FLAVONOIDS FROM THE LEAVES OF *Digitalis ciliata*

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By PC analysis, the presence of eight substances of flavonoid nature have been established in the leaves of *Digitalis ciliata* Trautv. For their isolation, the raw material was treated with 80% ethanol, the ethanol was distilled off from the extract, the precipitate was separated off, and the aqueous liquid was treated with chloroform. The purified aqueous solution was extracted with ethyl acetate. Three flavonoids of low polarity passed into the ethyl acetate. The polar substances remained in the aqueous phase. It was shown by acid hydrolysis that both fractions contained flavonoids consisting of derivatives of apigenin and luteolin.

From the ethyl acetate fraction by column chromatography on polyamide sorbent we obtained two individual crystalline aglycones — flavonoid 1 and flavonoid 2 — and from the aqueous extract a glycosidic substance — flavonoid 3.

With a solution of $FeCl_3$, flavonoid 1 formed a dark brown coloration. Acetylation gave an acetate, $C_{21}H_{16}O_8$, mp 179-183°C, the deacetylation of which restored the initial compound. By comparing IR spectra and by a mixed-melting point, the flavonoid was identified as apigenin. Flavonoid 2 proved to be luteolin, which we have also obtained from the leaves of *D. ciliata* as a byproduct in the isolation of cardenolides [1].

Flavonoid 3 with the composition $C_{29}H_{20}O_{11}$, mp 228-229°C, $[\alpha]_D^{20}$ −40° (c 0.1; ethanol—dimethylformamide, 1:1) gave with $FeCl_3$ solution a brown coloration changing to dirty green. In UV light it fluoresced a dark color, and after treatment with $AlCl_3$ it assumed a brown-yellow color.

On PC in the BAW (4:1:2) and 5% CH_3COOH systems it had R_f 0.22 and 0.30, respectively, which distinguishes it sharply from luteolin 7-glucoside [2]. It was not cleaved by alkali. It was not hydrolyzed by dilute H_2SO_4 (2 and 5%) and was cleaved with difficulty by 10% H_2SO_4, giving luteolin and D-glucose. It was hydrolyzed by the enzyme of the grape snail and formed luteolin and D-glucose. UV spectrum: λ_{max} 350, 256, 268 nm. The UV spectra obtained with diagnostic additives showed that the 4'-, 5-, and 7-OH groups in the glycoside are free. The results of a comparison of molecular rotation [3] with the introduction of a correction factor showed a β-glycosidic bond and a pyranose oxide ring of the sugar component in the glycoside investigated.

On the basis of the results obtained, the structure of flavonoid 3 can be represented as luteolin 3'-O-β-D-glucopyranoside, or dracocephaloside [4]. This is the first time that luteolin 3'-glucoside has been found in the genus *Digitalis*.

LITERATURE CITED

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