

STEROIDAL ALKALOIDS OF *SOLANUM ACCULEATISSIMUM*

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Solanum acculeatissimum Jacq. is a perennial undershrub that grows in tropical regions of Central America (local name 'tomate de equilebra'). The present work was carried out on ripe fruits collected in the lowland rain forest areas in Jutiapa Province, Guatemala. A voucher specimen is deposited with the herbarium at Missouri Botanical Garden, Missouri, U.S.A. No earlier reports on this species have appeared but related species of *Solanum* have been examined [1–7].

Solasodine, solamargine and solasonine were found in the acid methanol extracts of the fruits.

Two facts must be noted in connection with these findings: this is the first report of the isolation of steroidal alkaloids from *S. acculeatissimum*; and furthermore the yields of total solasodine in ripe fruits are surprisingly high (3.8% dry wt.). The latter aspect provides a good economic proposition for the extraction of steroidal alkaloids from this plant species as an alternate commercial source of steroid. The plant species is easy to cultivate and therefore is most suitable for biosynthetic studies of steroidal alkaloids.

EXPERIMENTAL

Extraction and isolation of steroid alkaloids. Dry, powdered fruits (1 kg) were continuously extracted with hot 80% MeOH containing 5% HOAc. The extract was concd under red. press. and the basic steroidal alkaloids precipitated with NH_4OH at pH 10. The ppts were dried, defatted and extracted with hot MeOH during 48 hr. The MeOH extract containing steroid alkaloidal mixture was evaporated *in vacuo*, chromatographed on Al_2O_3 packed in H_2O -satd-*n*-BuOH and eluted with the same solvent system [8]. 3 fractions which obtained were examined by TLC on Si gel G, using MeOH- CHCl_3 (1:19) [9]

and Clark's reagent as spray [10]. The sugars were examined by TLC on Si gel G, using a mixture of C_7H_8 -*iso*PrOH-EtOAc- H_2O (2:10:5:2.5) and a solution of diphenyl amine-aniline-phosphoric acid as spray reagent.

Fraction I (solasodine). R_f 0.45, mp 199–201°; $[\alpha]_D^{25}$ –96° (MeOH).

Fraction II (solamargine). R_f 0.48, mp 301–303°; $[\alpha]_D^{25}$ –99° (MeOH). The acid hydrolysate was tested for sugars and shown to contain glucose (R_f 0.46) and rhamnose (R_f 0.79).

Fraction III (solasonine). R_f 0.34 (solvent system I), mp 282–286°; $[\alpha]_D^{25}$ –67° (EtOH). Hydrolysis with 10% methanolic HCl for 3 hr. afforded solasodine hydrochloride, mp 295–298°, $[\alpha]_D^{25}$ –78° (MeOH). The sugars in the acid hydrolysate were identified as galactose (R_f 0.36), glucose (R_f 0.46) and rhamnose (R_f 0.79). The identification of steroid alkaloids were further confirmed by comparing their mmp, IR, MS and derivative properties with those of authentic samples.

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