

PHENOLIC COMPOUNDS OF *Elaeagnus angustifolia*

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The epigeal part of *Elaeagnus angustifolia* L. (Russian olive) collected in the flowering period in the environs of Zaporozhe has been investigated in order to determine its content of phenolic compounds.

The leaves were extracted with ethanol, and the aqueous residue was purified with chloroform, acidified with 15% sulfuric acid to pH 2-3, and extracted with ethyl acetate. By preparative paper chromatography, the ethyl acetate extracts yielded substances I, II, and III, giving positive qualitative reactions for phenolcarboxylic acids, their  $R_f$  values being, respectively, 0.28, 0.52, and 0.65 (0.1 N HCl system).

**Substance I**,  $C_9H_8O_4$ , had mp 195-197°C (from 50% ethanol). UV spectrum:  $\lambda_{\max}^{C_2H_5OH}$  325, 299, 235;  $\lambda_{\max}^{AlCl_3}$  360, 315, 240;  $\lambda_{\max}^{CH_3COONa}$  310; 230;  $\lambda_{\max}^{H_3BO_3+CH_3COONa}$  320, 295;  $\lambda_{\max}^{C_2H_5ONa}$  350, 260. The alkaline fusion of I formed protocatechuic acid. The substance gave no depression of the melting point in admixture with a sample of caffeic acid.

**Substance II**,  $C_{16}H_{18}O_9$ , had mp 203-205°C (from 50% methanol). UV spectrum:  $\lambda_{\max}^{C_2H_5OH}$  325, 240;  $\lambda_{\max}^{AlCl_3}$  360, 318, 240;  $\lambda_{\max}^{CH_3COONa}$  330;  $\lambda_{\max}^{H_3BO_3+CH_3COONa}$  350, 250;  $\lambda_{\max}^{C_2H_5ONa}$  380, 260. The products of alkaline hydrolysis included caffeic and D-quinic acids. On alkaline fusion, protocatechuic acid was formed; no lactonization took place under the influence of acetic acid. Substance II showed no depression of the melting point in admixture with chlorogenic acid and was identical with the latter.

**Substance III**. UV spectrum:  $\lambda_{\max}^{C_2H_5OH}$  330, 250;  $\lambda_{\max}^{AlCl_3}$  360, 310, 235;  $\lambda_{\max}^{CH_3COONa}$  325;  $\lambda_{\max}^{H_3BO_3+CH_3COONa}$  350, 250;  $\lambda_{\max}^{C_2H_5ONa}$  370, 260. On alkaline hydrolysis caffeic and D-quinic acids were obtained. On two-dimensional chromatograms, a mixture of substance III and of neochlorogenic acid yielded a single spot.

In an acetone extract of the bark of the Russian olive obtained after the treatment of the raw material with a mixture of benzene and chloroform (1 : 1) we found four catechin derivatives by paper chromatography in the butan-1-ol-acetic acid-water (40 : 12, 5 : 29) system. Two substances were identified as (+)-catechin ( $R_f$  0.68) and (-)-epicatechin ( $R_f$  0.58) in a two-dimensional chromatographic study in parallel with authentic samples kindly given to us by L. T. Pashinina (Alma-Ata).

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