

# Anti-haemorrhoidal Activity of the Decoction of Liana Bark from *Landolphia owariensis* P. Beauv. (Apocynaceae)

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**Abstract:** *This study consists in evaluating the antihemorrhoidal activity of the decocted bark of dried liana of Landolphia owariensis (Apocynaceae). Adjimou Ledjou's methods. J., 2002 and Mohammed Azeemuddin et al., 2014 were used. Acclimatized wista rats have free access to water and food before experimentation. The preventive and curative activity was evaluated. Hemorrhoidal seizures have been induced with anal croton oil. Oral therapeutic doses varied from 5.5; 55; 110; 165 and 550 mg / kg body weight. In the preventive evaluation, the rats are previously treated with the decocté before induction of the attacks. As a cure, they are treated as soon as the attacks appear. After treatment, the degree of prevention, the times for the resorption of the attacks, histological sections of rectoanal tissue were analyzed. The decocté has preventive and curative anti-hemorrhoidal activity. The effective dose varies between 5.5 and 550 mg / kg. Above 550 mg / kg, the response is stationary; the resorption time is the same. Resorption varies between 5 and 8 days depending on the dose administered. As a preventive measure, the time taken for the onset of seizures is long, the longer the dose administered is large.*

**Keywords:** *Landolphia owariensis*, hemorrhoids, anti-hemorrhoidal activity

## 1. Introduction

Hemorrhoids are affections of the veins in the anal area. This pathology constitutes a real public health problem. [1]. This disease upsets patients and puts them in a situation of discomfort [2, 3]. It has economic, social and psychological impacts linked to attacks of relapses and thrombosis. Treatments exist but the health coverage of nursing staff, the distribution of drugs and the solvency of the affected populations leads to less coverage. Thus, many patients resort to traditional treatment.

However, *Landolphia owariensis*, a liana of the Ivorian flora is used in traditional medicine to treat hemorrhoidal crises. Thus the use of decocted as an active principle in formulations could make it possible to take charge of this pathology.

It is in this context that the study aims to develop an improved traditional medicine of quality, effective and economically accessible for the management of hemorrhoidal patients. To achieve this objective upstream of the formulations, the present study was devoted to the evaluation of the preventive and curative anti-hemorrhoidal efficacy of the decocted powder of the dried bark of the stem

of this liana. This research work will ensure the safety and exploration of this plant, which is beneficial for treating hemorrhoidal crises.

### 1.1 Documentary investigation

Hemorrhoids are veins in the anal region, normal and anatomically present in all humans. They facilitate the opening and closing of the anus more tightly in the continence of stool. Factors and causes are at the origin of their transformation from the normal physiological state to the pathological state called by abuse of language "hemorrhoid". The factors and causes are multiple (dietetic, hygienic, vascular, mechanical) and linked to certain daily behaviors [3]. Hemorrhoidal disease has specific signs which are: rectal bleeding, pain, prolapse and thrombosis [4]. The treatments are of several types: medical treatment (tablet, gels), surgical (hemorrhoidectomy), instrumental (infrared, sclerosis, ligation), prevention (hygiene advice, dietetics.) [5].

*L. owariensis* P. Beauv. (Bri in Malinké-Djibrosso-Séguéla). It is a plant species used by the people of northern Côte d'Ivoire to treat this pathology. It is a liana of the savannah. On the other hand, one can also find it, in forest, where it

becomes an enormous climbing plant, being able to reach a length of 100 meters or more with a basal diameter of 10 to 30 cm. The fruit with sweet pulp is commonly harvested from the wild and is highly valued [6, 7]. The latex from the stems is used for the production of rubber and for the design of lotion. The bark of liana is used to fight against hemorrhoidal crises and intestinal worms. The leaves are boiled to be applied to sprains. As for the sap of the leaves, it is used to wash the patient's face in the treatment of vertigo and epilepsy. It is also rubbed as a massage in scarifications on areas of edema and rheumatism. Decoctions of the roots or green fruits are used as a purgative and for the evacuation of the urethra. The liquid of this preparation is used in steam baths for feverish ailments [7].

## 2. Material and methods

### 2.1 Collection of plant material

The bark of lianas of *Landolphia owariensis* (Picture 1) was collected in November 2017 in Séguéla (Djibrosso-Kani, in the north of Côte d'Ivoire) and identified by Prof. Tra Bi Fezan Honora, botanist at Nangui Abrogoua University (Ivory Coast).



Picture 1: *Landolphia owariensis* (liana and dried liana bark)

### 2.2 Preparation of the decoction

The preparation of the decoction of *L. owariensis* was carried out as follows. The dried liana bark powder (20 g) was placed in a glass jar (350 ml). Then, 200 ml of water was added. The closed vessel containing the mixture was placed in a boiling bath at 100 ° C for 30 minutes. The boiled liana bark powder was filtered through Whatmann No. 3 filter paper. The resulting solution was evaporated under reduced pressure to give 485.7 mg of crude aqueous extracts of *L. owariensis* [7].

