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Histological Impact of *Moringa olifera* on the Kidney of Adult Wistar Rats

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Abstract: Medicinal plants constitute an important source of potential therapeutic agents. Moringa oleifera is one of the well growing and farming plants all over the world which serve as a medicinal plant for many diseases and serve as a nutritional plant. *Aim & Objectives*: Demonstrating the exact quantity of *Moringa Olifera* (MO) that will cure any hepatocyte diseases and the one that can harm the hepatocytes of Adult wistar rats. *Material and Methods*: Twenty (20) adult wistar rats (both sex) were used for the study (caged based on same sex to avoid mating and pregnancy) and were randomly assigned equally into four groups received 0mg/BW (Control), 250mg/BW, 500mg/BW and 750mg/BW of MO orally for 3 weeks. *Result*: The crude aqueous extract of MO Lam showed insignificant increased in body weight at the first week of administration which latter dropped (P<0.05) compared to the control group. The Kidneys showed a significant difference in weight between the Kidneys (left and right kidneys) in relation to the control group rats. Moringa oleifera (MO) increased the weight of the animals morphologically by comparing the weight of the animals before and after administration. Histological sections showed a normal Glomerulli, Peri-Glomerular Space, Convoluted Tubules and Interstitium, after administration of the Crude Aqueous Extract of MO lame in terms with the control group rats. *Conclusion*: Moringa oleifera is a good herb that has no damaging effect on the body and hepatocytes and is more beneficial.

Key words: Crude Aqueous Extract · Moringa Oleifera Leaves · And Hepatocytes

INTRODUCTION

Herbal toxicity has been reported on some herbs used for curing of different ailment, one of the occurrences of toxicity involving Chinese herbs between 1991 and 1992 in Belgium, in which young woman were admitted to hospitals due to renal failure [1]. The moringa tree is native to the southern foothills of the Himalayas, Africa and the Middle East. The root contains an active antibiotic principle, pterygo-spermin. The root bark contains two alkaloids viz. moringine and moringinine [2]. Indian ancient traditional medicine called it ayurveda says the leaves of the Moringa tree prevent 300 diseases. Modern science has confirmed that these leaves could help prevent untold suffering and death caused by malnutrition and related diseases [2, 3]. *Moringa oleifera* have various ability to cure different diseases in which diabetes is not an exception [4].

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The kidneys been adark-red, bean-shaped organs with one side of the kidney bulges convex and the other side is concave. There is a cavity attached to the concave side of the kidney, called the Renal Pelvis, which extends into the ureter. Kidney is enclosed in the renal capsule, which helps to protect them against infections and trauma. It is divided into two main areas, a light outer area called the renal cortex and a darker inner area called the renal medulla. The renal artery delivers blood to the kidneys each day. Over 180 liters (50 gallons) of blood pass through the kidneys every day. When this blood enters the kidneys it is filtered and returned to the heart via the renal vein [5].

Pharmaceutical drugs are designed to elicit specific reactions. Their associated side effects are undesired actions, usually traded as a "risk" against the "benefit" of the primary effect. Herbs trend to have several broad actions on a number of whole physiological systems. These actions are usually oriented in the same general therapeutic direction and are usually complementary or synergistic, often non-specific and very rarely adverse. Herb actions cannot be adequately described using the vocabulary of "drug", e.g. diuretic etc. they are too complex. The clearest example of this is the coining of the term "adaptogenic" used to describe the multiple non-specific effects of herbs such as Ginseng [6]. Tis study aimed to investigate the effect of aquous extract of moringa olivera on the kidney and liver histo-pathology to reveal the histo-architectural effect of leaves extract of *Moringa oleifera*

MATERIALS AND METHODS

The ethical committee of the Ladoke Akintola University of Technology, Ogbomoso, Nigeria, approved the commencement of the research (LAUTRC: 10345). Twenty (20) adult wistar rats ((both sex) were caged based on same sex to avoid mating and pregnancy) with average weight of 110g were randomly assigned into four equal groups (n=5). Animal in the control group received 0mg/kgBW while animals in group te other three groups served as treated groups at different dosage (B=250mg/BW, C=500mg/BW and D=750mg/BW) of the extract of MO orally. The rats were obtained and maintained in the Animal Holding of the Faculty of Basic Medical Science, Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria. The animals were fed with grower's mash obtained from Bovajah Nig. Enterprises in Oke-Ado Area Ogbomoso, Oyo State, Nigeria.

