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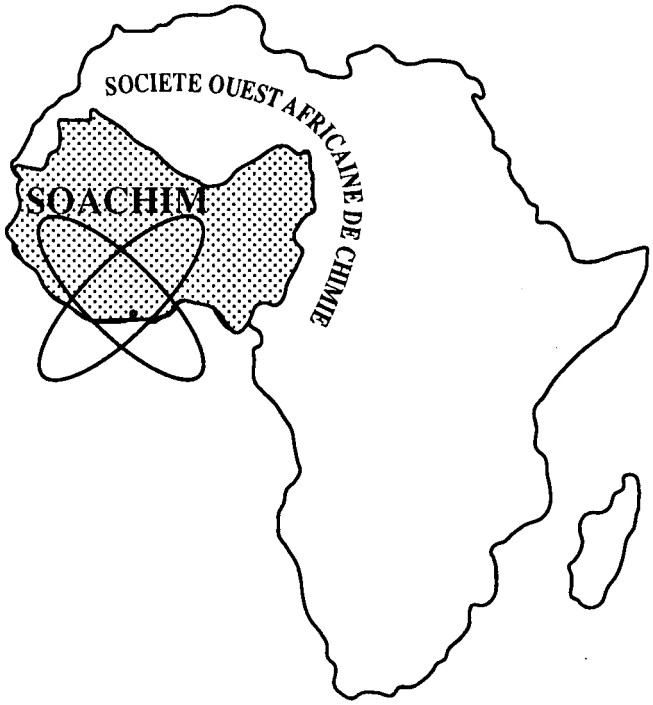

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Determination of the chemical composition and physicochemical parameters of seeds oil of *Moringa oleifera* Lam. (Moringaceae) of Côte d'Ivoire

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Abstract: The oil from the seeds of *Moringa oleifera* (Moringaceae) of Côte d'Ivoire (MOCI) was extracted using Soxhlet extractor. Then, the chemical composition and some physicochemical parameters have been determined. The oil content obtained after extraction is about 41%. MOCI seeds oil contains several fatty acids, with prevalence in monounsaturated fatty acids (74.36%). It is rich in oleic acid (70.28%). The unsaponifiable matter is 0.72% and contains about twenty compounds gathered in four families (alcohols, hydrocarbons, steroids and vitamins). The iodine value obtained is 62.6(±0.8). The saponification value is 184.66(±1) and the peroxide value is 0.74(±0.02). The dynamic viscosities determined in the temperature range: 29°C to 74.5°C, have been represented satisfactorily by the Eyring model. The densities were also studied in the same interval of temperature. The linear evolution with temperature was obtained. The refractive index of seeds oil of MOCI (λ_D=589.6 nm) is 1.4456 at 29°C. The decrease of the refractive index with the wave lengh obeys to the model of Cauchy.

Keywords: Seeds oil, *Moringa oleifera*, Côte d'Ivoire, chemical composition, physicochemical parameters.

Détermination de la composition chimique et des paramètres physico-chimiques de l'huile des graines de *Moringa oleifera* Lam. (Moringaceae) de Côte d'Ivoire

Résumé: L'extraction de l'huile des graines de *Moringa oleifera* (Moringaceae) de Côte d'Ivoire (MOCI) a été réalisée au moyen du Soxhlet. La composition chimique et certains paramètres physico-chimiques de celle-ci ont été déterminés. La teneur en huile obtenue après extraction est estimée à 41%. L'huile des graines de MOCI renferme plusieurs acides gras, avec une prédominance en acides gras mono insaturés (74,36%), en particulier l'acide oléique (70,28%). La matière insaponifiable possède une proportion évaluée à 0,72%. Celle-ci contient une vingtaine de composés regroupés en quatre familles (alcools, hydrocarbures, stéroïdes et vitamines). Ensuite, les valeurs d'iode, de saponification et de peroxyde de cette huile sont respectivement de 62,6 (± 0,8), 184,66 (± 1) et de 0,74 (± 0,02). Enfin, les viscosités dynamiques déterminées dans l'intervalle de température: 29°C à 74,5°C, ont été représentées de manière satisfaisante par le modèle Eyring. Par ailleurs, en ce qui concerne les densités, une évolution linéaire a été notée avec le même intervalle de température. L'indice de réfraction de l'huile des graines de MOCI (λ_D = 589,6 nm) est de 1,4456 à 29°C. La diminution de cette valeur avec la longueur d'onde obéit au modèle de Cauchy.

