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RESEARCH ARTICLE

PHYSICOCHEMICAL CHARACTERIZATION AND TECHNOLOGICAL VALORIZATION OF PYTHON FAT (*PHYTHONSEBAE*) OF CONGO BRAZZAVILLE

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ABSTRACT

In order to enhance the *Python sebae* fat used as a traditional remedy to treat the boils, hemorrhoids, joint pain, etc., in the Congolese traditional medicine, we realized a physicochemical characterization of this fat. Studied fats come from three locations: Dolisie, Kindamba and Brazzaville. The indices of acid vary between 2,38 and 127,6%, the rate of oxidation of our samples is between 0,28 and 5,75 meq. O_2/Kg; the detergent and foaming power varies between 157.99 and 178.73; the iodine value shows a high level of creation of the order of 127.12. The fatty acids profile reveals 39.19% SFA, 54.15% MUFA and 6,65% PUFA. The main components being (49.47%) oleic acid, Palmitic acid (28,51%), stearic acid (9.38%) and linoleic acid (5.85%). The viscosity of our samples varies between 65.88 and 949.7 mPa.s and a melting point between 38-40 ^{0}C. An ointment from the grease and a few ingredients was created, whose virtues have potential: antimicrobial, analgesic and anti-inflammatory.

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INTRODUCTION

In recent years, food fats suffer trends in today's societies (cult of thinness, diets...) and thus their tarnished image. Indeed, the fat consumption is increasingly the object of an alarming situation; many are those who deplore his contribution because it often leads to obesity. However, the use of fat goes back several centuries. They do ensure that our meals are tasty, deliver energy, vitamins and essential fatty acids for the body. They may be of animal or plant origin; the most widely used are those of plant origin for their food and industrial use. Outside this use, some fats are filled with many curative virtues. Natural oils are in general traditional remedies for many ailments. Therefore, many authors have studied certain oils of plant and animal origin for their pharmacological application and revealed antimicrobial (Nissen *et al*., 2010; Dias *et al*. 2013), antiinflation (Caldefie-Chézet *et al*., 2006; Ferreira *et al*., 2010; Cardoso *et al*., 2011), antioxidant (Sepahvand *et al*., 2014), and anticancer (Nikolakopoulou *et al*., 2013) properties. These properties are often due to the fatty acids that make up these oils or fats, especially polyunsaturated fatty acids (Nikolakopoulou *et al*., 2013; Black and Rhodes, 2006; Lim, *et al*., 2009; Mandal, *et al*., 2012; Guesnet *et al*., 2005). Snake oils are also often used in traditional medicine such as cobra fat oil to treat skin necrosis (Khunsap *et al*., 2016), the famous oil of snake Enhydrischinensis (Chinese water snake) which has anti-inflammatory effects and a therapeutic potential (Kunin, 1989); the oil extracted from boa constrictor fat has anti-inflammatory and antimicrobial properties (Falodun *et al*., 2008). In Congo, python fat is traditionally used to treat rheumatism, boils, hemorrhoids. It therefore seemed important to us to carry out a study on the physicochemical characterization of this fat to try to understand which are its

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constituents which are responsible for these virtues and try to valorize it by a technological application: the production of a ointment made from this fat.

Ointments

Ointments are soft-consistency preparations obtained by mixing drug substances with a suitable excipient, and intended to be applied to the skin for the purpose of administering drugs dermally (Dembélé, 2011).. They do not contain water, liquefy on contact with a heat source and consist only of lipids, waxes, fats mixed with finely ground resin powders. Ointments have excipients derived most often from natural plant substances, solid or crushed, pasty or semi liquid and liquid (oils, balms, resin, gums, mixed with finely ground resinous powders ...) or animal (honey, wax, animal fat ...) (Wouessi, 2011). Originally, we mainly used fatty substances of animal or mineral origin (axonge, lanolin, petrolatum), currently we can use many other basic principles (Arditty, 2007).

The python

In the Congo, there are two species of pythons: the Royal Python (*Python regius*) and the Python Seba (*Python sebae*) which is the subject of our study (Fig 1).

Fig. 1. Python sebae

This snake, which belongs to the family Pythonidae is both diurnal and nocturnal, it is not only the most ubiquitous (we meet everywhere) of the Congo, but also by far the heaviest and largest snake in Africa (Figure 2). He is easily differentiated from others by the shape of his head and the color of his body. Two other characters distinguish him at first glance. The very large number of dorsal scale ranks around the middle of the body (ranging from 71 to 95, while the other serpents all have less than 45), and the thermo-sensory dimples on the anterior supra-labial scales (Pauwels and VandeWeghe, 2008).

