

FATTY ACID PROFILE OF *BEILSCHMIEDIA MANNII* (LAURACEAE) SEEDS OIL

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(Received on Date: 4th July 2017

Date of Acceptance: 18th September 2017)

ABSTRACT

The seed from the fruit of the *Beilschmiedia mannii* (Lauraceae) tree provides edible oil. To help popularize this seed, which is a traditional vegetable, a study of its food potential is necessary. In this work, the profile oil fatty acid extracted from the seeds was determined. The results obtained showed that this oil is rich in linoleic acid (40.64%); Alpha linolenic acid (31, 16%); Palmitic acid (15.51%); Stearic acid (6.10%) and oleic acid (2.95%). Keywords: *Beilschmiedia mannii*, oil, fatty acid, seeds, valorisation. Profile

No: of Figures: 3

No: of Tables: 1

No: of References:11

INTRODUCTION

Beilschmiedia (Lauraceae), whose oil of the seed is the subject of our study, is a genus of about 240-250 species that are trees or shrubs, It has about 80 species in tropical Africa and Madagascar (Louppe *et al* 2008). In Ivory Coast the fruit, of the tree *Beilschmiedia mannii*, is gathered in the forest from October to December. Seeds are sold for food purposes (Bognon, 1988; Sahoré *et al*, 2011), It is a popular protein crop (Table 1) commonly

MATERIAL AND METHODS

Vegetable Material

The vegetable material studied was purchased at the market in Soubré, a city located in the center-west of Côte d'Ivoire, about 200 km from Abidjan. These are sun dried seeds and locally called "Bitéi" (Figure 2). This vegetable material was packaged in a plastic bucket and transported to the National Public Health Laboratory (LNSP) in Abidjan where it was studied It has been

sold on West African markets; It is roasted and pounded before being eaten, and added as a condiment and supplement in soups, rice and vegetables. But these *Beilschmiedia mannii* (Lauraceae) seeds also provide edible oil (Nyunai, 2008), and the objective of our work is thus to determine the fatty acid profile of this edible oil extracted from the seeds of *Beilschmiedia mannii*. It will be necessary to demonstrate the characteristic fatty acids of this vegetable oil

identified at the Houphouët Boigny University Floristic Institute of Abidjan Cocody, as consisting of *Beilschmiedia mannii* (Lauraceae) seeds. The seed of *Beilschmiedia mannii* (Figure.2) is a non-timber forest product (NTFP) food, It is a traditional vegetable (Sahoré *et al*, 2013), the fruits of the tree *Beilschmiedia mannii* (Lauraceae) (figure.1) are harvested from September to December. The seeds are then dried in the sun generally before being sold on the markets of Côte d'Ivoire (Kouamé *et al*, 2008),



Figure 1: Fruit of *Beilschmiedia mannii* (Sahoré *et al*,) 2013



Figure 2: Seeds of *Beilschmiedia mannii*

Methods

The extraction of the oil

The extraction of the oil was carried out according to the Soxhlet method (BIPEA, 1976). A sample of 10 g of dried *Beilschmiedia mannii* seeds were weighed and ground. The crushed (ground) sample was then packed into a cellulose cartridge which was deposited in the Soxhlet with 1 liter of solvent (petroleum ether) for each extraction, 75cl of solvent were poured directly onto the ground and the remaining 25cl poured into the flask in which a few grains of pumice stones were previously deposited.

The whole thing was brought to a boil in the thermostat. The assembly is ready for extraction, This was carried out with the aid of petroleum

Results

Chromatographic spectrum of *Beilschmiedia mannii* oil (figure: 3) indicates 24 fatty acids of which 13 have no peaks on the spectrum (fig. 2). The main eleven fatty acids, contained in the oil extracted from the *Beilschmiedia mannii* seeds and which gave peaks, are shown in Table1. They are broken down as follows:

- Six saturated fatty acids with Levels ranging from 0.07 % (Myristic acid) to 15.51 % (Palmitic Acid)

Discussion

Oil *Beilschmiedia mannii* is of the unsaturated type (75.58% unsaturated fatty acids). This oil is composed mainly: palmitic acids (15, 51%), stearic (6.10%),

ether 60-80 at the boiling point which gradually dissolves the vegetable oil, The solvent containing the vegetable oil returns to the flask by successive spills caused by a siphon effect in the lateral bend, Fat accumulates in the flask until extraction is complete, After extraction was complete, the petroleum ether was evaporated on a rotary evaporator or vacuum,

The study of the fatty acids

The study of the fatty acids was carried out by the injection of 1 µl of methyl esters, prepared according to the standard NF EN ISO 5509 (2000), to an HP 6890 chromatograph. We used a mass spectrometer HP 5973 MSD Electron impact

In this group, stearic acid and palmitic acid have remarkable levels (6.10%, 15.51%), respectively.

- Five monounsaturated fatty Acids with levels ranging from 0.15% (Acid Palmitoleic) to 2.95% (Oleic Acid). Oleic acid has a remarkable rate (2.95%) in this group.

