

Faecal Analysis of Pullet Birds Administered Aqueous *Lagenaria Breviflora* Robert Extract

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Abstract

*There is need to eradicate the usage of antibiotics in poultry industry due to the harmful residual effect on human health. A 98-days experiment was carried out at Directorate of University farms FUNAAB to determine the efficacy of aqueous extract of fruits of *Lagenaria breviflora* Robert on faecal samples of pullet birds. Ninety (90) pullet birds at two weeks old were treated with (100 and 150g of *Lagenaria breviflora* per litre of water) replicated three times (15 birds each). Data collected on faecal analysis (at weeks 8 and 16) were subjected to independent sample T-test. The analyzed result revealed a significant ($p < 0.01$) decrease in the oocyst per gram, egg worm count and total bacteria egg count at weeks 8 and 16 respectively. However, higher and best count reduction in oocyst, egg worm and likewise the Total bacterial count was obtained in 150g group compared to the 100g group. Therefore an alternative to conventional drugs, aqueous extract of the fruit of *Lagenaria breviflora* Robert can be used at the rate of 150g per litre of water.*

Keywords:

Ethno-veterinary,
Poultry Health, Phytobiotics

Introduction

Antibiotics are mostly used at sub-therapeutic level to improve the production performance of poultry birds. However, consistent use of antibiotics has led to various health issues and also a major contributor to higher feed cost. Thus, it is imperative to sort for alternatives that could effectively and economically substitute antibiotics (Toghyani *et al.*, 2011). Phytobiotics are natural growth promoters derived from herbs and spices as alternative to cure poultry diseases. Worthy of mention is *Lagenaria breviflora* Robert (Spotted Pumpkin) which has been relevant in Ethno-veterinary (rural poultry health management) (Ekunseitan *et al.*, 2016a). Ethno-veterinary involves the application of local veterinary knowledge, theory and practice to avoid, control and treat ailments in livestock. *Lagenaria* is a genus of gourd-bearing vines and consists of many species indigenous to tropical Africa (Morimoto *et al.*, 2004). *Lagenaria breviflora* Robert (Spotted pumpkin) is one of the phytogenic plants used as antibacterial and antiviral herbal remedies and common in West Africa. It flowers during the rainy season and fruits during the dry season. It is used as herbal remedy in both man and animals. Its extract has been used indiscriminately by rural poultry farmers in curing wide range of diseases with no real study done to affirm the said potency and action against several disease conditions. This study was therefore carried out to determine the potency of aqueous extract of the fruits of *Lagenaria breviflora* Robert on faecal samples of pullets.

Materials and Methods

Experimental Site

The experiment was carried out at the poultry unit of the Directorate of University Farms, Federal University of Agriculture, Abeokuta, Ogun State, South Western Nigeria. The area lies on latitude 7°10'N and longitude 3°2'E above sea level (Google Map, 2017).

Processing of Experimental Materials

Fresh fruits of *Lagenaria breviflora* Robert fruits were washed, weighed and cut into desirable sizes of 100g per litre of water and 150g per litre of water respectively and left for 24 hours. Aqueous *Lagenaria breviflora* Robert extract obtained at different dosages (100g/1 litre and 150g/1 litre of water) were given orally to the birds.

Experimental Birds and Management

A total of ninety (90) Yaffa Brown at two (2) weeks old chicks were used for the experiment. The birds were randomly allotted to two treatment groups and further sub-divided into three (3) replicates of fifteen (15) birds each. Birds in each treatment were given only aqueous *Lagenaria breviflora* Robert extract three days a week at dosages of 100g/1 litre and 150g/1 litre of water respectively with no conventional drugs or vaccines used. The experiment duration was 98 days (14 weeks) and was sectioned into two phases; chick phase (14th -56th day) and growing phase (57th -126th day). The birds were fed *ad libitum* with compounded feed from the starting phase i.e. 0-8 weeks on starter feed of crude protein 23% to the growing phase i.e. 9-18 weeks on grower feed of crude protein 15%.

