Influence of *Justicia carnea* and *Ocimum gratissimum* Leaf Extracts on Protozoan Load in Broiler Chickens

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Abstract

The common treatment for protozoan infections in broiler chickens involves the use of synthetic anthelminthic drugs, which are often expensive, have residual effects, cause environmental pollution, and adversely effects the host health. This study therefore evaluated the efficacy of ***Justicia carnea* and *Ocimum gratissimum*** as anthelminthic agents in broiler production. *Justicia carnea* and *Occimum grastissium* leaves were harvested from Gbogidi Ilaro forest, Ogun state, Nigeria. 500g each of the leaves and in combination were removed from the stalk and soaked in 10 liters of water in a different plastic tank for 72 hours (Akinlade et al, 2024). The extracted solution was provided to the broiler bird as drinking water. Four treatment groups of 75 birds each, totaling three hundred arbor acre broiler chicks which were randomly allotted and given the herbal extracts. On the 42nd day of the experiment, 2 birds per replicate were isolated in well labeled metabolic cage. Fresh faecal samples were collected from the birds for protozoa load evaluation. This result obtained suggests that administration of combination of *Justicia carnea* and *Ocimum gratissimum* extracts effectively reduce protozoan populations in broiler chickens. The study concluded that *Justicia carnea* and *Ocimum gratissimum* leaf extracts can act as natural alternatives to anthelminthic drugs in broiler chicken production.

Keyword: chicken, herbs, parasite, water, Justicia carnea, Ocimum gratissimum.

Introduction

The increasing demand for poultry products necessitates effective management strategies that enhance growth performance and health in broiler chickens. Among these strategies, the use of herbal extracts has gained attention as a natural alternative to synthetic anthelminthic drugs. Protozoan infections can significantly impact the health and productivity of broiler chickens, leading to poor growth performance and increased mortality rates (Zirintunda et al., 2022)

Currently, the common mode of treating protozoan infections in broiler chicken involves the use of synthetic anthelminthic drugs, which are often expensive, has residual effects, causes environmental pollution, adverse effects on host health (Anggrahini et al., 2021), widespread anthelmintic resistance and increases the cost of production (Wang et al., 2024).

Consequently, there is a growing interest in using phytogenic substances as potential the growth promoters and health enhancers (Anggrahini et al., 2021). Previous studies have demonstrated an improvement in growth performance of broiler chickens in response to the supplemental extracts from different herbal plants, such as sage (Rasouli et al., 2020), capsicum (Liu et al., 2021), basil (Thuekeaw et al., 2022), and milk thistle (Bendowski et al., 2022). Evidence also suggests that phytochemicals, present in various herbs and spices, possess anthelminthic properties and also strengthens the host's defense system (Pandey et al., 2019). This study therefore evaluated the efficacy of ***Justicia carnea* and *Ocimum gratissimum*** as anthelminthic agent in broiler production.

Materials and methods

Experimental site

The research was carried at the poultry section of Agricultural Technology Department, The Federal Polytechnic, Ilaro located in Yewa South Local Government area of Ogun State with coordinates 6°37′46″N and 6°55′42″N and 2°47′24″E and 3°6′48″E of Latitudes and Longitudes.

Sources and Preparation of *Justicia carnea* and *Occimum grastissium* extraction

Justicia carnea and *Occimum grastissium* were harvested from Gbogidi Ilaro forest, Ogun state, Nigeria. The plant sample was identified and authenticated as *Justicia carnea* and *Occimum grastissium*. 500g of the leaves were removed from the stalk and soaked in 10 liters of water in a different plastic tank for 72 hours at room temperature (Akinlade et al, 2024). The extracted solution was provided to the broiler bird as drinking water.

