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Growth and production potentials of Vezaguda chicken in its home tract

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Abstract
The present study was aimed at evaluating the growth and production potentiality of Vezaguda chicken, which is a lesser known chicken population in southern Odisha, reared since generations. These chickens are raised in small-holder production system, mostly by tribals under extensive system of management. The qualitative phenotypic traits like plumage color, plumage pattern, skin color, shank color, ear lobe color, comb and wattle color, eye color, type of comb and wattle, head shape, etc. and quantitative body measurement traits such as body weight at different stages, body length, body girth, keel length, shank length, shank width, breast angle, beak length, head width and height of the adult birds were studied. Attempt was also made to compare growth traits like body weight between sex and record egg production and egg quality parameters.

Keywords: Phenotypic characterization, production potential, Vezaguda chicken

Introduction
The most crucial element of the agricultural production system, particularly in India, is the genetic resources for poultry. Indigenous poultry breeds have demonstrated outstanding qualities such as high survivorship, high fecundity, good maternal ability, disease resistance, and the ability to survive, reproduce, and thrive under low plane of nutrition and sub-optimal management. There are currently 19 known breeds of chicken in our nation, and breed characteristics are given for each one. Occasionally, less well-known breeds of chicken are also identified and discussed (Mohapatra and Panda 1981, Mohapatra and Mishra 2008) [3, 2]. According to the Odisha Economic Survey from 2021-22, the State of Odisha ranks 10th in terms of chicken population, with 274 lakhs of birds living there in total. Vezaguda, a lesser known breed of chicken population is being maintained by the farmers of Malkangiri and Koraput districts of Odisha. Adult cocks are fairly large with majestic gait and high stamina. Males are aggressive in nature and well suited for fighting purpose. Predominant plumage colours are black and brown. However, white colour is also seen. Back is straight, long and parallel to the ground in normal standing position but gives a slanting appearance from neck to the base of the tail while standing erect. Pea comb is common, fairly large in size and firmly set. Flock size is 5 to 40. Average distribution of cocks, hens and chicks is 17.16%, 27.06% and 5.78%. Age at first egg is around 7 months. Egg shell colour is light brown and annual egg production is 50-60 with average weight of 40-50 grams.

Adult male Vezaguda bird | Egg of Vezaguda bird | Adult female | Vezaguda bird

Fig 1: Vezaguda bird in its home tract

Materials and Methods

The primary objective of this investigation was to identify the domestic poultry genetic resources available in the region, to characterize them for their phenotypic and performance traits and the information were collected from Vezaguda from Malkangiri districts by taking actual measurements on the birds at farmers' doorstep on biometric traits and by personal observation along with interaction with bird owners on traits includes the following heads:

1. **Growth traits:** Body weight measurements were taken at different stages of growth like day old body weight (g), 4th week body weight (g), 8th week body weight (g), 12th week body weight (g), 16th week body weight (g), 20th week body weight (g).
2. **Morphometric traits:** Quantitative traits such as body length, body girth, keel length, shank length, shank width, breast angle, beak length, head width and height of the bird were studied.
3. **Egg quality traits:** Egg weight, egg length, egg width, yolk height, yolk weight, yolk percentage, albumen to yolk ratio, albumen %, shape index, albumen index, yolk index, haugh unit, specific gravity of vezaguda birds were measured.

Communities responsible for developing the breed

The breed is patronized by people of all caste and communities. The major players in the field are Koya, Matia, Dhulia and Bhumia tribes and Dom community of Koraput district. As the birds are priced very high due to fighting ability, many other people belonging to different tribal and non-tribal communities in urban and peri-urban areas are also maintaining the breed. They are small and marginal farmers or landless labourer category of non-nomadic type where as in urban and peri-urban areas people maintaining the breed are even service holders and small business owners.

Distribution of the bird

The birds are distributed throughout Malkangiri district and areas of Nilaguda, Hantagaon, Raniput, Digapur, Bisiput, Baliput, Hardaput, Jamunda, Konga, Charagaon, and adjacent villages of Jeypur subdivisions of Koraput district and adjacent areas of Andhra Pradesh.

Some salient features of the bird

1. Adult cocks are large with high stamina, majestic gait and aggressive nature. Colour of the comb, wattles, face and ear lobes are red and head is light red and beak is yellow in colour. Pea comb is predominant.
2. Neck is fairly long, thick and covered with golden white or golden red or dark red hackle feather.
3. Body is fairly round and back is straight, long and parallel to the ground in normal standing position. Back shows a slanting appearance from neck to the base of the tail while standing erect.
4. Feathers are well distributed all over the body except on thigh, shank, joints and toes. Wings are medium in size, tail feathers are lustrous black with greenish sheen and spur is present in males and well developed in adults.