Mots clés: Huile de graines, *Moringa oleifera*, Côte d'Ivoire, composition chimique, paramètres physico-chimiques

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1. Introduction

Moringa oleifera is an important medicinal plant and a source of vegetable oil [1]. The oil of *Moringa oleifera* seeds is not only for cooking [2-5] but presents especially many bioactives compounds. It is an oil which is recognized for its anti-tumoral, anti-inflammatory and anti-bacterial properties [6-8]. It is also used for external use against skin diseases [9]. Moreover, it stimulates immune system. The oil of *Moringa* can be used against rheumatic pains and the gout [10-12]. In addition, the oil extracted from seeds of *Moringa oleifera* is similar to olive oil by his chemical composition and contains a significant amount of tocopherols [13]. This oil has the advantage of containing behenic acid (C22: 0), lignoceric acid (C24: 0) and traces of lauric, n-pentadecanoïc and pentadecenoïd acids [4; 10]. Its high rate in oleic acid confers a great thermal stability to it [14-16] and presents beneficial effects for health by reducing cholesterol and cardiac diseases [16]. The oil of *Moringa oleifera* turns thus from the new prospect of the use of the medicinal plants which relates not only to the curative but the preventive aspect. On the other side, *Moringa oleifera* seeds oil is a possible source of biodiesel [17] and has also a cosmetological use [18]. However, in spite of the investigations led on *Moringa oleifera*, the chemical and physical properties of seeds oil of *M. oleifera* growing in Côte d'Ivoire are not well known. The present work is devoted to the study of the chemical and physicochemical properties of seeds oil of *M. oleifera* of Côte d'Ivoire which are useful in the industrial processes.

2. Material and methods

2.1. Seed material and reagents

The seeds of *Moringa oleifera* were supplied by local Ivorian company named "Goutte d'eau", then indentified by Professor Aké-Assi Laurent from the herbarium of the Flora National Center (FNC) of Félix Houphouet-Boigny University (Côte d'Ivoire). The seed were peeled and oven-dried at 60 °C for 4 days. Then they were crushed in a blender to obtain a fine powder.

The reagents n-hexane, ethanol, methanol, HCl, pentane, KOH, KI, anhydrous Na_2SO_4, $Na_2S_2O_3$ were analytical grade and were purchased from POLYCHIMIE S.A. and RYCA-PHARMA Côte d'Ivoire. All reagents were used as received without further purification.

2.2. Methods

2.2.1. Oil extraction

10 g of *Moringa oleifera*'s seeds powder were carefully mixed with 3 g of anhydrous sodium sulphate. The resulting mixture was introduced into a Soxhlet apparatus containing n-hexane heated to reflux in a heating skullcap during 2 hours. The obtained oil was dried, weighed, and analyzed after vacuum distillation of the solvent with a rotary evaporator [13; 19-22].

2.2.2. Determination of unsaponifiable matter

5 g of extracted oil were mixed with 50 ml of KOH ethanolic solution (2N). The obtained mixture refluxed on a hot-plate for 1 hour. Then 100 ml of distilled water were added to the mixture after cooling and was transferred in a separating funnel. The organic phase was extracted with 4 x 50 ml of pentane and washed with distilled water until a pH close to 7 [20]. For the removal of water traces from the oil, the extract was treated with anhydrous Na_2SO_4, then filtered and the solvent was eliminated using a rotary evaporator. The obtained residue which is the unsaponifiable part, was dried, weighed and analyzed by GC-MS.

The unsaponifiable matter is calculated by means of the following formula:

$$Ins(\%) = \frac{m_1}{m_2} \times 100 \quad (1)$$

Where m_1 = mass in g of the unsaponifiable matter; m_2 = mass in g of the sample (oil)

2.2.3. Determination of fatty acids content

After unsaponifiable extraction, the saponified fatty acids were turned into fatty acids by addition of 1 ml of HCl (5N). The fatty acids were extracted with 3 x 25 ml of ethyl acetate. Then, the solvent was distilled off under vacuum in order to have a concentrate of fatty acids. The acids methylation was carried out by adding 1 ml hydrochloric methanol (2N) and heated to boiling on a hot-plate[23]. After cooling, 20 ml of distilled water were added to the mixture. The methyl esters were extracted with 3 x 25 ml of ethyl acetate. Finally, the obtained organic fractions were evaporated under pressure and analyzed by GC-MS.

