Original Research Article

Phenotypic Characterization of Indigenous Chicken, Daohaita in Chirang District of Assam

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ABSTRACT

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| **Aims:** The study was conducted to assess the morphological characteristics of indigenous Daohaita chicken in Chirang district of Assam. **Place and Duration of Study:** The study was carried out in three villages viz., Subhaijhar, Shantipur, and Bengtol under Sidli block of Chirang district as these villages have sizeable population of Daohaita birds. The observations on morphological characteristics were collected from the study areas during August, 2023 to April, 2024.**Methodology:** Data on 210 Daohaita chicken were utilized to study the traits like skin colour, plumage colour, comb type, comb colour, earlobe colour, shank colour, wattles type, wattles colour, eye colour and egg shell colour. The selected areas were visited to collect information on the phenotypic characteristics based on visual appraisal of the appearance of the Daohaita chicken from a total of 210 individual chickens. The data obtained from the present study were analyzed by adopting the method given by Snedecor and Cochran (1994).**Results:** The study revealed that 82% of the birds had pinkish skin and 18% had creamy white skin. The highest plumage colour birds were multi-coloured (40%) followed by soild brown (27%) and white with brown or orange (14%). The comb type of Daohaita was predominantly single combed. Most common comb colour was bright red (62%), followed by reddish (38%). Reddish white (43%) earlobes were most common, followed by Red (34%) and white (23%). The most prominent shank colour was white (65%), followed by yellow (20%), brown (8%) and grey (7%). Daohaita birds have small wattles (87%) which are red in colour. The yellow colour eye (62%) was most frequently observed than pearl colour (30%) and brown colour eyes (8%). Most of the hen lay creamy white shelled egg (75%) followed by white (15%) and light brown (10%). **Conclusion:** Future research should focus on the genetic basis of these qualitative traits, their impact on performance, and strategies for sustainable improvement. |

*Keywords: Daohaita; dwarf chicken; phenotypic; characterization; plumage colour*

1. INTRODUCTION

A dwarf type of desi chicken popularly known as Daohaita mostly found nearby villages inhabited by Bodo community in the Chirang district of Assam adjacent to Bhutan boarder. Daohaita chickens are distributed in the villages namely, Subhaijhar, Shantipur, Bengtol, Salbari etc. of Chirang district and some places of Kokrajhar district. The name Daohaita comes from the bodo word Dao means chicken and Haita means dwarf type. These birds are small, dwarf, compact with small legs known for resistance to diseases having ability to survive with low input feed with low productivity (Rahman et al., 2024). According to 20th Livestock census report Assam has the total poultry population 457.12 lacs out of which Chirang district possesses 7.34 lacs sharing 1.6 percent of state population (DADF, 2019). Assam possesses a wide variety of non-descript chicken, but the valuable germplasms are undergoing genetic erosion due to continuous indiscriminate crossing with improved breeds/varieties. In country like India, phenotypically the indigenous chickens are poorly characterized which has led to the loss of poultry genetic resources (Negassa et al., 2014 and Brown et al., 2017). Hence characterization, improvement and conservation programmes of indigenous chickens are very important to save them from their genetic loss. Recently, attention has been given to the improvement and conservation of native chickens due to higher preference of consumers and higher price than the exotic, crossbred and commercial hybrids (Hamid, 2019). Therefore, there is a need of phenotypic characterization of indigenous chickens for the purpose of sustainability and conservation. Furthermore, it is an useful tool as it is simple, easy, fast and cost effective (Maharani et al., 2021). Thus, the present study was undertaken with the objective of phenotypic characterization of dwarf type Daohaita chicken in their habitat place of Chirang district of Assam.

2. materials and methods

**2.1 Study Area**

The study was carried out in three villages viz., Shantipur, Bengtol and Subhajhar under Sidli block of Chirang district as these villages have sizeable population of Daohaita birds. The observations on morphological characteristics were collected from the study areas during August, 2023 to April, 2024. The birds were reared by the rural farmers specially the tribal women under traditional scavenging system of management. Birds are housed during night with make shift shelter made with bamboo.

**2.2 Sample Collection**

The selected areas were visited to collect information on the phenotypic characteristics based on visual appraisal of the appearance of the Daohaita chicken from a total of 210 individual chickens.The data obtained from the present study were subjected to simple mathematical calculations i.e., the percentage of the phenotypic characteristics from total number of chickens by adopting the method given by Snedecor and Cochran (1994).

3. results and discussion

**3.1 Skin Colour**

The present findings indicated that Daohaita native chicken has predominantly pinkish appearance in skin colour (82%) followed by creamy white (18%). The findings are also similar with that in Daothigir breed of Assam reported by Vij et al., 2007 and Zoar native chicken of Mizoram as reported by Lalhlimpuia et al., 2021.

**3.2 Plumage colour**

In the present study, the plumage colour was solid brown (27%), white irregulars spots mixed with base color brown or orange (19%), light orange (14%) and rest are multi-coloured (40%). The similar results were also in comparable with Meenaxi et al., 2023 who found that brown and mixed color accounted for 26% and 40% respectively in desi chickens in Bidar district of Karnataka.

