

# Genetic characterization of Koraput sheep of Odisha

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## ABSTRACT

A survey was conducted in the native breeding tract of the Koraput sheep in Odisha for the phenotypic characterization of this lesser known sheep population. Information on body biometry of 127 adult animals was collected from 21 sheep farmers. Comparison of body biometry measures of Koraput sheep with Ganjam sheep found in the same area revealed that Koraput sheep has lower average measures for body weight, body length, height at wither, chest girth, ear length and horn length. Moreover, the phenotypic appearance (notched ears, small body size and variations in coat colour) of this sheep population is also distinct from the Ganjam breed. Koraput sheep therefore has the potential to be recognised and registered as a distinct breed.

**Key words:** Koraput sheep, body biometry, Ganjam sheep, phenotypic characterization

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## INTRODUCTION

Odisha state of India is endowed with sheep breeds like Bolangir, Chottanagpuri, Dalua, Edka, Ganjam, Koraput and Kuzi. Koraput is an important mutton type sheep which is widely distributed in Koraput, Nabarangpur, Malkangiri and Rayagarda districts of Odisha. Koraput is a lesser known sheep breed which was first reported by Kornel Das in 1999. Ganjam is one of the well-recognized and registered sheep breed of the eastern region of India. Ganjam sheep breed is distributed in the Ganjam, Gajpati, Rayagada,

Koraput, parts of Phulbani, Nayagarh, Khorda and Puri Districts of Odisha (Arora et al., 2010). Thus the breeding tracts of Koraput and Ganjam sheep overlap with each other (Figure 1).

Previous reports on physical parameters (body size and weight, coat colour, mean values of various traits like horn, ear and head length, chest girth, neck, thigh and paunch girth, height at wither etc) of Koraput sheep were based on lesser number of observations (Kornel et al., 2004). Therefore, a survey was conducted in the distribution area of Koraput sheep to characterize it phenotypically and compare it with Ganjam sheep breed.

## MATERIALS AND METHODS

The study was undertaken in Koraput district of Odisha in the villages of Borigumma, Lamtaput, Pottangi and Semiliguda blocks. Body biometry (Body weight, body length, height at wither, chest girth, paunch girth, ear length, horn length, tail length and face length) on 127 adult animals were recorded from 21 sheep farmers. For comparison with the Ganjam breed, the data reported by Arora et al. (2010) was used.

## RESULTS AND DISCUSSION

### Habitat

The Koraput district of Odisha lies in 17.4°N to 20.7°N latitude and 81.24.4°E to 84.2°E longitude. The



**Figure 1.** Distribution of Ganjam and Koraput sheep in their respective breeding tract



**Figure 2.** Ram of the Koraput sheep



**Figure 3.** Ewe of the Koraput sheep

survey was conducted on the animals found in the hilly terrain of Koraput district. The temperature in this region ranges from a minimum of 12°C in winter (December- January) to maximum of 38°C in summer (May-June). The region receives average annual rainfall of about 152 cm. Rice (*Oriza sativa*) is the major crop with an area of 1, 13, 000 h under cultivation. Pulses, oilseeds and millets are the other crops grown in this area.

*Morphological characterization*

The body size of Koraput sheep varies from small to medium with an average body weight of about 18 Kg. The coat colour varies from light brown to dark brown and grey. Some animals were found to be completely black. The males are horned (figure 2)

and females are polled (figure 3). The tail is short and thin. Most of the Koraput sheep have very small sized ears. The body is covered by hairy and short fleece.

The body biometry parameters for the female and male animals are given in table 1 and table 2, respectively. The male animals exhibit higher values for most of the parameters except for body length, tail length and body weight. This may be due to the availability of lesser number of males than females and the use of comparatively younger rams (10-12 months age) for breeding purpose as the rams are usually retained in the flock for 1-2 breeding seasons and slaughtered thereafter. However, the females are retained in the flock as future breeding ewes. So, the adult rams could not be measured.

