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Short Communication

Fatty acid composition of the seed oil of *Chrysophyllum albidum* (G.Don)

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The fatty acid composition of seed oil of *Chrysophyllum albidum* was determined by gas chromatography-mass spectroscopy (GC-MS). The seed oil contained much important fatty acids with linoleic (26.21%) and palmitic (14.41%) acids being the most abundant unsaturated and saturated fatty acids, respectively. The total unsaturation for the oil was 67.61%. These results confirm that the oil of *C. albidum* is of industrial importance.

Key words: *Chrysophyllum albidum*, fatty acid, seed oil, methyl esters

INTRODUCTION

African star apple (*Chrysophyllum albidum* G. Don) is a tropical edible fruit tree. It belongs to the family of Sapotaceae which has up to 800 species and make up almost half of the order (Ehiagbonare et al., 2008). It is primarily a forest tree species and its natural occurrences have been reported in diverse ecozones in Nigeria, Uganda, Niger Republic, Cameroon and Cote d'Ivoire (Bada, 1997). The plant often grows to a height of 36.5 m though it may be smaller (Bada, 1997). Preliminary studies indicated that the oil was non-drying, based on its iodine value (Table 1) (Osamudiamen and Lukman, 2012). This paper is a report on the fatty acid constituents of the oil.

MATERIALS AND METHODS

Sample preparation

The oil was extracted using soxhlet extractor with n-hexane for 8 h and the fatty acid profile of the seed oil was obtained as fatty acid methyl esters. This was prepared by using commercial aqueous HCl as described by Ichihara et al. (2010). The reagent was made from 9.7 ml commercial concentrated HCl (35%w/w) diluted with 41.5 ml of methanol and 0.30 ml of the reagent solution were added in this order. The tube was vortexed and then heated at 100°C for 1 h. After cooling, 1 ml of hexane and 1 ml of water were added for extraction of methyl esters in the hexane phase. This was then analyzed with gas chromatography-mass spectrophotometer.

RESULTS AND DISCUSSION

The fatty acid composition of the seed oil investigated revealed that the fatty acid range was from 12:0 to 20:1 (Table 2). The saturated fatty acids comprised of lauric acid (12:0), palmitic acid (16:0) and stearic acid (18:0) while the unsaturated fatty acid comprised of two monoenes namely: vaccenic acid (18:1) and eicosenoic acid (20:1), one diene: linoleic acid (18:2) and one triene: α-linolenic acid (18:3). Linoleic (25.44%) and linolenic acid (26.12%) are the predominant unsaturated fatty acid. Linoleic acid undoubtedly is one of the most

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Table 1. Physicochemical characteristics of *C. albidum* oil.

Parameter	*C. albidum* oil
Colour	Dark yellow
State at room temperature	Liquid
Specific gravity (25°C)	0.89±0.12
Refractive index (25°C)	1.66±0.04
Mean molecular mass (g)	1332.54±0.70
Acid value (mgKOH/g)	3.56±0.59
Free fatty acid (%)	1.80±0.21
Saponification value (mgKOH/g)	126.30±0.70
Iodine value (mg iodine/g)	31.06±0.70
Peroxide value (MgO_2/g oil)	1.76±0.50

Table 2. Fatty acid composition of *C. albidum*.

Systematic name	Lipid number	Trivial name	Percentage
Dodecanoic acid	12:0	Lauric acid	0.46
n-hexadecanoic acid	16:0	Palmitic acid	14.41
Octadecanoic acid	18:0	Stearic acid	4.38
Trans-11-octadecanoic acid	18:1	Vaccenic acid	14.73
9,12-octadecandedienoic acid(z,z)	18:2	Linoleic acid	25.44
9,12,15-octadecantrinoic acid	18.3	α-Linolenic acid	26.12
Cis-13-eicoseneoic acid	20:1	Paullinic acid	1.32
Unsaturated acids			67.61
Saturated acids			19.25
Unidentifiables			13.14
Total acid			100.00

important polyunsaturated fatty acids in human food because of its prevention of distinct heart vascular diseases (Omode et al., 1995). It is well known that dietary fat rich in linoleic acid, apart from preventing cardiovascular disorders such as coronary heart diseases and atherosclerosis, also prevents high blood pressure (Vles and Gottenbos, 1989). The presence of one of the three essential fatty acids in the seed oils make them nutritionally valuable. Palmitic (14.41%) and stearic acid (4.38%) are also present in high proportion in the oil, which are of nutritional significance

Conclusion

This study has shown that the fatty acid composition of *Chrysophyllum albidum* was predominantly linoleic, linolenic and palmitic acids. The fatty acid profile suggests the possible application of the seed and its oil as a potential industrial resource.

Conflict of Interests

The author(s) have not declared any conflict of interests.

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