

Morphological characterization of feathered shank local hill fowl of Central Himalayan Region of India

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Most of the hill fowls are unique in their adaptation to agro-climatic conditions of their habitat and the prevalent managerial practices. This germplasm is unexplored and possess various potential gene combinations responsible for survival in very rough conditions of Uttarakhand. There is very little information available on characteristics of local hill fowl of Uttarakhand. However, existence of different strains of local hill fowl was reported by Pant *et al.* (2007), where, shank feathered strain was one of them. So, present survey work was carried out for the morphological characterization of shank feathered local hill fowl of Kumaon region of Uttarakhand state.

The information was collected from the selected villages of district Pithoragarh. Twenty villages were selected for detailed study in the following 4 Community Development Blocks of Pithoragarh, viz. Vin, Munakot, Kanalichhina and Gangolihat. Five villages were selected in each block. The families rearing poultry birds in each village were selected to collect desirable information for the pre-structured performa. Data were collected during the year 2005–06 on the phenotypic descriptor, viz. plumage colour and pattern, skin colour, earlobe colour, comb type and colour, eye color and shank colour. Randomly selected 736 birds from the population under study were sexed and described phenotypically (Fig. 1).

Morphological characterization of shank feathered local hill fowl of Kumaon region showed variation in body appearance. The variations were observed in general features such as crested and normal heads, plumage colour and pattern, skin colour, earlobe colour, comb type and colour, eye colour, shank colour etc.

Plumage colour: Shank feathered local hill fowl males had prominently mixed colours in their plumage with black

brown gold (49%), followed by black brown (29%), black golden (14%), black red brown white (5%) and black white (3%). On the other hand, female birds had 42% single colour plumage; most frequent single colour was found to be black (21%), followed by brown (15%), dusty brown (3%) and almond colour (3%). Shank feathered females also had notably mixed colour plumage (58%). In mixed colour plumage of females, 39% hens had black brown plumage, 11% black white, 3% black golden, 3% white black brown and 2% black brown gold mixed colour. The findings of Missohou *et al.* (2002) in Senegalese chicken, Mc Ains *et al.* (2004) in indigenous chicken, Badubi *et al.* (2006) in indigenous Tswana chickens and Pant *et al.* (2007) in hill fowl of Nainital region of Uttarakhand State were in close agreement with our results. Variability of plumage colour in hill fowl helps them to camouflage against predators.

Plumage pattern: Shank feathered local hill fowl possess different feather patterns. Males possess solid plumage pattern (56%), followed by solid spotted (14%), stripped (13%), dull (12%), barred (3%) and solid stripped (2%). In case of females, most of the hill fowl represent solid plumage pattern (46%), followed by dull (23%), stripped (11%), patchy (6%), dull stripped (6%), barred (4%) and spotted (4%). Badubi *et al.* (2006) in indigenous chicken of Botswana and Duguma (2006) in Tepi, Jarso and Horro ecotypes reported similar findings as of the present study.

Skin colour: The skin colour in shank feathered hill fowl was generally yellow. Nthime (2004) reported white skin in Lesotho native chicken. Colour of skin depends on combination of pigments in the upper and lower layers of skin that are particularly associated with presence or absence of melanin pigments in dermis and epidermis of the skin.

Shank colour: Black yellow coloured shanks were more frequently (51% in males and 53% in females) encountered in the present study.

Eye colour: Eyes were predominantly brown-black (49% in males and 56% in females), followed by grey-black (41% in males and 32% in females), orange-black (9% in males

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Table 1. Morphological traits of shank feathered local hill fowl (n=736)

