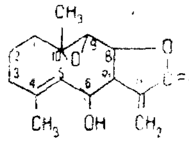
The form of the signal of the lactone proton (triplet) is preserved in all the derivatives of stizolin mentioned above, which shows the invariability of the $C_7—C_8—C_9—C_{10}$ fragment in the molecules. The low value of the position of the signal of the proton in the gem position to the OH group and its position adjacent to the lactone proton, and also the small chemical shift between the protons of the exocyclic methylene group in stizolin can be explained by the location of the hydroxyl in direct propinquity to the lactone ring. This is also in accord with the NMR spectrum of dehydrostizolin, where the signals of the exocyclic methylene are expressed in the form of doublets at 6.37 ppm and 5.53 ppm, which is customary for an exocyclic methylene attached to a γ-lactone ring.

The facts presented permit structure (I) to be proposed as the most probable for stizolin.



I

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A STUDY OF THE CHEMICAL COMPOSITION OF ARTEMISIA ABSINTHIUM

I. S. Akhmedov, Sh. Z. Kasymov, and G. P. Sidyakin

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An investigation of the chemical compositions of representatives of the genus Artemisia L. (wormwoods and sagebrushes) has begun in the Laboratory of the Chemistry of Terpenes and Acids of the Institute of the Chemistry of Plant Substances of the Academy of Sciences of the Uzbek SSR.

The epigeal part and the roots of A. absinthium L. were collected in the period of flowering of the plant (beginning of June) in the Tashkent Oblast and were separately extracted with chloroform. Fifty kilograms of the epigeal part gave 2900 g (5.8%) and 7.5 kg of the roots gave 525 g (7.0%) of total extractive substances. Treatment of the extract of the epigeal part with ether gave 763 g of a powder from which, using petroleum ether, a hydrocarbon $C_{29}H_{60}$ with mp 63° C was isolated. The ethereal solution was shaken with 3% potassium carbonate solution and acidified with hydrochloric acid, and the substances of an acidic nature (408 g) were extracted with chloroform.

The phenols were extracted from the ethereal solution with 0.5% caustic potash and after acidification of the alkaline solution they were re-extracted with chloroform. Yield 102 g. This mixture was treated with petroleum ether and then with acetone. The insoluble substance (3 g) had 162–163° C (from methanol). It consisted of 5-hydroxy-3, 6, 7, 3', 4'-pentamethoxyflavone, i.e., artemetin [1, 2].

By extraction of the epigeal part with petroleum ether and further treatment of the extract with acetone we obtained the sesquiterpene lactone artabsin [3, 4].

The extract from the roots was dissolved in ether and treated with sodium carbonate, and it was then acidified and the acids were extracted with chloroform. Using ether, an acid was isolated with mp 167° C which proved to be 3, 4, 5-trimethoxybenzoic acid. For identification, this substance was prepared by methylating gallic acid [5]. The methyl esters of the natural and synthetic acids were likewise identical.

Trimethoxybenzoic acid has been found for the first time in plants of the genus Artemisia L.

REFERENCES

1. M. M. Adrian and A. Trillat, Bull. Soc. Chim., 19, 1014, 1898.
2. Z. Cekan and V. Herout, Coll. Czech. Chem. Commun., 21, no. 1, 79, 1956.
3. V. Herout and F. Sorm, Coll. Czech. Chem. Commun., 18, 854, 1953.
4. V. Herout, Dolejs, and F. Sorm, Chem. listy, 51, no. 8, 572, 1957.
5. Preparative Organic Chemistry [in Russian], p. 355, 1964.

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Institute of the Chemistry of Plant Substances, AS UzSSR