- Two polyunsaturated acids with Levels varying from 31.16% (alpha linolenic acid) to 40.64% (Linoleic acid). In this group, the linoleic acid and alpha linolenic acid have respectively the remarkable levels (31, 16%, and 40.64%).

oleic acid (2.95%), linoleic acid (40.64%) and α-linolenic (31.16%). linoleic acid (C18: 2) and α-linolenic acid (C18: 3) are called essential fatty acids necessary for the growth and physiological activity of

all tissues. They are involved in the regulation of cardiovascular disorders (Grandgirard 1992). One of the main representatives of polyunsaturated fatty acids is Linoleic acid (18: 2). They are essential to man: he must find them in his diet because he cannot synthesize them. A deficiency in polyunsaturated leads to a slowing of growth and development, an alteration of the integrity of the skin and Kidneys, reproductive problems, etc. (Bourre, 1991). It is now believed that linoleic acid should represent 3 to 5% of the caloric intake, and linolenic acid 0.5

to 1%.(Either for a calorie intake of 2000 kcal / day, 7-11 grams of linoleic acid and 1 to 2 grams of linolenic acid) (Grandgirard, 1992). Some recent work suggests that the fatty acids such as linolenic acid (n-3) may have an anticancer effect (Simopoulos et al.1991). The ratio of polyunsaturated fatty acids to that of saturated fatty acids of this oil is 2.55, it remains above the ideal ratio (0.7) recommended by nutritionists (Fossati, 2000). The content of this oil in alpha linolenic acid would render it unusable for frying (Dilmi-Bouras,1998).

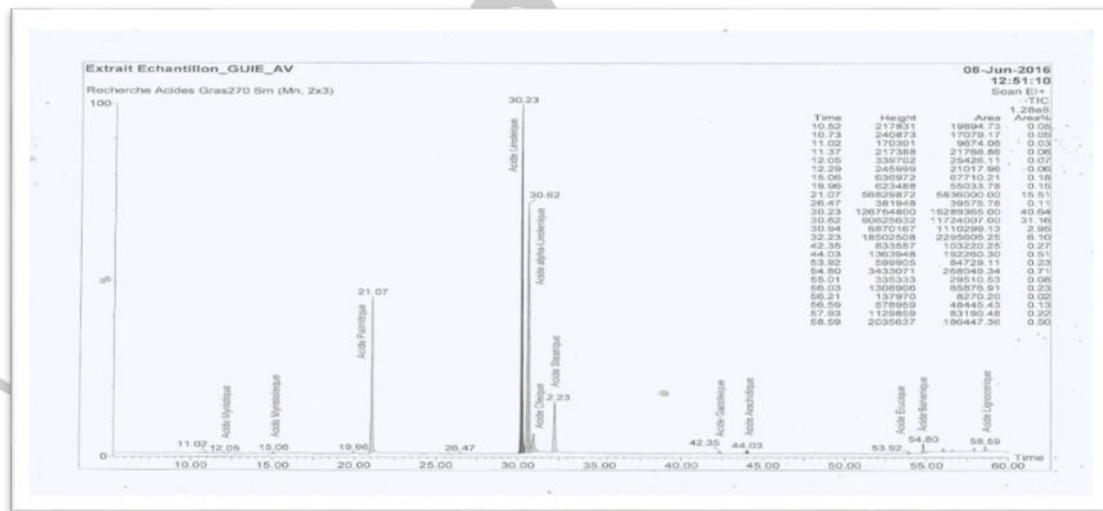


Figure 3: Chromatographic spectrum of *Beilschmiedia mannii* oil

Table 1: Fatty acid profile of *Beilschmiedia mannii* (Lauraceae) seeds oil

Profil en Acides gras	Nombre d'atomes de Carbone	Type d'acide gras	%
Acide Myristique	C14 : 0	Acides gras saturé	0,07
Acide Palmitique	C16 : 0	Acide gras saturé	15,51
Acide Stéarique	C18 : 0	Acide gras saturé	6,10
Acide Arachidique	C20 : 0	Acide gras saturé	0,51
Acide Béhénique	C22 : 0	Acide gras saturé	0,71
Acide Lignocérique	C24 : 0	Acide gras saturé	0,50
Acide Oléique	C18 : 1	Acide gras monoinsaturé	2,95

Acide Gadoléique	C20 : 1	Acide gras monoinsaturé	0,27
Acide Erucique	C22 : 1	Acide gras monoinsaturé	0,23
Acide Myristoléique	C14 : 1	Acide gras monoinsaturé	0,18
Acide Palmitoléique	C16 : 1	Acide gras monoinsaturé	0,15
Acide Linoléique	C18 : 2	Acide gras polyinsaturé	40,64
Acide alpha Linoléique	C18 : 3	Acide gras polyinsaturé	31,16

Conclusion

fatty acid composition of *Beilschmiedia mannii* oil showed a low percentage of saturated fatty acids, although the percentages of palmitic acid (15.51%), stearic acid (6.10%), oleic acid (2.95%) were and a high amount of unsaturated fatty acid characterized by the high

percentage of 2 essential polyunsaturated fatty acids (linoleic acid (C18: 2) and a-linolenic acid (C18: 3). This would make it very useful for Food preparation that can reduce the incidence of heart attack (arteriosclerosis).

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