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LUTEOLIN GLUCOSIDES FROM *Ferula varia*

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We have previously reported the isolation of cynaroside (luteolin 7-O-β-*D*-glucoside) from the epigeal part of *Ferula varia* (Schrenk) Trautv., synonym *F. schair* Borszcz, fam. Apiaceae [1]. Cynaroside is a biologically active compound and is of practical interest [2].

As a result of investigations performed with the aid of HPLC, it has been established that the crude cynaroside and an 80% ethanolic extract from the epigeal part of *F. varia* contained another two glycosides of flavonoid nature.

Chromatographic analysis was conducted on a Millikhrom-4 microcolumn liquid chromatograph with a UV-spectrophotometric detector, using standard stainless-steel columns (2 × 64 mm) filled with the sorbent Separon C18. The acetonitrile—phosphate/acetate buffer (pH 2.8) (25:75) system proved to be the optimum for separating the mixture of glycosides. Rate of flow 50 μl/min, time for measuring the signal 0.4 s. Detection was conducted at wavelengths of 256, 270, 330, and 352 nm.

The individual components of the mixture were identified by comparing their retention times with those for authentic substances and by comparing UV spectra, and also from the increase in the area of their chromatographic peaks on the addition of authentic compounds. In addition, we carried out acid hydrolysis followed by the HPLC analysis of the products and also the direct recording of the UV spectra of these substances on the Millikhrom-4. It was established that the aglycon of all three glycosides was luteolin. A typical separation of the *F. varia* glycosides is given in Fig. 1.

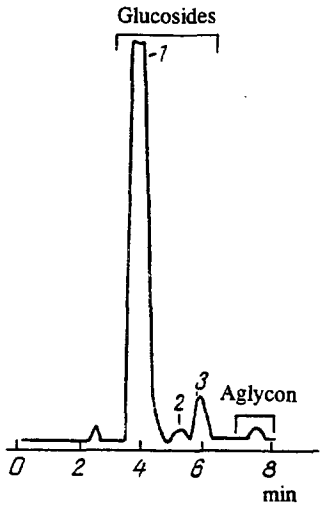

Fig. 1. Separation of the components of the crude cynaroside by the HPLC method (sorbent Separon C18, MP — acetonitrile—phosphate/acetate buffer, pH 2.8): elution profile: phase A — 270 μl; phase B — 230 μl; rate of flow of eluent 50 μl/min; analytical wavelength 352 nm.

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In order to isolate the luteolin glycosides detected, the mixture of flavonoids (10.0 g) that deposited when a chloroform-purified aqueous alcoholic (80%) extract of the epigeal part of the plant was cooled was chromatographed on a column of silica gel in a chloroform—methanol gradient system. Here, in addition to cynaroside, we isolated another two glycosides, (1) and (2). The acid hydrolysis of both compounds formed luteolin and *D*-glucose in equimolar amounts. By a study of UV and PMR spectra, and also by a comparison of the physicochemical properties with literature information, the flavonoid glycosides (1) and (2) were identified as luteolin 4′-O-β-*D*-glucopyranoside [3-5] and luteolin 3′-O-β-*D*-glucopyranoside [3, 4], respectively.

This is the first time that the above-mentioned glycosides have been isolated from *Ferula varia*.

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