PERIPLOGENIN FROM Rhodea japonica

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We have previously reported the isolation from the leaves of Rhodea japonica (Thunb.) Roth., family Liliaceae, introduced into Georgia, of a number of glycosides of cardenolide nature [1, 2].

The present communication is devoted to the determination of the structure of substance B, the method of isolating which is as follows. From the comminuted dry leaves the cardenolides were extracted with 80% ethanol. The ethanolic extract was distilled in vacuum to an aqueous residue, which was treated with carbon tetrachloride and was then filtered through a layer of alumina, after which the cardenolides were eluted with water until the Legal reaction was negative. The cardenolides were extracted from the aqueous filtrate with chloroform–ethanol (93 : 7) and the extract was evaporated to a dry residue. For additional purification from pigments, the light brown residue was dissolved in 50% ethanol and was passed repeatedly through a small layer of alumina. The ethanol was distilled off from the purified eluate and the cardenolides were extracted with chloroform–ethanol (85 : 15). The purified feebly polar cardenolides were separated by partition chromatography on silica gel. Water was used as the stationary phase and benzene with methyl ethyl ketone in various proportions as the mobile phase. This led to the isolation of three substance of cardenolide nature (A, B, C).

Substance A was isolated in very small amount in the amorphous state. On chromatography in a number of solvent systems it had the same R_f values as digitoxigenin. Substance C was identified as rhodexin B, which we had isolated previously [2].

Substance B, after additional purification on a column of alumina, was crystallized from aqueous ethanol. The crystals obtained melted at 222-227°C and, after recrystallization from a mixture of acetone and ether, at 232-236°C. The cardenolide investigated had the empirical formula $C_{23}H_{34}O_5$, $[\alpha]_D^{21}$ + 28.1° (c 0.7; acetone) and from its elementary composition and molecular weight it was an aglycone. With 84% sulfuric acid it formed colors changing with time: 0-1 min – orange; 2-5 min – orange with a blue edge; 15-30 min – greenish blue; 120 min – bright blue. The UV spectrum showed one maximum in the 218 nm region (log ε 4.2), which is characteristic for a five-membered unsaturated lactone ring.

From its physicochemical properties, the coloration with 84% sulfuric acid, a mixed melting point, and parellel chromatography in a number of systems ($R_{periplogenin} = 1$), substance B proved to be identical with the periplogenin obtained from periplocin from the grape vine [3].

This is the first time that periplogenin has been detected in Rhodea japonica.

LITERATURE CITED

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