

CONFEROL - A NEW COUMARIN FROM THE ROOTS OF *Ferula conocaula* AND *F. moschata*

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UDC 547.9:582.89

From an ethereal extract of the roots of *Ferula conocaula* Korov., collected in the valley of the R. Kasansai (Chatkal'skii range, Kirghiz SSR) by chromatography on alumina we have isolated a new terpenoid coumarin with the composition $C_{24}H_{30}O_4$ (M^+ 382, mp 137-138°C) (from a mixture of ethyl acetate and petroleum ether, Kofler), $[\alpha]_D^{20} - 84.2^\circ$ (c 1.3; ethanol), which we have called conferol. The same compound was isolated from an acetone extract of the roots of *Ferula moschata* (Reinsch) K.-Pol., collected in the environs of Lake Iskanderkul' (Zarafshanskii range, Tadzhik SSR).

The UV spectrum of conferol $[\lambda_{\text{max}}^{\text{EtOH}} 216, 242, 252, 325 \text{ nm} (\log \epsilon 4.15; 3.49; 3.42; 4.21)]$ shows that the compound is an umbelliferone derivative. The IR spectrum of the substance (Fig. 1) shows bands at 3620 cm^{-1} (OH), 1725 cm^{-1} (C=O of an α -pyrone), and 1615 and 1510 cm^{-1} (C=C).

The NMR spectrum of conferol (taken on a Varian HA-100D instrument, CDCl_3 , O - HMDS) shows the following signals (δ , ppm): 0.82 (6H) and 0.87 (3H) ($\text{CH}_3\text{-C-}$); 1.60, broadened signal ($\text{CH}_3\text{-C=C}$); 5.48 (1H), broadened signal (H-C=C-); 3.41 (1H), broadened signal, $W_{1/2} 5.7 \text{ Hz}$ (C-C-OH); 4.03 (2H), $J_{\text{gem}} = 9.7 \text{ Hz}$, $J_{1\text{vic}} = 3.6 \text{ Hz}$, $J_{2\text{vic}} = 5.7 \text{ Hz}$ ($\text{Ar-O-CH}_2\text{-CH}$); 6.14 (d, 1H), $J = 9.3 \text{ Hz}$ ($\text{C}_3\text{-H}$); 7.53 (d, 1H), $J = 9.3 \text{ Hz}$ ($\text{C}_4\text{-H}$); 7.28, d, $J = 9.0 \text{ Hz}$ ($\text{C}_5\text{-H}$), 6.76 (q, 1H), $J_{\text{ortho}} = 9 \text{ Hz}$, $J_{\text{meta}} = 2.5 \text{ Hz}$ ($\text{C}_6\text{-H}$); 6.73 (d, 1H), $J = 2.5 \text{ Hz}$ ($\text{C}_8\text{-H}$).

The acetylation of conferol with acetic anhydride in the presence of sodium acetate gave a monoacetate $C_{26}H_{32}O_5$, mp 158-160°C, in the NMR spectrum of which there were the signal of the methyl group of an acetoxy radical ($\delta 1.9 \text{ ppm}$) and the signal of a proton geminal to a hydroxy group shifted to 4.64 ppm (triplet, $\Sigma J = 5.7 \text{ Hz}$).

The oxidation of conferol with chromium trioxide gave a ketone $C_{24}H_{28}O_4$ with mp 142-142.5°C which was identical (IR and NMR spectra) with conferone [1].

The results obtained permit the formula given below to be regarded as the most probable for conferol.

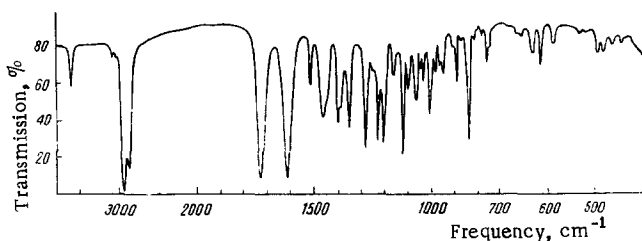
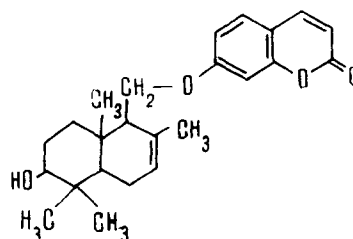


Fig. 1. IR spectrum of conferol (mull in paraffin oil).



LITERATURE CITED

1. V. V. Vandyshev, Yu. E. Sklyar, M. E. Perel'son, M. D. Moroz, and M. G. Pimenov, *Khim. Prirodn. Soedin.*, 670 (1972).

All-Union Scientific-Research Institute of Medicinal Plants. Translated from *Khimiya Prirodnkh Soedinenii*, No. 5, pp. 670-671, September-October, 1972. Original article submitted April 20, 1972.

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