

BRIEF COMMUNICATIONS

CHEMICAL COMPOSITION OF A CO₂ EXTRACT OF ROSE FRUIT

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The chemical composition and physicochemical characteristics of a CO₂ extract of rose fruit have been studied. It was established that the main component of the extract consisted of lipids, and the class and fatty-acid compositions of these are given.

We have studied for the first time the physicochemical indices and chemical composition of a CO₂ extract of the fruit of a rose growing in the environs of Almaty.

The CO₂ extract was obtained from the air-dry rose fruit at a pressure of 63 MPa and a temperature of 26°C. The yield of extract was 2.0%. The chemical composition and physicochemical characteristics of the CO₂ extract were studied by generally adopted methods [1-3] (Table 1).

The total lipids were separated into individual classes by column chromatography on silica gel in the solvent system *n*-hexane – diethyl ether – chloroform – methanol. The course of the analysis was monitored by TLC on Silufol plates using the solvent systems: 1) *n*-hexane – diethyl ether – glacial acetic acid (70:30:1) and 2) diethyl ether – benzene – ethanol – glacial acetic acid (40:50:2:0.2) [4, 5].

Among the lipids we identified (% on the weight of the lipids): hydrocarbons (0.5); carotenoids + wax esters (12.9); triacylglycerols, (18.5); free fatty acids (28.9); 1,3-diacylglycerols (15.2); 1,2-diacylglycerols (10.3); sterols (0.8); monoacylglycerols (8.3); and phospholipids (4.6).

The fatty acids isolated from the lipids by alkaline hydrolysis [6] were analyzed by GLC in the form of methyl esters [5]. The results of the analysis are given in Table 2.

TABLE 1. Characteristics of the CO₂ Extract of Rose Fruit

Index	Characteristic
External form	Oily nontransparent liquid of red-orange color
Odor	Characteristic for the raw material
n_D^{20}	1.5015
d_4^{20}	0.9026
Solubility in alcohol and chloroform	Partial
Acid No., mg KOH/g	57.0
Ester No., mg KOH/g	101.5
Iodine No., % I ₂	104.9
Content, mg/%:	
moisture, %	9.0
lipids, %	88.2
anthocyanins	47.0
carotenoids	86.0
carotenes	74.6
xanthophylls	11.4
tocopherols	81.0
ascorbic acid	153.0

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TABLE 2. Fatty-acid Composition of the CO₂ Extract of Rose Fruit

Acid, C _n	Content, % of the weight of the acids	Acid, C _n	Content, % of the weight of the acids
C _{8:0}	0.3	C _{17:1}	0.9
C _{9:0}	0.2	C _{18:0}	2.8
C _{10:0}	0.2	C _{18:1}	14.2
C _{12:0}	0.5	C _{18:2}	46.9
C _{13:0}	0.1	C _{18:3}	24.8
C _{14:0}	0.4	Total sat.	11.5
C _{14:1}	0.1	Total unsat.	88.5
C _{15:0}	Tr. (<0.1%)	Monoenic	16.8
C _{16:0}	6.2	Polyenic	71.7
C _{16:1}	1.6		
C _{17:0}	0.8		

GLC conditions: Chrom-5 chromatograph, flame-ionization detector, steel column, 0.3 × 370 cm, filled with Chromaton N-AW (0.20-0.25 mm) on which was deposited 15% of polyethyleneglycol succinate. Temperature of the column 180°C, and of the detector and evaporator 220°C; rate of flow of carrier gas (argon) 45 ml/min; rates of flow of hydrogen and air 45 and 500 ml/min, respectively.

The composition of the lipids of the CO₂ extract of rose fruit included acids with even and odd numbers of carbon atoms, the amount of the latter being 2.0% of the total acids. The main acids had 18 carbon atoms, making up 90% of the total acids.

The value of the CO₂ extract of rose fruit consisted in its high vitamin content: essential fatty acids (vitamin F), tocopherols (vitamins E), carotenoids (provitamin A), and ascorbic acid (vitamin C).

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