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The Pharma Innovation

ISSN: 2277- 7695
TPI 2015; 3(12): 34-40

www.thepharmajournal.com
Received: 04-01-2015
Accepted: 17-01-2015

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Assessment of toxic effects of hydro-alcoholic extract of *Terminalia mantaly* h. Perrier (Combretaceae) *via* hematological evaluation in rats

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Abstract
Objective: This study investigated the acute and subacute toxicity effects of hydro-alcoholic extract of *Terminalia mantaly*. Hematological assessments as well as the body weights of the rats were measured.
Methods: the acute toxicity of hydro-alcoholic extracts of stem bark from *Terminalia mantaly* was testing in mices. The hydro-alcoholic extract were administered orally at a single dose of 300, 2000 and 5000 mg/kg body weight to the mice and then observed individually 1 h post-administration, and at least once daily for 14 days. Subacute toxicity was evaluated after administering daily oral doses of 150; 300 and 600 mg/kg body weight, for 28 days to the rats. Hematological assessment as well as body weights of the rats were carried out.
Results: The limit dose of 5000 mg/kg did not cause any mortality or signs of acute toxicity in the mice tested during the observation period. Concerning the subacute toxicity, the result revealed an increase of the body weight of treated rats and control group body weight. The hemoglobin (Hb) amount, hematocrit (Hct) value, and the red blood cell (RBC) count decreased significantly ($P<0.01$) in the blood of in the treated group with 600 mg/kg body weight compared to contro. Lymphocyte were not significantly difference ($p<0.05$) treated groups as compared control in first week. The neutrophil and monocytes parameters increases significantly ($p<0,05$) for both groups of rats that received 150; 300 and 600 mg/kg extract as compared to effect time.
Conclusion: Our results suggest that the hydro-alcoholic extract of *T. mantaly* is relatively safe when administered orally in rats.

Keywords: *Terminalia mantaly*, Acute and subacute toxicity, Hematological parameters.

1. Introduction
In Africa, as elsewhere in the world, plants are widely used in the treatment of various ailments. More than 5000 medicinal plant species have been identified by Adjanohoun and Aké [3]. Today, traditional medicine rivaled with modern medicine despite the exploits of the latter. According to the World Health Organization (WHO), nearly 80% of people in developing countries depend on this traditional medicine for their primary health care needs due to the high cost of modern medicines [13]. In Côte d'Ivoire people using traditional medicines have increasingly high due to, the poverty of the population, prolong political instability, war and access to modern medicine for health care is becoming increasingly difficult.
However, knowledge of the healing power of plants by the people is acquired empirically [19, 24]. Thus, in order to provide a scientific justification for the utilization of these plants, verification of the efficacy and safety of medicinal plants through ethnopharmacological studies have been conducted by several scientific groups. One plant were selected for the purpose of this study, *Terminalia mantaly*. *Terminalia mantaly* H. Perrier a plant of the family Combretaceae [6]. This species is among the most stressed plants In a traditional environment in Madagascar, its bark and leaves are used for the treatment of dysentery [5]; mouth candidiasis and digestive; postpartum care [24]. In Cote d'ivoire they are used in the treatment of malaria1 [19] *Terminalia mantaly* has several pharmacological properties. It plays a role, antibacterial, antifungal [4, 13, 28]. People consume it due to their effectiveness, relatively low cost and have potential in therapeutic applications without been concerned with the toxicity effects it might cause. Investigation on the toxicity profile of *T. mantaly* in any applications is very important to ensure the safety of the public upon consuming this plant. This study,

therefore designed to Evaluate the acute and subacute toxicity effects of the ethanolic bark extract of *Terminalia mantaly* especially on hematological parameters toxicity effects of hydro-alcoholic extract of *Terminalia mantaly*. The hematopoietic system is one of the most sensitive targets for toxic compounds and an important target of the physiological and pathological statuts of man and animals [2].

2. Materials and Methods

2.1 Plant material

The materiel used was the plant bark of *Terminalia mantaly* H. Perrier harvested in the region of Azaguié (southern area of Abidjan) in the month of February 2014.

