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Research Article

Morphological and Physicochemical Characteristics of the Fruits of *Anisophyllea Quangensis* Engl. Ex Henriq from the Savannah Surrounding the City of Brazzaville-Congo

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Abstract

The present study is a contribution to the valorization of unconventional wild oilseed plants from the floristic biodiversity of Congo through the morphological and physicochemical characterization of the fruits of *Anisophyllea quangensis*. Ten fruit samples were collected from different locations in the savannah surrounding Brazzaville. Morphological characterization on 20 fruits from each sample was carried out using a caliper and a precision balance. The extraction and physicochemical characterization of fats from the pulp and seed were carried out according to standard analysis methods. The results show that the fruits of *Anisophyllea quangensis* are ellipsoids (l/L< 1). The pulp contains two (2) times more water than the seed, i.e. 83.13±3.10% and 38.8±5.2% respectively. The ash content of the pulp (8.1±2.1%) is also higher than that of the seed (3.28±1.02%); on the other hand, the oil content of the pulp (4 ±2%) is very low compared to the fat content of the seed (27 ± 3%). On physicochemical analyses, the fat of the seed has a refractive index between 1.4558 and 1.4725, an acid index around 45 mgKOH/g, a peroxide index less than or equal to 15 meq/Kg, an iodine index less than 110% and a calorific value of 41558 KJ/Kg on average. For the oil from the pulp we have a refractive index of 1.5046, acid index of 73.15 mgKOH/g; a peroxide index of 5.27 meq/Kg; iodine index 76.3% and a calorific value of 38095.77 KJ/Kg. These results make it possible to classify *Anisophyllea quangensis* among the medium oleaginous plants of the Congo Basin and attest to the nutritional and cosmetic interest of its fat.

Keywords

Fruit, Morphology, Fat, Physicochemical Characteristics, *Anisophyllea Quangensis*, Congo Basin

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1. Introduction

Oilseeds are an integral part of populations' food, cosmetic and even therapeutic uses, and their consumption increases with demographics. Over the past five years, oil production has reached an annual average of 15 million tonnes [1]. Vegetable oils are gradually replacing animal oils as the main source of dietary fat. In fact, they account for more than 70% of the production of dietary fat in the world. Their economic value on the world market is estimated at around 32 billion Euros [2]. In Congo, wild flora contains a diversity of plant species rich in fat, which are traditionally used by populations in rural areas with insignificant purchasing power, to cover their food needs. However, these plant matrices, which hide a socio-economic interest through their physico-chemical properties and their various invigorating virtues, could be used for industrial valorization. Among these, we were interested in *Anisophyllea quangensis*, a sub-shrub of the *Anisophylleaceae* family not exceeding 20 to 60 cm high, which is easily found on the Congolese territory and which gives a lot of fruits during the long dry season; it is also found in other countries of the Congo Basin (DRC, Angola). It is a versatile plant, its leaves can be used to treat certain diseases such as asthma; the macerated roots can be used as an aperitif, for the treatment of hemorrhoids and dental caries [3]. From the pulp, we can make juice with a pleasant and refreshing taste, which is a good pick-me-up and the seed gives a fat with a yield of almost 30%, which allows this plant to be classified among the medium oilseed plants [4].

The study on fatty acid and TAG composition carried out by Binaki *et al* (2013) revealed the presence of five (5) main fatty acids: C16:0 palmitic acid, C18:1 oleic acid, C16:1 palmitoleic acid, linoleic C18:2, stearic acid C18:0 in the pulp oil and in the seed fat of *Anisophyllea quangensis* and five (5) major TAGs PPP, PPO, POL, OOO and POO [5]. Which shows that this fat is of the palmito-oleic type.

The present work is devoted to the morphological and physicochemical characterization of the fruits of this plant in order to contribute to its valorization.

