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COUMARINS OF *Seseli peucedanoides*

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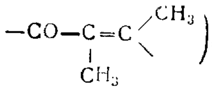
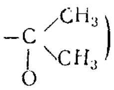
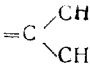
UDC 577.15/17.582.89

Previously [1], in a study of the coumarin composition of *Seseli peucedanoides* (Bieb.) K.-Pol., one of us isolated β-sitosterol and a linear 3',4'-dihydropyranocoumarin — decursinol. Continuing an investigation of this plant, 1.5 kg of air-dry ground roots collected in the environs of Altyagadzh, Azerbaidzhan SSR, was subjected to extraction successively with chloroform and methanol using three 2-liter portions in each case. Then the combined extracts were distilled in vacuum. This gave 96.5 g of a resinous residue which was chromatographed on a column (90 × 3 cm) of neutral alumina (400 g, activity grade II). Elution was performed with a mixture of petroleum ether and chloroform in a ratio of 4:1.4:2 [sic] and with chloroform. In addition to those mentioned above, another three substances were obtained: (I) — $C_{19}H_{20}O_5$, mp 108-109°C; (II) — $C_{16}H_{18}O_4$, mp 155-156°C; and (III) — $C_{14}H_{14}O_4$, mp 189-191°C; $[\alpha]_D^{22}$ $-20.5°$ (c 1.15; chloroform), which possessed the properties characteristic of coumarins.

Substance (I), according to its physicochemical constants and PMR spectrum [(HX-90, in $CDCl_3$, 0 — HMDS, δ, ppm): 6.23- 7.50 (d, J = 10 Hz, H-3 and H-4); 7.11, 6.64 (s, H-5 and H-8); 5.93 (m, =CH); 4.98 (t, J = 6.5 Hz, H-5'); 3.24 (d, J = 8.5 Hz, Ar—CH_2—); 1.76, 1.84 (s,  $-CO-\underset{\underset{CH_3}{|}}{C}=C\overset{CH_3}{\diagup}\diagdown$), 1.52 (s,  $-\underset{\underset{O}{|}}{C}\begin{smallmatrix}\diagup CH_3\\ \diagdown CH_3\end{smallmatrix}$)] corresponded to deltoin [2], but unlike the latter it was optically inactive. Alkaline hydrolysis with 5% KOH in methanol gave prangeferol (IV), $C_{14}H_{14}O_4$, mp 175-176.5°C, $[\alpha]_D^{22}$ ± 0° (c 2.08; chloroform) [3] and angelic acid (V), $C_5H_8O_2$, mp 45-47°C. Consequently, substance (I) was a prangeferol angelate. We have also isolated this from the roots of *Seseli tortuosum* L.

With respect to its chemical composition, melting point, and PMR spectrum [(HX-90 in $CDCl_3$ 0 — HMDS, δ, ppm); 6.12, 7.98 (d, J = 10 Hz, H-3 and H-4); 6.32 (s, H-6); 5.20 (t, J = 7 Hz, —CH=); 3.92 (s, 2 —OCH_3); 3.43 (d, J = 8 Hz, Ar—CH_2—); 1.65, 1.82 (s,  $=C\begin{smallmatrix}\diagup CH_3\\ \diagdown CH_3\end{smallmatrix}$)]. Substance (II) corresponded to the known coumarin coumarain [4]. This was also confirmed by the ^{13}C NMR spectrum.

Substance (III), unlike (I) and (II), was optically active and corresponded in its properties to odakenetin, which we have isolated previously from the roots of *Seseli grandivittatum* Schischk. [5].

Thus, in the roots of the plant studied there were four compounds of coumarin nature — decursinol, prangeferol angelate, coumurrayin, and nodakenetin. Seseloside (decursinol glucoside), which has been isolated from this species by other authors [6], was not found by us in the samples investigated.

Leningrad Sanitary-Hygienic Medical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 2, p. 248, March-April, 1984. Original article submitted October 27, 1983.

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PHENOLIC COMPOUNDS OF THE EPIGEAL PART AND IRIDOIDS OF THE HYPOGEAL PART OF VALERIAN.

VI. FLAVONOIDS AND VALEPOTRIATES OF *Valeriana eriophylla* AND *V. cardamines*

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UDC 547.918:547.192

We have previously reported a study of the qualitative composition of the phenolic compounds of the epigeal organs of *Valeriana eriophylla* Utk. and *V. cardamines* Bieb. [1]. Continuing a more profound investigation of these species, by two-dimensional paper chromatography we have detected in the epigeal organs more than twenty flavonoids, represented by flavonols and flavone aglycones, 7-monoglycosides, biosides, and other types of more complex compounds. In a comparison with samples of substances isolated from the epigeal parts of other species of valerian [2, 3], we have identified kaempferol, quercetin, apigenin, luteolin, diosmetin, and acacetin. Column chromatography on polyamide gave two individual substances which were characterized as the result of physicochemical investigations as apigenin and luteolin 7-O-β-D-glucosides.

By chromatography on Silufol plates, in the epigeal organs of the plants under investigation we detected no fewer than ten substances of monoterpenoid nature. Three substances were isolated by adsorption—partition chromatography on various sorbents, and on the basis of physicochemical investigations and a comparison with literature information [4], they were identified as valtrate, dihydrovaltrate, and acevaltrate. The predominating component was valtrate, which shows the closeness of the species of valerian studied to common valerian. For the quantitative determination of valepotriates we plotted a calibration graph for valtrate. The spectrophotometric determination of these compounds showed that their amount in the epigeal organs of *V. eriophylla* was about 0.65% and in *V. cardamines* about twice as great.

Thus, it may be concluded that the vegetative and reproductive organs of *V. eriophylla* and *V. cardamines* have similar sets of valepotriates. Differences relate primarily to the amounts of the individual substances.

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Zaporozh'e Medical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 2, p. 249, March-April, 1984. Original article submitted September 27, 1983.

0009-3130/84/2002-0231$08.50