*CIBTech Journal of Pharmaceutical Sciences ISSN: 2319–3891 (Online)*
*An Open Access, Online International Journal Available at http://www.cibtech.org/cjps.htm*
*2018 Vol.7 (3) July-September, pp.9-12/Okwari et al.*
***Research Article***

# HEPATO-PROTECTIVE EFFECT OF EXTRACT *JATHROPHA TANGORENSIS* ON MALE AND FEMALE WISTAR RATS

**Okwari O. O[1]., *Dasofunjo K.[2] and David M. E[1].**
[1]*Department of Human Physiology, Faculty of Basic Medical Sciences, Okuku Campus, Cross River University of Technology. Cross River State, Nigeria.*
[*2]*Department of Medical Biochemistry, Faculty of Basic Medical, Sciences, Okuku Campus, Cross River University of Technology, Cross River state, Nigeria.*
**Author for Correspondence:dasokay22@gmail.com*

## ABSTRACT
*Jatropha tangorensis* family, *Euphorbiaceae* is commonly called "hospital too far" due to its use in treating many disease conditions in local communities. 100mg/kg body weight of aqueous extract of plant was administered to 12 rats (6males, 6females) test while other 12 male and female served as control. The extract was given orogastrically for 28 days. Blood samples were collected through cardiac puncture into centrifuge tubes; serum was separated for analysis of total protein, total bilirubin and alkaline phosphatase. The result showed significant ($P<0.05$) decrease in total protein in the male test group compared with control. Albumin levels had significant ($P<0.05$) increase in female test group compared with control. Globulin levels show a significant ($P<0.05$) decrease in male and female test groups compared with control group. There was a significant decrease in the concentration of total bilirubin in male test group and significant ($P<0.05$) increase in female test group when compared to the control. This trend occurred in the concentrations of conjugated and unconjugated bilirubin in both the male and female test groups compared with control. Alkaline phosphatase concentration also produced a significant decrease in male test group. The spectrum of alterations from these results suggests that the extract possess hepato-protective effect.

***Keywords:*** *Jatropha tanjorensis, Protein, Bilirubin, Alkaline Phosphatase, Liver*

## INTRODUCTION
Medicinal plants are sources of many important scientific drugs of our modern world (Oduola *et al.,* 2007). The increased laboratory evaluation of their bioactivity provide valuable guide to those using them. *Jatropha tanjorensis*, family *Euphorbiaceae*, is native to Central America has been found in tropical and sub-tropical countries (Parabakran and Sujatha, 1999). It is commonly known as hospital too far (Iwalewa *et al*., 2005). Different parts of the plant have been found to be useful in the treatment of fever, eczema, itches, visceral diseases, stomach and sores on the tongue of babies (Taofeeq *et al*., 2005), anaemia, diabetes and cardiovascular disease (Iwalewa *et al.,* 2005;Olayiwola *et al.,* 2004). It is reported that aqueous leaf extract of *J .tanjorensis* exhibit antibacterial activity against *Staphylococcus aureus and Escherichia coli,* improved haematological indices in the rabbit (Macdonald *et al.,* 2014)
In vitro and in vivo antioxidant potentials of methanol leaf extract of *J tanjorensis* has been reported by Madubuike *et al*.,(2015), while Osuchukwu *et al*., (2015) showed that leaf extract enhance spermatogenesis when consumed in a short period of time. Recent claims have it that the plant is unsafe for use that it could be toxic to organs of the body (Oluwole *et al*., 2012). The aim of this study is to evaluate the effect of leaf extract of *J. tanjorensis* on some biochemical parameters in the rat.

## MATERIALS AND METHODS
### *Preparation of plant extract*
One and half grams of sun dried leaf powdered extract of *J. tenjorensis* were dissolved 25ml of deionized water and left to stand for 16h in a container. Thereafter , it was filtered with Whatman No 1 Filter Paper

and the filtrate was evaporated to a constant weight in an aerated oven at $45^{O}C$ and stored in capped sample bottles placed in a desiccator until used .

***Design of Experiment***

Male and female Wistar rats weighing 220-250g were obtained from the Animal House of the Department of Physiology, Faculty of Basic Medical Science, Cross River University of Technology, Cross River State, Nigeria. Animals were divided into four groups of 6 rats each: male and female control groups as well as male and female test groups. They were kept in cage separately in the Animal House at room temperature $28.0\pm4^{0}C$ and 60% relative humidity with 12 light/dark cycles. All animals had food and water *ad libitum* while test animals received 100mg/kg body weight of rat for 28days. Good hygiene was maintained by constant cleaning and removal of faeces and spilled feed from the cages daily.

***Collection of Blood***

The animals were anaesthetized sacrificed and blood was withdrawn from the heart into centrifuge tubes and allowed to stand for one hour then centrifuged and serum was collected for the analysis of total protein, bilirubin and alkaline phosphatase.

