

ANTHOCYANS AND ORGANIC ACIDS OF THE FRUITS OF SOME SPECIES OF SUMAC

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UDC 547.973

Continuing an investigation of the polyphenols of some species of sumac (*Rhus coriaria*, *Rh. typhina*, and *Rh. glabra*) [1, 2], we have now studied the chemical compositions of the fruits of these plants.

The total polyphenols were isolated from them by a procedure developed previously. It was established by PC in system 1 (butan-1-ol-acetic acid-water (40:12:28)) that the polyphenols of the fruits included not only flavonols, phenolic acids, and hydrolyzable tannins but also anthocyanins.

Each total polyphenol preparation was dissolved in system 1 and subjected to chromatographic separation on a column of cellulose, using the same system as eluent. The anthocyanins appeared in the form of yellow bands. These zones were cut out, eluted with methanol, and rechromatographed on columns of cellulose. Eluents containing individual compounds were combined, concentrated to small volume, and treated with a fivefold volume of petroleum ether, and the resulting precipitates were filtered off and dried.

Compound (1). Dark violet powder with mp 216-218°C, UV spectrum (0.01% HCl in MeOH, λ_{\max} , nm) 525, with 5% AlCl₃ in EtOH - 568; R_f 0.36 in system 2 (butan-1-ol-acetic acid-water (4:1:5), upper phase), 0.22 in system 3 (water-acetic acid-hydrochloric acid (82:15:3)); identified as cyanidin 3- β -D-glucoside (chrysanthemine).

Compound (2). Dark violet powder with mp 180-183°C, UV spectrum (0.01% HCl in MeOH, λ_{\max} , nm) 535, with 5% AlCl₃ in EtOH - 570; R_f 0.16 and 0.26 in systems 2 and 3, respectively; identified as delphinidin 3- β -D-glucoside (myrtillin).

Compound (3). Dark violet crystals with mp > 300°C (decomp.), R_f 0.21 (system 4: acetic acid-hydrochloric acid-water (5:1:6) and 0.35 (system 5: 2 N hydrochloric acid in *n*-butanol), UV spectrum (0.01% HCl in MeOH, λ_{\max} , nm) 545, identified as delphinidin.

It was also found that the fruits of all the sumac species investigated contained considerable amounts (5-7%) of organic acids.

In *Rhus glabra* we detected the following acids: malic with R_f 0.31 (system 6: isoamyl alcohol-5 M formic acid (1:1), descending PC); R_f 0.18 (system 7: ethanol-NH₄OH-water (16:1:3), descending PC); citric with R_f 0.22 (system 6), 0.04 (system 7); succinic with R_f 0.60 (system 2); fumaric with R_f 0.80 (system 6); maleic with R_f 0.54 (system 6) and 0.23 (system 7); and tartaric with R_f 0; 15 (systems 6 and 7); in *Rhus coriaria*: malic, citric, fumaric, and tartaric; and in *Rhus typhina*: malic, succinic, fumaric, and ascorbic with R_f 0.37 (system 2, descending PC) and 0.35 (system 8: water-saturated phenol + 1% acetic acid; descending PC).

The malic acid formed a considerable part (up to 25%) of the total amount of acids in all the sumac species investigated.

REFERENCES

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