COMMUNICATION

PLANT CONSTITUENTS

Sorbitol from Common Plantain

A sugar alcohol, D-glucitol, has been isolated from the leaf petioles of common plantain.

SORBITOL (D-glucitol) has been isolated from a number of plants, but there is no report in the literature of its isolation from common plantain (*Plantago major* L.) (*1–3*). We have isolated the sugar alcohol from this new source in 1.5% yield based on the weight of fresh leaf petioles.

The crystalline material, obtained after deionization and concentration of the aqueous plant extract, melted at 92–96° C. upon recrystallization. Lohmar and Goepp (*1*) list a melting point of 90.4–91.8° for the labile form and 96.7–97.2° for the stable form of sorbitol. Elemental analysis showed that the composition of the crystalline material corresponded to that of a hexitol.

Acetylation of the hexitol resulted in a good yield of a hexaacetate which melted at 100.5–101.5°. The literature melting point for sorbitol hexaacetate is 99° (*1*). An x-ray powder diffraction diagram of the prepared hexaacetate was identical with that of authentic sorbitol hexaacetate. The melting point was not depressed on admixture with the known.

Experimental

Melting points were determined on a Fisher-Johns melting point apparatus and are corrected. Microanalyses were carried out by Geller Laboratories, Bardonia, N. Y.

ISOLATION OF SORBITOL (D-glucitol). *Plantago major* L. leaves were gathered in the late spring. The petioles were cut away from the blades and worked up. The petioles (1.4 kg.) were washed with tap water, steeped in distilled water, then shredded in the steep water by means of a Waring Blendor (Waring Products Corp., New York, N. Y.). The gross mixture was filtered with the aid of Celite (Johns-Manville Co., New York, N. Y.) filter aid. Five liters of filtrate were collected. The filtrate was passed over an Amberlite MB-3 (Rohm and Haas Co., Philadelphia, Pa.) monobed ion exchange resin column (36 × 3 inch diameter) and the neutral, nonreducing (to Benedict's solution) effluent concentrated to a sirup in vacuo at temperatures below 50°. The sirup was covered with 95% ethanol, and after several days crystals appeared: yield 20.9 grams, m. 92–96°, after recrystallization from 95% ethanol, $[\alpha]_D^{20}$ + 0.25° (*c* 4.00, water). Analysis. Calculated for $C_6H_{14}O_6$: C, 39.55; H, 7.74. Found: C, 39.66; H, 7.86.

SORBITOL (D-glucitol) HEXAACETATE. Acetylation of 1.20 grams of crude sorbitol from plantain with acetic anhydride and anhydrous sodium acetate in the usual manner yielded 2.57 grams of sorbitol hexaacetate, m. p. 96–98°, after crystallization from 95% ethanol. The material was recrystallized from 95% ethanol [m. p. 100.5–101.5°, $[\alpha]_D^{25}$ + 10.1° (*c* 4.02, chloroform)]. Analysis. Calculated for $C_6H_8O_6(CH_3CO)_6$: (CH_3CO), 59.45%, mol. wt. 434. Found: (CH_3CO), 59.93%, mol. wt. (Rast) 445.

Literature Cited

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T. T. GALKOWSKI
P. N. GAUVIN
P. R. SANTURRI

Providence College
Providence, R. I.

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