MATERIAL AND METHODS

Material

Animal material

The animal material used is a fat that is extracted from the *Python sebae* from the following localities: Brazzaville (4 ° 16 '4 "S / 15 ° 16' 31" E), Dolisie (4 ° 11 '54 "S / 12 ° 39) '60' E) and Kindamba (3 ° 44 '37 "S / 14 ° 31' 34" E). The fat samples that were the subject of our study were purchased in the markets of the aforementioned cities and stored at -20˚C.

Ingredient

For the manufacture of our ointment, we used the following ingredients or products:

The python fat that we have characterized.

The camphor of scientific name CinnamomumCamphorawhich is extracted from the camphor tree. Its chemical formula is $C_{10}H_{16}O$. It is particularly famous for its medicinal properties. Indeed, camphor is a stimulant of the adrenal cortex, releases attacks of asthma and emphysema, and it fights infectious diseases (microbial, viral). It is an antalgic and a powerful antiseptic that heals blows and bruises.

It is also a stimulant of the central nervous system and an anti-inflammatory par excellence;

- Menthol of chemical formula: $C_{10}H_{20}O$ is a covalent organic compound obtained either by synthesis or by extraction from the essential oil of mint. It belongs to the monoterpenolfamily. Menthol has anti-inflammatory and antiviral properties. It is also used to relieve minor irritation of the throat. It is also a local anesthetic;
- Vaseline is a petroleum jelly, known for decades for its many uses. Its benefits to the skin are well known all over the world. It therefore has a moisturizing and insulating role at the same time.

METHODS

Lipid extraction

The lipids were extracted simply by heating the small pieces of fat from fat bags of fat extracted from the belly of python (Fig 2a and 2b) between 37 and 50 ˚C until complete dissolution of these fats. Lipids were kept at -20˚C until use (Khunsap S. *et al*. 2016)

Fig.2a. Sacs of fat of Python sebae

Fig. 2b. Fat of Python sebae

Methods of analysis

After lipid extraction, we proceeded to the characterization of these lipids, which generally refers to the determination of chemical indices, fatty acid profile, rheological properties and differential thermal analysis.

Physico-chemical analyzes

Determination of chemical indices

The different indices measured in this study were determined according to the following official AOAC standards: Acid Index (AOAC, 969.17, 1997); Iodine Number (AOAC, Standard 993.20, 1997); Peroxide Index (AOAC, Standard 965.33, 1997); Saponification index (AOAC, standard 920.160.1997) (AOCS, 1997; Kyari M.Z., 2008).

Viscosity

The viscosity is measured using the rheometer, Stress Techrorometer, REOLOGICA Instruments AB, Sweden calibrated according to the manufacturer's data. 7µl of sample are used by varying the stress (from 7 to 20 Pa) as a function of time. The kinematic viscosity η is expressed in mPa.S.

Determination of the fatty acid profile

KOH in solution in 2N methanol is used as a transmethylation reagent to prepare the fatty acid methyl esters of total lipids [Standard ID 182: 1999]. The methyl esters thus formed are analyzed by gas chromatography on a Per 2000 chromatograph (Périchrom, Saulx-le-Chartreux) equipped with a flame ionization detector. This device is equipped with a polyethylene glycol capillary column doped with terephthalic acid (Périchrom), 25 m long, 0.25 mm diameter and 0.5 m thick film. The temperature of the injector and detector is set at 260 ° C. The column is raised from 70 to 180 ° C (39.9 ° C / min), and is maintained at this temperature for 8 minutes. It then undergoes a second heating up to 220 ° C (3 ° C / min). The carrier gas is nitrogen (1.1 bar). The software Winilab (Périchrom, Saulx-le-Chartreux) allows the integration of chromatograms. The identification of the peaks is done by two standards of fatty acids provided by Supelco (Belle fonte, United States): PUFA1 (marine source) and PUFA2 (animal source).

Differential thermal analysis

Differential Thermal Analysis (DTA) consists in measuring a temperature difference between the sample studied and a reference sample, which does not show any thermal phenomena in the temperature range studied. The thermal profile thus obtained reflects the changes in the state of the analyzed product and the energy variations associated with these changes.

The thermal profile of the fats is determined according to Tan's method, and Che Man, (1999) (Sathivel S., 2005). Weigh 6 to 12 mg of Python sebae fat sample into hermetically sealed aluminum capsules, another empty and hermetically sealed aluminum capsule was used as a reference. The thermal program is as follows: in the chamber at 20 ° C., the cell block of the DSC was rapidly heated to 80 °C. at a rate of 40 °C/min and held for 5 minutes at this same temperature to destroy the crystal nuclei. The block is then rapidly cooled from 80 to -30 °C at a rate of 5 °C / min, and held for 5 minutes at this same temperature to allow for polymorphic changes. Finally, the block is new cooled from -30 to -85 °C at a rate of 1 °C / min to set the cooling profile.