***Analysis***

The serum samples were analysed for total protein albumin, globulin, bilirubin, conjugated, unconjugated bilirubin and alkaline phosphatase in the Department of Chemical Pathology Laboratory, University of Calabar Teaching Hospital, Calabar, using standard procedures.

***Statistical Analysis***

Data were expressed as mean ± SEM. The significant differences between means were evaluated using the student's t-test and analysis of variance (ANOVA). P values of less than 0.05 were considered statistically significant.

## RESULTS

The result of total protein concentration, albumin and globulin levels of male and female control and test groups. It was observe that the total protein concentration in male test group was significant lower ($P<0.001$) Compared with control group, but there was no significant difference in both male control and test group, but there was significant increase ($p<0.001$) in female test group compared to the control (Table 1).

The result of the globulin level of the male test show a significant decrease ($p<0.001$) compared with the control group. That of the female test showed a significant decrease ($p<0.01$) compared with the control group (Table 1).

It was observed that the total bilirubin concentration in male test was significantly decreased ($p<0.001$) compared with the control, also the female test was significantly increased ($p<0.001$) compared to the control (Table 2).

Conjugated bilirubin concentration in the male test showed a significant decrease ($p<0.001$) compared with the control group, also the female test was significantly increased ($p<0.05$) compared with the control. It was also observed that the unconjugated bilirubin concentration of male test was significantly decreased ($p<0.001$) compared with the control group, also the female test was significantly increased ($p<0.001$) compared with the control(Table 2).

It was observed that the alkaline phosphate concentration in the male test group was significantly decreased ($p<0.001$) compared with the control group. It was also observed that the was no significant difference in both female, control and the test groups.

**Table 1: Effect of aqueous extract of *Jatropha tanjorensis* on some biochemical parameters in rats**

| PARAMETER | MC | MT | FC | FT |
|---|---|---|---|---|
| **Total protein(g/l)** | $50.00\pm0.71^{acd}$ | $44.20\pm0.66^{bd}$ | $40.40\pm0.81^{ab}$ | $42.20\pm0.66^{c}$ |
| **Albumin(g/l)** | $34.00\pm0.55^{g}$ | $34.40\pm0.51^{f}$ | $28.80\pm0.37^{fgh}$ | $33.00\pm0.84^{h}$ |
| **Glubulin(g/l)** | $16.40\pm0.25^{ikm}$ | $9.80\pm0.490^{kl}$ | $11.40\pm0.510^{jlm}$ | $9.20\pm0.20^{ij}$ |
| **Total bilirubin (umol/l)** | $28.68\pm0.90^{aeg}$ | $11.74\pm0.34^{abd}$ | $13.96\pm0.54d^{ef}$ | $18.74\pm0.11^{bfg}$ |
| **Conj. Bilirubin (umol/l)** | $15.46\pm0.51^{hjkm}$ | $7.56\pm0.77^{hij}$ | $8.52\pm0.66^{kl}$ | $9.46\pm0.59^{ijlm}$ |
| **Unconj. Bilirubin (umol/l)** | $13.22\pm0.76^{nqs}$ | $4.18\pm0.02^{nop}$ | $5.44\pm0.25^{pqr}$ | $9.28\pm0.22^{ors}$ |
| **ALP(iu/l)** | $197.0\pm1.34^{de}$ | $119.8\pm1.77^{abc}$ | $114.6\pm1.33^{acd}$ | $113.6\pm0.69^{be}$ |

*Values are presented as mean ±SEM Similar superscript denotes significant difference at P< 0.05 n=6.*

## DISCUSSION

The study was aimed at evaluating the effect of *J. tangorensis* on some biochemical parameters of male and female Wistar rats. Test groups received 100mg/kg body weight for 28days. The result of the study showed that serum total protein in male test group had significant while there was no significant difference in the female test group. Previous reports on the mineral content of the plant showed that *J. tangorensis* leaves has low protein (Madamba *et al.*, 2006; Oboh and Masode, 2009). There was significant increase in albumin in female test while there was no significant difference amongst the male test compared with control. This may be a physiological response but not clearly understood. The increase in albumin content observed in the female test group suggests that there might have been synthesis of albumin in the female test group. There is a close relationship between the function of certain organs in the body and nutrient balance and imbalance both positive and negative. Liver function might be affected if there is insufficient protein and within normal limit become critical to the adequate processing of ingested protein or fats and the packaging/storage of certain vitamins and minerals (Bishop *et al.,* 2014). Albumin concentration in the body is influenced by albumin synthesis and degradation distribution; low level reflects low hepatic production or loss from transfer of albumin between extravascular and vascular compartments (Bishop *et al.*,2014).

