

COUMARINS FROM THE ROOTS OF *Prangos lipskyi*

T. Yu. Danchul, L. V. Kuz'mina,
and G. A. Kuznetsova

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Coumarin derivatives have been found previously in the roots of *Prangos lipskyi*: osthole, marmezin, isoimperatorin, oxypeucedanin hydrate, and pranchimgin [1, 2]. The present paper gives the results of a detailed investigation of the coumarin composition of the roots of *P. lipskyi* collected in the valley of the river Arslanbob (1450 m above sea level). The roots were treated with ethanol. The extract was found by chromatography on paper to contain 14 coumarin derivatives. The extract from the roots and the combined coumarins isolated by Svendsen's method [3] were analyzed by the GLC method. The GLC was performed on a Pye-Unicam 104 instrument in a column (l 1.5 m) with the stationary phase OV-17 (3%) on the carrier Chromosorb W (50-60 mesh). The temperature was programmed at $2^{\circ}\text{C}/\text{min}$ from 180 to 256°C . The rate of flow of the carrier gas, argon, was 30 ml/min. The samples investigated were dissolved in acetone (5% solution); $3\ \mu\text{l}$ was injected into the column.

On the basis of the results of GLC (with markers), psoralen (peak 2), bergapten (peak 4), osthole (peak 5), marmezin (peak 8), deltoin (peak 13), and pranchimgin (peak 14) were identified in the coumarin fraction (Fig. 1).

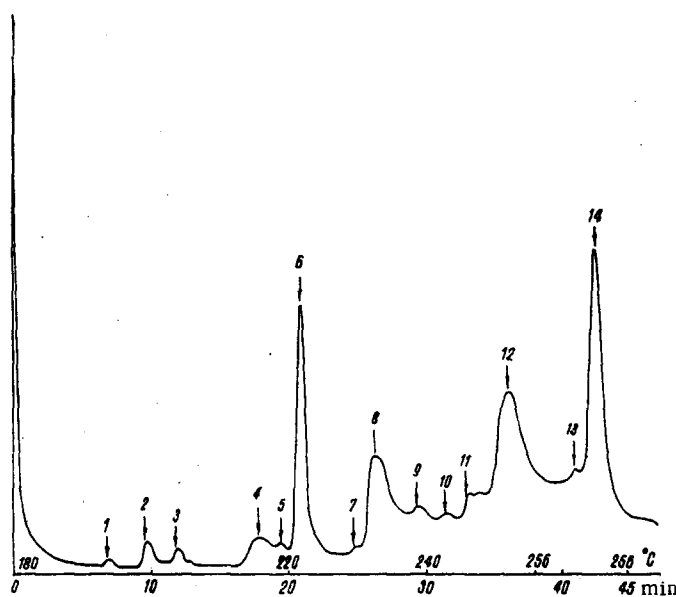


Fig. 1. Chromatogram of the coumarin fraction from the roots of *Prangos lipskyi* Korov: 1) unidentified compound; 2) psoralen; 3) unidentified compound; 4) bergapten + xanthotoxin; 5) osthole; 6) suberosin; 7) unidentified compound; 8) marmezin; 9) unidentified compound; 10) imperatorin; 11) isoimperatorin; 12) prangenin + oxypeucedanin; 13) deltoin; 14) pranchimgin.

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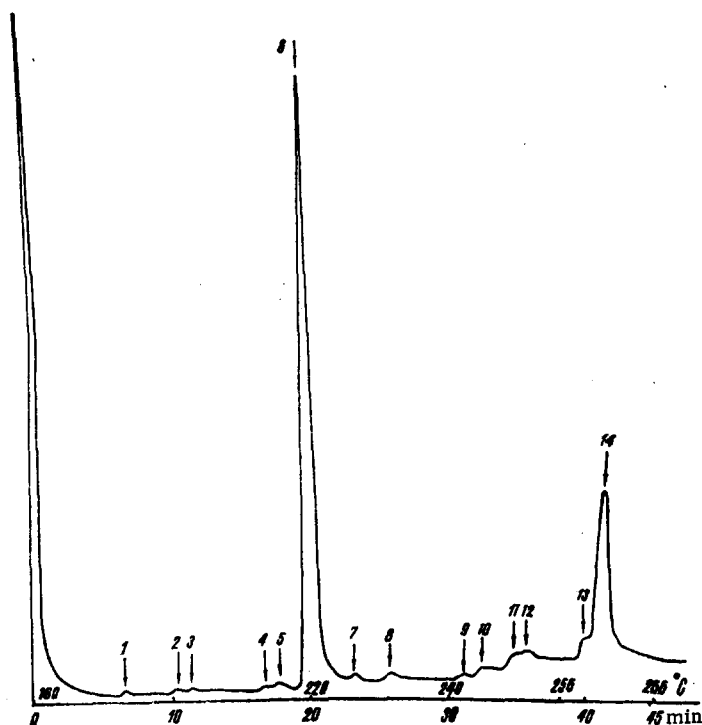


Fig. 2. Chromatogram of an extract from the roots of Prangos lipskyi Korov: 1) unidentified compound; 2) psoralen; 3) unidentified compound; 4) xanthotoxin + bergapten; 5) osthole; 6) suberosin; 7) unidentified compound; 8) marmezin; 9) imperatorin; 10) isoimperatorin; 11, 12) prangenin + oxypeucedanin; 13) deltoin; 14) pranchimgin.

Judging from the intensities of the peaks (Fig. 2), the main components of the extract from the roots are pranchimgin with a RRT (relative retention time, calculated with respect to osthole) of 2.33 (peak 14) and substance (X) with an RRT of 1.13 (peak 6). In order to isolate substance (X), the extract was subjected to chromatographic separation in a column of neutral alumina (Brockmann activity grade III). Elution was performed with petroleum ether, mixtures of petroleum ether and chloroform (4 : 1 and 2 : 1), and chloroform. The following were isolated from the various fractions and identified by the melting points, mixed melting points with authentic samples, and IR spectra: osthole, marmezin, imperatorin, isoimperatorin, oxypeucedanin, oxypeucedanin hydrate, and pranchimgin. Psoralen, bergapten, xanthotoxin, prangenin, prangenin hydrate, oxypeucedanin hydrate, and deltoin were identified chromatographically on paper (with markers) before and after the treatment of the chromatogram with alkali and a diazonium compound.

Elution with a mixture of chloroform and petroleum ether (1 : 5) yielded substance (X) with R_f 0.76 on a paper chromatogram (bright violet; ethylene glycol as the stationary phase and petroleum ether as the mobile phase) [4]. After repeated recrystallization from chloroform and petroleum ether, this substance had a melting point of 87-87.5°C and on GLC it corresponded to the compound with RRT 1.13. According to the results of elementary analysis, its IR spectrum, and its melting point, substance (X) was identified as suberosin, with the composition $C_{15}H_{16}O_3$, which was confirmed by its NMR spectrum. This is the first time that suberosin - 6-isopentenyl-7-methoxycoumarin - has been found in plants of the genus Prangos.

LITERATURE CITED

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