NOTIZEN

The Isolation and Structure of Lahoricine, a New Indolenine Alkaloid from *Ervatamia coronaria*

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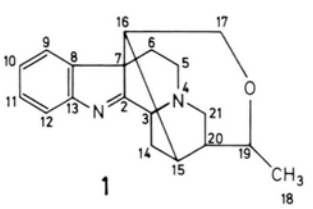
Indolenine Alkaloid, *Ervatamia coronaria*

A new indolenine alkaloid, "Lahoricine" has been isolated from the leaves of *Ervatamia coronaria* to which structure **1** has been assigned.

Ervatamia coronaria (Apocynaceae) is a glabrous, evergreen tree commonly grown in the gardens of West Pakistan. Various parts of the plant are used in the indigenous system of medicine for the treatment of ophthalmia, for application on wounds and inflammed parts of the body, as anthelmintic *etc.* A number of indole alkaloids have previously been reported from the leaves, stem bark and roots of the plant [1–8].

The crude alkaloids obtained from the ethanolic extract of the fresh leaves of the plant were subjected to pH fractionation. The fraction obtained at pH 3 afforded a mixture of alkaloids which were further purified by preparative t.l.c. to afford a new alkaloid, "Lahoricine" as a colourless amorphous material $[\alpha]_D = +99°$ ($CHCl_3$).

The compound afforded a typically indolenine UV spectrum showing absorption maxima at 260 nm (log ε 3.82) and 220 nm (log ε 4.31) and minimum at 238 nm (log ε 3.40). The IR spectrum (chloroform) afforded peaks at 2920, 2850 (C–H) cm^{-1}, and 1150 (C–O–C) cm^{-1}, but did not show any peaks in the carbonyl region.



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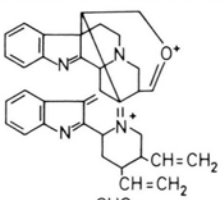
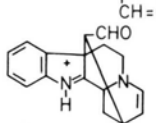
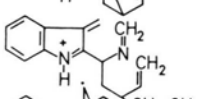
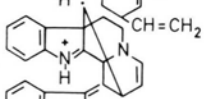
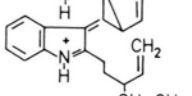
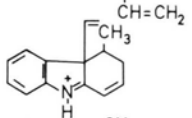
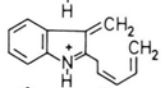
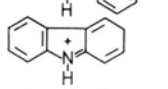
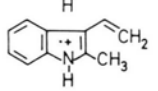
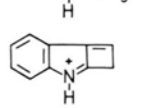
A detailed mass spectroscopic analysis of lahoricine was carried out. The molecular ion appeared at $m/z = 294.1719$ which was consistent with the formula $C_{19}H_{22}N_2O$ indicating ten double bond equivalents. Six of these were accounted for by the presence of an indolenine chromophore. Since the IR and H NMR did not show the presence of any additional olefinic linkages or any carbonyl group and since attempted acetylation failed to afford any acetylated product, it seemed plausible that the oxygen atom is in the form of an epoxide or ether linkage.

Table I. *m/z*, intensity, formulae and structure of fragment ions.

m/z	Intensity	Formulae	Proposed structure
I) 279.1459	8%	$C_{18}H_{19}N_2O$	
II) 277.1702	6%	$C_{19}H_{21}N_2$	
III) 265.1353	26%	$C_{17}H_{17}N_2O$	
IV) 251.1543	46%	$C_{17}H_{19}N_2$	
V) 236.1343	13%	$C_{16}H_{16}N_2$	
VI) 224.1438	100%	$C_{16}H_{18}N$	
VII) 210.1278	28%	$C_{15}H_{16}N$	
VIII) 196.1110	29%	$C_{14}H_{14}N$	
IX) 168.0803	22%	$C_{12}H_{10}N$	
X) 156.0810	25%	$C_{11}H_{10}N$	
XI) 142.0659	26%	$C_{10}H_8N$	