2.2.4. Study of the composition of unsaponifiable and fatty acids by GC-MS

The unsaponifiables and fatty acids were analyzed using GC/MS spectrometer SHIMADZU

(QP2010SE model) with a Zebron ZB-5ms column 20 m long, an internal diameter of 0.18 mm and a film thickness of the stationary phase of 0.18 µm. Helium was employed as gas carrying with a linear velocity of 0.9 ml/s. The oven temperature was settled to 50-280°C during 2 min, then to 280-300°C for 5 min and finally maintained at 300°C during 18 min. The injector temperature was set at 250°C and the detector at 280°C. The injection was carried out in splitless mode. The mass spectrometer parameters for the electron impact mode are ion source temperature (230°C), electron energy (70 eV), scan speed (50 scans/s) and acquisition speed (10 000 uma/s). The compounds identification was made by comparing retention times with those of reference compounds and the spectral data obtained from NIST and Wiley libraries [24].

2.2.5. Determination of the saponification value

Saponification value has been determined by volumetric dosage according to the method described by Gnao et *al*.[25] and AFNOR standars[26].

2.2.6. Determination of peroxide value

2 g of oil were weighed in 200 ml erlenmeyer previously dried and tarred. Then, 10 ml of chloroform and 15 ml of acetic acid were added in this order and the erlenmeyer was closed and agitated to dissolve the oil. 1 ml potassium iodide was added, the mixture was agitated and put in a dark place for 5 minutes. Then 75 ml of distilled water were added. The titration was performed with sodium thiosulfate solution (0.01 N) after addition of 2 or 3 drops of starch paste. During the titration, the erlenmeyer was vigorously agitated until total disappearance of purple colour. The same operation was performed without the oil.
The peroxide value, expressed in millimolecules of peroxide/kg, was calculated by the following formula:

$$Peroxide\ value = \frac{(V - V') \times 5}{m} \qquad (2)$$

Where V = volume of sodium thiosulfate used in the test with the oil;
V' = volume of sodium thiosulfate used in the trial;
m = mass of oil.

2.2.7. Determination of the iodine value

Iodine value has been determined by volumetric dosage according to the method described by AOAC standards [27] and AOCS [28].

2.2.8. Determination of the density

An electronic balance (METTLER Balances BD) and a gauged phial were used to determine the density of the oil. 50 ml of oil was put in the phial and was weighed. With the values of the mass and the volume of the oil, the density was determined by making the quotient of the mass and the volume for various temperatures.

2.2.9. Determination of the viscosity

A falling ball viscosimeter LEP 1. 4. 04 (PHYWE) was used. The time of fall of the ball between the annular marks is determined by a chronometer. The time of measure begins when the lower periphery of the ball reaches the superior annular mark which has to appear as a line to the observer. The chronometer is stopped when the lower periphery of the ball reaches the lower annular mark which also has to appear as a line.
The expression allowing to calculate the dynamic viscosity coefficient is given by:

$$\eta = K(\rho - \rho')t \qquad (3)$$

In certain cases, the variation of the dynamic viscosity coefficient can be interpreted by means of the model of Eyring[29]. This model suggests an exponential variation of the viscosity with the temperature, through the equation below:

$$\eta = A\exp\left(\frac{E_a}{RT}\right) \qquad (4)$$

2.2.10 Determination of the refractive index

A goniometer of Euromex Holland was used to measure the refractive index of the oil of *Moringa oleifera*. The angles of deviation of some lines (spectrum) were determined. This spectrum came from the decomposition of the incidental light by the prism containing oil of *Moringa oleifera* of Côte d'Ivoire. The refractive index was calculated by means of the following formula:

$$n = \frac{\sin\left(\frac{D_m + 2}{2}\right)}{\sin\left(\frac{A}{2}\right)} \qquad (5)$$

The angle A measures 60°.

Generally, for the electromagnetic waves and the light in particular, an expression of the refractive index according to the wave length is given by the relation of Cauchy presented below:

$$n = A + \frac{B}{\lambda^2} \quad (6)$$

Where *A* and *B* are constants characterizing the studied material. They are obtained by linear adjustment of the experimental values [30].

3. Results and discussion

3.1. Extracted vegetable oil

The oil content of *M. oleifera* seeds of Côte d'Ivoire is 41±1%. This oil content is higher than those of the varieties of Malaysia (30.8±2.19)[31] and Kenya (35.7)[13]. This difference could be justified by several factors as the variety of the plant, the climate of culture, the time of harvest, the method of extraction and the degree of maturity of seeds according to Abdulkarim et *al.*[31].