2. Materials and Methods

2.1. Plant Material

The fruits of Anisophyllea quangensis (figure 1) used in this study were collected in different localities (Mont cardinal, Odziba, Nganga lingolo1, Nganga lingolo2, Loua, Goma tsé-tsé1, Goma tsé-tsé2, Biri-biri, Mpéola1 and Mpéola2) of the savannah surrounding Brazzaville.

Figure 1. *Fruits of Anisophyllea quangensis.*

2.2. Morphological Analysis

For each sample, 20 fruits are taken in order to determine the morphological characteristics. The quantities taken into account in the assessment of the morphology are the length (major axis) and the width (minor axis) as previously defined for *Dacryodes edulis* [6]. These measurements were made using a caliper.

The 10^{-1} g precision balance was used for measurements of the masses of the whole fruit (mf), the pulp (mp) and the seed (mg). The thickness of the pulp was determined by making the difference between the width of the whole fruit and that of the stone.

2.3. Determination of the Overall Composition of The Pulp and Seed

2.3.1. Water Content of Seed and Pulp

The water content was determined by drying an extract of known mass (m_1) of the fresh product to the constant mass (m_2) using an oven heated to 70 ℃ and was calculated by relation (1):

$$\%Water = [(m1-m2)/m1] \times 100 \quad (1)$$

2.3.2. Fat Content

The determination of the oil content was made by the soxhlet method. The dried, crushed and weighed plant material (mass m_1) was introduced into an extraction cartridge and placed in the extraction column. After extraction for 2h 30 min with hexane, the extract was dried with sodium sulfate, the solvent evaporated under vacuum. And the traces solvent were removed by drying the oil in an oven at 70 ℃ for 24 hours. Let m_2 be the mass of the oil obtained, the oil content was given by relation (2):

$$\% \text{ Fat} = (m2/m1) \times 100 \quad (2)$$

2.3.3. Ash Content

The ashes represent the residue obtained after complete incineration of the cake in a muffle furnace at 550℃ until white ashes are obtained [7].

After drying a sample quantity of the cake in an oven at 105 ℃, the dry residue (m_1) was put in a crucible and placed in a muffle furnace at 550℃. The cremation was carried out for 24 hours until white ashes were obtained. The crucible was then removed from the oven, cooled in a desiccator and weighed (m_2).

The ash rate expressed in g/100 g DM was given by relation (3):

$$\%ash = [(m2-m0)/(m1-m0)] \times 100 \quad (3)$$

With: m0: mass of the empty crucible;
m_1: mass of dry cakes + crucible before incineration;
m_2: mass of white ashes + crucible after incineration.

2.4. Determination of the Physicochemical Characteristics of the Fat

The physicochemical characteristics of the oils were determined by different methods available in the literature [8, 9].

2.4.1. Volumic Mass

The density was determined at a constant temperature (60℃) set in the oven, with a pycnometer of 5 ml volume and calibrated according to the data in the Handbook relating to distilled water. The following expression (4) was used for the calculation:

$$\rho = (m_1 - m_0) / V \quad (4)$$

With: m_0: mass in grams of the empty pycnometer;
m_1: mass in grams of the pycnometer filled with oil;
V: volume of the pycnometer in ml.

2.4.2. Refractive Index (n)

The refractive indices were measured at constant temperature (thermostat), 25℃, using an Abbe type refractometer and ATAGO brand. The prisms were cleaned with acetone, then dried using Joseph paper. Two drops of the fatty substance were placed on the prism and after focusing, the index was read on the target ruler. The result was given at the temperature t= 25 ℃. The refractive index, at this temperature, was calculated using relation (5):

$$nD(t) = nD(t') + 0.0004(t'-t) \quad (5)$$

With: n = refractive index;
D = wave length;
t': measuring temperature;
t: 25℃.

2.4.3. Acid Number (AI)

1 g of oil was dissolved in 150 ml of the solvent mixture (1/1, V/V) of 95% ethanol and diethyl oxide. The solution obtained was titrated in the presence of a few drops of phenolphthalein, while stirring, with 0.1 N potassium hydroxide solution.

