by some color reactions, and by their hydrolysis products, and also with the aid of spectral methods and paper chromatography with authentic samples [7].

On the basis of the results obtained, the structures of seven substances were established, these being identified as rutin, hyperin, isoquercitrin, quercitrin, caffeic acid, chlorogenic acid, and esculetin. The other compounds were present in minor amounts but the aglycons of six of them were determined – quercetin, kaempferol, isorhamnetin, apigenin, and luteolin.

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FLAVONOIDS OF Astragalus macropterum

UDC 547.972

R. K. Yasinov

In the epigeal part of Astragalus macropterum (bird-egg pea) C. D. collected in the Tadzhik SSR (environs of the village of Ramit) in the flowering period (May-June, 1985), more than 15 polyphenolic compounds, 10 of which have been assigned to the flavonoids, have been detected by paper chromatography.

The flavonoids were exhaustively extracted with 70-96% ethanol, the ethanol was distilled off in vacuum, and the residue was purified with chloroform. The purified aqueous residue was treated with ethyl acetate. The ethyl acetate was distilled off and the residue was chromatographed on a column of polyamide sorbent. Four flavonoids (I-IV) were isolated. On the basis of the Bryant test [1], substances (I), (II), and (III) were assigned to the aglycons, and (IV) to the glycosides.

Substance (I): $C_{15}H_{10}O_5$, mp 349-350°C; the melting point of its acetate (183-185°C) was similar to that of apigenin triacetate. Phloroglucinol and p-hydroxybenzoic acid were identified in the products of alkaline degradation. Compound (I) was identified as apigenin.

Substance (II): $C_{15}H_{10}O_6$, mp 275-277°C; temperature of the acetate 181-183°C. By comparison with an authentic sample, compound (II) was identified as kaempferol.

Substance (III): $C_{15}H_{10}O_7$, mp 308-309°C, was identified as quercetin.

Substance (IV): $C_{21}H_{20}O_{10}$, mp 256-258°C, $[\alpha]_D^{20}$ −50.5° (c 0.1; ethanol). On acid hydrolysis, the aglycon apigenin and glucose were detected. UV spectrum, λ_{max}, nm: 270, 340; $+CH_3COONa$, 270, 340 [2]. The absence of a bathochromic shift for the glycoside under the influence of sodium acetate indicated the attachment of the sugar moiety at C_7. Compound (IV) was identified as apigenin 7-O-β-D-glucoside.

Two compounds of flavonoid nature (V) and (VI) were isolated from the aqueous residue with the aid of preparative paper chromatography.

Substance (V) was identified as rutin (quercetin 3-O-rutinoside), $C_{27}H_{30}O_{16}$, mp 190-191°C (aqueous ethanol); $[\alpha]_D^{20}$ −32.2° (c 0.3; methanol); λ_{max} 260, 360 nm [3].

Abu Ali Iban-Sina [Avicenna] Tadzhik State Medical Institute. Translated from Khimiya Prirodnykh Soedinenii, No. 4, pp. 513-514, July-August, 1986. Original article submitted March 17, 1986.

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Substance (VI) was identified as hyperoside (quercetin 3-O-galactoside), $C_{21}H_{20}O_{12}$, mp 237-238°C (aqueous ethanol), $[\alpha]_D^{20}$ −27.8° (c 0.5; methanol), λ_{max} 363, 257 nm [4].

This is the first time that any of these substances have been isolated from this species of milk vetch.

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CHEMICAL COMPOSITION OF THE HERB Ajuga chia

S. A. Prokopenko

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Ajuga chia Schreb (Lamiaceae) is one of the common plants in the south of the European part of the USSR [1]. We have obtained new information supplementing the facts already known about the chemistry of this species [2, 3]. In the process of investigating the chemical composition of the epigeal part of the plant, we have isolated a number of substances and have determined their structures. The raw material was first extracted with acetone and, after drying, it was extracted additionally with methanol. From the acetone fraction by preparative TLC on silica gel (unfixed 0.5-mm layer) in hexane—acetone (75:25), a white microcrystalline substance with mp 287-290°C was obtained that was identical with ursolic acid in its spectral and chromatographic properties.

The methanolic extract was mixed with a small amount of silica gel, and the solvent was driven off. The fraction sorbed on the support was deposited on a column of silica gel in chloroform. Elution was carried out with chloroform containing increasing concentrations of methanol (2, 5, and 10%). As a result, the following compounds were isolated:

Substance (I): mp 267-274°C; UV spectrum, λ^{CH_3OH}, nm: 256, 294, 351; it was characterized as 6,7-dihydroxycoumarin (esculetin);

Substance (II): mp 344-346; UV spectrum, λ^{CH_3OH}, nm: 269, 295 sh, 335; this was 4',5,7-trihydroxyflavone (apigenin);

Substance (III): mp 331-333°C; UV spectrum, λ^{CH_3OH}, nm: 256, 269 sh, 353; this corresponded to 3',4',5,7-tetrahydroxyflavone (luteolin); and

Substance (IV): mp 255-258°C; UV spectrum, λ^{CH_3OH}, nm: 255, 266 sh, 348. Luteoline and glucose were identified in the products of the hydrolysis of (IV); thus, the initial compound was luteoline 7-O-glucopyranoside.

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