Rheological properties

The viscosity is measured using the rheometer, (Stress ® rheometer, REOLOGICA Instruments AB, Sweden). We measured the viscosity by stress (from 1 to 78 Pa) as a function of time and at different temperatures (between 25 ° C and 40 ° C). Then, the viscosity of the liquid at the plateau of the curve was read.

Making an ointment

For the manufacture of our ointment, we used the Plackett-Burman Experience Plan (Plckett and Burman, 1946; Goupy, 2001). We selected four factors with the following maximum and minimum values: python fat (40.50); Vaseline (42.50); camphor (0.16); menthol (0,2). The results are recorded in the table 1.

Table 1. Experimental design generated according to the Plackett-Burman matrix

OrdEssai	Vaseline	Graisse de python	Camphre	Menthol
1	50	40	16	2
2	42	50	16	2
3	42	40	0	0
4	42	40	16	2
5	42	50	16	0
6	50	40	0	2
7	42	50	0	2
8	50	50	16	0
9	46	45	8	1
10	50	40	16	2
11	50	50	0	0
12	42	40	16	0
13	42	40	0	2
14	50	40	16	0
15	42	50	16	0
16	50	50	0	2
17	42	50	0	2
18	50	50	16	2
19	42	40	0	0
20	50	40	0	0
21	46	45	8	1
22	46	45	8	1
23	50	50	0	0

Table 2. Results of chemical index

Samples	IA values (% oleicacid)	IP values (meq d'O_2/kg)	IS value (mg KOH/g)	Value of II
FP*s*fromDolisie	39.18 ± 8.40	5.75 ± 0.53	169.25 ± 2.65	87.5 ± 3.53
FP*s*fromKindamba	127.60 ± 4.75	2.56 ± 0.05	175.68 ± 4.31	127.12 ± 7.47
FP*s*from Brazzaville 1	3.66 ± 0.42	0.28 ± 0.01	178.73 ± 7.64	103 ± 1.41
FP*s*from Brazzaville 2	2.38 ± 0.88	0.29 ± 0.07	157.99 ± 7.56	ND
**Python regius*fat	5.61±0.24	198.05±8.16	164.09±4.75	97.20±0.96

FP*s* : Fat of python *sebae*; IA: acidity in% oleic acid; IP: peroxide indice; IS: saponification indice; II: iodine indice; ND: not determined; * (Okere and al., 2014)

The compositions of the ointments were determined by the Plackett Burman mixing plane (Plackett R.L. and Burman J.P., 1946; Goupy J., 2001) based on a first-order model whose equation is as follows: $Y = \beta 0 + \Sigma\ \beta i\ Xi$ (1) Or Y is the answer (Composition of the ointment), β0 is the constant, βi is the linear coefficient and Xi is the level of the independent variable. We selected compositions whose total is equal to 100%.

Operating mode

Melt the fat of the python sebae in a bain-marie at a temperature of 50 ° C. Take the Vaseline, put it in a saucepan and melt it. Once the material has completely melted, add the oil obtained upstream based on the fat. Heat the mixture over low heat while stirring regularly with a spoon for a few minutes. Add camphor and menthol in this liquid mixture, continue to stir for one minute to homogenize it well. Verse all in a saucepan or pot and let cool by closing the lid. Keep the balm obtained in a cool place protect from light. We carried out the tests selected according to the results of the mixing plans.

Statistical Analysis

Results are expressed as mean ± standard deviation (SD). Statisticalanalysis was carried out by Excel Version 8.0 software. Significance was defined at $P < 0.05$.

