FLAVONOIDS OF Delphinium flexiosum AND D. elisabethae

A. I. Arazashvili, I. I. Moniava, and É. P. Kemertelidze

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Preliminary investigations of some plants of the genus Delphinium growing in Georgia (family Ranunculaceae) have shown that they are rich in flavonoid substances.

The flavonoids were extracted from the leaves of D. flexiosum and D. elisabethae (1 kg of raw material) with 80% methanol. The extracts obtained were concentrated to 400 ml, mixed with 65 g of Sephadex G-75 (coarse fraction) and, after swelling, deposited on a column (d 5.5). For eliminating accompanying substances, the column was first washed with petroleum ether and then with petroleum ether–chloroform (2:1). The flavonoids were eluted from the column successively with ethyl ether, ethyl acetate, and ethyl acetate–butanol (5:1) [1]. Two individual flavonoids, A and B, were obtained.

Flavonoid A, mp 218-219°C, $[\alpha]_D^{20} - 58°$ (c 0.1; ethanol). $\lambda_{max}^{C_2H_5OH}$ 256, 362 nm. Acid and enzymatic (rhamnodiastase) hydrolyses yielded quercetin (63.5%) and glucose. The information given, and also a UV spectral analysis of flavonoid A with complex-forming and ionizing compounds, and the calculated values of $[M]_D \cdot K_P$ according to Klyne [2] permitted its identification as 3',4',5,7-tetrahydroxyflavone 3-O-β-D-glucopyranoside, or isoquercitrin [3].

Flavonoid B, mp 188-189°C, $[\alpha]_D^{20} - 69°$ (c 0.1; ethanol), $\lambda_{max}^{C_2H_5OH}$ 256, 355 nm. Acid hydrolysis gave quercetin (48%), and glucose and rhamnose were found in the carbohydrate fraction.

The UV spectral analysis of flavonoid B with complex-forming and ionizing additives showed that the sugar components are attached in positions 3 and 7. Alkaline hydrolysis [4] yielded the monoside quercetin 3-O-β-D-glucoside and rhamnose, and enzymatic hydrolysis gave quercetin 7-O-β-L-rhamnoside and glucose. The results of enzymatic hydrolysis and the calculated values of $[M]_D \cdot K_P$ according to Klyne [2] of the products of alkaline and enzymatic transformation of flavonoid B confirmed that it is 3,4',5-trihydroxyflavone 3-O-β-D-glucopyranoside 7-O-β-L-rhamnofuranoside [5]. This substance is the dominating flavonoid of the leaves of D. flexiosum and D. elisabethae.

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I. G. Kutateladze Institute of Pharmaceutical Chemistry, Academy of Sciences of the Georgian SSR.
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