3.2. Qualitative analysis by GC-MS of the fatty acids

The analysis by GC-MS of *Moringa oleifera* seeds oil from Côte d'Ivoire (figure 1) revealed a dozen fatty acids including four monounsaturated fatty acids. The identified compounds are listed in table I. The results of this study show that the composition in fatty acid of *Moringa oleifera* is varied, with prevalence in monounsaturated fatty acids (74.36%). This value is close to those of the variety Periyakulam from India (75%) and slightly lower to those of virgin olive oil (75.75%)[15] and variety Mbololo from Kenya (77.71%)[13].

Peaks 2, 5, 7 and 9 reveal the presence of monounsaturated fatty acids. Peak 2 reveals a molecular ion [M^+] 268 and fragments 254 (loss of methyl), 236 (loss of methanol (32 u.m.a)), 43 (fragment corresponding to carboxylate) and 31 (fragment corresponding to a methanolate) indicates the presence of palmitoleic acid. 10-cis-heptadecenoic acid revealed by peak 5 gives a molecular ion [M^+] 282 and fragments 250 (loss of methanol (32 u.m.a)), 43 and 31. As for peak 7, it shows the presence of the major constituent with a proportion of 70.28%. This compound with a molecular ion [M^+] 296 and fragments 264 (loss of methanol (32 u.m.a)), 235 (loss of formic acid ester (60 u.m.a)), 43 and 31 was identified as being the oleic acid. Lastly, gondoic acid indicated by peak 9 gives a molecular ion [M^+] 324 and fragments 292 (loss of methanol (32 u.m.a)), 43 and 31.

Otherwise, various saturated fatty acids were revealed in *M. oleifera* seed oil. The most abundant are palmitic acid (9.76 %) and stearic acid (8.06%). The palmitic acid revealed by peaks 3 and 4 provides a molecular ion [M^+] 270 and fragments 256 (loss of methyl), 43 and 31. Concerning the stearic acid, it appears with a molecular ion [M^+] 298 and fragments 266 (loss of methanol), 43 and 31.

In brief, *Moringa oleifera* seed oil of Côte d'Ivoire is rich in oleic acid (70.28%), compared to that of olive (66-76%) and Raphia sese De Wild (14.62%)[23]. This oleic acid content is closed (slightly lower) to those from Kenya[13] and India[15]. Thus, our results are not in contradiction with those obtained in other studies performed on *M. oleifera* Lam. seed oil from Burkina Faso, which acid content is approximately of 73% [32].

