VARIATIONS IN MORPHOMETRIC TRAITS IN THE THREE STRAINS OF NIGERIA LOCAL TURKEY REARED IN KANO STATE, NIGERIA

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ABSTRACT
The study was aimed to provide baseline information on the genetic variation among local turkey populations using morphometric traits. A total of one hundred ninety-seven local turkeys at reproductive stage were used for the study, comprising of 71 White, 61 Black and 65 Lavender and were characterized under field condition following standard descriptors. All the three (3) senatorial zones present in Kano State were covered. Body weight was obtained using a weighing scale while five body measurements (body length, breast circumference, thigh length, shank length and wing length) were measured using tailor's tape rule (cm). Data generated were subjected to the analysis of variance using the general linear model procedure of SAS, (2003). Significant differences among means observed were separated using Duncan Multiple Range Test Procedure. The effect of strain on morphometric traits showed significant ($P<0.05$) difference in body weight and shank length. The highest and longest mean value (4.65 ± 0.22 kg) and (12.58 ± 0.22 cm) for body weight and shank length respectively was recorded in lavender turkey respectively, which was higher than (4.43 ± 0.17kg) and (4.01 ± 0.19kg) recorded in black and white turkeys respectively. The result of turkey with respect to sex indicated a significant ($P<0.05$) effect of sex in all traits measured. The male had a mean body weight value (5.20 ± 0.19kg), while the female had (3.56 ± 0.09kg). In conclusion, lavender strain is hereby recommended for the breeders as a strain of choice due to its passion of gene for faster growth that could be utilized in the genetic improvement of growth through selection than the other strains.
Key words: Local turkey, strains, body weight, morphometric c, sex

INTRODUCTION
There are three colour varieties of local Turkey in Nigeria. They are white, black and lavender (light grey feathers dotted with white). Adult males have a naked, heavily bumpy head that is normally bright red in colour but turns to white overlaid with bright blue when the birds are excited. Other distinguishing features of the common turkey are a long red fleshy ornament (called a snood) that grows from the forehead over the bill, a fleshy wattle growing from the throat, a tuft of coarse, black, hairlike feathers (known as a beard) projecting from the breast and more or less prominent leg spurs. The male turkey or tom, maybe 130 cm long and weighs 10 kg, though the average weight of the female turkeys, or hens, generally weigh only half as much as the males and have less warty heads than do the males (Encyclopedia Britannica, 2010).
Morphometric traits are generally the dimensions of different body parts and live weight that are directly related to production parameters (FAO, 2012). They are used to evaluate the characteristics of various breeds of animals, and could provide useful information on the suitability of animals for selection (Rastija *et al.,* 2004). According to Pundir *et al.* (2011) biometric traits are used to characterize the different breeds of livestock as they give an idea of body conformation and are also used for comparison of growth in different individuals. Up to date, there is little information available on the genetic diversity of Nigerian local Turkey strains, which are important to design effective selection and conservation strategies. In view of the foregoing, this study was undertaken to investigate genetic diversity among the Nigeria local turkey strains using morphometric traits.

MATERIALS AND METHODS
This study was carried out in Kano State, Nigeria. The state is located in North West Nigeria between latitude 10° 33'N and 12^0 23'N and longitude7^0 45'E and 9^0 29E. The annual mean rainfall is between 800mm to 900mm and variations about the mean values are up to ± 30% (Climate-Data, 2018).

Experimental Birds and their Management: A total of one hundred ninety-seven local Turkeys at reproductive stage belonging to three Strains (71 White, 61 Black and 65 Lavender) were used for the study. The birds were characterized under field conditions for traits following the standard morphometric descriptors (FAO, 2012). All the three (3) senatorial zones present in Kano State (Kano Central, Kano North and Kano South) were covered. The local turkeys were managed according to the semi intensive system, with little feed supplementation from the owners, with kitchen wastes and were partly sheltered in the night.

Data Collection: Six morphometric traits were taken on each sampled bird, and these include: body length, breast circumference, thigh length, shank length, wing length, and body weight. A normal tailor's measuring tape (cm) was used to take the linear measurements while body weight was measured using a sensitive 20-kg measuring scale.

Data Analysis: Data generated were subject to the analysis of variance (ANOVA) using the general linear model of SAS, (2003). Significant differences among means observed were separated using Duncan Multiple Range Test Procedure (Duncan 1955).

