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ARGLABIN — A NEW SESQUITERPENE LACTONE FROM *Artemisia glabella*

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The total extractive substances have been obtained from the epigeal part of *Artemesia glabella* Kar. et Kir. (~ smooth wormwood) collected in August 1978 (Kent mountains, Karaganda province, Kazak SSR) by treatment with water [1] followed by extraction with chloroform. When the resin was chromatographed on a column of silica gel, we isolated from benzene fractions a substance with the composition $C_{15}H_{18}O_3$, mp 100–102°C (hexane), $[\alpha]_D^{20} + 45.6^\circ$ (c 0.3; chloroform), which has proved to be a new sesquiterpene lactone and which has been called arglabin. In TLC [on Silufol; benzene–ethanol (9:1)], it has R_f 0.50. IR spectrum:

$\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}) 1760 (C=O of a γ -lactone), 1660 (C=C). UV spectrum: $\lambda_{\text{max}}^{C_2H_5OH}$ 204 nm, ϵ 19,800, characterizing an exocyclic methylene group conjugated with the carbonyl of the γ -lactone ring. The mass spectrum contains, with a low intensity, the peak of the molecular ion m/z 246, which corresponds to the molecular weight. The presence of a fragment with m/z 231 is due to the loss by the molecular ion of a methyl group at an epoxide system as this is less strongly attached to the neighboring carbon atom than a methyl group on a double bond. Fragments with m/z 213 ($M - CH_3 - H_2O$) $^+$, 203 ($M - CH_3 - CO$) $^+$, and 185 ($M - CH_3 - H_2O - CO$) $^+$ confirm the presence of a lactone carbonyl and of an epoxide group.

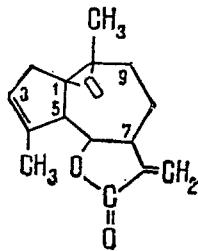
When the substance was dehydrogenated over selenium, chamazulene, identified by TLC with a marker, was obtained.

The presence of an epoxide group in arglabin was confirmed by its opening with oxalic acid [4].

The derivative obtained (II) had the composition $C_{15}H_{20}O_4$, mp 182–185°C (ether). IR spectrum, $\nu_{\text{max}}^{\text{KBr}}$ (cm^{-1}): 3450 (–OH), 1750 (C=O of a γ -lactone), 1665 (C=C).

In the NMR spectrum of arglabin (taken on a Varian HA-100D instrument in $CDCl_3$): the chemical shifts are given in the δ -scale from the signal of TMS taken as 0, there are two three-proton signals: one at 1.34 ppm (methyl at an epoxide ring) and the second at 1.94 ppm (methyl at a double bond); there are also one-proton doublets at 2.95 ppm with $J = 10$ Hz (proton at C_5), a one-proton triplet with its center at 3.97 ppm having $J_1 = J_2 = 10$ Hz (lactone proton), two one-proton doublets at 5.42 ppm with $J = 3$ Hz and at 6.10 ppm with $J = 3$ Hz (exomethylene at a lactone ring), and a one-proton signal at 5.56 ppm (vinyl proton).

On the basis of the physicochemical constants obtained, and also the results of a comparison of NMR spectra of the substance that we had isolated and sesquiterpene lactones of similar structure described in the literature (arborescin, ludartin, and others) [2, 3], we propose for arglabin structure (I) as the most probable.



*Deceased.

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COMPONENTS OF *Artemisia sieversiana*

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The epigeal part of *Artemisia sieversiana* Wild. [~ Sievers' wormwood] collected in the environs of the town of Karaganda in 1980 has been studied.

The raw material (6.5 kg) was extracted with chloroform by the steeping method. The concentrated chloroform extract was dissolved in ethanol (1 liter) and the solution was diluted with an equal amount of water. On standing, a precipitate deposited, and the aqueous ethanolic extract was treated with chloroform. The concentrated chloroform extract was separated by chromatography on alumina (activity grade IV). Elution was performed with hexane, hexane-benzene (7:3, 1:1, and 3:7), benzene, and benzene-acetone (19:1, 9:1, and 4:1).

Compounds were isolated with mp 205°C (I), mol. wt. 280; 170°C (II), mol. wt. 496; 152-153°C (III), mol. wt. 446; 120°C (IV), mol. wt. 398; and 143-145°C (V), mol. wt. 402.

Substance (I) has the composition $C_{15}H_{20}O_5$ and its IR spectrum has absorption bands at λ_{KBr}^{max} (cm^{-1}): 3430, 3470 (OH); 1770 (C=O of a γ -lactone); 1705 (C=C-C=O), and 1635 (C=C). Lactone (I) was identified as artemolin [1], and lactone (II) as absinthin [2].

On the basis of their IR and NMR spectra, compounds (III), (IV), and (V) were assigned to the lignans. Artemolin and lignan compounds have not previously been isolated from *A. sieversiana*.

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