2.1.1 Preparation of extracts

Pieces of bark from the trunk of *Terminalia mantaly* H. Perrier were harvested, cut and dried in the shade. After drying, the pieces of this plant were finely ground using an electric grinder IKAMAG - RCT® type. The powder obtained is brown. The extracts were prepared according to the method described by Zihiri and Kra [26]. For the preparation of ethanolic extracts 70%, 100 g of plant powder were extracted in blender (the process is repeated 3 times) with one liter of distilled water or a mixture of ethanol - water (729 ml of ethanol 96% et 271 ml of distilled water). After crushing, the mixture obtained was first spun in a clean square fabric, and then filtered twice in successivel with cotton wool and once with Whatman 3mm paper. The filtrate was concentrated using a rotary evaporator at 70 °C. The concentrate was evaporated at 50 °C. In an oven for 48 hours. The extracts obtained is the hydro-alcoholic extracts 70%.

2.2 Experimental Animals

Animals were selected as per the Organization of Economic Co-Operation and Development (OECD) guidelines no. 423 [20]. Healthy young and nulliparous, non-pregnant Wistar rats weighing from 100-120 mg and adult Swiss albino mice (20–23 g) of 8-10 weeks old obtained from the animal house of Pharmaceutical science, Abidjan(Ivory Coast)were selected. The animals are randomly selected, marked to permit individual identification, and kept in plastic cages with wood chips renewed every two days for 5 days prior to dosing to allow for acclimatization of the laboratory conditions (room temperature 25 °C (± 3 °C), moisture 35 to 60%, light and dark period 12/12 hours, bedding cleaned and sterilized). All animals had a regular supply of clean drinking water and food.

2.3 Acute Toxicity study

The acute oral toxicity of hydro-alcoholic extracts of the stem bark of *Terminalia mantaly* was performed on Adult Swiss albino mice, according to OECD-423 guidelines [21]. A total of 12 female animals were divided into 4 groups of 3 mice each because literature surveys of conventional tests show that usually there is little difference in sensitivity between the sexes, but generally females were found slightly more sensitive [16]. Two groups received the dose of 300 mg/kg and 2000 mg/kg per body weight of each extract. Then the last group received the same dose of 2000 mg/kg to confirm the first result. Otherwise, if the of amount 2000 mg/kg body weight did not prove to be toxic, higher dose (5000 mg/kg) is used to determine the toxicity of plant. The extracts were prepared with distilled water and administered orally at a single dose to the rats. A volume of 1 ml/100 g of body weight is used. Rats were maintained into fasting over-night before extract administration without water deprivation, and then they were normally fed 3-4 hours later after the substance has been administered. Following the fasting period, the rats were weighed and the concentration was calculated in reference to the body weight. The animals were observed 30 min after dosing, followed by hourly observation for 8h and once a day for the next 13 days. All observations were systematically recorded with individual records being maintained for each animal. Surviving animals were weighed and visual observations for mortality, behavioral pattern, changes in physical appearance, injury, pain and signs of illness were conducted daily during the period.

2.4 Subacute Oral Toxicity study

Repeated oral dose of toxicity study was carried out according to OECD Guideline 407 [22]. The animals were divided into four groups of 10 animals each (5 males and 5 females). Group 1 received 1 ml/100g body weight of distilled water and served as control. Groups 2, 3 and 4 received extract doses of 150, 300 and 600 mg/kg body weight, respectively. Mortality, body weights, food and water consumption as well as observation for general toxicity signs of the animals were evaluated daily for 28 days. At the end of each week, the animals were anesthetized with diethyl ether. The blood was drawn through cardiac puncture and collected into Ethylene diamine tetra acetic acid (EDTA) anticoagulant tube for hematological analysis.

2.5 hematological analysis

Hematological parameters including hemoglobin (HGB), red blood cells (RBC), white blood cells (WBC),hematocrit (Hct), platelets (PLT), mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), mean corpuscular haemoglobin concentration (MCHC);lymphocytes, monocytes, neutrophils and eosinophils were determined by an automatic analyzer (BC-3000 Plus Auto Hematology Analyzer, Shenzhen Mindray Bio-Medical Electronics Co. Ltd, China.

2.6 Statistical Analysis

The results are presented as mean ± standard deviation (SD). Analysis of variance (ANOVA) with repeated measures was employed to compare the results according to the administered doses and times of treatment. Analysis of variance was considered significant when the level of probability *(p)* was < 0.05; if $p < 0.01$, this difference is considered as very significant; if highly significant $P < 0.001$.

