

BRIEF COMMUNICATIONS

TERPENOID COUMARINS OF *Ferula violacea* AND *F. eugenii*

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Ferula violacea Korov. and *F. eugenii* R. Kam. are close taxonomically to *F. foetidissima* (section *Paleonarthex* Korov., subsection *Foetidissimae* M. Pimen. et J. Baranova), which has been studied previously [1]. The roots of *F. violacea*, which is endemic in southern and eastern Tadzhikistan, were collected in the region of Obi-Garm in the valley of the R. Vakhsh (herb. No. 73-893), and the roots of *F. eugenii*, which is found on the southern slopes of the Hissar range in the basin of the R. Varzob — in the classical habitat — the Kondara gorge (herb. No. 1258).

The comminuted roots were extracted with acetone, the evaporated acetone extract was partitioned between petroleum ether and 90% aqueous methanol, and the mixture of substances from the aqueous ethanolic layer was chromatographed on alumina in petroleum ether-ethyl acetate with increasing concentrations of the latter. Each of the two species yielded two substances: (I) $C_{24}H_{30}O_3$, mp 57-59°C; and (II) $C_{24}H_{30}O_5$, M^+ 398, mp 91-92°C.

The nature of the signals in the PMR spectra in the 6-8 ppm region showed that the substances were umbelliferone derivatives. According to an analysis of the PMR spectrum [Varian HA-100D, $CDCl_3 + CCl_4$, 20°C, TMS, δ , ppm: 1.67, s, $W_{1/2} = 5$ Hz, 3 H, and 1.76 s, $W_{1/2} = 5$ Hz, 3 H (C=C-CH₃); 1.58 s, 6 H ($=C \begin{matrix} CH_3 \\ | \\ CH_3 \end{matrix}$); 1.92-2.25 m, 8 H (C-CH₂-C); 4.54 d, 2 H, 6 Hz (CH-CH₂-O); 5.07 m, 2 H (-CH=); 5.45 t, 1 H, 6 Hz (-CH=)], substance (I) is umbelliprenin. The IR spectrum of (I) was identical with that of an authentic sample of umbelliprenin [2].

The PMR spectrum of substance (II) [$CDCl_3$, δ , ppm: 0.85 d 7.5 Hz (CH₃-CH); 1.11 s (CH₃-C); 1.42 s and 1.58 s (2CH₃-C=C); 2.90 t, $\Sigma J = 15$ Hz (-CH-C=C); 3.63 d and 3.81 d, 8 Hz (-CH₂-O-Ar); 8.85 s (COOH); 6.1-7.7 (the signals of the aromatic protons of umbelliferone)] corresponds to the structure of galbanic acid [3-5].

F. violacea contained a far larger amount of umbelliprenin than of galbanic acid, while in *F. eugenii* the latter predominated.

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