AURONE FROM *Astragalus microcephalus* STEMS

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In continuation of studies of phenolic compounds from plants of the genus *Astragalus* [1], we studied vegetative organs from *A. microcephalus* for the presence of their derivatives. It was found that the aerial part of this plant was rich in flavonoids; stems and roots, saponins. The flavonoid spectrum of leaves and flowers differed slightly. Leaves, flowers, and stems contained a compound with R_f 0.45 (*n*-BuOH:CH_3CO_2H:H_2O, 4:1:2) that did not give the color characteristic of flavones and flavonols on spraying with methanolic base (10%).

The thick aqueous alcohol extract (360 g) from stems of *A. microcephalus* was fractionated over polyamide sorbent (d = 5 cm, h = 30 cm) with successive elution by water and ethanol (45 and 90%). Flavonoids were not detected in the aqueous eluats. Condensation of the ethanol (45 and 90%) eluats produced amorphous brown powders in 2.7% (total 1) and 0.5% (total 2) yields. Total 2 contained the desired flavonoid.

Total 2 (2 g) was separated over a column of silica gel (d = 2 cm, h = 55 cm) with elution by $CHCl_3$ and $CHCl_3$:CH_3OH with increasing concentration of the latter to afford **1** (26 mg), **2** (35 mg), **3** (46 mg), **4** (40 mg), and **5** (38 mg).

Compounds **1** and **3**-**5** were yellow crystals and gave reactions characteristic of chalcones. They isomerized into flavanones upon refluxing with HCl and gave a positive Synod reaction [2].

Compound **2** was orange crystals and, in contrast with the other compounds, did not isomerize into a flavanone. It was dark yellow in visible and UV light on paper chromatography. Treatment with ammonia vapor did not change the nature of its fluorescence. Treatment with KOH solution (10%) gave an orange color. Compound **2** was not hydrolyzed by acid and base. Its MW (270.24, mass spectrometry) agreed with the formula $C_{15}H_{10}O_5$. UV spectrum (λ_{max}, nm): 270, 380 sh, 400, 420 sh. Table 1 lists the PMR and ^{13}C NMR spectra.

Based on a comparison of the PMR and ^{13}C NMR spectra of **2** with sulfuretin [3], the isolated compound was 3′,4′,6-trihydroxyaurone. The structure was confirmed by COSY, HMBC, and HMQC correlation spectra.

The aurone sulfuretin was isolated for the first time from a representative of the genus *Astragalus*.

TABLE 1. PMR and ^{13}C NMR Spectra of **2** (C_5D_5N, δ, ppm, J/Hz)

C atom	δ_C	δ_H	C atom	δ_C	δ_H
2	147.4	–	10	113.0	7.20 (s)
3	182.7	–	1′	125.2	–
4	126.5	7.87 (d, J = 8.4)	2′	119.3	8.13 (d, J = 2.0)
5	113.9	6.96 (dd, J = 8.4; 2.0)	3′	148.0	–
6	167.9	–	4′	150.4	–
7	99.7	6.91 (d, J = 2.0)	5′	117.4	7.30 (d, J = 8.3)
8	169.0	–	6′	125.7	7.55 (dd, J = 8.1; 2.0)
9	114.9	–			

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