O‘ZBEKISTONNING TOG‘LI HUDUDLARIDA O‘SUVCHI GENTIANA OLIVERI GRISEB (ERBAHOR) O‘SIMLIGINING VITAMINLAR MIQDORIY TARKIBINI O‘RGANISH

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Anotatsiya: *Vitaminlar bu - organizmning normal o`sishi va rivojlanishi uchun zarur bo’lgan va nisbatan oz miqdorda uchraydigan kimyoviy organik birikmalar hisoblanadi. Vitaminlar – tirik organizmda har xil biokimyoviy va fiziologik jarayonlar me’yorida o’tib turishini ta’minlaydigan moddalardir. Vitaminlarsiz odam va hayvon organizmi uzoq vaqt yashay olmaydi. Ushbu maqolada dorivor xususiyatga ega ayim o’simliklar va erbahor o’simligining tarkibidagi vitaminlar miqdoriy tahlili haqida fikrlar boradi.*

Kalit so’zlar*: Vitaminlar, fotosintez, E vitamin, S vitamin, PP vitamin, B2 vitamin, B12 vitamin, diod, gradient, xromatografiya, spektor, to’lqin*

Аннотация: *Витамины – это химические органические соединения, необходимые для нормального роста и развития организма и находящиеся в относительно небольших количествах. Витамины – вещества, обеспечивающие нормальное функционирование различных биохимических и физиологических процессов в живом организме. Без витаминов организм человека и животных не может жить долго. В данной статье рассматривается количественный анализ витаминов, содержащихся в лекарственных растениях и травянистых растениях.*

Ключевые слова*: Витамины, фотосинтез, витамин Е, витамин С, витамин РР, витамин В2, витамин В12, диод, градиент, хроматография, спектр, волна.*

Abstract*: Vitamins are chemical organic compounds that are necessary for the normal growth and development of the body and are found in relatively small quantities. Vitamins are substances that ensure normal functioning of various biochemical and physiological processes in a living organism. Without vitamins, the human and animal body cannot live for a long time. This article discusses the quantitative analysis of vitamins contained in medicinal plants and herbaceous plants.*

Key words: *Vitamins, photosynthesis, vitamin E, vitamin C, vitamin PP, vitamin B2, vitamin B12, diode, gradient, chromatography, spectrum, wave*

Vitaminlarni ilmiy nuqtai nazardan o‘rganish XVIII asrda boshlangan. Lind, Majandi, Lunin, Eykman, Xopkinslar vitaminlarni o‘rganishga juda katta hissa qo‘shdilar. Organizmda vitaminlar sintez qilinmaydi, kishi o‘zi uchun zarur vitaminlarni turli ovqat moddalar orqali oladi. Vitaminlarning asosiy manbai o‘simliklardir. Vitaminlar asosan o’simlik va mikroorganizmlarning hujayralarida sintezlanadi.[1]

Vitaminlar ta’sirida o’simliklarning hosildorligi oshadi, yetilishi tezlashadi va ildizi tez rivojlanadi. Ba’zi vitaminlar esa fotosintez jarayonida va o’simlik gulining changlanishida ishtirok etadi. Mahsulot tarkibidagi vitaminlar miqdori doimo o’zgarib turib, ko’pincha o’simliklarning gullash davrida yer usti organlarida maksimal miqdorda to’planadi. Mevalarda esa ular pishib yetilgan vaqtida ko’p yig’iladi. Shuning uchun vitaminli mahsulotlarni tayyorlash yuqoridagi aytib o’tilgan vitaminga boy davrda o’tkazilishi kerak. Ko’pchilik vitaminlarning o’zi turg’un birikma bo’lsa ham ma’lum sharoitlarda (yuqori harorat, namlik, yorug`lik ta’sirida) oksidlanishi, parchalanishi yoki boshqa o’zgarishlarga uchrashi mumkin. Natijada vitaminlar o`zining biologik faolligini yo`qotadi. Vitaminli mahsulotlarning yuqori sifatliligini saqlab qolish uchun ularni tayyorlashda, quritishda va saqlashda yuqorida ko’rsatilgan sharoitlarni hisobga olish zarur. Tarkibida ko’p miqdorda vitaminlar saqlaydigan o’simliklar qatoriga quyidagi dorivor giyohlar va mahsulotlar kiradi: na’matak mevasi, qoraqat bargi va mevasi, o’rmon qulupnayining bargi va mevasi, chetan mevasi, chakanda mevasi va moyi, tirnoqgul, gazanda bargi, makkajo’xori gulining ustunchasi, jag’-jag’ yer usti qismi. Masalan Chakanda - Hippophae rhamnoides L. o’simligi tarkibida S (450 mg gacha), B1 (0,035 mg gacha), B2 (0,056 mg gacha), E vitaminlari (145 mg gacha), foliy kislotasi (0,79 mg gacha) va yog‘li moy (8% gacha), tarkibida olein, stearin, linolin va palmitin kislotalarning gliseridlari mavjud. Meva tarkibida turli xil vitaminlar mavjud va u eng yaxshi tabiiy vitamin saqlovchi hisoblanadi. Dalachoy - Hypericum perforatum L o’simligi tarkibida S va PP vitaminlari, alkaloidlar va fitonsidlarning izlari bor. Qizilpoycha - Hypericum scabrum L o’simligi tarkibida S vitamini, to‘pgullarida PP vitamini topilgan. Qizilarcha - Juniperus seravschanica Kom o’simligining igna barglarida 120-140 mg S vitaminlari mavjud.[2]

