

GROWTH PERFORMANCE OF BROILERS CHICKEN ADMINISTERED ORAL PLUME AND SCENT LEAVES EXTRACTS

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ABSTRACT

The study evaluated the growth performance and carcass characteristics of 150 Broiler chicken administered oral *Justicia carnea* and *Occimum gratissimum* extract. The birds were divided into four treatment groups; control, *Justicia* (JC), *Ocimum gratissimum* (OG), and JC+OG combination. Growth performance data were collected and subjected to one way analysis of variance. Results showed significant improvements ($p < 0.05$) in the feed intake, daily feed intake of 2045.80 g and 97.42 g, respectively, while the JC+OG combination had the highest final weight of 1847.22 g ($p > 0.05$). Aqueous extracts of *Justicia carnea* and *Occimum gratissimum* had no significant ($p < 0.05$) effect on feed conversion ratio (FCR). Oral administration of *Justicia carnea* and *Ocimum gratissimum* extracts improved growth performance of broiler chickens, offering a potential natural alternative to synthetic growth promoters.

Keywords: Broiler chicken, Feed, Plume plant, Scent leaf,

INTRODUCTION

The demand for poultry products has increased since chicken meat is more nutrient-dense and healthful than beef and mutton due to its high level of beneficial unsaturated fatty acids (Erinle & Adewole, 2022). To boost the growth and overall health of their birds, poultry producers essentially employ growth promoters (polamix, anidone, multivitamin, albiovit, etc.) that include antibiotics at sub-therapeutic doses (Achilonu et al., 2018). According to reports, persistent use can lead to the buildup of chemical residue in poultry birds' bodies, which can be passed on to humans (Achilonu et al., 2018). This can lead to pathogenic bacteria developing resistance to certain antibiotics. Consequently, there is a need to develop a safe and effective strategies to maintain intestinal health of animals which plant derived additives have proven to be a viable alternative (Pandey et al., 2005). The study therefore evaluated the growth performance of broiler chicken administered oral *Justicia carnea* and *Occimum gratissimum* extract.

MATERIALS AND METHODS

Experimental Site

This experiment was carried out at the Poultry Unit of School of Agriculture, Federal Polytechnic Ilaro, Ogun State, Nigeria situated at coordinated latitude 6.895550N and longitude 2.977167E and altitude of 14m above sea level (GPS display, 2023).

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

Justicia carnea and *Occimum gratissimum* was harvested Federal Polytechnic Ilaro, farm. The leaves were removed from the stalk and weighed. 500g was soaked into 10 litres of water and the process was repeated weekly. The solution was provided to the broiler bird as drinking water.

Experimental Animal and Management

The brooder home was cleaned and disinfected a few days prior to the chicks' arrival. A digital hygrometer was used to measure the temperature and relative humidity (Akinlade *et al.*, 2024). A respectable hatchery provided the 160-day-old broiler chicks, which were then randomly assigned to four treatments of 40 birds each after being brooded for a week. Each treatment was given *Justicia carnea* or and *Occimum gratissimum* orally through their drinking water namely:

Treatment (T) 1: - water + enrofloxacin (Control), T2: 500g of *Occimum gratissimum* in 10 Liters of water, T3: 500g of *Justicia carnea* leaves in 10 Liters of water, T4: 500g each of *Justicia carnea* and *Occimum gratissimum* in 10 Liters of water.

Data collected

The weight gains for each week were obtained as the difference in the body weights of the birds at the beginning and end of the week.

Weight gain (g) = Final weight(g) – Initial weight(g)

Feed intake (g)

Each bird received a predetermined amount of feed, and the amount of feed that remained was weighed to calculate the daily and, hence, weekly feed intake. The amount of feed consumed was computed as:

$$\text{Feed intake(g)} = \text{Feed supplied(g)} - \text{Feed left over(g)}$$

Feed conversion ratio (FCR)

By calculating the ratio of feed intake to weight gain, the feed conversion ratio of each bird was established:

$$FCR = \frac{\text{Feed intake (g)}}{\text{Weight gain (g)}}$$

RESULTS AND DISCUSSION**Effect of *Justicia carnea* and *occimum gratissimum* aqueous extract on performance of broiler chicken**

Effect of aqueous extract of *Justicia carnea* and *Occimum gratissimum* on performance of broiler chickens is presented in table 1. Aqueous extracts of *Justicia carnea* and *Occimum gratissimum* had significant ($P < 0.05$) influence on the feed intake and daily feed intake. Birds administered aqueous extracts of *Justicia carnea* had higher feed intake and daily feed intake of 2045.80g and 97.42 respectively while T1 had the least feed intake value of 1986.93 g. T4 which received combination of aqueous extracts of *Justicia carnea* and *Occimum gratissimum* had the highest final weight of 1847.22 g ($p > 0.05$). Aqueous extracts of *Justicia carnea* and *Occimum gratissimum* had no significant ($p < 0.05$) effects on the feed conversion ratio of the birds.

This present result shows a significant increase in the feed intake of the broilers administered the experimental aqueous extracts as their values are higher than those of the control groups. This outcome negates the report of Akinlade et al. (2024) who reported no significant difference in the feed intake of the birds administered aqueous extract of *Justicia carnea*. This may be because of the differences in dosage of incorporation used in the two experiments. This outcome on the other hand corroborates that of Onu and Aja (2011) who reported that herbs and spices control and limit the proliferation of pathogenic and non-pathogenic bacteria species in the gut of livestock enhancing appetite and increase the conversion of feed to the flesh. The treatment groups had numerically higher final weight and weight gain values. The increased performance value in the birds on treatment groups in this study, compared to the control birds, further authenticates the nutritional and health benefits of *Justicia carnea* and *Occimum gratissimum* (Onyeabo et al., 2017). The phytochemicals present in *Justicia carnea* and *Occimum gratissimum* aqueous extracts may have contributed to the improved overall health and vitality of the birds, leading to enhanced performance metrics such as weight gain, feed conversion efficiency. Studies have shown that certain phytochemicals can positively influence physiological processes, including metabolism, immune function, and stress response, thereby promoting better performance outcomes in livestock and poultry (Lillehoj et al., 2018).

Table 1: Effect of *Justicia carnea* and *Occimum gratissimum* aqueous extract on performance of broiler chicken

Parameters	T1	T2	T3	T4	SEM	P-value
Initial weight (g)	610.32	605.56	644.44	647.22	10.08	0.34
Final weight (g)	1789.04	1783.33	1841.66	1847.22	29.41	0.26
Weight gain (g)	1178.73	1177.78	1197.22	1200.00	30.69	0.59
DWG (g/b/d)	56.13	56.08	57.01	57.14	1.46	0.59
Feed Intake (g)	1986.93 ^b	2023.63 ^a	2045.80 ^a	2034.50 ^a	43.95	0.00
DFI (g/b/d)	94.61 ^b	96.36 ^a	97.42 ^a	97.02 ^a	2.09	0.00
FCR	1.68	1.72	1.71	1.70	0.34	0.62

Means with the same superscript are not significantly different ($p < 0.05$), g/d/b: grams per day per bird, SEM; standard error of mean

CONCLUSION

Based on the findings of this study, administration of *justicia carnea* and *Occimum gratissimum* aqueous extract enhanced weight gain in broiler chicken, statistically compared with control group. This means that the administration of *Justicia carnea* and *Occimum gratissimum* extract in broiler chicken production can similar results as the conventional antibiotics growth promoters. To promote sustainable poultry production and reduce antibiotic resistance, poultry farmers should explore phyto-based growth promoters like *Justicia carnea* and *Ocimum gratissimum* as alternatives to antibiotics.

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