

## THE COUMARIN AND FLAVONOID COMPOSITION OF PEUCEDANUM RUTHENICUM

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The roots of Peucedanum ruthenicum L. (family Umbelliferae) have been investigated in comparatively great detail in respect of their coumarin composition [1], including the synthesis of an amino derivative of the peucedanin isolated [2] and of the products of its photodimerization [3], and the method of analysis, and the physiological action [4, 5] and anatomical structure of the roots [6].

It was of interest to study Peucedanum ruthenicum L. growing in Bulgaria only in the region of the Kabiushkaya Magila for its content of coumarin and flavonoid substances, since in recent years information has appeared on the isolation of flavonoids from other plants of the family Umbelliferae [7-9].

From the roots of the species mentioned we have isolated peucedanin with a yield of 1.5%. According to the literature the yield was 2% [1]. The amount of peucedanin in the seeds was extremely small, and it was not detected at all in the epigeal part collected in the flowering and fruit-ripening phase.

The peucedanin obtained was identified by its melting point, the absence of a depression in admixture with an authentic sample, and by paper and thin-layer chromatography.

A qualitative study of extracts from the roots, epigeal part, and seeds (using color reactions) showed the absence of flavonoids from the roots, a very small amount in the seeds, and a larger amount in the epigeal part.

One substance was shown to be present in a methanolic extract of the epigeal part by two-dimensional chromatography on paper in the systems: 1) butanol-acetic acid-water (4:1:2), and 2) 2% acetic acid.

The epigeal part was extracted with methanol, and, after the elimination of the bulk of the accompanying substances by means of chloroform, the extract was chromatographed on a column of polyamide.

Elution with ethanol-water (1:1) gave a yellow crystalline substance  $C_{27}H_{30}O_{16} \cdot H_2O$  with mp 191-192° C (from 50% ethanol) in a yield of 1.2%.

The elementary analysis, a mixed melting point, the UV and IR spectra, and the UV spectrum with an ionizing agent (0.002 M sodium ethoxide), and also paper chromatography, showed that this substance was rutin.

Hydrolysis of the substance with hydrochloric acid gave quercetin, D-glucose, and L-rhamnose, which were identified by paper chromatography.

The quercetin was also identified from the results of elementary analysis, the absence of a depression in admixture with authentic quercetin, and its IR and UV spectrum.

Thus, the flavonoid isolated from the epigeal part of Peucedanum ruthenicum L. is rutin.

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