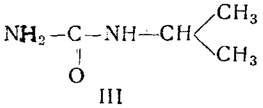
All that has been said above, the composition, the melting point, and the spectral characteristics, and also a comparison with the literature [3], permitted the assumption that base (III) was isopropylurea, and this is the first time that we have isolated it from a plant:



$NH_2-C(=O)-NH-CH(CH_3)_2$

III

LITERATURE CITED

1. S. F. Aripova, O. Abdilalimov, V. M. Malikov, and S. Yu. Yunusov, Khim. Prirodn. Soedin. 556 (1976).
2. S. F. Aripova, S. T. Akramov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 762 (1975).
3. Beilsteins Handbuch der organischen Chemie, Vol. 4, 165 (1962).

THE STRUCTURE OF SEVERZININE

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UDC 547.943

Continuing the separation of the total alkaloids of *Corydalis sewerzowi* [1], from the nonphenolic part of the combined alkaloids we have isolated a new base with mp 90-91°C (with foaming, from ethanol), $[\alpha]_D + 109°$ (c 1.2; chloroform), which we have called severzinine (I). UV spectrum: $\lambda_{max}^{ethanol}$ 290 nm (log ε 4.04). The IR spectrum of (I) showed absorption bands at (cm^{-1}) 3400 (OH), 1510 and 1490 (aromatic ring), and 1050 and 930 (CH_2O_2). The mass spectrum of (I) has the peaks of ions with m/e 369 (M^+, 336, 322 (100%), 292, and 190. The NMR spectrum contains the signals from a N-methyl group at 2.47 ppm (3 H, singlet), and from two methylenedioxy groups at 5.76 ppm (2 H, singlet) and 5.92 ppm (2 H, quadruplet).

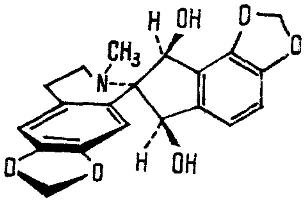
In the aromatic region of the spectrum there are signals in the form of two one-proton singlets at 6.14 and 6.56 ppm (paraaromatic protons) and a two-proton singlet at 6.76 ppm. At 5.10 and 5.33 ppm there are one-proton singlets, at 2.35 ppm a two-proton singlet, and at 2.5-3.5 ppm a multiplet. The features of its UV, IR, NMR, and mass spectra permit the assignment of (I) to the spirobenzylisoquinoline alkaloids with two hydroxy groups in the five-membered ring [2, 3].

The presence in the mass spectrum of an ion with m/e 190 shows that there is one methylenedioxy group in the isoquinoline moiety of the molecule. The presence of one of the singlets of the aromatic protons at 6.14 ppm, which is characteristic for C_1, shows that the methylenedioxy group is located at C_2 and C_3.

The second methylenedioxy group is present in ring D. To determine its position we compared severzinine with dihydrosibiricine, obtained by the reduction of sibiricine with $NaBH_4$ [4].

A direct comparison of the two substances showed their identity (melting point, TLC, IR spectra).

On the basis of what has been said above, it may be concluded that severzinine has the following structure:



Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR, Tashkent. Translated from Khimiya Prirodnykh Soedinenii, No. 4, pp. 536-537, July-August, 1978. Original article submitted April 6, 1978.

0009-3130/78/1404-0464$07.50

LITERATURE CITED

1. I. A. Israilov, M. S. Yunusov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 811 (1975).
2. T. Kametani, M. Takemura, M. Iharo, and K. Fukumoto, J. Chem. Soc. Perkin Trans. I, No. 4, 390 (1977).
3. R. H. F. Manske, R. G. A. Rodrigo, D. B. MacLean, D. E. F. Gracey, and J. K. Saunders, Can. J. Chem., 47, 3589 (1969).
4. R. H. F. Manske, R. Rodrigo, D. B. MacLean, D. E. F. Gracey, and J. K. Saunders, Can. J. Chem., 47, 3589 (1969).*

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*Given as in the Russian original — Consultants Bureau.

THE STRUCTURE OF LEDECORINE

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and S. Yu. Yunusov

UDC 547.943

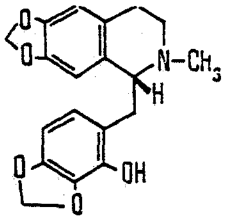
Continuing the separation of the combined alkaloids of *Corydalis ledebouriana* [1], we have isolated a new base with mp 199-200°C (methanol), $[\alpha]_D$ −112° (c 0.42; CH_3OH) which we have called ledecorine (I). The UV spectrum [$\lambda_{max}^{ethanol}$ 240 infl., 295 nm (log ε 3.88, 3.74)] is similar to that of corydalisol [2]. The IR spectrum of the base shows absorption bands at (cm^{-1}) 935 and 1040 (methylenedioxy group), 1590 and 1620 (aromatic ring), and 3430 (hydroxy group). The mass spectrum of the base lacks the peak of the molecular ion and has the peaks of ions with m/e 190 (100%), 175, 160, and 149.

In the NMR spectrum of ledecorine at 4.20 ppm (J = 6 Hz) there is a triplet characteristic for the C_1 proton of a benzyltetrahydroisoquinoline alkaloid. Signals are also observed in the form of a three-proton singlet at 2.55 ppm ($N-CH_3$), one-proton singlets at 5.86 and 5.88 ppm (CH_2O_2), a two-proton singlet at 6.01 ppm (CH_2O_2), one-proton singlets at 6.23 and 6.54 ppm (para aromatic protons), and one-proton doublets at 6.27 and 6.58 ppm (J = 8 Hz, orthoaromatic protons). Methylene protons are represented by signals at 2.60-3.20 ppm.

The facts given permit ledecorine to be assigned to the benzyltetrahydroisoquinoline alkaloids. The methylation of ledecorine with diazomethane gave the O-methyl ether (II).

When the protons of the methoxy group in O-methylledecorine were irradiated with a strong radiofrequency field, no nuclear Overhauser effect with the aromatic protons was observed. Consequently, there are no aromatic protons adjacent to the hydroxy group in ledecorine. The presence in the mass spectra of (I) and (II) of an ion with m/e 190 and of the signals of para and ortho aromatic protons in the NMR spectrum, and also the results of the NOE measurements show that one of the methylenedioxy groups is present in ring A at C_6 and C_7, and the second methylenedioxy group and the hydroxy group are present in ring C at C'_4, C'_3, and C'_2, respectively.

In the ORD spectrum of ledecorine there are two negative Cotton effects which show the R configuration of the asymmetric center [3]. According to the results obtained, ledecorine has the following structure:



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