A NEW STEROID SAPOGENIN FROM ALLIUM GIGANTEUM

F. S. Khristulas, M. B. Gorovits, V. N. Luchanskaya, and N. K. Abubakirov

Khimiya Prirodnykh Soedinenii, Vol. 6, No. 4, p. 489, 1970

UDC 547.597+547.918

From 3.2 kg of the bulbs of Allium giganteum Rgl. (family Liliaceae), collected in the flowering stage (Turkmen SSR, Central Kipet-Daghe region), we have obtained by extraction with chloroform and subsequent purification on Al_2O_3 (elution with methanol) 30 g of a resinous mixture of substances giving a positive reaction for steroid saponins [1]. The hydrolysis of 15 g of the combined saponins with 5% HCl in 50% aqueous methanol at the boil for 4 hr gave 2.0 g of a crystalline compound, $C_{27}H_{44}O_6$, which has been provisionally called "alliogenin." The melting point of this genin is 321–325° C (chloroform–methanol), $[\alpha]_D^{18}$ −71.4° (c 1.12, pyridine), mol wt 464 (mass spectrometry).

The IR spectrum of the genin has absorption bands characteristic for steroid sapogenins of the iso series (865, 900 > 920, and 985 cm^{-1}) [2] and for an OH group (3200–3500 cm^{-1}). The acetylation of the sapogenin with acetic anhydride in pyridine (36° C, 3 days) gave a triacetate, $C_{33}H_{50}O_9$, mp 250–253° C (ether–petroleum ether), $[\alpha]_D^{20}$ −109.5° (c 1.15, chloroform), mol wt 590 (mass spectrometry). The IR spectrum of the triacetate of the genin, in addition to the absorption characteristic of an ester group (1740 cm^{-1}), has a band at 3470–3500 cm^{-1} (OH group). The residual free hydroxyl group resisted oxidation with chromium trioxide in pyridine.

Thus, the genin that we have isolated is a tetrahydroxysapogenin of the iso series (25-D) with three secondary and one tertiary hydroxyl groups, and its constants differ from those of the tetrahydroxysapogenins described in the literature.

REFERENCES

1. C. Sannié, S. Heitz, and H. Lapin, Compt. Rend., 233, 1670, 1951.
2. M. E. Wall, C. R. Eddy, M. L. McClennan, and M. E. Klump, Anal. Chem., 24, 1337, 1952.

21 April 1970

Institute of the Chemistry of Plant Substances, AS UzSSR