

## FLAVONOIDS OF *Tithymalus dehsus*

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We collected *Tithymalus dehsus* (Schrenk.) Kl. et Gke. in the full flowering phase in June, 1972 in the Tamdina region of the Bukhara oblast [1].

In an ethanolic extract of the herbage of the plant under investigation by two-dimensional paper chromatography in 15% acetic acid (1) and butan-1-ol-acetic acid-water (4:1:5) (2) we detected five substances of phenolic nature. It was shown by qualitative reactions that three of them were flavonoids and two were phenolcarboxylic acids.

The chromatography on polyamide sorbent of an aqueous solution of the extracted substances yielded the phenolcarboxylic acids (eluent water, 20°C). The eluates were concentrated in vacuum to small volume, the mixture of acids was extracted with ethyl acetate, and the solvent was distilled off. The mixture of phenolcarboxylic acids so obtained was separated by preparative paper chromatography. Chlorogenic acid (yield 0.43%) and neochlorogenic acid were isolated.

Continuing the elution of the column with water heated to 40°C, a substance with  $R_f$  0.76 (1) and 0.96 (2) was isolated. The eluates were combined and evaporated, and the residue was recrystallized from ethanol-ethyl acetate (1:2). This gave a substance with mp 192-194°C  $[\alpha]_D^{20} -18^\circ$  (c 0.1; methanol). The results of elementary analysis and of IR and UV spectroscopy showed that the substance was kaempferol 3-galactoside. It was present in the herbage in an amount of 0.54% of the weight of the air-dried raw material.

When the column was eluted with water heated to 60°C, we found in the eluates a single substance with  $R_f$  0.42 (1) and 0.70 (2). The eluates were combined and evaporated. The residue was recrystallized from methanol and a substance was obtained that was identical according to a mixed melting point with hyperoside (yield 0.64%). Subsequent elution with water heated to 80°C gave a fifth substance [ $R_f$  0.26 (1) and 0.34 (2)].

UV spectrum:  $\lambda_{max}$  in methanol 265, 325 sh, 365 nm, with sodium acetate 265 and 365 nm, with zirconyl chloride 465 nm, with alkali 415 nm, with sodium acetate and boric acid 265, 365 nm, with zirconyl chloride and citric acid 365, 415 nm. The products of alkaline hydrolysis were found to comprise kaempferol and  $\alpha$ -galactose. Consequently, this substance is kaempferol 7-galactoside.

### LITERATURE CITED

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