RESULTS AND DISCUSSION

Physicochemical characterizations of the fats of Python sebae

The results of chemical analyzes of the *Python sebae* fat, obtained after various manipulations are presented in the table 2. From the point of view of acidity, the acid values obtained in Table I vary in average from 2.38 to 127.59 mg KOH / g of Python Sebae fat. According to the Codex Alimentarius (CODEX STAN 19-1981), a good quality fat must have an acidity level of 4 mg KOH / g of fat. Only samples from Brazzaville conform to the standard. The high acidity of the Dolisie and Kindamba samples could be explained by the poor storage and storage conditions during the transport of these samples, since the conversion of triglycerides to fatty acids and glycerol increases the acid number (Falodun, A. *et al*., 2008). But it could also be that the environment and the geographical conditions have something to do with it because the Kindamba fat which has a higher acidity rate seemed cooler than that of Dolisie. Note also that we found much larger values in the literature for boa constrictor fat (310.73 mgKOH / g). From the point of view of oxidation, the peroxide index of the fats analyzed oscillate on average between 0.28 and 5.75 meq. O2 / kg. These values are in accordance with Codex Alimentarius standards (CODEX STAN 211-199) which sets the lower value up to 10 meq of active oxygen / kg of fat. Which means that our fats are of good quality. There is a considerable difference between the peroxide values of these different samples. Although the level of oxidation of our fats is acceptable, that of the Dolisie and Kindamba samples shows that the latter are older than the fat from Brazzaville. We also note that the quality of the fat from Dolisie tends towards oxidation. It is noted that there is no considerable difference between the saponification indices of the 3 samples analyzed, it varies on average from 169.25 to 178.73 mg KOH / g of fat. These high values in the saponification index prove that our greases have long chains of carbon and can be applied in the field of soap. These results are close to those found by Okere *et al*., 2014 on python regius fat (164.09 mgKOH / g). Our *Python sebae* fats analyzed have an iodine index that varies between 87.5 and 127.12. The high values of iodine index shows that our *Python sebae* fats from the three localities (Dolisie, Kindamba and Brazzaville) are mostly composed of unsaturated fatty acids (UFA).

Fatty acid profile of Seba python fats

The chromatograms obtained on the analysis of the three *Python sebae* fats have the same profile and we present an example of the chromatogram illustrated in Fig3. Fig 3 shows the chromatogram of fatty acid standards with well separated and well resolved peaks. This good separation of the various fatty acids also noted allows to easily consider the quantification.

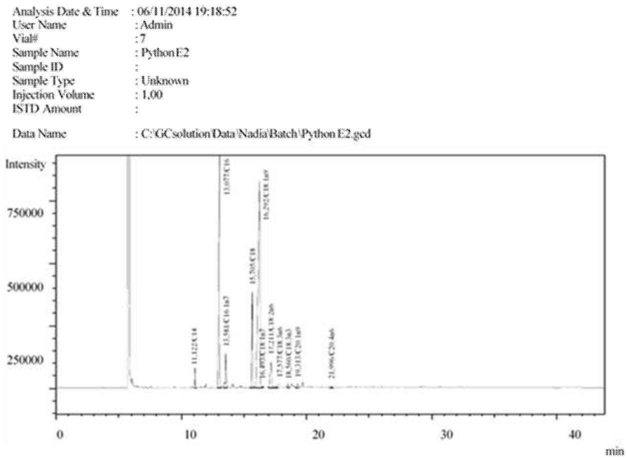

Fig. 3 **: Chromatogram of *Python sebae* fat**

The chromatographic profile of the fatty acids shows the order of exit of the fatty acids. Table II shows the percentage probability of obtaining the majority fatty acids in the fats which we analyzed as well as their standard deviations. *Python sebae* fats give a high probability of unsaturated fatty acids (60.80%), the most represented being oleic acid with 49.47%. Saturated fatty acids represent only 39.19% of total fatty acids with a significant proportion (28.51%) of palmitic acid. The ratio of unsaturated fatty acids to saturated fatty acids is 1.55.

Table 3. Fatty Acid Profile of Python Sebae Fat

Fatty Acid	Symbol	FPS (%)
SFA		
Myristic acid	C14:0	1.30±0.01
Palmitic acid	C16:0	28.51±0.28
Stearic acid	C18:0	9.38±0.09
MUFA		
Palmitoléic acid	C16:1n7	3.80±0.06
Oléicacid	C18:1n9	49.47±0.31
Vaccénic acid	C18:1n7	0.15±0.04
Gadoléic acid	C20:1n9	0.72±0.05
PUFA		
Linoléicacid	C18:2n6	5.85±0.03
γLinolénicacid	C18:3n6	0.19±0.04
α Linolénic acid	SC18:3n3	0.36±0.06
Arachidonic acid	C20:4n6	0.25±0.02
∑SFA		39.19
∑MUFA		54.15
∑PUFA		6.65
∑UFA		60.80
∑PUFA/∑MUFA		0.12
∑UFA/∑SFA		1.55
∑MUFA/∑SFA		1.38
∑PUFA/∑SFA		0.17
∑MUFA/∑PUFA		8.14
∑n-6/∑n-3		16.77
∑ FA		100

FP*s* : Fat of python *sebae*; FA: Fatty Acid; SFA: Satured fatty acid; MUFA: monousatured fatty acid; PUFA: polyunsatured fatty acids; UFA: unsatured fatty acids. Les teneurs en ΣAGS, ΣAGMI, ΣAGI et ΣAGPI ont été calculées en considérant tous les acides gras détectés pour chaque classe d'acides gras en fonction du degré d'insaturation. Les données rapportées sont la moyenne ± l'équartype de trois measures.