### 2.3 Animal treatment

Forty rats (Wistar) weighing between 133g and 175g were used for the present study. They were purchased and maintained at the Nangui Abrogoua University animal facility for experimental purposes. Animals were maintained under controlled conditions of temperature (23 ± 2) C, humidity (50 ± 5)% and 12 h light-dark cycles. All animals were acclimatized seven days before the study. Animals were randomized into groups (experimental and control) and housed individually in sanitized polypropylene cages containing a sterile paddy envelope as bedding. They had free access to standard pellets as a basic diet and to water at

will. The animals were accustomed to the laboratory conditions 48 h before the experimental protocol in order to minimize, if necessary,

## 3. Anti-hemorrhoidal Activity

### 3.1 Crotonoil hemorrhoidal activity

A cotton stick soaked in croton oil is used to induce hemorrhoidal disease. The rod is introduced into the anus of the rat over 2 cm and for 60 seconds, until the appearance of hemorrhoidal signs. The rats having received the distilled water are used as a control. The time to onset of hemorrhoidal signs is determined.

### 3.2. Anti-hemorrhoidal activity of *L. owariensis* decocté

#### 3.2.1. Therapeutic dose

##### Mass of dry powder sample required for processing

The traditional health practitioner uses a tablespoon of the powder from the dried bark of *Landolphia owariensis* which weighs on average 14.7 g. This powder was steeped in a glass containing 250 mL of boiled water, which he administered to patients once a day to treat hemorrhoids. However, after evaporation of the water, the Total Aqueous Extract of the bark of *Landolphia owariensis* (EATLo) obtained 3.75 g, which corresponds to a mass concentration of 15 mg / ml or 3750 mg / 250 ml. As this condition is recurrent in people aged 45 to 65 [9], it has been assumed that an individual with hemorrhoid can weigh on average 67 kg. The therapeutic dose administered is determined as follows:

- Equation:  $D = C \times V / m$ ;

With,

- $m$  = body mass of the individual in Kg;
- $VS$  = concentration of the extract;
- $V$  = volume of the extract to be administered;

The rats received various doses of the single dose to the double and then to the triple of the decocté of *L. owariensis*, during the experiment. Daflon® was used as a reference molecule for the experiment. This dose was framed by a low dose and a high dose according to OECD 2008. Thus by dividing and multiplying by a common factor  $K = 10$ , was obtained:

Low dose =  $D / k$ ; High dose =  $D / k$ .

### 3.3 Anti-hemorrhoidal activity as a preventive measure

*L. owariensis* decocted was administered to rats at various doses before the induction of hemorrhoidal attacks. We determined the time to onset of hemorrhoidal attacks. This time was compared to that of rats not previously treated [10].

The degree of prevention has been assessed. In fact, the treated rats are weighed and then sacrificed by overdose with ether. The recto-anal tissues are removed over 2 cm. The recto-anal tissues are then weighed. The ratio of the mass of the recto-anal tissue collected to the mass of the treated rats determines the Recto-anal Coefficient (CRA) or degree of prevention [10]. The appearance of tissues fixed

with 10% formalin was performed in order to analyze tissue constriction. A histological section of the tissues was carried out to assess the vein-tonicity of the decocté.

### 3.4 Anti-hemorrhoidal activity for curative purposes

*L. owariensis* decocted was administered to rats at various doses from the onset of hemorrhoidal attacks. The times of onset and resorption of seizures are determined [9, 10].

#### 3.4.1. Weight load

A measurement of the weight of the rats on day 0, day 5 and on day 14 were reported before then after treatment. The variation of the weight, indicator of the physiological state was analyzed.

### 3.5. Analysis of macroscopic and histological sections of recto-anal tissue

The macroscopic and histological sections of the recto-anal tissue of the rats treated with the different doses of the decoctate were analyzed.

## 4. Results and Discussion

### 4.1 Yields of the different extractions

The yields of the aqueous extracts (cold and hot), of the methanolic extract and of the chloroform extract are given in table 1. Our choice finally fell on the hot aqueous extract (the decocté). Indeed, it is the decocté which is used by the traditional healer. In the rest of our study, we will evaluate the anti-hemorrhoidal activities of the remaining extracts and compare them to the results of the decocté.

**Table 1:** Yields of the different extractions

Species studied	Extraction	Powder mass (g)	Mass of extracts (g)	Returns (%)
<i>L. owariensis</i> (Apocynaceae)	Aqueous	20	1,594	1,970
	Decocted	20	4.942	24,710
	Methanol	20	6.020	30,100
	Chloroform	20	7.446	37,230

### 4.2. Anti-hemorrhoidal activity of croton oil

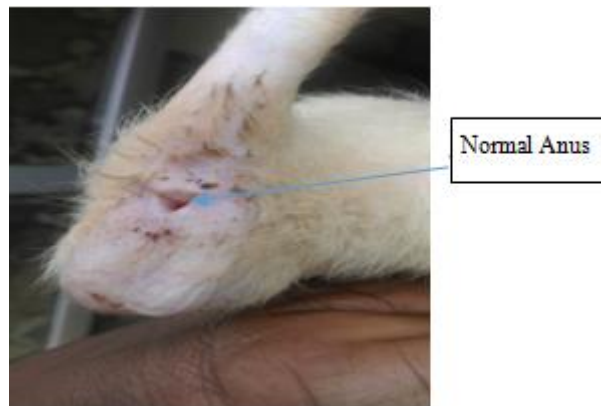
#### 4.2.1. Lot of rats treated with distilled water (control)

Table 2 provides information on hemorrhoidal signs in animals given distilled water. As for picture 2, it shows us the rat not showing hemorrhoidal signs.

