BRIEF COMMUNICATIONS

A CHEMICAL STUDY OF THE FRUIT OF *Persica vulgaris*

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The isolation of phenolic substances from the leaves, bark of the stems, bark of the roots, and flowers of *Persica vulgaris* Mill has been reported previously [1, 2]. The present paper gives the results of a study of the chemical composition of its fruit. To isolate the natural components, 1 kg of comminuted air-dried fruit was extracted successively with chloroform, ether, ethyl acetate, and methanol. The material from the evaporation of the chloroform extract was treated with acetone and separated into acetone-soluble and acetone-insoluble fractions. The acetone-soluble fraction, by treatment with petroleum ether and passage of the resulting solution through a column filled with alumina, yielded crystalline substances with mp 50-51, 53, 55-56, 60-61, and 63°C, which were identified as the high-molecular-weight hydrocarbons tetracosane, pentacosane, hexacosane, octacosane, and nonacosane on the basis of the results of IR spectroscopy and gas–liquid chromatography with markers on a Hitachi model K-53C chromatograph with a double flame-ionization detector. The conditions of chromatographic analysis were: stationary phase SE = 30 (10% of the weight of the solid support – silanized Chromosorb W, 60-80 mesh), column 1 m long, internal diameter 3 mm, temperature of the evaporator 350°C and of the column 280°C, rate of heating 5 deg/min, carrier gas helium. The C_{22}, C_{24}, C_{26}, C_{28}, and C_{30} hydrocarbons were used as markers. The acetone-soluble fraction was subjected to saponification. From the unsaponifiable part after separation on a column of alumina we isolated a crystalline substance with 137-138°C, composition $C_{29}H_{50}O$. IR spectrum: 3437, 1672 cm^{-1}. The preparation of a number of derivatives (acetyl derivative with mp 129-130°C; benzoyl derivative with mp 145-146°C) and a mixed melting point showed its identity with β-sitosterol isolated from the cotton plant [3].

From the ethereal extract, by chromatography on a column with polyamide powder, we obtained three colorless crystalline substances (I-III). Substance I, $C_{17}H_{16}O_6$, mp 164-165°C; acetate, mp 130-132°C. Substance II, $C_{15}H_{12}O_5$, mp 247-248°C, acetate, mp 124-126°C. Substance III, $C_{15}H_{12}O_6$, mp 237-239°C; acetate, mp 119-120°C. The UV, IR, and NMR spectra of these substances showed that they were the aglycones persicogenin, naringenin, and aromadendrin.

When the ethyl acetate was passed through a column of silica gel (type ASK), two fractions, A and B, were obtained. From fraction A a substance was isolated with mp 168-170°C, R_f 0.63, and from fraction B colorless acicular crystals with mp 234-235°C, R_f 0.70. The individuality of the compounds obtained was shown by paper chromatography in the BAW (40:12:28) system. In addition, the combined chromatography of these substances with the complex of catechins of the tea plant increased the size of the (+)-catechin and (–)-epicatechin gallate spots, respectively. On the basis of the facts given, and also of the results of a study of the products of alkaline fusion, these compounds were characterized as (+)-catechin and (–)-epicatechin gallate.

The methanolic extract of the fruit yielded a crystalline substance with mp 204-205°C, which was characterized as chlorogenic acid [4].

A further study of the methanolic extract by PC in several systems of solvents [1) butan-1-ol–pyridine–water (6:4:3); 2) ethyl acetate–pyridine–water (2:1:2); 3) BAW (4:1:5)] with markers showed the presence in it of maltose with R_f 0.30, 0.39, 0.30; lactose with R_f 0.32, 0.21, 0.23; sucrose with R_f 0.40, 0.48, 0.39; galactose with R_f 0.74, 0.53, 0.44; and glucose with R_f 0.49, 0.59, and 0.50 in systems 1, 2, and 3. When the combined carbohy-

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drates obtained were hydrolyzed with 2 N H_2SO_4, the intensities of the glucose and galactose spots increased and the spot of fructose appeared with R_f 0.50, 0.73, 0.63 in systems 1, 2, and 3, respectively [5].

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AN INVESTIGATION OF CO_2 EXTRACTS FROM THE ROOTS AND RHIZOMES OF *Potentilla erecta* AND *Archangelica officinalis*

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The roots and rhizomes of *Potentilla erecta* (L.) Hampe (tormentilla cinquefoil) and of *Archangelica officinalis* (Mococh.) Hoffm. (*Angelica archangelica*; garden angelica) have long been used as spice-aromatic plants, in view of which the compositions of their essential oils have been most studied [1, 2].

The use of liquified carbon dioxide as an extractant for plant raw material has enabled the lipid fraction to be extracted from plants in addition to terpenoids.

We have investigated the main physicochemical indices of CO_2 extracts of cinquefoil and angelica, devoting our main attention to their fatty-acid compositions.

The CO_2 extracts of *P. erecta* and *A. officinalis* were obtained from the air-dry raw material ground to a fineness of 0.10-0.16 mm. Extraction was performed in a laboratory apparatus under strictly controlled thermodynamic conditions ($P = 2.4 \cdot 10^4$ Pa, 165 min). The amount of essential oil was determined by steam distillation with a Ginsberg receiver, and the lipid fraction of the extract was isolated by precipitation with cooled methanol from the initial product. The saponifiable and unsaponifiable substances were obtained after alkaline hydrolysis by extraction with petroleum ether of the hydrolyzate before acidification (unsaponifiables) and after acidification (saponifiables). To study their fatty-acid compositions the lipid fractions were subjected to transesterification in absolute methanol in the presence of sodium methoxide. The methyl esters of the fatty acids were analyzed in a "Khrom-2" gas chromatograph with a column 190 cm × 4 mm using as the stationary phase polyethylene glycol succinate on Chromosorb (60-80 mesh) 20% W_1/W_2, temperature +195°C, carrier gas nitrogen (80 ml/min):

Index	CO_2 extract of P. erecta	CO_2 extract of A. officinalis
Yield of extractive substances, % on the absolute dry weight of the raw material	4.7	3.4
In the extract (%):		
essential oil	26.0	23.0
lipids	11.2	7.3

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