Ko’plab dorivor xususiyatlarga ega, O‘rta Osiyoda, Kavkazning janubida, O‘zbekistonning Toshkent, Samarqand, Jizzax, Surxondaryo, Buxoro, Namangan va Andijon viloyatlarida keng tarqalgan Gentiana Olivieri Griseb (Erbahor) o’simligining O‘zbekistonning Andijon, Namangan va Toshkent viloyatlarida o’sgan na’munalari terib olinib, kimyoviy tarkibiga ko’ra vitaminlar tahlili o’tkazildi. Olib borilgan ishlar natijasida quyidagi tahlil hisobotlari ni taqdim eta olamiz. 1-jadval

TAHLIL HISOBOTI

2024 yil 25 iyundan

Namuna nomi: O‘simliklarning vegetativ organlari – 1 ta namuna

Qo'shimcha ma'lumot:

Tanlov sanasi: 18.06.2024

Suvda eriydigan vitaminlar tarkibi uchun tahlil natijalari.

1-jadval

№	Namuna nomi	Miqdoriy tarkib mg/100 g						
		B1	B6	B9	PP	C	B2	B12
1	Gentianana oliveri	-	-	-	4.941	31.289	51.198	33.738

Tadqiqot materiallari va usullari.

Suvda eriydigan vitaminlarni tahlil qilish HPLC tomonidan gradient elutsiya rejimi va diodli massiv detektori (DAD) yordamida amalga oshirildi. Mobil faza sifatida asetonitril va bufer eritmasi ishlatilgan. Spektral ma'lumotlar 200 dan 400 nm gacha bo'lgan spektral diapazonda o'rganildi.[3]

Xromatografiya shartlari:

Mobil faza (gradient rejimi) – asetonitril – bufer eritmasi pH=2,92 (4% : 96%) 0-6 min., (10% : 90%) 6-9 min., (20% : 80%) 9-15 ., (4% : 96%) 15-20 min.

In'ektsiya hajmi - 10 ml.

Mobil fazaning tezligi 0,75 ml/min.

Ustun - Eclipse XDB - C18. 5,0 mikron, 4,6x250 mm.

Detektor - diodli matritsali detektor, to'lqin uzunligi 272, 292, 254, 297, 360 nm.

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Acq. Operator	SYSTEM		Seq. Line	5
Sample Operator	SYSTEM			
Acq. Instrument	HPLC		Location	P2-A-05
Injection Date	6/24/2024	11:37:54 AM	Inj	1
			Inj Volume	10.000 ml

