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FLAVONOIDS OF *Acacia dealbata* AND *Filipendula vulgaris* GROWING IN AZERBAIJAN

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Flowers of *Acacia dealbata* Link (Fabaceae) and leaves and stems of *Filipendula vulgaris* Moench (Rosaceae Juss.) growing in Azerbaijan were studied in a search for possible new sources of biologically active compounds [1, 2].

Previously, flowers of *A. dealbata* yielded naringenin, naringenin diglucoside, robinetin, rutin, quercetin, and other flavonoids [3]. Several flavonoids and oleanolic acid were isolated from flowers of *F. vulgaris* [4].

Flowers (0.8 kg) of *A. dealbata* that were collected at the end of March 2015 were extracted (2×) with EtOH (80%) for 24 h. The extracts were condensed in an IKARV8 rotary evaporator (Germany) to an aqueous residue that was washed with $CHCl_3$ and EtOAc. The EtOAc washings were evaporated to a dry residue that was dissolved in H_2O (100 mL) and extracted with EtOAc–hexane (1:1) and with a gradually increasing amount of EtOAc. The extraction was monitored using paper chromatography (BAW solvent system, 4:1:5, Filtrak FN5 paper).

Identical extracts were combined, evaporated, and recrystallized from aqueous EtOH to afford **1** and **2**.

Leaves and stems (without flowers) (0.6 kg) of *F. vulgaris* were extracted with EtOH (80%). The extract was evaporated to an aqueous residue that was extracted with $CHCl_3$ and EtOAc–hexane (9:1). Evaporation of the EtOAc–hexane extract and recrystallization of the residue from EtOH produced **3**. Other flavonoids were not detected in the extract.

Compound 1, $C_{21}H_{20}O_{12}\cdot 2H_2O$, mp 226–228°C (aq. EtOH), $[\alpha]_D^{20}$ –60° (*c* 0.4, MeOH). UV spectrum (MeOH, λ_{max}, nm): 362, 256. Yellow crystals cleaved by acid hydrolysis into quercetin (63.3%) and D-glucose. ^{1}H NMR spectrum (600 MHz, DMSO-d_6, δ, ppm, J/Hz): 3.10 (1H, m, H-5″), 3.13 (1H, br.t, J = 9.5, H-4″), 3.23 (1H, br.t, J = 8.5, H-3″), 3.31 (1H, br.t, J = 8.5, H-2″), 3.34 (1H, dd, J = 11.9, 6.0, H-6″b), 3.57 (1H, m, H-6″a), 5.44 (1H, d, J = 7.9, H-1″), 6.20 (1H, d, J = 1.9, H-6), 6.41 (1H, d, J = 1.9, H-8), 6.85 (1H, d, J = 8.8, H-5′), 7.56 (1H, dd, J = 8.8, 1.9, H-6′), 7.57 (1H, br.s, H-2′). ^{13}C NMR spectrum (150 MHz, DMSO-d_6, δ, ppm): 156.6 (C-2), 133.6 (C-3), 177.7 (C-4), 104.2 (C-4a), 161.5 (C-5), 98.9 (C-6), 164.4 (C-7), 93.8 (C-8), 156.6 (C-8a), 121.4 (C-1′), 116.4 (C-2′), 145.3 (C-3′), 148.7 (C-4′), 115.5 (C-5′), 121.9 (C-6′), 101.1 (C-1″), 74.3 (C-2″), 76.7 (C-3″), 70.1 (C-4″), 77.7 (C-5″), 61.3 (C-6″). Compound **1** was identified as quercetin-3-*O*-β-D-glucopyranoside (isoquercitrin) [5, 6].

Compound 2, $C_{21}H_{20}O_{13}$, mp 258–260°C (aq. EtOH), $[\alpha]_D^{20}$ –50° (*c* 0.58, DMF). UV spectrum (MeOH, λ_{max}, nm): 364, 262. Dark-yellow powder cleaved by acid hydrolysis into myricetin (64.0%) and D-glucose. ^{1}H NMR spectrum (600 MHz, DMSO-d_6, δ, ppm, J/Hz): 3.10 (1H, m, H-5″), 3.13 (1H, br.t, J = 9.5, H-4″), 3.23 (1H, br.t, J = 8.5, H-3″), 3.31 (1H, br.t, J = 8.5, H-2″), 3.34 (1H, dd, J = 11.9, 6.0, H-6″b), 3.57 (1H, m, H-6″a), 5.44 (1H, d, J = 7.9, H-1″), 6.19 (1H, d, J = 1.9, H-6), 6.38 (1H, d, J = 1.9, H-8), 7.19 (2H, s, H-2′, 6′). ^{13}C NMR spectrum (150 MHz, DMSO-d_6, δ, ppm): 156.5 (C-2), 133.7 (C-3), 177.7 (C-4), 104.2 (C-4a), 161.5 (C-5), 98.9 (C-6), 164.4 (C-7), 93.7 (C-8), 156.5 (C-8a), 120.2 (C-1′), 108.8 (C-2′, 6′), 145.6 (C-3′), 136.7 (C-4′, 5′), 101.1 (C-1″), 74.2 (C-2″), 76.8 (C-3″), 70.1 (C-4″), 77.7 (C-5″), 61.3 (C-6″).

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Compound 3, $C_{21}H_{20}O_{12}$, mp 234–236°C (EtOH), $[\alpha]_D^{20}$ –58° (*c* 0.1, MeOH). UV spectrum (MeOH, λ_{max}, nm): 354, 265, 255. Light-yellow crystals cleaved by acid hydrolysis into quercetin (63.3%) and D-galactose. PMR and ^{13}C NMR spectra of **3** were identical to those of quercetin-3-*O*-*β*-D-galactopyranoside (hyperoside) [5, 6].

Isoquercitrin and isomyricitrin were not detected previously in *A. dealbata.*

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