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RESEARCH ARTICLE

THE STUDY OF AMINO-ACIDE COMPOSITION OF HELIANTHUS TUBEROSUSE BLOOMS AND ORGANIC SOLVENTS' EXTRACTS BY PHYSIC-CHEMICAL METHODS.

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Abstract

In this article the definition of Helianthus tuberosuse blooms' amino-acid composition by the gas-chromotographc using "Karlo-Erba-4200" device is given. As a result, 20 amino acids such as glutamine, aspartate, lactamic acide, proline, arginine, leusine, serine, isoleucine, tyrosine, etc. were defined. Also, UV-spectra of organic solvents' extracts were made with the usage of "Evolution 600" device. It is determined that the basic components of the extracts are lipochromes (vitamin A) and α-chlorophyll.

Bioligically active substances are such substances that affect biological processes in a human and animal body. They can be product of primary (vitamins, fats, carbohydrates, albumens) and secondary (alkaloids, glycosidas, tannins) biosynthesis. Plant always contain a complex of biologically active substances, but only one or few of them have therapeutic effect. They are called active substances and used in production of medicinal drugs.

Plants also contain called accompanying substances. This a conventional name of plants' primary and secondary synthesis products (menthol, papaverine, tanning agants). Some accompanying substances positively influence a human body as they have a supplement effect to basic active substances. For example, vitamins, mineral substances, flavavanoids increase absorbability of active substances and their useful effect, and decrease a harmful effect of strong bonds [1,5].

Nowadays plants' generating biologically active substances arouses a great interest. Among these are Helianthus tuberosuse composite plants.

Research methods and Materials:-

The purpose of this work is the Helianthus tuberosuse blooms' definition of amino-acid composition and study of their organic extracts by the UV-spectroscopy method.

The object of the research is Almaty and Tashkent regions "Interes" cultivar's blooms picked in the end of September-middle of October 2013-2015.

To cany out UV-spectroscopic research the exctacts of organic solvents (chloroform, benzole, acetone, hexane) were used, as well as the definition of amino-acid composition by the gas-chromotography with the usage of "Karlo-Erba-4200" device (Italy-USA) [2]. The results of amino-acid composition are listed n table 1.

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Result and their Consideration:-

Table 1:- Amino-acid composition of Helianthus tuberosuse plant's blooms.

The object of the research	Name of amino acids																			
	alanine	glycines	leusine	isoleucine	valine	glutamate	Threonine	proline	Methionine	Serine	aspartate	Sisteyn	Hydroxy-proline	Phenylalanine	Thyrosinum	Histidinum	Ornitine	Arginine	Lysine	tryptophan болгарский
Almaty region (mg/100g)	1550	502	813	546	408	2015	442	1248	220	910	1754	102	6	625	596	480	6	612	440	225
Tashkent region (mg/100g)	1675	544	883	548	450	2194	448	1295	298	978	1820	121	7	652	685	503	7	638	462	244

According to the the table, a considerable amount of glutamate, aspartate, lactamic acid and proline was found: in Tashkent region - 2194mg/100g, 1820mg/100g, 1675mg/100g, 1295mg/100g, and in Almaty region - 2015mg/100g, 2015mg/100g, 1550mg/100g, 1248mg/100g respectively.

Amino acids are the organic compounds that act as construction materials for protein and muscular tissues. Amino acids perform a lot of important functions in a human body. Glutamate is considered an indispensable amino acid for a human organism. It is quite common in nature, thus it can be synthesised in sufficient volumes. Its concentration in blood reaches 500-900 mcM/l, which exceeds the concentration of any other amino acid. In an organism, aspartate and glutamate are used by all cells for the synthesis of purine and pyrimidine bases.