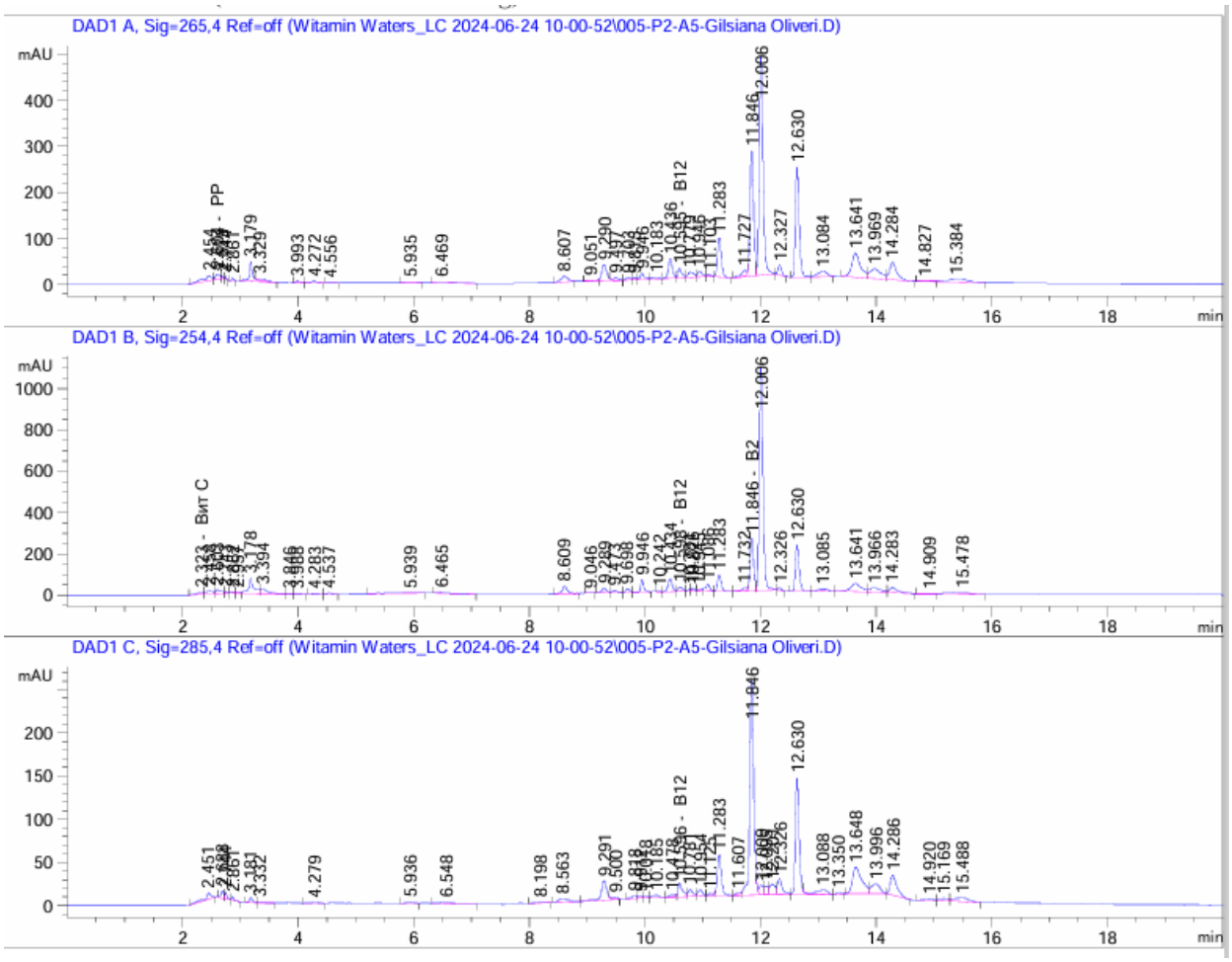
Acq. Method : C:\Users\Public\Documents\ChemStation\1\Data\Witamin Waters_LC 2024-06-2410-00-52\Vitamin Waters_LC.M

Last changed : 2/14/2024 6:33:15 PM by SYSTEM

Analysis Method : C:\Users\Public\Documents\ChemStation\1\Data\Witamin Waters_LC 2024-06-2410-00-52\Vitamin Waters_LC.M (Sequence Method)

Last changed : 6/24/2024 12:20:12 PM by SYSTEM

(modified after loading)



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Area Percent Report

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Sorted By : Signal
Calib. Data Modified : 6/24/2024 12:22:36 PM
Multiplier : 1.0000
Dilution : 1.0000
Use Multiplier & Dilution Factor with ISTDs
Signal 1: DAD1 A, Sig=265,4 Ref=off

