

BRIEF COMMUNICATIONS

LEPIDOSIDE FROM LEPIDIUM PERFOLIATUM

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This communication gives the results of a further chemical study of the flavonoids of Lepidium perfoliatum L. (clasping pepperweed) [1]. By chromatography on Kapron using isopropanol and isobutanol eluents we isolated an individual flavonoid glycoside, which we have called "lepidoside."

Lepidoside consists of small yellowish-green acicular crystals soluble in water and alcohols with mp 259–261° C (from ethanol); $[\alpha]_D -65^\circ$ (methanol); R_f 0.68 (15% acetic acid), 0.79 (50% formic acid); λ_{max} in ethanol, $m\mu$: 350, 265 ($E_{1\%}^{1\text{cm}} = 215$); with alkali: 405, 380, 270; with zirconyl nitrate: 400, 350, 280; with zirconyl nitrate and citric acid: 350, 265; and with sodium acetate: 350, 265.

In a study of the products of acid hydrolysis we found kaempferol, D-xylose, and L-rhamnose (1:1). Consequently the carbohydrate components are present in positions 3 and 7. The percentage content of the aglycone (48.5%) and also the ratio of the intensities of the absorption maxima of the first band in the UV spectra of the glycoside and the aglycone (28%) show that the substance is a diglycoside. Its acid hydrolysis with 10% acetic acid led to the formation of two intermediate products (I and II).

Substance I has R_f 0.42 (15% acetic acid) and 0.62 (50% formic acid), λ_{max} in ethanol, $m\mu$: 350, 265; with sodium acetate 370, 273; with zirconyl nitrate: 405, 280; with zirconyl nitrate and citric acid: 350, 265; and with alkali 400, 273. Acid hydrolysis yielded kaempferol and D-xylose, which showed that this intermediate is kaempferol 3-D-xyloside.

Substance II has R_f 0.16 and 0.34 (in the systems mentioned above, respectively), λ_{max} in ethanol, $m\mu$: 365, 260; with zirconyl nitrate: 445, 255; with zirconyl nitrate and citric acid: 430, 270; and with sodium acetate 365, 260. The products of acid hydrolysis were found to contain kaempferol and L-rhamnose. These results show that intermediate II is kaempferol 7-L-rhamnoside.

The alkaline cleavage with 0.5% caustic soda solution of lepidoside led to the formation of kaempferol 3-D-xyloside as the sole product, and hydrolysis with emulsin gave kaempferol 7-L-rhamnoside.

Thus, lepidoside can be characterized as kaempferol 7-L-rhamnosido-3-D-xyloside.

REFERENCES

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