Globulins perform enzymatic functions in the plasma and principally responsible for both the natural and acquired immunity against invading organisms (Guyton and Hall, 2000). The significant decrease in globulin level of male and female test rats suggest that the plant may supress the immune system, thereby suppressing the defence mechanism of the body and may hinder the transport of certain vital biological substance in the blood. This decrease may be due to severe malnutrition since the plant is reported to have low protein content (Madamba *et al*, 2006).

The results obtained after the administration of the extract shows that there was a significant decrease in the concentration of total bilirubin in male test group and a significant increase in female test group when compared to the control. Increase in bilirubin concentration suggests that there was mass break down of heamoglobin in the female group. Large amount of bilirubin in the plasma may result in jaundice. Red blood cells are also lysed by drugs and infections. The susceptibility of red cell to haemolyse may be due to their physiologic differences with the male group (Ganong ,2005). This result may also be that either the extract dose (100mg/kg) was rather large for the female group, although this same dose had no effect

on the male. It followed that the male group had decreased level of conjugated and unconjugated bilirubin. Whether the plant has potential agents to facilitate red cells breakdown in the female has to be proven in other research work.

Alkakine phosphatase serves as marker of extra hepatic biliary obstruction in the common bile duct or intrahepatic cholestasis such as drug cholestasis or primary biliary cirrhosis (Green and Flamm, 2002; AGA, 2002). The result showed that the enzyme concentration in the male test group was significantly decrease compared with the control. This suggests that the plant has hepato-protective activity.

## CONCLUSION

The spectrum of alterations from this result suggests that the extract possess hepato-protective effect.

## REFERENCES

**Bishop, ML, Fody, PF, Schoeff (2014).** Clinical Chemistry: Techniques, Principles, Correlations. 6th ed Lippincott Williams & Wilkins. London.

**Green RM and Flamm S (2002)**. AGA technical review on evaluation of liver chemistry tests. *Gastroenterology* **123** 1367- 1384

**Iwalewa EO, Adewumi CO, Omisere NO, Adebanji and Azike CK (2005).** Proantioxidant effect and cytoprotective potentials of nine edible vegetables in Southwest. *Nigerian Journal of Medicine and Food* 8 539-544.

**MacDonald I, Goddidit I and Joseph E (2014).** Anti-anemic activity of *Jatropha tanjorensis*, Ellis and Saroja in rabbit. *Journal of Medicinal Plants Studies* 2 64-72

**MadambaR, Grubben GJH, Asante IK and Akromah R (2006).** Vigna nuguiclata (L.) Walp.In Plant Resources of Tropical Africa 1 Cereal and Pulses, Brink, N and G. Belay (Eds). PROTA Foundation/BackhuysPublishers/CTA Wageningen, Netherlands, ISBN: 90-5782-170-2,221-229.

**Madubike PC, Ezigbo IJ, Ekpe IO and Onukwube SI (2015).** Evaluation of the Quality and Level of Adulteration of Palm oil obtained from different locations in Enugu Metropolis, Nigeria. International Journal of Multidisciplinary Sciences and Engineering **6**(6) 23-26.

**Oduola, T, Adeniyi, FFA, Ogunyemi, EO, Bello, IS, Idowu, TO, Subair, HG (2007).** Toxicity study on an unripe *Carica papaya* acqueous extract: biochemical and haematological effects in wistar rats. *Journal of Medical Plant Resource* 1 001-004

**Olayiwola G, Iwalea EO, Omobuwajo OR, Adeniyi AA and Verspohi EJ (2004).** The anti-diabetic potential of *Jatropha tanjorensis* leaves. *Nigerian Journal of Natural Product Medicine* **8** 55-58.

**Oluwole I, Oyewole OT, Oladipupo and Bukola VA (2012).** Assessment of renal and hepatic functions in rats administered methanolic leaf extract of *Jatropha tanjorensis*, *Annals of Biological Research* **3**(2) 837-841.

**Osuchukwu IW, Sakpa CL, Ekezie J, Okeke CU, Eke CC and Ezeindu DN (2016).** Effect of leaf extract of Jatropha tanjorensis on testis of wistar rats. *Journal of Dental and Medical Sciences* 2279 66-71.

**Oyewole IO, Akingbala FP (2011).** Phytochemical Analysis and Hyplipidemic Properties of *Jatropha tanjorensis* Leaf Extract. *European Journal of Medical Plants* **1**(4) 180-185.

**Prabakaran AJ, Sujatha, M (1999).** *Jatropha tanjorensis* Ellis and Saroja, a natural interspecific hybrid occurring in Tail Nadu, India. General Research in Crops **46** 213-217.

**Taofeeq O, Ganiyu OA, Tesleem AO, Godwin OA, Mutiyat AO (2005).** Mechanisms of action of *Jatropha gossypifolia* stem latex as a haemostatic agent, *European Journal General Medicine* **2**(4)140-143