Phenotypic Characterization of Non-descript Cattle of Mahakaushal Region of Madhya Pradesh

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ABSTRACT

The present research work was carried out in Jabalpur, Mandla, Dindori and Seoni districts of Mahakaushal region of Madhya Pradesh and total of 1121 animal were used for phenotypic characterization, where adult male, adult female, male calf and female calf was 184, 817, 40 and 80 in numbers, respectively. The cattle population of Mahakaushal region had mostly white and grey skin and coat colour; muzzle and eyelid colour was black. Tail switch, hooves and horn colour was mostly black. Horn orientation was towards upward and forward with straight orientation. Ear position was horizontal. Forehead was flat and triangular. Hump, dewlap and udder was small in size with round shape teats. Animals were mostly of ferocious nature and had alert temperament. Phenotypic characterization findings of the present study revealed that the non-descript cattle population of Mahakaushal region is a unique descriptive breed of Madhya Pradesh and can be registered as new breed of cattle. These findings will be used for conservation and designing breeding strategy for genetic improvement.

HIGHLIGHTS

◉ The cattle have a small size body with mostly grey and white coat and skin colour.
◉ The muzzle, eyelids, hooves, horns and tail-switch are the mostly black colour.
◉ It is a first preliminary data on genetic diversity of population of cattle in Mahakaushal region of Madhya Pradesh.

Keywords*: Genetic diversity, Mahakaushal region, characterization, survey*

India has the largest number of livestock (535.78 million), representing over 17 per cent of the world population. As per the 20th livestock census, the total cattle population in India is 192.49 millions showing an increase of 0.80 per cent over previous census. However, there is a decline of 4.42 per cent in total number of cattle (18.70 millions) in Madhya Pradesh over the 19th livestock census (BAHFS, 2020). The present study has been planned to assess the phenotypic characterization of local cattle population in Mahakaushal region of Madhya Pradesh.

Breed characterization enables us to investigate the genetic variability, a significant factor in working out breeding strategies and genetic conservation plans. There are 50 recognized breeds of cattle in India, in addition to large number of non-descript cattle. In previous times, many number of the indigenous breeds declined in number mainly due to their becoming uneconomical. India has large number of breeds with wide genetic diversity than other countries. The local breeds have many merits over

exotic breeds like better disease resistance than exotic breeds, more suitable for low input management system, survive better in local environmental condition, suitable for draught work in addition, existence of superior indigenous breeds can provide valuable research inputs for developing superior breeds. Therefore, it is essential that indigenous breeds of cattle are to be conserved, developed and proliferated. Breed registration and recognition is a crucial step for breed certification and all relevant information regarding the enormous and bio-diverse animal genetic resources of our country the procedure shall lead to formation of breed inventory and try identifying and understanding these unique genetic resources which shall ultimately facilitate the genetic improvement of the native livestock population (Savalia *et al.*, 2019).

MATERIALS AND METHODS

The present study was carried out in Department of Animal Genetics and Breeding, College of Veterinary Science and Animal Husbandry, NDVSU, Jabalpur (M.P.) in association with ICAR-National Bureau of Animal Genetic Resources Karnal, Haryana, India. The research work was planned to study the morphological or phenotypic characterization of non-descript cattle in Mahakaushal region of Madhya Pradesh. In the present study, an attempt was made to assess the phenotypic variability of cattle population in the Mahakaushal region of Madhya Pradesh. Phenotypic characterization of cattle population was carried out in accordance to the standard protocol of ICAR-NBAGR, Karnal (Haryana). The information of physical traits was obtained through interview of cattle owners on pre designed questionnaire by ICAR-NBAGR. The information of morphological characters *i.e.* body coat and skin colour, horn colour, hooves colour, tail switch colour etc. were considered.

The analysis data collected over various physical and morphological traits of non-descript cattle population of Mahakaushal cattle was done using Microsoft excel.

RESULTS AND DISCUSSION

Physical characteristics of cattle population in Mahakaushal region

The cattle population under study are mainly present in the interior areas of districts and villages which are close to the forest area where hardly any facility for artificial insemination was available. During the survey, it was found that the cattle population was in the pure form because the mating of animals was mainly based on natural service and artificial insemination was rarely preferred by the farmers. The physical characteristics of cattle population in Mahakaushal region is shown in Table 1.