The acid number was calculated by the following formula (6):

$$AI = (M_{KOH} \times V_E \times 0.1)/m \quad (6)$$

With: M_{KOH}: molar mass of KOH;
V_E: volume of alcoholic potash (in ml);
m: mass of the sample (in grams);
0.1: normality of alcoholic potash.

2.4.4. Saponification Index (SI)

In a 250 ml conical flask containing 2 grams of oil, 25 ml of the 0.5 N ethanolic potassium hydroxide solution and pumice were added. A reflux condenser was then fitted to the conical flask and brought to a gentle boil in a water bath for 60 minutes, stirring occasionally. A few drops of phenolphthalein were added to this hot solution and titrated with the 0.5 N aqueous hydrochloric acid solution. The solution changed from pink to yellow. A blank assay was carried out under the same conditions. The saponification index was calculated using relation (7):

$$SI(mgKOH/g) = [M_{KOH} \times (V_T - V_E) \times 0.5]/m \quad (7)$$

With: V_E: volume (ml) of hydrochloric acid necessary to dose the test portion;
V_T: volume (ml) of hydrochloric acid to measure the control;
m: mass of the sample (in grams);
0.5: normality of hydrochloric acid.

2.4.5. Peroxide Index (PI)

1 gram of oil was introduced into a conical flask fitted with a stopper and quickly dissolved in 10 ml of chloroform. 15 ml of acetic acid then 1 ml of potassium iodide solution were added and immediately the flask was stoppered. After stirring for one minute, the mixture was then left to rest for 5 minutes away from light. 75 ml of distilled water were added with vigorous stirring in the presence of starch. The released iodine was titrated with 0.0105 N sodium thiosulfate solution. A blank assay was carried out under the same conditions. The peroxide index expressed in milliequivalents of active oxygen per kilogram of fat was calculated using formula (8):

$$PI = 100 \times (V_E - V_T) \times N/m \quad (8)$$

With: $V_{E:}$ Volume (ml) of the thiosulfate solution used to measure the test portion;

$V_{T:}$ Volume (ml) of the thiosulfate solution used for the blank test;

N: Exact normality of the sodium thiosulfate solution used;

m: Test portion (in grams).

2.4.6. Iodine Index (II)

15 ml of CCI4 were introduced into a 250 ml Erlenmeyer flask containing 0.20 g of fat. The oil was dissolved by rapid stirring. Then, 25 ml of Wijs reagent (ICI) were added to the Erlenmeyer flask which, after stirring, was capped and placed for 1 hour in the dark. 150 ml of distilled water and then 20 ml of KI (100 g/L of water) were added to the Erlenmeyer flask. And the solution obtained was titrated with sodium thiosulfate (0.1N) in the presence of starch until complete discoloration. The volume V1 of the thiosulfate solution was noted. A blank assay was carried out under the same conditions and the volume VO of the thiosulfate solution was noted.

Expression (9) was used to calculate the iodine value.

$$II = 127 \text{ x } T(V_0 - V_1)/m \quad (9)$$

With: V_0: volume of the 0.1N thiosulfate solution used for the blank test;

$V_{1:}$ volume of the thiosulfate solution used for the sample;

T: Exact title of the thiosulfate solution;

m: mass of the sample (in grams);

127: atomic mass of Iodine.

2.4.7. Ester Index (EI)

This index is not measured experimentally, but calculated by making the difference between the saponification index (IS) and the acid index (AI).

2.4.8. Calorific Value (CV)

The calorific value was calculated using the iodine and saponification indices according to the formula (10) of [10].

$$CV = 47645 - 4.187II - 38.31IS \text{ (KJ/Kg)} \quad (10)$$

2.5. Statistics

Statistical processing (mean, standard deviations) was carried out using Excel software.

3. Results

3.1. Morphological Characteristics of Fresh Fruits

Table 1 gives the morphological characteristics of the fruits of *Anisophyllea quangensis* from the savannah surrounding the city of Brazzaville.

