INVESTIGATION OF THE FLAVONOIDS OF HYPERICUM ELONGATUM AND H. SCABRUM

V. A. Bandyukova and Kh. Kh. Khalmatov

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We have investigated the flavonoids of the epigeal part of the plants Hypericum elongatum Ldb. and H. scabrum collected in the flowering period in the Tashkent Oblast. The plant raw material, previously treated with chloroform, was extracted with ethanol. The alcoholic extract was evaporated to a syrupy state and was treated with hot water, and the flavonoid compounds were extracted with ethyl acetate. The extracts were concentrated, and the flavonoids were precipitated with chloroform. To characterize the total flavonoids isolated, they were chromatographed on paper. The initial total flavonoids from H. elongatum gave two spots on paper chromatography which were identified as quercitrin and hyperoside. The total flavonoids from H. scabrum were found to contain quercitrin, quercetin, hyperoside, and rutin.

The individual flavonoids were separated and purified on a column of polyamide sorbent, being eluted with increasing concentrations of ethanol (10, 20, and 30%, etc). In the elution of the flavonoids of H. elongatum, the first fraction collected contained quercitrin, and then hyperoside was eluted. Because of the ready hydrolyzability of hyperoside, a quercetin zone appeared on the column.

The column chromatography of the total flavonoids from H. scabrum showed that the main constituents were hyperoside and rutin. Quercitrin was present in considerably smaller amount.

The UV spectra taken with ionizing and complex-forming additives confirmed the results of the paper-chromatographic analysis. Thus, it was shown that all the glycosides contained a sugar residue in position 3 and a free hydroxyl group in position 7 [1]. The shapes of the curves obtained agreed with the corresponding curves of reference glycosides.

The IR spectra of the glycosides isolated showed absorption bands for the carbonyl groups of flavonols (1655–1600 cm^{-1}), a double bond (1600–1615 cm^{-1}) [2, 3] and hydroxyl groups (3300–3500 cm^{-1}). From the characteristic bands of the nonplanar deformation vibrations (810–830 cm^{-1}) it may be concluded that substituents are present in positions 3' and 4' of the lateral phenyl radical [3].

From the results of acid hydrolysis, the aglycone of the glycosides studied is quercetin, as was confirmed by UV and IR spectra and R_f values on paper chromatography.

The sugar content of the hydrolyzate was determined by thin-layer chromatography on silica gel with gypsum impregnated with 0.1 N boric acid in the methyl ethyl ketone–methanol–acetic acid (3:1:1) [4], ethyl acetate–pyridine–water (2:1:2), and butan-1-ol–acetic acid–water (4:1:5) systems (spots revealed with aniline phthalate reagent).

Thus, H. elongatum contains quercitrin and hyperoside, and H. scabrum contains rutin and quercetin in addition to these two glycosides.

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Pyatigorsk Pharmaceutical Institute,
Tashkent Pharmaceutical Institute