LUTEOLIN 7-β-D-GLUCOSIDURONIC ACID FROM Phlomis tuberosa

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By chromatography on polyamide we have isolated from an ethanolic extract of the leaves of Phlomis tuberosa L. a flavonoid glucosiduronic acid in the form of a salt with mp 210-215°C, readily soluble in water. After extraction from an acidified aqueous solution with butanol, a substance $C_{21}H_{18}O_{12}$ was obtained with mp 190-193°C, λ_{max} 350, 267, 255 nm, R_f 0.39 in 15% acetic acid.

The NMR spectrum of the trimethylsilyl ether of the glycoside had the following signals: multiplet at 7.30 ppm (2H) corresponding to H-2',6'; doublet at 6.80 ppm (1H), J = 9 Hz corresponding to H-5'; singlet at 6.40 ppm (1H) corresponding to H-3; two doublets (1H each) at 6.44 and 6.30 ppm, J = 2.5 Hz corresponding to the protons in position 8 and 6, respectively.

The substance is a monoglucosiduronic acid, as can be seen from its NMR spectrum. A doublet at 5.00 ppm (1H), J = 7 Hz, is due to the proton of the glycosidic center of β-glucuronic acid; the signals of the four protons of the glucuronic acid residue are found in the 3.5-4.0-ppm region. The hydrolysis of the compound with β-glucuronidase formed an aglycone, $C_{15}H_{10}O_6$, with mp 320-325°C, identified from its NMR spectrum in comparison with that of an authentic sample of luteolin. Glucuronic acid was found in the hydrolyzate. Ultraviolet spectra show that the glucuronic acid is attached to position 7 of the luteolin.

When the substance was methylated by Hakomori's method, followed by methanolysis, methyl 2,3,4,6-tetra-O-methylglucuronide, identified by the GLC method [1], was obtained.

Thus, this compound is luteolin 7-β-D-glucopyranosiduronic acid, which has previously been isolated from various plants [2].

LITERATURE CITED

1. G. O. Aspinall, J. Chem. Soc., No. 3, 1676 (1963).
2. T. B. Harborne, Comparative Biochemistry of Flavonoids, Academic Press, New York (1967).

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