**Table 2:** Evolution of hemorrhoidal signs in rats given distilled water

Lot 1	T0 (distilled water injection)	Hemorrhoidal signs
Rat 1	10 h 15 min	-
Rat 2	10 h 17 min	-
Rat 3	10 h 18 min	-

T0 : time of injection of the solution with distilled water :- : absence of hemorrhoidal signs



**Picture 2:** non-hemorrhoidal rat

#### 4.2.2. Lot of rats treated with croton oil

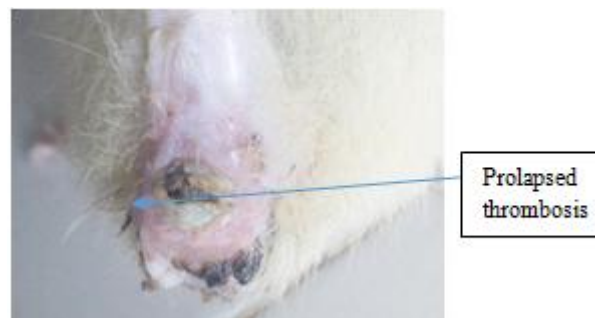
Table 3 shows us the evolution of hemorrhoidal signs of the rats having received croton oil.

**Table 3:** Evolution of hemorrhoidal signs in rats given croton oil

Lot 2	T0 (anal insertion of croton oil)	Hemorrhoidal signs
Rat 1	9:15 am	+
Rat 2	9h18 mn	+
Rat 3	9H20 mn	+

T0: time of injection of the distilled water solution; +: presence of hemorrhoidal signs

#### Observation of the anus of the hemorrhoidal rat (photo 3)



**Picture 3:** Hemorrhoidal rat

The results of the observation of the anus of the rat treated with croton oil show hemorrhoidal signs (inflammation, prolapse, thrombosis) unlike the rat treated with distilled water. Croton oil induces hemorrhoidal disease.

### 4.1.2. Anti-hemorrhoidal activity of *Landolphia owariensis* decocté

#### 4.1.2.1. Therapeutic dose

We retained as low dose, the therapeutic dose of the traditional healer (one glass of 250 mL once a day. Thus, the lyophilization of two glasses of volume 250 mL of decocted of the solution of *Landolphia owariensis* gives 3.75 g (14, 7 g / 250 mL) of lyophilisate. This corresponds to the daily dose of 15 mg / mL (3750/250 mL) for a 67 kg man. The daily therapeutic dose is therefore 53.57 mg / Kg (250 mL). x 15 mg / 70 kg) or 55 mg / kg body weight.

4.1.2.2. As a preventive measure

Times of onset and resorption of seizures

The results of tests 1, 2, 3 are shown in table 4.

**TEST 1:** anti-hemorrhoidal activity (without priortreatment) for different concentrations of *L. owariensis* decocted using Daflon® as a reference substance

**TEST 2:** anti-hemorrhoidal activity (as a preventive measure) for different concentrations of *L. owariensis*

decocted 1 hour before the induction of hemorrhoidal disease using Daflon® as a reference substance

**TEST 3:** antihemorrhoidal activity (as a preventive measure) for different concentrations of *L. owariensis* decocted 3 days before the induction of hemorrhoidal disease using Daflon® as a reference substance

**Table 4:** Summary of the results of the anti-hemorrhoidal activity of *L. owariensis* decocted

Solutions	TEST1		TEST2		TEST3	
Doses administered	TL	TR	TL	TR	TL	TR
Control (distilled water)	51s	20 days	54s	18d	53s	16d
55mg / kg of bw	1h17 mn	6 days	1h25 mn	5 days	3 days	8 days
110mg / kg of bw	1h43 mn	6 days	1h35 mn	6 days	5 days	6 days
165mg / kg of bw	1h50 mn	6 days	1h52 mn	6 days	5 days	6 days
Daflon® (300mg / kg bw)	2h 00 mn	6 days	1h43 mn	5 days	1h43 mn	5 days

TL: latency time, TR: absorption time, days: days

Analysis of the summary table of results shows that in the absence of treatment, hemorrhoidal disease appears with a very short latency time. On the other hand, animals previously treated with the solution of the decocted take longer to manifest hemorrhoidal crises. Going from the single dose (55 mg / kg bw) to the double dose (110 mg / kg of bw) and the triple dose (165 mg / kg of bw), the time to onset of hemorrhoidal crises is increasingly long. These related decocted times vary from 51 minutes to about 3 days. This effect is dose dependent. With reference to Daflon®, the observation is the same. These results make it possible to make the following observations: the use of the decocté upstream of the induction of the hemorrhoidal crisis delays the onset of this and those regardless of the number

of days. Also the increase in the dose of the decocted leads to an increase in the time of onset of the hemorrhoidal disease. The decocté has a preventive action against hemorrhoidal crises.

