GLYCOSIDIC ALKALOIDS OF Solanum dulcamara

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In the present paper we give the results of a study begun previously [1-3] of the glycosidic alkaloids of Solanum dulcamara L. (bitter nightshade), which grows abundantly in Belorussia. The air-dry epigeal part of the plant collected in the flowering period was extracted with 2% acetic acid. The extract was treated with 25% ammonia solution and the precipitate of "crude" glycosidic alkaloids was dried and extracted with boiling methanol. The combined glycosidic alkaloids were separated by chromatography on a column of silica in the ethyl acetate–methanol (15 : 10) system. Two individual compounds were obtained.

After recrystallization from methanol, the first substance had the composition $C_{50}H_{83}NO_{21}$, mp 268-270°C (decomp.), $[\alpha]_D^{20} - 58°$ (c 0.6; methanol). The IR spectrum had absorption bands at, cm^{-1}: 3400 (OH): 1140 (>NH); 1050 (CH_2-OH). UV spectrum of a solution of the substance in 94% sulfuric acid: λ_{max} 255, 318, 400 nm (log ε 4.14, 4.85, 3.87).

The composition of the second substance was $C_{45}H_{75}NO_{16}$, mp 246-248°C (decomp.) $[\alpha]_D^{20} - 39°$ (c 0.38; methanol). IR spectrum, cm^{-1}: 3400 (OH), 1140 (>NH), 1050 (CH_2-OH). UV spectrum of a solution of the substance in 94% sulfuric acid: λ_{max} 267, 325, 410 nm (log ε 4.01, 4.31, 3.66).

The acid hydrolysis of the two substances separately gave the same aglycone, with the composition $C_{27}H_{45}NO_2$, mp 205°C (decomp.), $[\alpha]_D^{20} - 52.5°$ (c 0.6; chloroform). IR spectrum, cm^{-1}: 3600 – 3460 (alcoholic OH); 2750 – 2850 ($C-CH_3$); 1140 (>NH). UV spectrum of a solution of the substance in 94% sulfuric acid: λ_{max} 340, 397 nm (log ε 3.94, 3.93). From its IR spectrum, the UV spectrum of a solution in 94% sulfuric acid, its behavior on paper and thin-layer chromatography, and by the constants given, we identified the aglycone as soladulcidine [4-6].

The analysis of the carbohydrates in an acid hydrolyzate of each glycosidic alkaloid [7] showed that the first substance contained two molecules of D-glucose and one molecule each of D-galactose and D-xylose, and the second substance contained one molecule each of D-glucose, D-galactose, and L-rhamnose.

On the basis of what has been stated above, we identified the compounds as, respectively, α- and β-soladulcines [6, 8].

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