The major unsaturated fatty acid present in *Python sebae* fat is oleic acid. It reduces total cholesterol and low density lipoprotein (LDL) cholesterol without affecting high density lipoprotein (HDL). This leads to a reduction in the risk of cardiovascular disease, since HDL rids LDL-cholesterol blood, known as "bad cholesterol," (Dommels *et al*., 2002; Mensink RP and Katan MB; 1992; Guesnet P. *et al*., 2005). We note essentially the presence of saturated fatty acids: myristic acid (C14: 0), palmitic (C16: 0), stearic (C18: 0).

On the other hand, as far as *Python sebae* fat is concerned, no study to our knowledge has been done on its chemical composition, hence the lack of a standard for it. However, we can see that it is a fat that could be very nutritious given its levels of essential fatty acids (oleic acid and linoleic). We have made a table comparing the fatty acid profiles of certain reptilian fats (Table 4). All these fats have fatty acid profiles rich in unsaturated fatty acids (AGI), and they have any ethnopharmacological activity (Khunsap *et al*., 2016; Dias *et al*., 2013; Okere *et al*., 2014), the fatty acid profile of the python fat sebae is closer to that of the fat of python regius. We can therefore say that the fat of the *Python sebae* certainly presents these ethnopharmacologicalactivities, whichare recognized in traditional medicine.

Rheological properties

The rheological properties make it possible to study the flow and the deformation of the fats. At 30 ° C, the viscosity of these fats varies between 65.88 and 949.7 mPa.s characterizing very viscous Python sebae fats. The high viscosity of *Python sebae* fats indicates that these fats could be used in the manufacture of lubricating greases and fuels (Adebanjo *et al*., 2005).

Differential thermal analysis

Fig 4 shows the polymorphic changes of the analyzed fats. These changes are observed following a change in temperature. The differential thermal analysis of the samples studied reveals the existence of two peaks. We present in Figure 4 a copy of the thermal profile of our greases. The first peak has amelting point of 0.8 ° C (ΔHf = 17.47 J / g) for the Dolisie sample and 3.08 ° C (ΔHf = 26.86 J / g) for the sample of Brazzaville. The last most important peak is at 40.1 ° C (ΔHf = 28.09 J / g) for the Dolisie sample and 38.8 ° C (ΔHf = 33.74 J / g) for the sample of Brazzaville. This peak represents those of high melting compounds. These peaks correspond to a fusion process because (ΔH> 0).

Table 4. Comparison of fatty acid profiles of the fat of a few reptiles

Fattyacids	Symbol	*Python sebae* (%)	*Python regius*[25] (%)	*Naja kaouthia*[11] (%)	*Phrynops geoffroanus*[24](%)
Myristic ac.	C14:0	1.30±0.01	-	0.71	-
Pentadecylicac.	C15 :0	-	-	0.18	3.68
Palmitic ac.	C16:0	28.51±0.28	16.05±3.22	17.47	6.82
Stéaric ac.	C18:0	9.38±0.09	10.10±2.87	4.81	-
Arachidicac.	C20:0	-	2.25±0.65	0.25	-
Tétradécenoïcac.	C14:1n-9	-	0.5±0.02	-	
Palmitoléicac.	C16:1n7	3.80±0.06	4.85±1.45	4.01	58.39
Oléicac.	C18:1n9	49.47±0.31	41.27±5.22	3.84	15.70
Vaccénic ac.	C18:1n7	0.5±0.04	0.15±0.04	22.98	-
Gadoléic ac.	C20:1n9	0.72±0.05	11.87±3.67	-	-
Linoléicac.	C18:2n6	5.85±0.03	7.60±1.95	16.80	4.50
γLinolénicac.	C18:3n6	0.19±0.04	3.00±0.95	-	2.28
α Linolénic ac.	C18:3n3	0.36±0.06	0.36±0.06	-	-
Arachidonic ac.	C20:4n6	0.25±0.02	0.25±0.02	-	-
Erucic ac.	C22 :1n9	-	3.06±1.00	-	3.76
Docosahexaenoïcac. (DHA)	C22 :6n3	-	-	4.45	-

This fat could be a nutritional oil because the ratio of unsaturated fatty acids to saturated fatty acids is greater than 1. These fatty acids are separated on the chromatogram at irregular intervals. In addition, the same number of fatty acids is present in *Python sebae* fats from different localities. These different elements allowed us to extrapolate to deduce some fatty acids present in *Python sebae* fats.

