

Greener Journal of Medical Sciences

ISSN: 2276-7797 ICV: 5.98

Submitted: 06/02/2017

Accepted: 08/02/2017

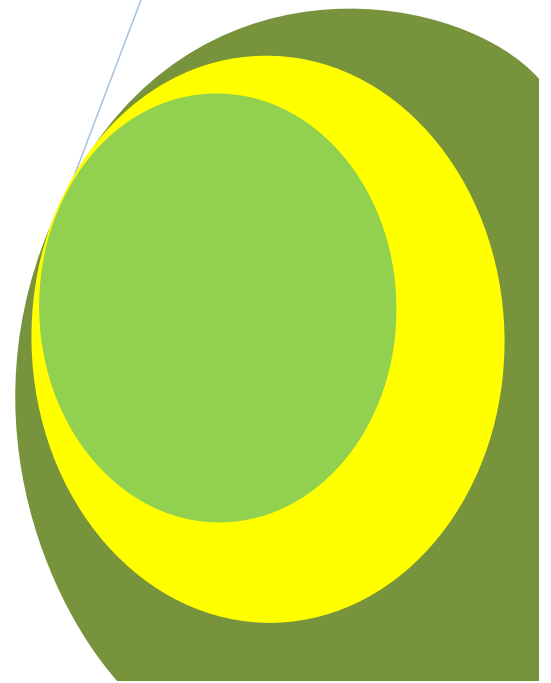
Published: 28/02/2017

DOI: <http://doi.org/10.15580/GJMS.2017.1.020617015>

Effect of Pawpaw (*Carica papaya*) Latex on the Haemostatic Mechanism and Biochemical Profile of Male Albino Wistar Rat

By

**Oguwike FN
Nwafia WC
Nwozor CM
Okeke JC**



Research Article (DOI: <http://doi.org/10.15580/GJMS.2017.1.020617015>)

Effect of Pawpaw (*Carica papaya*) Latex on the Haemostatic Mechanism and Biochemical Profile of Male Albino Wistar Rats

Oguwike FN*, Nwafia WC, Nwozor CM, and Okeke JC

Department of Physiology, Chukwuemeka Odumegwu Ojukwu University (Former Ansu) Uli Campus, Anambra State

Corresponding Author's E-mail: foguwike@ gmail. com; Phone: +2348037791363

ABSTRACT

Extracts of roots, stem, bark, leaves and sap of some medicinal plants have been known to have effect against the most dreaded pathogenic organism like the bacteria, Fungi, viruses (Russel et al, 1997). Soldiers need training, men and women do engage in exercises, children play in the field, most times people are not allowed to partake in their trainings, exercises or play due to bleeding from minor injuries which could be arrested using simple remedies from plants that could be found around the bush. Hence the effect of pawpaw (*Carica papaya*) latex on the haemostatic mechanism and biochemical profile of male albino wistar rats was studied to show the ability of *Carica papaya* latex to enhance haemostatic mechanism and stop bleeding.

Forty (40) male albino rats weighing 200-250g were selected for the study. Group 1 (10 rats) is the control group. Group 2 (10 rats) received topical application of the latex after wound laceration, Group 3 (10 rats) was fed orally (Enteral) with the latex for 5 days, while Group 4 (10 rats) was injected (Parenteral) with the latex (0.5ml) for 5 days. Thereafter, blood samples were collected from Groups 1, 3 and 4 for analysis such as Full blood count, Platelet count, Prothrombin time test, Partial thromboplastin time test, bleeding time, clotting time, biochemical test such as serum total bilirubin, conjugated bilirubin, alkaline phosphatase, aspartate transaminase and alanin transaminase.

Calcium and alkaloids (protein precipitates) was discovered present in the latex of *Carica papaya*. They are known to be involved in the precipitation of coagulation factors (Tafeeq, et al 2008) which promotes clotting in rats. The latex of *Carica papaya* reduced haemoglobin concentration, packed cell volume and white blood cell count significantly ($p < 0.05$) but the platelet count was very high ($p < 0.05$). It also increased the total bilirubin, conjugated bilirubin and the liver enzymes but shortened bleeding and clotting times in vitro. It could be deduced that the presence of calcium and papain helped to reduce the bleeding and clotting times.

Key words: haemostasis, *Carica papaya*, clotting time, cuts, haemoglobin, platelets, bilirubin, aspartate transaminase.

INTRODUCTION

In developing countries especially sub-saharan part of Africa, majority of the population depend mostly on herbal medical cure. In the eastern part of Nigeria, traditional medicine has been used in preventing and curing diseases, thereby playing an important role in the healthcare services especially to the low socio-economic class. These herbs are mostly administered orally or can be applied topically as ointments and some others still serve as liver tonic. The need to know and identify the effectiveness of medicinal plants such as pawpaw (*Carica papaya*) as a clotting agent in emergencies such as knife cuts, bullet wounds in the bush, iron cut during road accident, minor cuts and abrasions in the fields and bushes during exercise or trying to escape from danger prompted my curiosity to embark on this study to find a possible agent that can be used to stop bleeding of vessels, tissues and skin in a lonely region away from home, hospital and clinics. Soldiers, security agents, training in the bush, school children playing in the field and places away from home can find the knowledge from this research study very useful.

