ASTRAGALIN FROM Sempervivum ruthenicum

L. A. Gumenyuk, P. A. Gnedkov, and
V. S. Batyuk

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By paper chromatography and by specific qualitative reactions we have established that the polyphenolic complex of plants of the family Crassulaceae is represented by four classes [1].

By column adsorption chromatography on polyamide, from an extract of the herb Sempervivum ruthenicum with 40% methanol we have isolated a crystalline substance $C_{21}H_{20}O_{11}$, mp 174-176° C [from acetone–water (1 : 1)], $[\alpha]_D^{20}$ – 56.0°, R_f 0.82 in the ethyl acetate–formic acid–water (10 : 2 : 3) system and 0.40 in 15% acetic acid.

D-glucose and an aglycone were isolated from the products of hydrolysis with 2% sulfuric acid. The aglycone, $C_{15}H_{10}O_6$, had mp 274-276° C [from aqueous acetone (1 : 1)]. By qualitative reactions and UV spectroscopy [2, 3], the aglycone was found to contain hydroxy groups in the 3, 5, 7, and 4' positions. The detection of phloroglucinol and p-hydroxybenzoic acid in the products of alkaline cleavage permit the conclusion that the aglycone is 3,5,7,4'-tetrahydroxyflavone (kaempferol).

In its elementary composition, qualitative reactions, bathochromy, products of acid hydrolysis and alkaline degradation, UV and IR spectra, R_f values, and the melting point of a mixture, the glycoside isolated was identical with kaempferol 3-O-β-D-glucopyranoside (astragalin), and this is the first time that this glycoside has been found in plants of the family Crassulaceae.

LITERATURE CITED

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Zaporozhe Medical Institute. Khar'kov Scientific-Research Institute of Pharmaceutical Chemistry.
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