3. Results

3.1 Acute Toxicity

No sign of acute (sharp) toxicity was observed, after the administration of the doses of 300 of the physical 2000 and 5000 mg/kg weighty, by the hydro-alcoholic extract of *Terminalia mantaly* all the animals survived the single administration of the extract.

According to the method of determination of the DL_{50} indicated previously, the DL_{50} is superior to 5000 mg/kg body weight

Table 1: Effect of dose on the mortally of mice

Doses (physical mg / kg weighty)	300	2000 5000
Number of mice	3	6 3
Percentage of mortality (%)	0	0 0
DL_{50} (physical mg / kg weighty)	>300	>2000 >5000

3.2 subacute toxicity

3.2.1 Hematological resultant

The figure shows the results of hematology test. The extract caused a significant change of hematological parameters compared with controls and compared to the effect time.

Effect of *Terminalia mantaly* on the level of hemoglobin

The hemoglobin level was significantly decreased with treated animals compared to control groups. For doses 600 mg/kg decreases are from 13.38±1.64 to 12.02±1.22 of 10.16% (w1); from 13.47±1.55 to 11.56±0.56 of 14.17% (w2); from 13.47±1.24 to 11.77±1.08 of 19.89% (w4) with p <0.01. Hemoglobin levels did not change significantly with treated animals compared to the time effect.

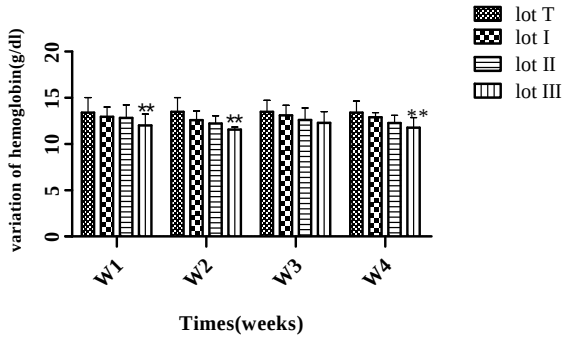

Fig 1: Variation of the haemoglobin count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg / kg; Lot I = 300 mg / kg batch III = 600 mg / kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). **p<0, 01 at significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of red blood cells

The rate of red blood cell decreased significantly in treated animals compared to controls .For doses 600 mg/kg, decreases were from 6.21±0.64 to 5.66±O.16 16% (w1) with p < 0.01. The red blood cell count did not vary significantly p>0, 05 with treated animals compared to time effect.

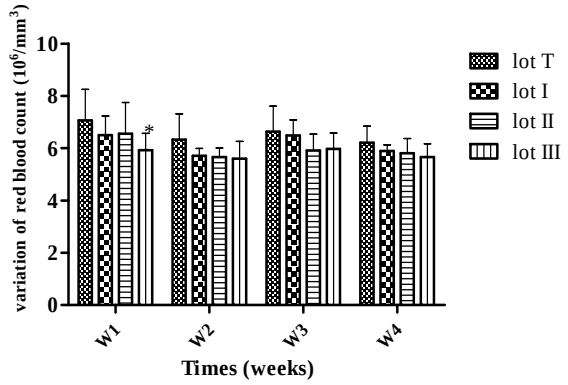

Fig 2: Variation of the red blood cell count (10^6/mm^3) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1, W2, W3, W4). * p < 0.05 : significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of hematocrit

The hematocrit not vary significantly with the treated animals except in the animals treated at a dose 600 mg/kg (w1) from 36.93±4.90 to 32.99±2.87 of 10.66% compared to control. The hematocrit has a significant decrease in the control animals from 36.93± 4.90 to 34.14 ±1.92 of 7.55% with p <0.05 in the second week compared to the first week but increased in animals treated with 150 mg/kg with p <0.001 of 10.53% and the 600 mg dose from 34.45± 2.26 to 32.O9 ±1.43 of 7.45% with p < 0.05 in the fourth week compared with the second week.

