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Phenotypic characteristics of desi chickens in Bidar district of Karnataka

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Abstract

A study was undertaken to evaluate the phenotypic characteristics of indigenous chicken under farm conditions in Bidar district of Karnataka state. The sample size comprised of two hundred and fifty desi chickens in Bidar district. The qualitative characteristics like skin colour, earlobe colour, comb colour, comb type, wattle presence or absence, plumage colour shank colour and eye colour, these characteristics were quite distinct than the other native chickens. The 80% of the birds had yellow skin and 20% had white skin. Red (52%) earlobes were most common, followed by white (20%) and a combination of red and white (32%). The comb type of indigenous chicken from Bidar district of Karnataka was predominantly single. The highest plumage colour birds were multi-coloured, brown, black and white, of these, 18% were black, 26% were brown, 16% were white and 40% were multicoloured. The most prominent shank colour was yellow (62%), followed by white (20%), black (10%) and green (8%). All of the desi chicken of Bidar district had shown 100% yellow colour eye. This study revealed distinctive variations among the desi birds of Bidar division.

Keywords: Qualitative characteristic, indigenous chicken, plumage, shank, comb

Introduction

India is one of the richest countries in the world in terms of its flora and fauna, including poultry genetic resources, which play a major role in supporting the economic development of rural Indian populations (Padhi, 2016) [20]. In India the poultry rearing has occupied a pivotal position both in providing employment and contributing a substantial proportion to the national GDP. Among the 72 poultry breeds found in Asia, India has 20 indigenous poultry breeds along with various subtypes that has been catalogued by the National Bureau of Animal Genetic Resources (NBAGR) in Karnal. Indigenous chicken is a storehouse of genetic diversity, along with several genomes and major genes of tropical relevance. In addition, native germ plasm has great utility for backyard poultry which reduced malnutrition and unemployment especially in rural areas. Indigenous poultry farming played a vital role in the economic development of India.

According to the 20th Livestock Census report, the total poultry population is 851.81 million, in which the backyard and commercial poultry production in India were 317.07 million and 534.74 million, respectively. The backyard and commercial poultry cover approximately 18.56% and 81.44%, respectively (DADF, 2019) [5]. Native chickens play an important role in rural and tribal homes in India (Khan, 2008) [13]. Backyard chicken rearing is integral to many rural households in India. The rearing of indigenous chickens is a prime livelihood option for landless tribal people and small-scale enterprises for marginal and small farmers (Pathak and Nath, 2013) [22] and backyard chicken rearing is a lucrative and parallel source of supplementary income. Subsidiary income, nutritional security with the addition of important animal proteins and empowerment of women are the main concerns of poor farmers with small landholdings (Shukla *et al.*, 2011) [26]. Native chickens are known for their disease resistance and ability to adapt to harsh humid climatic conditions. Furthermore, consumers have a huge demand for native chicken meat because of its desirable taste, superior flavour, firm texture, lower cholesterol, free from antibiotic residues (Zhao *et al.*, 2007; Chen *et al.*, 2008) [37, 4] and higher levels of the amino acids threonine and valine in eggs, pigmented lean meat and meat rich in the amino acids arginine and lysine make rural poultry goods preferable over commercial poultry.

Native chicken production has a huge demand for meat and eggs because of their nutritional and medicinal value. Native chickens exhibit significant morphological variation in qualitative traits, such as plumage colour, skin colour, shank colour, ear lobe colour and comb colour, as well as quantitative traits, such as body weight, shank length, shank colour and keel length. Domestic chicken breeding strategies should consider their unique characteristics and aim to increase productivity while preserving natural characteristics, such as hardiness, improved immunological function, flight and broodiness. (Rajkumar, 2018) [24].

Materials and Methods

The present study was carried out in the department of Livestock Production and Management, Veterinary College Bidar, KVAFSU Karnataka. The study was conducted on desi birds in Bidar district to record its phenotypic characteristics. A total of 500 desi eggs were collected from surrounding villages of Bidar district, Karnataka. These eggs were incubated for 21 days following the incubation and hatching protocol. After hatching, 250-day-old good quality chicks were selected and wing banded individually, further they were used for the research study. The phenotypic characters desi chickens from Bidar district consisting of both male and female birds were recorded. Included skin colour, ear lobe colour, comb type, comb colour, shank colour, plumage colour and presence or absence of wattle.

The data obtained from the present study were subjected to simple mathematical calculations to derive the individual percentages.

