# SHORT COMMUNICATION

# Study of the Seed Oil of *Solanum platanifolium* Sims


## ABSTRACT

Seed oils from species of *Solanum* such as *S. ferox* (1), *S. indicum* (2), *S. nudiflorum* (3), and *S. chacoense* (4,5) have been shown to contain mainly linoleic, oleic, palmitic, and stearic acids. The seed oil from *S. platanifolium* contains palmitic, stearic, oleic, linoleic, and hexadecenoic acids, and a mixture of $C_{20}$-$C_{31}$ alkanols and sterols.


## PROCEDURES AND RESULTS

The seeds of *S. platanifolium* gave with petroleum ether (60-80 C) 6.48% of dark green colored oil having the following characteristics: sp gr (25 C/25 C) 0.92, $nD^{25} = 1.47$, iodine value (IV) 119.00, acid value 3.40, and saponification value 189.40.

The oil was saponified and the unsaponified matter separated from the mixed fatty acids which showed IV = 129.50 and saponification equivalent 283.70.

The mixed fatty acids were converted to methyl esters (3). The petroleum ether solution of methyl esters was cospotted with methyl esters of castor oil on thin layer chromatoplates coated with Silica Gel G and developed with a mixture of petroleum ether:ether:acetic acid (70:30:1). On spraying with concentrated sulphuric acid followed by heating 10 min at 150 C, only one spot ($R_f$ 0.87) corresponding to the nonoxygenated fatty acid esters was produced, thus indicating the absence of oxygenated acid esters in the oil.

The methyl esters on TLC studies using silver ion complex (6) and reverse phase chromatographic techniques (7) revealed the presence of methyl oleate, methyl linoleate, methyl stearate, and methyl palmitate, respectively.

The methyl esters were then analyzed by gas liquid chromatography (GLC) using Perking-Elmer 881 gas chromatograph with a 6 ft x 1/8 in. outside diameter glass column containing 10% Reoplex 400 on Chromosorb W (40-60 mesh) and a flame ionization detector. Nitrogen was used as a carrier gas with a flow rate of 45 ml/min. The column temperature was 185 C, whereas injection port and the detector were maintained at 240 C. The peak areas were measured by triangulation. The calculated composition of the acids converted from wt to mol % were: palmitic, 12.2/13.1; stearic, 2.1/1.9; oleic, 24.6/24.2; linoleic, 56.3/55.7; and hexadecenoic, 4.8/5.1.

The unsaponifiable matter was resolved on alumina (E. Merck, Darmstadt, W. Germany) by elution with successive series of solvent and solvent mixture of increasing polarity. Residues from petroleum ether:benzene (9:1) and pure benzene fractions gave crystalline compounds A (mp 78-81 C) and B (mp 128-132 C), respectively.

The acetate derivative of A was studied by GLC using 3 m x 6 mm U tube glass column with 3% SP-1000 (Supelco, Inc., Bellefonte, PA) on 100/120 mesh Gas Chrom Q at the oven temperature of 240 C and injection port and detector temperature of 250 C. Helium was used as carrier gas at a flow rate of 80 ml/min. The chromatogram showed the presence of 10 compounds of $C_{20}$-$C_{31}$ chain lengths. Of these, $C_{26}$ (19.08%) and $C_{28}$ (60.74%) compounds were the major components of the alkanol mixture of fraction A. Other compounds present were $C_{20}$ (0.31%), $C_{22}$ (0.23%), $C_{24}$ (0.79%), $C_{25}$ (0.81%), $C_{27}$ (7.28%), $C_{29}$ (3.85%), $C_{30}$ (6.43%), and $C_{31}$ (0.48%).

The compound B, which gave positive tests for sterols, was also analyzed by GLC on an F and M Gas Chromatograph model 402, with a flame detector and a 2.55 m x 6 mm inside diameter glass column packed with 5% OV-101 on Anakrom ABS 80/90 mesh. The column temperature was 275 C, whereas the injection port and detector temperature was kept at 315 C. Helium gas with a flow rate of 120 ml/min was used as the carrier gas. Standards were used for comparison and identifications. The analysis showed the presence of a mixture of sitosterol, 63.9%; stigmasterol, 24.1%; campesterol, 9.6%; and cholesterol, 2.4%.


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ACKNOWLEDGMENTS

C. Grunwald, Department of Agronomy at Kentucky University, helped with gas chromatographic analyses of sterols.


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[Received September 12, 1975]