Freshly plucked MO leaves were collected from moringa tree around Tippa garage area, Tanke, Ilorin, Kwara State, Nigeria and were taken to the Botany section in the Pure and Apply Biology Department, Ladoke Akintola University of Technology, Ogbomoso for verification, identification and authentication; and were latter dried at a room temperature (25°C) and grounded to powder, which was then taken to Laboratory of Food Science, Ladoke Akintola University of Technology, Ogbomoso for Crude aqueous Extraction and was then moved to the site of the experimentation. Extraction process as carried out using the method described elsewhere [7-9].

The whole experiment lasted for three weeks (21 days) after which the animals were fasted overnight and were sacrificed by cervical dislocation and both kidney (Right and Left) were harvested and processed with Haematoxylin and Eosin (H & E) according to (Drury 1967).

Please Add the Statistical Analysis: Data are presented as mean± S.E.M. Simple one-Way ANOVA was used to study the effect of treatment on the body weight and kidney weight. Duncan's Multiple Range test was used to differentiate between significant means. P- Value at 5% is considered the level of significance.

The BW of male rats is usually higer than females So you have to determine the kidney relative body weight by dividing the kidney weigt on the body weight.

Regarding the body weight because you used both sexes you have to determine the BW before the study (initial BW) and the BW at the end of the study (Final BW) and to determine the % of increasease in the body weight by determining the difference (Final BW-Initial BW)/Initial BW*100.

RESULTS

Table 1: Mean Weight of the Animals in each Groups Data; at 5% level of significance, the data suggest that the mean weight of the rats does not differ significantly from each other

Groups	Mean ± S.E.M	P-Value
A	161.67 ± 3.663	0.0000
A-B	174.87 ± 4.935	0.0982
A-C	184.17 ± 10.64	0.1162
A-D	182.50 ± 10.00	0.1221
B-C	184.17 ± 10.64	0.4722
B-D	182.50 ± 10.00	0.5312
C-D	182.50 ± 10.00	0.9146

Table 2: Mean Weight of the Organ (Kidney) Data; since p-value (0.00) <0.05, at 5% level of significance, It's concluded that there is a significant difference between the left and right kidney after sacrificed

Groups	Mean ± S.E.M	P-Value
A	0.5875 ± 0.042500	0.0000
A-B	0.5988 ± 0.006250	0.8179
A-C	0.5413 ± 0.003750	0.3916
A-D	0.5138 ± 0.018750	0.2533

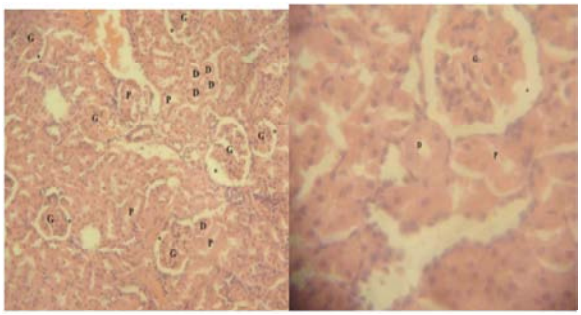

Fig. 1: Group A Control Rats Photomicrograph of a Kidney Section Showing normal Histology of glomeruli (G), Distal (D) and Proximal (P) Convoluted Tubules, Interstitium and Peri-Glomerular Space (*). (H & E Method X100 and X400 respectively)

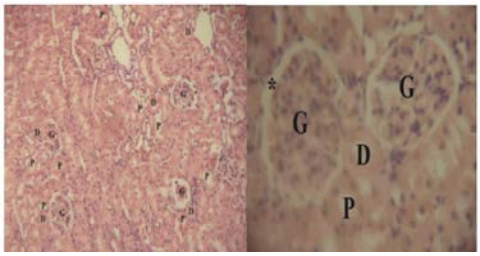

Fig. 2: Group B tested rats section of a Kidney revealing normal Histology of Glomeruli (G), Distal (D) and Proximal (P) Convoluted Tubules and Glomerular Space (*).(H & E Stain X100 and X400 respectively)

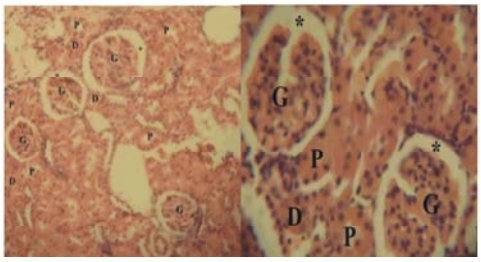

Fig. 3: Group C treated Ratssection of a KidneyShowing Normal Histology of glomeruli (G), Distal (D) and Proximal (P) Convoluted Tubules and Glomerular Space (*). (H & E method Stain of X100 and X400 respectively)