**Table 1.** Some morphometric parameters of the Ewes of the Koraput sheep

Parameter	Koraput (n=113)		Ganjam (n=329)*	
	Mean ± SE (cm)	Range (cm)	Mean ± SE (cm)	Range (cm)
Body Length	51.08±0.34	40-59	58.7±0.36	50-69
Height wither	55.58±0.42	42-69	64.9±0.45	52-74
Chest girth	66.34±0.45	54-79	69.5±0.47	54-79
Paunch girth	69.69±0.56	56-82	-	-
Ear Length	4.61±0.23	2-13	12.0±0.55	3-18
Tail length	9.77±0.15	6-16	-	-
Face length	14.44±0.10	12-18	-	-
Body Weight (Kg)	18.89±0.35	10-30	23.9±0.63	14-36

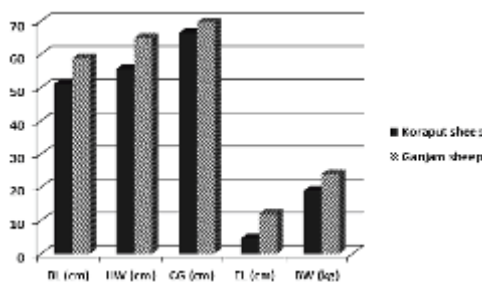
\*Arora et al.(2010)

**Table 2.** Some morphometric parameters of the Rams of the Koraput sheep

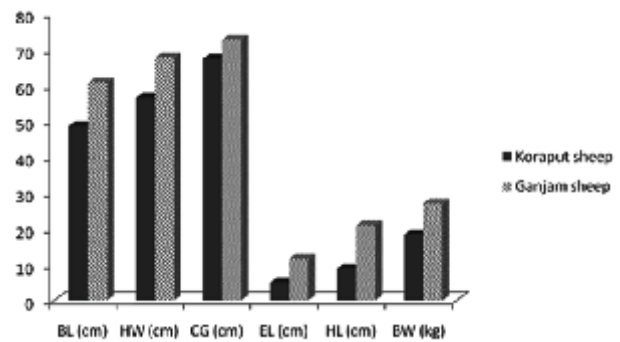
Trait	Koraput (N=14)		Ganjam (N=37)*	
	Mean ± SE (cm)	Range (cm)	Mean ± SE (cm)	Range (cm)
Body Length	48.64±0.89	42-54	60.7±0.50	54-69
Height wither	56.50±0.99	49-62	67.7±0.48	61-78
Chest girth	67.43±0.77	63-72	72.7±0.68	63-88
Paunch girth	70.00±1.72	62-84	-	-
Ear Length	4.86±0.52	3-9	11.6±0.52	7-14
Horn length	8.82±1.18	4-19	-	-
Tail length	9.29±0.22	8-11	-	-
Face length	15.36±0.23	14-17	-	-
Body Weight (Kg)	18.32±0.82	13-24	27.0±0.96	19-41

\*Arora et al. (2010)

The present analysis revealed that the males were larger than the females for chest girth, paunch girth and height at withers. This is in agreement with the results of Das et al. (2004) for these parameters in Koraput sheep. The Ganjam sheep is an important and well recognised breed found in the same region. While comparing body biometry results of the present study with the Ganjam sheep (Arora et al. 2010) it was found that Koraput sheep have lower values for most parameters for body biometry like body weight, body length, height at wither, chest girth, ear length and horn length (figure 4 and 5). Moreover, the phenotypic appearance, like the presence of the notched ears, variations in coat colour from light brown to greyish black and black in some case and body size, signifies their distinction from the Ganjam animals which are slender, medium sized, leggy animals with coat colour varying from brown to dark tan. Thus the Koraput sheep appears



**Figure 4.** Comparison of the Ewes of the Koraput (N=113) and Ganjam (N=329) sheep. (BL- Body weight, HW- Height at wither, CG- Chest Girth, EL- Ear Length and BW- Body Weight)



**Figure 5.** Comparison of the Rams of Koraput (N= 14) and Ganjam (N=37) sheep for some morphometric parameters. (BL- Body weight, HW- Height at Wither, CG- Chest Girth, EL- Ear Length, Horn Length and BW- Body Weight)

distinct and can be differentiated from Ganjam breed.

### CONCLUSION

Based on the results of this study the Koraput sheep appears to be a distinct population from the Ganjam sheep which is also distributed in the same region. Results of this study will help in recognition of the Koraput sheep as a new breed of indigenous sheep.

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