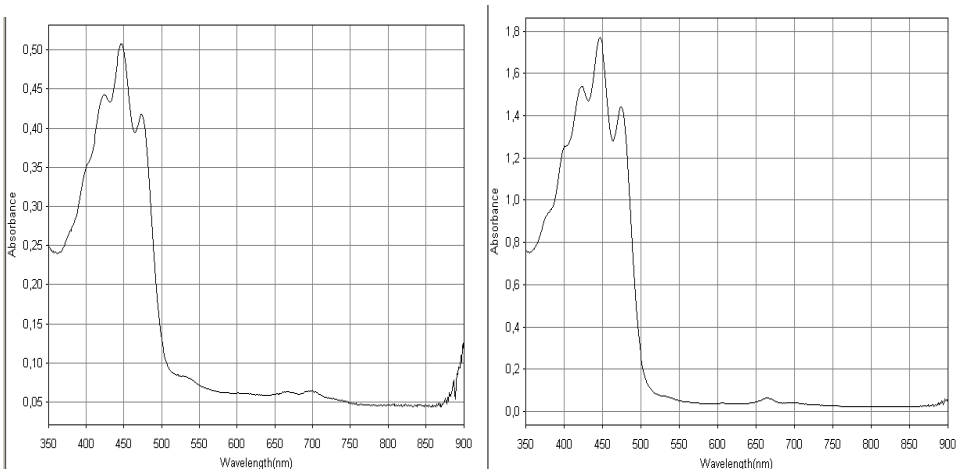
Amid derivatives of these amino acids are the transportation forms of ammonia from tissues to kidneys and liver. Additionally, glumatic acid is a part of glutathione - the substance, that performs two different functions: amino acids transfer through a membrane and a key part of a cell antioxidant system.

Alanine (lactamic acid) controls blood sugar level, taking part in gluconeogenesis (glucose synthesis) and in the exchange of sugar and organic acids. It also facilitates concentration of glycogen in liver and muscles. Alanine is used as an energy source by brain cells and participates in generating immunoglobulin and antibodies.

Proline is the main component of collagen, that strenghtens chordas and ligaments, provides a good functioning of joints, and when coupled with redoxon helps to heal wounds and traumas [3].

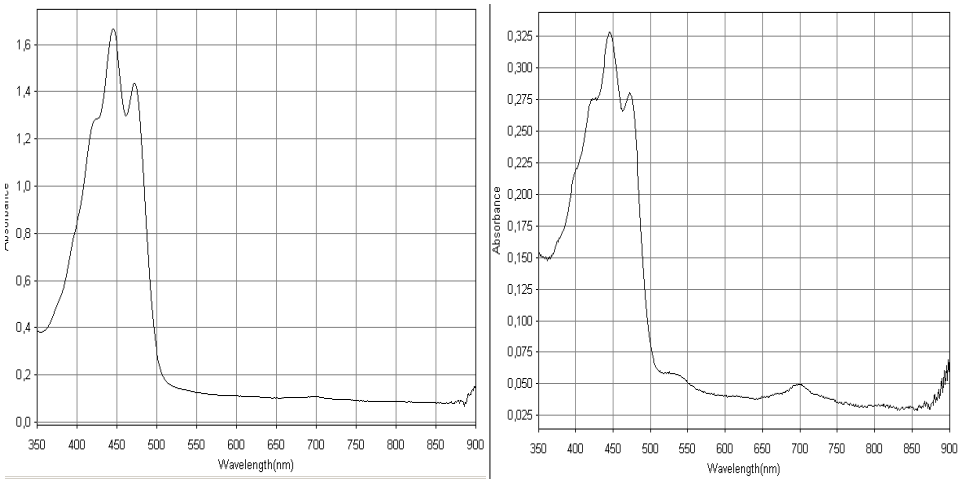
Also the UV-spectra of Helianthus tuberosuse blooms' extracts from organic solvents of chloroform, benzole, acetone, hexane on the "Evolution 600" device was made. The results are given in pictures 1-4 and table 2.

According to table 2, the basic component is liprochome's α-chlorophyll (vitamin A).