Table 1. *Morphological characteristics of the fruits of Anisophyllea quangensis from the savannah surrounding the city of Brazzaville.*

Origin of samples	L (Cm)	L (Cm)	Pulp thickness (Cm)	l/L
Odziba	3,16 ±0,40	2,70 ±0,38	1,25 ±0,31	0,85
Mont Cardinal	3,20 ±0,53	2,63 ±0,44	1,21 ±0,29	0,82
Loua	2,90 ±0,37	2,41 ±0,24	0,97 ±0,15	0,83
Bri-Biri	3,15 ±0,36	2,68 ±0,22	1,06 ±0,32	0,85
Mpeola	3,39 ±0,37	2,61 ±0,30	1,00 ±0,40	0,77
Nganga lingolo	3,00 ±0,27	2,53 ±0,31	1,03 ±0,18	0,84
Goma ts é-ts é	3,22 ±0,5	2,53 ±0,21	1,05 ±0,22	0,79

Origin of samples	Mass Fruit (g)	Mass Pulp (g)	m_p/m_f (%)	Mass Seed (g)	m_g/m_f (%)
Odziba	12,17 ±3,80	8,88 ±3,20	73	1,22 ±0,30	10
Mont Cardinal	12,59 ±5,59	9,19 ±4,40	73	1,19 ±0,44	9
Loua	8,78 ±1,93	6,30 ±1,46	72	1,24 ±0,26	14
Bri-Biri	11,57 ±3,20	8,10 ±2,71	70	1,30 ±0,61	11
Mpeola	11,48 ±2,86	8,00 ±2,51	70	1,23 ±0,21	11

Origin of samples	Mass Fruit (g)	Mass Pulp (g)	m_p/m_f (%)	Mass Seed (g)	m_g/m_f (%)
Nganga lingolo	9,10 ± 2,18	6,73 ±1,90	74	1,12 ±0,15	12
Goma ts é-ts é	10,78 ±2,96	7,61 ±2,70	71	1,20 ±0,17	11

3.2. Overall Composition of the Pulp and Seed

The overall composition of the pulp and seed of *Anisophyllea quangensis* is presented in Table 2.

Table 2. *Water, ash and fat content of the pulp and seed of Anisophyllea quangensis from the savannah surrounding the city of Brazzaville.*

Origin of samples	Pulp and seed	Water content (%)	Ash content (%)	Fat content (%)
Odziba	Pulp	84,73	4,5	3,70
	Seed	32,31	3,06	28,86
Mont Cardinal	Pulp	83,00	8,85	6,21
	Seed	30,17	3,86	22,14
Loua	Pulp	83,00	7,38	5,54
	Seed	42,98	4,12	29,95
Biri-biri	Pulp	85,63	9,36	2,50
	Seed	42,10	3,42	25,41
Mp éola	Pulp	87,00	11,18	1,62
	Seed	41,53	1,14	28,51
Nganga lingolo	Pulp	80,12	7,63	5,12
	Seed	39,22	3,32	25,81
Goma ts é-ts é	Pulp	78,15	7,76	3,20
	Seed	42,67	4,03	28,57
Average ± Standard deviation	Pulp	83,13 ±3,10	8,1 ±2,1	4 ±2
	Seed	38,8 ±5,2	3,28 ±1,02	27 ±3

3.3. Physico-Chemical Characteristics of the Fatty Matter of the Pulp and Seed of *Anisophyllea Quangensis*

After soxhlet extraction and evaporation of the extractive solvent, we obtained: for the pulp, an oil (figure 2a) with a dark red color comparable to that of palm oil; for the seed, a fluid fat (figure 2b) of yellowish color which solidified quickly at room temperature and which, to the touch, presents a certain smoothness.

