PHENOLIC COMPOUNDS OF Sempervivum ruthenicum

L. A. Gumenyuk, V. S. Batyuk, and N. N. Dykhanov

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The phenolic compounds of the epigeal part of the plant Sempervivum ruthenicum consist of derivatives of flavone, enol carboxylic acids, hydroxycoumarins, and tanning substances of the pyrogallol and catechol groups [1, 2].

To isolate the individual substances, extracts from Sempervivum ruthenicum after the elimination of the solvent, were exhaustively extracted with chloroform and then with ethyl acetate.

When the chloroformic extracts were chromatographed on a column of alumina (Brockmann activity grade II), a substance $C_9H_6O_2$ with mp 65-67°C, identified as coumarin, was isolated. The ethyl acetate fraction gave a mixture of flavonoids (0.6% of the weight of the raw material) which was chromatographed on a column of Kapron. By using ethanol of various concentrations as eluents, we isolated three substances: astragalin, $C_{21}H_{20}O_{11}$, mp 174-176°C, $[\alpha]_D^{20}-56.0°$; kaempferol, $C_{15}H_{10}O_6$, mp 330-331°C; and quercetin, $C_{15}H_{10}O_7$, mp 310-312°C.

The aqueous phase remaining after the extraction with ethyl acetate was concentrated in vacuum to small volume and was likewise chromatographed on a column of Kapron. When the column was eluted with 40% ethanol, a substance $C_{27}H_{30}O_{17}$ with mp 190-191°C (from ethanol), $[\alpha]_D^{20}-32.0°$, was obtained.

Both acid hydrolysis (5% H_2SO_4) and enzymatic cleavage of the glycoside with a preparation from Aspergillus oryzae gave quercetin (yield 48%), D-glucose, and L-rhamnose.

The glycoside was identified by its physicochemical properties, hydrolysis products and bathochromy, and also by a mixed melting point, as rutin.

LITERATURE CITED

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2. L. A. Gumenyuk, N. F. Komissarenko, V. S. Batyuk, and P. A. Gnedkov, Khim. Prirodn. Soedin., 392 (1971).

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