ALKALOIDS OF Leontuce smirnovii

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The plant L. smirnovii (family Berberidaceae) is widely distributed in Georgia; it is rich in alkaloid [1]. Chloroform extraction of the bulbs yielded 4% of combined alkaloids. When the chloroform extract was treated with 5% sulfuric acid, grayish crystals of a sulfate deposited which charred at a temperature above 360° C. A direct comparison of the melting point of mixtures and the IR spectra of the base and of thaspine established their identity [2].

Paper and thin-layer chromatography of the total material showed that it contained more than eight alkaloids. The combined alkaloids were separated into ether-soluble and chloroform-soluble fractions. The action of perchloric acid on the ethereal fraction in ethanol gave a crystalline perchlorate which, after recrystallization from ethanol, melted at 165° C. The base from this perchlorate had the composition $C_{21}H_{25}NO_4$, mp 152-153° C, optically active $[\alpha]_D$ +218° (ethanol), and gave a methiodide with mp 269-270° C.

The IR spectrum of the base exhibited absorption bands at 2840, 3005, and 1450 cm^{-1} (O- and N-methyl groups) and 1610 and 1520 cm^{-1} (aromatic ring). The UV spectrum was similar to that of the pavine alkaloids. The mass spectrum of the alkaloid was characterized mainly by the peak of the molecular ion [m/e 355 (30%)] and the peak of an ion with m/e 204 (100%), corresponding to a dimethoxy-N-methylisoquinolinium ion. Such decomposition is characteristic of alkaloids of the type of pavine and isopavine [3]. The results of a study of the PMR spectrum show that the base contains four methoxy groups (δ 3.77 and 3.68 ppm) and a N-methyl group (δ 2.44 ppm).

The signals of four aromatic protons appear in the form of two singlets (δ 6.51, 6.38), which shows the para substitution of the protons in symmetrical benzene rings.

On Hofmann degradation of the methiodide of the base, a des-N-methyl product was formed the NMR spectrum of which exhibited a multiplet corresponding to six aromatic protons because of a disturbance in the symmetry of the molecule. These results show that the alkaloid is a new optical antipode of the d-argemonine isolated from Argemona hispida [4].

The aqueous mother liquor after the isolation of the d-argemonine perchlorate was separated into fractions passing and not passing into chloroform. The latter, on separation according to basicities, yielded a perchlorate with mp 211-212° C. The corresponding base crystallized with difficulty and had the composition $C_{15}H_{24}N_2O$, mp 43-44° C $[\alpha]_D$ –75.3°. A comparison of these constants and the IR and mass spectra showed that it was *l*-lupanine [5]. Thus, the bulbs of Leontice smirnovii have yielded three alkaloids relating to the biphenyl, pavine, and quinolizidine groups.

LITERATURE CITED

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