part of the BAs in the intestine is exposed to the action of bacterial enzymes that cleave glycine and taurine, as well as the BAs hydroxyl group, forming secondary BAs. Secondary fatty acids: deoxycholic, formed from cholic, and lithocholic, formed from chenodeoxycholic, dissolve worse and are more slowly absorbed in the intestine than primary ones. Normally, a small part of BAs not absorbed in the ileum (about 0.3-0.6 g / day) is excreted from the body with feces. With an increase in the amount of secondary fatty acids in the colon, the secretion of sodium and water increases, and chronic diarrhea occurs.

The amino acid glycine is involved in the synthesis of heme - the iron-containing part of hemoglobin, conjugated bile acids, improving the characteristics of bile, lipids, creatine, NAD and FAD, peptides and proteins [15].

Since bile contains water, bile acids, inorganic substances, vitamins A, B, C, D, amino acids, phospholipids, cholesterol, bilirubin, proteins, mucus and drug residues, and BAs contain such amino acids as glycine and taurine, it was also necessary to

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establish the quantitative content of glycine in the choleric polyherbal tea "Triflos" and dry extract "Gepaflox".

Research Objective. Study of the qualitative and quantitative content of free amino acids in the choleric polyherbal tea "Triflos" and dry extract "Gepaflox".

Materials and methods. Choleric polyherbal tea "Triflos" and in dry extract "Gepaflox" were used as objects of research.

HPLC analysis of phenylthiocarbomail - amino acid derivatives was carried out in the laboratory of peptide and protein chemistry at the Institute of Bioorganic Chemistry named after academician A.S. Sadykov of the Academy of Sciences of the Republic of Uzbekistan.

Isolation of free amino acids. Precipitation of proteins and peptides of the aqueous extract in centrifuge beakers. For this, 1 ml (exact volume) of 20% tetrachloroacetic acid (TCAA) was added to 1 ml of the test sample. After 10 minutes, the precipitate was separated by centrifugation at 8000 rpm for 15 minutes. Separating 0.1 ml of the supernatant liquid, it was lyophilized.

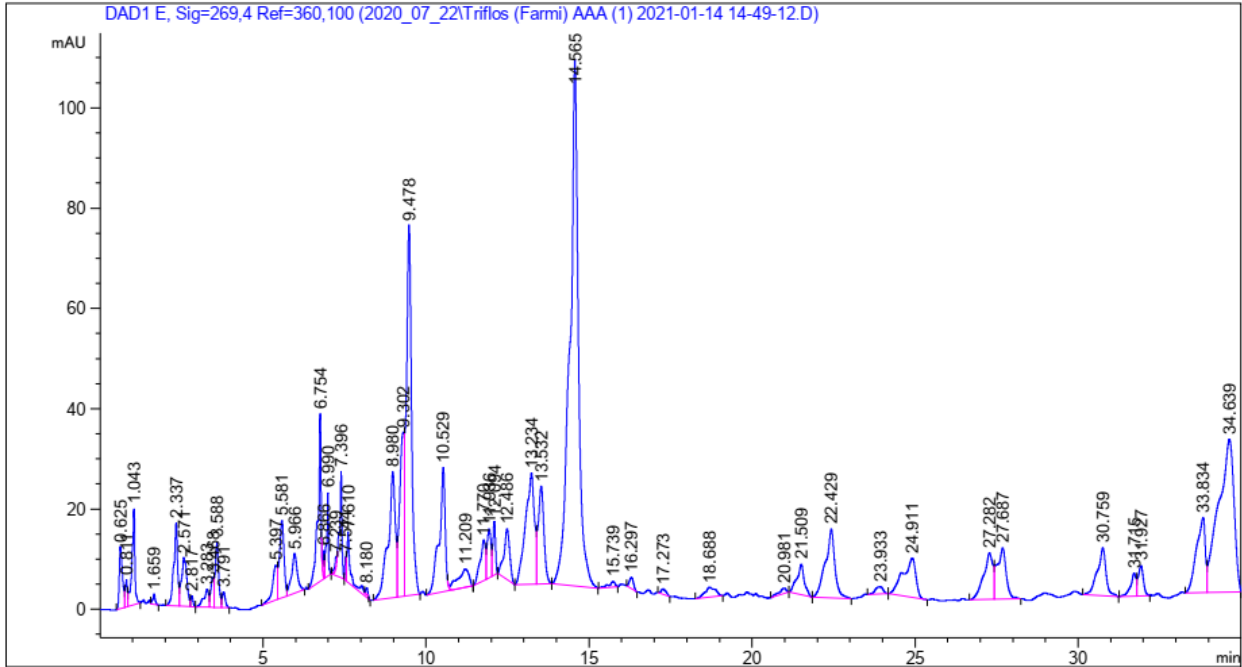
HPLC analysis of phenylthiocarbomail derivatives of amino acids. The synthesis of phenylthiocarbomail derivatives of free amino acids was carried out according to the method of Steven A., Cohen Daviel [16].