PROBLEM STATEMENT/JUSTIFICATION

The need to know *Carica papaya* latex as a clotting agent in emergencies such as knife cuts, bullet wounds in the bush, iron cuts during road accidents, cuts in football fields and bushes during training.

OBJECTIVES OF STUDY:

The major objective of the study is to determine if the latex of *Carica papaya* has advantageous effect on Prothrombin and Partial thromboplastin times of albino wistar rats.

Other specific objectives include:

1. To determine the effect of the latex on bleeding and clotting times of albino wistar rats.
2. To determine the full blood counts and platelet counts of rats fed with *Carica papaya* latex.
3. To determine the effect of the latex on liver function profile (total bilirubin, conjugated bilirubin, aspartate transaminase, alanine transaminase and alkaline phosphatase) of albino wistar rats.

LITERATURE REVIEW:

The term haemostasis means stoppage of blood loss. Whenever a vessel is damaged, haemostasis is achieved by a succession of different mechanisms in cooperating vascular spasm, immediately after a blood vessel is cut, the trauma to the vessel wall itself causes the vessel to contract. This instantaneously reduces the flow of blood from the cut vessels. The more the vessel is traumatized, the greater is the degree of spasm. This means that a sharply cut blood vessel usually bleeds much more than a blood vessel ruptured by crushing. Formation of a platelet plug is probably the second event in haemostasis and it is an attempt by the platelet to close bleeding vessels.

Papaya is a powerhouse of nutrients and is available throughout the year. It is a rich source of three powerful antioxidants, vitamin C, A and E; the minerals, magnesium and potassium; the B vitamin panthothenic acid, and folate and fiber. In addition to all this, it contains a digestive enzyme-papain which effectively treats causes of trauma, allergies and sports injuries (Aravid et al, 2013). It can be used as anti-sickling agents (Beckstrom et al, 1994). The fruits, leaves, seeds and latex are used medically. Its main medical use is as a digestive agent prescribed for people who experience difficulty in digesting protein. Papain, an enzyme obtained from pawpaw is used as coagulant in surgery. It is also popular for topical application, in the cardiovascular system, protects heart diseases, heart attacks, strokes and prevents damage caused by free radicals that may cause some forms of cancer. It is reported that it helps in the prevention of diabetic heart disease (Beckstrom et al, 1994).

Papaya lowers high cholesterol levels as it is a good source of fiber. The skin of papaya works as a best medicine for wounds. The enzymes papain and chymopapain and antioxidant nutrients found in papaya have been found helpful in lowering inflammation and healing burns. Previous studies in phytochemical analysis of *Carica papaya* reveals the presence of papain in high concentration, saponin, alkaloids, flavonoids, monoterpenoids, minerals (calcium, potassium, magnesium, zinc, manganese, iron), carotenoids, glucosinolates and carposide (Aravid et al, 2013). However, evidence has been presented that PF3 is found at least in part, in micellular formations which arise from platelet granules and then are extruded (Spaet, 1964). Such structures may escape from the main plug into the circulation, concept which is reinforced by the observation that much of the PF3 cannot be sedimented from serum even at extremely high centrifugal force. An important consequence of platelet plug formation in this process is probably dual. It serves to consolidate the haemostatic plug by means of inducing platelet retraction and the various changes collectively known as viscous metamorphosis (Spaet, 1966). It also produces clotting of plasma in the immediate vicinity of the plug which may lead to extension and lead permanence to the haemostatic structures. One of the effects of thrombin on platelets is to augment the release reaction described above increasing the potential yield of platelet haemostatic factors liberated into the general circulation. Irrespective of the means by which blood clotting is initiated, proper functioning of the process requires that the final reaction to fibrin formation be confined to the haemostatic area: plasma trapped in the interstices between adhering and aggregated platelets, of turbulent flow in direct association with the haemostatic plug. The third mechanism for haemostasis is formation of the blood clot.

This is in three steps-Initiation of prothrombin activator, conversion of fibrinogen to fibrin and clott formation. When fibrin is formed wound healing commences. Wound healing is a dynamic interactive process involving soluble mediators, blood cells, extracellular matrix and parenchymal cells and has three phases; inflammation, tissue formation and tissue remodelling that overlap in time. The primary goals of the treatment of wounds are rapid wound closure, functional and aesthetically satisfactory scar. Recent advances in cellular and molecular biology have greatly expanded our understanding of the process involved in wound healing, repair and tissue regeneration (Clark, 1996).

MATERIALS AND METHOD

Selection of Animals for Study

The albino wistar rats were randomly selected and kept in a metal cage with iron netting at Chukwuemeka Odumegwu Ojukwu University Physiology Lab in the Department of Physiology, Faculty of Basic Medical Sciences.

The animals were kept under standard conditions of temperature and humidity receiving 12h light. They were fed with commercial rat pellets (Guinea feed nig LTD) and drinking water ad libitum. They were allowed to stabilize for two weeks before starting the experiment. The specie of the pawpaw was identified by a taxonomist and characterized at the Department of Crop Science of the University (COOU).

