FATTY ACID COMPOSITIONS OF THE NEUTRAL LIPIDS OF SOME VARIETIES OF *Carthamus tinctorius*

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A number of varieties of *Carthamus tinctorius* L. (safflower) are promising oil plants which have long attracted attention. However, in the literature available to us there is no information on the fatty acid composition of the seeds and petals of the safflower varieties that we have investigated.

In the present communication we give the results of an investigation of the fatty acid composition of the neutral lipids obtained from the seeds and petals of two varieties of safflower: Gila and No. 6 (8-2) of Mexican origin — according to the VIR [Vavilov All-Union Scientific-Research Institute of Plant Breeding] catalog, K-438 and K-439, respectively — family Asteraceae [1], grown in the Zakataly region of the Azerbaidzhan SSR.

Extraction [2] of the comminuted material with petroleum ether (bp 40-60°C) gave a light yellow fatty oil. Its fatty acid composition was determined by GLC on a Khrom-4 chromatograph using a 4 mm × 2.5 m column filled with 17% of ethylene glycol succinate on Chromaton N-AW-DMCS at 196°C.

The fatty acids were identified from their relative retention times and with the aid of the plotting of graphs of the dependence of the logarithm of the retention time on the number of carbon atoms [3]. The results of the investigations are given below:

	Gila		*№ 6* (8—2)	
Fatty acid	seeds	petals	seeds	petals
12:0	Tr.	Tr	Tr	Tr
14:0	0,2	0,8	0,4	0,8
16:0	11,3	42,1	9,6	37,0
16:1	0,7	2,2	1,0	1,6
18:0	4,6	3,3	3,9	2,8
18:1	12,7	19,3	18,2	22,6
18:2	70,5	28,7	66,9	31,7
18:3	Tr	0,9	Tr	0,6
20:0	Tr	2,7	Tr	2,9
Total acids				
saturated	16,1	48,9	13,9	43,5
unsaturated	83,9	51,1	86,1	56,5

As we see, the oils of the seeds and petals of the above-mentioned varieties of safflower did not differ with respect to their quantitative fatty-acid compositions but had different amounts of the individual acids. The main fatty acid of the seeds was linoleic (66.9-70.5%) and of the petals palmitic (37.0-42.1%). The seed oil contained very small amounts of lauric, myristic, linolenic, and arachidic acids (from traces to 0.4%), while there was a considerably larger amount of these acids in the petal oil.

The amount of unsaturated acids in the seed oil was considerably smaller than in the petal oil, the highly unsaturated fatty acids in the seed oil making up 83.9-96.1% of the total amount of acids.

The fatty acid composition of the neutral lipids of the oil of the seeds and leaves of two varieties of safflower have been investigated and considerable difference have been found in the amounts of saturated and unsaturated fatty acids.

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HYDROXYCOUMARINS AND FLAVONES OF *Securigera securidaca*

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It is known that the seeds of *Securigera securidaca* (L.) Degen et Döerfler, family Fabaceae, contain cardiac glycosides of the cardenolide group [1, 2] which are identical with the hyrcanoside and deglucohyrcanoside obtained from several species of the *Coronilla* genus [3, 4].

We have investigated the coumarins and flavonoids of the epigeal part of *S. securidaca* collected in the flowering period. They were isolated in the following way. The comminuted herbage was treated with a 10-fold amount of 80% ethanol. The resulting extract was evaporated to an aqueous residue, the chlorophylls and other lipophilic substances that had precipitated were filtered off, the washed residue was discarded, and the filtrate was treated successively with chloroform and ethyl acetate.

By column chromatography on silica gel and polyamide sorbent using benzene, chloroform, and mixtures of them as eluents [5], the chloroform extract yielded the hydroxycoumarins scopoletin ($C_{10}H_8O_4$, mp 200-202°C) and umbelliferone ($C_9H_6O_3$, mp 230-232°C), which were identical with the compounds that we had obtained previously from crown vetch coronilla. No coumarins were detected in the seeds of the plant under investigation.

From the ethyl acetate extract, by chromatography on a column of polyamide, using chloroform–ethanol mixtures with 5 to 20% of the latter as eluents, we isolated the flavone C-glucoside saponaretin, $C_{21}H_{10}O_{10}$, mp 194-197°C $[\alpha]_D^{20}$ + 49° (methanol) [6].

The structures of the substances isolated were confirmed by the results of elementary analysis, UV and IR spectroscopy, and a study of the products of dealkylation, acetylation, and methylation, and also by comparison with authentic samples.

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