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SIEVERSIGENIN — A TRITERPENOID SAPOGENIN FROM *Astragalus sieversianus*

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We have investigated the roots of the plant *Astragalus sieversianus* Pall. (family Leguminosae) collected at the foot of Mt. Chimgan (Chatkal range, Western Tien-Shan).

The air-dry comminuted roots (5 kg) were extracted with methanol. After the bulk of the solvent had been distilled off, a viscous syrupy mass was obtained, which was dissolved in two volumes of water and extracted with butanol. The butanolic extract was evaporated to dryness, the dry residue was dissolved in methanol, and the clear solution was diluted with acetone. The precipitate that deposited (217 g) was separated off. Part of the total extractive substances (10.0 g) was hydrolyzed in aqueous methanol (1:1 by volume) containing 8% of H_2SO_4 on the boiling water bath for 10 h. The sapogenins were separated and chromatographed on silica gel with elution by chloroform-ethanol (50:1). The product partially purified in this way was rechromatographed on silica gel and was eluted with ethyl acetate.

This gave 1.0 g of a crystalline compound with mp 229–231°C (ethyl acetate) $[\alpha]_D^{20} +67.1 \pm 2^\circ$ (c 1.92; methanol), ν_{max}^{KBr} 3450–3250 cm^{-1} (OH), 3045 cm^{-1} and 1640 cm^{-1} (double bond). According to the results of mass-spectroscopic analysis (MKh-1310 instrument), the genin isolated had the elementary composition $C_{30}H_{50}O_5$ (M^+ 490). Ions with m/e 143 ($C_8H_{15}O_2$) (100%) with m/e 59 (C_3H_7O) belong, in all probability, to fragments of the side chain and show that the latter is a substituted tetrahydrofuran [1].

Oxidation of the sapogenin with the Jones reagent in acetone [2] yielded a triketo derivative $C_{30}H_{44}O_5$ (M^+ 484) with mp 217–220°C (methanol), $[\alpha]_D^{20} -58.4 \pm 2^\circ$ (c 1.36; methanol). The IR spectrum of the triketo compound contained, in addition to the absorption characteristics of carbonyl functions (1710, 1728 cm^{-1}), a band of the absorption of the hydroxy group (3440–3470 cm^{-1}).

The facts given above show that the sapogenin that we had obtained belongs to the tetracyclic terpenoid series and contains three secondary and one tertiary hydroxy groups. This compound differs in its physicochemical constants from the triterpenoids reported in the literature, and we have called it sieversigenin.

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