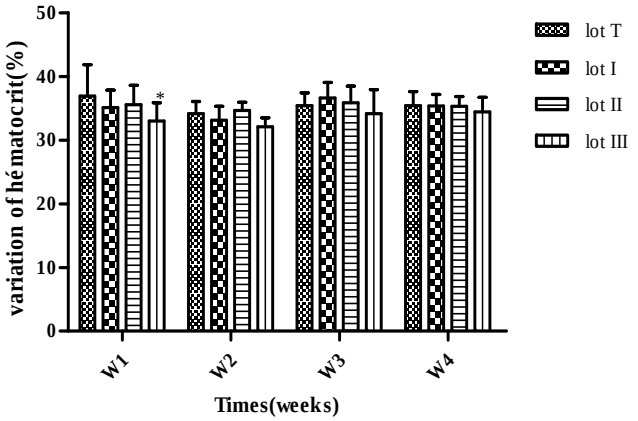

Fig 3: Variation of the haematocrit count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1, W2, W3, W4). * p < 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of MCV

The rate of MCV increased but had no significant difference with p> 0.05 in treated animals compared to control animals. The rate of MCV did not change significantly over time, except in the animals treated with 300 mg/kg dose with a significant increase with p <0.05 from 58.40±2 to 55.34± 2.25 of 3, 64% in the second week and from 58.29±1. 95 to 55.34±2 of 7, 38% in the fourth week compared to the first week.

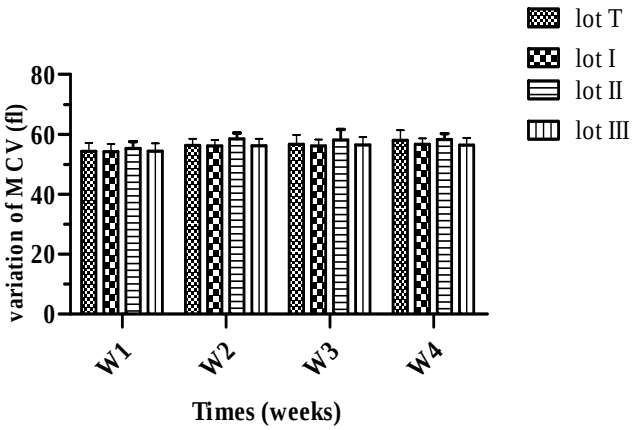

Fig 4: Variation of the packed cell volume (MCV) count (fl) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg / kg; Lot I = 300 mg / kg batch III = 600 mg / kg body weight of the animal on the 4 weeks (W1, W2, W3, W4). P > 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of MCHC

The rate of MCHC did not vary significantly with p> 0.05 in treated animals compared to control animals and compared to the effect time.

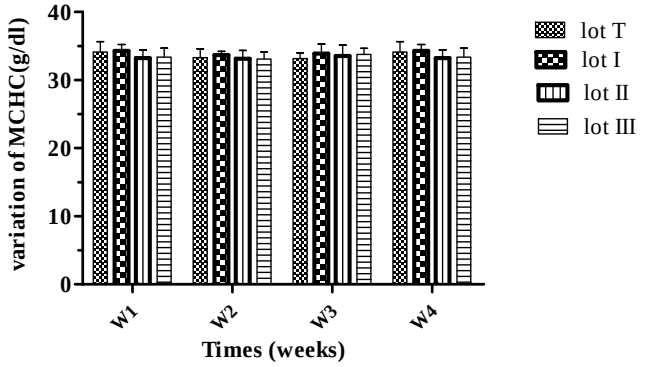

Fig 5: Variation of the cell MCHC count (g/dl) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). p > 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of MHC

The rate of MCH did not vary significantly with p> 0.05 in treated animals compared to control animals. However, it was significantly increased as versus of time in animals treated with the dose 300 mg/kg p < 0.05 from to of 0.9%; dose 600 mg/kg from to of 6.66% in the third week and 6% in the fourth week from the first week.