Data Collection

Faecal Analysis: Faecal samples were collected at week 2, 8 and 16 to determine bacterial load, oocyst and egg worm count. Average faecal samples were collected from each replicate using swab sticks. Bacteria colonies were counted using a colony counter while oocyst and egg worm count was determined using the MacMaster (Maff, 1986) method.

Statistical Analysis

Data collected were analyzed using Independent Sample T-test at 99% confidence interval and presented in bar charts.

Results and Discussion

Effect of *Lagenaria breviflora* Robert administration on the Oocyst count of Pullet Bird

The effect of *Lagenaria breviflora* (Benth) Robert administration on excreta oocyst count of pullets is presented in Figure 1. Both levels of Aqueous extract of *Lagenaria breviflora* Robert highly ($P < 0.01$) influenced the oocyst count of birds across the phases of growth (weeks 8 and 16). There was continuous reduction in the counts across each phase of growth, with the highest count reduction observed in 150g group. This is in agreement with Okitoye *et al.*, (2007) who stated that herbal preparations are used traditionally for improvement of poultry health in developing countries. Bioactive components in its fruits has been reported (Adeyemi *et al.*, 2017) most especially the phenolic compound termed oocysticide (Williams, 1997) and active against *Eimeria* spp. as observed in the present study (The main parasitic oocyst found in the analyzed faeces was identified as *Eimeria*). This confirms the ability of spotted pumpkin in treating coccidiosis confirming reports of appraisals conducted by researchers

(Tomori *et al.*, 2007; Ekunseitan *et al.*, 2016) among rural poultry farmers. It could hence be inferred that the effect of the aqueous fruit extract of *Lagenaria breviflora* Robert on coccidian oocyst output was dose dependent. Similar dose related responses in faecal oocyst count on coccidian infection in broiler chickens had been reported previously, Biu *et al.*, 2006 on neem (*Azadirachta indica*) aqueous and El-Khtam *et al.* (2014) in broilers infected with *Eimeria* species and treated with turmeric (*Curcuma longa*) or garlic (*Allium sativum*).