This explains why this fat is solid at room temperature. The results obtained indicate the interval in which our fats can be heated without affecting their quality. Above 40 °C, there is a structural modification of our greases. Differential thermal analysis is one of the simple ways to study the characteristics of fats. Among other things, the influence of fat composition, aging and heat treatment on fat quality can be explained by the

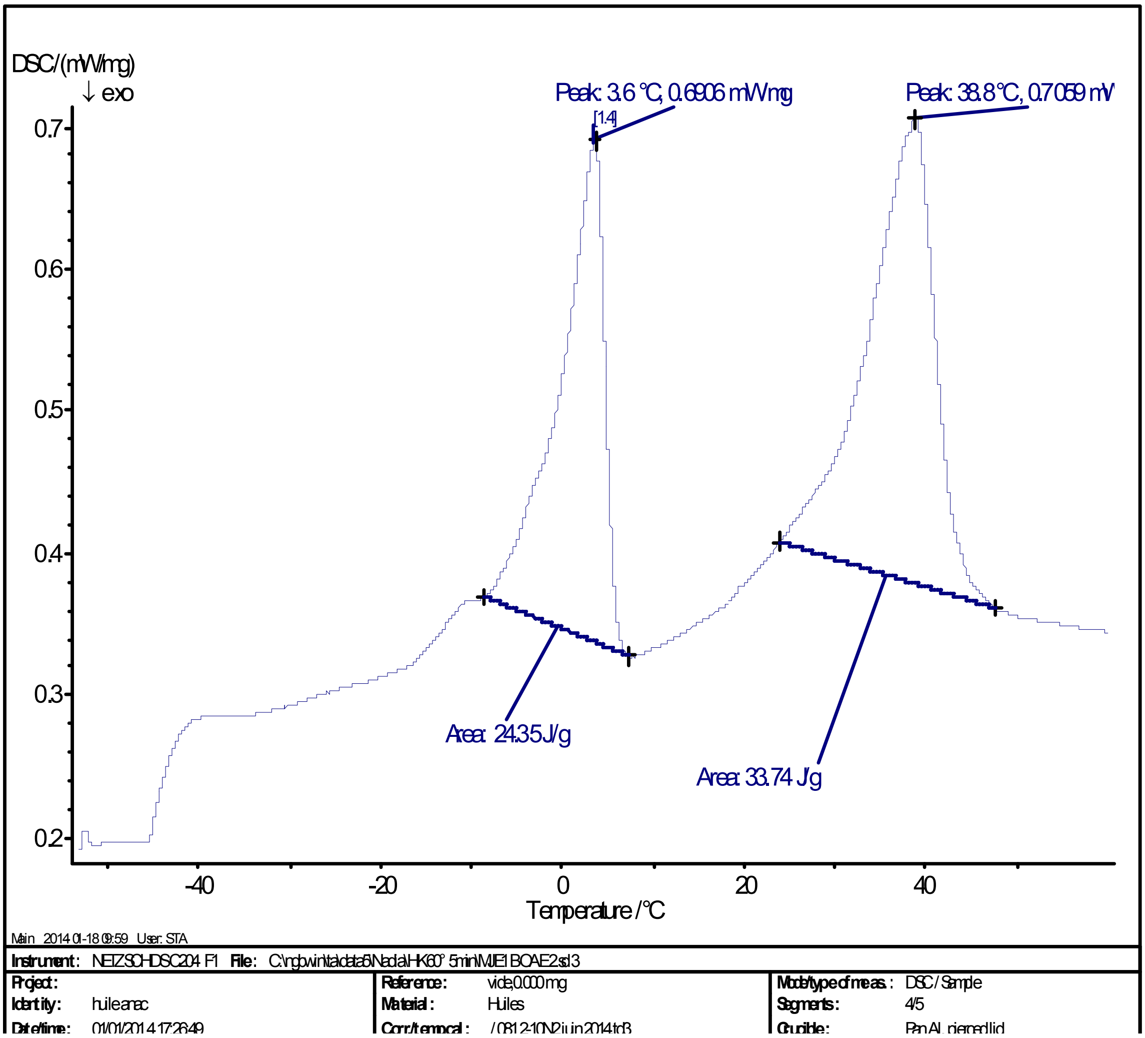

Fig. 4. Thermal Profile of Python Sebae fat

DSC (Tan et Che Man, 2002). DSC provides an approach to physical properties such as melting point, enthalpy, and specific heat capacity of fats (Sathivel, 2005; Sathivel *et al.*, 2008).

