COUMARINS OF Libanotis lehmannae

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On studying the epigeal part of Libanotis lehmannae collected in the region of Lake Iskanderkul', we detected in it a considerable amount of coumarins consisting of a mixture of at least eight substances. Extraction with alcohol and adsorption chromatography on KSK silica gel with elution by mixtures of petroleum ether and chloroform with gradually increasing concentrations of the latter enabled us to isolate seven individual substances: a hydroxycoumarin with the composition $C_{19}H_{20}O_6$, mp 148-149°C, $[\alpha]_D^{23}$ −91.8° (c 1.0; chloroform) (I) and an amorphous powder with $[\alpha]_D^{23}$ −54.5 (c 1.0; chloroform) (II). On the basis of the products of alkaline hydrolysis and IR and NMR spectroscopy, it was established that compounds (I) and (II) are isomeric monoangelates of khellactone. The first compound has the structure of 3'(S)-angeloyloxy-4'(S)-hydroxy- and the second 4'(S)-angeloyloxy-3'(S)-hydroxydihydroseselin.

The possibility of the existence of these lactones in nature has been shown previously by Bohlmann [1] on the basis of mass and NMR spectroscopy in a study of Angelica ursina, but he did not obtain them in the crystalline form and they remained uncharacterized.

A coumarin (III), $C_{22}H_{28}O_5$, obtained in the form of an oil with $[\alpha]_D^{22}$ +30.2° (c 0.4; chloroform) was cleaved on alkaline hydrolysis into xanthogalol with mp 184-185°C (ethanol) and caprylic acid. On the basis of these facts and also NMR and mass spectra, it was identified as capryloxyloxyxanthogalol isolated previously from Seseli gummiferum Pall [2].

Coumarins (IV), $C_{14}H_{14}O_5$, mp 174-175°C, $[\alpha]_D^{23}$ + 73.9 (c 1.0; chloroform), and (V), $C_{24}H_{26}O_7$, mp 174-176°C, $[\alpha]_D^{23}$ −56.2 (c 0.6; chloroform) were identified by mixed melting points and the coincidence of their IR spectra with, respectively, (+)-cis-khellactone [3] and its diester anomalin [4].

A furocoumarin (VI), with the composition $C_{12}H_8O_4$, mp 187-189°C, was identified on the basis of a comparison of IR spectra as bergapten.

From the fraction of water-soluble substances we isolated two glycosides: (VII) and (VIII). On acid hydrolysis the first of them split into 8,9-dihydrooroselol with mp 161-163°C and D-glucose and, consequently, it is identical with columbianin [5].

LITERATURE CITED

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