MINOR STEROIDAL SAPOGENINS FROM FENUGREEK SEEDS, *TRIGONELLA FOENUM-GRAECUM*

R.K. GUPTA, D.C. JAIN, and R.S. THAKUR*

Central Institute of Medicinal & Aromatic Plants, Lucknow-226016, India

In our continuing chemical analysis (1-3) of *Trigonella foenum-graecum* L. (Leguminosae), we report here nine steroidal sapogenins found in the seeds. In addition to six previously reported compounds (4-7), three more minor sapogenins, smilagenin, sarsa-sapogenin, and yuccagenin, were identified.

EXPERIMENTAL

EXTRACTION AND ISOLATION OF SAPOGENINS.—Air-dried, powdered seeds (500 g) of *T. foenum-graecum* (Fenugreek, Ethiopian variety) cultivated at our institute farm were defatted with *n*-hexane. The marc was extracted with MeOH, and the MeOH extract (70 g) was dissolved in H_2O and fractionated with *n*-hexane, $CHCl_3$ and EtOAc. The H_2O layer was concentrated and dissolved in alkali solution (100 ml, 1% NaOH). The solution was further fractionated with *n*-BuOH saturated with H_2O. The BuOH extract was hydrolyzed with 2 N HCl by refluxing on a water bath for 3 h. Crude sapogenins, obtained in the form of a precipitate, were filtered and washed with H_2O until neutral. The dried, acid insoluble residue was extracted with $CHCl_3$ for 8 h.

The crude sapogenin extract was examined by two dimensional tlc on Si gel (8). The crude sapogenin mixture (1.5 g) was chromatographed on neutral alumina (100 g) with a solvent gradient from *n*-hexane to $CHCl_3$/MeOH. Three fractions of increasing polarity were obtained and named as fraction A (0.063%), fraction B (0.612%), and fraction C (0.146%).

The three fractions (A-C) were separated into their individual components by preparative tlc on argentized Si gel. Two crystalline compounds obtained from fraction A were identified as smilagenin (20 mg) and sarsasapogenin (28 mg); fraction B showed the presence of diosgenin, yamogenin, tigogenin, and neotigogenin only. Fraction C furnished three pure compounds identified as yuccagenin (9 mg), gitogenin (65 mg), and neogitogenin (13 mg). All the compounds were identified by standard spectral data as well as by comparison with authentic samples.

Full details of isolation and identification of the compounds are available on request to the senior author.

ACKNOWLEDGMENTS

The authors thank Dr. Akhtar Husain, Director, CIMAP, Lucknow, for his keen interest and for providing necessary facilities for this work. One of the authors (RKG) thanks CSIR for the award of a research fellowship. The authors are grateful to Prof. G. Blunden for providing authentic samples.

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Received 6 *March* 1986