Results and Discussion

Skin colour

In the present study, when the skin colours of desi chickens were recorded, two skin colours were noted. Out of 250 birds, 200 birds had yellow skin colour (80%) and the remaining 50 birds had white skin colour (20%). These findings of the present study were comparable with those of Msoffe *et al.* (2001) [17] on local chickens in Tanzania with 71% and 29% of the birds being yellow and white, respectively; The present study was also closely correlated with those by Pandey *et al.* (2005) [21] on the Aseel chicken breed, Vij *et al.* (2006a) [29] on Punjab Brown chicken and Dana *et al.* (2010) [7] on Ethiopian indigenous chicken.

Earlobe colour

In the present study, when the earlobe colour of desi chickens was observed, three ear lobe colours were noted. Out of 250 birds, 130 birds had red earlobe colour (52%), 80 birds had mixed colour of red and white (32%) however, the remaining 40 birds had white earlobe colour (20%). The results of the present study were in agreement with earlier findings by Msoffe *et al.* (2001) [17] in Tanzanian local chickens had 65% red and 35% white ear lobes. Similar findings were also reported by Bhuiyan *et al.* (2005) [2] on indigenous chickens in Bangladesh, Moreda *et al.* (2014) [16] in indigenous chickens in Ethiopian, Sarker *et al.* (2014) [25] in indigenous chickens of Bangladesh, Lahlimpua *et al.* (2021) [14] in the native chickens of Mizoram and Maharani *et al.* (2021) [14] on indigenous chickens of Indonesia.

Comb type

The comb types of desi chickens from the Bidar district have been documented as 100 percent single. According to the

literature, indigenous chickens primarily had single combs, followed by rose and pea (Vij *et al.* 2005 [28] in Danki chicken birds, Vijn *et al.* 2005 [28] in Miri chicken birds, and Tantia *et al.* 2005 in Kashmir Favrolla chicken breed). The findings of the present study were comparable to those of Bhuiyan *et al.* (2005) [2] in desi chickens of Bangladesh was single (97%), Badubi *et al.* (2006) [1] in native birds of Botswana was single (90.4) and Vij *et al.* (2006b) [30] in Daothigir chicken breed had single combs. Similar study were also relatively associated with Vij *et al.* (2007) [31], Chatterjee and Yadav (2008) [3] in Nicobari fowl, Faruque *et al.* (2010) [9] in Bangladesh native birds.

Comb colour

In the present study, the predominant comb colours were red and black. The percentages of red-combed and black-combed birds were 92% and 8%, respectively. This observation is supported by Vij *et al.* (2005) [28] Vijn *et al.* (2005a) [34] Tantia *et al.* (2005a) [27] and Vijn *et al.* (2006) [36] reported red combs in Danki, Miri, Kashmir Favrolla and Nicobari chicken breeds, respectively. Similar findings were also found in Vij *et al.* (2007) [31] in Tellicherry chickens, Iqbal and Pampori (2008) [11] in Kashmiri Favarolla birds and Gopinath (2013) [10] in indigenous chickens of Mysore division. Vij *et al.* (2015) [32] in the Harringhata Black breed, Vij *et al.* (2016) [33] in the Kaunayen chickens

Shank colour

In the present study, the shank colour was yellow, black, green and white. Of these, 62% were yellow, 10% were black, 8% were green and 20% were white. In the present study, the shank colours were yellow (62%), black (10%), green (8%) and white (20%). The results of present study are in conformity with those of Vij *et al.* (2005) [28] reported most birds were yellow shanked in Danki chicken, Tantia *et al.* (2005a) [27] noted that most of the Kashmiri Favorolla birds were yellow shanked, Daikwo *et al.* (2011) [6] noted most of the local chickens of Dekina birds were white (8.5%), black (13.75%), black/yellow (37.25%) to yellow (40.50%) shanked.

The similar study was also reported by Gopinath (2013) [10] in indigenous chickens of Mysore division Rajakumar (2013) [23] in indigenous chickens of Bangalore division of Karnataka, Veeranna Gowda (2020b) [38] on indigenous birds of Belgaum division and Sudhir *et al.* (2021) [39] on native chicken of Gulbarga division.

Plumage colour

In the present study, the plumage colour was brown, black, white and multi-coloured. Of these, 18% were black, 26% were brown, 16% were white and 40% were multicolour. The findings of the current study were consistent with those of Orheruata *et al.* (2006) [19] who found that brown, black, white and mixed accounted for 62%, 22%, 13% and 3% of the plumage colours respectively in indigenous chicken of Nigeria, Duguma (2006) [8] in indigenous chickens of Ethiopia, showed that black (13.9%), white (18.8%), reddish gray (9.3%), gray (18.2%), red (20.8%) and red brown (18.9%).

