

HISTOPATHOLOGICAL CHANGES IN LIVER OF BROILER FINISHER CHICKEN ADMINISTERED DIFFERENT LEVELS OF *Jatropha gossypifolia* AQUEOUS LEAF EXTRACT AND HONEY

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Abstract

This study assessed the histopathological changes observed in Liver sections of broiler finisher chicken administered different levels of *Jatropha gossypifolia* Aqueous Leaf Extract (JGALE) and honey. Seventy five (75) 4 weeks old broiler chicken were allotted into five treatments T_1 , T_2 , T_3 , T_4 and T_5 of fifteen (15) birds per treatment; each treatment was replicated three times. T_1 served as control and was given only water; T_2 , T_3 , T_4 and T_5 received 10mls JGALE, 10mls JGALE with 1ml honey, 20mls JGALE and 20mls JGALE with 1ml honey respectively. The results showed discernable pathological changes in the liver of the broiler chicken observed in Treatments 2 and 3 while Treatments 1, 4 and 5 revealed no visible lesions in the study of the liver. It was concluded that the use of 20ml of JGALE with or without 1ml of honey had no visible adverse effect on the liver and can be administered to broiler chickens to prevent liver abnormalities.

Keywords: Histopathological changes, *Jatropha gossypifolia*, Liver, Broiler chickens, Honey

Introduction

Livestock farming is an age long venture and from time immemorial, men have become great either by their riches from livestock farming or from the number of various species of animals they had (Thornton, 2010). There are a number of factors, which affect the productivity and profitability of animals and in general, livestock farming. These among others include feed, management, breed, disease and marketing. Diseases and parasitic infestation cause great losses in livestock production and management. Effective curative practice can alleviate the effect of specific diseases and parasitic infestation which are usually treated with traditional remedies as an alternative to expensive conventional drugs (Lebajoa, 2001).

Jatropha gossypifolia L. is a small shrub with dark green or more frequently purplish-red dark leaves with 16-19cm in length and 10-12.9cm in width. Several human and veterinary uses in traditional medicinal are described for different parts (leaves, stems, root, seeds and latex) and preparation (infusion, decoction and maceration among others) based on this plant by different routes (oral or topical). The most frequent report concern is its hypertensive, anti-inflammatory, healing action, antidiabetics, antidiarrheal, antianalgesic and antiheamorrhagic activities among others,

(Bhagat *et al.*, 2011).

The medicinal use of honey is probably the most widely known, but such uses does not require special preparation. If not used directly, it is mixed domestically with other liquid such as hot milk, teas or other infusions, wine and other alcoholic beverages. The pharmacopoeisis of many countries describe a honey- based preparation, which can be prepared by pharmacists (honey rose water), which is use for topical application in infected threats and ulcers of the mouth (Kandi *et al.*, 1989).

Materials and Methods

Seventy- five unsexed 4 weeks old Abor Acre broiler chicken were used for this study. The chickens were housed at the National Cereals Research Institute Staff quarters (NCRI) Apata Ibadan. The birds were randomly allotted into five (5) dietary treatments of 15 birds which were further divided into three replicates of 5 birds each. The chickens were managed on a deep litter system in pens. The pens were cleaned, disinfected and provided wood shavings as litter material. Feed ingredients were purchased from Sheba feed mills Odo-ona Ibadan, these were used to formulate the basal diet to meet the nutrient requirement of broiler finishers. Table 1 shows the gross composition of the basal diet.

Table 1: Gross Composition of the Basal Diet

Ingredients	Percentage (%)
Maize	55.00
Soya bean meal	30.00
Ground nut cake	3.80
Fish meal (72%)	1.00
Wheat bran	5.00
Bone meal	2.50
Limestone	2.00
Salt	0.25
Premix (broiler)	0.25
Lysine	0.10
Methionine	0.10
Total	100.00
Calculated Analysis	
Crude protein (%)	21.36
ME (kcal/kg)	2921.12

Jatropha gossypifolia leaves were plucked from the plant at the premises of NCRI quarters Ibadan. The fresh leaves were collected very early in the morning and crushed. The crushed leaves were placed in a clean sieve squeezed to get its extract and this was done on a daily basis throughout the period of the experiment. The honey used was purchased at Oke-Ado market, Ibadan.

Experimental treatments were tagged T₁, T₂, T₃, T₄ and T₅, in which treatment one (T₁) served as the control (water only), treatment two (T₂) 10 mls of *Jatropha gossypifolia* leaf extracts added to one litre of water, treatment three (T₃) 10 mls of *Jatropha gossypifolia* leaf extracts with 1ml of honey added to one litre of water, treatment four (T₄) 20 mls of *Jatropha gossypifolia* leaf extracts added to 1 litre of water and treatment five (T₅) 20 mls of *Jatropha gossypifolia* leaf extracts with 1 ml of honey added to 1 litre of water.

At the end of the experiment, two birds were randomly selected from each replicates in each treatment. The birds were slaughtered by severing the jugular vein, defeathered and eviscerated. The liver from the birds were collected and placed in sample bottles, 10% formalin was added to prevent tissue degeneration. The sample bottles were labeled accordingly to avoid confusion.