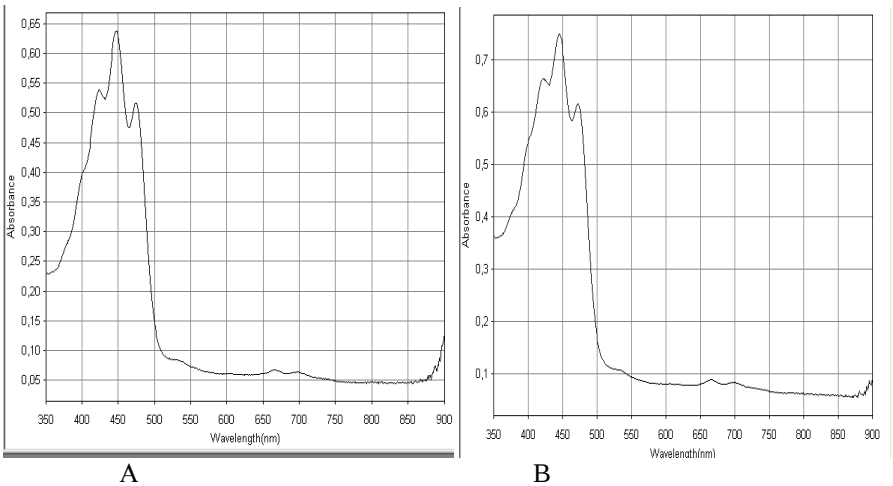
A B

Picture 1:- UV -spectra of Helianthus tuberosuse blooms' acetone extracts in Almaty (A) and Tashkent (B) regions.



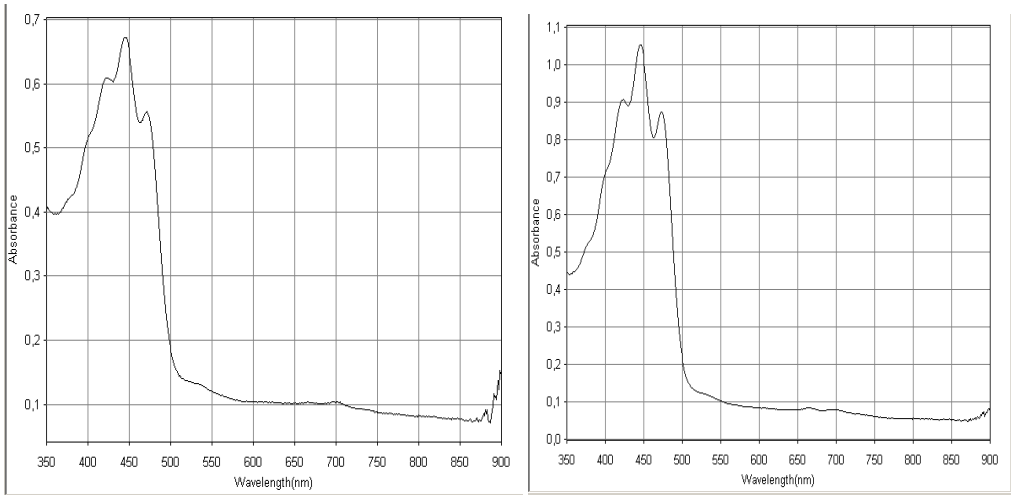
A B

Picture 2:- UV -spectra of Helianthus tuberosuse blooms' hexane extracts in Almaty (A) and Tashkent (B) regions.



A B

Picture 3:- UV -spectra of Helianthus tuberosuse blooms' chloroform extracts in Almaty (A) and Tashkent (B) regions.



A B

Picture 4:- UV -spectra of Helianthus tuberosuse blooms' benzole extracts in Almaty (A) and Tashkent (B) regions.

Table 2:- The UV-spectrum data.

