

SCUTELLAREIN 7-RUTINOSIDE FROM

Sempervivum ruthenicum

L. A. Gumenyuk

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In a further study of the phenolic complex* isolated from the flowers of *Sempervivum ruthenicum* on a column containing polyamide (elution with 10% ethanol), we have isolated an individual substance with R_f 0.35 [ethyl acetate-formic acid-water (10:2:3) system]. A positive cyanidin reaction the colored products from which did not pass into octyl alcohol [2] showed its glycosidic nature.

The substance isolated readily crystallizes from aqueous acetone (1:1) in the form of yellow acicular crystals which are readily soluble in water, aqueous solutions of ethanol and methanol (less readily in the anhydrous alcohols), and does not dissolve in ether, chloroform, benzene and ethyl acetate. This substance, with the molecular formula $C_{27}H_{30}O_{15}$, has mp 213-215°C [from aqueous acetone (1:1)]; $[\alpha]_D^{20} - 35.0^\circ$ (50% methanol). From the products of hydrolysis with 2% H_2SO_4 were obtained an aglycone and the sugar components, which were identified on the basis of a chromatographic analysis on paper and comparison with authentic samples (from the mps of the osazones, 201-203°C and 178-180°C, respectively) as D-glucose and L-rhamnose. The mild acid hydrolysis and the enzymatic cleavage of this substance with a rhamnodiastase preparation gave the aglycone and biose which was identified as rutinose. The same biose was obtained from rutin under similar conditions.

The aglycone had the formula $C_{15}H_{10}O_6$ and melted at 345-347°C; mp of the acetyl derivative ($C_{23}H_{18}O_{10}$) 236-238°C and of the methyl derivative ($C_{18}H_{18}O_6$) 161-163°C, which corresponds to scutellarein. This was confirmed by qualitative reactions, UV and IR spectroscopy, and the results of alkaline destruction.

The site of attachment of the carbohydrate component to the aglycone was established on the basis of the UV spectrum of the bioside. The absence of a marked shift in the spectrum of the bioside (λ_{max} of band I - 350 nm; of band II - 290 nm) on the addition of sodium acetate (in comparison with the aglycone, λ_{max} for band I - 370 nm and for band II 280 nm) showed the substitution of the OH group in position 7. Thus, the substance investigated can be represented as scutellarein 7-rutinoside.

LITERATURE CITED

1. L. A. Gumenyuk, N. N. Dykhanov, and V. S. Batyuk, *Khim. Prirodn. Soedin.*, 391 (1972).
2. E. T. Bryant, *J. Amer. Pharm. Ass., Sci. Ed.*, 39, No. 8, 480 (1960).

*In communication 1, the content of phenolic compounds in the flowers of *S. ruthenicum* was erroneously given as 85% instead of the actual 0.85%.

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