THE POLYPHENOL COMPOUNDS OF *Astragalus*
SPECIES OF THE FLORA OF THE NORTHERN
CAUCASUS AND UZBEKISTAN. II

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UDC 507.972

Continuing a study of the composition of the polyphenol compounds of plants of the genus *Astragalus* [1], from the epigeal part of *Astragalus turkestanicus* L. (family Fabaceae) we have isolated two flavonol glycosides by extraction with acetone. They were separated on a polyamide solvent using water-saturated ethyl acetate for elution. They were purified finally by gel filtration through Sephadex LH-20.

Substance I—yellow crystals with the composition $C_{22}H_{22}O_{11}$ —was readily hydrolyzed with 5% sulfuric acid, giving 1 mole of D-glucose and an aglycone with mp 220°C. UV spectrum of the glycoside in C_2H_5OH : 353, 267 nm; with CH_3COONa : 353, 267 nm; with $H_3BO_3 + CH_3COONa$: 353, 267 nm; with $AlCl_3$: 387, 352 sh., 303, 276, 230 nm; with $AlCl_3 + HCl$: 392, 348, 303, 248, 228 nm; with C_2H_5ONa : 392, 276, 247 nm. According to color reactions, the glucoside lacks free hydroxy groups on the third and seventh carbon atoms, which is confirmed by the results of UV spectroscopy.

Acetylation of the glycoside with acetic anhydride in the presence of anhydron [2] led to the formation of colorless crystals having absorption maxima in the UV spectra at 255, 309 nm (presence in the nucleus of the flavone of substituents other than acetyl groups) [3]. In the IR spectra, apart from the absorption bands of a carbonyl group, of an aromatic bond, of a substituent in the lateral phenyl radical, and of hydrogen bonds, the absorption band of a methoxy group appeared. Enzymatic hydrolysis with emulsin showed the presence of a glycosidic bond on the aglycone with the sugar. UV spectrum of the aglycone in C_2H_5OH : 368, 267 nm; with CH_3COONa : 368, 267 nm; with $H_3BO_3 + CH_3COONa$: 368, 267 nm; with C_2H_5ONa : 420, 268 nm; with $AlCl_3$: 423, 353, 305, 271, 245 nm; with $AlCl_3 + HCl$: 417, 352, 271, 235 nm; NMR spectrum: (δ scale, pyridine- d_6 , ppm): singlet at 3.65 (Ar-OCH₃), doublet at 6.47 ($J = 3.6$ Hz) (H-8; H-6); multiplets at 7.18 and 8.38 ppm (H-3', H-5', H-2', H-6' and the protons of the solvents). Demethylation of the aglycone led to kaempferol. On reductive acetylation [4], an anthocyanidin was obtained with an absorption maximum at 510 nm ($CH_3OH + HCl$), which is characteristic for 7-O-methylpelargonidin [5]. There was no bathochromic shift in the presence of aluminum chloride. On the basis of the facts given, substance (I) was identified as 7-O-methylkaempferol 3-O- β -D-glucopyranoside (rhamnocitrin 3-O-glucoside). The physicochemical properties of this compound have not been described previously. This is the first time that it had been found in the genus *Astragalus*.

Substance (II) is a 3-O-glucoside of a methylated quercetin. Its structure is being determined in more detail.

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Pyatigorsk Pharmaceutical Institute. Tashkent Pharmaceutical Institute. Translated from *Khimiya Prirodnikh Soedinenii*, No. 3, p. 388, May-June, 1976. Original article submitted August 28, 1975.

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