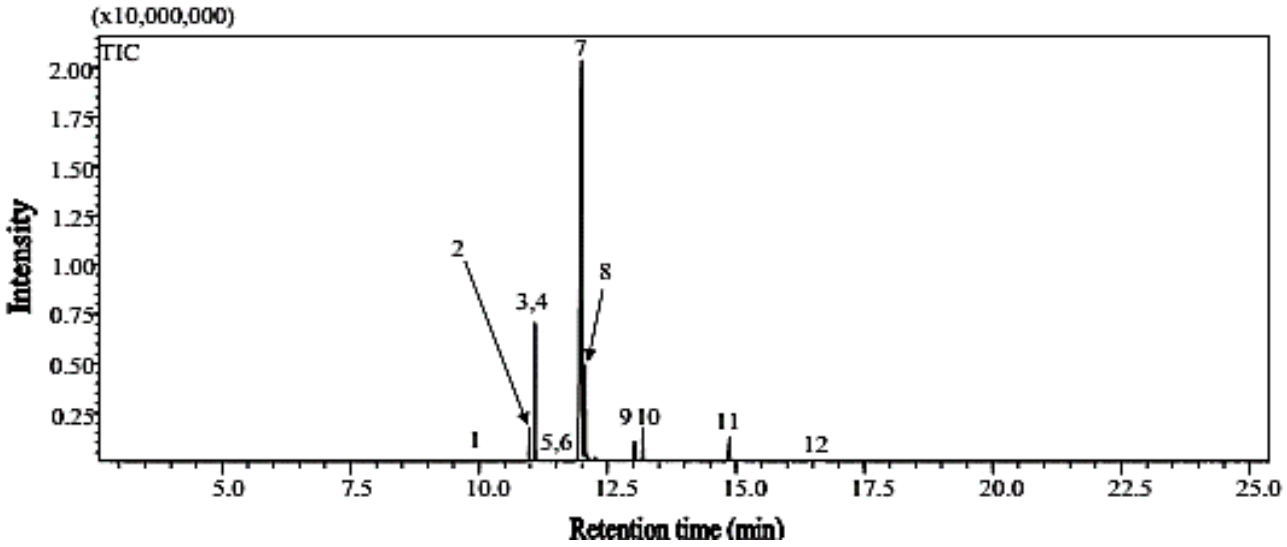

Figure 1: GC-MS chromatogram of fatty acids of *M. oleifera* of Côte d'Ivoire

3.3. Qualitative analysis by GC-MS of the unsaponifiables.

The phyto-chemical compounds constituting the unsaponifiable fraction of *Moringa oleifera* seeds (figure 2) are gathered in table II. The analysis by GC-MS of the unsaponifiable fraction of *M. oleifera* allowed to detect approximately about twenty compounds with a yield of 0.72%, gathered in four families (alcohols, hydrocarbons, steroids and vitamins). Most abundant are steroids (31.33%) and alcohols (56.56%). Some compounds are revealed with very significant proportions. These are alcohols (Z)-11-Pentadecenol (9.55%), (E)-9-Tetradecen-1-ol (9.58%) and Pentadecan-1-ol (27.53%) and steroids Stigmastan-3,5,22-trien (7%) and Stigmastan-3-5-dien (15.25%). Furthermore, B6 vitamin with a content of 4.59% is in the unsaponifiable fraction of *M. oleifera* of Côte d'Ivoire. Indeed, the presence of B6 vitamin confirms the use of *M. oleifera* seed oil as cooking oil[2; 32].

3.4. Iodine, peroxide and saponification values

The iodine, peroxide and saponification values are shown in table III. They are compared with those obtained by Lalas and Tsakni, Tsaknis et *al.*[13; 15], Abdulkarim et *al.*[31] and Anwar et *al.*[33] (table III). *M oleifera* seeds oil for the varieties from Pakistan, Malaysia, Kenya (Mbololo) and India (periyakulam) have higher iodine values than these of the variety of Côte d'Ivoire. This small iodine value shows that *M. oleifera* seeds oil of Côte d'Ivoire unsaturated fatty acid content is lower than these varieties. The peroxide value is lower than those of India (n-hexane) Kenya but higher than that of Pakistan. The oil of *M. oleifera* of Côte d'Ivoire hardly oxidizes in free air.

Table I: Identification by GC-MS of the fatty acids of *Moringa oleifera*

Peaks	Tr (min)	Compounds Identified	Molecular formula	Percentage (%)	Fragmentations
1	10	Myristic acid	$C_{15}H_{30}O_2$	0.14	m/z 242 (M^+), 211 (M^+-CH_3O^-), 185 (M^+-$C_2H_4O^-$), 43, 31
2	10,98	Palmitoleic acid*	$C_{17}H_{32}O_2$	2.14	m/z 268 (M^+), 254 (M^+-CH_3), 236 (M^+-CH_3O^-), 43, 31
3,4	11,09	Palmitic acid	$C_{17}H_{34}O_2$	**9.76**	m/z 270 (M^+), 256 (M^+-CH_3), 43, 31
5	11,47	10-cis-Heptadecenoic acid*	$C_{18}H_{34}O_2$	0.05	m/z 282 (M^+), 250 (M^+-CH_3O^-), 43, 31
6	11,58	Margaric acid	$C_{18}H_{36}O_2$	0.1	m/z 284 (M^+), 270 (M^+-CH_3), 252 (M^+-CH_3O^-), 43, 31
7	12	Oleic acid*	$C_{19}H_{36}O_2$	**70.28**	m/z 296 (M^+), 264 (M^+-CH_3O^-), 235 (M^+-$C_2H_4O^-$), 43, 31
8	12,08	Stearic acid	$C_{19}H_{38}O_2$	**8.06**	m/z 298 (M^+), 266 (M^+-CH_3O^-), 43, 31
9	13,03	Gondoic acid*	$C_{21}H_{40}O_2$	1.89	m/z 324 (M^+), 292 (M^+-CH_3O^-), 43, 31
10	13,20	Arachidic acid	$C_{21}H_{42}O_2$	3.07	m/z 326 (M^+), 311 (M^+-CH_3), 294 (M^+-CH_3O^-), 43, 31
11	14,88	Behenic acid	$C_{23}H_{46}O_2$	3.73	m/z 354 (M^+), 322 (M^+-CH_3O^-), 43, 31
12	16,56	Lignoceric acid	$C_{25}H_{50}O_2$	0.78	m/z 382 (M^+), 368 (M^+-CH_3), 351 (M^+-CH_3O^-), 43, 31