Ointment manufacturing

Among the 23 trials, we retained only those whose omposition is 100% and therefore the following three compositions or formulations:

Fig.4. Differents ointments manufactured

Ointment 1: 46 g of petrolatum, 45 g of python fat, 8 g of camphor and 1 g of menthol

Ointment 2: 42 g petrolatum, 40 g python fat, 16 g camphor and 2 g menthol

Ointment 3: 50 g of Vaseline, 50 g of python fat, 0 g of camphor and 0 g of menthol.

The ointments that we manufacturedare represented on figure 5

Conclusion

It is clear that the characterization of *Python Sebae* fat in this work has been complete. The results we have just acquired, allow us to know, in the context of the valuation of our products (ointments), the quality of the different *Python Sebae*fats widely encountered in Congo. The first results found show how the environment and geographical conditions could influence the chemical composition of *Python Sebae*'s fats. We note also that *Python Sebae* grease from Kindamba has an acidity and a higher degree of unsaturation than those of Dolisie and Brazzaville, which indicates that this fat is very sensitive to oxygen and therefore very fragile. to rancidity. From the oxidation point of view, all fat samples analyzed are within acceptable limits, in accordance with Codex Alimentarius standards. The saponification index of our fats indicates a high detergency and foaming power. The fatty acid profile shows that our fats contain a lot of unsaturated fatty acids. Unsaturated fatty acids, in particular n-3, are precursors of prostaglandins and leukotrienes and have, among other things, a muscular, antimicrobial and anti-inflammatory potential, which confers therapeutic advantages (Guesnet P. *et al*., 2005; Khunsap*et al*., 2016) . But these unsaturated fatty acids are also known for their hypocholesterolemic and antiatherogenic function.

In addition, the thermal and rheological analyzes indicate the range of melting temperature in which our greases can be heated without affecting the quality of the latter. Seen the ingredients added to our ointment, we can certify the therapeutic virtues (analgesics and analgesics) of the latter. It is important to note the importance of conducting in-depth studies of Python Sebae fats from various localities in our country, to see if the geographical conditions, environment and diet of these latters influence the composition of our fats. It would also be interesting to go deeper into a study on the therapeutic effects of these, in order to know the real and direct effect of the application of our ointments on human health. In view of the nutritional quality of our fat, studies may be conducted for culinary use of our fat.

REFERENCES

AdebanjoA.O., Dalai A.K., Bakhshi N.N. 2005. Production of Diesel-Like Fuel and Other Value-Added Chemicals from Pyrolysis of Animal Fat. *Energy Fuels.19*(4),1735–1741

AOCS (American Oil Chem. Soc) 1997. In D. Firestone (Ed.), Official methods and recommended practices of the American Oil Chemists Society (4th ed.), Champaign, Illinois (USA): AOCS.

Arditty S. 2007. Fabrication, stabilité et propriétés rhéologiques des émulsions stabilisées par des particules colloïdales. Analyse de données, Statistiques et Probabilités. Université Sciences et Technologies. Bordeaux I, p 78.

Black, H.S. and Rhodes, L.E. 2006. The potential of omega-3 fatty acids in the prevention of non-melanoma skin cancer. *Cancerdetection and prevention*.30: 224-232.

Caldefie-Chézet, F., Fusillier, C., Jarde, T., Laroye, H., Damez, M. 2006. Potential anti-inflammatory effects of *Melaleuca alternifolia* essential oil on human peripheral blood leukocytes. *Phytother Res*.20: 364- 370.

Cardoso, C.R., Favoreto, Jr. S., Oliveira, L.L., Vancim, J.O., Barban, G.B. 2011. Oleic acid modulation of the immune response in wound healing: A new approach for skin repair. *Immunobiology*.216: 409-415.

DEMBÉLÉ Daouda Lassine (2011) : Formulation de pommade antalgique et anti-inflammatoire à base de *Securidacalongepedunculata* Fresen. http:// www. keneya.net/fmpos/theses/2011/pharma/pdf/11P48.pdf, Consulté le 15/08/2017

Dias D.Q., Cabral M.E.S., Sales D.L., Oliveira O.P., Filho J.A.A., Teles D.A., Sousa J.G.G., Coutinho H.D.M.. , Costa J.G M., Kerntopf M.R., Alves R.R.N., Almeida W.O. (2013): Chemical Composition and Validation of the Ethnopharmacological Reported Antimicrobial Activity of the Body Fat of *Phrynopsgeoffroanus*Used in Traditional Medicine, *Hindawi Publishing CorporationEvidence-Based Complementary and Alternative Medicine*. Article ID 715040, 4 pages.

Dommels Y.E.M, Alink G.M, van Bladeren P.J, van Ommen B 2002 Dietary *n*−6 and *n*−3 polyunsaturated fatty acids and colorectal carcinogenesis: results from cultured colon cells, animal models and human studies.*EnvironToxicolPharmacol* 11: 297–308.

