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MINOR FATTY ACIDS OF BRAZILIAN CASHEW KERNELS *

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The fatty acids present in the lipids of cashew have been studied using both classical methods (3) and liquid chromatography (1) (4). Although the fatty acids present in greatest quantity were found to be the same, some disagreement as to the presence of several minor fatty acids exists. The purpose of this study was to further substantiate the existence of certain major and minor fatty acids in cashew kernel lipids.

MATERIAL AND METHODS

Cachew nut lipid

Cashew nuts used in this study were collected from the Fazenda Guarany in the country of Pacajus, Ceará, Brazil from the 1972-73 harvest. Before being opened they were allowed to dry in the sun for a period of five days.

The whole, mature cashew nuts were opened with a knife and the kernel was removed. The testa was removed from the kernel manually without steaming, and 25 gram samples of the kernel were extracted with 100 of chloroform/methanol, 1/2, v/v, in a Waring Blender for two minutes. The resulting slurry was filtered (Whatman no. 1) and the solvent was removed from the filtrate by rotary evaporation at 40°C.

The turbid extract was then centrifuged at 2,000 rpm for 10 minutes after which the clear vellow oil was separated from the pellet by decanting.

Formation of methyl esters

For transmethylation of the cashew nut lipids, a slight modification of the method of Gammon and Whiting (2) was used. It consisted of placing 0.2 ml of the cashew oil in a 50 ml Erlenmeyer flask, adding 3 boiling beads, and drying for 10 minutes at 100°C. Five ml of freshly prepared sodium methylate (0.025 gm sodium to 20 ml anhydrous methanol) was added to the dried sample. The flasks were loosely stoppered with a Teflon stopper and placed in an agitating water bath at 61°C for 1 hour. After esterification, 2.5 ml distilled water and 2 drops of acetic acid were added with agitation. One ml of hexano was added, the mixture was agitated and transfered to a 30 ml se-

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paratory funnel where the phases were allowed to soparate. The lower aqueous layer was discarded, and the uppor layer, containing the methylated fatty acids was transfered to a screw top test tube.

Gas Chromatography of Fatty Acid Methyl Esters

Instrument	Tracor model MT 160
Detector	Flame Ionization H2 — 30 ml/min Air — 150ml/min
Recorder	Beckman mod. 1005
Column	S.S. 2.0 m X 1/4"
Packing	20% LAC 728 (DEGS) on Chromosorb CWR 60/80
N2 flow	30 ml/min
Injector temp.	250°C
Detector temp.	250°C
Column temp.	190°C
Chart speed	0.2 in/min
Atenuation	64 x 10^2
Sample size	1-2 microliter

The area of each peak was calculated by multiplying peak height by peak width at half height and the percentages of each fatty acid by normalization. Identification of each fatty acid was made by co-chromatography and/or by calculating the logarithm of the expected relative Rf with stearic acid used as a reference. In addition, for more specific information concerning the minor fatty acids present, attenuation was increased 100 times and the relative Rf of minor peaks calculated.

RESULTS AND DISCUSSION

During the study of effects storage of the unshelled cashew nut upon the fatty acids of cashew oil, the presence of small chromatographic peaks was noted. An increase in electrometer attenuation and subsequent calculation of relative Rf's gave identification to these peaks.

The graph resulting from the increase of the attenuation factor by 100 is seen in Fig. I. Those acids found to

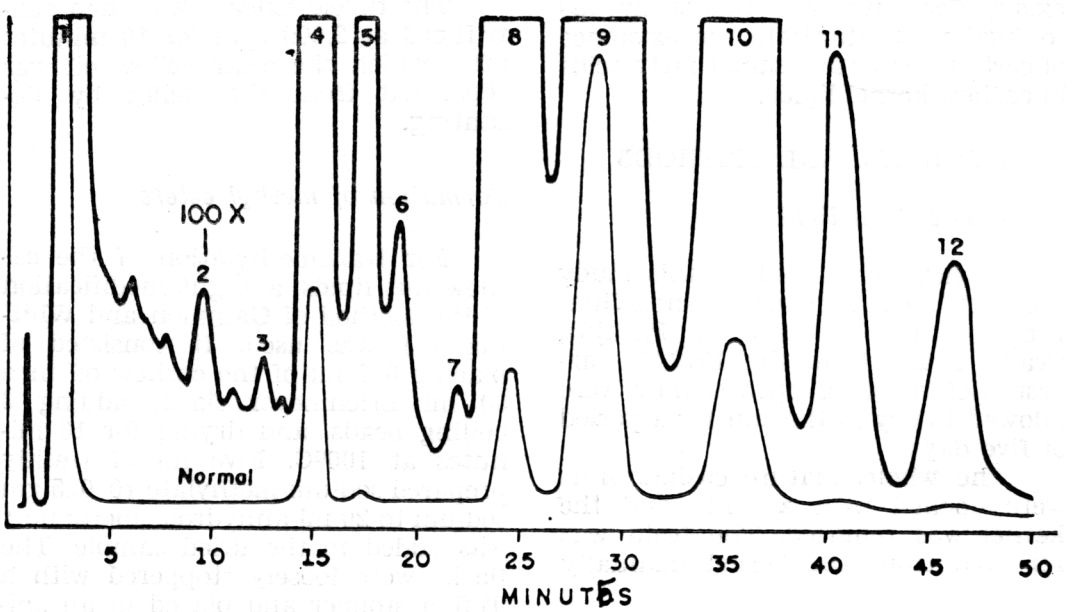

FIG 1 - *FATTY ACID ESTERS IN CASHEW KERNEL*

1. SOLVENT	2. C-12	3. C-14	4. C-16
5. C-16:1	6. C-17	7. C-17:1	8. C-18
9. C-18:1	10. C-18:2	11. C-20	12. C-18:3

be in measurable quantities (palmitic, stearic, oleic, and linoleic) by Barroso *et al.* (1) were also present in the greatest quantities here. In addition, three minor fatty acids, palmitoleic, arachidic, and linoleic, were found in slightly lesser quantities, $< 0.5\%$ of each, than the approximately 1% of each found by Pereira and Pereira (4). Myristic acid, found by Jacqmain (3), but not by other authors, was found in this study, but was found to be present in lesser quantities ($< 0.1\%$) than the 0.2% found by him. The sensitivity of the detector used in this study also indicated the definite presence of very minor quantities ($< 0.1\%$) of fatty acids that have not been reported before to be present in cashew kernel lipids. These acids were lauric (C-14), margaric (C-17), and C-17:1 with other small peaks suggestive of smaller-chained, add-numbered fatty acids. Lignoceric acid, found by Patel *et al.* as cited by Jacqmain, was not found to be present. The amount of total kernel oil extracted and the percentages of each measurable fatty acid were within the values previously established by Barroso *et al.* (1).

SUMMARY

Minor fatty acids of brazilian cashew kernels were studied by GLC. In addition to those acids, reported by the literature, the presence of minor quantities ($< 0.1\%$) of C-14 (Lauric), C-17 (Margaric), and C-17:1 fatty acids were found. Other smaller peaks suggesting the presence of chained and add-numbered fatty acids were detected.

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