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Artemisia saissanica (Krasch.) Filat. (Zaisan wormwood) (a new plant not appearing in the "Flora of the USSR" [1]) is a vicarious species of *Artemisia nitrosa* Web. ex Stechm., described from Eastern Siberia. The area of this plant, which was first determined by N. Filatova, occupies a comparatively small territory of the Zaisan basin. However, as our investigations have shown, the area of *A. saissanica* is wider than was first considered. This plant is widely distributed in Central Kazakhstan on saline soils with a light mechanical composition.

The buds, leaves, and small stems of the Zaisan wormwood collected in the budding phase in the Nura region of Karaganda province Kazakh SSR were exhaustively extracted with chloroform. The chloroform extract, after evaporation of the solvent, was treated with a mixture of ethanol and water (2:1). Substances were extracted from the aqueous ethanolic fraction with chloroform, and after the solvent had been distilled off in vacuum, a syrupy mass (resin) was obtained.

The results of biotests show the repellent activity of the resin obtained in relation to the pests of stored grain *Calandra granaria* (grain weevil) and *Rhizopert dominica* (lesser grain borer), and also against *Tetranychus urticae* (redspider mite) — a pest of hothouse corps.

The IR spectrum of this resin contained absorption bands in the 1790, 1750, 1670, and 1620 cm^{-1} regions showing the presence of sesquiterpene γ -lactones. TLC on a Silufol plate showed that the resin contained five components. When the total substances obtained from the Zaisan wormwood were separated by chromatography on a column containing type KSKG silica gel in a ratio of material to support of 1:60, with elution by benzene and by benzene-ethyl acetate (9:1, 4:1, 3:2, and 1:1), three crystalline substances (I-III) were isolated.

Substance (I). $\text{C}_{15}\text{H}_{20}\text{O}_3$, M^+ 248, mp 105-107°C (from ethyl acetate) gave on TLC a single spot with R_f 0.76 (in the hexane-ether (2:3)). The yield was 0.02% on the weight of the dry raw material. The IR spectrum showed absorption bands in the regions of (cm^{-1}) 1790 (γ -lactone CO), 1730 (CO), and 1660 (C=C). The PMR spectrum had the signals of the protons of a secondary methyl — a doublet at 1.2 ppm (3 H; $J = 6.5$ Hz); of an angular methyl — singlet at 1.30 ppm (3 H); of a methyl at a double bond — singlet at 1.93 ppm (3 H); and of a lactone proton — broadened doublet at 4.60 ppm (1 H; $J = 10$ Hz). On the basis of the physicochemical constants obtained, the results of IR, PMR, and mass spectroscopies, and a comparison of them with literature information [2], we came to the conclusion that substance (I) was the sesquiterpene lactone 1-keto-6 β ,7 α ,11 β (H)- Δ^4 -eudesmanolide.

Substance (II). $\text{C}_{15}\text{H}_{22}\text{O}_4$, M^+ 266, mp 225-227°C (ether) gave TLC a single spot with R_f 0.50 (in the hexane-ether (1:4) system). Yield 0.06%. In its physicochemical constants and spectral characteristics (IR, PMR, and mass spectra), substance (II) proved to be identical with the eudesmanolide artemin [3].

Substance (III). $\text{C}_{15}\text{H}_{18}\text{O}_3$, M^+ 246, mp 171-172°C (from ethyl acetate) gave on TLC a single spot with R_f 0.43 (in the diethyl ether system). The yield was 0.11% on the weight of the raw material. From the characteristics of its IR, UV, and PMR spectra and a mixed melting point with an authentic sample, substance (III) was identified as α -santonin [3].

This is the first time that 1-keto-6 β ,7 α ,11 β (H)- Δ^4 -eudesmanolide, artemin, and α -santonin have been isolated from Zaisan wormwood.

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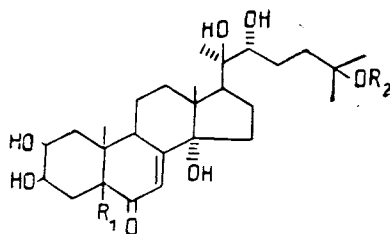
PHYTOECDYSTEROIDS OF THE PLANT *Dianthus hoeltzeri*

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We have previously reported the presence of phytoecdysteroids in representative of the genera *Silene* [1, 2] and *Melandrium* [3], belonging to the family Caryophyllaceae. Continuing a study of plants of this family for the presence of ecdysteroids, we have investigated the the peigeal part of *Dianthus hoeltzeri* Winkl. The plant raw material was collected in 1989 on the northern slopes of the Pskem range in the environs of the village of Burchmulla.

The air-dry comminuted raw material (1 kg) was exhaustively extracted with methanol. Then the solvent was distilled off and the dry residue was dissolved in 60% aqueous ethanol. The insoluble part, which did not contain ecdysteroids, was separated off. The ethanol was evaporated off and the residual aqueous solution was shaken with chloroform and then with ethyl acetate. The ethyl acetate extract was chromatographed on a column of silica gel. On elution with chloroform-methanol (9:1), three ecdysteroids were isolated



- I. $R_1 = H; R_2 = Ac$
- II. $R_1 = OH; R_2 = H$
- III. $R_1 = R_2 = H$

Substance (I), $C_{29}H_{46}O_8$, mp 196-198°C (from acetone), $[\alpha]_D^{20} +59.7 \pm 2^\circ$ (c 0.87; methanol) was obtained with a yield of 0.035% (here and below, the yield is calculated on the weight of the air-dry material). $\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}); 3400 (OH), 1655 (Δ^7 -6-keto grouping), 1725, 1275 (ester group). This compound was identified from its spectral indices and by a direct TLC comparison with an authentic sample as viticosterone E [4, 5].

Phytoecdysteroid (II), $C_{27}H_{44}O_8$, mp 251-252°C (from acetone), $[\alpha]_D^{20} +92.4 \pm 2^\circ$ (c 0.56; methanol), yield 0.052%. $\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}); 3400 (OH); 1685 (Δ^7 -6-keto grouping). Substance (II) was identified from its spectral characteristics and by a direct TLC comparison with an authentic sample as polypodine B [5, 6].

Compound (III), $C_{27}H_{44}O_7$, mp 241-242°C (from acetone), $[\alpha]_D^{20} +60.1 \pm 2^\circ$ (c 0.36; methanol), yield 0.3%, was identified from its physicochemical constants and spectral characteristics and by a direct comparison with an authentic sample as ecdysterone [5].

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