DELECTINE — A NEW DITERPENE ALKALOID FROM *Delphinium dictyocarpum*

B. T. Salimov, M. S. Yunusov,
S. Yu. Yunusov, and A. S. Narzullaev

UDC 547.944/945

From the roots and epigeal part of *Delphinium dictyocarpum* D. C., collected in the flowering phase in the outskirts of the village of Topolevka (Djhungarian Ala-Tau), in addition to the bases known previously [1], we have isolated a new one — delectine (I), $C_{31}H_{44}O_8N_2$, mp 107-109°C (hexane—acetone).

The IR spectrum of (I) shows absorption bands at (cm^{-1}) 3475 (hydroxy groups), 1695 (ester grouping), 1595 (aromatic ring) and 1100 (ether C—O bonds). The NMR spectrum of delectine has signals due to a N-ethyl group (three-proton triplet at 1.02 ppm), to three methoxy groups (three-proton singlets at 3.20, 3.32, and 3.34 ppm), to a primary amino group (broadened two-proton singlet at 5.71 ppm), and to four aromatic protons (multiplets at 6.65 and 7.80 ppm).

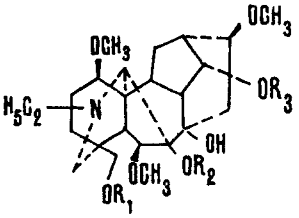
The saponification of (I) gave an amino alcohol (II), $C_{24}H_{39}O_7N$, with mp 167-169°C and anthranilic acid. The mass, NMR, and IR spectra of (I) and (II) permit delectine to be assigned to the diterpene alkaloids with a lycoctonine skeleton. The methylation of (II) with methyl iodide in the presence of sodium hydride gave a product (III) identical with O,O-dimethyllycoctonine, which we isolated under just the same conditions. The results of a correlation confirmed the presence of the lycoctonine skeleton in delectine and the positions of all the functional groups. All that was left was to investigate their mutual arrangement.

In the mass spectrum of (II) the maximum peak is the M — 31 peak, which shows the location of the methoxy group at C_1 [2]. On acetylation with acetic anhydride in pyridine, delectine formed a O,N-diacetyl derivative (IV) and compound (II) a O,O-diacetyl derivative (V). The NMR spectra of (IV) and (V) showed one-proton signals in the form of triplets with $J = 5$ Hz at 4.63 and 4.67 ppm. The position and the nature of the splitting of the signals showed the presence of an α-hydroxy group in (I) at C_{10} [3]. Since there are four hydroxy groups in (II), then, taking the results of acetylation into account, it is possible to consider that two of them are secondary (or one is primary) and two are tertiary. The presence of a hydroxy group at C_6 is excluded: its presence would be readily revealed from the mass and NMR spectra of the acyl derivatives [1] and, consequently, there is a methoxy group at C_6. The anomolous ease of methylation of one of the tertiary hydroxy groups observed in the amino alcohol of delectine and in lycoctonine we have reported previously for the 7,8-α-glycol system in demethylenedelcorine, acomonine, and iliensine [4-6]. The protons geminal to the second acetoxy group in (V) are not revealed in the weak field of its NMR spectra, and the acetoxy group itself does not take part in fragmentation on electron impact. We have observed similar behavior for monoacetyl lycoctine (VI). (See scheme on the following page).

The results presented enable us to suggest for the amino alcohol of delectine the structure (II) and for delectine itself (on the basis of the acetylation reactions of delectine and of its amino alcohol) the structure (I).

Institute of the Chemistry of Plant Substances, Academy of Sciences of the Uzbek SSR. Translated from Khimiya Prirodnykh Soedinenii, No. 5, pp. 665-666, September-October, 1975. Original article submitted April 16, 1975.

© 1976 Plenum Publishing Corporation, 227 West 17th Street, New York, N.Y. 10011. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, microfilming, recording or otherwise, without written permission of the publisher. A copy of this article is available from the publisher for $15.00.



I. R_1– anthranoyl; $R_2 = R_3 = H$
II. $R_1 = R_2 = R_3 = H$
III. $R_1 = R_2 = R_3 = CH_3$
IV. R_1–N– acetylanthranoyl;
$R_2 = H$; $R_3 = COCH_3$
V. $R_1 = R_3 = COCH_3$; $R_2 = H$
VI. $R_1 = COCH_3$; $R_2 = H$; $R_3 = CH_3$

LITERATURE CITED

1. A. S. Narzullaev, M. S. Yunusov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 498 (1972).
2. M. S. Yunusov, Ya. V. Rashkes, V. A. Tel'nov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 515 (1969).
3. S. W. Pelletier, L. H. Keith, and P. C. Parthasarathy, J. Amer. Chem. Soc., 89, 4146 (1967).
4. V. E. Nezhevenko, M. S. Yunusov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 409 (1974).
5. V. E. Nezhevenko, M. S. Yunusov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 107 (1975).
6. V. E. Nezhevenko, M. S. Yunusov, and S. Yu. Yunusov, Khim. Prirodn. Soedin., 4 (1975).