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ISOFLAVONOIDS OF *Cicer mogoltavicum*

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Many plants of the family *Leguminosae* produce various isoflavonoids playing the role of phytoalexins, phytoestrogens, and growth inhibitors [1, 2]. There is information on the presence of isoflavonoids in some species of chick pea [2, 3]. In the present communication we give the results of a study of the flavonoids of the roots of *Cicer mogoltavicum* A. Korol (Mogoltavian chick pea) collected in the Kara-Tau mountains, Dzhabul province.

The comminuted roots (1 kg) were extracted at room temperature with chloroform six times, and then with ethanol six times. The concentrated chloroform and ethanol extracts were chromatographed on columns of silica gel in chloroform-hexane and chloroform-isopropanol solvent systems. As a result, the chloroform extract yielded compounds (I-IV) and ethanol extract (V and VI).

On the basis of the results of a study of the IR, UV, and PMR spectra, the preparation of methyl ethers and of acetyl derivatives, and the results of acid hydrolysis and a comparison with authentic samples, the compounds (III) (V) and (VI) that had been isolated were identified as known isoflavonoids.

Compound (I) - inerin, $C_{16}H_{12}O_5$, mp 178-179°C (methyl ether with mp 184-185°C);
 $\lambda_{max}^{ethanol}$ 282, 287, 311 nm (log ϵ 3.53, 3.59, 3.78) [2, 4].

Compound (II) - biochanin A, $C_{16}H_{12}O_5$, mp 213-214°C (diacetate with mp 190-191°C),
 $\lambda_{max}^{ethanol}$ 263, 335 (infl.) nm (log ϵ 4.48, 3.73) [2, 4].

Compound (III) formononetin, $C_{16}H_{12}O_4$, mp 260-261°C (methyl ether with mp 170-171°C),
 $\lambda_{max}^{ethanol}$ 239 (infl.), 251, 261 (infl.), 304 nm (log ϵ 4.28, 4.32, 4.28, 4.01) [5].

Compound (IV) - pratensein, $C_{16}H_{12}O_6$, mp 273-274°C, $\lambda_{max}^{ethanol}$ 264, 283 (infl.) nm (log ϵ 4.39, 4.05) [2, 4].

Compound (V) - ononin (formononetin 7-O- β -D-glucopyranoside), $C_{22}H_{22}O_9$, mp 215-216°C (tetraacetate with mp 186-187°C), $\lambda_{max}^{ethanol}$ 251 (infl.), 262, 302 nm (log ϵ 4.01, 4.03, 3.55) [5].

Compound (VI) - trifolirhizin (inerim O- β -D-glucopyranoside), $C_{21}H_{24}O_{10}$, mp 140-141°C (tetraacetate with mp 186-187°C, $\lambda_{max}^{ethanol}$ 278, 285, 311 nm (log ϵ 3.57, 3.58, 3.81) [6].

According to the results of thin-layer chromatography, substances (II-V) were also present in the epigeal part of the plant.

This is the first time that the isoflavonoids mentioned above have been isolated from Mogoltavian chick pea.

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CAROTENOIDS OF *Urtica dioica*

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Urtica dioica L. (common stinging nettle) is not only a medicinal plant but also a natural source of fodder the food value of which is not inferior to that of clover. The properties of the stinging nettle are largely due to the presence of carotene and carotenoids in it.

The carotenoids were extracted and separated by the method of B. G. Savinov and S. E. Kudritskaya [2]. The carotenoid extract of fresh stinging nettle leaves so obtained was saponified and was then subjected to chromatographic separation on a column filled with magnesium. Petroleum ether yielded mixture A of carotenoids. Mixture B of carotenoids was adsorbed in the upper part of the column. By thin-layer chromatography, carotenoid mixture A was separated into three zones: an orange zone (1) rose to the top part of the chromatogram, then a pale yellow zone (2) was adsorbed, and at the starting line there was a bright orange zone (3). The chromatography of a benzene extract of carotenoid mixture B on magnesia calcined at 700°C and the development of the chromatogram with the same solvent led to the separation of the mixture into two zones: a yellow zone (4) collected in the receiver, and a pink zone (5) remained on the adsorbent.

The carotenoids isolated were investigated on a SF-10 spectrophotometer in various solvents. The maxima of the absorption curves in the visible region of the spectrum are given below (nm):

Zone	In petroleum ether	In ethanol	In benzene
1	483, 452, 425	484, 451	493, 466, 425
2	474, 445, 419		
3			461, 433, 407
4	470, 442	471, 442, 418	482, 453, 426
5	472, 444, 418	471, 441, 420	483, 453, 428

The following carotenoids were identified [2-4]: β -carotene in the trans form, $C_{40}H_{56}$ (zone 1), hydroxy- α -carotene, $C_{40}H_{56}O$ (zone 2), luteoxanthin, which is the 5:6;5':8'-diepoxide of zeaxanthin, $C_{40}H_{56}O_4$ (zone 3), lutein epoxide ($C_{40}H_{56}O_3$, which is lutein 5:6-epoxide (zone 4), and violaxanthin, the 5:6;5';6'-diepoxide of zeaxanthin, $C_{40}H_{56}O_4$ (zone 5).

The amount of carotenoids in stinging nettles was 18.0 mg % at a moisture content of the leaves of 57.34%, or 29.6 mg% calculated to the dry matter. The amounts of the carotenoids isolated in percentage of their total were as follows:

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