A GLYCOSIDE OF MYRICETIN FROM THE FLOWERS OF Hibiscus cannabinus

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Flowers of Hibiscus cannabinus (kenaf), family Malvaceae, of variety 1574, were collected in August 1974 in the Kirov kolkhoz (collective farm), Nizhnechirchikskii Region, Tashkent oblast. A quantitative determination showed the presence in it of more than 4% of combined flavonoids, including five substances with R_f 0.18, 0.27, 0.55, and 0.66 (BAW) [sic].

After preliminary pre-extraction of the flowers with chloroform, the flavonoids were extracted by heating with 70% methanol three times. The methanol was distilled off, and the flavonoids were extracted from the aqueous residue with ethyl acetate. After 3-4 days, the concentrated ethyl acetate extract deposited lemon-yellow crystals of substance (I) (yield 1% on the weight of the flowers).

Substance (I), dried at 105°C, had mp 198-200°C, and when dried at 120°C its mp was 238-240°C and its composition $C_{21}H_{20}O_{13}$; R_f on paper 0.18 (BAW), 0.27 (60% acetic acid), and on Silufol plates 0.72 (BAW); $[\alpha]_D^{23}$ + 1.93° (c 0.1; dimethylformamide). UV spectrum: λ_{max} 374, 254 nm (C_2H_5OH); 376, 252 nm (C_2H_5OH + CH_3COONa); 388, 258 nm (C_2H_5OH + CH_3COONa + H_3BO_3); 438, 268 nm ($AlCl_3$); acetyl derivative, $C_{39}H_{38}O_{22}$, mp 210°; methyl ether, mp 149-150°C.

The hydrolysis of (I) by heating it with concentrated hydrochloric acid for 15 min or with 10% HCl for 4 h led to glucose [R_f 0.59, ethyl acetate–pyridine–water (2 : 1 : 2)] and an aglycone, (II), with the composition $C_{15}H_{10}O_8$, mp 340°C; mol. wt. 318 (mass spectrometry). UV spectrum: λ_{max} 372, 253 nm (C_2H_5OH); acetyl derivative, mp 220°C; pentamethyl ether, mp 194-196°C.

The physicochemical constants of (II) coincide with those of myricetin. The ratio of (II) and glucose was 1:1.

The PMR spectra of the acetyl derivatives of (I)–(III)– and of (II)–(IV)–showed the following features: in (IV) in the weak-field region there were three signals. Two doublets at 7.34 and 6.86 ppm (J = 2 Hz) relate to the H-8 and H-6 protons, respectively. A singlet at 7.60 ppm with an integral intensity corresponding to two protons relates to the equivalent H-2' and H-6' protons of ring B. Six signals in the 2.2-2.9-region show the presence of O-acetyl groups at C-3, 3', 4', 5, 5', and 7. In the spectrum of (III), the number of aromatic O-acetyl groups in the 2.2-2.4-ppm region has decreased to 5, the chemical shifts of the H-6 and H-8 protons have remained unchanged, and the signals of the H-2' and H-6' protons have shifted upfield (7.3 ppm) in comparison with the spectrum of (IV) by Δ = 0.23 ppm. Consequently, the glucose is attached to (II) in the C-3' or C-5' position.

Analysis of the IR spectra and differential IR spectra (the presence of bands at 1079 and 1037 cm^{-1}) of (I), and also a molecular rotation calculation according to Klyne [1] showed the presence of D-glucose in the furanose form attached in the equatorial position.

For compound (I) we propose as the most probable structure myricetin 3'- (or 5'-)-α-D-glucopyranoside. In its physicochemical properties, substance (I) differs from the cannabiscitrin isolated by Seshadri et al., [2, 3] from Indian varieties of kenaf.

LITERATURE CITED

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