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PTERYXIN FROM THE ROOTS OF LIBANOTIS CONDENSATA

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From the roots of Libanotis condensata (L.) Crantz., collected by M. G. Pimenov on the island of Sakhalin, we have isolated 6.81% of a mixture of lactones of the coumarin group consisting, according to the results of paper chromatography, of six substances.

From an alcoholic extract of the roots of this plant we have isolated a substance with the composition $C_{21}H_{22}O_7$ having mp 78° – 80° C (ether–petroleum ether), $[\alpha]_D^{24.3} + 12.9^{\circ}$ (c 0.58; ethanol), which, from its chemical properties and UV spectrum λ_{max} : 246, 256, 323 m μ (log ϵ 3.54; 3.46; 3.96), is related to the coumarins. Its IR spectrum contained the following bands characteristic for the coumarins: 1748 (carbonyl of an α -pyrone ring), 1615 (skeletal vibrations of an α -pyrone ring), 1579 (aromatic C=C bonds), and 1321, 1234, and 1107 cm^{-1} (C–O of an α, β -unsaturated ester). A broad carbonyl band at 1748 cm^{-1} permits the assumption of the presence of one or more ester groups.

The alkaline hydrolysis of this coumarin gave a monohydroxycoumarin $C_{15}H_{16}O_5$ with mp 159° – 160° C which was identified on the basis of the melting point, IR spectra, and the absence of a depression of the melting point of a mixture as methylhellactone, which we have isolated by the hydrolysis of dihydrosamidin [1, 2], together with acetic acid and angelic acid (trans-1, 2-dimethylacrylic) acid.

The acetylation of the methylhellactone gave an acetate $C_{17}H_{18}O_6$ with mp 147° – 148° C (from methanol).

Thus, through a comparison of the constants of the coumarin isolated and its saponification products with published data, and also a comparison of their IR spectra [4], it has been identified as pteryxin (2', 2'-dimethyl-3'-acetyl-4'-angeloyl-5', 6': 8, 7-pyrano-coumarin), which has been isolated from the roots of Pteryxia terebinthina (Hook.) [4]. Pteryxin possesses a definite spasmolytic effect [3].

By column chromatography on acidic alumina (Brockman activity grade II), we have also isolated from the roots of this plant a substance with the composition $C_{29}H_{50}O$ having mp 133° – 135° C which has been identified on the basis of IR spectra, the absence of a depression of the melting point of a mixture, and by the production of an acetate, as β -sitosterol.

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