HOMOORIENTIN FROM Phlomis tuberosa

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Continuing an investigation of the polyphenolic substances from Phlomis tuberosa (L.) Sp. pl. (family Labiatae Juss.), in addition to orientin and cynaroside, which have been isolated previously, we obtained homoorientin (III). To isolate it, the epigeal part of the plant collected in June, 1972, in the flowering period in the environs of the town of Kursk was extracted with 80% ethanol with subsequent purification and separation on polyamide sorbent.

Substance (III), with the composition $C_{21}H_{22}O_{11}$, after additional purification on Kapron consisted of yellow needles with mp 234-235°C, R_f 0.29 (15% acetic acid, system 1), 0.37 [butan-1-ol–acetic acid–water (4 : 1 : 5), system 2]; λ_{max} in ethanol: 250, 270, 352 nm; with zirconium nitrate: 280, 330, 412 nm. The magnitude of the bathochromic shift with zirconium nitrate shows the site of attachment of the carbohydrate residue to be position 6 or 8 in the form of a C-glycoside. The 60-nm bathochromic shift of the first band characterizes substitution at position 8, which agrees with literature information.

The hydrolysis of substance (III) with a 10% solution of HCl led to two substances: the starting material and a substance with R_f 0.16 (system 1) and 0.32 (system 2) which was identical with the orientin isolated previously. The isomer was detected after hydrolysis for 30 min: on more prolonged hydrolysis (more than 4 h) the equilibrium shifted in the direction of substance (III).

Acid hydrolysis according to Kiliani [2] of the compound under investigation gave the aglycone, with mp 328-330°C, R_f 0.90 (system 2), identified as luteolin. The carbohydrate moiety consisted of D-glucose with a small amount of D-arabinose. The appearance of the latter is characteristic for the hydrolysis of C-glycosides and can be explained by the assumption that bond cleavage takes place not only between the carbohydrate substituent and the aglycone but also between the first and second carbon atoms of the sugar.

The yield of the aglycone (63%) shows that the glycoside under investigation is a monooside.

The IR spectrum has absorption bands at 1082, 1056, 890, and 835 cm^{-1}, showing that the D-glucose is attached to the aglycone by a β-glycosidic bond and is present in the pyranose form, which is confirmed by the numerical values of $[M]_D \cdot K_p$ (+74.3) calculated by Klyne's method [3].

A mixture of the material under investigation with an authentic sample of homoorientin (luteolin 8-C-anti-β-D-glucopyranoside) gave no depression of the melting point.

LITERATURE CITED

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