

## FLAVONOIDS OF *Pachyphragma macrophyllum*

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*Pachyphragma macrophyllum* (Hoffm.) N. Busch. family Cruciferae [1] was collected in the wooded zone of Mt. Beshtau (Caucasian mineral-water region) in the flowering period (May, 1973). By chromatographic analysis with the use of color reactions [2] we have established that the flowers contain six, and the leaves four, flavonoid compounds.

Two compounds were isolated by the extraction of the freshly gathered leaves with acetone followed by the concentration of the extract to  $\frac{1}{5}$  of its initial volume and recrystallization from methanol.

Substance (I) with the composition  $C_{27}H_{30}O_{16}$ , after three recrystallizations from methanol-acetone (1:1) melted at 222-224°C,  $R_f$  0.61 (15%  $CH_3COOH$ ), 0.37 (2%  $CH_3COOH$ ), 0.7 [BAW (4:1:5)]. According to the Hörhammer test [3] and UV spectroscopy with the addition of complex-forming and ionizing reagents, the compound under investigation has no free hydroxy groups at  $C_3$  and  $C_7$ . On quantitative acid hydrolysis the yield of aglycone was 46.93%, which is characteristic for diglycosides. The alkaline hydrolysis of substance (I) [4] did not lead to the formation of a monoside. The action of 2%  $H_2SO_4$  on substance (I) cleaved it after 7 min into the aglycone and the carbohydrate moiety. From the hydrolysis products an aglycone with the composition  $C_{15}H_{10}O_6$  was isolated which was identified as kaempferol by means of its melting point (274-276°C), UV spectroscopy ( $\lambda_{max}^{CH_3OH}$  267, 360 nm), the products of alkaline degradation, and the results of comparison with authentic samples. The carbohydrate component was D-galactose.

Enzymatic hydrolysis and differential IR spectroscopy showed the  $\beta$  configuration of the glycosidic bond.

The above facts have enabled substance (I) to be identified as kaempferol 3,7-di-O- $\beta$ -D-galactopyranoside.

Substance (II), with the composition  $C_{21}H_{20}O_{11} \cdot 2H_2O$ , mp 227-229°C, was characterized by UV and IR spectroscopy and acid and alkaline cleavage as kaempferol 3-O- $\beta$ -D-galactopyranoside (trifolin).

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