Collection of Latex

Latex of *C. papaya* was collected from locally grown plants at Uli, Anambra state. The incisions were repeated 4 times at 3 days interval. The Latex was collected using the method of Jean et al, 2013.

A 5.0g of *C. Papaya* crude latex was mixed with 100ml of distilled water (5g/100ml) and used for oral administration to the animals for 5 days.

Phytochemical Analysis of Latex

The latex of *Carica papaya* was screened for the presence or absence of various secondary metabolites using standard phytochemical screening procedures as described by Harbournes (1973), Trease and Evans (1996) respectively. The latex was tested for glycosides, flavenoids, alkaloids, tannins, reducing sugars, calcium, saponins, acidic compounds, resins, fats and oil, carbohydrates and steroid.

Toxicity Studies

The LD₅₀ of latex in albino rats was determined using Lorke's method (1983). The procedure of determining the lethal dose will be increasing the concentration of the extracts administered to the rats (after weighing them) in each group of the groups consisting of eight rats per group for five days. The concentration to give will be at the rate of 1000mg/kg, 500mg/kg, 2000mg/kg, 2500mg/kg, 3000mg/kg and 4000mg/kg. The percentage rate of their death and survival will be noted and graph to be plotted to determine the LD₅₀.

Other Tests

Haematological Studies

Haemoglobin estimation was determined by method described by Baker et al, 1998. The packed cell volume estimation was estimated by the Method of Alexander et al, 1998. The total white blood cell count was also done by method described by Baker et al, 1998. The platelet count was done as described by Brecher and Cronkite, 1950.

Coagulation Studies

The whole blood clotting time was determined using the method of Lee and White (1998), the bleeding time was carried out as described by Dejana et al (1982). The prothrombin time and the partial thromboplastin time kaolin tests were carried out as elaborated in Quick's one stage method (1998).

Biochemical Studies

The liver function test (LFT) was carried out by the method described by Baker et al, 1998.

- Study on effects of the routes of administration on rats.
 - a) Enteral: Oral administration of aqueous latex of *Carica papaya* was carried out by intubation and the control rats were given normal rat diet during this period.
 - b) Parenteral This consists of intraperitoneal injection of the aqueous latex of *Carica papaya* to the rats. The dose of 5mg/100ml of the latex was used and it lasted for 5 days. This was used to compare the enteral administration.
- Effect of *Carica papaya* latex on clotting time of rats.

In this study, Prothrombin time (PT) and partial thromboplastin time kaolin was done to establish the possible pathway of the action of the latex. The concentration of latex was used 5mg/100ml.

Experimental Procedure

The animals were randomly divided into 4 groups of 10 rats each. Initial blood specimen was withdrawn from the test and control animals to determine their initial blood picture before commencing the parenteral and enteral administration for 5 days.

The procedure is as follows:

- Group 1: Control groups to receive grower feed, and water ad libitum.
- Group 2: Topical application of latex on the lacerated wounds, growers feed and water for two weeks.
- Group 3: Oral administration of 5g/100ml of the latex, grower feeds and water ad libitum for 5 days.
- Group 4: Consists of intraperitoneal injection of the latex of *Carica papaya* to the rats. The dose of 5mg/100ml of the latex was used for 5 days.

Obtaining of Blood Samples for the Study (Effraim et al, 2000):

At the end of administration of latex bleeding and clotting time, tests were conducted on the test rats. Later they were stunned and sacrificed. Then blood samples (2.0ml) were collected by cardiac puncture, placed in plain tubes for serum liver function tests viz: Total bilirubin, conjugated bilirubin, alkaline phosphatase, aspartate transaminase. Another 2.0ml of blood was collected and placed in anticoagulant tubes (EDTA) and sodium citrate bottles for determining haemostatic and haematological indices.

Hypothesis

They are categorical statements about the relationship between exposure variables and outcomes. A null hypothesis states that there is no difference between groups or no associations between variables. Relevant data are then collected and assessed for their consistency with the null hypothesis. For this study, the alternative hypothesis stated as follows:

1. Null hypothesis: Latex extract of *Carica papaya* does not shorten the bleeding and clotting times of rat following the administration of the latex in rats.
Alternative hypothesis: Latex extract of *Carica papaya* shortens the bleeding and clotting times of rat following the administration of the latex in rats.
2. Null hypothesis: Latex extract of *Carica papaya* does not affect the liver function profiles in rats.
Alternative hypothesis: Latex extract of *Carica papaya* affects liver function profiles following the administration of the latex in the rats.

The null hypothesis was tested at a significant level (P value) of 0.05. it would be rejected if the p value is <0.05 and accepted if P value >0.05. at P value <0.05, the null hypothesis would be rejected implying that latex extract of *C. papaya* shortens bleeding and clotting times following the administration of the latex in rats.

Statistical Analysis

The results obtained in this study were represented as Mean and Standard deviation (Mean \pm S.D). The students' t-test was used to determine the level of significance.