* : monounsaturated fatty acids

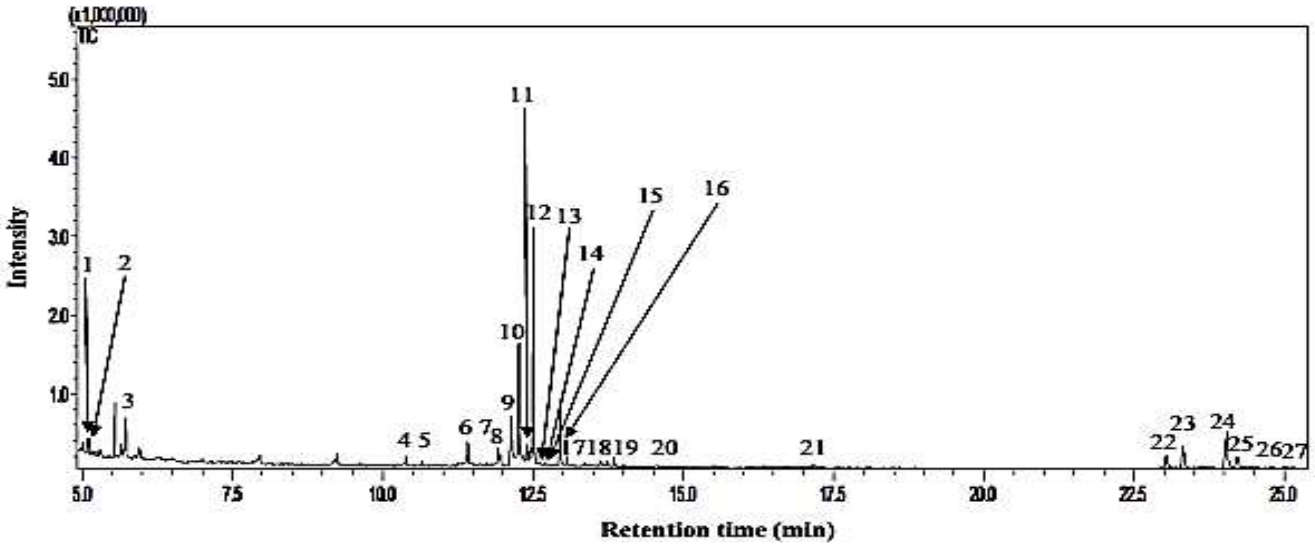

Figure 2: GC-MS chromatogram of unsaponifiables of *M. oleifera* of Côte d'Ivoire

On the other side, the saponification value of the oil of the variety of Côte d'Ivoire is lower than those of Malaysia and Kenya. But it is higher than those of India. The variation of iodine and saponification values is linked with several factors such as the variety of the plant, the climate of culture, the time of harvest, the method of extraction and the degree of maturity of the seed according to Abdulkarim et *al*.[31]. Otherwise, oil of *M. oleifera* of Côte d'Ivoire has a saponification value very close to that of the oil of the variety Periyakulam from India extracted by hexane. They have appreciably the same foaming power.

3.5. Viscosity

The viscosity of *Moringa* oil from Côte d'Ivoire (figure 3) was determined for ten temperatures in the interval [29°C–74.5°C]. The variation of the dynamic viscosity coefficient with the temperature is interpreted by means of Eyring model[29]. This model suggests an exponential variation of the viscosity according to the temperature and matches with the experimental values in a satisfactory way with a coefficient of correlation R^2 = 0.998. So we have A = 0.00308 mPa.s and Ea = 23499 J/mol. A is a constant and Ea is the activation energy of viscosity. We used the Eyring model to give the viscosity at 25°C, η = 40.4 ± 0.7 mPa.s. This value is lower than that obtained for the varieties Periyakulam 1 and Mbololo which are 45.05 and 57 respectively for the extraction with hexane[13; 15].

3.6. Density

The density of *Moringa* seeds oil of Côte d'Ivoire has been determined for ten temperatures in the interval [29°C – 74.5°C]. The density has a linear variation with the temperature as shown in figure 4, with a coefficient of correlation R^2 = 0,998. The linear adjustment equation in the interval of temperature [29°C – 74°C] is: $\rho' = 1.0908 - 0.0006T$. According to this equation the density of the oil at 24°C is 0.888 g/cm^3. Our results are similar to those obtained by Lalas and Tsaknis[15] and Tsaknis et *al*.[13]. Indeed, for the same temperature, these authors obtained 0.909 g/cm^3 and 0.8809 g/cm^{3}respectively for variety Periyakulam and Mbololo.

