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Economically Useful Plants of Sri Lanka Part V.* Seed Fats of some *Garcinia* Species (Guttiferae)

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Abstract: Seed fats of four *Garcinia* species have been analysed. Percentages of acids in the seed fats have been compared. *Garcinia bunucao* seed has been found to be a good source for stearic and oleic acids.

1. Introduction

The fat from coconut kernel, also called coconut oil, is used very extensively in Sri Lanka as a source of food and also in soap manufacture. With the escalation of coconut oil prices there is a necessity to find an alternative for coconut oil. With this view, we analysed the seed fats of some *Garcinia* species and the results are reported in this paper.

2. Results and Discussion

The seed fats of the following *Garcinia* species were obtained: *Garcinia bunucao*, *Garcinia cornea*, *Garcinia dulcis* and *Garcinia xanthochymas*. The seeds were crushed and extracted with light petroleum. Evaporation of the solvent yielded the fat in each case. Table I gives the percentage fat present in the seeds studied. The fats were hydrolysed and the hydrolysates were esterified using BF_3-MeOH. Methyl esters of the fatty acids were subjected to gas liquid chromatographic analysis. The percentage compositions of the fatty acids are given in Table 2. The seed fats of *G. dulcis* and *G. xanthochymas* are remarkably similar. There is some resemblance between the seed fats of *G. cornea* and *G. bunucao* despite the apparent reversal of the relative contents of stearic and oleic acids and the higher content of linoleic acid in the former. The seed fat of *G. bunucao* is interesting because it consists almost entirely of two acids: stearic and oleic acids. Oleic acid is used in the preparation of soft soaps. The barium salt of oleic acid is used in rodent extermination.[2] The present study reveals that the *G. bunucao* seed is a good source for stearic acid which is required in the rubber compounding. Unfortunately the

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seeds examined had a low linoleic acid content. This is an essential fatty acid and it is nutritionally important. *G. cornea* seed fat had 12.5% of this essential fatty acid. The fatty acid composition of the seed of *G. bunucao* is similar to those reported for the seeds of *G. morella*[1] and *G. indica*.[3]

TABLE 1. Percentage fat in the seeds of some *Garcinia* species

Species	*% fat*
Garcinia bunucao	50
Garcinia cornea	60
Garcinia dulcis	50
Garcinia xanthochymas	30

TABLE 2. Percentage acids in the seed fats of some *Garcinia* species

Acids	*Garcinia cornea*	*Garcinia dulcis*	*Garcinia bunucao*	*Garcinia xanthochymas*
Myristic	—	0.2	—	0.1
Palmitic	1.5	37.6	1.4	36.3
Palmitoleic	—	10.1	—	9.8
Stearic	59.7	1.2	44.3	1.1
Oleic	25.2	49.4	53.2	51.5
Linoleic	12.5	1.1	0.6	0.8
- linolenic	0.5	—	0.3	—
- linolenic	0.6	0.4	0.2	0.4

The component acids are expressed as g/100 g of total acids

3. Experimental

The seeds were collected from the trees growing in the Peradeniya Botanical Gardens. The seeds were dried, crushed and were separately extracted with light petroleum in a soxhlet. The light petroleum extracts were considered as fats. The fats were hydrolysed with methanolic KOH. The acids were isolated in the usual manner and their methyl esters were subjected to gas-liquid chromatographic examination.

3.1 Preparation of methyl esters

The fatty acid mixture (100 mg) was refluxed for 20 min with benzene (1 ml), boron trifluoride-MeOH (20%, 0.1 ml) and MeOH (2 ml). The esters were isolated in the usual manner.

The acids were identified by the retention times of their methyl esters and their peak areas were used to calculate the percentages.

3.2 Gas-liquid chromatography

Gas chromatography was carried out on a Varian Model 2440 chromatograph equipped with a flame ionisation detector and using glass columns (1.8 m × 2 mm i.d.) packed with 10% SP 2340 coated on 100/120 chromosorb WAW. The column was maintained at 190°C. Argon was used as the carrier gas at a flow rate of 30 ml min^{-1}.

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