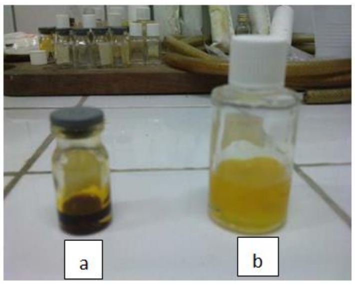

Figure 2. *Pulp oil (a) and seed fat (b) of Anisophyllea quangensis.*

Table 3 presents the results of the determination of the physicochemical characteristics of the fat of Anisophyllea quangensis from the different localities near Brazzaville.

***Table 3**. Physico-chemical characteristics of the fat of the Anisophyllea quangensis seed from the savannah surrounding the city of Brazzaville.*

Origin of samples	Volumic mass (g/mL)at 60 ℃	Refractive indexat 25 ℃	Acid number (mgKOH/g)	Iodine Index (%)
Tout venant S/B	0,8612 ±0,0002	1,4653 ±0,0006	44,80 ± 1,08	80,3 ± 0,5
Nganga linngolo1	0,8567 ±0,0004	1,4610 ±0,0004	48,72 ±0,14	77,9 ± 1
Loua	0,8611 ±0,0002	1,4577 ±0,0002	52,64 ±0,42	78,7 ± 1
Biri-biri	0,8905 ±0,0006	1,4587 ±0,0001	7,28 ±0,23	78,2 ± 0,6
Mpéola1	0,8671 ±0,0004	1,4558 ±0,0003	47,6 ±0,03	80,4 ± 0,3
Mpéola2	0,8680 ±0,0006	1,4725 ±0,0005	41,5 ± 0,31	76,8 ± 0,5
Goma tsé-tsé1	0,8620 ±0,0012	1,4568 ±0,0007	17,82 ±0,14	76,6 ± 0,6
Goma tsé-tsé2	0,8615 ±0,0009	1,4627 ±0,0002	16,24 ±0,05	78,5 ± 1
Odziba	0,8910 ±0,0007	1,4677 ±0,0002	41,00 ±1,32	70,6 ± 1
Mont Cardinal	0,8910 ±0,0005	1,4665 ±0,0003	42,13 ±0,41	78,9 ± 0,4

Origin of samples	Peroxide index (meq/Kg)	Saponification index (mgKOH/g)	Ester index (mgKOH/g)	Calorific power (KJ/Kg)
Tout venant S/B	8,10 ±0,01	143 ±2	98,2 ±3,1	41830,45
Nganga linngolo1	5,04 ±0,61	144 ±11	95,3 ±11,1	41802,20
Loua	8,50 ±0,00	154 ±5	101,36 ±5,42	41415,74
Biri-biri	3,36 ±1,02	144 ±8	137,52 ±8,23	41800,93
Mpéola1	6,00 ±1,32	141 ±12	93,4 ±12,0	41906,66
Mpéola2	5,79 ±0,81	160 ±10	118,5 ±10,3	41193,83
Goma tsé-tsé1	14,20 ±2,10	153 ±10	135,20 ±10,14	41462,84
Goma tsé-tsé2	8,50 ±0,73	155 ±3	138,76 ±3,05	41378,27
Odziba	6,00 ±0,21	151 ±16	110,00 ±17,32	41564,59
Mont Cardinal	15,00 ±0,10	159 ±5	116,87 ±5,41	41223,36

4. Discussion

4.1. Morphological Characteristics of Fresh Fruits

On the morphological characteristics of fresh fruits, we see that the values of the length and width (maximum diameter) of the fruits, as well as those of the thickness of the pulp of Anisophyllea quangensis, are homogeneous whatever the place of origin. And, these are consistent with those in the literature [11]. The proportions of the different parts of the fruit made it possible to have the first elements on the type of fruit necessary for specific applications. The ratio of the width which represents the average maximum fruit diameter to the average fruit length is significantly less than 1.0, which allows us to conclude that the fruits are ellipsoids. Thus a collection of fruits can be made in all the localities considered without consideration of the form. We can propose in view of these first results that the fruits of Anisophyllea quangensis can be used for the extraction of oil due to the interesting proportions of almond, 11.14% compared to the mass of the fruit and juice, jams and wines due to the high proportion of its pulp, 72% on average compared to the mass of the fruit.