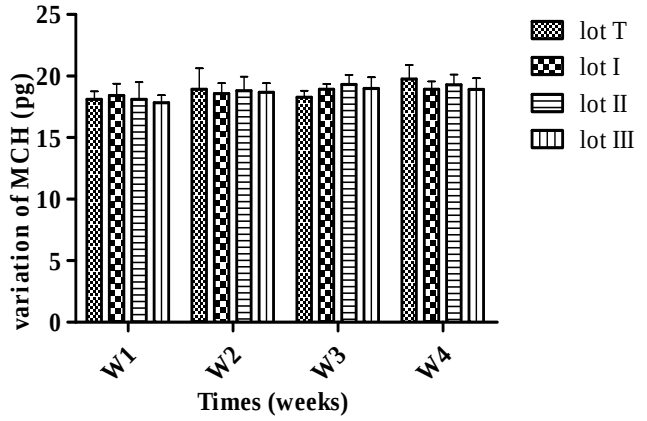

Fig 6: Variation of the MCH count (pg) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). p >0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of lymphocytes

The lymphocytes significantly decreased with treated animals compared to control groups For the 150 mg/kg dose decrease is from 64.8±4.95 to 47.26±4.8 of 27% p < 0.01; for 300 mg/kg dose decrease is from 64.80± 4.95 to 53.15±8.4 of 17.97% with p <0.05; for 600 mg/kg doses decreases are from 64.80 ±4.95 to 49.81± 9.18 of 23% with p <0.01 to first week. The rate decreased significantly with treated animals compared to the time effect in animals treated at the 150 mg/kg dose from 66.01±9.1 to 47.26±4.8 of 28.4% in the third week compared to first week; from 59.27±5.7 to 47.26±4.8 of 20.26 % with p <0.01 in the third week compared with the second week; 300 mg/kg dose: from 65.17±14.65 to 53.15±8.4 of 18.44% with p<0.01 in the third week compared to the first week; from 65.17±14.65 to 52.24±11.5 of 19.84% with p<0.01 in the fourth week compared to the first week ; dose 600 mg/kg from 66.02±7.7 to 49.81±9.2 de19.84% with p<0.001 in the first week compared to the first week ; from 66.02±7.7 to 55.8±5 7.6 of 15.40% with p<0.05 in the fourth week from the first week.

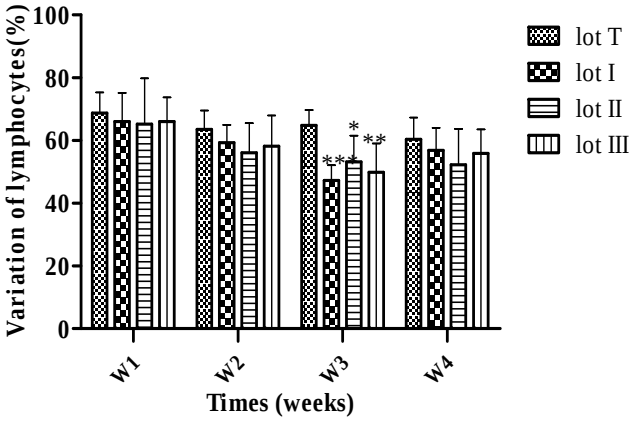

Fig 7: Variation of the lymphocyte count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). * P < 0.05;**p< 0, 01 significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of white blood cell

The rate of white blood cells did not vary significantly with p> 0.05 in treated animals compared to control animals and compared to the time effect

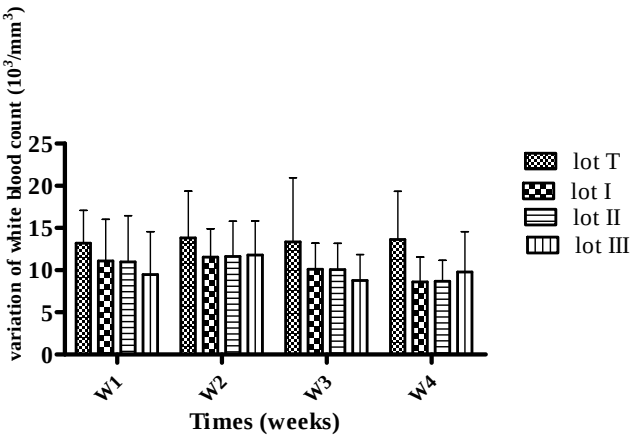

Fig 8: Variation of the white blood cell count ($10^3/mm^3$) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). P> 0, 05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of neutrophil

Neutrophil counts not change significantly with p> 0.05 in treated animals compared to control animals. The evolution of neutrophils was significantly increased compared to the effect time in animals treated at the dose 150 mg/kg p < 0.05 from 29.91±10.33 to 40.68±4.94 of 36% in the third week from the

first week and 300mg dose of from 21.64± 6.5 to 32.79± 12.38 of 51.47% with p <0.05% for the second week compared to the first week from 21.64± 6.5 to 38.51± 9.6 of 72. 45% with p <0.001 in the fourth week compared to the first week in animals treated with the dose 600 mg/kg from 23.72±5.58 to 35.92±8.23 of 51.43% with p < .0.05 in the fourth week compared to the first week of from 23.72±5.58 to 38.99±9.69 of 64.37% with p <0.001 by the third week from the first week.

