

BRIEF COMMUNICATIONS

COUMARINS OF WORMWOODS OF THE Frigidae SERIES

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We have investigated the epigeal part of the plant *Artemisia jacutica* Drob., gathered in the environs of the village of Maiya (Yakutia) and of *A. sieversiana* Wild. and *A. absinthium* gathered in the environs of Tomsk in the flowering phase.

From six to eight substances of coumarin nature were detected by descending chromatography on LS paper impregnated with formaldehyde-acetone (1:3) [1].

To isolate the coumarins, the comminuted herbage was extracted with 70% ethanol, the extract was evaporated to an aqueous residue, and this was treated successively with chloroform, diethyl ether, and ethyl acetate. The chloroform fraction, after elimination of the extractant, was deposited on a column of Lachema silica gel 5/40 μm . The fractions eluted by hexane-chloroform (2:3) and (1:4) were rechromatographed on Silufol plates in the benzene-ethyl acetate (2:1) system. Individual substances (I) and (II) were isolated. Then the column was washed with chloroform-ethanol (4:1), leading to the isolation and crystallization of substance (III). The ethyl acetate fraction was chromatographed on polyamide. Ethanol-water (1:4) eluted substance (IV). The substances obtained were subjected to repeated crystallization from methanol.

Substance (I) - colorless crystals, $\text{C}_{10}\text{H}_8\text{O}_4$, mp 205-207°C. UV spectrum: λ_{max} , nm ($\text{C}_2\text{H}_5\text{OH}$) 340, 298, 256 nm. The IR spectrum (tablets with KBr) contained absorption bands at (cm^{-1}) 3340 (OH group), 2850 (OCH_3), and 1707 ($-\text{C}=\text{O}$). Compound (I) was identified as scopoletin [2].

Substance (II) - colorless acicular crystals with mp 233-236°C, $\text{C}_9\text{H}_6\text{O}_3$. UV spectrum: λ_{max} , nm ($\text{C}_2\text{H}_5\text{OH}$) 325, 256. The IR spectrum (tablets with KBr) contained bands at (cm^{-1}) 1725 (α -pyrone) and 3300 (OH group). On the basis of the results obtained, compound (II) was identified as umbelliferone [2].

Substance (III) - yellowish acicular crystals with mp 269-271°C, $\text{C}_9\text{H}_6\text{O}_4$. UV spectrum: λ_{max} , nm ($\text{C}_2\text{H}_5\text{OH}$) 262, 306, 355. IR spectrum (KBr), ν_{max} (cm^{-1}): 1598, 1630, 1686 ($\text{C}=\text{C}$), 1718 ($-\text{C}=\text{O}$), and 3400 (OH group). The results of the investigation agreed with literature information for esculetin [3].

Substance (IV) - colorless crystals, mp 204-205°C, $\text{C}_{15}\text{H}_{16}\text{O}_9$, $[\alpha]_{\text{D}}^{20} -143^\circ$ (c 0.8; methanol). On enzymatic hydrolysis, the compound was split into esculetin and D-glucose. From its melting point, a mixed melting point, its cleavage products, and parallel chromatography with an authentic sample it was identified as esculin [4].

The detection of esculetin in a Siberian wormwoods has been reported in the literature [5]. We are the first to have isolated umbelliferone, scopoletin, and esculin from the species investigated.

LITERATURE CITED

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