4.2. Overall Composition of the Pulp and Seed

From table 2, it appears that whatever the area of origin, the pulp of Anisophyllea quangensis contains almost twice as much water as its seed, i.e. 83.13±3.10% for the pulp and 38.8±5.2% for the seed, which explains the much greater concentration of the mass of these fruits in the pulp than in the seed. And this very high water content of the pulp justifies the fragility and perishability of this fruit; and therefore, the difficulty of preserving it at room temperature. It is the same situation with safou pulp (around 70% water) [12]. And the seed water content values are close to that obtained by Binaki *et al* (2013) [5]. Concerning the ash content, we make the same observation: the pulp contains more ash (8.1±2.1%) than the seed (3.28±1.02%). On the other hand, in terms of fat content, the situation is reversed: the oil content of the pulp (4.0 ± 1.7%) is very low compared to that of the seed (27 ± 3%). a value very close to that found by Binaki *et al* (2013) [5] and this result is contrary to Raphias fruits where the pulp gives a higher oil yield (around 25%) compared to the seed (around 0.01%) [13] and in safou, where we have, at the pulp level, an oil content of 60% on average and at the seed level 10% on average. Thus, it is from the fat content of its seed that Anisophyllea quangensis is classified among the medium oleaginous plants (20 to 50% fat), such as Cucurbita maxima, Moringa oleifera whose oil contents are respectively 48% and 35% [4].

4.3. Physico-Chemical Characteristics of the Fatty Matter of the Pulp and Seed of *Anisophyllea Quangensis*

Examination of Table 3 shows that:

1) Acid number values are high for most samples. And these values explain the acidity state of the fat of *Anisophyllea quangensis*. These values are commonly encountered in oilseeds and oils such as the fat of *Irvingia gabonensis*, the value of which fluctuates around 45 [4]. The low values of the Goma tsetse and Biri-biri samples can be explained by poor conservation.
2) The peroxide value is almost low in the majority of samples. The Codex Alimentarius indicates that for unrefined vegetable oils the value of the peroxide index is 15 meq O2 /kg [14], the peroxide indexes of fats lower than this value indicate their primary oxidative stability. From this point of view, the seed fat of *Anisophyllea quangensis* presents good stability with respect to the formation of peroxides, thus reducing the risk of spoilage at room temperature due to the hydrolysis of triacylglycerols alone. They also prove the slightly unsaturated nature of this fat, % (unsaturated fatty acids) / % (saturated fatty acids)>1 [5].
3) The value of the saponification index is around 150. This value, a little low compared to that of cucurbit seed oil (around 180) [15], gives this fat has a cosmetic interest [16].
4) The refractive index values varying from 1.4558 to 1.4725 are all less than 1.480 (minimum indicative value for drying oils). These values are close to the refractive indices of *Griffonia simplicifolia* oil (1.47153±0.00112) [17], cotton (1.470-1.473) [18] and oil of olive 1.4703±0.0004 [19].
5) -The density, measured at 60°C, is between 0.86 and 0.89 g/mL for all samples, this shows that the fat of *Anisophyllea quangensis* is less heavy than water.
6) The iodine index values obtained are all less than 110%, which allows us to affirm that this fat is non-drying, like olive oil (80-88%) [20] and to justify the presence in significant proportions of unsaturated fatty acids, nutritionally interesting, dominated by oleic acid [5]. These values confirm that the conservation of this oil can be done without too much risk of auto-oxidation.
7) The values of the ester indices are between 95 and 138 mgKOH/g of oil, they are lower than that of the saponification index. Which means that this oil contains an appreciable quantity of free fatty acids. Therefore, pre-refining and packaging precautions must be taken to limit subsequent denaturation which would lead to discoloration of the oil. These values are significantly lower than that of the seeds of *Citrullus colocynthis* (192.32 mg KOH/g of oil) [21]. The ester index also makes it possible to determine the molar mass (therefore the structure) of the triglycerides in an oil. For *Anisophyllea quangensis* seed oil, the value of the calculated molar mass of triglycerides is between 1217.39 and 1768.42 g/mol.
8) The calorific value of the fat from the sheaths of *Anisophyllea quangensis* is higher than that of palm oil (39758 KJ/Kg) which is one of the plants used for energy crops since, through transformation, we obtain approximately 85% of diesel fuel starting from crude oil [22]. The grease of *Anisophyllea quangensis*, if not solid, could be used as fuel and engine lubricant. But in the case where this oil is edible, this parameter would then give positive information on the calorific value of this fat in human food.

