

Evaluation of Lipids Extracted from Mango and Melon Seeds.

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ABSTRACT

The importance of including fats and oils in our daily diets can hardly be over emphasized. Fats and oils with some of their unsaturated fatty acids are an indisputable part of the diet aside from their important function as a source of energy. To this end, attempts have been made to extract lipids from African Bush Mango and Melon Seeds, quantitatively.

The aim of this study is to evaluate the percentage of oil from seeds of mango and melon. The methodology for the extraction of lipids was by addition of isopropanol to the grounded seeds in order to obtain a slurry and then petroleum ether was also added to it.

The results obtained showed that, the lipids in African Bush Mango contained a very high percentage (51.5%) of neutral lipids and 55.7% of total lipids, respectively. It can be concluded that with high percentage of oil content in African Bush Mango, it would contribute to the world's demand of vegetable oil.

(Keywords: mango, melon seeds, lipids, extraction)

INTRODUCTION

The African Bush Mango is known as simarubaceae. Mangoes belong to the genus 'Mangifera' consisting of numerous species of tropical fruiting trees in the flowering plant family Amacaliaceae. Mango is one of the most extensively exploited fruits for food, juice, flavor, fragrance, and color. Three species of African Bush Mango occur in Nigeria, one of which is *Irvingia grandifolia* which has leaves and stipules very similar to those of Klaimadoxe. The other species; *Irvingia gabonensis* Baill, called Wild Mango or Dika nut, has mango like edible fruit.

The tree may be readily recognized by its dense green evergreen foliage and characteristic stipules which are similar to those of Klainedoxam but smell. African Bush Mango is found all over the country or Nigeria. The fruit has a yellowish fibrous pulp surrounding a large stone which is called the seed. Its seed powder is regarded as one of the important ingredient for soup in Nigeria. The bark of the African Bush Mango tree is reported as a herbal/traditional medicine for the treatment of fever and gonorrhoea (McGovern and Lawarre, 2001). Very little information is available on the qualitative and quantitative investigations of lipids present in its seed.

Seeds of melon from its plants in West Africa are used in daily meals. Little nutritional detail on (egus) melon oil is readily available in international literature. Research studies have shown that melon (Egusi) seeds contained 50% oil (Martin, 1988), 42-57% oil, and 44-53% oil (Fokou et al., 2004) for seed cultivated in different bioclimatic regions of Camerron.

Lipids are a broad group of naturally occurring molecules, which includes fats, waxes, sterols, fat-soluble, vitamins (A, D, E, and K) monoglycerides, diglycerides, and phospholipids. The main biological function of lipids is energy storage as structural components of cell membranes (Prayer, 1997). Oil content of some oil bearing vegetable materials is shown in Table 1.

Categories of lipids are fatty acyls, glycerolipids, glycerophospholipids, spingolipids, sterol lipids, prenol lipids, and saccharo lipids (Gunstone, 2007). Little nutritional detail on mango seed oil is readily available in the international literature. In this regard, the present study was aimed at evaluation of lipids from both mango and melon seeds and to characterize these lipids and also to quantitatively convert the crude oil fats of low palatability into refined products that meet the

regional requirement for food fats. Oil extracted from melon at the home level appears to be very popular. In fact, this oil has been found to be more comparable with groundnut with respect to its consumption.

Table 1: Oil Content of Some Oil Bearing Vegetable Material.

RANKING	OIL BEARING MATERIAL	OIL CONTENT%
1	Copra	65-68
2	Babessu	60-65
3	Sessame Seed	50-55
4	Palm Fruit	45-50
5	Palm Kernel	45-50
6	Groundnut (Peanut)	45-50
7	Grape Seed	45-50
8	Sunflower Seed	35-40
9	Safflower Seed	30-35
10	Olive	25-30
11	Cotton Seed	18-20
12	Soya Bean	18-20

MATERIAL AND METHODS

Collection: African Bush Mango and Melon seeds were collected from Ogbomoso, in Oyo State, Nigeria. The seeds were screened to remove the bad ones, washed, and dried in an oven.

Determination of Moisture: 100g of grounded African Bush Mango and Melon seeds were weighed, then dried in an oven at 105°C. They were later removed from the oven at several intervals and reweighed after cooling in desiccators. The process was maintained until a constant weight was obtained.

Extraction of Lipids from Seeds: 100g of African Bush Mango and Melon seeds were weighed and grounded in a mortar in the presence of 65ml isopropanol to make a slurry. The slurry was transferred to a round bottom flask and 150ml of petroleum ether was added to it. After cooling, it was decanted. The process was repeated for 4 times in order to ensure complete extraction of lipids. In order to remove water soluble materials, the combined extracts were washed with water 3 times and evaporated to dryness in a high vacuum pump. Any trace of

solvent that might remain was evaporated in a stream of nitrogen.

Total Lipids: 100g of African Bush Mango and Melon seeds were separately mixed with 65ml of isopropanol to make a slurry. It was then transferred to a round bottom flask and evaporated under reduced pressure by using water suction.

About 150 ml of a mixture of chloroform methanol (2:1V/V) was added to the dried residue and refluxed for 4 hours. The contents were evaporated to dryness and an aliquot of chloroform (100ml) was added to the dried residue and the contents were mixed thoroughly and filtered. The lipid solution in chloroform was evaporated to dryness under reduced pressure in water suction.

Table 2: Moisture Content of African Bush Mango and Melon Seeds.

SEEDS	% MOISTURE CONTENT	MEAN OF MOISTURE CONTENT
African Bush Mango	9.1, 9.3, 9.2	9.2
Melon	6.1, 6.3, 6.8	6.4

Table 3: Neutral Lipids and Total Lipids Contents in African Bush Mango and Melon Seeds.

SEEDS	NEUTRAL LIPIDS(%)*	TOTAL LIPIDS*
African Bush Mango	51.5	55.7
Melon	48.5	51.6

Note : *as expressed as % on fresh weight basis.

It is apparent that African Bush Mango contained the highest % of both Neutral and Total Lipids

CONCLUSION

Neutral and total lipids have been extracted from Melon and African Bush Mango seeds. Melon seeds contained 48.5% and 51.6% of neutral and total lipids, respectively, while the corresponding figures for the African Bush Mango seeds were 51.5% and 55.7%, respectively.

These findings implied that lipids present in African Bush Mango seed contained a very high % of fats when compared with Melon seed. African Bush Mango which is high in % of oil content would contribute to meet the world's demand for vegetable oil. Based on the findings; manufacturing African Bush Mango seed could be used for butter.

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