

DYNAMICS OF THE ACCUMULATION OF ALKALOIDS IN  
*Vinca herbacea* CULTIVATED IN EASTERN GEORGIA

G. V. Chkhikvadze

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The indoline alkaloids of the herbage of *Vinca herbacea* Waldst. et Kit. — vincarine, vincamajine, herbadine, and herbamide — have revealed a specific pharmacological activity [1]. We have studied the dynamics of accumulation of the alkaloids in the herbage of the cultivated plants. The observations were made from 1981 to 1983. Together with a change in the total amount of bases, fluctuations were observed in the individual alkaloids during the phases of vegetation. For analysis, in each case, 50 g of air-dry raw material was taken and the alkaloids were extracted with methanol-water-glacial acetic acid (70:27:3). After the methanol has been distilled off, the acid solutions were acidified with 12% aqueous ammonia to pH 9-10 and the alkaloids were extracted with chloroform. By the usual purification procedure [2], concentration of the organic solution, and drying, the combined bases were obtained in amorphous form. The percentage content was calculated from the formula

$$X = \frac{b \cdot 100}{a(100 - c)} \cdot 100,$$

where  $a$  is the height of raw material, g;  $b$  is the weight of the dry residue, g; and  $c$  is the loss in weight on the drying of the raw material, %.

Using a chromatometric method for the quantitative analysis of vincarine, vincamajine, herbadine, and herbamide that we had developed previously [3], we determined their amounts in the herbage in various vegetative phases. It was established that the largest amount of total alkaloids was present in the phases of incipient vegetation and flowering (Table 1). So far as concerns the individual alkaloids, the intensive accumulation of vincarine, vincamajine, herbadine, and herbamide took place in the period of active growth of the plant and it may therefore be recommended to gather the raw material for isolating the total and individual alkaloids in the budding and flowering phases.

TABLE 1. Quantitative Changes in the Amounts of Alkaloids in the Herbage of *Vinca herbacea*

Year of collection	Time of collection	Vegetation phase	Amount of the total and individual alkaloids in the herbage, %				
			total alkaloids	vincarine	vincamajine	herbadine	herbamide
1981	3.IV	Budding	0.61	0.058	0.067	0.085	0.074
	12.IV	Flowering	0.10	0.053	0.060	0.079	0.071
	9.VI	Fruit-bearing	0.3	0.042	0.048	0.061	0.063
1982	9.IV	Budding	0.94	0.051	0.073	0.097	0.079
	11.IV	Flowering	0.85	0.057	0.050	0.070	0.069
	6.VI	Fruit-bearing	0.63	0.038	0.040	0.069	0.070
1983	10.IV	Budding	1.0	0.064	0.068	0.089	0.075
	16.IV	Flowering	0.65	0.058	0.049	0.078	0.060
	18.V	Fruit-bearing	0.49	0.046	0.040	0.070	0.055

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