RUTIN FROM Campanula Oblongifolia

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In order to study the chemical composition of Campanula oblongifolia (C. Koch.) Charadze, we collected the epigeal part of it in the Pyatigorsk region (peak of Mt. Besh-Tau) on July 22, 1968 in the vegetation-budding period.

The air-dried raw material (1.5 kg), after preliminary treatment with petroleum ether and chloroform, was exhaustively extracted with 96% ethanol. From the concentrated extract, at a chloroform–water boundary, the combined flavonoid separated out with a yield of about 0.5%. Paper chromatography and qualitative color reactions revealed three flavonoids, one of which was present in the combined flavonoids in predominating amount.

The recrystallization of the combined flavonoids from 75% ethanol gave a flavone glycoside with mp 189.5-192°C (from ethanol), $[\alpha]_D^{22}$ −32° (c 0.054, ethanol).

When the glycoside was subjected to acid hydrolysis with 5% H_2SO_4 solution and to enzymatic hydrolysis with a preparation from Aspergillus oryzae the aglycone was obtained (yield 46%) together with the sugar components, which were identified as D-glucose and L-rhamnose. The aglycone had the composition $C_{15}H_{10}O_7$, mp 313°C (from ethanol) and gave an acetyl derivative with mp 198°C. From its UV and IR spectra, the products of alkaline cleavage (phloroglucinol and protocatechuic acid), the aglycone was characterized as quercetin.

On acid hydrolysis under mild conditions [1% H_2SO_4, ethanol–water (1 : 1), 30 min on the water bath], quercetin and rutinose [O-β-D-glucopyranosyl-(6$\rightarrow$ 1)-β-L-rhamnopyranose] with mp 187-188.5°C; R_f 0.34 in the ethyl acetate–pyridine–H_2O (20 : 1 : 20) system were isolated [1].

The characteristics given and the fact that on stepwise hydrolysis under the usual conditions the bioside did not give an intermediate monoglycoside confirm that the substance is rutin, and not isorutin [2].

Mixtures of the glycoside and rutin, and also of the aglycone of the glycoside and quercetin, showed no depressions of the melting points. Their respective IR spectra were also identical.

LITERATURE CITED

1. P. A. J. Gorin and A. A. Perlin, Canad. J. Chem., 37, 1930 (1959).
2. V. I. Litvinenko and T. P. Nadezhdina, Rast. resursy, 4, No. 1, 68-70 (1968).

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