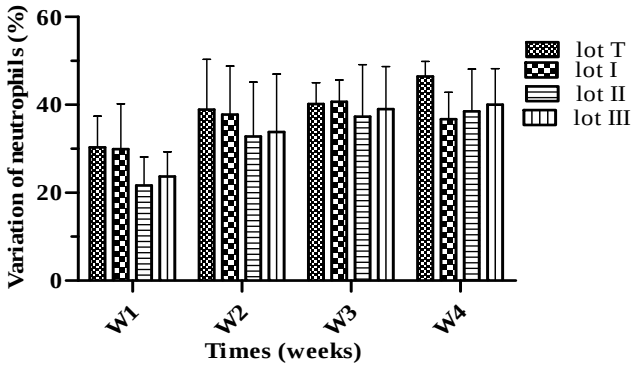

Fig 9: Variation of the neutrophil count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg / kg; Lot I = 300 mg / kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). P > 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of eosinophils

The rates of eosinophils not vary significantly with p> 0.05 in treated animals compared to control animal and animals treated compared to time.

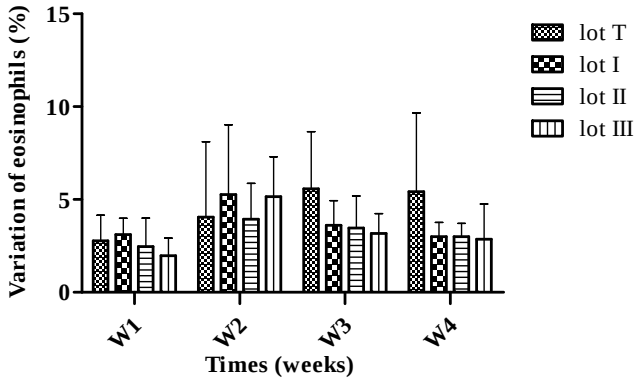

Fig 10: Variation of the eosinophil count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; ot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). * P < 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of monocytes

The rate of monocytes did not vary significantly with p> 0.05 in treated animals compared to control animals. The rate increased significantly with treated animals compared to the time effect in animals treated at the dose 150 mg/kg from 22.15±6 to 37±8 of 33% beyond the third week in the first week and at the dose 300 mg/kg from 22.8±3 to 37.13±8 of 65.9 % with p <0.01 in the fourth week in the first week. The dose 600 mg/kg from 22.42±9 to 37.13±8 of 62.7% with p<0.01 in the third week in the first week.

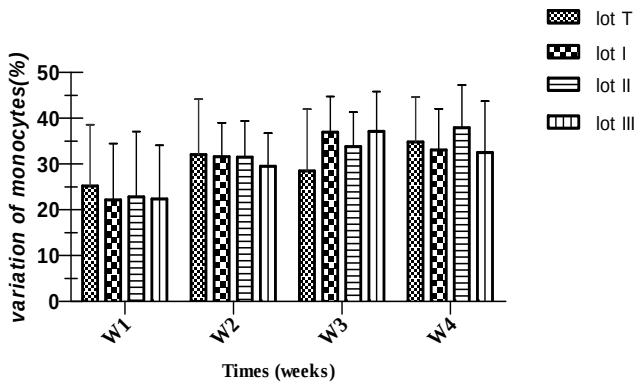

Fig 11: Variation of the Monocyte count (%) versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III= 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). P > 0.05: significant difference compared with the control.

Effect of *Terminalia mantaly* on the level of platelets

Platelet rate decreased significantly with treated animals compared to control groups. For the 150 mg/kg decreases are from 776 ±147 to 439.60±58.78 of 43.35% doses (w3) with p <0.01; for doses 300 mg/kg, decreases are from 776±147 to 454 ±102.7 of 41.49% (w3) with p<0.01, from 688±82 to 455.6±102 of 33.77% (w4); for the dose 600 mg/kg decreases are from 776±147 to 474.4±81 of 38.65% (w3) with p < 0.01, from 688±82 to 451±60 of 34.44% (w4) with p <0.05. The platelet rate did not vary significantly with p> 0.05 in treated animals compared to the effect time.

