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Morphological Characteristics of Pati Duck

Dishanta Dutta[1], Indu Borah Dutta[1], Purabi Kaushik[2], Mrinal Bora[1], R.J. Deka[2], B.N. Bhattacharyya[2], Kabita B. Kalita[2]

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ABSTRACT

Background: The favorable climatic condition and fertile land resources of Assam plays a significant role for agricultural and livestock production in the region. Assam is one of the regions of north-eastern India, famous for different varieties of indigenous ducks reared by farmers under traditional system. Due to hot-humid climatic condition of Assam along with extensive availability of resources like ponds, river, marshy wet lands *etc*. provides a suitable natural habitats for duck rearing in rural areas of the states. Pati Duck was recognized as a breed by the National Bureau of Animal Genetic Resources in the year 2017.

Methods: The study was conducted at Govt. Duck and Poultry Farm, Joysagar, Sivasagar district of Assam. Ducklings were hatched at the Hatchery unit present at the farm. Eggs were been collected from different farmer's house where they reared ducks in the backyard systems. Ducklings born were been studied for the different morphological characteristics and their body weight were been measured in weekly interval. All ducks received adlibitum feed from day one onwards.

Result: Pati ducks were divided into five major groups based on their body coat colour. They are Whitish light brown, White, Blackish brown, Black and white and Khaki coloured. The different body measurement shows the male to be superior to the females in different parameters with different coat colour. The major colour pattern of bill, shank and feet was found to be yellow, whereas skin was mostly white in colour and plumage colour pattern found to be white, black and brown in different parts of the body.

Key words: Morphology, Pati ducks.

INTRODUCTION

The favorable climatic condition and fertile land resources of Assam plays a significant role for agricultural and livestock production in the region. Ducks have been playing an important role in the socio-economic sphere of the rural people in Assam since time immemorial. Assam is one of the regions of north-eastern India, famous for different varieties of indigenous ducks reared by farmers under traditional system. The desi ducks constitute 86.5 per cent of the total duck population (4.99 million) in the state. Duck farming is a major component in integrated farming system and plays a significant role in women empowerment and upliftment of socio-economic status of the farming community of Assam. The people of Assam are mostly shown their keen interested in duck husbandry to meet their demands for meat and egg as a source for animal protein. The state has a 7.33 lakhs duck population and stands second position in India. Out of the total duck population reared in Assam, available duck breeds are Pati, Nageswari, Chara-Chambeli, Khaki Campbell and White Pekin. Pati duck is the most commonly reared by rural people of Assam and it was recognized by the National Bureau of Animal Genetic Resources in the year 2017. Their age at sexual maturity is in between 220-235 days and age at first egg laying is on an average of 240 days. They have an average egg weight of 60.5 g and egg production ranging from 75-90 eggs per annum.

Pati duck is extensively reared by the rural woman of Assam in backyard system and proved as a major source of livelihood as well as machinery for women empowerment and an effective tool for socio-economic up liftmen of rural people. It is one of the most important domesticated species of poultry next to chicken primarily reared for table egg production in India. Though, many phenotypic studies have been done on Pati duck, but scanty information are found in morphology and morphometrical characteristics. Hence, the present study is undertaken to identify the morphology characteristics of Pati duck.

[1]Govt. Duck and Poultry Farm, Joysagar-785 665, Sivasagar, Assam, India.
[2]College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781 022, Assam, India.

Corresponding Author: Purabi Kaushik, College of Veterinary Science, Assam Agricultural University, Khanapara, Guwahati-781 022, Assam, India. Email: purabiicar@gmail.com

