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FLAVONOIDS OF *Pseudosophora alopecuroides*

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Pseudosophora alopecuroides (L.) Sweet (fam. Fabaceae) is a perennial herbaceous weed plant possessing an insecticidal and repellent action [1, 2]. In folk medicine, crushed seeds of this plant are recommended for poor digestion and loss of appetite [2]. The flavonoids isobavachin, glabrol, ammothamnidin, trifolirhizin, vexibinol, and vexibidin have previously been isolated from its roots [3, 4].

We have now studied the flavonoids of the epigeal part of the plant gathered in the fruit-bearing period on the territory of the Republic of Karakalpakstan.

The air-dry comminuted raw material (2.7 kg) was extracted with chloroform (5 × 10 liters) at room temperature. The chloroform was distilled off, the residue was dissolved in hot ethanol, the solution was diluted with water, and the resulting precipitate was filtered off. The filtrate was evaporated in vacuum, and the residue was dried and chromatographed on a column of silica gel in a chloroform–hexane gradient system and chloroform. Compounds (**1-4**) were obtained.

By the column chromatography on silica gel of an alcoholic extract of roots gathered in the Tashkent oblast we have isolated vexibinol, trifolirhizin, and substance (**5**).

Compounds (**1-5**) were identified from the results of spectral (UV, mass, and ^1H and ^{13}C NMR) investigations and, in the case of substances (**1-4**), by direct comparison with authentic specimens.

Genistein (1), (4',5,7-trihydroxyisoflavone) — $C_{15}H_{10}O_5$, M^+ 270, mp 299-302°C, λ_{max} 263, 329 nm (lg ε 4.42; 3.81) [5].

Isobavachin (2), (4',7-dihydroxy-8-[γ,γ-dimethylallyl]flavanone) — $C_{20}H_{20}O_4$, M^+ 324, mp 204-205°C, λ_{max} 287, 312 nm (lg ε 3.91; 3.78) [3].

Inermin (3), (3-methoxy-8,9-methylenedioxypterocarpan) — $C_{16}H_{12}O_5$, M^+ 284, mp 178-179°C, λ_{max} 282, 288, 309 nm (lg ε 3.55; 3.61, 3.74) [6].

β-Sitosterol (4), $C_{29}H_{50}O$, M^+ 414, mp 137-138°C.

Sophoraflavanone (5) — $C_{39}H_{38}O_9$, amorphous substance with decomposition temperature 137-140°C, $[\alpha]_D$ −97.8° (MeOH). λ_{max} 292, 341 nm; $+AlCl_3$, 315, 388 nm; $+CH_3COONa$, 304, 335 nm.

On acetylation with acetic anhydride in pyridine, compound (**5**) formed a hexaacetyl derivative with mp 92-93°C. The ^1H NMR spectrum of the latter in $CDCl_3$ showed — in addition to the signals of the protons of six $Ar-OCOCH_3$ groups (2.09 ppm, 3H; 2.17 ppm, 15H) and of a lavandulyl group (1.54, 1.62, 1.68 ppm; br.s, each 3 × ($>C-CH_3$); 4.54 and 4.61 ppm, br.s, each $>C=CH_2$; 5.05 ppm, br.t, 6.5 Hz, $-CH_2-CH=$) — the signals of the protons of the heterocyclic ring *C* of a flavanone (2.40-2.80 ppm, m, 2H-3; 5.44 ppm, dd, 12.8 and 3.0 Hz, H-2) and also of H-α (5.61 ppm, d, 5.5 Hz) and H-β (4.32 ppm, d, 5.5 Hz) of a disubstituted benzofuran nucleus. The signals of 10 appeared in the 6.72-7.32 ppm region, 4 of them in the form of two-proton doublets with SSCCs of 9.0 Hz at 7.01 and 7.24 ppm.

The fact that substance (**5**) was a flavanolignan was confirmed by the presence of the signals of the carbons C-2 (73.8 ppm), C-3 (42.6 ppm), C-α (92.9 ppm), and C-β (54.2 ppm) in the ^{13}C NMR spectrum of the hexaacetate.

A comparative study of the ^1H and ^{13}C NMR spectra with the literature permitted the substance under investigation to be identified as sophoraflavanone I [7], isolated previously from two species of *Sophora* L. [7, 8].

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