TRITERPENOIDS AND STEROLS FROM THREE SPECIES OF *Pulicaria*

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Natural sterols and triterpenoids are pharmacologically active compounds that possess antibacterial and hypocholesterinemic action and relieve cramps [1]. Furthermore, sterols (cholesterol, ergosterol, sitosterol) are used to prepare steroid hormones and vitamin D. Sterols play a structural role in plant-cell membranes [2].

Plants of the *Pulicaria* (Asteraceae) genus contain clerodane [3, 4], caryophyllene [5, 6], and guaiane [7, 8] terpenoids and flavonoids [9, 10] that have valuable biological properties.

In continuation of a study of terpenoid compounds from the *Pulicaria* genus, we investigated hexane fractions of the $CHCl_3$ extract of three species of fleabane: *P. salviifolia*, *P. gnophaloides*, and *P. uliginosa*. The raw material was the aerial part of the plants that was collected during fruiting near Pungan in Namangansk district.

Total *P. salviifolia* was chromatographed on a KSK silica-gel column with elution by benzine-ethylacetate followed by volume increase. Two compounds of triterpenoid and sterol nature were isolated.

Compound 1, $C_{32}H_{52}O_2$, mp 221-222°C, $[\alpha]_D$ +95.9° (*c* 1.0, $CHCl_3$). IR spectrum: 1642, 1729, 2857-3073 cm^{-1}.

The mass spectrum of **1** is typical of triterpene acetates and contains peaks for ions with *m*/*z* 468 (M^+, 1.9), 453 (1.1), 408 (1.7), 393 (1.6), 249 (3.8), 229 (3.5), 218 (5.2), 204 (15), 203 (16), 191 (32), 189 (100), 175 (24), 161 (24), 149 (19), 147 (32), 137 (12), 135 (56), 121 (75), 109 (82), 107 (73).

PMR spectrum (400 MHz, $CDCl_3$, δ, ppm, J/Hz) of **1** contains signals for protons at 0.842 (3H, s), 0.848 (3H, s), 0.853 (3H, s), 0.874 (3H, d, J = 3.4), 0.925 (3H, d, J = 3.4), 1.010 (3H, s), 1.019 (3H, s), 1.028 (3H, s), 2.0 (3H, s), 2.45 (1H, m, CH_2=C–CH), 4.50 (1H, t, CH–OAc), 4.60 (2H, m, CH_2=C).

The composition, chemical properties, and spectral data for **1** identify it as the acetate of taraxasterol [11].

Compound 2 was a mixture of sterols for which the mass-spectral fragmentation pattern showed *m*/*z* M^+ 414 (sitosterol, $C_{29}H_{50}O$), M^+ 412 (stigmasterol, $C_{29}H_{48}O$), M^+ 400 (campesterol, $C_{28}H_{48}O$), M^+ 386 (cholesterol, $C_{27}H_{46}O$), 399, 397, 396, 385, 382, 381, 371, 368, 367, 329, 315, 303, 301, 289, 273, 271, 255, 231, 213 [12].

A compound of composition $C_{30}H_{50}O$ (M^+ 426) was isolated from *P. gnophaloides* and *P. uliginosa* using the method described above. The physicochemical and spectral properties are identical to α-amyrin [13]. A crystalline mixture of sterols for which mass-spectral fragmentation showed sitosterol (M^+ 414), stigmasterol (M^+ 412), campesterol (M^+ 400), and cholesterol (M^+ 386) was also isolated.

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