Results and Discussion

Table 1: Growth traits of Vezaguda chicken

Body weight parameters	Day old body weight (g)	4th week body weight (g)	8th week body weight (g)	12th week body weight (g)	16th week body weight (g)	20th week body weight (g)
M (29)	37.00±0.08	143.93^{a}±0.23	441.00^{a}±0.43	723.35^{a}±0.46	1111.30^{a}±0.48	1342.22^{a}±0.55
F (107)	35.50±0.23	127.24^{b}±0.09	390.56^{b}±0.67	676.45^{b}±0.66	1051.11^{b}±0.65	1269.75^{b}±0.56

Figures in parentheses indicate number of observations *Means with different superscripts along the column (for a trait) indicate significantly (p<0.05) different values

Male and female chicks at hatch were 37.00 and 35.50g, respectively without any significant difference between them. The male chicks at 4th, 8th, 12th, 16th and 20th week of age were 143.93, 441, 723.35, 1111.30, 1342.22 g and corresponding weights of females were 127.24, 390.56, 676.45, 1051.11, 1269.75 g, respectively with significant difference between male and female at all stages of growth making males heavier than females.

Table 2: Morphometric traits of Vezaguda chicken

Sl. No.	Parameters	M (55)	F (67)
1	Shank length	11.23^{a}±0.05	10.33^{b}±0.04
2	Shank circumference	5.10^{a}±0.04	4.07^{b}±0.07
3	Shank width	1.63±0.02	1.47 ±0.01
4	Thigh length	15.33 ^{a} ±0.45	13.50 ^{b} ±0.45
5	Chest girth	31.00±0.45	30.00±0.48
6	Keel length	11.50±0.95	10.00±0.82
7	Body length	50.90 ^{a}±0.37	48.60 ^{b} ±0.25
8	Height	72.00 ^{a}±0.73	63.67 ^{b} ±0.45
9	Back length	26.50 ^{a}±0.14	23.67 ^{b} ±0.11
10	Wing length	22.67 ^{a}±0.25	21.00 ^{b} ±0.22
11	Floded wing length	19.33±0.49	17.77±0.46
12	Wing span	79.67 ^{a}±0.45	72.00 ^{b} ±0.43
13	Neck length	17.83 ^{a}±0.26	16.13 ^{b} ±0.15
14	Head length	9.23±0.31	8.47±0.20
15	Head width	3.20±0.01	3.07±0.02
16	Beak length	3.03±0.02	2.80±0.03
17	Breast angle	38.67 ^{a}±0.08	34.00 ^{b} ±0.10

Figures in parentheses indicate number of observations *Means with different superscripts along the row (for a trait) indicate significantly (p<0.05) different values

Males were significantly higher than females in body measurements like Shank length, Shank Circumference, Thigh length, Body length, height, back length, wing length, wing span, neck length, breast Angle etc. were showing in table no 2. Shank width, chest Girth, keel length, floded wing length head length head width, beak length parameters were non significant between male and females. (Table no 2).

Table 3: Egg quality traits of Vezaguda chicken (N=104)

1	Egg weight (g)	45.01±0.46
2	Egg length (mm)	49.13±0.34
3	Egg width (mm)	40.12±0.37
4	Yolk height (mm)	16.88±0.78
5	Yolk weight (g)	12.99±0.38
6	Yolk %	28.87±0.38
7	Albumen to yolk ratio	2.05 ±0.06
9	Albumen %	59.34±0.39
10	Shape index	77.26±0.49
11	Albumen index	0.12±0.1
12	Yolk index	0.47±0.02
13	Haugh unit	103.21±0.66
14	Specific gravity	1.09±0.02

*Figures in parentheses indicate number of observations

Egg weight, egg length, egg width, yolk height, yolk weight, yolk percentage, albumen to yolk ratio, albumen %, shape index, albumen index, yolk index, haugh unit, specific gravity of vezaguda birds were 45.01g, 49.13mm, 40.12mm, 16.88mm, 12.99g, 28.87%, 2.05, 59.34%, 77.26, 0.12, 0.47, 103.21, 1.09 respectively.

Management

In terms of management, they are raised in backyards under the small-holder production method. They rarely eat at home, usually using food scraps, and they scavenge to cover their nutritional needs.

Conclusion

This research provides a baseline data on phenotypic and performance traits of Vezaguda chicken germplasms of Odisha. Realizing the uniqueness in ability to escape from predation, disease resistance, mothering quality and low-input system of rearing, Vezaguda chicken germplasm may be registered as a chicken breed at national level. Besides, immediate actions on its conservation and improvement strategies may be made to protect this unique chicken germplasm from dilutions or even extinct.

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