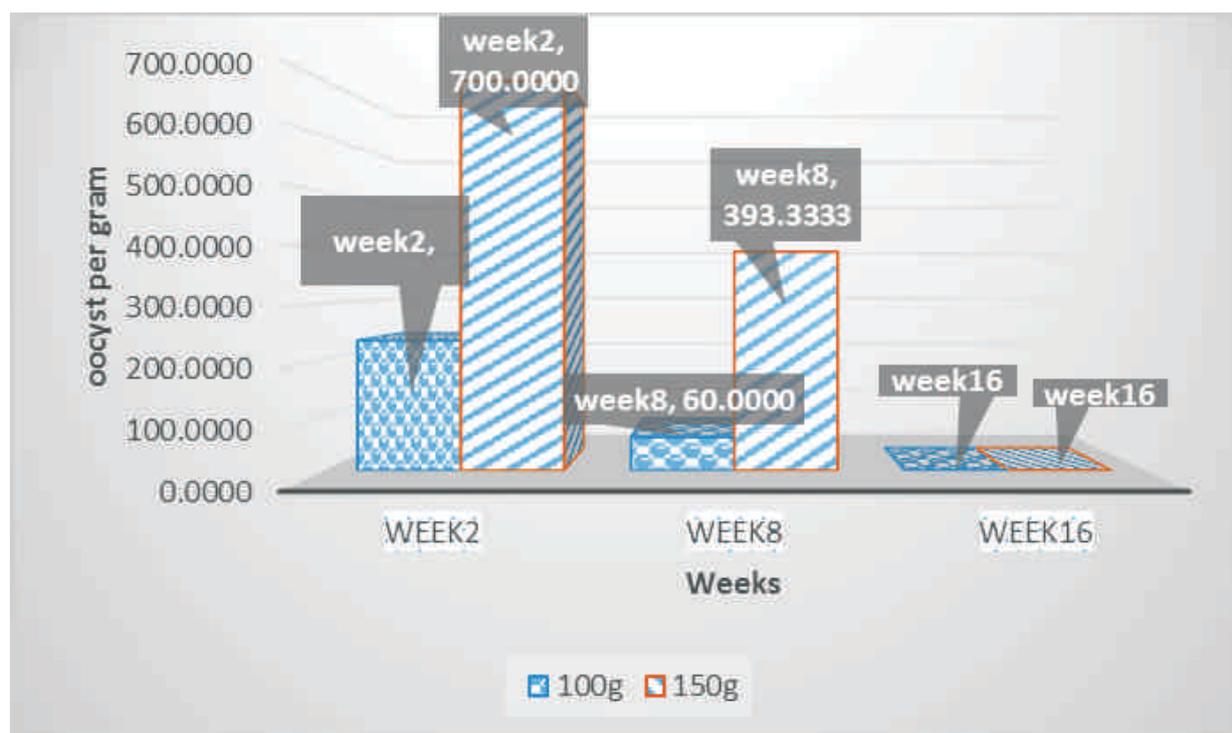


Figure 1. Effect of *Lagenaria breviflora* Robert administration on the Oocyst count of Pullet birds

Effect of *Lagenaria breviflora* Robert administration on Total Bacterial Count of Pullet Birds

The effect of *Lagenaria breviflora* Robert administration on the total Bacterial Count of pullets presented in Figure 2 positive effect ($p < 0.01$) on total Bacterial Count. The reduction was higher in 150g group recording the least (0.35 cfu/g) value compared to 100g group. This can be attributed to the presence of saponin and tannin (Lai *et al.*, 2010 Ekunseitan *et al.*, 2016a) which is indicative of its antimicrobial activity. This also affirms the *in vivo* study conducted on its fruit extract on selected pathogenic organisms (Ekunseitan *et al.*, 2016a). Tricosane an active compound identified (Adeyemi *et al.*, 2017) and also present in Neem (Lacikova *et al.*, 2007) is known to have an inhibitory effect and also positively disrupts membranes of bacterial cells. The following bacteria were identified *Escherichia coli*, *Bacillus spp*, *Klebsiella spp*, *Streptococcus faecalis*, *Pseudomonas spp*, *Staphylococcus aureus* and were totally eradicated in the 150g group. Jamroz *et al.* (2005) observed a significant reduction of *Escherichia coli* number following an application of natural plant extract.

