FLAVONOIDS OF Melandrium album

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Melandrium album (Mill.) Gareke, family Caryophyllaceae, has long been used in folk medicine for diseases of the kidneys and rheumatism and as an antiinflammatory agent [1, 2]. There is information in the literature on the presence of saponins in it [3]. We have studied the polyphenolic compounds of M. album.

By qualitative reactions and one- and two-dimensional chromatography on paper we have found in the epigeal part of the plant no less than eight substances of flavonoid nature. For isolating individual substances we used chromatography on a polyamide sorbent.

This gave flavonoid substances 1, 2, 3, and 4 with R_f 0.75, 0.61, 0.67, and 0.49 in 15% acetic acid. As preliminary investigations showed, substances 1 and 2 were apigenin O,C-glycosides and substances 3 and 4 were luteolin O,C-glycosides.

Substance 2 had mp 235°C, λ_{max} 335 nm (in ethanol), $\varepsilon^{1\%}_{1cm}$ 287, λ_{max} (with zirconyl nitrate) 395, 355 nm. The hydrolysis of substance 2 with 10% hydrochloric acid for two hours formed substances A and B.

Substance A had mp 264-265°C, $[\alpha]^{20}_D$ +50° (methanol), λ_{max} 335 nm, $\varepsilon^{1\%}_{1cm}$ 560, λ_{max} (with zirconyl nitrate) 387, 355 nm.

Substance B had mp 258-260°C, $[\alpha]^{20}_D$ −14.7°, λ_{max} 335 nm, $\varepsilon^{1\%}_{1cm}$ 545, λ_{max} (with zirconyl nitrate) 390 nm.

Kiliani hydrolysis led to the formation of an aglycone with mp 344-345°C. From the results of a spectral investigation, the aglycone contained hydroxy groups in positions 4', 5, and 7, and on alkaline cleavage it formed phloroglucinol and p-hydroxybenzoic acid, which enabled it to be identified as 4',5,7-trihydroxyflavone — apigenin.

D-glucose was found in the hydrolyzate after neutralization on AV-17 ion-exchange resin (OH^- form).

The acid hydrolysis by Kiliani's method of substances A and B led to the formation of apigenin and D-glucose. Hydrolysis in a 10% ethanolic solution of hydrochloric acid showed the following isomerization: On hydrolysis substance A gave two spots, which had R_f 0.53 and 0.21 (15% acetic acid); the hydrolysis of substance B gave the same products. This enables us to state that they are C-glycosides of apigenin [4].

Stepwise hydrolysis of the initial glycoside, as a result of which saponaretin (about 70%) was first formed, and also a comparison of the intensities of absorption of apigenin, saponaretin, and its glycoside showed that the initial material is a diglycoside in which the C-glycosidic substituent is present in position 8 and the O-glycosidic substituent in position 4'.

The paper chromatography of glycoside 2 and a sample of isosaponarin confirmed their identity.

LITERATURE CITED

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