Table II: Identification by GC-MS of the unsaponifiables of *Moringa oleifera*

N°	RT	Phyto-chemical compounds identified	Percentage %
1	5	(E)-hex-3-en-2-ol	0.95
2	5,18	(2E,4E)-2,4-Hexadienyl	0.49
3	5,72	**B6 Vitamin**	**4.59**
4	10,38	(E)-5-Eicosene,	0.87
5	10,65	6,10-dimethylundecan-2-ol	0.51
6	11,31	Ethyl 9-hexadecenoate	0.20
7	11,49	Z-10-Tetradecen-1-ol	0.11
8	11,96	Nonadecan-2-ol	1.48
9	12,14	**Z-11-Pentadecenol**	**9.55**
10	12,23	9,12-Octadecadienoic acid, ethyl ester	0.55
11	12,44	3-Eicosanol	1.10
12	12,47	1-Hexadecanol	1.30
13	12,50	**Pentadecan-1-ol**	**27.53**
14	12,53	2-Heptadecanol	1.15
15	12,70	**(E)-9-Tetradecen-1-ol**	**0.14**
16	12,95	**(E)-9-Tetradecen-1-ol**	**9.44**
17	13,07	Nonadecan-2-ol	1.29
18	13,74	Octadecan-4-ol	0.72
19	13,85	2-Heptadecanol	1.18
20	14,56	Tetratetracontane	0.56
21	17,16	Squalene	0.38
22	23,03	Desmosterol	4.61
23	23,31	**Stigmastan-3,5,22-triene**	**7.00**
24	24,04	**Stigmastan-3,5-diene**	**15.25**
25	24,22	Cybisterone	3.34
26	24,79	Scillarenin	0.41
27	25	5-α-Stigmasta-7,16,25-trien-3β-ol	0.74
		Others	3.68

The variation of the density is negligible from one variety to another.

3.7. Refractive index

The refractive index of *M. oleifera* oil of Côte d'Ivoire has been determined at 29°C according to five wave lengths: red (Cd), yellow (Hg), green (Hg), blue (Cd), indigo (Hg). The results are represented on figure 5. The model of Cauchy[30] describes in a satisfactory way the experimental values with a coefficient of correlation $R^2 = 0.997$. The constants A and B were determined by linear adjustment: $A = 1.4456$ and $B = 4.63 \times 10^{-15}$ m^2 (equation 6). The coefficient *A* represents the limit value of the refractive index when λ is infinite. The refractive index according to the wave lengh λ_D = 589.3 nm was determined by extrapolation: $n_D = 1.4589$ at 29°C. Lalas and Tsaknis obtained 1.457 and 1.4549 for variety Periyakulam and Mbololo respectively at the same temperature and wave length when extraction was done with hexane[15]. When the solvent of extraction is chloroforme : methanol (1 :1), they get 1.459 and 1.4581 for Periyakulam and Mbololo respectively. The refractive index seems to not depend on the variety, nor on the extraction solvent. It also varies very little for a difference of temperature of about 10°C, with an error lower than 1%.

Table III: Comparison of iodine, saponification and peroxide values of *Moringa oleifera* seeds oil

Variety (origin)	Methods of extraction	Iodine values	Saponification values (mgKOH/g)	Peroxide values
Periyakulam 1 (Inde)	Cold pressure	65.73	199.32	0.11
	n-hexane	65.58	188.36	1.83
	Chloroforme : methanol (1 : 1)	65.46	186.32	1.48
Mbololo (Kenya)	n-hexane	66.83	178.11	1.80
	Chloroforme : methanol	66.66	176.23	0.94
Malaisie	Soxhlet (8h)	65.4±0.5	164±1.49	
	2% Neutrase 0,8L(Enzyme)	66.1±1.32	163±0.98	
Pakistan	Soxhlet (4-5h)	69.8±3.48	…	0.23±0.01
Côte d'Ivoire	Soxhlet (2h) n-hexane	62.6±0.8	185±1	0.74±0.02

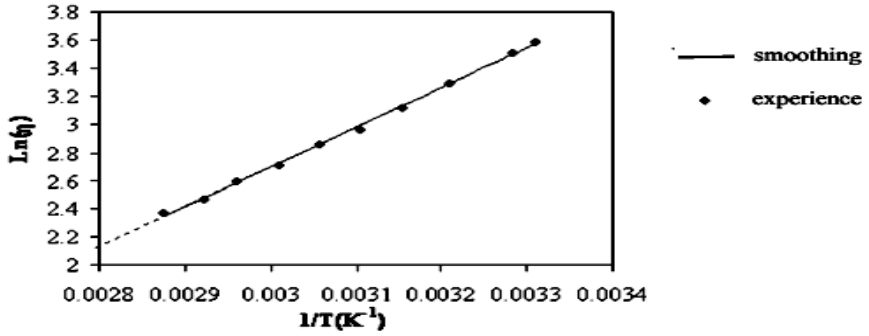

Figure 3: Variation of the logarithm of the viscosity of the oil of *M. oleifera* of Côte d'Ivoire with the inverse of the temperature