Histopathological analysis was carried out using Masson's trichrome with Hematoxylin Eosin and Saffron (HES) stain on the liver to examine the general organs morphology. The tissues were examined in a Tecna G2 Brotwin (FER) electron

microscope using an accelerated voltage of 100kv. Magnification of Liver section was at 400X.

Results and Discussion

The microscopic section of the liver of broiler finisher birds showed that birds on T₂ administered with 10mls of *J. gossypifolia* aqueous leaf extract (fig. 2) and T₃, administered 10mls of *J. gossypifolia* aqueous leaf extract with 1ml of honey (fig 3) showed widespread vacuolar change of hepatocytes, and marked congestion of hepatic sinusoids and central veins. This could be due to disruption of fat metabolism in addition to an increased formation of lipoprotein that is converted into triglycerides which in turn infiltrated in the liver causing cytoplasmic vacuolation. While no visible lesions were observed in liver sections of birds in T₄ (administered 20mls of *J. gossypifolia* aqueous extract) and T₅ (administered 20mls of *J. gossypifolia* and 1ml of honey. This indicated that at higher level of *J. gossypifolia*, there was no visible effect on the liver; this is in agreement with Panda *et al.*, 2009. They studied the hepatoprotective activity of *J. gossypifolia* against carbon tetrachloride induced hepatic injury rats. The authors observed a close relationship between the hepatoprotective action observed and the possible antioxidant mechanism present in the extracts.

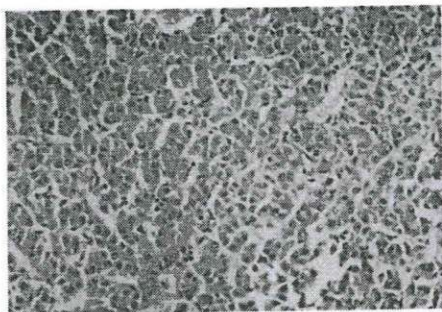


Figure 1. Microphotograph of liver section of broiler finisher birds in Treatment 1 (Control) showed no visible lesions

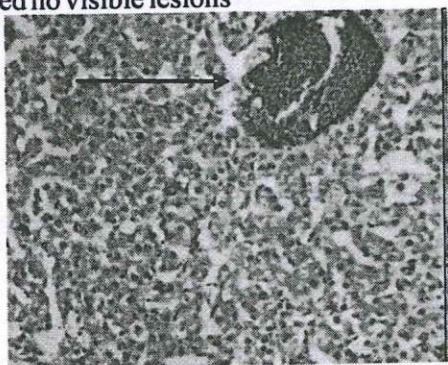


Figure 2. Microphotograph of liver section of broiler birds in Treatment 2 (administered 10mls of *J. gossypifolia* leaf extract) showed marked congestion of sinusoids and central veins

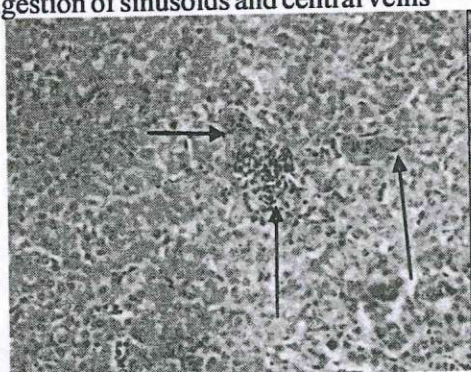


Figure 3. Microphotograph of liver section of broiler finisher birds in Treatment 3 (administered 10mls of *J. gossypifolia* leaf extract with 1ml of honey) showed widespread moderate vacuolar changes of hepatocytes

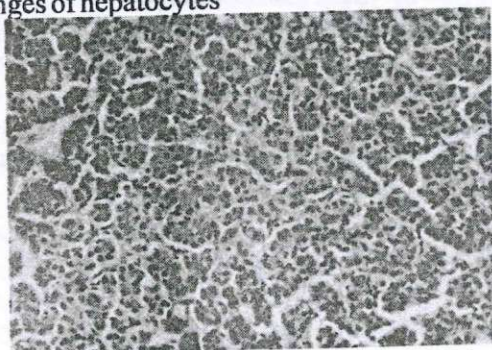


Figure 4. Microphotograph of liver section of broiler finisher birds in treatment 4 (administered 20mls of *J. gossypifolia* leaf extract) showed no visible lesions

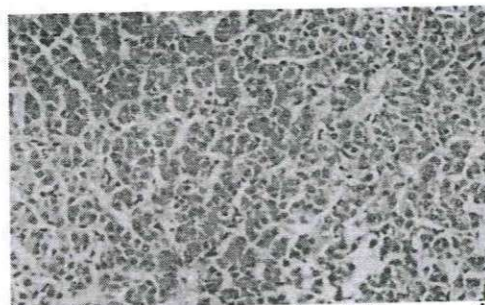


Figure 5: Microphotograph of liver section of broiler finisher birds in Treatment 5 (administered 20mls of *J. gossypifolia* leaf extract with 1ml of honey). It showed no visible lesions

Conclusion

Based on the result obtained, it was concluded that the use of 20mls of *J. gossypifolia* aqueous extract with or without the use of 1ml of honey administered to broiler finisher chickens prevented liver abnormalities.

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