RESULTS AND DISCUSSION

The effect of strain on body weight and body measurements of local turkey is presented in Table 1. The finding indicates that strain showed significant ($P<0.05$) difference in body weight and shank length. The highest mean value (4.65 ± 0.22 kg) for body weight was recorded in lavender turkey, which was higher than (4.43 ± 0.17 kg) and (4.01 ± 0.19 kg) recorded in black and white turkeys respectively. While strain indicates no significant ($P>0.05$) influence on body length, breast girth, thigh length and wing length, except for shank length that showed variation ($P<0.05$) across the strains. The longest shank length with a mean value (12.58 ± 0.22 cm) was recorded for lavender turkey. The significant difference obtained in body weight is line with the reports that variation exist in growth performance of different strains, genotypes or breeds of birds (Kabir *et al.,* 2016; Chana, 2014; Okon *et al.,* 1997). The finding disagrees with the report of Djebbi *et al.* (2014) who reported that body weights of indigenous adult turkey strains were not significantly different. The result of the traits studied suggests that lavender was superior to white and black turkey with respect to body weight and shank length. These differences obtained across the strains may be due to differences in their genetic constitution.

Result of turkey strains with respect to sex is represented in Table 2. The study showed a significant ($P<0.05$) difference in all traits measured (body weight and body length, breast girth, thigh length, shank length and wing length) between males and females. The males had a mean body weight value of 5.20 ± 0.19kg, while the females had 3.56 ± 0.09kg. Body measurements of males in this study were higher than those of females. These variations were in agreement with the reports of other studies (Chana, 2014; Djebbi *et al.,* 2014; Ogah, 2011). Sexual dimorphism observed in this study was in line with studies of many authors, who reported that the body weight and linear body measurements of the indigenous turkey were significantly affected by sex (Chana, 2014; Djebbi *et al.,* 2014; Ogah, 2011; Adewumi, 2011). This implies that males are better and superior to females in the studied traits. This finding also concords with the report of Fayeye, *et al.* (2006) who attributed these differences to a genetic effect of sex which arises from the male sexual activities. The body weight values observed in this finding were higher than those reported by Ogah (2011) and Chana (2014), but lower to what was reported by these authors (Djebbi *et al.,* 2014; López-Zavala *et al.,* 2008).

Table 1: Effect of strain on morphometric traits of local turkey

	Strains			
Traits	White (n= 71)	Black (n= 61)	Lavender (n= 65)	SEM
Body weight (kg)	4.01±0.19^{b}	4.43±0.17^{ab}	4.65±0.22^{a}	0.94
Body length (cm)	46.01±0.42	46.95±0.72	47.45±0.65	2.80
Breast girth (cm)	53.42±0.79	50.23±1.25	52.35±1.81	6.22
Thigh length (cm)	16.49±0.21	16.98±0.31	17.32±0.48	1.62
Shank length (cm)	11.75±0.15^{b}	12.25±0.28^{ab}	12.58±0.22^{a}	1.02
Wing length (cm)	28.22±0.32	28.31±0.32	29.05±0.69	2.25

abc= Means with different superscripts in the same row are significantly different $P<0.05$, n = Sample size, SEM= Standard Error of Mean

Table 2: Effect of sex on morphometric traits of local turkeys

	Sex		
Traits	Male (n= 95)	Female (n= 102)	SEM
Body weight (kg)	5.20±0.19[a]	3.56±0.09[b]	0.83
Body length (cm)	49.04±0.51[a]	44.67±0.37[b]	2.25
Breast girth (cm)	57.47±0.95[a]	47.06±0.95[b]	5.47
Thigh length (cm)	18.59±0.29[a]	15.36±0.16[b]	1.34
Shank length (cm)	13.21±0.21[a]	11.22±0.05[b]	0.86
Wing length (cm)	30.23±0.36[a]	26.93±0.35[b]	2.04

abc= Means with different superscripts in the same row are significantly different P<0.05, n = Sample size, SEM= Standard Error of Mean

CONCLUSION

The present study indicated the existence of variations in body weight and shank length among the three strains of Nigeria local turkey populations in the study areas The finding showed that lavender was superior to white and black turkey with respect to body weight and shank length. The lavender strain is hereby recommended for the breeders as a strain of choice due to its possession of gene for faster growth that could be utilized in the genetic improvement of growth through selection that the other strains.

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