A NEW TRITERPENE FROM THE LEAVES OF *Betula costata*

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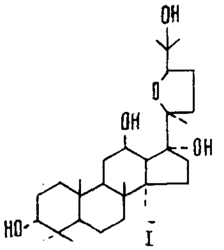
From the unsaponifiable part of an ethereal extract of the leaves of *Betula costata* (collected in the Maritime Territory, Shkotovo region, at the beginning of July by P. G. Gorov) by separation on a chromatographic column containing silica gel (KSK) in the benzene–ethyl acetate system we have isolated a triterpene (I) with the composition $C_{30}H_{52}O_5$ (yield on the weight of the air-dry leaves 0.12%) with mp 250-251.5°C (acetone), $[\alpha]_D^{20}$ + 6° (c 0.5; chloroform). The IR spectrum of (I) ($CHCl_3$) shows the bands of hydroxyl absorption at 3420 cm^{-1} (not depending on the concentration) and 3610 cm^{-1}.

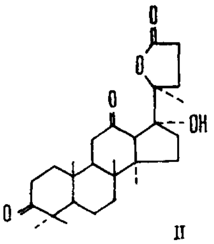
The ratio of the intensities of the peaks with m/e 477 ($M - CH_3$) and 474 ($M - H_2O$) in the mass spectrum of (I) and the considerable peaks with m/e 349 (tetracyclic system) and 143 (side chain) showed that substance (I) is a tetracyclic triterpene with a side chain in the form of a substituted tetrahydrofuran ring. According to the results of mass spectroscopy of the oxide of betulafolientriol [1], the peak with m/e 143 in the mass spectrum of (I) must belong to the ion *a* showing the presence of a side chain of the same type as in betulafolientriol oxide.

In the NMR spectrum (ν = 90 MHz, in $CDCl_3$) of the triterpene (I) the signals of the protons of eight methyl groups were found at (δ, ppm): 0.83 (3 H, s), 0.86 (3 H, s), 0.93 (3 H, s), 0.97 (3 H, s), 1.11 (3 H, s), 1.18 (3 H, s), 1.29 (3 H, s), and 1.34 (3 H, s) and the signals of the protons on the corresponding carbon atoms at: 3.39 (1 H, triplet, J = 2.2 Hz; proton at C_3, 3.80 ppm (1 H, sextet, J = 11 Hz and J = 7 Hz); proton at C_{12}; 3.74 (1 H, triplet, J = 6.6 Hz; proton at C_{24}); and 5.24 (1 H, broad singlet), corresponding to the proton of the hydroxy group at C_{12} bound by an intramolecular hydrogen bond with the oxygen of the tetrahydrofuran ring.

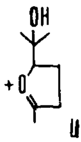
When compound (I) was oxidized with the Jones reagent in acetone, by analogy with [1], the hydroxy diketo lactone (II) was obtained which had similar characteristics to the hydroxy diketo lactone obtained by Fischer and Seiler from betulafolientetraol [2] with mp 280-290°C (decomp.), $[\alpha]_D^{20}$ + 49.°0 (c 1.0; chloroform). The IR spectrum of (II) (KBr) showed absorption in the 1770-cm^{-1} region (γ-lactone) and at 1750 cm^{-1} (CO) in $CHCl_3$ there was absorption in the 3450-cm^{-1} region (OH). In the NMR spectrum of (II) there was a signal at δ 5.31 ppm (1 H, s) corresponding to the proton of the hydroxy group at C_{17} bound by an intramolecular hydrogen bond with the carbonyl at C_{12}.



I



II



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On the basis of these results, structure (I) is suggested as the most probable for this new triterpene.

LITERATURE CITED

1. M. Nagai, N. Tanaka, and S. Ichikawa, Chem. Pharm. Bull., 21, 2061 (1973).
2. F. G. Fischer and N. Sieler, Ann. Chem., 644, 146 (1961).