ALKALOIDS OF Veratrum lobelianum. IV

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By chromatography on a column of cellulose [2], from the combined alkaloids obtained by the ether treatment of the roots with rhizomes of Veratrum lobelianum Bernh. [1] we have isolated two alkaloids: (I) with R_f 0.10 and (II) with R_f 0.82 [system 1: chloroform saturated with formamide; paper impregnated with formamide, 1 : 2].

The alkaloid $C_{37}H_{59}O_{12}N$ (I) had mp 202-204°C (from benzene), $[\alpha]_D^{22}$ −18.7° (c 0.95; pyridine). IR spectrum (KBr), cm^{-1}: 3600−3100 (−OH), 2940, 1460 ($-CH_3$, $-CH_2-$), 1738, 1248 (ester C = O). In the products of alkaline hydrolysis [3], by paper chromatography with the "markers" formed in the hydrolysis of deacetylprotoveratrine A (III) [4], we detected the presence of the amino alcohol protoverine [system 2: butan-1-ol-$CH_3COOH-H_2O$ (4 : 1 : 5)], *l*,d-methylbutyric acid, and d-α-hydroxy-α-methylbutyric acid [system 3: butan-1-ol-1.5 N aqueous ammonia (1 : 1)]. The presence of protoverine in (I) was also confirmed by the nature of the UV spectrum of its sulfuric-acid solution [5], which had λ_{max} 250, 291, 370, 540 nm. In R_f value, compound (I) coincides with 3-(d-2-hydroxy-2-methylbutyryl)-15-(*l*-2'-methylbutyryl)protoverine obtained by the separation on a column of cellulose [2] of the products of the methanolysis of (III) [4]. A mixture of the two samples gave no depression of the melting point.

The results of analysis permit the conclusion that the alkaloid (I) isolated is 3-(d-2-hydroxy-2-methylbutyryl)-15-(*l*-2,methylbutyryl)protoverine [6]. This is the first time it has been found in plants of the genus Veratrum. It was obtained previously by the methanolysis of protoveratrine A (IV) [6]; it had no trivial name. Consequently, we have named this substance dideacetylprotoveratrine A.

In order to confirm whether (I) is a native ester alkaloid or a product of the partial hydrolysis of (III) and (IV), we investigated their stability under the conditions of all the stages of preparation of the combined alkaloids [1]. The influence of the operation of moistening the raw material with a solution of ammonia was excluded by extracting the roots with 95% ethanol without their preliminary treatment with ammonia. Consequently, compound (I) is a native ester alkaloid of Veratrum lobelianum Bernh.

The alkaloid $C_{14}H_{63}O_{14}$ (II) had mp 228-229°C (from benzene), $[\alpha]_D^{21}$ −70° (c 0.38; pyridine). IR spectrum (KBr), cm^{-1}; 1739, 1247 (ester C = O), 1458, 1377 (second band more intense than the first − acetyl group). The products of the alkaline hydrolysis of (II) [3] were shown by paper chromatography with "markers" to contain the amino acid germine [2] and acetic and *l*-α-methylbutyric acids and, apparently, *l*-α,β-dihydroxy-α-methylbutyric acid (R_f 0.15) [13]. The presence of germine in (II) was also confirmed by the nature of the UV spectrum of its sulfuric-acid solution [5]. On paper chromatography, the R_f value of the alkaloid (II) coincided with that of a sample of germitetrine which was kindly given to us by Dr. I. Tokmo (Czechoslovakia). A mixture gave no depression of the melting point.

Thus, the results of the analysis of (II) agree with literature information for germitetrine [7].

LITERATURE CITED

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