The amounts of polysaccharides and reducing and acidic sugars in the WSPS and PcS fractions of C. majalis were approximately the same, and their qualitative and quantitative compositions did not differ. The main monosaccharides were D-galactose and L-arabinose.

The WSPS and PcS fractions of C. keiske differed considerably with respect to the amounts of polysaccharides and reducing and acidic sugars that they contained, although their monosaccharide compositions were similar. Their main monosaccharides were D-galactose, L-arabinose, and D-xylose.

The species investigated differed from one another considerably with respect to their levels of PcSs and reducing and acidic sugars, which confirmed the results of other chemotaxonomic studies [6].

Thus, various carbohydrate fractions have been isolated from the flowers of Convallaria majalis and C. keiske and have been characterized by the monosaccharide compositions of the PcSs, RSs, and acidic sugars that they contained.

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COUMARINS OF Althaea officinalis AND A. armenica

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In the present communication we give the results of a study of the coumarins of the epigeal parts and roots of Althaea officinalis (marshmallow) and A. armenica Ten. [1].

Both species were gathered in 1988 in the floodplains of the R. Belaya (Krasnodarsk Territory): the epigeal parts in the period of incipient flowering, and the roots in the autumn.

The coumarins were isolated by a procedure described previously [2-4]. As a result, nine compounds [(I)-(IX)] were obtained. Under the action of hydriodic acid in a liquid phenol–acetic anhydride medium [5], substances (II) and (III) were converted into substance (I) (coumarin) or into α-pyrone, which showed their coumarin nature. The substances isolated were identified on the basis of physicochemical properties, UV and IR spectroscopy, and parallel comparative paper chromatography in the hexane–formamide, benzene–formamide, chloroform–formamide, and 5% acetic acid systems, and also by mixed melting points with authentic samples and, in the case of glycosides [substances (VII)-(IX)], by acid and enzymatic hydrolysis.

Coumarin (I), $C_9H_6O_2$, mp 67-68°C [2]; herniarin (II, 7-methoxycoumarin), $C_{10}H_8O_3$, mp 117-118°C [3]; umbelliferone (III, 7-hydroxycoumarin), $C_9H_6O_3$, mp 232-234 [5]; scopoletin (IV, 7-hydroxy-6-methoxycoumarin), $C_{10}H_8O_4$, mp 203-205°C [4]; isoscopoletin (V, 6-hydroxy-

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7-methoxycoumarin), $C_{10}H_8O_4$, mp 184-187°C [6]; esculetin (6,7-dihydroxocoumarin), $C_9H_6O_4$, mp 267-270°C [7]; esculin (VII, 6,7-dihydroxycoumarin 6-O-β-D-glucopyranoside), $C_{15}H_{16}O_9$, mp 202-205°C, $[\alpha]_D^{20}$ −143° (c 0.5; CH_3OH) [6, 7]; cichorin (VIII, 6,7-dihydroxycoumarin 7-O-β-D-glucopyranoside), $C_{15}H_{16}O_9$, mp 212-214°C, $[\alpha]_D^{21}$ −103° (c 0.5; dioxane); scopolin (IX, 7-glucopyranosylox-6-methoxycoumarin), $C_{16}H_{18}O_9$, mp 217-219°C, $[\alpha]_D^{21}$ −89° (c 0.6, CH_3OH).

In a comparative chromatographic analysis of alcoholic extracts of the epigeal parts and the roots of A. armenica and A. officinalis in the solvent systems given above it was established that their coumarin compositions were similar. This is first time that any of the compounds obtained have been isolated from the species investigated.

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XANTHONES AND FLAVONOIDS OF Gentiana algida AND G. karelinii

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Some plant species of the genus Gentiana L. are used in medical practice for digestive disorders and diseases of the liver and of the gallbladder. They are rich sources of xanthones, flavonoids, iridoids, and alkaloids [1].

We have studied the phenolic compounds of G. algida Pall. and G. karelinii Griseb. Flavone C-glycosides have previously been isolated from G. algida [1], but G. karelinii has not been investigated phytochemically.

The air-dry comminuted epigeal part of G. algida gathered in the flowering period on the territory of Kyrgystan was extracted with ethanol at room temperature. The concentrated extract was diluted with water and was re-extracted with chloroform, ethyl acetate, and butanol. The fractions so obtained were separated by column chromatography on silica gel in a chloroform–methanol gradient system. The ethyl acetate fraction yielded compound (I), and the butanol fraction compounds (II) and (III). Substance (IV) was isolated from an alcoholic extract of the epigeal part of G. karelinii. To identify the compounds isolated we used UV, mass, and (^1H and ^{13}C) NMR spectroscopies, and also some chemical transformations.

Bellidifolin (I) – yellow crystals with the composition $C_{14}H_{10}O_6$ (M^+ 274), mp 273-274°C, λ_{max} 254, 276, 330 nm. The PMR spectrum showed the signals of four aromatic protons (6.06 ppm, d, 2.5 Hz, H-2; 6.34 ppm, d, 2.5 Hz, H-4; 6.68 ppm, d, 8.5 Hz, H-6); 7.34 ppm, d, 8.5 Hz, H-7), and of one CH_3O group (3.50 ppm) and two chelate hydroxy groups (singlets at 11.30 and 12.05 ppm).

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