**Degree of prevention**

A: distilled water; B: 6% croton oil + distilled water; C: 6% croton oil + Daflon® (300 mg); D: 6% croton oil + decocted (5.5 mg); E: 6% croton oil + decocted (55 mg); F: 6% croton oil + decocted (550 mg). The ratio of the mass of the tissue taken to the mass of the rat defines the recto-anal coefficient (CRA). Variation weights and recto-anal coefficient of the treated rats are given in table 5.

**Table 5:** Variation in weight and recto-anal coefficient of treated rats

Lots	Body weight	Fabric weight recto-anal (g)	CRA	Interpretation
A. Lot 1 (distilled water)	241 ± 12.372	0.861 ± 0.741	0.357 ± 0.001	normal tissue
B. Lot 2 (croton oil%)	238 ± 10.147b	2.678 ± 0.314u	1.125 ± 0.003d	severe tissue damage
C. Lot 3 (Daflon®)	245 ± 14.236c	0.734 ± 0.443k	0.299 ± 0.001z	strong prevention
D. Lot 4 (5.5 mg / kg)	232 ± 11.514x	1.536 ± 0.535g	0.662 ± 0.002q	Low prevention
E. Lot 5 (55 mg / kg)	247 ± 13.724y	1.253 ± 0.814v	0.507 ± 0.005t	medium prevention
F. Lot 6 (550 mg / kg)	285 ± 15.651a	0.804 ± 0.627e	0.282 ± 0.007f	Strong prevention

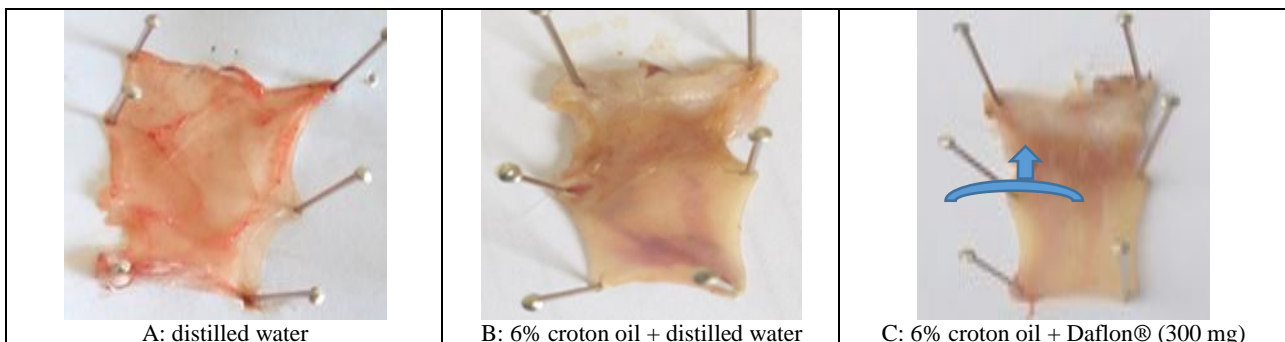
The values in the same column bearing different letters are statistically different from the control (6% croton oil) at P < 0.05, n = 6 rats. CRA = Recto-Anal Coefficient

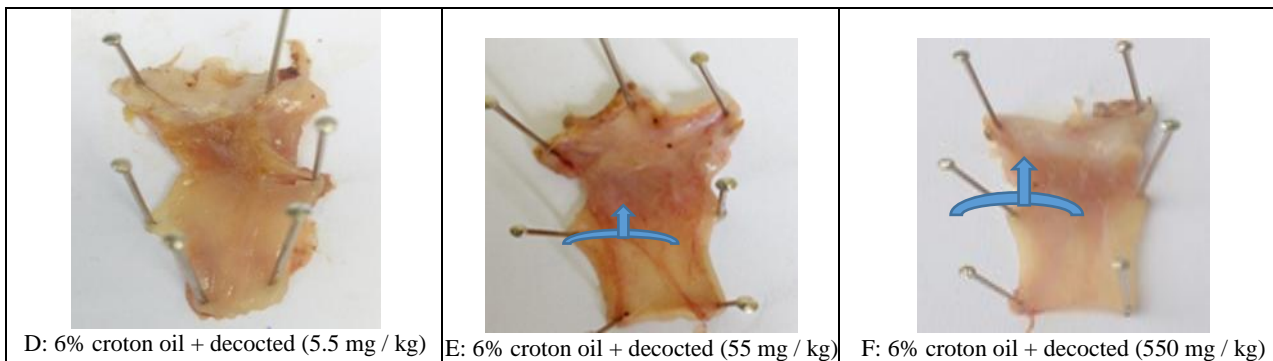
are obtained respectively for treatment doses 5.5; 55 and 550 mg / kg. Of bw

In terms of the degree of prevention, analysis of the table of variation in the weight and recto-anal coefficient of the treated rats indicates dose-dependent prevention with reference to daflon®. Weak, medium and strong prevention


**Observation of recto-anal tissue sections fixed with formalin 10% of treated rats**

The rats are sacrificed by overdose with ether. The recto-anal tissues are taken over 2 cm and are then fixed with 10% formalin (Picture 4).