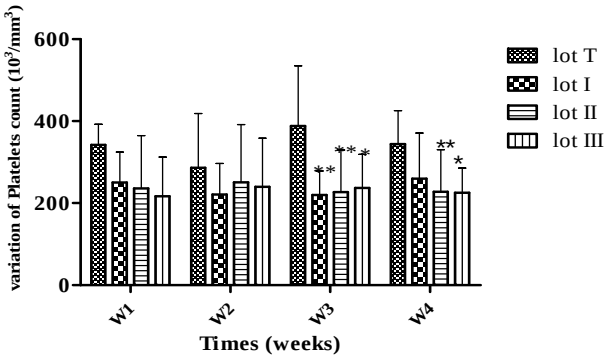

Fig 12: Variation of the platelets count ($10^3/mm^3$) versus time. Each bar represents the mean ± SD, n=10; Lot T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch; lot III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4). * P < 0.05;**p< 0, 01: significant difference compared with the control.

4. Result weight change

Witness for the lot, the value of body mass evolved from 98.60 ± 14.75 (W0) to 120.5 ± 22.55 (W5) an increase of 14%. In batches I to III (lot treated) values of body weight have evolved 122.3 ± 14.75, respectively (W1) 139.70 ± 16.56 (W5) of 116.8 ± 10.53 (W1) 145.40 ± 20.99 (S5); of 129.3 ± 13.17 (W1) to 133.5 ± 17.26 (W5); An increase is 14.22%, 24.48% and 3.24%.

L, statistical analysis showed a significant difference in the time, exhibition. It indicates that the values of body mass increased significantly in the controls; lots I, II batches.

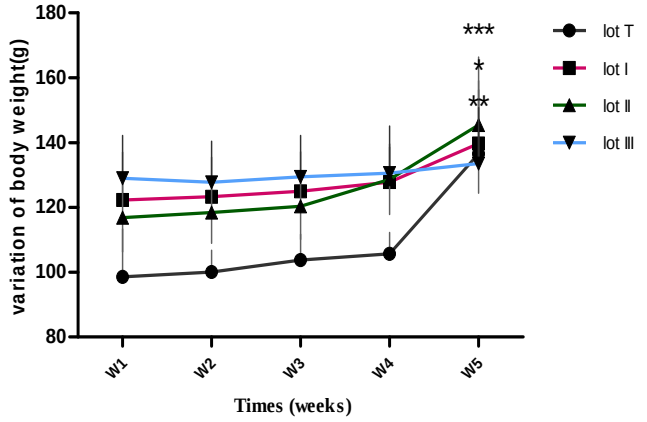

Fig 13: Variation of the body weight versus time. Each bar represents the mean ± SD, n = 10 T = control with batch; lot I = 150 mg/kg; Lot I = 300 mg/kg batch III = 600 mg/kg body weight of the animal on the 4 weeks (W1; W2; W3; W4; W5).* P <0.05; ** p <0. 01, *** p < 0.001 Significant Difference compared with the W1.W1 one week before the treatment; W2 to W5: Four weeks of treatment.

5. Discussion

The present study has given detailed information on the toxicological profile of *Terminalia mantaly* by acute and repeated oral toxicity studies on mice and rats. According to the OECD test guideline 423 [21] when there is information in support of low or non-toxicity and toxic mortality nature of the test material, then the limit test at the highest starting dose level (5000 mg/kg body weight) was conducted. There were no mortality and toxicity signs observed at 5000 mg/kg. Hydro-alcoholic extract of *Terminalia mantaly* can be classified under category-5 and LD_{50} value was greater than 5000 mg/kg in accordance with Globally Harmonised System of Classification and Labelling of chemicals and this provides us a direct relevance for protecting human and animal health [23]. Since examination of clinical signs plays major role in toxicological testing mortality and morbidity were recorded twice a day throughout the study. According to FAO/WHO Expert Committee on Food Additives [27], if there is no death occurred at 2 g/kg of body weight, and then it can to assume that the substance is non-toxic. The results is in line with Aboudoulatif and al [1] who indicate that the LD_{50} of the extract hydroalcoholic of *Ageratum. Conyzoides* extract is more than 5000 mg/kg and Mama & al [15] with the extract de *Sacoglottis gabonensis.* Therefore, it could conclude that extract when administered at single dose is non-toxic and can be used safely in oral. A 28-day repeated oral toxicity or subacute toxicity study was performed followed OECD test guideline 407 [22] in both male and female Albinos rats. The hematopoietic system is one of the most sensitive targets for toxic compounds and an important target of the physiological and pathological statuts of man and animals [2]. The changes in the hematopoietic system have a predictive value for human toxicity when given was deducted from studies in animals. In this regard the state of the activity of the bone marrow, and intravascular effects were controlled blood work.