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MATERIALS AND METHODS

The study was conducted at Govt. Duck and Poultry Farm, Joysagar, Sivasagar district of Assam and ducklings were hatched at the Hatchery unit present at the farm. Eggs for hatching were been collected from different farmer's house where they reared ducks in the backyard systems and stored at room temperature. Duck hatching eggs are washed in

lukewarm water prior to grading and fumigation. Candling of the eggs was carried out and after candling fumigation of the eggs with potash and formaldehyde was done. The eggs were then transferred to the incubator or setter machine maintaining a temperature of 37.5°C and 55%-60% relative humidity for 26 days. On day 26 of incubation, eggs were transferred to hatchers set at 36.9°C and 65%-70% relative humidity. On day 28, hatched ducklings were transfer to the brooder house. They were provided with starter feed and clean lukewarm drinking water. Temperature of the brooder was maintained by providing 100 W electric bulbs in the Hover Brooder. Ducklings born were been studied for the different morphological characteristics and their body weight were been measured in weekly interval. All ducks received adlibitum feed from day one onwards. The ducks were weighed every week on an empty stomach before feeding in the morning. Pati duck reared in the farm condition were fed starter feed for the first month and then grower ration for another one month followed by layer ration. Body weight were been studied upto 8th weeks of age and after that the ducks shows more or less a constant body weight. Nearly 200 numbers of Pati ducks were been reared and studied for the weekly body weight and different body measurements. Parameters measured in the study are as follows.

Body weight

This was taken with a sensitive top loading scale of 5000 g capacity at day-old and at weekly intervals.

Bill length

This was measured as the distance between the tip of the bill and rear end of the beak.

Bill width

This was measured over the point of nostrils.

Head length

This was measured as the distance between rear end of bill and condyle occipital.

Neck length

This was measured as the distance between the first and last cervical vertebrae.

Breast length

This was measured between the anterior and the posterior border of the breast-bone crest.

Body length

It was measured as length of the body from the base of the bill to the tail near the uropygial oil gland.

Wing span

This was measured as the distance from the shoulder joint to the extremity of the terminal phalangx.

Body circumference

This was measured as the circumference of the body under the wing through the anterior border of the breast bone crest and the central thoracic vertebrae.

Shank length

This is the distance from the hock joint to the extremity of the digitus pedis.

Thigh length

This is the distance from the knee joint to the hock joint.

All linear body parameters were taken with a tailor tape in centimeters. The birds were closely observed for distribution of colour pattern in Bill, Eye and Eyelid. Plumage colour pattern in all part of the body (Head, Neck, Wing, Back, Tail, Thigh and Breast) were identified and documented by visual observation for the present study.

RESULTS AND DISCUSSION

Table 1 shows the mean growth performance based on the body weight of the Pati Ducks kept in farm condition (Barua *et al*., 1992, Das *et al*., 2000, Islam *et al*., 2002).

The matured Pati ducks after attaining an age of 8 weeks and above show different body coat colour. So Pati ducks were divided into five major groups based on their body coat colour (Mahanta *et al.* 2001) and mentioned in Fig 1 the five groups are coded as A, B, C, D and E based on their colour pattern.

Pati duck started laying eggs at an age of 26 weeks. There after they continuously kept on laying eggs more or less in all day (Phookan, *et al* 2018). The average weight of the eggs laid is mentioned above. The hatching percentages of the Pati duck eggs were on an average above 55%. The matured Pati ducks were then studied for different body parameters as mentioned in the Table 2.

Table 3 and Table 4 shows the colour pattern of the different groups of ducks shows different contour in respect

Table 1: Average weekly body weight of Pati duck.

Age	Average body weight of Pati duck (in kg)
Day old	0.039±0.56
1st week	0.065±0.32
2nd week	0.123±0.71
3rd week	0.233±0.35
4th week	0.353±0.18
5th week	0.523±0.41
6th week	0.803±0.38
7th week	0.925±0.13
8th week	1.243±0.42

Table 2: Average weight of eggs laid by Pati ducks.

Age	Average weight of Pati duck egg (in gm)
1st week of lay	38.4±1.42
2nd week of lay	40.9±0.76
3rd week of lay	43.2±0.43
4th week of lay	45.1±0.38
5th week of lay	50.3±0.72

of their body coat colour. Predominantly the bill colour is found to be yellow to orange in all the groups irrespective of male and female except in the case of khaki coloured female the bill colour is somewhat brown in colour. The feet colours in case of all the ducks and drakes are orange in colour. A typical greenish colour marking of the head region is seen in male of the Blackish brown group, whereas the marking is absent in case of the females.