2-jadval

Peak #	RetTime [min]	Type		Width [min]	Area [mAU*s	Area %	Name
1	2.320			0.0000	0.00000	0.0000	Вит С
2	2.454	BV		0.1356	109.65678	1.3718	?
3	2.604	VV		0.0812	60.12460	0.7522	PP
4	2.679	VB		0.0338	10.25046	0.1282	?
5	2.744	BB		0.0265	7.56521	0.0946	?
6	2.861	BV		0.0446	15.57276	0.1948	
7	3.033			0.0000	0.00000	0.0000	
8	3.179	VV	R	0.0553	169.98196	2.1265	
9	3.329	VB	E	0.1545	44.14224	0.5522	?
10	3.510			0.0000	0.00000	0.0000	

11	3.993	VB		0.0743	11.55852	0.1446	?
12	4.272	BB		0.1013	20.10535	0.2515	
13	4.556	BB		0.0822	7.65105	0.0957	
14	5.935	BB		0.1074	12.51526	0.1566	?
15	6.469	BB		0.1790	25.20049	0.3153	
16	8.135			0.0000	0.00000	0.0000	
17	8.607	BB		0.1125	101.71381	1.2724	?
18	9.051	BV	E	0.1017	15.95862	0.1996	?
19	9.290	VV	R	0.0941	224.89787	2.8135	
20	9.497	VB	E	0.0846	31.28447	0.3914	
21	9.703	BV		0.0774	24.75249	0.3097	?
22	9.815	VV		0.0740	17.79132	0.2226	?
23	9.946	VV		0.0737	69.64322	0.8712	
24	10.152			0.0000	0.00000	0.0000	B9
25	10.183	VB		0.0929	26.42327	0.3306	
26	10.436	BV		0.0753	208.36165	2.6066	
27	10.595	VV		0.0692	100.32588	1.2551	B12
28	10.779	VV		0.0931	84.50008	1.0571	
29	10.946	VV		0.0869	75.84735	0.9488	
30	11.103	VB		0.0833	21.21470	0.2654	?
31	11.283	BB		0.0716	389.96194	4.8784	?
32	11.727	BV	E	0.0939	86.54334	1.0827	
33	11.846	VV	R	0.0685	1204.31934	15.0660	B2
34	12.006	VB		0.0706	2179.26440	27.2625	?
35	12.327	BB		0.0703	91.16058	1.1404	?
36	12.630	BB		0.0698	1085.59277	13.5807	
37	13.084	BB		0.1695	133.62334	1.6716	?
38	13.641	BV		0.1536	555.34015	6.9473	
39	13.969	VV		0.1871	284.18344	3.5551	
40	14.284	VB		0.1250	322.53879	4.0350	?
41	14.827	BV	E	0.1772	13.95959	0.1746	?
42	15.384	VB	R	0.3297	150.09406	1.8777	?

Totals : 7993.62114

Signal 2: DAD1 B, Sig=254,4 Ref=off

3-jadval

Peak #	RetTime [min]	Type		Width [min]	Area [mAU*s	Area %	Name
1	2.323	BV		0.1209	73.17460	0.6392	Вит С
2	2.458	VV		0.1090	120.69255	1.0543	?
3	2.603	VV		0.1073	136.00375	1.1881	PP
4	2.743	VB		0.0359	22.70396	0.1983	?
5	2.862	BV	E	0.0459	17.82760	0.1557	
6	2.957	VV	E	0.0635	11.80819	0.1032	
7	3.178	VV	R	0.0853	486.04114	4.2459	
8	3.394	VB		0.1152	163.65173	1.4296	
9	3.509			0.0000	0.00000	0.0000	

10	3.846	BV		0.0685	6.58846	0.0576	?
11	3.988	VB		0.0850	16.32758	0.1426	?
12	4.283	BV		0.0949	16.32167	0.1426	
13	4.537	VB		0.0970	24.43495	0.2135	
14	5.939	BB		0.3795	49.62299	0.4335	?
15	6.465	BB		0.1291	41.97413	0.3667	
16	8.609	BV	R	0.0832	211.64182	1.8488	?
17	9.046	BB		0.0783	8.97877	0.0784	?
18	9.289	BV		0.0926	142.37518	1.2437	
19	9.473	VB		0.0892	65.73225	0.5742	
20	9.698	BV		0.0712	82.62189	0.7218	
21	9.946	VB		0.0574	220.45705	1.9258	
22	10.150			0.0000	0.00000	0.0000	B9
23	10.242	VB		0.0510	15.87229	0.1387	
24	10.434	BV		0.0767	305.88968	2.6721	
25	10.598	VB		0.0872	105.67942	0.9232	B12
26	10.781	BV		0.0396	19.42841	0.1697	
27	10.826	VB		0.0546	38.08621	0.3327	
28	10.945	BV	E	0.0498	15.18532	0.1327	
29	11.086	VB	R	0.0819	178.69792	1.5610	?
30	11.283	BB		0.0704	346.97852	3.0311	?
31	11.732	BV	E	0.0869	98.28277	0.8586	
32	11.846	VV	R	0.0686	1134.30920	9.9089	B2
33	12.006	VB		0.0694	4844.92090	42.3234	
34	12.326	BB		0.0653	50.57537	0.4418	?
35	12.630	BB		0.0697	1014.67700	8.8638	
36	13.085	BB		0.1611	124.10027	1.0841	?
37	13.641	VV	R	0.1853	525.73572	4.5926	
38	13.966	VV		0.1840	294.47186	2.5724	
39	14.283	VB		0.1347	248.38422	2.1698	?
40	14.909	BV	E	0.1580	12.71221	0.1110	?
41	15.478	VB	R	0.3127	154.40982	1.3489	?

