DIOSGENIN, NEORUSCOGENIN, AND RUSCOGENIN FROM Ruscus ponticus, R. hypophyllum, and Allium albidum

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We have found steroid sapogenins in Ruscus ponticus Woronow and R. hypophyllum L., family Liliaceae [1], growing in Georgia. From the epigeal parts of R. ponticus we have isolated two aglycones. One of them, obtained in very small amount, is a monohydroxysapogenin with mp 196-198°C which has been identified as diosgenin from its thin-layer chromatographic mobility and its IR spectrum. This is the first time that the presence of diosgenin in the genus Ruscus has been established.

The second substance, isolated in an amount of 0.70%, is a dihydroxysapogenin with mp 199°C, $[\alpha]_D^{20}$ −129.8° (c 1.00; chloroform), mp of the diacetate 130°C, $[\alpha]_D^{20}$ −76.2° (c 1.00; chloroform); it gives a positive reaction for a double bond, and on TLC migrates in the region of ruscogenin [2]. The IR spectrum of the genin and its acetate have absorption bands at 900 and 920 cm^{-1}, the former being the less intensive [3].

On the basis of these facts, the substance under consideration has been characterized as neoruscogenin (25S).

We also obtained two steroid sapogenins from R. hypophyllum. One, monohydroxysapogenin, was identified by its melting point, chromatographic behavior, and IR spectrum as diosgenin. The other, dihydroxysapogenin (0.47%), had mp 201-203°C, $[\alpha]_D^{20}$ −131.5° (c 1.00; chloroform); its diacetate had mp 187-190°C, $[\alpha]_D^{20}$ −86.55° (c 1.00; chloroform). The IR spectra of the genin and of its acetate have absorption bands at 898 and 922 cm^{-1} and also at 909 and 926 cm^{-1} of almost equal intensities, which shows the presence of both isomeric forms of the genin (25R and 25S). The IR spectrum of a synthetic mixture of authentic samples of ruscogenin and neoruscogenin (1 : 1) that we prepared was identical with the IR spectrum of the sapogenin from R. hypophyllum and also with the spectrum described in the literature of a mixture of the two isomers of ruscogenin from R. aculeatus [4]. Thus, the sapogenin isolated from R. hypophyllum is ruscogenin in its two isomeric forms (25R and 25S).

We reported previously [5] that the plant Allium albidum yielded, in addition to diosgenin, a dihydroxysapogenin which we did not identify, with mp 201-204°C, $[\alpha]_D^{20}$ −135° (c 1.00; chloroform). This substance gives a positive reaction for a double bond and on TLC it appears at the level of ruscogenin. The NMR and IR spectra also confirmed that this substance is ruscogenin.

This is the first time that ruscogenin has been isolated from the genus Allium.

LITERATURE CITED

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