ALKALOIDS OF Senecio erraticus

R. I. Gaiduk, M. V. Telezhenetskaya, and S. Yu. Yunusov

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Senecio erraticus Berthol, grown in Transcaucasia and Transcarpathia has not been studied for its alkaloid content. From the epigeal part of the plant growing in Czechoslovakia a number of alkaloids have been isolated [1, 2]. the main component being senecionine.

By ethanolic extraction [1] of the epigeal part of Senecio erraticus collected in the flowering phase in July, 1971, in the environs of Kobuleti, Adzhar ASSR, we isolated 0.18% of combined alkaloids, and 0.05% of a mixture of bases obtained from N-oxides. The two fractions proved to be similar chromatographically [nonfixed layer of alumina, chloroform–methanol (9.5 : 0.5) system], and they were therefore studied together.

Separation was performed on a column of Al_2O_3, with elution by mixtures of ether and chloroform (9 : 1, 2 : 1, and 1 : 1) and then with chloroform and methanol. Elution with ether–chloroform (1 : 1) yielded an alkaloid (I), and chloroform gave a base (II). A base (III) was obtained from the additional separation of the methanolic fraction from the column.

Alkaloid (I), mp 229-231°C (acetone), M^+ 335 (mass spectrum), R_f 0.92. UV spectrum: λ_{max} 218 nm ($\log\varepsilon$ 3.86); mass spectrum: 335 (M^+), 248, 220, 120 (100%), 119, 95, 94, 93. IR spectrum: 1710, 1740 cm^{-1}.

A mixed melting point with an authentic sample of senecionine showed no depression of the melting point, and the R_f values of the two bases were the same. The IR, UV, and mass spectra also agreed with those given in the literature for senecionine [3].

The alkaloid (II), mp 212-222°C (acetone), $[\alpha]_D$ +11° (c 2.28; chloroform), M^+ 381 (mass spectrum), R_f 0.71.

The compound does not absorb in the UV region, and in the IR spectrum there are absorption bands at 1700, 1760, and 1580 cm^{-1}, while the mass spectrum shows a peak with m/e 381 and also strong peaks characteristic for otonecine ethers [4]. The NMR spectrum has the signals of four methyls groups and an olefinic proton.

The results of a comparison of the IR, UV, mass, and NMR spectra, and also the absence of a depression of the melting point of a mixture with an authentic sample, show that (II) is otosenine [4, 5].

The alkaloid (III), mp 192-193°C. No absorption in the UV region, and the IR spectrum has the absorption bands of hydroxy and ester groups and also of a carbonyl group trans-annularly linked with nitrogen; in the mass spectrum there is the peak of the molecular ion with m/e 441 and a number of peaks characteristic of otonecine ethers; and in the NMR spectrum there are the signals of five methyl groups. These facts correspond to floridanine [4, 6].

Thus, three alkaloids have been isolated from Senecio erraticus growing in Transcaucasia and identified: otosenine (the main component), senecionine, and floridanine.

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