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FLAVONOIDS AND ISOFLAVONOIDS FROM *Genista sessilifolia* DC. GROWING IN TURKEY

F. Tosun,[1*] C. Akyuz Kizilay,[1] and A. U. Tosun[2]

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The genus *Genista* L. (Leguminosae) is represented by 13 species among the Turkish flora, inclusive of *G. involucrata*, *G. aucheri, G. burdurensis*, and *G. sandrasica*, which are endemic [1, 2]. Continuing our investigations on the Turkish *Genista* species [3, 4], we now report an investigation of the flavonoid content of *Genista sessilifolia* DC. by chromatographic and spectroscopic methods.

Previous phytochemical studies on *Genista sessilifolia* reported the isolation of alkaloids [5, 6] and the occurrence of flavonoid compounds such as daidzein, genistein, formononetin, and fisetin, which have been identified by TLC analysis [7]. Antiinflammatory activity was found for the flavonoid extract of this plant [8].

Current research into *Genista sessilifolia* led to the isolation of genistein (**1**, 4′,5,7-trihydroxyisoflavone), daidzein (**2**, 4′,7-dihydroxyisoflavone), formononetin (**3**, 7-hydroxy-4′-methoxyisoflavone), chrysoeriol (**4**, 5,7,4′-trihydroxy-3′-methoxyflavone), genistin (**5**, genistein7-*O*-glucoside), daidzin (**6**, daidzein7-*O*-glucoside), luteolin (**7**, 3′,4′,5,7-tetrahydroxyflavone), luteolin 7-*O*-glucoside (**8**), luteolin 7-*O*-diglucoside (**9**), and vitexin (**10**, 5,7,4′-trihydroxyflavone 8-*C*-glucoside).

All the identified flavonoids (five isoflavonoids and five flavones) are known compounds and, except for genistein, daidzein, and formononetin, have been reported for the first time from *Genista sessilifolia*.

The results of this phytochemical study are in agreement with the distinctive characteristics of the tribe *Genisteae*, namely high concentration of isoflavones, absence of leucoanthocyanidins, regular occurence of glycoflavones, and presence of flavones, which in phylogenetic terms is a more advanced character than the presence of flavonols [7].

Melting points were determined on an Electrothermal 9200 Digital Melting Point Apparatus. PMR spectra were recorded on a Bruker 400 MHz NMR spectrometer. Thin-layer chromatography was performed on a silica gel 60 F_{254} plates (Merck No.5554). Column chromatography was performed on a silica gel 60 (0.040–0.063mm, Merck No. 9385) column. Preparative thin-layer chromatography was carried out on silica gel 60 F_{254} plates (Merck No. 5744).

Plant Material. Aerial parts of *Genista sessilifolia* were collected in the vicinity of Ankara-Lalahan (Turkey) during the flowering period by Prof. F. Tosun, who identified the plant. A voucher specimen (AEF 13470) is preserved at the Herbarium of the Faculty of Pharmacy, Ankara University, Ankara, Turkey.

Isolation of the Constituents. Powdered air-dried aerial parts of *Genista sessilifolia* (250 g) were extracted in a Soxhlet apparatus with MeOH (R_M, 35.56 g). R_M was dissolved in H_2O–MeOH (90:10). The soluble part was successively extracted with petroleum ether (R_P, 1.15 g) and AcOEt (R_A, 3.56 g). R_A was chromatographed on a Si gel column, which was eluted with a mixture of $CHCl_3$–MeOH–H_2O of increasing polarity, from (65:25:0.5) to (65:25:2). The collected fractions (R_{A1}–R_{A74}) were applied to preparative-TLC. After chromatography on Si gel plates using $CHCl_3$–MeOH (80:10), fractions R_{A1}–R_{A2}, R_{A3}–R_{A5}, and R_{A6}–R_{A15} yielded **3** (9.2 mg), **4** (9.1 mg), **1** (23.5 mg), **2** (2.5 mg), and **7** (12.5 mg), respectively. Fractions R_{A15}–R_{A36} were chromatographed on Si gel plates with $CHCl_3$–MeOH–H_2O (65:25:1) to give **5** (33.8 mg), **6** (4.4 mg) and **10** (10.5 mg). Fractions R_{A36}–R_{A74} were applied to chromatography on Si gel plates with $CHCl_3$–MeOH–H_2O (65:25:2). Compounds **8** (10.3 mg) and **9** (7.2 mg) were isolated.

Identification of compounds **1-10** was performed by comparing R_f values, melting points, and UV and ^{1}H NMR data with those reported in the literature [9–11] or by direct comparison with authentic samples.

1) Department of Pharmacognosy, Faculty of Pharmacy, Gazi University, 06330 Ankara, Turkey, fax: +90 312 215 16 49, e-mail: ftosun@gazi.edu.tr; 2) Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Gazi University,06330 Ankara, Turkey. Published in Khimiya Prirodnykh Soedinenii, No. 1, pp. 73-74, January-February, 2009. Original article submitted June 6, 2007.

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Luteolin 7-*O*-Diglucoside (8). UV data were in good agreement with published data [12]. PMR spectrum (DMSO-d_6, δ, ppm, J/Hz): 3.22–3.76 (12H, m, glucosyl and glucosyl protons), 5.21 (2H, d, J = 9, H-1″ and H-1‴), 6.27 (1H, s, H-6), 6.49 (1H, s, H-3), 6.67 (1H, s, H-8), 7.29 [1H, d, J = 7, H-5′), 7.78 (2H, dd, J = 7, 7, H-2′ and H-6′), 12.95 (3H, s, Ar-OH).

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