The identification of phenylthiocarbomail amino acids was carried out on an Agilent Technologies 1200 chromatograph on a 75x4.6 mm Discovery HS C18 column. Solution A: 0.14M CH₃COONa + 0.05% TEA pH 6.4, B: CH₃CN. Flow rate 1.2 ml / min, absorption 269nm. Gradient% B / min: 1-6% / 0-2.5min; 6-30% / 2.51-40min; 30-60% / 40.1-45min; 60-60% / 45.1-50min; 60-0% / 50.1-55min.

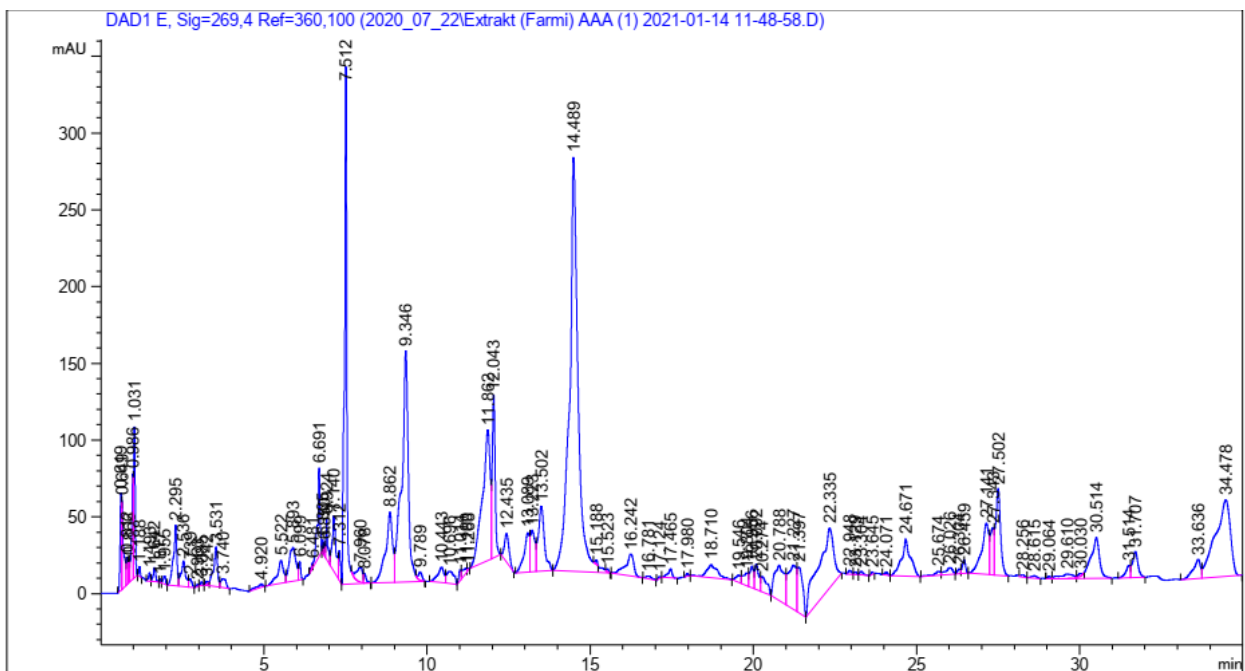
Results and discussions.