**3.3 Comb Type**

The comb type of Daohaita from Chirang district have been documented as 100 percent single. The findings of the present study were same with 100 percent single in Daothigir chicken breed by Vij et al., 2006b and by Meenaxi et al., 2023 in desi chickens of Bidar district of Karnataka.

**3.4 Comb Colour**

In the present study, the predominant comb colours were bright red (62%) followed by reddish (38%). This observation is supported by Ferdaus et al., 2016 who also reported 66.67% as bright red earlobe followed by 33.33% reddish earlobes. Similar findings were reported by Bhuiyan et al., 2005 and Faruque et al. 2010.

**3.5 Earlobe colour**

In the present study, three earlobe colours were observed. Out of 210 birds, 90 birds had reddish white earlobe colour (43%), 72 birds had red colour (34%) however, the remaining 48 birds had white earlobe colour (23%). The results of the present findings agreed with earlier findings by Sarkar et al., 2014 and Ferdaus et al., 2016. While Lalhlimpuia et al., 2021 found that most frequent earlobe colour observed in local chicken of Mizioram was red (73.38%), followed by red and white mixture (22.37%)

**3.6 Shank colour**

Shank colour was observed and indicated into four types white (65%), yellow (20%), Brown (8%) and grey (7%). Similar results with white dominant characters reported by Rahman et al., 2024 who reported white colour (40%), black (30%), yellow (20%) and brown (10%). Moreda et al., 2014 also reported in their findings where white colour was dominant in regards to shank colour of indigenous chicken population in South West and South part of Ethiopia.

**3.7 Wattles**

All the birds under present study showed presence of small wattles (87%) and absent in 13%. Majority of birds having red coloured wattles (100%) which was similar with the findings reported by Gopinath, 2013. As per breed descriptor (NBAGR, 2011) the Ghagus breed had smaller red wattles while wattles are absent in Danki breeds Vij et al., 2005.

**3.8 Eye Colour**

Most common eye colour in the present study was yellow colour (62%) followed by pearlcolour (30%) and brown colour (8%). These findings were similar with the observations reported by Kamal et al., 2024.

**3.9 Egg Shell color**

In the present study egg shell colour of Daohaita chicken was reported as creamy white (75%), white (15%) and light brown (10%). Similar findings were reported by Kamal et al., 2024 in Jharkhand native chicken where he showed a predominance of cream white egg shell.

**Table 1. Phenotypic characteristics of Daohaita chicken of Chirang district**

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| --- | --- | --- | --- |
| Sl. No | Parameters | Number of birds | Phenotypic Frequency (%) |
| A |  | Skin Colour |
| i | Pinkish appearance | 173 | 82 |
| ii | Creamy White appearance | 37 | 18 |
| B |  | Plumage Colour |
| i | Solid brown  | 57 | 27 |
| ii | White irregular spots mixed with base colour brown or orange | 30 | 14 |
| iii | Multi coloured | 85 | 40 |
| C |  | Comb type |
| i | Single | 210 | 100 |
| D |  | Comb colour |
| i | Bright Red | 130 | 62 |
| ii | Reddish | 80 | 38 |
| E |  | Ear lobes |
| i | Reddish white | 90 | 43 |
| ii | Red | 71 | 34 |
| iii | White | 49 | 23 |
| F |  | Shank Colour |
| i | White | 136 | 65 |
| ii | Yellow | 42 | 20 |
| iii | Brown | 17 | 8 |
| iv | Grey | 15 | 7 |
| G |  | Wattles |
| i | Small Wattles | 183 | 87 |
| ii | Wattle absent | 27 | 13 |
| iii | Red colour wattles | 210 | 100 |
| H |  | Eye colour |
| i | Yellow | 130 | 62 |
| ii | Pearl colour | 63 | 30 |
| iii | Brown | 17 | 8 |
| I |  | Egg Shell colour |
| i | Creamy white | 158 | 75 |
| ii | White | 31 | 15 |
| iii | Light brown | 21 | 10 |





**Fig. 1. Daohaita cock Fig. 2. Daohaita hen**

4. Conclusion

The study on the morphological characteristics in Daohaita chickens provides valuable perceptions into their unique phenotypic traits, which play a key role in their adaptability, productivity, and economic importance. The observed variations in plumage colour, skin colour, comb type, shank colour, earlobe colour and other qualitative traits indicate a diverse genetic pool, which is essential for maintaining genetic flexibility and adaptability to local environmental conditions. Future research should focus on the genetic basis of these qualitative traits, their impact on performance, and strategies for sustainable improvement. Strengthening breeding programmes and integrating these chickens into structured poultry development plans can contribute to food security, rural livelihood, and biodiversity conservation.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

All Authors hereby declare that no generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

**ETHICAL APPROVAL**

All authors hereby declare that there is no ethical issue in this manuscript.

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**COMPETING INTERESTS**

All authors have declared that they have no known competing interests.

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