Totals : 1.14474e4

Signal 3: DAD1 C, Sig=285,4 Ref=off

4-jadval

Peak #	RetTime [min]	Type		Width [min]	Area [mAU*s	Area %	Name
1	2.313			0.0000	0.00000	0.0000	Вит С
2	2.451	BB		0.1004	51.29890	1.3364	?
3	2.612			0.0000	0.00000	0.0000	PP
4	2.688	VV		0.0512	30.57640	0.7965	?
5	2.744	VB		0.0365	18.54219	0.4830	?
6	2.861	BB		0.0440	10.95542	0.2854	
7	3.181	BV		0.0563	24.74839	0.6447	
8	3.332	VB		0.0808	7.29979	0.1902	?
9	3.505			0.0000	0.00000	0.0000	

10	4.279	BB		0.1281	11.77409	0.3067	
11	5.069			0.0000	0.00000	0.0000	
12	5.936	BB		0.0961	11.50286	0.2997	?
13	6.548	BB		0.1671	26.45852	0.6893	?
14	8.198	BB		0.1265	12.27640	0.3198	?
15	8.563	BV	R	0.1460	46.54226	1.2125	?
16	9.291	BV	R	0.1010	154.65889	4.0290	
17	9.500	VB	E	0.0688	11.86246	0.3090	
18	9.818	BV		0.0799	18.19426	0.4740	?
19	9.912	VV		0.0643	9.81872	0.2558	
20	10.018	VB		0.0670	7.36971	0.1920	
21	10.185	BB		0.0864	17.26758	0.4498	
22	10.478	BV	E	0.1106	17.44860	0.4546	
23	10.596	VV	R	0.0752	86.59967	2.2560	B12
24	10.690			0.0000	0.00000	0.0000	
25	10.781	VV		0.0811	47.15213	1.2284	
26	10.954	VB		0.0866	39.56981	1.0308	
27	11.125	BV	E	0.0734	13.58373	0.3539	?
28	11.283	VB	R	0.0752	231.37254	6.0275	?
29	11.607	BV	E	0.0719	10.53526	0.2745	?
30	11.846	VV	R	0.0724	1191.88965	31.0500	
31	12.009	VV	E	0.0706	51.38622	1.3387	?
32	12.095	VV	E	0.0717	47.62271	1.2406	
33	12.201	VV	E	0.0949	75.86491	1.9764	?
34	12.326	VB	E	0.0843	102.76580	2.6772	?
35	12.630	BV	R	0.0709	610.45599	15.9031	
36	13.088	VB	E	0.1838	68.86556	1.7940	?
37	13.350	BB		0.0728	9.96404	0.2596	?
38	13.648	BV		0.1604	345.22537	8.9935	
39	13.996	VB		0.1669	121.52888	3.1660	
40	14.286	BB		0.1195	187.35753	4.8809	?
41	14.920	BB		0.1434	13.94701	0.3633	?
42	15.169	BV		0.1520	23.12601	0.6025	?
43	15.488	VB		0.2282	71.20061	1.8549	?
Totals				3838.60889			

FOYDALANILGAN ADABIYOTLAR;

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3. O‘zbekiston Respublikasi Fanlar Akademiyasi Biorganik kimyo instituti test hisoboti. № 39. Mirzo Ulug‘bek tumani, Mirzo Ulug'bek- ko‘ch 83. tel: 71-269