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SAPOGENINS OF THE ROOTS OF Gypsophila bicolor

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We have previously [1-3] reported the presence of triterpene saponins in the roots of Gypsophila bicolor Freyn et Sint (family Caryophyllaceae) growing in Azerbaidzhan. In the second paper we give the results of an investigation of the sapogenins of this plant.

The saponins were extracted from the roots of G. bicolor with water-saturated n-butanol with heating. The butanolic extract was filtered hot and was then cooled to room temperature. The saponins that deposited were separated off, washed repeatedly with n-butanol, and dried. This gave the combined saponins in the form of a nonhygroscopic white powder with a faint greyish tinge.

In a study of its quantitative composition by chromatography on paper and in a thin layer of silica gel in various systems, the presence of four individual triterpene glycosides – A, B, C, and D – was detected.

The combined saponins so obtained were hydrolyzed with 10% H_2SO_4 solution at 90°C for 10-12 h. The precipitate was filtered off and washed with water, and the saponins were extracted with chloroform. Chromatographic analyses in the toluene–ethanol (10:2), benzene–ethanol (10:1), and chloroform–methanol–ethyl acetate (2:1:3) systems showed that the extract obtained included the two saponins A and B.

The sapogenins were separated on a column of Al_2O_3 (activity grade II) (elution with toluene).

After recrystallization from ethanol, the composition of sapogenin A was $C_{30}H_{46}O_4$, mp 269-271°C, $[\alpha]_D^{20}$ + 90° (c 1.0; ethanol). The acetate of sapogenin A had mp 176-178°C.

From its physicochemical constants and spectral characteristics in the IR region and on the basis of comparative chromatographic investigations with authentic samples, it was established that sapogenin A was gypsogenin.

Sapogenin B, with the composition $C_{30}H_{46}O_4$, had mp 330-335°C (from methanol), $[\alpha]_D^{20}$ +40° (c 0.5; ethanol). The IR spectrum showed absorption bands in the region of 3400 cm^{-1} (OH) and 1735-1740 cm^{-1} (C=O of a γ-lactone and of an aldehyde).

The results that we obtained agree with those given in the literature [4, 5] for gypsogenin lactone, and show that sapogenin B was gypsogenin lactone.

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