

Studies on *Balanites aegyptiaca* Seed Oil

Sir:

In our efforts to screen nontraditional oilseeds in the State of Madhya Pradesh, India, the seed oil of *Balanites aegyptiaca* (Simarubaceae) (1) has been studied. The powdered seeds (collected locally and identified by the Botany Department of this university) after proximate analysis (2) (moisture content, 2.6%; ash content, 1.7%) were subjected to extraction with petroleum ether (60–80 C) in a Soxhlet, and purified over charcoal (yield 45%). Physicochemical values (3) of the oil were determined (sp gr (28 C), 0.9051; acid value, 0.58; iodine value, 56.5; saponification value, 172.7). After saponification (4) of the oil, the saponifiable and nonsaponifiable contents (yield 0.7%) were separated. The mixed fatty acids were converted to methyl esters and analyzed by GC (SE 30 column, FID Detector and N<sub>2</sub> carrier gas). Oleate and linoleate were found to be the major constituents, followed by palmitate and stearate. The oil did not show the presence of unusual functional groups as tested by spectroscopic and chromatographic methods.

The nonsaponifiable fraction gave a positive Liebermann-Burchard test and contained  $\beta$ -sitosterol as identified by TLC (5) (petroleum ether:ethyl acetate, 90:10) and IR ( $\lambda$  max (KBr) 3300 ~ 3400<sup>cm-1</sup>; (OH), 1639<sup>cm-1</sup>; (>C = CH -), 957<sup>cm-1</sup> (cyclohexane). The defatted seeds were treated with 10% saline and protein (yield 16%) recovered by adding HCl. For liberation of amino acids, the protein was hydrolyzed by refluxing it with acid. The hydrolysate was taken up in 10% isopropanol for paper chromatography (6), using n-butanol:acetic acid:water (40:10:50) as the solvent system. Ninhydrin

was used for detection. Thirteen amino acids (histidine, asparagine, serine, glutamic acid, lysine, glycine, glutamine, valine, threonine, aspartic acid, tyrosine, proline and cysteine) could be identified. The oil was found nontoxic but repellent (7), possibly due to its sterol-rich nature, against the domestic vermin *Periplaneta americana*. The activity was compared against a known insecticide (Baygon). The oil could be a good source of oleic and linoleic acids. Natural sources of linoleic are significant because it is an essential fatty acid.

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## REFERENCES

1. Chopra, R.N., S.L. Nayar and I.C. Chopra, *Glossary of Indian Medicinal Plants*, C.S.I.R., New Delhi, 1956, p. 32.
2. *Pharmacopoeia of India*, Ministry of Health, Government of India, 1966, p. 947.
3. *Official and Tentative Methods of the American Oil Chemists' Society*, 3rd edn., edited by W.E. Link, AOCS, Chicago, IL, 1973.
4. Hilditch, T.P., and P.N. Williams, *Chemical Constitution of Natural Fats*, 4th edn., Chapman and Hall, London, U.K., 1964.
5. Stahl, E. *Thin Layer Chromatography*, Academic Press, New York, NY, 1965.
6. Krishnamurty, K., and M. Swaminathan, *Anal. Chem.*, 27:1396 (1955).
7. Loomis, T.A., *Essentials of Toxicology*, Lea and Febiger, Philadelphia, PA, 1978.

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