RESULT

The 40 male albino wistar rats have been analyzed for haemostatic and biochemical profiles after feeding and injecting some of them with the *Carica papaya L* for a period of 5 days. The samples were analysed for prothrombin time (seconds), platelet count ($\times 10^9/l$), haemoglobin concentration (g/dl), packed cell volume (%), white blood cell count ($\times 10^3/l$), total bilirubin, conjugated bilirubin, alkaline phosphatase, alanin transaminase, and aspartate transaminase.

The mean and the standard deviation of the parameters were calculated for each of the group. The test of significance used was students'-t-test.

- Table 1:** Shows the phytochemical studies of the fresh latex of *Carica papaya*. The different elements present in the latex were shown in the table.
- Table 2:** This indicates the haematological and the haemostatic indices of rats fed with the latex of *Carica papaya* L for 5 days. The results shows clearly that the haemoglobin concentration of test rats were 6.04 ± 0.39 indicating a 60% reduction in haemoglobin concentration when compared to the control group 1 level which gave 13.6 ± 1.05 g/dl. The Packed cell volume, white blood cell counts were significantly reduced but the platelet counts were significantly elevated in the test rats (Group 3) giving an average value 550×10^9 /l. The bleeding and clotting times were shortened.
- Table 3:** Shows the rate of wound healing in group 2 rats on topical application of latex compared to control on normal saline.
- Table 4:** Shows bleeding and clotting times in albino wistar rats (Group 4) following intraperitoneal injection of *C. Papaya* latex.
- Table 5:** Indicates the liver function analysis after feeding the test rats (Group 3) with the *Carica papaya* latex. The results indicate significant elevation in the liver enzymes ($p < 0.05$) in the test rats compared with the control rats.
- Figure 1:** Shows the lethality of the rats used, during the study. The lethal dose of the latex used during the research was of a very low concentration for the safety of the animals.
- Figure 2:** Shows a histogram representation of prothrombin time of the test rats injected with 0.5mg body weight of the latex of *Carica papaya* latex for 5 days. The result indicated a prolongation of the prothrombin time in the test rats ($p < 0.05$) compared with the control rats.
- Figure 3:** A histogram representation showing the effect of *Carica papaya* latex in the partial thromboplastin time of the test rats. There is a prolongation of the partial thromboplastin time kaolin in the test rats ($p < 0.05$) compared to their corresponding control.

TABLE 1: Phytochemical analysis of latex of *Carica papaya*.

CONSTITUENTS OF <i>Carica papaya</i> latex								
	Alkaloids	Calcium	Carbohydrates	Reducing sugar	Saponins	Tannins	Cardenolides	Terpenoids, Glycosides, fats and oils, resins
Degree of concentration	+	+++	+	+	+++	++	++	-

- Negative (absent),
- + Present in small concentrations.
- ++ Present in moderate high concentration
- +++ Present in very high concentration.

TABLE 2: Haematological and haemostatic profile of male albino wistar rats before the administration of the latex and 5 days after the administration of the latex of *Carica papaya*

LATEX	Hbg/dl ± S.D	PCV (%)± S.D	WBC ± S.D	Platelet x 10 ⁹ /l ± S.D	Bleeding Time Min ± S.D	Clotting time Min ± S.D	Prothrombin sec ± S.D	Partial thromboplastin time sec ± S.D
Control rat Group 1, n=10 (Latex free)	13.6 ± 1.05	40.0 ± 2.16	4,700 ± 21.06	175 ± 30	3.2 ± 0.8	6.14 ± 0.4	12.5 ± 0.7	30 ± 0.5
Group 2 n=10	13.4 ± 0.07	39.6 ± 0.3	4,750 ± 319	180 ± 22	3.0 ± 0.4	6.04 ± 0.2	12.0 ± 0.5	28 ± 1.2
Group 3 N=10	13.62 ± 0.18	40.8 ± 0.5	4,830 ± 225	200 ± 56	3.1 ± 0.7	6.0 ± 1.8	12.2 ± 0.4	21 ± .7
Group 4 N=10	13.17 ± 0.24	39.5 ± 3.0	4,500 ± 178	174 ± 32	3.0 ± 0.6	5.9 ± 0.2	12.0 ± 0.6	24 ± 0.3
After latex feed Group 2 n=10	13.84 ± 2.05	40.21 ± 6.15	5000 ± 106	187 ± 42	3.1 ± 0.2	6.0 ± 0.8	12.5 ± 0.7	28 ± 1.2
Group 3 N=10	6.3 ± 0.39	18.6 ± 3.2	2,360 ± 24	550 ± 64	1.18 ± 0.5	2.04 ± 0.9	35 ± 0.1	61 ± 2.5
Group 4 N=10	5.17 ± 0.24	15.72 ± 4.6	2,108 ± 18	500 ± 35	1.24 ± 0.2	2.03 ± 0.5	2.03 ± 0.5	65 ± 2.1
P value	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05

TABLE 3: Rate of wound healing in the test rats on topical application of the latex in the lacerated wounds of Group 2 rats, healing is faster in the test rats (P<0.05)

LATEX	DAYS OF WOUND HEALING	COMMENT
Control rats (Normal saline Topical application)	10 days	Slower
Test Rats, Group 2 (n=10) Latex topical application	4 days	Faster