Fig 1: Body coat colour of pati duck.

Table 3: Body measurement of matured Pati ducks and drakes.

Colour pattern of Pati duck and drake	Bill length	Bill width	Head length	Head width	Neck length	Breast length	Body length	Wing span	Body circumference	Shank length	Thigh length
White drake	6.166	4	6.5	6.8	18	18.66	29.66	44.33	32.33	5.33	7
White duck	5.5	3.33	6.33	6.5	16.33	17.66	28.66	43	30.33	5.67	7
Whitish light brown drake	6.16	3.9	6.33	6.33	15.67	18	30	43	30.67	5.67	8
Whitish light brown duck	5.8	3.66	6.5	6.5	14	17.33	28	39.33	31.66	5.33	8.67
Blackish brown drake	7.03	4.1	7.36	8.33	15.33	19.33	36.66	46.16	33	5.33	8.66
Blackish brown duck	5.83	3.2	6.33	6.66	12.66	17.33	27	34	31.33	5.33	7.66
Black and white drake	6.5	3.66	7	6.66	16.66	20	30.66	43.33	32.33	5.33	8.33
Black and white duck	5.83	3.66	7	6.5	15.33	19.33	28	42	30.66	5	8
Khaki coloured drake	6	3.33	6.33	6.5	16	20	31.33	43	30.66	5.33	8
Khaki coloured duck	5.33	3.33	6.5	6.66	16	18.33	30.66	42	30.66	5.33	7

Table 4: Colour pattern of matured Pati ducks and drakes.

Colour pattern	Head colour	Neck colour	Wing colour	Back colour	Tail colour	Thigh colour	Breast colour	Bill colour	Eye colour	Eyelid colour	Feet colour
White drake	White	White	White	White	White	White	White	Orange	Brown	White	Orange
White duck	White	White	White	White	White	White	White	Orange	Brown	White	Orange
Whitish light brown drake	White	Brown	Brown	Brownish	Brownish	Brown	Brown	Yellow	Brown	Black	Orange
Whitish light brown duck	Yellowish brown	White	White	Whitish Brown	Brown	White	Light Brown	Orange	Brown	Brown	Orange
Blackish brown drake	Grenish Black	Brown	Brown	Brown	Brownish	Brown	Brown	Yellow	Brown	Black	Orange
Blackish brown duck	Brownish Black	Brownish white	Brownish white	Brownish black	Brownish black	Brownish black	Brownish black	Orange	Brown	Brown	Orange
Black and white drake	Greenish	Greenish brown black	Brownish with white stripe	Brownish black	Brownish white	Brownish black	Brownish Black	Orange Black	Black white	black	Orange
Black and white duck	White and black spot	Black and white	Brownish black with white spot	Brownish black	Brownish black	Brownish black with white spot	Light Brown	Orange	Brown	Brown	Orange
Khaki coloured drake	Greenish Black	Green	Brown	Brown	Brownish black	Brown	Brown	Yellow	Brown	Brown	Orange
Khaki coloured duck	Brownish Black	Brownish Black	Brownish Black	Brownish Black	Brownish Black	Brownish Black	Brownish Black	Brown	Brown	Black	Orange

CONCLUSION

Procurement of improved genetic stock, adoption of better management system, providing qualities ration to the ducks and increased knowledge and application of disease control, have an important role for popularization and further development of duck farming in this region. The present study will provide baseline information of morphological characteristics of native Pati duck breed of Assam. Moreover it needs another few generations to study its consistence performance both in respect of production and adaptability. The present study will provide baseline information of morphology and morphometric characteristics of native Pati Duck breed of Assam. It will help to formulate the selection strategies and systematic breeding policy. The study also helps to exploiting potentiality of native ducks and conservation of unique germplasm for near future.

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Conflict of interest

Authors declare no conflict of interests for this article.

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