DARVASOLINE – A NEW ALKALOID OF Leontice darvasica

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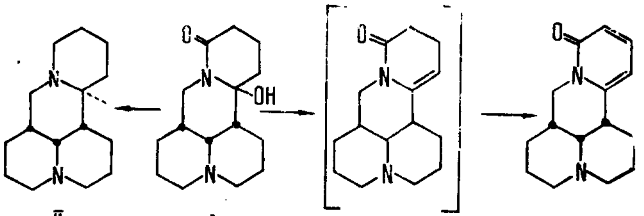
Continuing the separation of the combined alkaloids of the epigeal part of the plant L. darvasica, the mother solutions after the isolation of the darvasamine and sophoridine were separated into ether-soluble and chloroform-soluble fractions. From the ether fraction of the combined alkaloids we obtained a crystalline base with mp 115-116°C (ether), composition $C_{15}H_{24}N_2O_2$. The base was optically active, $[\alpha]_D$ 28°, monoacidic, ditertiary, giving a crystalline perchlorate with mp 235-237°C and a methiodide with mp 247-249°C. The IR spectrum of the base contained absorption bands showing the presence in it of a hydroxy group (3440 cm^{-1}), a trans-linked quinolizidine system (2800-2700 cm^{-1}), and a lactam carbonyl (1640 cm^{-1}). The properties that have been described for the alkaloid differ from those of known alkaloids, and therefore we have called it darvasoline.

In the mass spectrum of the base, together with the peak of the molecular ion (M^+ 264), confirming the composition of the alkaloid, there are peaks of ions with m/e 246, 203, 176, 150, 136, 96, and 83. A comparison of the mass spectrum of the base with the mass spectra of hydroxy derivatives of the matrine and sparteine alkaloids showed that it belonged to the matrine group [1, 2]. Reduction of the alkaloid with lithium tetrahydroaluminate in absolute ether gave an optically active crystalline saturated oxygen-free ditertiary diacid base with mp 60°C, forming a number of crystalline di-salts. A comparison of the IR spectra of this product and of matridine, and also a mixed melting point, showed that they were identical. The formation of matridine (II) proves that the hydroxy group is located at C_{11} or C_{17}.

To establish the position of the hydroxy group, the base was heated with phosphorus pentoxide at 200-210°C for 5 h. An anhydro derivative was isolated which had mp 160°C (petroleum ether), $[\alpha]_D$ −90°, the UV spectrum of which showed absorption maxima at 235 and 311 nm, which are characteristic for a dihydropyridin-α-one chromophore. A comparison of the physicochemical properties and the IR spectra of the anhydro derivative and of sophoramine (III) [3] showed that they were identical.



II I III

Consequently, when the alkaloid was dehydrated, dehydrogenation took place simultaneously, as in the case of leontisimine [4]. Thus, davasoline has the structure of 11-hydroxymatrine (I).

LITERATURE CITED

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