GLYCOSIDIC ALKALOIDS OF Solanum rostratum

É. N. Novruzov, S. M. Aslanov, and N. M. Ismailov

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The present communication gives the results of a study of the alkaloids of Solanum rostratum Dun. (buffalobur nightshade) growing in Azerbaidzhan. The plant material was collected in the Stepanakert region at the beginning of fruit bearing. The air-dried epigeal part of the plant was extracted with 5% acetic acid. The extract was treated with 25% ammonia solution. The resulting precipitate of alkaloids was dried and extracted with methanol in a Soxhlet apparatus. The yield of combined glycoalkaloids was 0.2% (on the dry weight).

The results of thin-layer chromatography [fixed layer of KSK silica gel–gypsum (8:2), ethyl acetate–pyridine–water (20:5:2) system, chromogenic agent Dragendorff's reagent [1], and a fixed layer of Al_2O_3 (activity grade II) with the same solvent system and iodine vapor as the chromogenic agent] showed that the combined alkaloids contained two substances. They were separated by column chromatography on alumina (activity grade II) with elution by ethyl acetate–pyridine–water (20:5:2). Two individual compounds were obtained.

The first substance had mp 276-278°C (decomp., from methanol) $[\alpha]_D^{20}-57.5°$ (c 0.62; pyridine). Its IR spectrum (mull in paraffin oil) had absorption bands at (cm^{-1}) 3600-3200 (OH and NH groups), 1610 (double bond), 1450, 1410, and 1370 (CH_3 and CH_2 groups), and 1140 (> NH). The UV spectrum of a solution of the substance in 94% sulfuric acid had λ_{max} 260, 325, 412 nm (log ε 4.1, 4.34, 3.86).

The second substance had mp 301-303°C (decomp.), $[\alpha]_D^{20}-95.7°$ (c 0.51; CH_3OH). Its IR spectrum (mull in paraffin oil) showed absorption bands at (cm^{-1}) 3550-3180 (OH and NH groups), 1620 (double bond), 1460 and 1380 (CH_3 and CH_2 groups), 1160 (> NH), and 1050 (CH_2OH). The UV spectrum of a solution of the substance in 94% sulfuric acid had λ_{max} 268, 320, 408 nm (log ε 4.24, 4.49, 3.94).

The acid hydrolysis of the two substances gave the same aglycone with mp 199-200°C, $[\alpha]_D^{20}-91.7°$ (c 0.73; CH_3OH), which was identified as solasodine [2, 3].

Analysis of the carbohydrate fraction of the hydrolyzate by paper chromatography showed that the first substance contained D-glucose, D-galactose, and L-rhamnose, and the second contained D-glucose and two molecules of L-rhamnose.

By the absence of depressions of the melting points of mixtures of these substances with authentic samples and by the identity of the corresponding IR spectra, these substances were identified as solasonine and solamargine [4-10].

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