ARBUTIN IN SOME PLANTS OF THE GENUS SEDUM

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In a study of the composition of three species of Sedum: S. hybridum L., S. aizoon L., and S. purpureum Link (Crassulaceae) by chromatography in a nonfixed layer of alumina in a butan-1-ol–ethanol–water (5 : 1 : 2) system, we found a substance of phenolic nature with R_f 0.41 (detection with diazotized sulfanilic acid).

In order to isolate the substance, the epigeal parts of the plants were extracted with ethanol and the dry residue was separated on a column of alumina (activity grade II, neutral) by discrete-gradient elution with chloroform–ethanol systems (10 : 0 → 1 : 9). When the column was eluted with the systems having ratios of 1 : 1 and 3 : 7, a phenolic glycoside was eluted in the form of colorless acicular crystals, $C_{12}H_{16}O_7 \cdot H_2O$, mp 161–162° C (from a mixture of chloroform and ethanol), $[\alpha]_D^{20}$ −64.7° (c 0.91, water). Its UV spectrum has maxima at 220 and 283 mμ (log ε 2.84 and 2.33, respectively). After drying in a vacuum pistol over P_2O_5 at 110° C for 3 hr, a hygroscopic anhydrous glycoside with mp 195–195.5° C was obtained. The substance forms a pentaacetate with mp 145–145.5° C.

On hydrolysis of the glycoside with 5% H_2SO_4 and with the enzymes of the fungus Aspergillus oryzae, equimolecular amounts of hydroquinone (mp 168.5–169° C; melting point of the diacetate 120–121° C) and D-glucose were formed.

According to its qualitative reactions [1], cleavage products, UV and IR spectra, and R_f values, and a mixed melting point test, the isolated glycoside was identified as arbutin [2, 3].

From S. aizoon two substances were isolated, with mp 139–140° C and mp 298–300° C, which were identified by their chemical properties (Lieberman-Burchard reaction) and mixed-melting point tests as β-sitosterol and oleanolic acid, respectively.

This is the first time that arbutin has been isolated from the family Crassulaceae.

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