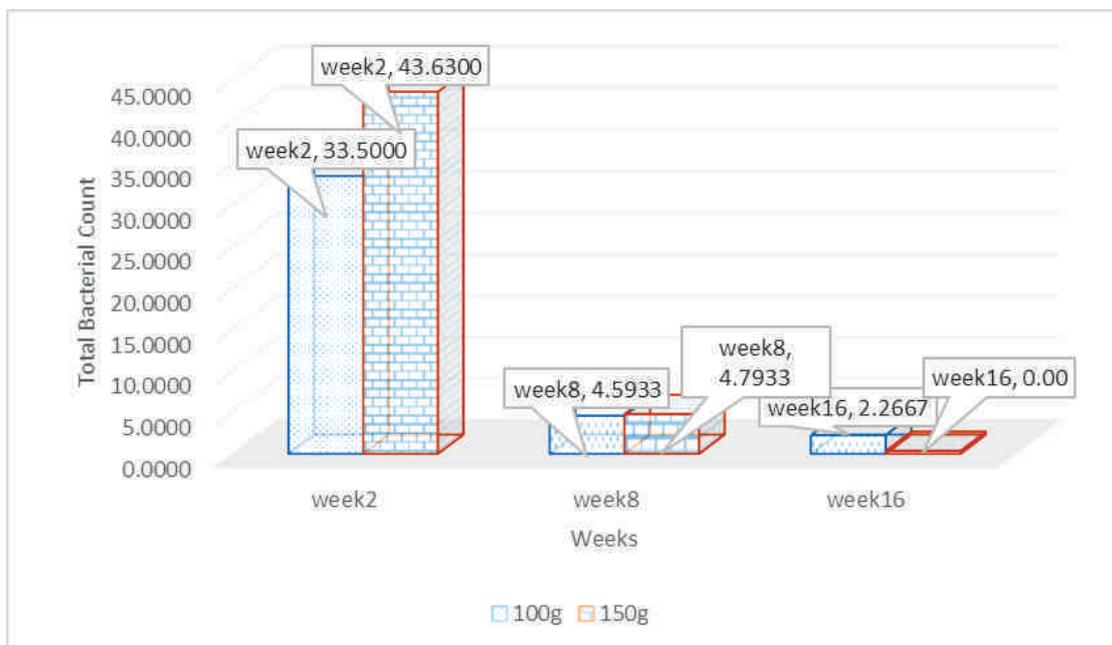


Figure 2. Effect of *Lagenaria brevisflora* Robert administration on Total Bacterial Count of Pullet Birds

Effect of *Lagenaria brevisflora* Robert administration on the Egg worm count of Pullet Birds

The Effect of *Lagenaria brevisflora* Robert administration on the Egg worm count of Pullet Birds is shown in Figure 3. Though values observed was similar at the start of the experiment. A highly significant ($P < 0.01$) continuous reduction was observed all through with 100 percent reduction obtained in 150g dosed group. The mode of operation of *Lagenaria brevisflora* R. may due to its rich content of saponins, flavonoids and tannins capable of inducing oxidative stress on parasites leading to reduced count and low degree of parasitization. The phenolic metabolites with the highest concentration of occurrence in *Lagenaria brevisflora* R. could be responsible for the positive effect on helminthic organisms interfering with the glycoprotein of the parasites cuticle leading to death and expulsion (John *et al.*, 2009) from bird's body system.

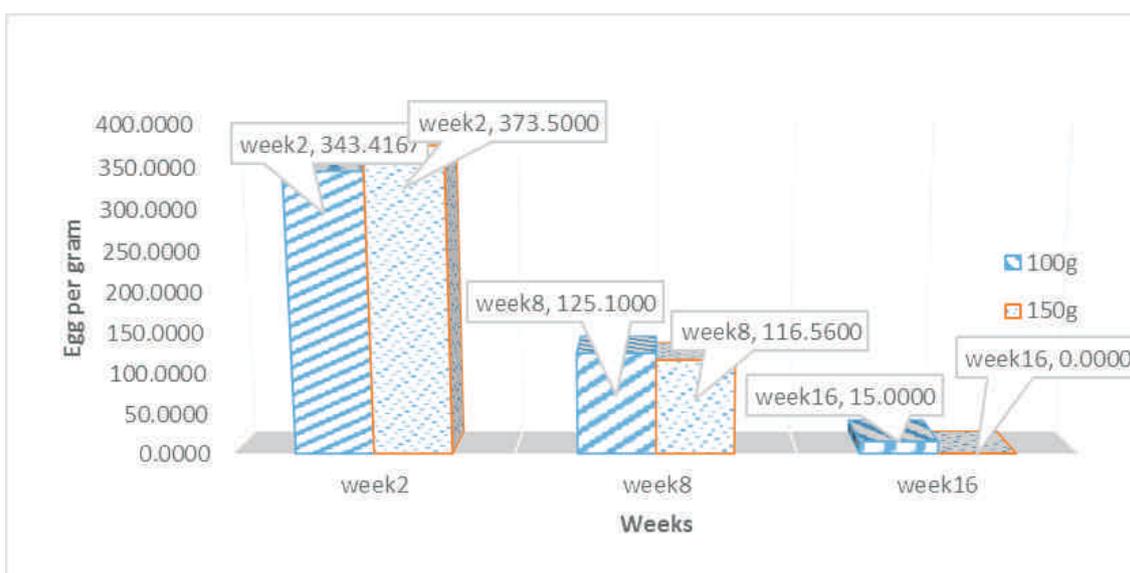


Figure 3. Effect of *Lagenaria brevisflora* Robert administration on the Egg worm count of Pullet Birds

Conclusion

The administration of the aqueous fruit extract of *Lagenaria breviflora* Robert at 150g/litre of water greatly reduced oocyst count and total Bacterial Count of pullet birds and could therefore be recommended to manage and reduce oocyst and bacterial counts in chickens either as curative or prophylactic measure.

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