Technical

Fatty Acid Composition of Brazilian Plants. I. *Stizolobium aterrimum* Piper & Tracy and *Lucuma caimito* Roem. Seed Oils

R. SCHUCH, R. BARUFFALDI and **L.A. GIOIELLI**, Department of Biochemical-Pharmaceutical Technology, Faculty of Pharmaceutical Sciences, São Paulo, Brazil

ABSTRACT

The fatty acid composition of the diethyl ether extract from velvet bean, *Stizolobium aterrimum* Piper & Tracy (family *Leguminosae*, subfamily *Papilionacea*), and abio, *Lucuma caimito* Roem. (family *Sapotaceae*), seed oils was determined by gas liquid chromatography (GLC). Palmitic, oleic and linoleic were the major fatty acids present in both species.

INTRODUCTION

The genus *Stizolobium (Leguminosae—Papilionaceae)* was formely included under the genus *Mucuna* Adams, but is now distinguished from the latter by its seeds and other characters (1). In Brazil, the major species (in terms of adaptability) is velvet bean (*S. aterrimum* Piper & Tracy), with black seeds (2,3).

Abio, *Lucuma caimito* Roem. (*Pouteria caimito* Randlk.), family *Sapotaceae,* is a tropical tree cultivated for its edible fruits. Its wood can also be used in carpentry and joinery.

The fat contents of several species from genera *Stizolobium* and *Mucuna* have been reported: *Stizolobium* sp., 3.2% and 4.2% (4); *S. deeringianum* Bort., 5.6% (4) and 5.8% (5); *M. pruriens* D.C., also referred to as *S. pruriens* Pers. (1), 3.3% (6) and 4.3% (7); *M. flagellipes* T. Vogel, 3.7% (8); *M. imbricata* 7.0% (9); *M. holtonii* 4.1% (4); *M. sloanei* Faw et Randle, 7.0% (10).

In relation to the genus *Lucuma*, the only species mentioned in the literature are *Calocarpum mammosum* Pierre, also referred as *Lucuma mammosa* Gaertn. (1,11,12) and *Lucuma salicifolia*, whose fat contents are 57.0% (13) and 5.8% (6), respectively.

The present study is part of our program of investigating fatty acid composition of Brazilian plant species. The species analyzed have not been previously reported. The results of the analysis of *S. aterrimum* were compared with literature data on *Stizolobium* and *Mucuna.*

MATERIALS AND METHODS

The velvet bean seeds were collected in Goiás State and the abio seeds in São Paulo State.

Oil Extraction

The seeds were ground, dried at 105 C and extracted with diethyl ether in a modified Soxhlet extraction apparatus (14). A design of this modified apparatus is shown in Fig. 1. The evaporation of the solvent under a CO_2 stream yielded the oil contents given in Table I.

Preparation and GLC of Methyl Esters

The Hartman and Lago (15) method was adapted for small samples and used in the preparation of the methyl esters. Gas chromatography was carried out on a 7.2 ft × 1/8 in. column of DEGS (17%) on chromosorb W (80-100 mesh), 190 C, using a gas chromatorgaph (GC) equipped with a flame ionization detector (FID). The fatty acid components were identified by comparing them with chromatograms of fatty acid analytical standards from Polyscience Corporation (6366 Gross Point Road, Niles, IL). The peak areas were measured by triangulation. The percentage of each peak was calculated as the percentage of the total area of all the peaks. The results are given in Table I.

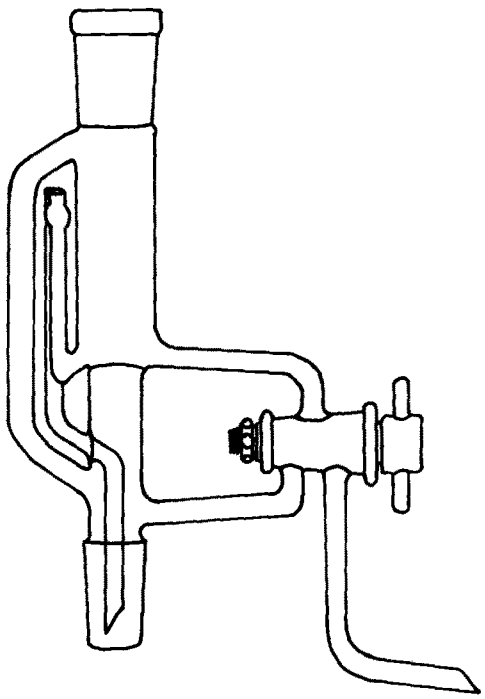

FIG. 1. Modified Soxhlet extraction apparatus.

RESULTS AND DISCUSSION

The literature data for the oil contents and fatty acid composition of species of genera *Stizolobium, Mucuna* and *Lucuma* and the values obtained in our experiments are presented in Table I.

The major fatty acids in *S. aterrimum* are palmitic and linoleic. Comparing the present results with those presented by Hilditch and Williams (16), this species, because of its negligible amount of long-chain saturated fatty acids, can be included in the same group with soybean, alfalfa (lucerne), some pulses and vetches. It presents a linoleic-rich seed fat with a higher linoleic/oleic acid ratio than soybean seed oil. This linoleic/oleic acid ratio is similar to the values reported for various *Phaseolus* seed fats. The linolenic acid content of the species is close to soybean seed oil.

The major fatty acids of *Lucuma caimito* are palmitic and oleic. Like other species of this genus, it is an oleic-rich seed fat without long-chain saturated fatty acids.

TABLE I

Oil Content and Fatty Acid Composition of Species of Genera *Stizolobium*, *Mucuna* and *Lucuma*

	Oil content (%)	Fatty acid composition (%)										
		Saturated						Unsaturated				
		12:0	14:0	16:0	18:0	20:0	22:0	12:1	16:1	18:1	18:2	18:3
Stizolobium aterrimum Piper & Tracy	4.3	—	0.2	30.2	8.2	tr	—	0.5	0.6	10.5	42.6	7.4
Mucuna pruriens D.C. (6)	3.3			26.5	6.3	1.5	3.6		0.9	11.4	42.1	7.7
(*S. pruriens* Pers.) (6)				23.8	5.6	0.9	2.0		1.0	10.9	46.6	9.2
(7)	4.3		1.3	53.7	19.8					18.1	10.2	
Mucuna flagellipes T. Vogel (8)	3.7			23.0	6.8	tr			tr	30.9	37.5	1.8
Mucuna imbricata (9)	7.0			15.6	4.7					37.5	32.4	
Lucuma caimito Roem.	13.2	tr	0.4	23.1	8.8	—	—	tr	tr	57.2	9.7	0.3
Calocarpum mammosum Pierre (17)				9.40	20.95	0.02				52.1	12.88	
(*Lucuma mammosa* Gaertn) (18)	57.0				37.5					38.2	24.2	
Lucuma salicifolia (6)		3.0	2.5	16.1	9.2	1.7				50.1	18.7	0.7

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