ALKALOIDS OF Vinca erecta

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UDC 547.944/1

Having continued an investigation of the alkaloids of V. erecta from the Surkhandar'ya oblast [1], we have isolated another three alkaloids: majdinine [2], 8-oxo-6,7-dehydrokopsinine N-oxide [3], and a new base with the composition $C_{22}H_{26}N_2O_6$ (I) with mp 246-247°C (methanol). Its UV spectrum [λ_{max} 218 nm (log ε 4.59)] is characteristic of the hydroxyindole alkaloids. The IR spectrum of (I) shows absorption bands at 810, 830 cm^{-1} (1,2,4-trisubstituted benzene ring), 1705 and 1630 cm^{-1} (ester and amide carbonyl groups), and 3600-3300 cm^{-1} (NH). The NMR spectrum of (I) shows the signals from the protons of the following groups: $CH-CH_3$ (1.24 ppm, doublet, 3H; 4.15 ppm, quartet, 1H); $COOCH_3$ (3.53 ppm, singlet, 3H); $ArOCH_3$ (3.74 ppm, singlet, 3H); $=CH-O-$ (7.53 ppm, singlet, 1H), C_9H (7.66 ppm, doublet, 1H), and $C_{10}H$ and $C_{12}H$ (6.43-6.55 ppm, 2H). All these facts show that the base is vinerine N-oxide. In actual fact, the reduction of (I) with zinc in hydrochloric acid gave vinerine [4].

When vinerine was heated with 10% acetic acid, isomerization took place and a mixture of substances was formed; vinerine (II), vineridine (III), and two iso compounds (IV), (V).

In its chemical properties, substance (IV) was similar to carboxine [5]. Substance (V), which we have called isovineridine, has the composition $C_{22}H_{26}N_2O_6$, mp 184-185°C (acetone), $[\alpha]_D -97°$ (c 1.1; methanol). IR spectrum, cm^{-1}: 780, 795, 840 (benzene ring), 1720, 1640 (CO, NCO), 3280 (NH), 2760-2800 (Bohlmann bands). NMR spectrum: $CH-CH_3$ (1.35 ppm, 3H; 4.50 ppm, 1H); $COOCH_3$ (3.54 ppm, 3H); $Ar-OCH_3$ (3.76 ppm, 3H); $=CH-O-$ (7.44 ppm, 1H). From its spectral characteristics, isovineridine is an isomer of vinerine at C_3 and has the (3S, 4R, 7R, 15S, 19S, 20S) configuration.

In the investigation of the hydroxyindole alkaloids, it was found that the sign of the specific rotation of the compounds depends on the orientation (α or β) of the proton at C_3 in the bases with the cis linkage of rings D/E, i.e., when $C_3\alpha H$ is present the substance rotates the plane of polarization of the left, and when $C_3\beta H$ is present, to the right:

$C_3\alpha H$ Orientation		$C_3\beta H$ Orientation	
Majdine	−137	Vinerine	+20
Isomajdine	− 90	Vineridine	+27
Vinerinine	− 70	Isomer of majdine	+28
Carapanubine [6]	−115	Isomer of isomajdine	+45
N-Acetylvinerine [7]	− 99	Uncarine [9]	+85
Caboxine	− 70	Rauvoxine [10]	+98
Isovineridine	− 97	Rauvoxinine [10]	+64
Pteropodine [8]	−109	Speciophylline [11]	+73
Isopteropodine [8]	−111		

These facts can be used in the chemical investigation of the hydroxyindole alkaloids.

The NMR spectra were taken in $CDCl_3$ on a JNM-4H-100/100-MHz instrument with HMDS as internal standard.

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 401-402, May-June, 1976. Original article submitted October 24, 1975.

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ALKALOIDS OF THE ROOTS OF Paracynoglossum imeretinum

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UDC 547.944/945

We have previously reported [1] that four alkaloids have been isolated from the epigeal part of Paracynoglossum imeretinum (Kuzn.) M. Pop. The composition of the combined alkaloids isolated from the roots has not been studied. We have now investigated the roots of this plant collected in the region of the town of Kobuleti.

A chromatographic comparison of the combined alkaloids of the epigeal part of the roots showed that the qualitative compositions of the alkaloids were identical. After separation by the previous method [1], we succeeded in isolating four individual bases which were identified as heliosupine and echinadine and their N-oxides.

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Leningrad Institute of Pharmaceutical Chemistry. Translated from Khimiya Prirodnykh Soedinenii, No. 3, pp. 402-403, May-June, 1976. Original article submitted November 25, 1975.

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