

TRITERPENE SAPONINS OF *Zygophyllum fabago*

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It has been reported previously that the epigeal parts of *Zygophyllum fabago* L. (Syrian beancaper) contain saponins [1]. We have studied the subterranean parts of this plant growing in the Azerbaidzhan SSR.

It was found that the small amount of saponins in the raw material is accompanied by a considerable quantity of substances of similar polarity, which complicates the isolation of the saponins by the generally adopted procedure. The raw material was extracted successively with chloroform, acetone, and 100% and 80% methanol. The saponins passed into the acetone fairly readily (1.9%). The methanolic extract yielded 34% of saponin fraction and the aqueous methanolic extract 2.6%.

A chromatographic analysis of the combined saponins of the acetone fraction in a thin layer of silica gel in the chloroform-methanol-water (65:35:10) system showed the presence of five triterpene glycosides with close R_f values which we have called, in order of increasing polarity, zygophyllosides A, B, C, D, and E. Substances B, C, D, and E remained in the methanolic and aqueous methanolic fractions.

The acid hydrolysis of the combined triterpene glycosides from the acetone fraction yielded an aglycone with mp 305-306°C $[\alpha]_D^{25} + 78.4^\circ$ (c 0.8; chloroform); mp of the acetate 238.5°C, $[\alpha]_D^{25} + 70.2^\circ$ (c 0.9; chloroform); in a thin layer of silica gel the substance appeared at the level of an authentic sample of oleanolic acid. The IR spectra of the genin and its acetate were identical with those of oleanolic acid and its acetate. Thus, the aglycone obtained is pure oleanolic acid.

D-Galactose, D-glucose, and L-arabinose were found in the aqueous hydrolysate remaining after the separation of the genin.

By partition chromatography on a column of Sephadex, 4.0 g of the combined saponin fraction yielded zygophyllosides C (0.1 g) and D (0.23 g). It was established by acid hydrolysis that these glycosides contain oleanolic acid as the aglycone, while the carbohydrate moiety in saponin C consists of D-glucose and L-arabinose and in saponin D D-glucose and D-galactose.

It was shown by gas-liquid chromatography [2, 3] that in zygophylloside C the ratio of the sugars glucose and arabinose is 3:1, and in zygophylloside D the ratio of D-glucose to D-galactose is 5:1.

LITERATURE CITED

1. A. I. Ismailov, Dokl. Akad. Nauk AzerbSSR, **4**, No. 11, 471 (1949).
2. G. Wulff, J. Chromatogr., **18**, 285 (1965).
3. T. T. Gorovits, Khim. Prirodn. Soedin., **5**, 49 (1969).

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