Experimental Birds

Four dietary treatments of 75 birds each, totaling three hundred arbor acre broiler chicks which were randomly allotted were reared for a period of 6 weeks with adequate care which involved the regular supply

of feed and water, heat, vaccination, protection from predator, and good litter management. The treatment includes:

Treatment (T) 1: - water + embazin forte (Control)
T2: 500g of *Occimum grastissium* water (10 litres)
T3: 500g of *Justicia carnea* water (10 litres)
T4: 300g of *Justicia carnea* and 200g of *Occimum grastissium* water (10 litres)

Protozoan load measurement

On the 49th day of the experiment, 2 birds per replicate were isolated in well labeled metabolic cage. Fresh faecal samples were collected from the birds for protozoa load evaluation (Nagwa et al., 2013). A small drop of faecal samples were put on a microscopic slide, mixed well with a drop of saline 0.9% by the aid of a wooden stick, covered with a cover glass slip and examined under high power X40 of light microscope for detection of any oocysts in faeces.

Results and Discussion

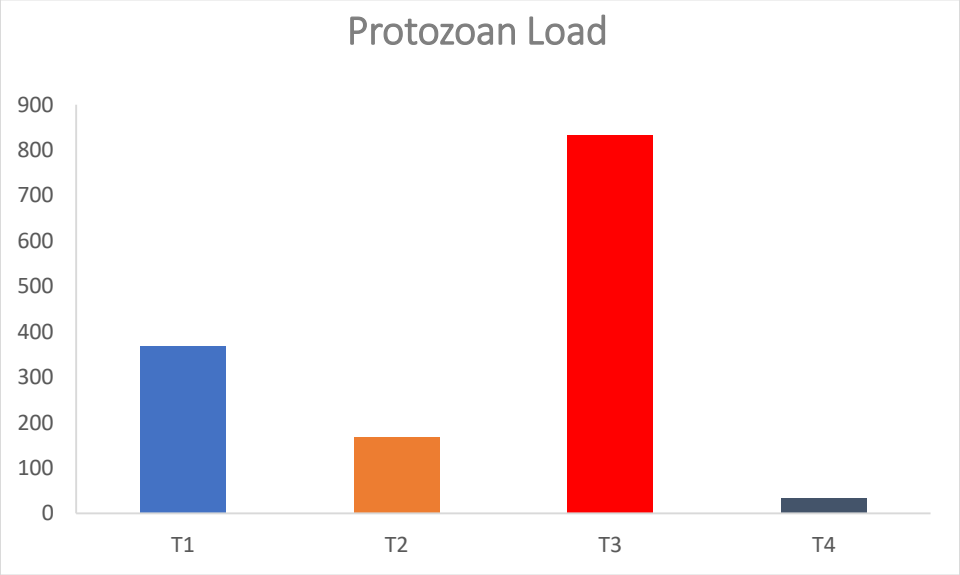

Fig 1: Effects of *Ocimum gratissimum and Justicia carnea* extracts on protozoan load of broiler chicken

T1 – control, T2 – *Ocimum gratissimum,* T3 - *Justicia carnea,* T4 – *Ocimum gratissimum and Justicia carnea* combination

Discussion

The effects of Scent leaves and some other medicinal plants in disease treatment and prevention, especially in man and as few animals are well documented (Adebolu and Salau, 2005; Bora, et al., 2011; Boutoial, et al., 2013; Casanova, et al., 2013 Boate et al., 2018; Okafor-Elenwo, et al., 2021). The results obtained from this study indicate a significant reduction in protozoan load in the treatment groups receiving the leaf extracts, particularly in T4, which had the lowest protozoan count. This suggests that administration of *Justicia carnea* and *Ocimum gratissimum* extracts combination effectively reduces protozoan populations in broiler chickens, this is in agreement with the findings of Nagwa *et al*. (2013) who reported that inclusion of phytogenic herbs in the ration of chicken significantly reduces their intestinal protozoan load. The most significant reduction was observed here, highlighting the potential of these extracts as effective natural remedies against protozoan infections. The active compounds present in *Justicia carnea* and *Ocimum gratissimum*, such as eugenol and other phytochemicals were believed to have exerted anthelminthic effects by disrupting cellular functions in protozoa or enhancing the immune response of the birds.

Conclusion

The findings from this study underscore the potential benefits of using *Justicia carnea* and *Ocimum gratissimum* leaf extracts as natural alternatives to anthelminthic drugs in broiler chicken production. The significant reduction in protozoan load suggests that these herbal treatments can enhance the health status of broilers while promoting better growth performance. Further research is warranted to explore optimal dosages and long-term effects on overall poultry health.

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