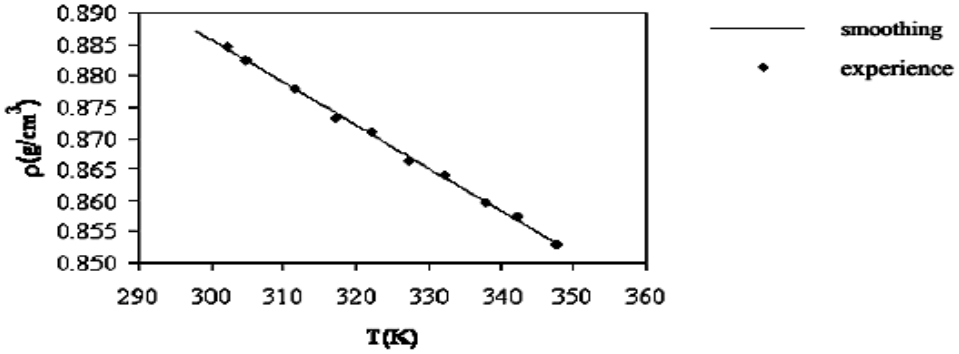

Figure 4: Variation of density of the oil of *M. oleifera* of Côte d'Ivoire with the temperature

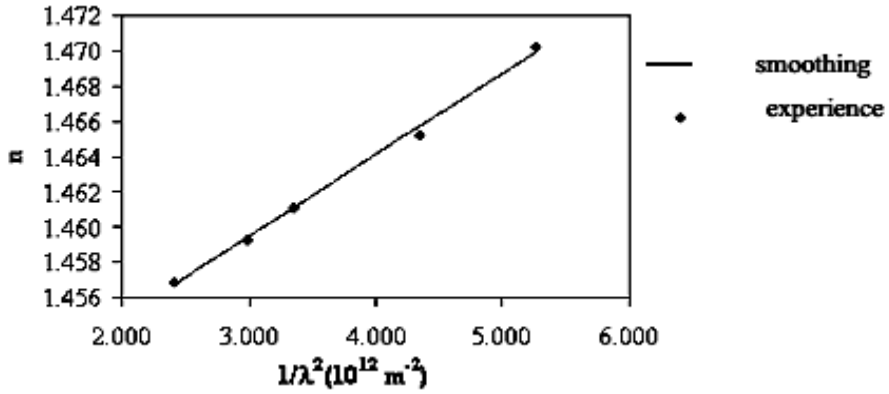

Figure 5: Variation of the refractive index of the oil of *M. oleifera* of Côte d'Ivoire with the inverse of the square of the wave length

4. Conclusion

Through several experimental techniques, we determined some important physicochemical parameters of the seeds oil of *Moringa oleifera* of Côte d'Ivoire obtained by extraction with a Soxhlet extractor. We also determined the composition in fatty acids, the unsaponifiable content and his composition. With an oil content of 41%, the variety of Côte d'Ivoire is among the varieties presenting an important oil content. The composition in fatty acid of *Moringa oleifera* of Côte d'Ivoire is varied and dominated by monounsaturated fatty acids (74.36%). The more abundant monounsaturated acid is oleic acid (70.28%). This oil has an unsaponifiable matter of 0.72%. The unsaponifiable matter contains approximately twenty compounds gathered in four families (alcohols, hydrocarbons, steroids and vitamins). The oil of *M. oleifera* of Côte d'Ivoire has an iodine value of 62.6. The oil of Côte d'Ivoire variety contains less insaturations than the others varieties. The peroxide value is 0.74. Its saponification value is 184.66. The activation energy from 29°C to 74.5°C is Ea=23499 J/mol. The density at 24°C is 0.888 g/cm^3. The refractive index of oil of *M. oleifera* of Côte d'Ivoire for the wave length λ_D = 589.6 nm (Yellow of Sodium) is n_D = 1.4456 at 29°C. This study is the first that has been performed on the determination of the chemical composition and physicochemical parameters of seeds oil of *Moringa oleifera* Lam. (Moringaceae) of Côte d'Ivoire. In order to have a complete characterization of *Moringa oleifera* of Côte d'Ivoire, studies on the protein content and the mineral composition of different parts of the plant (leaves, seeds, bark, drumstick and root) are already undertaken.

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