

ALKALOIDS FROM *Spartium junceum* GROWING IN GEORGIA

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UDC 547.944/945

Spartium junceum L. (Fabaceae) is widely distributed over the territory of Georgia [1, 2]. We studied various vegetative organs from four- and eight-year and older specimens collected near Tbilisi. Total alkaloids were obtained by ordinary extraction with CHCl_3 followed by separation into ether and CHCl_3 fractions that were then separated stepwise according to base strength by citrate—phosphate buffers at pH 2.2-7.0. The yield of total alkaloids was determined gravimetrically. Qualitative analysis was performed using TLC on Merck plates with elution by CHCl_3 : CH_3OH (6:1) and detection by Dragendorff's solution.

Total bases were separated into pure compounds using columns of Al_2O_3 (activity II, 1:100 compound:sorbent ratio). Alkaloids were eluted by C_6H_6 , C_6H_6 : CH_3OH , and CHCl_3 . Fractions of 20-25 mL were collected. We isolated four pure compounds that were identified as the known alkaloids cytosine, methylcytosine, α -sophoridine, and anagryne based on mp, $[\alpha]_D^{20}$, and UV and IR spectra [3-5].

The accumulation dynamics of total alkaloids were studied in vegetative organs of four- and eight-year and older specimens during various vegetative phases. The content of total alkaloids was determined gravimetrically after extraction of basicified plant material with CHCl_3 in a Soxhlet apparatus (Tables 1 and 2).

Table 1 shows that the alkaloid accumulation dynamics during the active vegetation phase differ substantially in the aerial organs depending on the age. The total content in older specimens was 2-3 times greater than in the four- and eight-year specimens.

Table 2 shows the alkaloid accumulation dynamics in vegetative organs. The highest content of total alkaloids occurred in young runners during the start of vegetation.

With respect to collection of plant raw material over the years (1986, 1988, 2007), the seasonal variations were practically the same.

Thus, the alkaloids cytosine, methylcytosine, α -sophoridine, and anagryne were isolated and identified from *S. junceum* growing in Georgia. The cytosine content calculated per raw material dry weight was 0.06% in the aerial organs during the active vegetation phase.

TABLE 1. Accumulation Dynamics of Total Alkaloids in the Aerial Part of *S. junceum* as a Function of Plant Age

Plant age	Collection time		Total alkaloid content, % in air-dried raw material	
	1986	2007	1986	2007
Four-year	07.05.1986	10.05.2007	0.64	0.68
	11.06.1986	15.06.2007	0.36	0.30
	11.07.1986	12.07.2007	0.23	0.18
Eight-year	11.06.1986	10.05.2007	0.83	0.90
Older	05.04.1986	10.05.2007	1.75	2.0
	12.06.1986	18.06.2007	0.37	0.39
	11.07.1986	12.07.2007	0.36	0.30

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TABLE 2. Accumulation Dynamics of Total Alkaloids in Various Organs of *S. junceum* During Various Vegetation Phases

Collection time		Vegetative phase	Total alkaloid content, %												
			runners		leaves		stems		buds		skin of unripe fruit		unripe fruit		
1988	2007		1988	2007	1988	2007	1988	2007	1988	2007	1988	2007	1988	2007	
20.04	24.04	Start of vegetation	1.87	1.69	1.6	1.65									
11.05	10.05	Budding	1.98	2.0	0.75	0.67	0.45	0.3	0.42	0.45					
15.05	12.05	Flowering	0.9	0.83	0.3	0.2	0.66	0.7	1.15	1.4					
07.07	12.07	Unripe fruit			0.56	0.45	0.48	0.40				0.51	0.5	2.1	2.0
07.09	18.07	Second vegetation	1.8	1.88			1.4	1.6							

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