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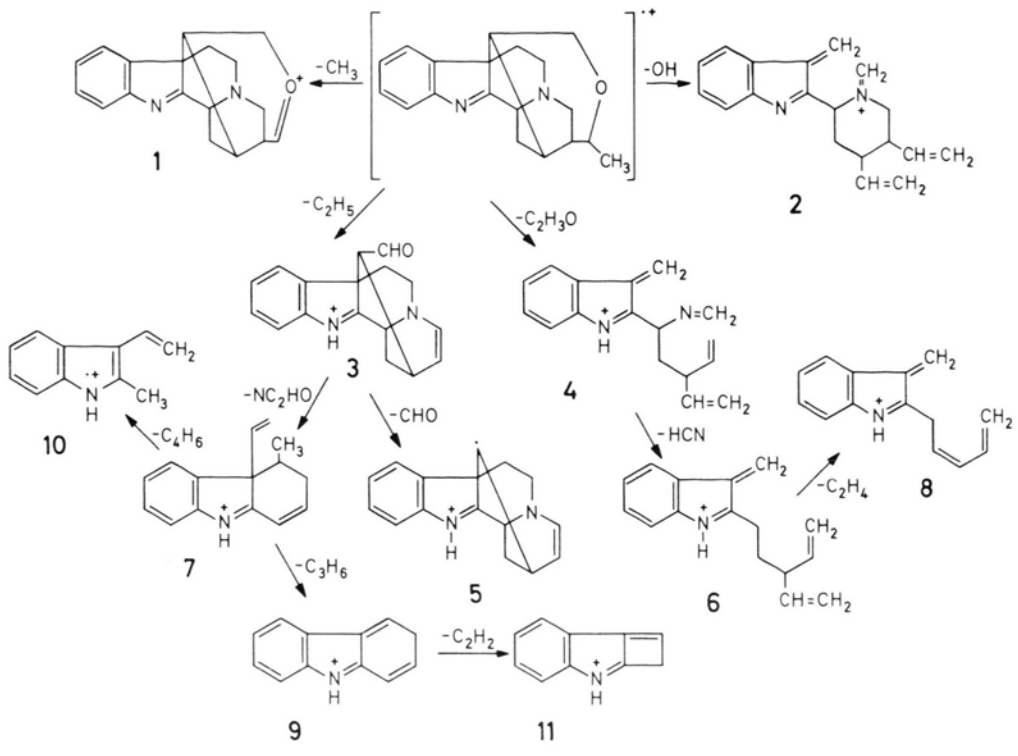
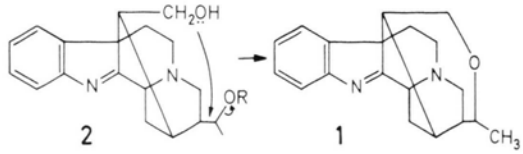


Lahoricine showed the following major peaks in its mass spectrum: 294.1719 (M^+, $C_{19}H_{22}N_2O$, 88%), 279.1459 (M^+-CH_3, $C_{18}H_{19}N_2O$, 8%), 277.1702 (M^+-OH, $C_{19}H_{21}N_2$, 6%), 265.1353 ($M^+-C_2H_5$, $C_{17}H_{17}N_2O$, 26%), 251.1543 ($C_{17}H_{19}N_2$, 46%), 236.1343 ($C_{16}H_{16}N_2$, 13%), 224.1438 ($C_{16}H_{18}N$, 100%), 210.1278 ($C_{15}H_{16}N$, 28%), 196.1110 ($C_{14}H_{14}N$, 29%), 168.0803 ($C_{12}H_{10}N$, 22%), 156.0810 ($C_{11}H_{10}N$, 25%), 142.0659 ($C_{10}H_8N$, 26%). The formulae of the ions were established by computer monitored high resolution mass measurements and confirmed by peak matching experiments on important ions. As a result of these studies, the structure of some of the fragment ions have been identified. The exact masses of ions, intensities, formulae and proposed structures are shown in Table I. Plausible mechanisms for the formation of these ions are presented in Scheme 1. Linked scan measurements were carried out to confirm some of the key fragmentation processes.

The proton NMR spectrum ($CDCl_3$) showed the presence of a doublet centered at δ 0.93 (J = 7 Hz) which was assigned to the methyl group. Two downfield multiplets, one centered at δ 3.51 and the other centered at δ 3.17 were assigned to the methine and methylene protons on C-19 and C-17 respetively. A downfield double-doublet centered at δ 3.87 (J_1 = 3 Hz, J_2 = 8 Hz) was assigned to the C-3 proton. On the basis of these data, structure **1** is proposed for lahoricine.

Lahoricine probably arises through an intramolecular cyclization of a precursor such as **2** (Scheme 2).



SCHEME 2

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