Neoxanthin	8.1	9.6
Unidentified xanthophylls	3.2	5.9
Total amount, g/kg dry weight	8.8	12.2

The increase (1.3-fold) of the amount of oxygen-containing forms of the carotenoids in the SWE must be noted, which obviously indicates the occurrence of carotene-oxidation processes in the digestive tract of the silkworm caterpillar. The predominant forms of the carotenoids are β-carotene, lutein, violaxanthin, and neoxanthin, which is extremely characteristic for the leaves of many plants [6].

Thus, the investigations performed have shown that SWE contains a considerable amount of various carotenoids which, together with chlorophyll [2] can, obviously, likewise be utilized in the national economy.

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IRIDOID GLYCOSIDES OF *Verbascum sinuatum*

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UDC 547.918:547.192

Continuing investigations of iridoids of species of mullein [1-3], we have studied the iridoid glycosides of *Verbascum sinuatum* L.

The epigeal part of this plant, collected in the flowering phase in the basin of Lake Sevan, Armenian SSR, was exhaustively extracted with methanol. Successive chromatography, on columns of polyamide sorbent and of silica gel, of an aqueous solution of the methanolic extract that had been washed with organic solvents and freed from flavonoids with alumina gave the new iridoid glycoside (I). From the remainder of the iridoid fraction, aucubin, catalpol, and 6-α-L rhamnopyranosylaucubin (II) [4] were isolated.

Substance (I) — $C_{30}H_{38}O_{16}$, mp 266-266.5°C (methanol–water) α_{546}^{20} −178.5° (s 0.84; pyridine–methanol), ν_{max}^{KBr} 3200-3600 (OH), 1700 (C=O), 1640 1655, 1630 ($C_3 = C_4$), 1516 (Ar) cm^{-1}; $\lambda_{max}^{C_2H_5OH}$ 206, 222, 312 nm. ^1H NMR spectrum (DMSO-d_6, δ, ppm): 7.56 d (2H, J = 9 and 1 Hz; arom); 7.58 d (1H, J = 16 Hz, H-β); 6.82 d (2H, J = 9 and 1 Hz, arom.); 6.46 dd (1H, J = 6 and 1.5 Hz, H-3); 6.43 d (1H, J = 16 Hz, H-α); 5.29 d (1H, J = 5.5 Hz, H-1); 5.01 dd (1H, J = 6 and 3 Hz, H-4); 4.85 d (1H, J = 2, H''); 4.67 d (1H, J = 7.5 Hz, H'); 1.2 d (3H, J = 6.2 Hz, CH_3 of

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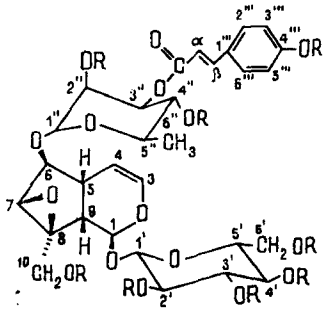
Translated from Khimiya Prirodnykh Soedinenii, No. 1, pp. 146-147, January-February, 1987. Original article submitted July 17, 1986.

0009-3130/87/2301-0125$12.50

rhamnose). ^{13}C NMR spectrum (DMSO-d_6): 93.19 d (C-1); 140.87 d (C-3), 102.34 d (C-4); 35.57 d (C-5); 84.84 d (C-6): 57.49 d (C-7); 65.26 s (C-8); 41.95 d (C-9); 58.88 t (C-10); 97.91 d (C-1'); 73.91 d (C-2'); 77.34 d (C-3'); 70.22 (C-4'); 76.32 d (C-5'); 61.29 t (C-6'); 98.90 d (C-1"); 68.16 d (C-2"); 73.33 d (C-3"); 69.09 d (C-4"); 68.89 d (C-5"); 17.67 q (C-6"); 125.25 s (C-1'"); 130.14 d (C-2'"); 115.76 d (C-3'"); 159.63 s (C-4'"); 115.76 d (C-5'"); 130.14 d (C-6'"); 144.37 d (C-β); 114 d (C-α); CO — 166.33. Mass spectrum of the octaacetate of (III) (m/z, %): 436 (6%, triacetylcoumaroyldeoxyrhamnopyranose), 376 (18), 331 (30), 279 (9); 223 (9), 200 (30), 195(7), 189 (25), 169 (55), 149 (100), 147 (50), 145 (28), 131 (86), 109 (30).

On the basis of a comparative analysis of the ^{13}C NMR spectra of glycoside (I), of saccatoside [3] and of methyl α-rhamnopyranoside [5], and also of the mass spectrum of the octaacetate (III) of glycoside (I) it was established that glycoside (I) was a position isomer of saccatoside and had the structure of 6-O-(3"-O-p-coumaroyl-α-L-rhamnopyranosyl)catalpol.



I. R = H
III. R = CO-CH_3

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