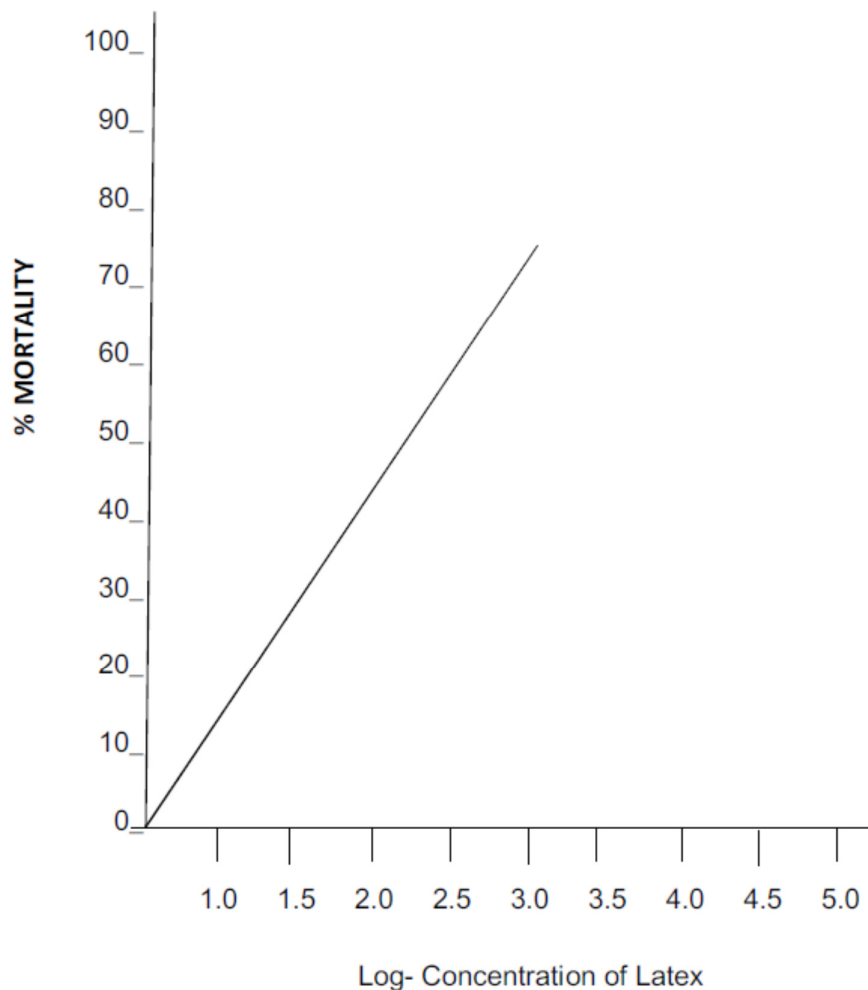
TABLE 4: Bleeding and clotting times in albino wistar rats following intraperitoneal administration of extracts for 5 days (Group 4)

Extracts	Dose of extract	Bleeding time (min) Mean ± S.D	Clotting time (min) Mean ± S.D	Observation	Level of Significance
Control (Placebo)	5mg/g	2.8 ± 0.3	6.2 ± 0.4	Nil	P>0.5
C. papaya latex	5mg/g	1.4 ± 0.5	4.03 ± 0.6	Reduced	P<0.05

There was a reduction in the bleeding and clotting times of the test rats group 4 (P<0.05).

TABLE 5: Liver function profile of albino wistar rats on *Carica papaya* latex feed for 5 days

LATEX	Total Bilirubin mg/dl \pm S.D	Conjugated Bilirubin mg/dl \pm S.D	Alkaline phosphatase iu/l \pm S.D	Aspartate Transaminase i.u/l \pm S.D	Alanin Transaminase iu/l \pm S.D
Control rats n=10 (Latex free)	0.20 \pm 0.00	0.3 \pm 0.00	30.2 \pm 1.7	7.0 \pm 1.0	6.5 \pm 0.6
Group 3 n=10	0.10 \pm 0.00	0.2 \pm 0.00	32.4 \pm 1.5	7.0 \pm 1.4	6.0 \pm 0.4
Group 4 n=10	0.10 \pm 0.00	0.2 \pm 0.00	30.2 \pm 1.4	6.9 \pm 0.5	6.0 \pm 0.5
5 days after Latex feed Group 3 n=10	15.4 \pm 1.8	5.1 \pm 0.6	35.2 \pm 2.9	8.0 \pm 1.4	20.4 \pm 2.8
Group 4 N=10	11.56 \pm 2.6	3.4 \pm 0.3	90 \pm 5	16 \pm 2.0	20.2 \pm 1.6
P value	P<0.05	P<0.05	P<0.05	P<0.05	P<0.05

**FIGURE 1:** Lethality studies (LD₅₀) of *Carica papaya* latex.

The LD₅₀ of rats on latex of *Carica papaya* gave 1,000mg/kg.

