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THE STRUCTURE OF ERVAMICINE

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After the isolation of ervinceine [1], the total alkaloids from the epigeal part of Vinca erecta Rgl. et Schmalh. were dissolved in benzene, and the benzene solution was extracted successively with citrate-phosphate buffer solution at pH 4.5 and 2.8 and with 1 N HCl. The last fraction deposited crystals of a hydrochloride with mp 213–214° C (decomp., methanol), from which an amorphous base was obtained with R_f 0.78 in TLC on a fixed layer of silica gel (ether–chloroform, 1 : 1), $[\alpha]_D^{20}$ −274.4 (c 1.4; chloroform). The hydriodide had mp 207–208° C (decomp., methanol). The UV spectrum, $\lambda_{max}^{C_2H_5OH}$ 248, 329 mμ (lg ε 3.89, 4.00), is characteristic for α-methyleneindoline alkaloids. IR spectrum: 1670 cm^{-1} (NH), and 795, 860 cm^{-1} (1,2,4-trisubstituted benzene ring). M^+ 366 (mass spectrometry). Thus, the alkaloid has the composition and developed the formula

$$C_{19}H_{19}(=N-)(NH)(COOCH_3)(OCH_3)(=)_2.$$

The mass spectrum of the base, which we have called ervamicine, is similar to that of 16-methoxytabersonine [2].

On Adams hydrogenation in ethanol, ervamicine absorbs 1 mole of hydrogen and forms 6,7-hydroervamicine, M^+ 368 (mass spectrometry). The latter was found to be identical (R_f, UV, IR, and mass spectra) with ervinceine.

The NMR spectrum of the base taken on a JNM-4H-100/100 MHz instrument in carbon tetrachloride (τ scale) showed signals at 3.06–3.82 (aromatic protons, 3H), 6.37 (singlet, $COOCH_3$), 6.34 (singlet, OCH_3), 1.05 (NH, singlet), and 9.42 (triplet, $C-C_2H_5$).

The two olefinic protons of ring D form an AB system and give a quartet with τ_A = 4.39 and τ_B = 4.47 ppm and J_{AB} = 10.0 Hz, which shows the cis arrangement of these hydrogen atoms relative to the double bond. In a comparison of some chemical properties and the NMR spectra of ervamicine and of 16-methoxytabersonine, the signals of all the protons were found to be different. This gives grounds for assuming that these alkaloids are steroisomers [2].

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