	C_1	C_2	C_3	C_4	C_5	C_6
Residues of β-2→1-bound fructose units	62.0	104.2	78.8	75.7	82.3	63.4
Residues of α-1 → 2-bound fructose units	93.4	72.7	73.7	70.45	72.7	62.0

The glucose was present at the nonreducing end of the polymer chain and was attached to C_2 of a fructose unit, as was shown by the magnitude of the chemical shift of the C-1 atom of α-D-Glcp (93.4 ppm), which is characteristic for this type of linkage.

Thus, it has been established that the monosaccharide residues of the glucofructan of *E. lactiflorus* are linked by β-2 → 1 bonds in the inulin manner and there is glucose residue at the nonreducing end.

LITERATURE CITED

1. A. Dzhumamuratova, D. A. Rakhimov, and Z. F. Ismailov, Khim. Prir. Soedin., 767 (1980).
2. A. Dzhumamuratova, D. A. Rakhimov, A. S. Shashkov, and E. S. Kondratenko, Khim. Prir. Soedin., 14 (1982).
3. A. Dzhumamuratova, D. A. Rakhimov, and Z. F. Ismailov, Khim. Prir. Soedin., 604 (1979).
4. R. G. Zhbankov, Infrared Spectra and the Structure of Carbohydrates [in Russian], Minsk (1972), p. 78.
5. S. Hakomori, J. Biochem. (Tokyo), 55, 205 (1972).
6. G. Kubberred, Acta Chem. Scand., 26, 2514 (1972).
7. M. A. Khodzhaeva and Z. F. Ismailov, Khim. Prir. Soedin., 137 (1979).

FATTY ACID COMPOSITION OF THE LIPIDS OF POLLEN (POLLEN PELLETS) OF SOME HERBACEOUS PLANTS. III.

V. A. Bandyukova, G. I. Deineko, and D. K. Shapiro

UDC 547.915+665.31

Continuing a study of the fatty acid composition of the lipids of pollen (pollen pellets) of honey-bearing plants, we have investigated the pollen collected by bees from common dandelion (*Taraxacum officinale* Wigg.), fireweed (*Chamaenerion angustifolium* Scop.), buckwheat (*Fagopyrum esculentum* Moench.), and red clover (*Trifolium pratense* L.).

We have previously established that pollen (pollen pellets) of the common dandelion and red clover contains carotenoids, leucoanthocyanidins, flavonols, and ascorbic, chlorogenic, and triterpene acids [1].

By using the previous methods for the isolation and identification of the acids [2], we detected about 17 acids in the lipids of dandelion pollen. Among them, palmitic, stearic, linoleic, and linolenic predominated. In addition to these acids, the clover pollen contained palmitoleic acid (12.8%). The fatty acid composition of the fireweed lipids differed sharply from those of the lipids of all the other samples of pollen studied [2, 3]. Only two acids predominated in the fireweed lipids — linoleic (83.68%) and palmitic (15.88%).

By comparing the results that we obtained previously (pollens of three species of willow and of plants of the Rosaceae family [2, 3]) it can be seen that the pollen of herbaceous plants contains unsaturated acids of high molecular weight that are absent from that of woody plants. The presence of arachidonic acid, $C_{20:4}$, in the clover and buckwheat pollen deserves particular attention.

Pyatigorsk Pharmaceutical Institute.

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TABLE 1. Fatty Acid Compositions of the Lipids of the Pollens (Pollen Pellets) of Some Herbaceous Plants

Acid	Amount, %				Acid	Amount, %			
	dandelion	fireweed	buckwheat	clover		dandelion	fireweed	buckwheat	clover
$C_{10:0}$	0,20	Tr.	—	—	$C_{17:2}$	0,12	Tr.	—	—
$C_{12:0}$	4,13	Tr.	2,1	1,1	$C_{18:0}$	13,44	Tr.	11,7	3,4
$C_{13:0}$	—	—	Tr.	Tr.	$C_{18:1}$	7,16	Tr.	16,1	13,5
$C_{14:0}$	0,17	Tr.	1,6	1,8	$C_{18:2}$	16,43	Tr.	4,1	11,6
$C_{14:1}$	Tr.	Tr.	0,2	0,2	$C_{18:3}$	27,41	83,68	9,2	1,7
$C_{15:0}$	Tr.	Tr.	0,9	0,5	C_x	3,86	Tr.	—	—
$C_{15:1}$	—	—	0,3	0,5	$C_{19:0}$	0,10	Tr.	—	—
$C_{16:0}$	1,27	Tr.	—	—	$C_{20:2}$	0,16	0,12	0,8	2,9
$C_{16:0}$	21,99	15,88	44,9	42,0	$C_{20:3}$	—	—	0,4	—
$C_{16:1}$	Tr.	Tr.	3,0	12,8	$C_{20:4}$	—	—	2,0	2,9
$C_{16:2}$	0,16	Tr.	—	—	$C_{21:0}$	2,58	Tr.	—	—
$C_{17:0}$	0,36	Tr.	0,5	1,0	$C_{22:0}$	—	—	0,6	1,0
$C_{17:1}$	0,20	Tr.	0,6	0,8	$C_{22:1}$	—	—	1,1	2,3
						99,74	99,68	100,1	100,0

The gas—liquid chromatographic results are given in Table 1.

LITERATURE CITED

1. A. K. Shapiro, M. P. Shamyatkov, L. V. Anikhimovskaya, T. I. Naryzhnaya, and L. S. Garadko, Vestsi Akad. Nauk BSSR, No. 4, 68 (1980).
2. G. I. Deineko, V. A. Banduakova, D. K. Shapiro, and G. E. Ryazhskikh, Khim. Prir. Soedin., 515 (1981).
3. V. A. Bandyukova, G. I. Deineko, and D. K. Shapiro, Khim. Prir. Soedin., 247 (1982).

COUMARINS AND CARDENOLIDES OF *Periploca sepium*

N. F. Komissarenko, P. P. Khvorost, and V. D. Ivanov

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Two species of the genus *Periploca sepium* (silk vine) grow in the USSR — *P. graeca* L. (Grecian silk vine) and *P. sepium* Bunge (Chinese silk vine) [1].

The isolation from the Grecian silk vine of coumarins, flavonoids, and cardenolides has been reported previously [2]. We have found no reports of a chemical study of Chinese silk vine, which grows on the territory of the Soviet Union in the coniferous/broad-leaved forests of the Ussuri krai.

In the present paper we give the results of a study of the coumarins and cardenolides of the bark and young shoots of Chinese silk vine grown in the Moscow area.

The coumarins and cardenolides were isolated by a method described previously [2]. One substance of coumarin nature (I) and one substance of cardenolide nature (II) were obtained.

Substance (I), with the composition $C_9H_{10}O_4$, mp 201-203°C, fluoresced bright blue in UV light. λ_{max} (in ethanol), nm: 256, 295, 340. Acetylation gave a monoacetate with mp 176-177°C and the empirical formula $C_{12}H_{10}O_5$.

From the physicochemical properties of its acetyl derivative, its mixed melting point and that of its acetyl derivative with authentic samples, and IR spectra, the compound under investigation was identified as scopoletin [2].

All-Union Scientific-Research Institute of the Chemistry and Technology of Drugs, Kharkov.

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