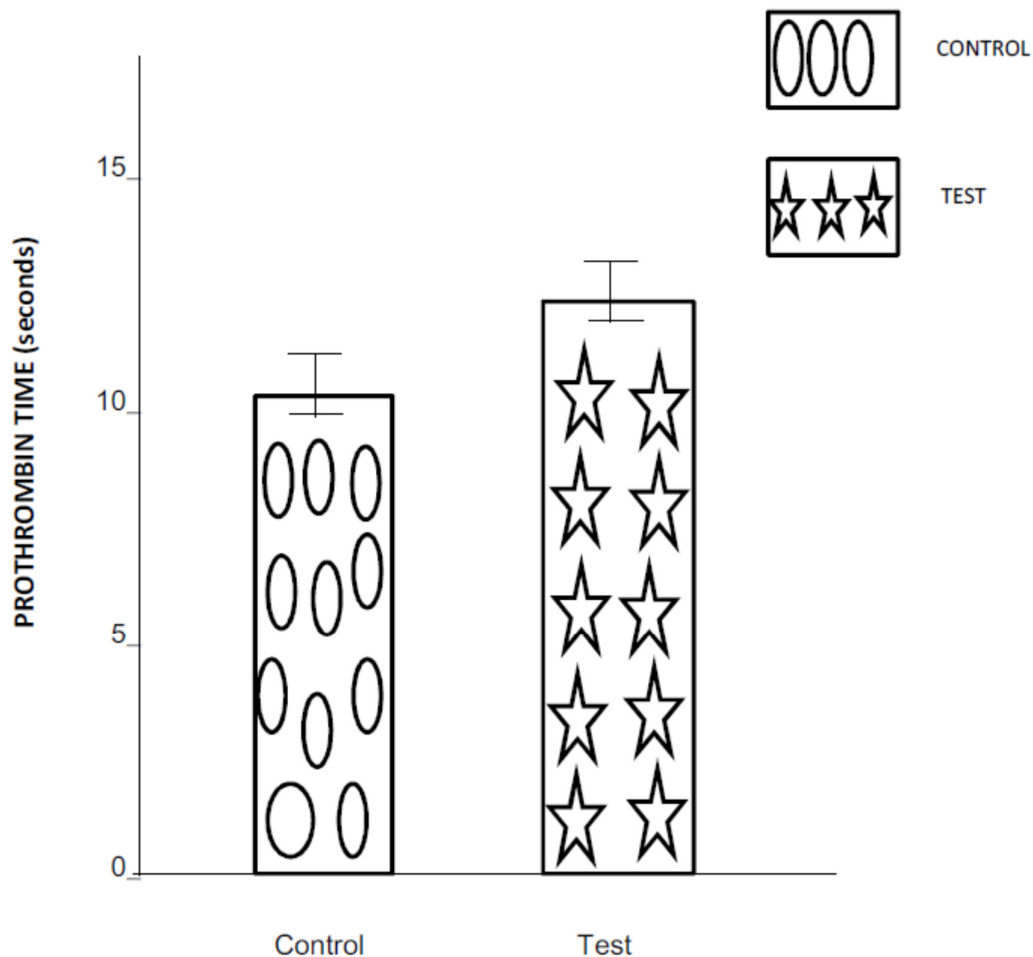


FIGURE 2: The histogram representation of prothrombin time test of rats on intraperitoneal injection (5mg/dl) of latex of *Carica papaya*.