 Limit of rectoanal tissue retraction

 direction of retraction

Picture 4: Condition of recto-anal tissue after preventive treatment

Observation of types of recto-anal fabrics shows that all doses considerably reduce dilation of rectal veins. The dose at 550 or 55 mg / kg bw is best when taking Daflon® as a reference molecule. The dilation of the rectal veins is greatly reduced at this dose.

**Anti-hemorrhoidal activity for curative purposes**

The curative antihemorrhoidal activity results for different concentrations of *L. owariensis* decocted are shown in Table 6.

Table 6: Latency and resorption time of hemorrhoidal crises

Tests	1	2	3	4	5	Reference
Doses administered	5.5mg / kg bw	55mg / kg of bw	110mg / kg of bw	165mg / kg of bw	550mg / kg of bw	Daflon® (300mg / kg from pc)
Latency	1h17 mn	1h25 mn	1h35	1h43 mn	1h50 mn	2h
Resorption time	8 days	5 days	6 day	6 days	6 days	6 days

The analysis of the summary table of the results of the curative antihemorrhoidal activity of the decocted shows that all the doses of the decocted varying from 5.5 to 550 mg / kg of bw lead to the resorption of the attacks. Beyond the 110 mg / kg dose, the response is stationary, the absorption

time is the same. Resorption varies between 5 and 8 days depending on the dose.

**Weight load of treated rats**

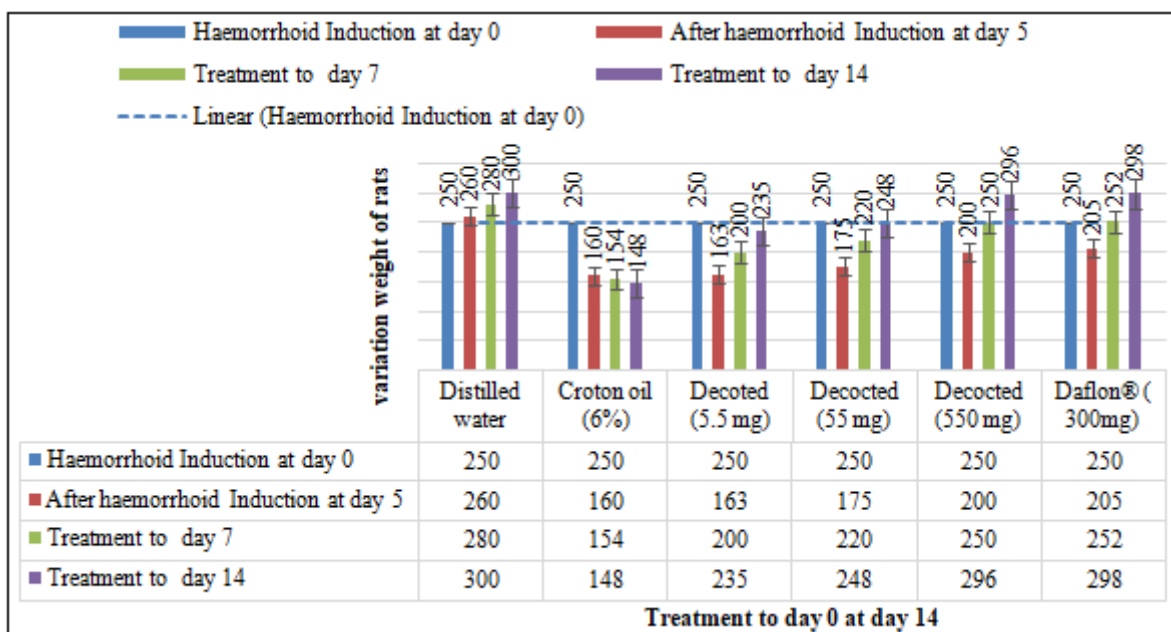


Figure 1: Body weight of rats treated with different doses of decocted after hemorrhoid inductions

