THE STRUCTURE OF ERVINCIDINE

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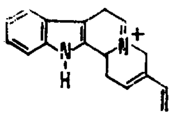
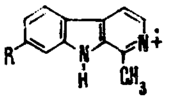
Ervincidine, $C_{19}H_{24}N_2O_2$ (I), has been isolated from the ether-soluble alkaloids of the epigeal part of Vinca erecta [1]. Its UV spectrum is characteristic for indole bases. Its IR spectrum has a broad band at 3000-3330 cm^{-1} due to OH and NH groups connected by a hydrogen bond.

The mass spectrum of ervincidine (Table 1) has the peaks of ions with m/e 310 (M^+), $(M-18)^+$, 168, and 169 (maximum peak), which are similar to the peaks of the spectra of alkaloids of the sarpagine and tombosine group [2] and differ from the latter by 16 m/e. This indicates the presence of one hydroxy group in (I).


a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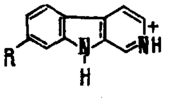
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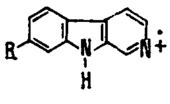

d

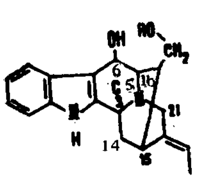
From the facts given it may be concluded that ervincidine is a hydroxy derivative of tombosine. The nonphenolic nature of the base and the presence of a maximum peak with m/e 169 in its mass spectrum shows that the hydroxy group is present in the aliphatic part of the molecule, possibly in ring C.

Acetylation with acetic anhydride gave the O-acetyl derivative of ervincidine (II). Its IR spectrum had the absorption bands of a carbonyl group and of a secondary nitrogen atom. The appearance of the peak of the molecular ion with m/e 394 in the mass spectrum of O-acetylervincidine shows the formation of an O,O'-diacetyl derivative in the acetylation of the base. In addition to the molecular ion, the spectrum of (II) also has the peaks of ions with m/e 352 $(M-CH_3C=O)^+$, 335 $(M-CH_3COO)^+$, 334 $(M-CH_3COOH)^+$, 249, 169, and 168, which are typical for ether alkaloids [3]. These values show that the second hydroxy group in ervincidine is secondary and may be located in positions C_6, C_{14}, or C_{21}.

On the basis of a comparison of the mass spectrum of (I) with those of tombosine, akuammidine, and gardnerine (see Table 1), and bearing in mind the fact that there is some possibility of a biogenetic interrelationship of (I) with tombosine analogous to that between gardnutine and hydroxygardnutine [4], we consider the most probable position for the hydroxy group in ervincidine to be C_6 and, therefore, propose for it the structure of 6-hydroxy-16-demethoxycarbonylpolyneuridine [5].

TABLE 1

Ions	Relative intensities (%), m/e			
	akuammidine, R = H	tombosine, R = H	gardnerine [5], $R = OCH_3$	ervincidine, R = H
M^+	352(100)	294(100)	324(56)	310(80)
$(M-1)^+$	351(58)	293(71)	323(57)	309(75)
$(M-18)^+$	334(8)	276(5)	306(59)	292(32)
$(M-CH_2OH)^+$	321(18)	263(25)	293(36)	279(12)
a	249(62)	249(7)	—	249(12)
b	182(20)	182(9)	212(16)	182(62)
c	169(70)	169(37)	199(84)	169(100)
d	168(61)	168(26)	198(100)	168(75)



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EXPERIMENTAL

Ervincidine (I). The combined ether-extracted alkaloids (pH 8) (0.7 g) were separated according to their solubilities in benzene, acetone, and methanol. The methanol-soluble fraction yielded 95 mg of ervincidine with mp 279-280°C (decomp., methanol), $[\alpha]_D^{25}$ + 29.5° (c 0.6; methanol), R_f 0.38 (in a thin layer of silica gel in the methanol system). IR spectrum: 3330–3000, 760 cm^{-1}. UV spectrum: λ_{max} 227, 282, 292 nm (log ε 4.80, 4.11, 4.0).

O,O'-Diacetylervincidine (II). The base (15 mg) was acetylated with acetic anhydride. An amorphous substance with R_f 0.45 (methanol) was obtained. IR spectrum, cm^{-1}: 1720 (CO), 3400 (NH), 730 (benzene ring). Mass spectrum: 394 (100%), 352 (81), 335 (63), 334 (37), 249 (74), 169 (73), and 168 (73).

SUMMARY

The new alkaloid ervincidine has been isolated from the epigeal part of *Vinca erecta*.

The results of a study of the IR, UV, and mass spectra of the base and of its O,O'-diacetyl derivative have permitted the probable structure of 6-hydroxy-16-demethoxycarbonylpolyneuridine to be put forward for ervincidine.

LITERATURE CITED

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