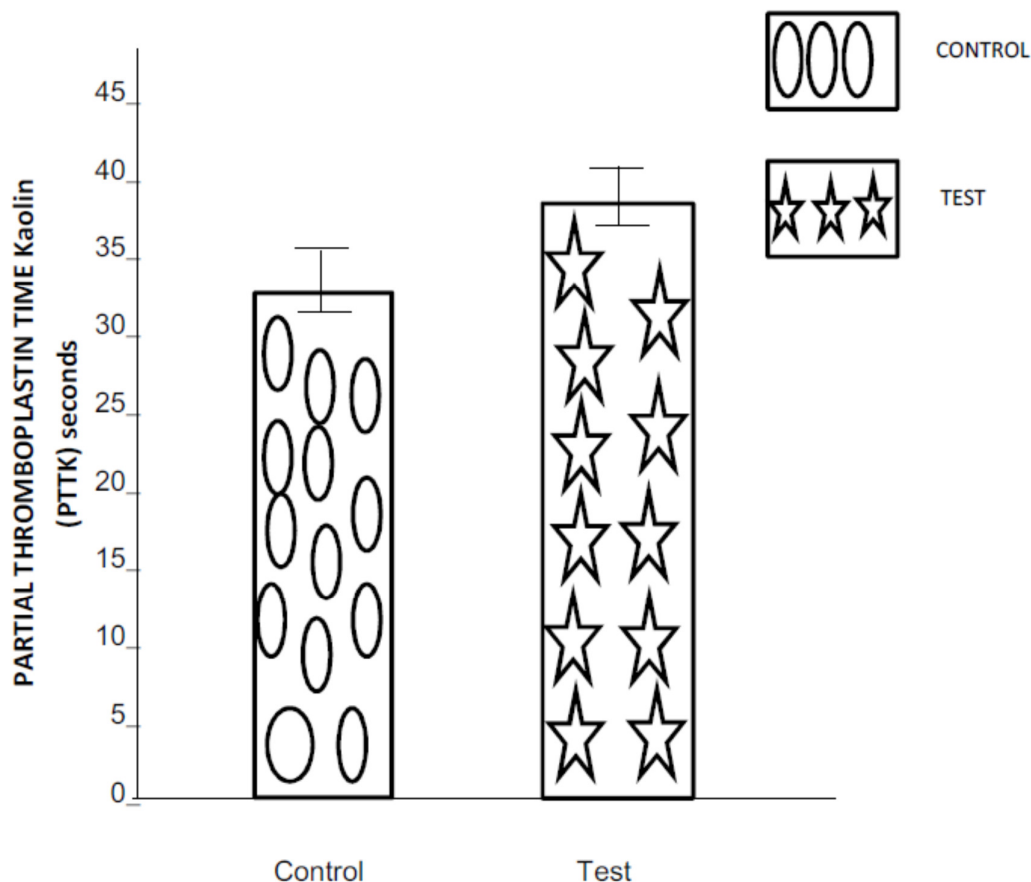


FIGURE 3: Shows the histogram representation of the partial thromboplastin time kaolin of rats on 5 days intraperitoneal injection (5mg/dl) of latex of *Carica papaya*

DISCUSSION

The primary goal of exercise, soldiers training in the bush, children playing in the fields and sportsmen training in the fields is for body fitness and wellbeing. Hence the curiosity in finding a solution to stoppage of external bleeding due to cuts and abrasions sometimes sustained by the subjects has been expressed in the study of the effect of *Carica papaya* latex in the haemostatic mechanism and liver function profiles of male albino wistar rats. Crude extracts of plants have been found very useful in ethnomedical practice as part of the process for the treatment of diseases (Iwu, 1982). In this study, it was shown from the phytochemical studies that there is presence of typical plant constituents (Okoli, 2007) such as calcium, alkaloids, carbohydrates, tannins, saponins, fats, reducing sugar, while other constituents such as resins, terpenoids, acidic compounds, steroids, oil, glycosides were absent.

The calcium and alkaloids (protein precipitates) contained in this plant extract are known to be involved in the precipitation of coagulation factors (Taofeeq et al, 2008) which promotes clotting in rats. *Carica papaya* preparations can be efficiently used in tissue burn (Macalood et al, 2013) and microbial helminthic infection. Dried latex contained higher amount of crude protein, crude fat and crude fibre (Macalood et al, 2013).

In this study to compare the effect of route of administration, it was observed that intraperitoneal administration of the extract demonstrates rapid onset of action than the oral route. This could be because in oral route, the extract underwent first pass effect and a reduction in bioavailability, while the intraperitoneal route has a higher bioavailability. It took a shorter period for the clotting and bleeding times to occur via this route.

The mean value of packed cell volume (%) haemoglobin concentration (g/100ml), white blood cell count (per mm³) were observed to be low in groups 3 and 4 rats compared to the corresponding controls, thus suggesting possible retardation on erythropoiesis and increase in haemolysis of red blood cells in vivo causing anaemia. This can also indicate that consumption of latex of *Carica papaya* can result to haemolytic anaemia, weight loss in the users. Hence external or topical use on cuts and abrasions is advocated.

The evaluation of the haemostatic effects in albino wistar rats showed that it reduced bleeding and clotting times, but prolonged prothrombin and partial thromboplastin kaolin times hence did not demonstrate haemostatic activity latex formulated in the carbopol gel based on hydroxyproline content causes wound contractions and epithelisation time to be effective in the treatment of burns (Furie et al, 1988) hence it was observed in this study that rats in Group 2 placed on topical treatment with latex of *Carica papaya* L had their lacerations contracted and closed within 4 days while those in the control group receiving topical application of normal saline on their wound had the lacerations closed in 10 days.

The increase in platelet count in the test rats was more than that of those in control group (Table 2), is advantageous to wound healing. Platelets are vital in some biochemical reactions particularly haemostasis where they are involved in formation of platelet plugs aimed at closing any ruptured blood vessel to prevent undue haemorrhage. When any blood vessel is ruptured, the sub-endothelium and collagen are exposed and this stimulates the platelets to undergo viscous metamorphosis, which culminate in aggregation, adhesion and secretion. The biochemical reaction is further propagated by agonist like ADP, adrenaline, serotonin, prostaglandins and some other vasoactive substance (Kroll,1998). Calcium is one of the important cations necessary for many biochemical reactions of haemostasis. It occurs in many animal and plant tissues which serve as dietary sources. The ionic form of calcium (Ca^{2+}) is involved in clotting mechanism, bone formation, muscle contraction, enzyme and complement activation (Ureme et al, 2002).

The observed significant ($p < 0.05$) increase in the total bilirubin concentration, conjugated bilirubin implies that the albumin, globulin and total protein increased as well. Thus this implies that the latex produced an increase in protein synthesis and mobilization.

