mol. wt. 161 (mass spectrometry).

The UV spectrum is characteristic for pyridine bases:  $\lambda_{max}$  (in chloroform) 265 m $\mu$ .

The IR spectrum of the alkaloid has absorption bands at 3200 cm<sup>-1</sup> (hydroxy group), 2960 (C-CH<sub>3</sub> group), 1950 (pyridine ring), and 810-890 cm<sup>-1</sup> (2, 3, 4-trisubstituted benzene ring).

This alkaloid has proved to be new and has been called pediculine. The catalytic hydrogenation of pediculine forms a dihydro derivative.

The mass spectrum of pediculine has a strong molecular ion with m/e 161 (100%), which is characteristic for pyridine bases, and the peaks of ions with m/e 146, 117, and 91.

The ion with m/e 146 is formed from the molecular ion by the splitting off of a methyl group, the ion with m/e 117 from the ion with m/e 146 by the splitting off of a formyl radical and the ion with m/e 91 from the ion with m/e 117 by the elimination of a CH=CH group. The following structure is considered probable for pediculine:



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THE STRUCTURE OF ALBERTINE

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Albertine, isolated from the epigeal part of Leontice Albertii is an optically active  $[a]_D$  -101°) ditertiary monoacid crystalline base (mp 161° C) with the composition  $C_{15}H_{22}O_2N_2[1]$ . Its IR spectrum has absorption bands due to the presence of a lactam carbonyl group (1655 cm<sup>-1</sup>), a double bond (1675 cm<sup>-1</sup>), a trans-quinolizidine system (2795, 2760 cm<sup>-1</sup>),

and a hydroxy group (3300 cm<sup>-1</sup>). The UV spectrum is characteristic for the -C=C-N-C=0 chromophore ( $\lambda_{max}$  244 m $\mu$ , log  $\epsilon$  4.2). The base forms an o-tosyl ester with mp 155-156° C. The catalytic hydrogenation of albertine in acetic acid over platinum at 70-80° C forms dihydroalbertine with mp 170° C. Reduction of the alkaloid with lithium aluminum hydride leads to the deoxy base, which gives a diperchlorate having mp 190° C. Reduction of the latter with lithium aluminum hydride or borohydride and also catalytic hydrogenation give a saturated dihydro base ( $C_{15}H_{26}ON_2$ ) with mp 214° C, the IR spectrum of which has no absorption band between 1700 and 1600 cm<sup>-1</sup>, the absorption band of the active hydrogen being somewhat displaced (3150 cm<sup>-1</sup>). It has been established by a study of the mass spectra of deoxydihydroalbertine and matridine and a comparison of them with the spectrum of hydroxysparteine [2] that albertine has the heterocyclic skeleton of matridine with a hydroxyl present in ring D.

When the alkaloid was heated with phosphorus pentoxide at  $200-210^{\circ}$  C (5 hr), anhydroalbertine was formed with mp 163-164° C,  $[a]_{D}$  -90°, which was identical with sophoramine [3]. The NMR spectrum of albertine lacks the signal of an olefinic proton. Consequently, the double bond is located at  $C_7-C_{11}$ . The displacement of the absorption bands of the hydroxy group in the IR spectra of deoxyalbertine and deoxydihydroalbertine excludes the location of the hydroxyl at  $C_{14}$ , and it is probably attached to  $C_{13}$ .

Thus, albertine corresponds to the structure 13-hydroxy- $\Delta^{7,11}$ -dehydromatrine and it is the first representative of the matrine alkaloids with a substituent in ring D.



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## THALSIMIDINE - A NEW BISBENZYLISOQUINOLINE ALKALOID FROM THALICTRUM SIMPLEX

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From the epigeal part of Th. simplex L., collected on 5 July 1966 in the Fergana Valley in the gorge of the R. Naukatsai we have isolated 0.7% of total alkaloids, from which we have obtained 0.49% of thalsimine [1] and 0.02% of a crystalline base (I) with mp 195° C (ethanol)  $[a]_D^{14} + 48°$  (c 1.10; chloroform). The homogeneity of I was checked by chromatography in a thin layer of silica gel G in the benzene-chloroform-DEA (1.5:0.40:0.1), benzene-methanol (8:2), and chloroform-acetone-DEA (1.0:0.8:0.2) systems. UV spectrum:  $\lambda_{max} 280$ , 312 m $\mu$  (log  $\varepsilon$  4.12; 3.76), similar to the UV spectrum of thalsimine. The base is insoluble in aqueous solutions of alkalies and in Claisen's cryptophenol reagent [2], but it gives a positive Millon reaction [3]. IR spectrum: 3490 cm<sup>-1</sup> (hydroxy group), 1630 cm<sup>-1</sup> (conjugated double bond). The reduction of I on an Adams platinum catalyst gave a dihydro derivative (II). UV spectrum:  $\lambda_{max} 285 m\mu$  (log  $\varepsilon$  3.94). The acetylation of II with acetic anhydride in-the presence of pyridine gave an acetyl derivative (III). IR spectrum: 1650 cm<sup>-1</sup> (amide carbonyl group), 1778 cm<sup>-1</sup> (phenol ester).

By interpreting the bands in the IR spectrum in a solid sample of III [4], two acetyl groups were found.

We have established for I the composition  $C_{37}H_{38}O_7N_2$  and the developed formula  $C_{32}H_{22}O_2(OCH_3)_4(OH)$  (-N=) (NCH<sub>3</sub>), mol. wt. 622 (mass spectrometry).

The properties of I mentioned above indicate that the base is a bisbenzylisoquinoline alkaloid. We have called it thalsimidine.

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