At the pulp level, taking into account the very low oil contents, only one index is determined per sample. Thus, the average values obtained for the physicochemical characteristics are as follows: Acid number 73.15 ± 6 mgKOH/g; saponification index 241 ± 11 mgKOH/g; refractive index 1.5046 ± 0.0120; peroxide index 5.27 ± 0.6 meq/Kg; iodine index 76.3 ± 0.3%; ester index 167.85 mgKOH/g and calorific value 38095.77 KJ/Kg.

1. The acid number value is greater than that of the seed; hence the very acidic character of the pulp of Anisophyllea quangensis.
2. The saponification index has a value much higher than that of the seed and close to that of palm oil which is around 200 [23].

3. The very low value of the peroxide index of the pulp oil tells us about its good stability.
4. The value of the refractive index obtained is characteristic of drying oils (1.480< IR< 1.523) [14] and proves the presence of di and tri-unsaturated fatty acids in the oil from the pulp of Anisophyllea quangensis [5].
5. The iodine index has a value which confirms, as in the seed, the significant presence of unsaturated fatty acids in the oil of the pulp [5], unlike the fat of Irvingea gabonensis which is of the lauric type, with an iodine index around 11%.

5. Conclusion

As part of the valorization of unconventional vegetable oils, this study was devoted to the morphological and physicochemical characterization of the fruits of Anisophyllea quangensis, from the savannah surrounding the city of Brazzaville. Ten fruit samples (Mont cardinal, Odziba, Nganga lingolo1, Nganga lingolo2, Loua, Goma tsé-tsé1, Goma tsé-tsé2, Biri-biri, Mpéola1 and Mpéola2) were collected.

The measurement of the morphological parameters of the fruits was carried out using a vernier caliper and a precision balance and the determination of the physicochemical characteristics according to standard analysis methods. The results show that the fruits of *Anisophyllea quangensis* are ellipsoids (l/L < 1), its seed contains 38.71 ± 5.28% water; 3.28 ± 1.02% ash and 27 ± 3% fat. Its pulp contains twice (2) times more water and ash than the seed (83 ± 3%; 8 ±2% respectively) with a very low oil content (4 ± 2%). The oil from the pulp obtained has a dark red color, comparable to that of palm oil. On the other hand, the fat extracted from the seed has a yellowish color.

On physicochemical analyses, the fat of the seed has a refractive index between 1.4558 and 1.4725, an acid index around 45 mgKOH/g, a peroxide index less than or equal to 15 meq/Kg, an iodine index of less than 110%, a saponification index of around 150 mgKOH/g and a calorific value of 41558 KJ/Kg on average. For the oil from the pulp we have a refractive index of 1.5046, acid index of 73.15 mgKOH/g; a peroxide index of 5.27 meq/Kg; iodine index 76.3%, an index of saponification of 241 mgKOH/g and a calorific value of 38095.77 KJ/Kg. These results make it possible to classify *Anisophyllea quangensis* among the medium oleaginous plants of the Congo basin and attest to the nutritional and cosmetic interest of its fat.

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Data Availability Statement

The data supporting the outcome of this research work has been reported in this manuscript.

Conflicts of Interest

The authors declare no conflicts of interest.

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