Significant increase in the serum level of both total bilirubin and conjugated bilirubin is an indication that the drug might induce injury to the hepatic tissue or cause conjugated hepatobiliary injury in the albino wistar rats. Serum alanin amino transferase (ALT) and alkaline phosphatase are known to increase when there is liver disease and they have been used as tool for measuring hepatic necrosis (Bush, 1991). Hence the observed increase in serum SGOT and alkaline phosphatase suggest that the latex may not be safe to the hepatic tissue if used orally or injected. It is therefore concluded that *Carica papaya* latex is very effective externally in managing wound lacerations and abrasions due to its presence of calcium and crude protein content.

REFERENCES

- Araivid G, Debjit Bhowmik, Duraivel S, Harish G (2013). Traditional and Medicinal uses of *Carica papaya*. Journal of Medical Plants Studies Year 2013. Vol. 1 Issue 1. www.plantsjournals.com.
- Arthur C.G (2014). Haemostasis and blood coagulation. Textbook of Medical Physiology pp 79-80. Pub W>B Saunders company. Philadelphia, London Toronto.
- Baker F.J (1985). Investigation for haemostatic abnormalities. Investigation to medical Laboratory Technology Butterworths Publication, Woburn London p 348.
- Beckstrom S, Stephen M, James A, Wain K.K, (1994). The ethno-botany Database [http://11probe.Nalusada.Gov8300kg:bin//browse/ethnobotdb\(ACEDB Version.3dataversion\)](http://11probe.Nalusada.Gov8300kg:bin//browse/ethnobotdb(ACEDB Version.3dataversion)).
- Brecher L and Cronkite M (1950). Platelet count. In Dacie J.V ed. Basic Haematological Techniques. Practical haematology 6th Edition. Churchill Livingstone Melbourne p43.
- Bush B.M (1991). Interpretation of Laboratory results for small animal clinicians. Oxford, Blackell Scientific publication. P25-34.
- Clark R.A.F (1996) ed. The molecular and cellular biology of wound repair 2nd edition, New York Plenum press.
- Dejana E, VILLA S, De GACIANO G (1982). Bleeding time in rats. A comparison of different experimental conditions. Thromb. Haemostat 48: 108-111.
- Furie B and Furie B.C (1988). The molecular base of blood coagulation. Cell, 53:505-518
- Iwu M (1982). African ethno-medicine seminars delivered at institute of Medical Research Yaba Lagos Nigeria P1.
- Jean. S. Macalood, Helen J. Vincente, Ranao D, Boniano, Jessie G. Gorospe, Einor C. Roa (2013). Chemical analysis of *Carica papaya* L, crude latex. American Journal of plant sciences pp 1941-1948.
- Kroll M.H (1998). Biochemical basis of platelet activation. Blood 74:1181-1195.
- Lee L and White W (1985). Investigation for haemostatic abnormalities. Introduction to Med. Lab Technology, 6th edition Butterworth Publication Woburn p 346.
- Lorke D, (1985). A new approval to Practical Acute Toxicity Testing. Arch Toxicol 54: 275-278.
- National Research Council, WRC (US) Committee On Guidelines For The Use Of Animals In Neuroscience And Behavioral Research (2003). Guideline for the care and use of Mammals in Neuroscience and Behavioral Research Washington D.C: National Academic Press (US): A sample size Determination Available from: <http://www.nchi.nlm.nih.gov/book/NBK43321/>.
- Okoli C.O, Akah P.A, Okoli A.S (2007). Potentials of leaves of *Aspillia Africa* (compositae) in wound care. An experimental evaluation B.M.C complement. Allern Med. 2007:7:24.
- Spaet T.H (1964). Mechanism of platelet plug formation and role of adenosine diphosphate. AM. J. Physiol. 206:1267.

- Spaet T.H (1966). Studies on the mechanism hereby platelets are clumped by adenosine diphosphate. *Thromb. Diath. Haemorrh.* 15:36.
- Taofeeg O, Oyeniyi M.A, Tesleem A.O (2005). Mechanism of actions of *Jatropha gossypifolia* stem latex as a hamostatic agent. *European journal o General Medicine* 2(4): 14-145.
- Ureme S.O, Ezimah A.C.U, Akwu C.I (2002). The relationship of clot retraction platelet count and serum calcium concentrations in apparently healthy adolescents in Enugu metropolis. *Journal of life an Environmental Science.* Vol.4. No.2 p251-254.
- Quicks W (1985). Basic hematological techniques; In: *Practical haematology*, 6th Edition Churchill Livingstone Edinburgh London Melbounre p 43.
- Russel B.A, Hardin J.N, Grand L, Traser A (1997). Poissonous plants of North Carolina, *Caesalpinasp* (Pride of Barbados). Department of Horticulture Science North Caroline state University. <http://www.ces.nessy.edu/dept>.

Cite this Article: Oguwike FN, Nwafia WC, Nwozor CM, and Okeke JC (2017). Effect of Pawpaw (*Carica papaya*) Latex on the Haemostatic Mechanism and Biochemical Profile of Male Albino Wistar Rats. *Greener Journal of Medical Sciences*, 7(1): 005-011, <http://doi.org/10.15580/GJMS.2017.1.020617015>