Chemistry of Natural Compounds, Vol. 47, No. 4, September, 2011 [Russian original No. 4, July-August, 2011]

TERPENOIDS FROM *Artemisia anethifolia*

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UDC 547:314

In continuation of chemical research on representatives of the genus *Artemisia* L. (Asteraceae), we investigated terpenoid compounds from *A. anethifolia* Web., which does not occur in the flora of Azerbaidzhan [1]. According to the literature, the epigeal part of this species contains organic acids [2]; essential oil with constituents 1,8-cineol, *p*-cymene, linalool [2], α-pinene, Δ^3-carene, and limonene [3]; the sesquiterpene lactone ketopelenolide b [4], triterpenoids, alkaloids, and vitamin C [2].

We studied the aerial part of *A. anethifolia* collected in the village Upper Tagirdzhal, Gusar Region, Azerbaidzhan Republic, in September 2009.

The dark-green total extracted substances obtained by extraction (3×, each time for 3 d) with acetone of the air-dried aerial part of *A. anethifolia* was chromatographed over a column (h = 75; d = 2.5 cm) of Al_2O_3 (Brockmann activity III–IV). Fractions of 100 mL were collected upon elution by hexane, hexane:benzene (9:1, 8:2, 7:3, 6:4, 1:1, 1:2, 1:3, etc.), benzene, benzene:$CHCl_3$ (4:1, 3:2, 1:1, 1:2) and $CHCl_3$.

The chromatographic separation isolated four pure compounds (**1**–**4**).

Fraction 21, which eluted with hexane:benzene (1:1), afforded **1**, which after recrystallization had formula $C_{15}H_{20}O_3$, mp 117–118°C. IR spectrum (cm^{-1}): 1750 (γ-lactone CO), 1715 (six-membered ring ketone CO). PMR spectrum (δ, ppm, J/Hz): 1.12 (3H, d, J = 7, CH_3), 1.30 (3H, s, CH_3), 1.90 (3H, s, CH_3–C=) and 4.80 (1H, d, J = 10, lactone-ring H).

^{13}C NMR spectrum (δ, ppm): 12.0 (CH_3), 19.0 (CH_3), 22.0 (CH_3), 24.0 (CH_2), 33.0 (CH_2), 35.0 (CH_2), 36.0 (CH_2), 40.0 (CH), 49.0 (C), 52.0 (CH), 81.0 (CH), 126.0 (-C=), 130.0 (-C=), 178.0 (lactone >C=O), 212.0 (ketone >C=O).

^{13}C DEPT 135 NMR spectrum (ppm): 12.0 (CH_3), 19.0 (CH_3), 22.0 (CH_3), 24.0 (CH_2), 33.0 (CH_2), 35.0 (CH_2), 36.0 (CH_2), 40.0 (CH), 52.0 (CH), 80.05 (lactone CH).

Fractions 25–28, which eluted with hexane:benzene (1:1), afforded **2**, which after recrystallization from aqueous alcohol had formula $C_{29}H_{50}O$, mp 138–139°C. IR spectrum (cm^{-1}): 3450, 3345 (OH), 1670, 810.

Compound **3** was isolated from fractions that eluted with hexane:benzene (1:2) and had after recrystallization from aqueous alcohol formula $C_{15}H_{22}O_3$, mp 172–174°C. IR spectrum (cm^{-1}): 3500 (OH), 1760 (γ-lactone CO).

PMR spectrum (δ, ppm, J/Hz): 1.10 (3H, s CH_3–C-), 1.15 (3H, d, J = 7, CH_3–CH<), 1.80 (3H, s, CH_3–C=), 3.45 (1H, d, J = 10, -CH–OH), 4.70 (1H, d, J = 10, lactone H). ^{13}C NMR spectrum (δ, ppm): 12.0 (CH_3), 18.0 (CH_3), 19.0 (CH_3), 24.0 (CH_2), 26.0 (CH_2), 33.0 (CH_2), 39.0 (CH_2), 40.0 (CH), 53.0 (CH), 78.0 (CH–OH), 82.5 (lactone CH), 125.0 (-C=), 130.0 (-C=), 178.0 (lactone >C=O).

^{13}C DEPT 135 NMR spectrum (ppm): 12.0 (CH_3), 18.0 (CH_3), 19.0 (CH_3), 24.0 (CH_2), 26.0 (CH_2), 33.0 (CH_2), 39.0 (CH_2), 40.0 (CH), 53.0 (CH), 77.0 (CH–OH), 82.0 (lactone CH).

Compound **4** was isolated from fractions 87–88, which eluted with $CHCl_3$, and had formula $C_{15}H_{22}O_4$, mp 232–233°C (hexane:$CHCl_3$).

The IR spectrum of **4** showed at the characteristic frequencies of absorption bands for hydroxyl (3495 cm^{-1}), γ-lactone CO (1775), and a double bond (1670). Acetylation of **4** produced a monoacetyl derivative of formula $C_{17}H_{24}O_5$, mp 219–221°C. Its IR spectrum had absorption bands for OH (3460 cm^{-1}), γ-lactone carbonyl (1778), acetyl (1745, 1260), and a double bond (1655).

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0009-3130/11/4704-0648

Based on results of interpreting PMR and ^{13}C DEPT 135 NMR spectra and comparing IR spectra, **1**–**4** were identified as taurine, β-sitosterol, dihydrotaurine, and artemin, respectively [5, 6].

Taurine, β-sitosterol, dihydrotaurine, and artemin were isolated for the first time from *A. anethifolia*.

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