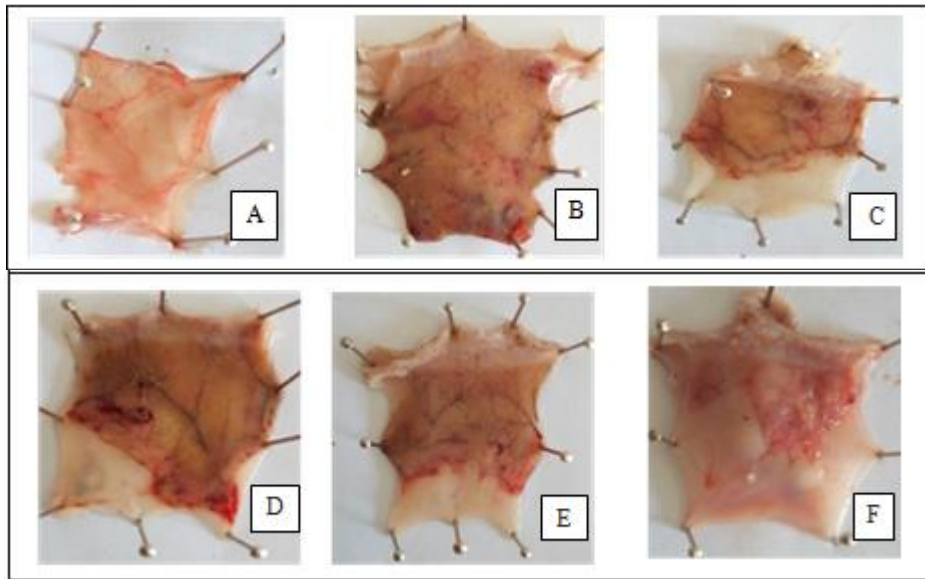
As regards the evolution of the body weight of the treated rats, the analysis of the weight evolution curve during the treatment reveals that the rats treated with croton oil lose weight considerably. This weight loss varies from 4 g to 92 g. The untreated hemorrhoidal rat continually loses weight. On the other hand, the rats treated with various doses of

decocted gradually regain weight. This gain varies from 18g to 90g depending on the dose of decocted administered. The dose of 550 mg / kg of bw records the best convalescence with reference to Daflon® and to the control. If weight loss is correlated with non-healing then *Landolphia owariensis* decocted has effect on resorption of hemorrhoidal attacks.

**Macroscopic analysis sections of recto-anal tissue fixed with formalin 10% of treated rats**

A: distilled water; B: 6% croton oil + distilled water; C: 6% croton oil + Daflon® (300 mg); D: 6% croton oil + decocted

(5.5 mg); E: 6% croton oil); % + decocted (55 mg); F: 6% croton oil + decocted (550 mg). The tissues are then opened and fixed with 10% formalin (Picture 5)



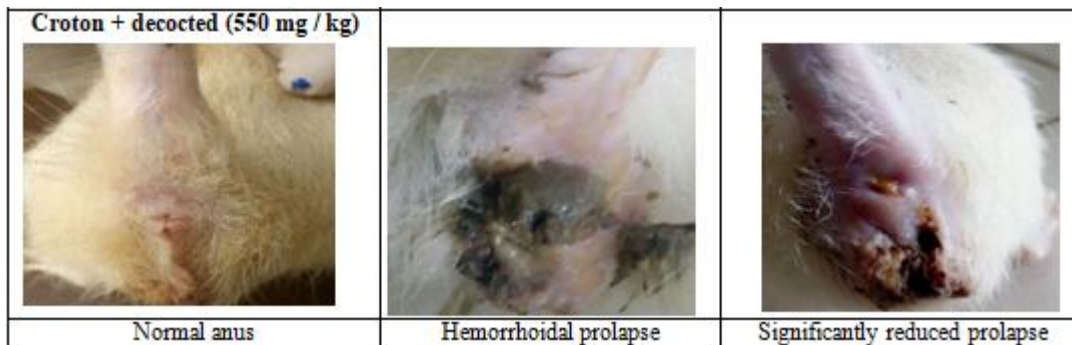
**Picture 5:** Condition of recto-anal tissues of rats after curative treatment

Observation of types of recto-anal fabrics shows that all doses considerably reduce dilation of rectal veins. The total aqueous extract of *L. owariensis* at a dose of 550 mg has the same yield as the referencemolecule Daflon® (300

mg). Vein-constriction is best at a dose of 550 mg / kg of bw by taking Daflon® as a reference molecule. The dilation of the rectal veins is greatly reduced at this dose.

**Treatment and Observations of the anus of rats treated at various doses (picture 6)**

Hemorrhoid induction on D0 Croton + Daflon® 300mg / kg	Recto-anal state on D5	Recto-anal state at D14
<b>Croton + decocted (5.5 mg / kg)</b>		
<b>Croton + decocted (55 mg / kg)</b>		

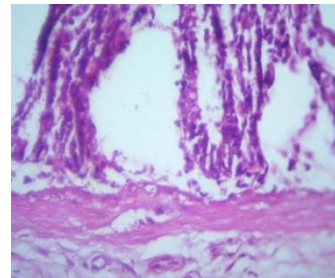


Picture 6: Macroscopic observation of seizures before and after treatment

• **Histological sections of recto-anal tissues after treatment**

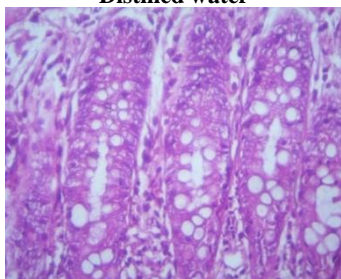
Histological sections are taken to further appreciate the anti-hemorrhoidal activity of the decocted. Picture7 shows the condition of the recto-anal tissue before hemorrhoid induction with croton oil (control) and Picture8 shows the condition of the same tissue after hemorrhoid induction.