Falodun, A., Owolabi, O.J. and Osahon, O. 2008. Physicochemical, antimicrobial and antiinflammatory evaluation of fixed oil from Boa constrictor. *ActaPoloniaePharmaceutica-Drug research*.65 (4), 477-480.

Ferreira, F.S., Brito, S.V., Saraiva, R.A., Araruna, M.K.A., Menezes, I.R.A. 2010. Topical anti-inflammatory activity of body fat from the lizard *Tupinambismerianae*. *Journal of Ethnopharmacology*. 130: 514-520.

Goupy Jacques 2001. "Introduction aux Plans d'expériences", Dunod. Paris. 303 pages.

Guesnet P., Alessandri J.M., Astorg P., Pifferi F., Lavialle M. 2005. Les rôles physiologiques majeurs exercés par les acides gras polyinsaturés (AGPI). *Oléagineux Corps Gras Lipides*. 12(5) : 333-43.

Khunsap, S., Vesaratchapong, T., Laongbao, P., Chanhome, L., Buranapraditkun, S., Pakmanee, N. and Boonchang, S. 2016. Antioxidant, Anticancer Cell Lines and Physiochemical Evaluation of Cobra Oil, *Int. J. Pure App. Biosci.* 4(3),21-27.

Kunin, A.R. 1989. Snake oil. *West J.Med*., 151: 208.

Kyari M.Z., 2008. Extraction and characterization of seed oils, *Int. Agrophysics*.22: 139-142.

Lim, K., Han, C., Dai, Y., Shen, M. and Wu, T. 2009. Omega-3 polyunsaturated fatty acids inhibit hepatocellular carcinoma cell growth through blocking β-catenin and cox-2. 8: 3046-3055.

Mandal, C.C., Ghosh-Choudhury, T., Dey, N. 2012. Ghosh-Choudhury, G. and Ghosh- Choudhury, N., miR-21 is targeted by Omega-3 polyunsaturated fatty acid to regulate breast tumor CSF-1 expression. *Carcinogenesis*.33: 1897-1908.

Mensink R.P, Katan M.B. 1992. Effect of dietary fatty acids on serum lipids and lipoproteins. A meta- analysis of 27 trials. *ArteriosclerThromb*. 12:911-919.

Nikolakopoulou, Z., Shaikh, M.H., Dehlawi, H., Michael-Titus, A.T. and Parkison, E.K. 2013. The induction of apoptosis in pre-malignant keratinocytes by omega-3 polyunsaturated fatty acids docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA) is inhibited by albumin. *Toxicology Letters*. 218: 150-158

Nissen, L., Zatta, A., Stefanini, I., Silvia, G., Sgorbati, B. 2010. Characterization and antimicrobial activity of essential oils of industrial hemp varieties (*Cannabis sativa* L.). *Fitoterapia*.81: 413-419.

Okere O.S., Okoli B.J., Moses Dele AdamsM.D., OmolabiAdeyemo S.O. 2014. Physicochemical, Trace Metal Analysis and Fatty Acid Profile of *Python regius*Fat, *British Biotechnology Journal.*4(10), 1064-1076.

Pauwels O.S.G., J.P.VandeWeghe, (2008), «Reptiles du Gabon ».Washington: Smithsonian Institution. p 272.

Plackett R.L. and Burman J.P. (1946): "The design of optimum multifactorial experiments", Biometrika, n°33.

Sathivel S. 2005. Thermal and flow properties of oils from salmon head. *Journal of the American Oil Chemists' Society*.82: 147–151.

Sathivel S., Prinyawiwatkul W., Negulescu I., King J.M. 2008. Determination of melting points, specific heat capacity and enthalpy of catfish oil during different purification steps. *Journal of the American Oil Chemists' Society*. 85(3), 291-296

Sepahvand, R., Delfan, B., Ghanbarzadeh, S., Rashidipour, M., Veiskarami, G.H. 2014. Chemical composition, antioxidant activity and antibacterial effect of essential oil of the aerial parts of *Salvia sclareoides*. *Asian PacJ Trop Med*.7: S491-S496.

Tan C.P., Che Man Y.B. 1999. Quantitative differential scanning calorimetric analysis for determining total polar compounds in heated oils. *Journal of the American Oil Chemists' Society*. 76 (9), 1047-1057.

WouessiDjewe D. 2011. Formes galéniques administrées par voie cutanée, TICE de la Faculté de Médecine et de Pharmacie de Grenoble (Université Joseph Fourier – Grenoble 1) p 8.

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