By the PC and GLC methods we found, in addition to the coumarin derivative mentioned, suberosin, imperatorin, isoimperatorin, marmezin, deltoin, prangenin hydrate and oxypeucedanin hydrate. For PC we used the following systems: 1) mobile phase petroleum ether; stationary phase ethylene glycol, and 2) mobile phase benzene, stationary phase formamide [3]. GLC was performed on a "Pye-Unicam 104" instrument using a column 1.5 m long containing as the stationary phase OV-17 (3%) on Chromosorb W (50-60 mesh). The temperature was programmed at 2 deg/min, 180-256°C. The rate of flow of the carrier gas, argon, was 30 ml/min [4, 5]. The high sensitivity of the GLC method enables microamounts (traces) of coumarin derivatives to be detected in extracts.

The use of the above-described GLC conditions with programming of the temperature makes it possible to separate substances similar in structure – in particular, deltoin and pranchimgin – through their relative retention times. These furocoumarins together or separately are frequently found in various parts of plants of the genus Prangos, but it is very difficult to identify them by the PC and GLC methods without isolation. The detection of scopoletin is interesting from the point of view of the biogenesis of the coumarins in plants of this genus.

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FLAVONOIDS OF Ajania Fruticulosa

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Ajania fruticulosa (Ledeb.) Poljak., family Asteraceae is found in the USSR in the regions of Central Asia, and Western and Eastern Siberia [1]. We have investigated the flavonoids of the epigeal part of this plant growing in the Mongolian People's Republic. The material was collected by the resources-prospecting division of the Combined Soviet-Mongolian Comprehensive Biological Expedition in 1972 and 1974 on the territory of the Kobdo and South Gobi aimaks in the vegetation period.

The dry ground epigeal mass of the plant was extracted with petroleum ether to eliminated lipophilic components, and then the flavonoids were extracted with 70% ethanol. The concentrated ethanolic extract was dissolved in water and the solution was treated successively with chloroform, ethyl acetate, and butanol. The ethyl acetate fraction was separated chromatographically on a Kapron column. Elution with chloroform–ethanol (9:1) yielded substances (I) and (II). The chloroform fraction of the extract was chromatographed on Woelm silica gel (activity grade 5) in the chloroform–benzene (1:1) system, giving substance (III). All three substances showed a positive cyanidin reaction and were flavonoid aglycones [2].

Substance (I), mp 236-238°C (chloroform), 360, $\nu_{max}^{CH_3OH}$: 266, 272 sh., 360 nm; melting point of the triacetate 157°C (chloroform). According to UV spectroscopy with ionizing and complex-forming additives and the PMR spectroscopy of (I) and its triacetate, the substance contained three free OH groups in positions 3', 4', and 5 and three OCH_3 groups in positions 3, 6, and 7, and it was identified as 3',4',5-trihydroxy-3,6,7-trimethoxyflavone [3, 4].

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Substance (II), mp 206-208°C (chloroform–acetone), $\nu_{max}^{CH_3OH}$: 262, 269, 358 nm, melting point of the tetraacetate 159°C (chloroform). According to its PMR and UV spectra, (II) differed from (I) by the presence of a free OH group in position 7 and was 3',4',5,7-tetrahydroxy-3,6-dimethoxy-flavone – axillarin [4-6].

Substance (III), mp 160°C (acetone), M^+ 388, $\nu_{max}^{CH_3OH}$ 254, 279, 345 nm. Analysis of UV and mass spectra and their comparison with literature information [8, 9] enabled substance (III) to be identified as 5-hydroxy-3,3',4',6,7-pentamethoxyflavone – artemisetin.

Paper chromatography with markers showed the presence of caffeic and chlorogenic acids in the plant.

This is the first time that all the above substances have been detected in Ajania fruticulosa.

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TRIFOLIN FROM Euphorbia condylocarpa

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We have previously reported the isolation of a flavanone 7-glucoside from the herbage and flowers of Euphorbia condylocarpa M. B. [1]. On further separation of the combined flavonoids on a column containing polyamide sorbent and by fractional crystallization, we isolated an individual substance $C_{21}H_{20}O_{11}$, mp 229-231°C, R_f 0.76 (15% acetic acid system).

The positive cyanidin reaction of the substance and its UV spectrum with absorption maxima in the 258 and 364 nm regions showed its flavonoid nature. The orange pigment formed in the cyanidin reaction of the substance did not pass into octanol.

Hydrolysis of the substance with 3% sulfuric acid yielded 63% of an aglycone $C_{15}H_{10}O_6$ with mp 271-273°C, and D-galactose was identified in the acid hydrolyzate by paper chromatography. Enzymatic hydrolysis with a preparation from Aspergillus oryzae gave the same products.

On the basis of UV and IR spectroscopy and the results of alkaline hydrolysis, the aglycone was identified as kaempferol. A spectral analysis of the aglycone and of the glycoside in the UV region with ionizing and complex-forming reagents showed that the sugar component in the glycoside under investigation was present at C_3 of the flavonoid aglycone [2], and the glycoside isolated is kaempferol 3-O-β-D-galactopyranoside (trifolin).

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