Trait	Colours	Percentage (%)	
		Male	Female
Plumage colour	Black golden	14	3
	Black brown	5	40
	White black	3	6
	Black brown gold	49	1
	Black red brown white	29	—
	Dusty brown	—	3
	Almond	—	3
	Brown	—	15
	Black	—	21
	Brown gold	—	5
	White black brown	—	3
Plumage pattern	Dull	12	23
	Stripped	13	4
	Solid	56	46
	Barred	3	4
	Solid spotted	14	—
	Solid stripped	2	—
	Patchy	—	6
	Spotted	—	4
	Dull striped	—	6
Shank colour	White	14	—
	Yellow	35	7
	Blackish yellow	51	53
	Whitish yellow	—	40
Earlobe colour	Red	21	48
	White red	53	41
	Yellow red	26	11
Eye colour	Black	1	3
	Orange black	9	6
	Brown black	49	56
	Grey black	41	36
	Grey brown	—	3
Comb type	Single	98	92
	Rose	2	—
	Pea	—	8
Multi spur	Present	31	—
	Absent	69	—
Bunch of feathers on head	Present	31	42
	Absent	69	58

and 6% in females), total black (1% in males and 3% in females); and grey brown (2% in females only) in hill fowl. For eye colour similar trend was observed in both sexes. The findings of present study revealed that sex did not affect eye colour pattern in local hill fowl. Duguma (2006) found 100% black eyes in all 3 ecotypes of Ethiopian chicken.

Earlobe colour: Earlobe colour in male Shank feathered hill fowl was mainly white red (53%), followed by yellow red (26%) and red (21%). However, red colour predominantly distributed (49%) in females followed by white red (41%) and yellow red (10%). Duguma (2006) reported white colour predominantly in the Horro, Tepi and Jarso ecotypes of Ethiopia and Nthimo (2004) reported red earlobe in



Fig. 1. Feathered shank local hill fowl

indigenous chicken.

Comb colour and comb type: It was found that shank feathered local hill fowl dominated with single type comb, i.e. 98% and 92% in male and female birds, respectively. However, 8% female birds possess pea type comb and male birds occasionally have rose comb (2%). While regarding colour pattern, the majority of comb colour was red with a few having pale comb. Black colour was also visible on tip of the comb blade. The results of present study were in close agreement with those reported by Mc Ainsh *et al.* (2004) in local chicken. Nthimo (2004) reported mainly single and pea comb and occasionally rose comb in Lesotho chicken.

Other specific traits: Shank feathered strain of local hill fowl also possess multi-spur in 31% of male population in the field. As we know that multi-spur was visible in the later stage/age. During the study cockerels were also considered in the male category. Close observations clearly showed that some variation existed in leg feathers such as scanty, moderate and dense. In Shank feathered fowl 42% females and 30% males possess bunch of feathers on their head, just like crest. Mc Ainsh *et al.* (2004) and Badubi *et al.* (2006) in indigenous Tswana chickens also reported crested head.

Local Hill Fowls are well adapted to the harsh climatic conditions of the mountain areas and poor management provided to them. They are contributing significantly by providing nutritional security to their families and income generation through sale of egg, meat and live birds. Feathered shank local hill fowl represents an important reservoir of genetic variation that should be conserved. There is urgent need to take up the *in-situ* and *ex-situ* conservation of potential unexplored germplasm by setting up the appropriate breeding plans and sufficient infrastructure. It can be further used for development of new breed/commercial strains to strengthen backyard production system.

SUMMARY

Morphologically shank feathered local hill fowl of Kumaon region showed some variation in body appearance.

Shank feathered local hill fowl had prominently mixed colour in their plumage with solid, spotted, stripped, dull and barred plumage pattern. The skin colour in shank feathered hill fowl was generally yellow. Black-yellow coloured shanks and brown-black eyes were most frequently encountered. Earlobe colour in shank feathered male hill fowl was mainly white-red followed by yellow-red and red. However, red colour predominantly distributed in females followed by white-red and yellow-red. Shank feathered local hill fowl dominated with single type comb. However, female birds possess pea type comb. The majority of comb colour was red with a few having pale comb. Shank feathered strain of local hill fowl possess multi-spur in 31% of male population in the field. In Shank feathered fowl some birds (42% and 30% in females and males, respectively) possess bunch of feathers on their head, just like crest. Male birds were superior in comparison to females in all the physical traits. Local have good adaptation in mountain areas and show high resistance against many diseases and stress conditions. They are also subjected to challenging selection pressure due to the poor management conditions under which they are kept.

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