The similar results were also in comparable with Faruque *et al.* (2010) [9] in indigenous chickens of Bangladesh, Iqbal and Pampori (2008) [11] in the Kashmir indigenous birds, Kaur *et al.* (2010) in local hill fowl of Central Himalayan, Daikwo *et al.* (2011) [6] in the local chickens of Dekina, Gopinath (2013)

[10] in indigenous chickens of Mysore division, Rajakumar (2013) [23] in indigenous chicken of Bangalore division,

Wattles

In the present study, the presence and absence of wattles in the birds were 54% and 46%, respectively. In the present study, the presence and absence of wattles in the desi chickens of Bidar district were 54% and 46%, respectively. These results are in conformity with the breed descriptor of

chicken (NBAGR-2011) Ghagus breed smaller red wattles. Genetically, wattle is inherited as a polygenic trait. Rajakumar (2013) [23] found similar results in indigenous chickens of Bangalore Division, noting that the overall percentage of female birds with wattles (50.93%) and without wattles (49.07%). The findings were also in agreement with those of Vijn *et al.* (2005b) [35] in the Kalasthi chickens, Vijn *et al.* (2006) [36] in the Punjab Brown.

Table 1: Phenotypic Characteristics of Desi Chicken of Bidar District

S. No	Number of Birds	Parameters	Percentage
1.	250	Skin colours	80
		Yellow	20
2.	250	Earlobes Colour	32
		Red & White	52
		Red	16
3.	250	Comb type	100
4.	250	Single	92
		Comb colour	8
5.	250	Red	54
		White	46
6.	250	Wattles	62
		Present	10
		Absent	8
		Shank Colour	20
		Yellow	10
7.	250	Black	18
		Green	26
		White	16
		White	40
		Multicolour	



Plate 1: Earlobe Colour of Desi Chickens in Bidar District

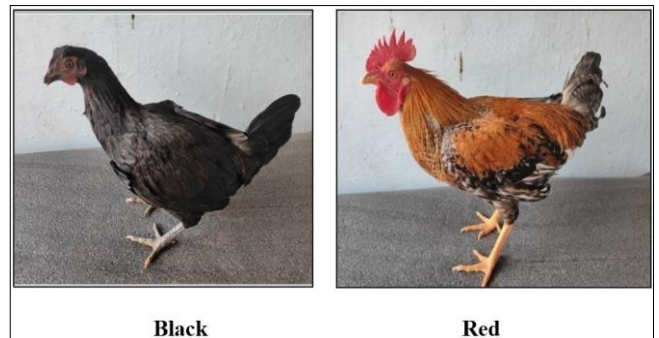


Plate 3: Comb colour of Desi Chickens in Bidar District

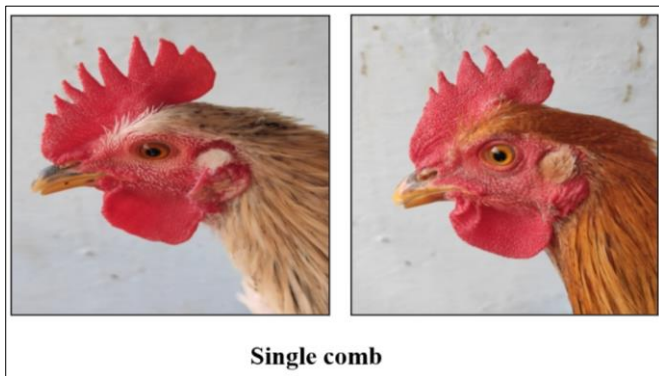


Plate 2: Comb Type of Desi Chickens in Bidar District



Plate 4: Shank Colour of Desi Chickens in Bidar District



Plate 5: Plumage Colour of Desi Chickens in Bidar District

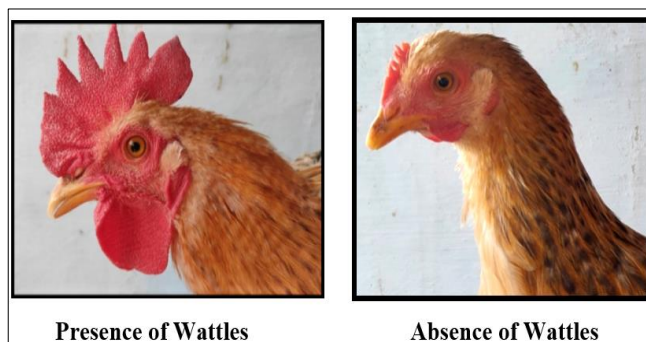


Plate 6: Presence or Absence of Wattles in Desi Chickens of Bidar District

Conclusion

This study will help to identify the desi chickens by observing their distinct phenotypic characteristics and phenotypic variation in birds is affected by both environmental and genetic factors. It will help to conserve and utilize this pure indigenous genetic material. Further research is required to determine the molecular characterization of the desi chickens of the Bidar district as well as its genetic resemblance and genetic divergence from other Indian breeds.

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