

FRUIT LIPIDS OF FOUR ROSE VARIETIES

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A study has been made of the fruit lipids of four vitamin-bearing varieties of rose: Vorontsovskii-1, Vorontsovskii-3, Besshipnyi, and Vitaminnyi of VNIIVI [All-Union Scientific-Research Institute of the Vitamin Industry], that have been introduced into Tashkent Botanical Garden. It has been found that the oil is concentrated mainly in the seeds — about 9% — and the carotenoids in the pericarp — 2613-3933 mg% of the weight of the lipids. Essential fatty acids make up 61.5-70.6% of the weight of the fruit fatty acids.

The genus *Rosa L.* (rose), fam. Rosaceae, numbers about 250 species, of which seven grow in Uzbekistan [1]. The rose is one of the most promising crops of a new branch of Uzbekistan agriculture, because of its capacity for adaptation in culture, its high yield, and the high level of vitamins in the fruit.

We have investigated the fruit lipids of four vitamin-rich varieties of rose: Vorontsovskii-1, Vorontsovskii-3, Besshipnyi, and Vitaminnyi of VNIIVI [All-Union Scientific-Research Institute of the Vitamin Industry], which were obtained from VILR [All-Union Scientific-Research Institute of Medicinal Plants] (Moscow province) and introduced into the Tashkent Botanical Garden.

For each variety, the air-dry fruit was studied for oil content, the mass ratio of seeds and pericarp was determined, and the yields of their hexane and chloroform–methanol extracts were found (Table 1). The fruit of the Vitaminnyi variety had the highest oil content, which was due to a higher weight of seed in the fruit than for the other varieties. The seed oil was transparent and light orange. According to analytical TLC it consisted mainly of TAGs. In addition to these, hydrocarbons (HCs), including carotenoids, free fatty acids, sterols and their esters, and tocopherols were detected.

The hexane extract of the pericarp, of salve-like consistency and orange-red in color, amounted to 0.8-1.1% of the weight of the pericarp. It was found by analytical TLC to contain neutral lipids (HCs, TAGs, FFAs) and sterols and their esters, while five carotenoid zones were also revealed.

The polar lipids (PhLs and GLs) were concentrated mainly in the pericarp (chloroform–methanol extract)

The main indices of the rose fruit lipids are shown in Table 2. The richest in carotenoids were the fruit lipids of the variety Besshipnyi, and the poorest those of Vorontsovskii-3.

TABLE 1. Characteristics of the Rose Fruits

Variety	Oil content % on the a.d.w.	Amount, % on the weight of the fruit		Yields of extracts, % by weight			
		seeds	pericarp	hexane		chloroform–methanol	
				seeds	pericarp	seeds	pericarp
Vorontsovskii-1	4.5	38.0	62.0	8.6	0.9	1.2	6.2
Vorontsovskii-3	4.4	37.0	63.0	8.6	0.8	1.4	6.7
Besshipnyi	4.6	36.0	64.0	8.0	1.0	1.2	5.5
Vitaminnyi	4.9	44.0	56.0	8.9	1.1	0.9	6.3

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TABLE 2. Main Indices of the Rose Fruit Lipids

Index	Variety			
	Vorontsovskii-1	Vorontsovskii-3	Besshipnii	Vitaminnyi
Amount of carotenoids, mg%				
fruit	669	406	838	681
seeds	2.7	3.5	2.5	5.0
pericarp	3482	2613	3933	3888
Acid No., mg KOH				
fruit	8.45	7.05	8.35	9.10
seeds	2.3	2.2	2.6	2.8
Fatty acid composition, GLC, % by weight				
14:0	0.5	1.4	2.0	1.3
16:0	7.7	7.8	7.2	6.8
16:1	0.3	0.8	1.0	0.8
18:0	0.6	1.4	2.8	1.1
18:1	19.0	18.2	20.0	16.8
18:2	41.0	37.8	36.7	32.5
18:3	29.6	23.7	28.5	34.9
20:0	0.7	4.5	2.0	2.6
22:0	0.6	4.4	2.5	3.2

The amount of carotenoids in the dry fruit, with allowance for the oil content, was only 17.8 mg% for the variety Vorontsovskii-3, while for the other varieties it was 30.1-38.5 mg%. The fatty acid compositions of the fruits were identical with respect to both the sets of components and their amounts. The main acids, quantitatively, were the 18:1, 18:2, and 18:3 species, and the essential fatty acids amounted to 61.5-70.6% by weight.

EXPERIMENTAL

For general observations, see [2].

Analytical TLC was conducted on Silufol plates in the hexane-ether (8:2) solvent system.

The oil contents of the fruits were determined in a Soxhlet apparatus [3], acid Nos. as described in [4], and carotenoid contents by the procedure of [5].

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