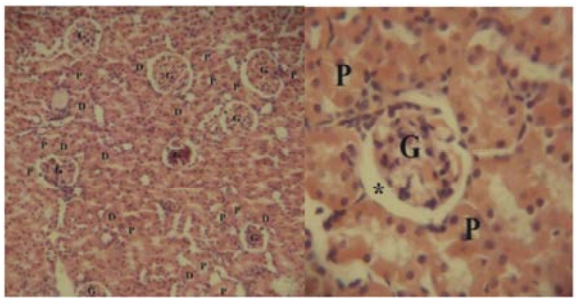

Fig. 4: Group D treated RatsPhotomicrograph of a Kidney Section Showing Normal Histology of Glomeruli (G), Distal (D) and Proximal (P) Convoluted Tubules, Interstitium and Peri-Glomerular Space (*).(H & E method Stain of X100 and X400 respectively)

DISCUSSION

Moringa oleifera increase the weight of the animals morphologically by comparing the weight of the animals before administrating with after administration but at 5% level of significance, the data suggest that the mean weight of the rats does not differ significantly, likewise between the left and right kidneys after sacrificing the rats. The rats in the treated group appeared active and well nourished and the male treated group showed hyper-activeness in sexual acts in all groups except in control group.

The photomicrographs of the Control group A showed normal glomeruli, normal distal and proximal convoluted tubules. These are keeping in line with normal Kidney histological findings. The photomicrograph (Figure 2-4) of the histology of the Kidney of the treated groups (B, C and D) also showed normal glomeruli, distal and proximal convoluted tubules are also within normal limit. There are similarities in the histological findings in these groups at different dosage and that of control analysed. But when considering the weights of the animals, the bar charts show insignificant based on the P-value and the mean ± S.E.M.

CONCLUSION AND RECOMMENDATION

Moringa oleifera is a good herb that have no damage effect to body and kidney but of more beneficial effect, the finding of this experiment indicate that both low and high dosage consumption of Moringa Oleifera have more beneficial effect to body and kidney and it of no damage effect to body and kidney.Therefore further studies are recommended to support the above findings.

Serum, creatinine and urea, electrolyte levels could be done for further elucidation of effects of the extracts on the kidney. Also creatinine and urea clearance could be done. The above are necessary before any conclusion could be made on the above findings because there might have been derangement of biochemical data before it could be noticed morphologically.

REFERENCES

1. Jean-louis Vanherweghem, 1998. Misuse of herbal remedies: the case of an outbreak of terminal renal failure in belgium (chinese herbs nephropathy). the Journal of Alternative and Complementary Medicine, 4(1): 9-13
2. Paul ChikwuogwoWokpeogu and Didia C. Blessing, 2012. The Effect of Methanolic Extract of Moringa oleifera Lam Roots on the Histology of Kidney and Liver of Guinea Pigs. Asian Journal of Medical Sciences, 4(1): 55-60, ISSN: 2040-8773.
3. Fahey W. Jed, 2005. Moringa oleifera: A Review of the Medical Evidence for Its Nutritional, Therapeutic and Prophylactic Properties. Part 1. Trees for Life Journal, a Forum on Beneficial Trees and Plants.
4. National Academy of Clinical Biochemistry Laboratory Medicine practice guidelines: Clinical utilization of cardiac biomarker testing in heart failure. Circulation, 2007. Jul 31; 116(5): e99-109. Epub 2007 Jul 14.
5. Clinical Oriented Anatomy, 2006. By Keith l. More, Arthur F. Dalley and Anne M.R. Agur, Lippincott Williams and Wilkins, Fifth Edition.
6. Fabricant, D.S. and N.R. Farnsworth, 2001. The value of plants used in traditional medicine for drug discovery. Environ Health Perspect, 109(Suppl 1); PMC1240543.
7. Harborne, J.B., 1972. Methods of Plant Analysis. Phytochemical Methods, pp: 1-32.
8. Uhegbu Friday, Onwuchekwa C. Chioma, Iweala Emeka and I. Kanu, 2005. Effect of Processing Methods on Nutritive and Antinutritive Properties of Seeds of Brachystegiaeurycoma and Detariummicrocarpum from Nigeria. Pakistan Journal of Nutrition, 8(4) DOI: 10.3923/pjn.2009.316.320.
9. Nwinuka M. Nwibani, Monanu O. Michael and Nwiloh Barine, 2008. Effects of Aqueous Extract of Mangiferaindica L. (Mango) Stem Bark on Haematological Parameters of Normal Albino Rats. Pakistan Journal of Nutrition, 7(5) DOI:10.3923/pjn.2008.663.666.
10. Drury, 1967. Carleton's histological technique. Ulster Med. J., 36(2); Summer 1967. PMC2385117.