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A NEW XANTHONE COMPOUND FROM *Centaurium erythraea*. III.

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We have previously reported the isolation from the herb *Centaurium erythaea* Rafn. of two new xanthone compounds, 1,6,8-trihydroxy-3,5,7-trimethoxyxanthone and 1,8-dihydroxy-3,5,6,7-tetramethoxyxanthone [1, 2].

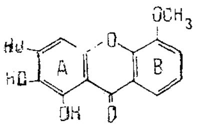
From a chloroform extract by chromatography on silica gel and elution with chloroform, a crystalline yellow substance of xanthone nature with the formula $C_{14}H_{10}O_6$, M^+ 274, mp 256-258°C (from MeOH) has been isolated.

The UV spectrum of the substance shows five absorption maxima (nm): λ_{max}^{MeOH} 244, 263 sh., 273 sh., 313, 366; + NaOAc 238, 262 sh., 292, 353, 420; + $AlCl_3$ 245, 265, 281, 343, 420; + $AlCl_3$/HCl 245, 266, 280, 339, 420; + NaOMe 232, 256, 292, 352. The PMR spectrum of the substance (0 — TMS, δ, d-pyridine, 100 MHz) shows the signals of four aromatic protons: 6.5 ppm (s, 1 H), relating to H-4 and also three aromatic protons of ring B: 7.94 ppm (q, J_1 = 8 Hz, J_2 = 3 Hz, 1 H), corresponding to H-8; 7.46 ppm (q, J_1 = 8 Hz, J_2 = 3 Hz, 1 H) and 7.26 ppm (t, $J_1 = J_2$ = 8 Hz, 1 H), relating to H-6 and H-7, respectively. There is the signal of one methoxy group at 3.94 (s, 3 H, OCH_3). The position of the methoxy group was determined from the results of mass spectrometry. The mass spectrum contained, in addition to the molecular peak, M^+ 274 (100%), a peak with m/z 259 (67%) corresponding to M — 15, which is characteristic for xanthones with a methoxy group in position 5 [3]. The presence of three hydroxy groups in the compound was confirmed by the PMR spectrum of its acetate (δ, $CDCl_3$, ppm): 2.52, 2.42, and 2.36 (s, 3 H each, $OCOCH_3$).

The presence of a free proton in position 4 was shown by the Gibbs test [4].

To prove the 1,2,3,5- type of substitution, methylation of the initial compound with diazomethane was carried out to form the known 1-hydroxy-2,3,5-trimethoxyxanthone [5]. A compound $C_{16}H_{14}O_6$ with mp 189-190°C was obtained. Its UV spectrum has six absorption maxima: (nm) λ_{max}^{MeOH} 244, 253 sh., 263 sh., 272 sh., 305, 366; + NaOAc 243, 253 sh., 262 sh., 272 sh., 305, 366; + NaOAc/H_3BO_3 242, 253 sh., 262 sh., 272 sh., 305, 366; + $AlCl_3$ 245, 266, 283, 338, 420; + $AlCl_3$/HCl 246, 266, 282, 336, 420 [5].

The facts given above permit the conclusion that the substance has the structure of 1,2,3-trihydroxy-5-methoxyxanthone and is a new xanthone compound:



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A CATECHIN 7-XYLOSIDE FROM *Ulmus laevis*

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Ulmus laevis Pall. (Russian elm) is widely distributed in Kazakhstan [1]. The bark of its young branches has long been used in folk medicine for the treatment of catarrhal diseases [2]. The chemical composition of this species has not previously been studied.

In the bark of the Russian elm we have detected nine flavans. We give the results of an investigation of a catechin xyloside. The xyloside was isolated by steeping with methanol followed by the dissolution of the dry residue from the methanolic extract in water and subsequent extraction with ether and with ethyl acetate. The xyloside passed into the ethyl acetate. Further purification was performed by partition chromatography on silica gel.

The catechin xyloside was isolated in the form of colorless needles with the composition $C_{20}H_{22}O_{10}$, mp 165-167°C, $[\alpha]_D^{20}$ −19.0°, (c 3.91; acetone), R_f 0.55 [butanol—acetic acid—water (40:12.5:29)] and 0.63 (2% acetic acid).

The elementary analyses of the xyloside itself and of its acetyl derivative corresponded to the calculated figures.

In the products of acid hydrolysis we detected (+)-catechin and D-xylose. Acylation with acetic anhydride in pyridine yielded a pentaacetyl derivative $C_{34}H_{36}O_{17}$ in the form of colorless needles with mp 181-183°C, $[\alpha]_D^{20}$ −76° (c 0.50; acetone), R_f 0.58 (TLC in the benzene—acetone (8:2) system). PMR spectrum ($CDCl_3$), ppm: δ 1.94 (1 al. Ac), 2.02 (3 sugar Ac), 2.22 (3 ar. Ac).

The physicochemical constants of the xyloside itself and of its acetyl derivative, and also the PMR spectrum of the acetyl derivative showed its complete identity with the (+)-catechin 7-β-D-xylopyranoside isolated from *Spirea hypericifolia* [3]. It must be mentioned that catechin in the form of glycosides has been found in plants extremely rarely.

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