

d,l-VINCADIFFORMINE, 11-METHOXYVINCADIFFORMINE, AND ERVINE
FROM THE HERB *Vinca herbacea*

G. V. Chkhikvadze and V. Yu. Vachnadze

UDC 547.944/945

In the present paper we give the results of an investigation of the alkaloids of the herb *Vinca herbacea* Waldst. et Kit., (family Apocynaceae), cultivated in the A. N. Dzhorbenadze Center for Medicinal Plants of the Institute of Pharmacology of the GSSR. The total material was obtained in the usual way [1]. On separation by means of citrate-phosphate buffers, from the fraction with pH 8.6-3.0 by chromatography on a column of neutral alumina with elution by benzene and benzene-ethyl ether in ratios of 8:2, 6:4, and so on with increasing concentrations of ether, we isolated three compounds: (I), $C_{21}H_{26}N_2O_6$, amorphous, $[\alpha]_D^{20}$, M^+ 338; (II), $C_{22}H_{28}N_2O_3$, amorphous, $[\alpha]_D$ -440° , M^+ 368; and (III), $C_{21}H_{24}N_2O_3$, mp 220-222°C (methanol), $[\alpha]_D$ -57.2° .

On the basis of physicochemical constants and spectral characteristics, compounds (I), (II), and (III) were identified as *d,l*-vincadifformine, 11-methoxyvincadifformine, and ervine, respectively [2-4].

LITERATURE CITED

1. A. P. Orekhov, Alkaloid Chemistry [in Russian], Moscow (1955). p. 14.
2. I. Mokry and I. Kompis, *Lloydia*, 27, 428 (1964).
3. D. A. Rakhimov, V. M. Malikov, M. R. Yagudaev, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 226 (1970).
4. V. M. Malikov, P. Kh. Yuldashev, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 338 (1966).

I. G. Kutateladze Institute of Pharmacology, Academy of Sciences of the Georgian SSR, Tbilisi. Translated from *Khimiya Prirodnikh Soedinenii*, No. 3, pp. 383-384, May-June, 1986. Original article submitted January 23, 1986.

COMPONENTS OF *Haplophyllum acutifolium*

D. M. Razakova, I. A. Bessonova,
and S. Yu. Yunusov

UDC 547.944/945

We have previously [1, 2] reported the isolation of the alkaloids acutine and skimmianine, the lignan eudesmin, and acetamide from the epigeal part of *Haplophyllum acutifolium* collected in the fruit-bearing period in regions of the Turkmen SSR (Kara-Kara and Kizyl-Arvat). The aim of the present work was to study the changes in the chemical composition of the epigeal part of this plant according to the vegetation period and growth site.

By extraction with methanol of the epigeal part of *H. acutifolium* collected by S. A. Khamidkhodzhaev in the early vegetation period (see below) from the southern slopes of the Kopet-Dagh range along the road from Kizyl-Arvat to Kara-Kala, and separation of the evaporated extract into basic, acidic, and neutral fractions, followed by the chromatography of each of them on alumina, we obtained, in addition to substances detected previously [1, 2], evoxine [3], haplamine [3], and β -sitosterol [4], and also crystals with mp 110°C, which, judging from their NMR and mass spectrum, were a mixture of acutine (M^+ 241), dihydroacutine (M^+ 243), 2-n-nonadienyl-4-quinolone (M^+ 267), and 2-n-nonyl-4-quinolone (M^+ 271).

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from *Khimiya Prirodnikh Soedinenii*, No. 3, pp. 384-385, May-June, 1986. Original article submitted February 3, 1986.

The amounts of alkaloids and the other components in the epigeal part of *H. acutifolium* collected in Turkmenia were as follows (% on the weight of the dry material; the + sign denotes the presence of less than 0.001% of the substances).

Phase of growth	Acutine	Mixture of 2-alkyl-4-quinolones	Skimmianine	Evoxine	Haplamine	Eudesmin	β -Sitersterol	Acetamide
Budding	+	0,02	+		0,001	0,004	+	+
Incipient flowering	0,001	0,002	+	+	+	0,01		
Flowering	0,025	+	+			0,08		
Fruit-bearing	+	+	+			+		+

It can be seen from the facts given that the greatest number of substances, and also the maximum amount of haplamine and of the mixture of 2-alkyl-4-quinolones, were found in the budding period. As the plant developed, the amounts of these substances decreased while those of acutine and the lignan eudesmin rose, reaching a maximum in the period of vigorous flowering. The amount of skimmianine changed little during the growth of the plant; evoxine was detected in the period of incipient flowering, and β -sitersterol and acetamide during budding. The latter was also isolated in the fruit-bearing period. Thus, as the plant develops, considerable qualitative and quantitative changes take place in the amounts of alkaloids and other components in the epigeal part of *H. acutifolium*.

A similar investigation of the epigeal part of this plant collected in the fruit-bearing period in the gorge of the R. Kafirnigan, Hissar range, Tadzhik SSR, showed that it contained the alkaloids haplamine (0.05%), evoxine (0.01%), perfamine (0.009%), and skimmianine (<0.001%), the lignan eudesmin (0.09%), β -sitosterol (0.01%), and acetamide (0.005%).

A comparison of the results obtained shows that the composition of the epigeal part of the plant from Tadzhikistan differed from that of the plant from Turkmenia by a higher content of the components, by the presence of perfamine, and by the absence of alkaloids of the 2-alkyl-4-quinolone type. Consequently, the conditions of growth apparently have a greater influence on the chemical composition of the plant than the vegetation period.

LITERATURE CITED

1. D. M. Razakova, I. A. Bessonova, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 850 (1971).
2. D. M. Razakova, I. A. Bessonova, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 206 (1973).
3. I. A. Bessonova and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 303 (1977).
4. D. M. Razakova, I. A. Bessonova, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 810 (1979);
D. M. Razakova, and I. A. Bessonova, *Khim. Prir. Soedin.*, 673 (1981).
5. D. M. Razakova, I. A. Bessonova, and S. Yu. Yunusov, *Khim. Prir. Soedin.*, 246 (1983).