A FLAVONOID GLYCOSIDE AND HYDROCARBONS AND STEROLS FROM Thalictrum simplex

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Continuing a chemical study of plants of the genus Thalictrum, we have investigated the epigeal part of Thalictrum simplex (slimtop meadow rue), fam. Ranunculaceae. The material was gathered in Irkutsk province during the vegetation period. The air dry raw material was extracted with 80% methanol, and the extract was evaporated and treated with chloroform. From the chloroform extract, by repeated column chromatography on silica gel L 40/100 in the chloroform–methanol–water (70:12:1) system, we obtained fractions 1 and 2, and in the ethyl acetate–methanol–water (10:2:3) system fraction 3.

Fraction 1 consisted of an individual compound (I), mp 270-272°C (methanol–water), $C_{28}H_{32}O_{14}$, which, according to IR (1600, 1650, 3390-3450 cm^{-1}) and PMR spectroscopy, was a glycosylated 4',5,7-substituted flavone. FAB–MS, m/z: 593 (M + H); 285 (M + H − a hexose − a deoxyhexose)$^+$. The PMR ^{13}C NMR (DMSO) spectra contained the signals of anomeric protons at (ppm) 4.58 (H-1 of Rha) and 5.03 (H-1 of Glc) and of carbon atoms at 100.17 (C-1 of Rha) and 100.49 (C-1 of Glc), which showed the biosidic nature of the glycoside. It followed from the values of the chemical shifts at 162.47 and 162.50 ppm that there were two etherified glycosyl groups, one of which was methoxylated (55.43 ppm). The positions of attachment of the carbohydrate chain at C-7 and of the methoxy substituent at C-4' of the genin were determined by a comparison with the corresponding C-7-O-Glc and C-4'-O-Me derivatives [1, 2]. The characteristics of the ^{13}C NMR spectrum in the carbohydrate moiety agreed with those for glucose linked to a terminal rhamnose residue at the C-6 position [3]. The totality of all the facts for (I) and their comparison with the literature enabled (I) to be identified as acacetin 7-O-β-rutinoside (linarin) [2, 3].

According to IR spectroscopy and mass spectrometry, fraction 2 was a mixture of higher hydrocarbons and acids. A chromato-mass spectrometric analysis of the products of the methylation of fraction 2 showed that the hydrocarbons were represented by a homologous series of saturated C_{21}–C_{32} paraffins with a predominance of the C_{23}–C_{28} group, while the acids were represented by a homologous series of saturated C_{14} C_{18} and C_{20} acids with a predominance of stearic and palmitic.

Fraction 3 consisted of sterol glycosides (TLC with "markers", IR spectroscopy). In the products of acid hydrolysis we identified by chromato-mass spectrometry β-sitosterol (M^+ 414), stigmasterol (M^+ 412), and campesterol (M^+ 400), while glucose was identified by PC and TLC with markers as the carbohydrate component of all the sterol glycosides.

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