The name of sample	Wave length, nm	Intensity, A	the bond type
1	2	3	4
Spectra of Helianthus tuberosuse blooms' chloroform extracts (Tashkent region)	375	0,402	
	401	0,544	
	422	0,664	
	445	0,749	lipochrome
	473	0,615	lipochrome
	536	0,105	
	667	0,087	α-chlorophyll
	700	0,083	
Spectra of Helianthus tuberosuse blooms' benzole extracts (Tashkent region)	375	0,510	
	400	0,708	
	424	0,908	
	445	1,053	lipochrome
	474	0,874	lipochrome
	534	0,118	
	667	0,085	α-chlorophyll
Spectra of Helianthus tuberosuse blooms' hexane extracts (Tashkent region)	378	0,165	
	398	0,215	
	423	0,276	
	446	0,329	lipochrome
	472	0,280	lipochrome
	539	0,057	
	665	0,041	α-chlorophyll
	679	0,050	
Spectra of Helianthus tuberosuse blooms' acetone extracts (Tashkent region)	378	0,931	
	400	1,251	
	423	1,539	
	447	1,773	lipochrome
	475	1,443	lipochrome
	665	0,064	
Spectra of Helianthus tuberosuse blooms' chloroform extracts	400	0,396	
	425	0,538	

(Almaty region)	445	0,638	lipochrome
	475	0,516	lipochrome
	535	0,082	
	665	0,068	α-chlorophyll
	698	0,064	
Spectra of Helianthus tuberosuse blooms' benzole extracts (Almaty region)	378	0,422	
	400	0,514	
	424	0,610	
	445	0,673	lipochrome
	472	0,557	lipochrome
	535	0,131	
	700	0,104	
Spectra of Helianthus tuberosuse blooms' hexane extracts (Almaty region)	423	1,282	
	446	1,667	lipochrome
	473	1,437	lipochrome
Spectra of Helianthus tuberosuse blooms' acetone extracts (Almaty region)	402	0,354	lipochrome
	442	0,444	lipochrome
	447	0,508	lipochrome
	473	0,418	lipochrome
	535	0,081	
	667	0,064	α-chlorophyll
	698	0,064	

According to the results of blooms' chloroform extracts in Almaty region, they are characterised by the absorption band's presence of 445-475 nm, and the intensity index is 0,638-0,516 A°; in Tashkent region the absorption band's presence of 445-475 nm, and the intensity index is 0,749-0,615 A°, which corresponds to lipochrome. Blooms' benzole extracts in Almaty region are characterised by the absorption band's presence of 445-472 nm, and the intensity index is 0,673-0,557 A°; in Tashkent region the absorption band's presence of 445- 474 nm, and the intensity index is 1,053-0,874 A°, which corresponds to lipochrome.

Blooms' hexane extracts in Almaty region are characterised by the absorption band's presence of 446- 473 nm, and the intensity index is 1,67-1,42 A°; in Tashkent region the absorption band's presence of 446-472 nm, and the intensity index is 0,32- 0,280 A°, which corresponds to lipochrome.

Blooms' acetone extracts in Almaty region are characterised by the absorption band's presence of 446- 473 nm, and the intensity index is 0,508-0,418 A^0; in Tashkent region the absorption band's presence of 447-475 nm, and the intensity index is 1,77-1,44 A^0, which corresponds to α-chlorophyll.

Blooms' chlorophormic extracts in Almaty region are characterised by the absorption band's presence of 665 nm, and the intensity index is 0,068 A°; in Tashkent region the absorption band's presence of 667 nm, and the intensity index is 0,86 A°, which corresponds to α-chlorophyll [4].

Conclusion:-

1. The definition of Helianthus tuberosuse blooms' amino-acid composition by gas-liquid chromotography with the usage of "Karlo-Erba -4200" device (Italy-USA) is given. As a result, a considerable amount of glutamate, aspartate, lactamic acid and proline is attained: in Tashkent region it reaches 2194 mg/100g, 1820mg/100g, 1675mg/100g, 1295mg/100g, and in Almaty region it reaches 2015mg/100g, 2015mg/100g, 1550mg/100g, 1248mg/100g.
2. Helianthus tuberosuse blooms' extracts of organic solvents of chloroform, benzole, acetone, hexane by the UV-spectrum methods using "Evolution 600" device are studied. According to research, it is determined that the basic components of extracts are lipochromes (vitamin A) and α-chlorophyll.

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