

When the substance was heated with hydriodic acid, a methyl group was split off and the compound $C_9H_6O_3$ was formed, which was identified as umbelliferone. The action of diazomethane on umbelliferone yielded the initial coumarin compound. Consequently, the substance isolated from *Artemisia diffusa* is the methyl ether of umbelliferone, i. e., herniarin [2]; this is the first time that it has been obtained from this plant.

REFERENCES

1. M. I. Goryaev, R. N. Sazonova, and P. P. Polyakov, Tr. in-ta khim. nauk AN KazSSR, 4, 24, 1954.
2. J. Barth and J. Herzig, Mon., 10, 161, 1889.

13 June 1969

Institute of the Chemistry of Plant Substances AS UzSSR

UDC 577.15/17:582.89

COUMARINS AND ACIDS OF THE FRUIT OF *ANETHUM GRAVEOLENS*

L. I. Dranik and A. P. Prokopenko

Khimiya Prirodnikh Soedinenii, Vol. 5, No. 5, p. 437, 1969

The fruit of *A. graveolens* (common dill) is a source of the composite preparation Anethine, which is used for the treatment of chronic coronary insufficiency, for the prophylaxis of attacks of angina pectoris, and in spastic states of the musculature of the organs of the peritoneal cavity [1]. Information on the chemical composition of the fruit of the dill is fairly limited and relates mainly to a study of the composition of the essential oils. Only recently has a paper appeared on the presence in the fruit of coumarin derivatives—bergapten, umbelliprenin [2], scopoletin, and a new compound of this series—8, 8-dimethyl-6, 7-dihydro-2H, 8H-benzof[1, 2-b; 5, 4-b']dipyran-2, 6-dione [3].

By paper chromatography in several systems of solvents, we detected in an ethanolic (60°) extract no less than 14 coumarin derivatives. On the basis of color reactions, the paper chromatography of mixtures with known substances, and UV spectroscopy, five of them were identified as bergapten, umbelliprenin, scopoletin, esculentin, and umbelliferone. This is the first time that the last two compounds have been found in dill. By chromatography on polyamide we isolated a substance which has been assigned preliminarily to the hydroxycoumarin derivatives (mp 276–277° C; UV spectrum λ_{max} , m μ : 243, 330, 345; IR spectrum, cm^{-1} : 1730, 1610, 1570, 3090, 3210).

In addition to coumarin derivatives, phenolcarboxylic acids have been detected in the fruit of the dill. The acids were isolated by preparative paper chromatography (2% acetic acid) from the fraction obtained in the following way: an aqueous extract of the evaporated ethanolic extract was treated with ethyl acetate, the phenolic acids were extracted from the ethereal phase with half-saturated aqueous sodium carbonate solution, and the extract was acidified with sulfuric acid to pH 3 and treated with ethyl acetate. The ethyl acetate extract yielded caffeic, ferulic, and chlorogenic acids.

REFERENCES

1. S. G. Kislichenko, D. G. Kolesnikov, and Ya. I. Khadzhai, USSR authors' certificate no 152723, 1962.
2. Th. Kartnig, Fette, Seifen, Anstrichmittel, 68, No. 2, 131, 1966.
3. R. T. Aplin and C. B. Page, J. Chem. Soc. (C), 2593, 1967

8 May 1969

Khar'kov Chemical and Pharmaceutical Scientific-
Research Institute