In subacute toxicity study, hematological evaluation showed the decreased significantly (p<0.01) among all treated groups for 600 mg/kg compared to control in hemoglobin concentration Hb and red blood cells RBC and hematocrit values (Hct) with p<0,05. Red blood cell is a cell whose main function is the transport of oxygen and carbon dioxide provided by hemoglobin contained the reduction in Hct; Hb and RBC values indicated that the extract was toxic to circulating cell and possibly had interfered with RBC production [1] and are used in anemia diagnosis in most animals [9]. The decrease in RBCs, Hb and Hc is also due to the exaggerated disturbances that occurred in both metabolic and hematopoietic activities [18]. These results are similar with that of Michel [17] which showed that the aqueous extract at a dose 1200 mg/kg body weight decrease the hematocrit levels and red blood cell. But the value of these hematological parameters showed not a severe anemia because references values in rats [10] give a margin of 11 to 15 g/dl of hemoglobin, hematocrit of 32 to 40% and from 5 to 7 10^{12}/l for red blood cells. The values were closed to our results. Thus that the extract would be well tolerated at high doses (600 mg/kg body weight).

Meanwhile, lymphocyte were significantly difference (p<0.01) in treated groups as compared to control group in first week.

Reduction of lymphocyte count is known to compromise the systemic immunity and predispose to opportunistic diseases and infections. The decrease in WBC count and lymphocyte the makes the animal vulnerable to infections caused by pathogens [7]. The observed reduction in lymphocyte would suggest the decline in the functioning of immune systems at long terms. In a similar study conducted by Iweala and Obidoa [12], they observed that the presence of phytosterols and flavonoids in the leaf extract of *Gompholobium latifolium* might possibly interfere with the process of WBC synthesis. The presence of these phytochemicals may however play synergistic roles in mediating this activity. The variation obtained in this study would be due, possibly, to the presence of phytosterols and flavonoids but that decrease was not dose - dependent. Moreover The neutrophil and monocytes parameters increases significantly (p<0,05) for both groups of rats that received 150;300 and 600 mg/kg extract as compared to effect time. As neutrophils and monocytes counts have the anti infection properties. Thus *Terminalia mantaly* would stimulate anti-infectious actors of the body. This treatment was in agreement with earlier work by Tang [26] who showed that garlic extract stimulates immune functions [25].

The significant increase in body weights of rats might also be attributed to captivity, where energy expenditure is minimal [10]. The increase in weight could be related to appetite stimulation of animals with the extract, which would result in an increase in food intake. This same result was indeed obtained by Michel *et al.* [16] in rats treated for 28 days with the aqueous extract of *Passiflora foetida*.

6. Conclusion

Our results had demonstrated that the hydro alcoholic extract of *Terminalia mantaly* could to be well tolerated by mice and rat model. No deaths or signs of toxicity were observed in the mice that received the extract up to an oral acute limit dose of 5000 mg/kg. Therefore, it could be concluded that extract when administered at single dose is non-toxic and can be used safely in oral.

In relation to the evaluation of hematologic parameters, we can say that the extract is tolerated at high doses and would stimulate anti-infectious actors of the body but would decline the functioning of immune systems at long terms.

Therefore, it is recommended that a comprehensive study should be conducted to ascertain the toxicity effects of *T. mantaly* extract on other biological parameters.

7. Acknowledgment

We express gratitude to the Department of biochemistry,

University Felix Houphouet-Boigny of Abidjan (Ivory Coast) and to the authorities of Superior Normal School Abidjan for providing the facilities for conducting this research.

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