**Croton oil hemorrhoid induction**



Picture 8: recto-anal tissue (hemorrhoidal)

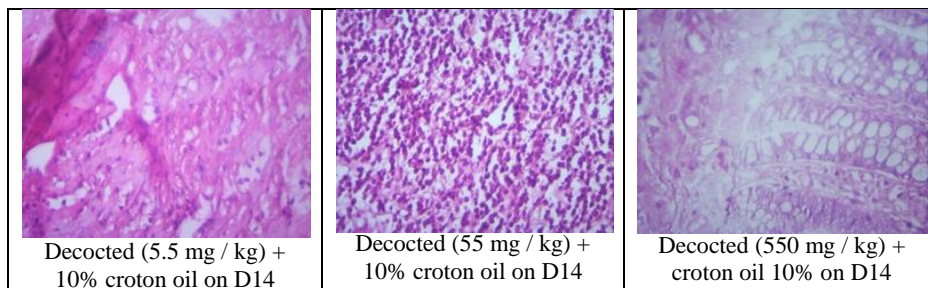
**Distilled water**



Picture7: recto -anal tissue (normal) control from D0 to D5

• **Appearance of recto-anal tissues in the case of preventive decoctate treatments on D14**

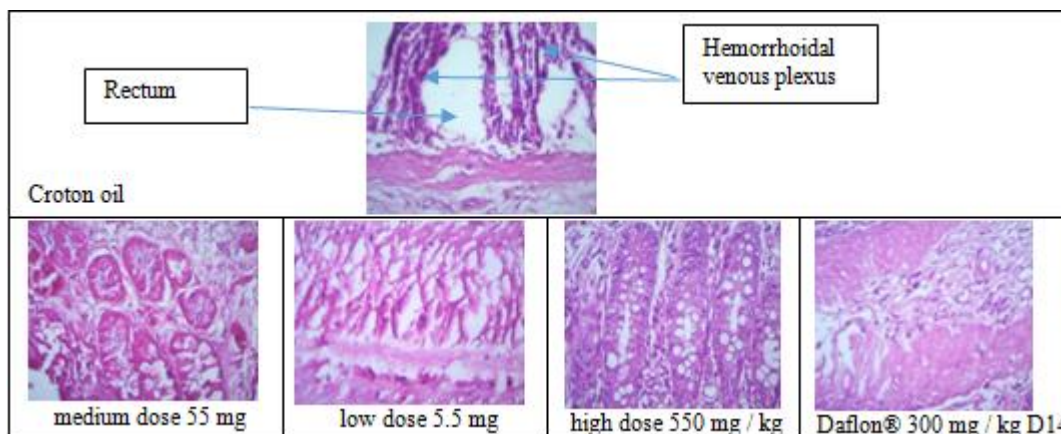
Picture 9 shows the appearance of the recto-anal tissue of rats previously treated before induction of hemorrhoidal crises.



Picture 9: Results of histological sections of recto-anal tissues before and after treatment

• **States of the recto-anal tissue in the case of curative treatment at various doses of the decocté on D14**

The (Picture10) shows the appearance of the recto-anal tissue of the rats treated with different doses of decocted of *L. owariensis* as soon as the hemorrhoidal crises appear.



Picture 10: States of the recto-anal tissues after treatment for various doses of the decocté

Analysis of Picture 7, 8, 9, 10 shows that hemorrhoidal rats (rats treated with croton oil) present thrombosed veins engorged with coagulated blood. These veins in crisis are under tension, present with hematoma in the form of a knot. These veins are presented like "ropes" saculated along the rectum.

On the other hand, after treatment with decocté, the veins return to their normal state. No thrombosis, there is no more varicose vein (hematoma). The veins line the comparatively control rectum.

## 5. Discussion

*L. owariensis* is an Apocynaceae used in several regions of black Africa for its various therapeutic virtues, including anti-hemorrhoidal activity. Inflammation in hemorrhoidal disease leads to increased vascular permeability and loss of venous tone [4]. There are many drugs used in the treatment of this condition. There are phlebotomies or venotonics with vitamin P activity (based on vitamin P). Topical hemorrhoidal medications contain anti-inflammatory drugs. These two forms can be combined in a medicinal formulation in certain cases of inflammatory and thrombotic processes of the anal canal. Thus, the anti-inflammatory property of a product can be assessed by studying its venotonic or anti-inflammatory activity. In our study, we were mainly interested in the inflammatory aspect of the hemorrhoid because we do not have sufficient technical means for the venotonic approach. However, the two aspects are linked in the case of hemorrhoidal crises because the venous aspect causes inflammation as the case may be. The creation of inflammation in rats was induced by croton oil. Our work has enabled us to highlight certain therapeutic qualities of our plant. Thus, according to the tests carried out two qualitative aspects have been clarified: the two aspects are linked in the case of hemorrhoidal crises because the venous aspect causes inflammation as appropriate. The creation of inflammation in rats was induced by croton oil. Our work has enabled us to highlight certain therapeutic qualities of our plant. Thus, according to the tests carried out two qualitative aspects have been clarified: the two aspects are linked in the case of hemorrhoidal crises because the venous aspect causes inflammation as appropriate. The creation of inflammation in rats was induced by croton oil. Our work has enabled us to highlight certain therapeutic qualities of our plant. Thus, according to the tests carried out two qualitative aspects have been clarified:

### Preventive aspect

In the absence of treatment, inflammatory-type hemorrhoidal disease appears with a very short latency time. On the other hand, in animals having received the decocted solution (55 mg / kg of bw) one hour before induction of the hemorrhoidal crisis, the latency time is a little longer. Those who receive the double dose (110 mg / kg bw) and the triple dose (165 mg / kg bw) have an increasingly long lag time to onset of hemorrhoidal attacks (dose dependent). With reference to Daflon®, the delaying effects of hemorrhoidal inflammation are the same. The animals are treated beforehand with the decocted of the bark of *L. owariensis* liana, the animals take a long time to show the hemorrhoidal

type inflammation. These results allow us to make the following observations:

- The use of the decocted upstream of the induction of the hemorrhoidal crisis delays the onset of this regardless of the number of days.
- Increasing the dose of the decocted leads to an increase in the latency time and therefore delays the onset of hemorrhoidal disease.
- The use of the decocted would be very interesting for the prevention of hemorrhoidal crises. The results of the histological section confirm the normality of the veins and of the structure of the recto-anal tissue after upstream treatment. We can deduce from these observations that our plant has a preventive effect in the occurrence of hemorrhoidal crises.

### Curative aspect

The use of the decocted for curative purposes makes it possible to considerably reduce the healing time of the treated animals (5 and 6 days) depending on the doses of the solutions compared to the healing time of the animals without treatment (9 to 10 days). Thus, we can deduce that the decocted has a curative action on hemorrhoidal crises. Histological sections of the recto-anal tissue confirm the tissue repairs (normality of the veins and recto-anal tissue) after treatment and compared to those of the reference molecule (Daflon® 300 mg / ml).

The decocted can be used for preventive and curative purposes also regardless of the concentration of decoction used. The anti-inflammatory response obtained is essentially the same. This would imply that there would be a minimum active concentration from which the anti-inflammatory effect would be maximum and therefore any concentration higher than this could only give a plateau response.

Thus, the determination of this minimum concentration would make it possible to avoid the misuse of the plant for a treatment. It would also allow the avoidance of chronic intoxication in a treatment over a long period. This is not dangerous because the plant is not poisonous [7].

The pharmacological study demonstrated this anti-hemorrhoidal property in rats. In addition to the anti-hemorrhoidal action, the decocted has a delaying effect on inflammation. This species has a preventive effect and a curative effect on hemorrhoidal disease.

### Mass of dry powder sample required for processing

The various catches which we carried out in order to determine the average weight of a tablespoon of dry powder of *L. owariensis* made it possible to note that the weighings carried out on the contents of each table spoon give different values. There are disparities between the doses of the traditional health practitioner with a clear difference in powder between the maximum 16.1 g and the minimum 13.6 g. This reflects a variation in the dosage of active principle from one preparation to another as well as from one patient to another. It could have had huge consequences if the toxic and curative doses were very close. But in our case study, these doses can be considered as very distant from each other since our plant is devoid of acute and subacute toxicity [7]. This difference would be a disadvantage for the patient



who is still spared from possible intoxication in the event of daily intake. It would therefore be interesting for the traditional healer to harmonize his intakes by weighing precision in order to have identical treatment for all patients. The pharmacological study demonstrated this anti-hemorrhoidal property in rats. In addition to the anti-hemorrhoidal action, the decocted has a delaying effect on inflammation. This species has a preventive effect and a curative effect on hemorrhoidal disease. The pharmacological study demonstrated this anti-hemorrhoidal property in rats. In addition to the anti-hemorrhoidal action, the decocted has a delaying effect on inflammation. This species has a preventive effect and a curative effect on hemorrhoidal disease. The pharmacological study demonstrated this anti-hemorrhoidal property in rats. In addition to the anti-hemorrhoidal action, the decocted has a delaying effect on inflammation. This species has a preventive effect and a curative effect on hemorrhoidal disease.

## 6. Conclusion

In this work, the anti-hemorrhoidal activity of *Landolphia owariensis*, a species of the Ivorian flora was carried out. The decocted of the bark of this plant is traditionally used orally to treat hemorrhoidal crises. This work has enabled us to make a

contribution to the biological knowledge of this species. Indeed, the decocté was shown to be active at a concentration of 55 mg / kg of body weight. The plant has a preventive and curative effect on hemorrhoidal disease. The anti-hemorrhoidal activity would be attributable to compounds possessing anti-oxidant activities and present in the decocted of the bark of *L. owariensis* liana. Flavonoids by their property act by increasing the resistance and the venous tone. They decrease capillary permeability. It is thanks to this mechanism that they intervene in the treatment of hemorrhoidal disease. If the decocted turns out to be active on hemorrhoidal disease, its formulation can be improved by a combination of molecules. Formulation by the rectal route is also possible. A continuation of the chemical study by the isolation of the venotonic molecules present in the bark of the *Landolphia owariensis* liana would allow the discovery of new molecules and therefore the development of a more active drug on hemorrhoidal disease.

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