

According to the results of two-dimensional paper chromatography, an ethanolic extract of the epigeal part of *Astragalus subrobustus* Boriss. collected in Armenia on the shores of Lake Sevan contained no less than nine phenolic compounds represented by flavonoids and hydroxycinnamic acids.

The air-dry raw material was exhaustively extracted with 70% ethanol in a Soxhlet apparatus. The ethanolic extract was evaporated in vacuum and the aqueous residue was treated successively with chloroform and ethyl acetate. Five flavonol aglycons and glycosides (I-V) and four hydroxycinnamic acids (VI-IX) were isolated from the ethyl acetate extract by column chromatography on polyamide sorbent.

The structures of the individual substances were shown with the aid of chemical and physical methods on the basis of the results of acid and alkaline hydrolysis, and also by comparison with authentic samples.

Substance (I) — $C_{15}H_{10}O_6$, mp 275–277°C, λ_{\max} 265, 370 nm — was characterized as kaempferol [1].

Substance (II) — $C_{15}H_{10}O_7$, mp 308–312°C, λ_{\max} 265, 375 nm — was identical with quercetin [1].

Substance (III) — $C_{21}H_{20}O_{12}$, mp 238–241°C, $[\alpha]_D^{20}$ — 58° (s 0.1; ethanol), λ_{\max} 259, 365 nm. On acid hydrolysis (2% H_2SO_4 , 100°C, 60 min) it was split into D-galactose and an aglycon — quercetin. Compound (III) was identified as hyperoside [1, 2].

Substance (IV) — $C_{21}H_{20}O_{11}$, mp 178–180°C $[\alpha]_D^{20}$ — 69° (s 0.5; ethanol) λ_{\max} 267, 350. In a hydrolysate, D-glucose was revealed by paper chromatography, and the aglycon kaempferol was isolated. This substance was identified as astragalin [2].

Substance (V) — $C_{21}H_{20}O_{11}$, mp 191–193°C $[\alpha]_D^{20}$ — 45° (s 0.1; methanol, λ_{\max} 255, 359 nm. Acid hydrolysis yielded kaempferol, and D-galactose was detected in the hydrolysate. Substance (V) was identified as trifolin [2].

Substances (VI-IX), on alkaline hydrolysis (0.1 N KOH, 99°C, 60 min) formed quinic acid, which was detected by the barbituric acid reagent (blue coloration in visible light and pink coloration in UV light). The aromatic components of substances (VI) and (VII) proved to be caffeic acid, of (VIII) ferulic acid, and of (IX) p-coumaric acid. Comparison with authentic samples permitted substances (VI-IX) to be identified as chlorogenic, neochlorogenic, and 3-feruloyl- and 3-p-coumaroylquinic acids, respectively [3].

This is the first time that any of these substances have been isolated from *Astragalus subrobustus* Boriss.

LITERATURE CITED

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