Table 1: Physical characteristics of cattle population

Traits	Types
Skin colour	Black/dark grey/light grey (white)/light brown
Coat colour	Light brown/Black/dark grey/light grey (white)
Muzzle colour	Black/light black/light grey
Eyelids colour	Black/brown/ light grey
Tail switch colour	Black/light grey/light brown
Hooves colour	Black/grey
Horns Colour	Black/dark grey/light grey
Horn Shape	Straight/curved
Horn Orientation	Upward & inward pointing tips/downward/ backward /Forward Pointing tips/others
Ears Orientation	Horizontal/ Vertical
Forehead	Convex/ Concave/Straight
Hump	Small/Medium/Large
Dewlap	Small/Medium/Large
Navel Flap	Small/Medium
Penis sheath	Small/Medium
Basic temperament	Moderate/ Ferocious/Docile
Udder Shape	Bowl/Round/Trough/Pendulous
Fore-udder size	Large/Medium/Small
Rear-udder size	Large/Medium/Small
Teat shape	Cylindrical/ Funnel/Pear shape
Teat tip	Pointed/ Round/flap
Milk Vein	Prominent/Less Prominent

Morphological characteristics of cattle population

The summary of characteristic features of cattle population of Mahakaushal region has been presented in table 02. The body coat colours of the cattle under study were black (8.38%), grey (22.56%), white (54.68%) and brown (13.73%). The skin colour was black (14%), red (19.8%), grey (32.7%) and white (33%). Animals were having hairy

skin. Animals were having range of body coat colours but grey and white colour animals were predominantly found. The most common muzzles colours (95%) and eye lid colour (97%) observed was black. The tail switch colour was found to be black in more than 95 per cent cattle population. Hooves colours were mostly black (98%). Most of the animals were having black (98%) colour horn. Almost 80 per cent animals had straight horns and about 19 per cent animals had curved horn, The common ear position was horizontal (92%) and very less animals were having drooping ears, The shape of forehead were mostly straight, flat and triangular (>90%) and some animals were also having slightly concave forehead (<10%). Most of the cattle population of Mahakaushal region had small sized hump (69%) and remaining animals had medium size hump. The basic temperament of cattle of Mahakaushal region was found to be furious (74.7%) and remaining animals were docile in nature. Colour of udder was ranged from white to pinkish. Udder was small in size with about 99 per cent of the fore udders and rear udders were small in size. Most of the cattle population had cylindrical type of teats (91%) followed by funnel and conical (9%) type. Round shaped teats were observed in 93 per cent of the cattle population whereas; only 14 per cent of cattle population had pointed teats. The milk vein was prominent in only 15 per cent of cattle population. Present findings are in consistent with the previous findings of indigenous cattle of Asam (Kayastha *et al.,* 2011), Uttara cattle of Uttarakhand (Pundir *et al*., 2013), non-descript cattle population in Ratnagiri district of Konkan region (Khirari *et al.,* 2014), non-descript cattle of north 24 Parganas and Howrah districts of West Bengal (Biswas *et al.,* 2015), indigenous cattle of Manipur (Pundir *et al*., 2015), Belahi cattle (Vohra *et al*., 2016), Pasundan cattle of West Java Province of Indonesia (Said *et al*., 2017) and Kosali cattle of Chhattisgarh (Jain *et al.,* 2018).

Table 2: The morphometric characteristics of the cattle population

Morphometric Trait	Types	Percent (%)
Coat Colour	Black	8.38
	Grey	22.56
	Brown	13.73
	White	54.68

Skin Colour	Black	14.00
	Red	19.8
	Grey	32.7
	White	33.00
Muzzle	Black	95.00
Eye lid	Black	97.00
Tail switch	Black	95.00
	Other	5.00
Hooves	Black	98.00
Horn colour	Black	72.00
	Grey	28.00
Horn shape	Straight	80.00
	Curved	20.00
Horn orientation	Upward	60.00
	Downward	15.00
	Forward	21.00
	Backward	4.00
Ear orientation	Horizontal	92.00
Forehead	Straight and flat	90.00
Hump	Large	0.00
	Medium	31.00
	Small	69.00
Dewlap	Large	0.00
	Medium	30.00
	Small	70.00
Basic temperament	Moderate to docile	25.30
	Ferocious	74.70
Udder shape	Bowl	0.00
	Round	98.00
	Trough	0.00
	Pendulous	00.00
Fore udder size	Large	0.00
	Medium	0.00
	Small	99.00
Rear udder size	Large	00.00
	Medium	0.00
	Small	99.00
Teat shape	Cylindrical	91.00
	Funnel	5.00
	Conical	4.00
Teat tip	Pointed	13.50
	Round	82.00
	Flat	4.50
Milk Vein	Prominent	15.00
	Less prominent	85.00

CONCLUSION

The present study was the first attempt to examine the genetic variability in population of non-descript cattle in Mahakaushal region of Madhya Pradesh. The cattle have a small size body with mostly grey and white coat and skin colour. The muzzle, eyelids, hooves, horns and tail-switch are the mostly black colour. The results of the present study generated first preliminary data on genetic diversity of population of cattle in Mahakaushal region of Madhya Pradesh.

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