This is the first time that the flavonoids of *Astragalus melilotoides* have been studied.

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FLAVONOL AGLYCONES OF SOME SPECIES OF *Astragalus* GROWING IN KARA KALPAK

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The composition of the flavonoid aglycones of the epigeal parts of eight species of *Astragalus* L. (milk vetch), family Fabaceae, collected in the flowering period in Kara Kalpak, have been investigated.

The total flavonoids from each species were exhaustively extracted by ethanol with heating in the boiling water bath. The extracts were evaporated, freed from ballast substances by preextraction with chloroform, and subjected to hydrolysis with 5% H_2SO_4 with heating in the boiling water bath for 4 h. The completeness of hydrolysis was checked by paper chromatography in 15% acetic acid. The aglycones were extracted from the hydrolysate with diethyl ether. After the solvent had been distilled off, the combined aglycones were separated on columns of polyamide sorbent with elution by aqueous alcohol in various concentrations [1].

The substances isolated were identified from their chromatographic behavior staining with specific reagents, physicochemical properties, and IR and UV spectra [2-5] and also by comparison with authentic samples. From the species investigated, four flavonol aglycones were isolated, three of which were identified as kaempferol, quercetin, and isorhamnitin. The fourth aglycone is now being studied.

The distribution of the aglycones among the species investigated for the first time is given below.

Species	Number of flavonoid substances	Kaempferol	Quercetin	Isorhamnetin	Aglycone 4
Astragalus bacaliensis B g e.	17	+	+	+	—
A. transcaspicus F r e y n	20	+	Tr.	—	—
A. lasiophyllus L e d e b	14	+	"	—	—
A. erioceras F i s c h. et M e y	8	+	"	—	—
A. flexus F i s c h.	14	+	+	+	—
A. contortuplicatus F i s c h.	19	+	+	+	+
A. chivensis B g e.	14	+	+	+	+
A. tribuloides Delile	5	+	+	+	—

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FLAVONOIDS OF *Ferula schair* AND *F. samarkandica*

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We have studied the flavonoids of *Ferula schair* Borszcz. and *F. samarkandica*, family Apiaceae. An ethanolic extract of the epigeal part of *F. schair* collected in the environs of Alim-Tau (southern Kazakhstan) was concentrated in vacuum, diluted with water, and filtered. The filtrate was washed three times with chloroform. On cooling, the purified aqueous ethanolic solution deposited a precipitate which, after recrystallization from ethanol, had mp 240-242°C, $[\alpha]_D$ −27.6° (c 1.45: pyridine—methanol (1:1)), $\lambda_{max}^{ethanol}$, nm: 256, 268 (sh.), and 350 (I). The hydrolysis of (I) with 10% H_2SO_4 led to glucose and luteolin (mp 329-330°C, M^+ 286) in equimolar amounts. According to UV spectroscopy, the carbohydrate component was present in position 7.

The study of IR, UV, and PMR spectra, and also enzymatic hydrolysis with β-glucosidase, enabled us to characterize substance (I) as luteolin 7-O-β-D-glucopyranoside [1, 2]. From its mother liquor we isolated luteolin (II).

To extract flavonoids, the seeds of *Ferula samarkandica* collected in the Tashkent province were extracted with ethanol three times. The concentrated extract was diluted with water (1:2) and was freed from lipophilic substances by washing with petroleum ether and with benzene. Then the flavonoids were extracted with ethyl acetate. When the ethyl acetate extract was concentrated, a precipitate deposited the repeated crystallization of which from a mixture of ether and ethyl acetate yielded a new flavonoid (III).

The flavone (III) had the composition $C_{22}H_{22}O_{11}$, mp > 340°C, $[\alpha]_D^{20}$ +75° (c 0.8; pyridine—methanol (1:1)), R_f 0.44 in the toluene—ethyl acetate—ethanol (1:1:1) system. On the basis of Bryant's cyanidin reaction, compound (III) was assigned to the flavone glycosides [3]. This was confirmed by the presence in the PMR spectrum of (III) (Py-d_5) of the signal of the protons of a sugar residue (7 H in the interval 4.05-4.58 ppm) and of an anomeric proton (5.69 ppm, J = 6 Hz). The signal of a CH_3O group appeared at 3.72 ppm, and the protons of the flavone nucleus resonated in the region of aromatic protons [1, 4].

The UV spectrum of (III) had maxima at 255, 270, and 347 nm, which showed that it was a derivative of 3',4',5,7-tetrahydroxyflavone. According to the results of UV spectroscopy with various additives [5], there were free hydroxy groups in positions 3' and 5. When (III) was hydrolyzed with 5% HCl (80°C, 30 min), D-glucose was obtained together with an aglycone having mp 249-251°C, M^+ 300, which was identified on the basis of its mass and UV spectra as diosmetin [1, 6]. The absence of a shift of the maxima in the presence of sodium acetate showed the attachment of the glucose residue to position 7 of the aglycone. However, (III) differed from the known diosmetin 7-O-β-glucopyranoside [6]. The considerably greater hydrolyzability of (III) relative to known 7-O-glucopyranosides with dilute acids was probably due to the furanose form of the sugar residue [7]. This was confirmed by the presence of absorption bands at 1038, 1076, and 845 cm^{-1} in the IR spectrum, and also by the results of a Klyne calculation of molecular rotation, which showed the furanose form of the glucose and the α-configuration of the glucosidic bond [8].

On the basis of the facts given above, we propose for the flavone glycoside (III) the structure of 7-α-D-glucofuranosyloxy-3',5-dihydroxy-4'-methoxyflavone.

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