The chromatogram of the standard mixture of phenylthiocarbomail amino acid derivatives and the separation conditions are shown in Figures 1 and 2. The identification of amino acids was carried out by comparing their retention time in the analytical column, and quantitative determination was carried out by comparing the peak areas of each amino acid in the chromatograms of the standard and test samples. The data obtained are presented in the table 1.

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Chromatogram of the standard mixture of phenylthiocarbomail -amino acids of the choleric polyherbal tea "Triflos".



Chromatogram of the standard mixture of phenylthiocarbomail-amino acids of the dry extract "Gepaflox".

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Table 1

The amino acid composition of the choleric polyherbal tea "Triflos" and dry extract "Gepaflox"

№	Name of amino acids	Choleric polyherbal tea "Triflos"	Dry extract "Gepaflox"
		Concentration mg / g	
1.	Aspartic acid	0,220035	0,459313
2.	Glutamic acid	0,460955	0,642135
3.	Serine	0,354399	0,744492
4.	Glycine	0,478139	0,757236
5.	Asparagine	0,481069	0,789212
6.	Glutamine	0,206455	1,624356
7.	Cysteine	0,322198	0,999461
8.	Threonine *	0,134158	0,314709
9.	Argenin **	0,701957	0,447639
10.	Alanin	0,260395	0,612474
11.	Proline	2,8041	3,883376
12.	Tyrosine	0,211795	1,039585
13.	Valine *	0,393891	1,884164
14.	Methionine *	0,424696	0,889586
15.	Isoleucine *	0,347065	0,971263
16.	Leucine *	0,323984	0,976093
17.	Histidine **	0,219225	0,340428
18.	Tryptophan *	0,307732	0,900312
19.	Phenylalanine *	0,076303	0,232049
20.	Lysine*	0,206975	0,140497
	Total	8,935527	18,64838

* - essential amino acids, ** - conditionally essential amino acids

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As can be seen from the data in the table 1, the composition under study contains at least 20 amino acids, of which 8 are essential amino acids: threonine, valine, methionine, isoleucine, leucine, tryptophan, phenylalanine, lysine; 2 conditionally irreplaceable - histidine and arginine. Also, the amino acid composition of the choleric polyherbal tea "Triflos" and dry extract "Gepaflox" includes glycine, which is important, its content in the polyherbal tea is 0.478139 mg / g, and in the dry extract - 0.757236 mg / g. Since the composition of bile acids includes such amino acids as glycine and taurine (not found in plants), the high content of glycine provides the choleric activity of the choleric polyherbal tea "Triflos" and dry extract "Gepaflox". It was found that the quantitative content of amino acids in the dry extract (18.64838 mg / g) is two times higher than in the polyherbal tea (8.935527 mg / g).

In combination with other biologically active substances (phenolic compounds, polysaccharides, organic acids, macro- and microelements), the presence of a sufficient amount of amino acids emphasizes the therapeutic significance of the choleric polyherbal tea "Triflos" and dry extract "Gepaflox" and makes it possible to create new drugs of combined action on their basis.

Conclusions:

1. The amino acid composition of the choleric polyherbal tea "Triflos" and dry extract "Gepaflox" was studied
2. 20 amino acids in various ratios, including 8 essential and 2 conditionally essential amino acids were identified.
3. The content of glycine, which is a part of bile acids, in the polyherbal tea and in the dry extract was 0.478139 mg / g and 0.757236 mg / g respectively.
4. It was found that the rich content of amino acids in the studied objects in combination with other biologically active substances provides their choleric activity.

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