

Morphological variability and management of Lonand sheep of Maharashtra

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ABSTRACT

To characterize Lonand sheep of Maharashtra, 7 morphometric traits (height at withers, body length, chest girth, paunch girth, ear length, tail length and body weight) were recorded on 114 animals. The study included animals having 2-8 tooth. Management practices, production and reproduction traits were recorded using interview method. The average body weights of rams and ewes were 42 ± 3.69 and 29.3 ± 0.45 kg whilst the chest girth were 81.3 ± 2.25 and 74.4 ± 0.37 cm respectively. Males were 47% heavier than females. The coefficient of variation of all traits ranged from 3.8 % to 27.8 %. The average flock size of 41 flocks was 85.7 which comprised 65.2 ewes, 1.6 rams and 18.9 lambs. The animals were primarily maintained under extensive management system. The flocks were migratory, mostly within the Satara district. Introduction of Madgyal rams in flocks was observed. Breed purity was 14.7 %. Age at first lambing was 16-18 months. Daily milk yield was 200 ml and lactation length was 90 days. Average annual greasy wool yield was around 500 gm. The study has contributed to the knowledge of morphometric characterization and population structure of Lonand sheep, and would enable to have insight for its conservation and improvement programmes.

Keywords: Characterization, Lonand, morphometric traits, sheep

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INTRODUCTION

The Indian sheep accounts 65.06 million heads and occupies third position worldwide. It is a traditional source of livelihood for marginalized communities in the drought prone areas. The total sheep population of Maharashtra is 25.8 lakh. This accounts for 3.97% of the total sheep in the country (19th Livestock Census, 2012). About 1 lakh families depend upon sheep rearing in Maharashtra. Contribution of sheep in total meat production of the state is around 11%. Indian sheep breeds/populations are endowed with many traits like disease resistance, tolerance to high temperature and humidity, multiple births, high feed conversion efficiency etc. The genotypes have performed better than exotic breeds under low input conditions and climatic stresses especially during draughts (Karim and Prince, 2011). Sheep breeds of India exhibit large variations in the morphology and production. Distinct phenotypic characteristics have been defined for these breeds (Acharya, 1982; Bohra et al. 1993; Sahana et al. 2001, 2004; Kumar et al. 2006; Singh et al. 2007; Yadav et al. 2009, 2011); however decrease in breed purity, a major concern, has been observed primarily due to intermixing between them and needs to be tackled on priority.

Sheep genetic diversity signifies a unique resource to

respond to the present and future needs of sheep production and human needs. The ICAR-National Bureau of Animal Genetic Resources, a nodal government agency for registration of livestock breeds in India, has registered 40 sheep breeds (www.nbagr.res.in). One of these, the Deccani breed is widely distributed in the Deccan plateau across the four states of Maharashtra, Andhra Pradesh, Telangana and Karnataka. The distribution area of the breed lies between 160 to 200N latitude and 720 to 780E longitude. The Deccani is a medium-sized course-wool sheep breed reared mainly for mutton. The breed is well adapted to the semi-arid environment of the Maharashtra state and thrives well through long migration, poor nutrition and draught, and tropical diseases. There are five sheep ecotypes viz. Kolhapuri, Lonand, Madgyal, Solapuri and Sangamneri in Maharashtra (Ghanekar, 1983; Gokhale, 2003; Karim and Prince, 2011) and they exhibit distinct morphological characteristics (Yadav et al. 2014), thrive in less favoured rural areas and are reared mainly by the marginalized and landless farmers. Despite their distinct identity, the morphometric standards of the ecotypes are yet to be defined. This paper provides a comprehensive morphometric description, management practices, and production and reproduction traits of the Lonand sheep.

MATERIALS AND METHODS

Purposive sampling was used to determine the distribution area of the Lonand sheep. Villages having Lonand sheep were identified for data recording based on information of the animal husbandry officials and shepherds. Interview method was used for data collection on management practices, production and reproduction parameters. The age was determined by dentition and the animals having two or more permanent teeth were included in the study. A dial spring balance was used to determine body weight (BW) in kilogram (kg). Body dimensions were measured using a steel tape with records taken to the nearest centimeter (cm) holding the animal in normal standing position. The traits measured were body length (BL), height at withers (HW), chest girth (CG), paunch girth (PG), ear length (EL) and, tail length (TL). The sheep originated from 41 different flocks and were reared under extensive management system. One hundred fourteen sheep (10 males and 104 females) were recorded on above parameters. Statistical analysis

was carried out using JMP software of SAS (2012).

RESULTS AND DISCUSSION

Habitat and Population Status

The Lonand sheep might have been named after Lonand, a village in Khandala taluka in Satara district of Maharashtra. The origin of Lonand sheep is not known but is believed to have originated through local adaptation of Deccani sheep. The ecotype is distributed in Man, Phalton, Khandala, Koregaon and Wai talukas of Satara district of Maharashtra. But over the years, the farmers have introduced Madgyal rams in the sheep flocks for better growth. The intervention was due to state government's policy of providing Madgyal rams for better growth. Migration also had its effect on breeding of Lonand sheep with Madgyal and other rams. As a result currently the ecotype is confined mainly to the Phalton taluka. In the average flock size of 85.7 sheep, 12.6 exhibited Lonand characteristics, a substantial decrease in breed purity in the distribution area. Figure 1 shows the distribution area of Lonand Sheep. Table 1 gives total sheep population of the Satara district.



Figure 1 : Distributor Area of Lonard Sheep

Table 1. Sheep population of Satara district of Maharashtra (2012)*

S.No.	Block/Taluka	Exotic/ crossbred	Indigenous	Total
1	Jaoli	17	484	501
2	Karad	319	14876	15195
3	Khandala	151	37426	37577
4	Khatav	298	18467	18765
5	Koregaon	2680	12180	14860
6	Mahabaleshwar	6	73	79
7	Man	50	94216	94266
8	Patan	188	1168	1356
9	Phalton	2162	63672	65834
10	Satara	100	6034	6134
11	Wai	341	9313	9654
	Total	6312	257909	264221

*Source-19th Livestock Census 2012- Maharashtra State

Morphometric Characteristics

Lonand are hardy, large, polled (hornless), white coat sheep. They have straight back line, medium deep barrel, narrow forehead, straight nose line, medium

to long drooping ears, gray hooves, long thin and strong legs, medium and thin tail. Head, face, belly and legs are devoid of wool. Some of the animals also have short and notched ear. This is a coarse wool mutton-type sheep.

Morphological Variability

Table 2 gives the means and variability of morphometric traits of adult Lonand sheep. The average body weights of males and females were 42 ± 3.69 kg and 29.3 ± 0.45 kg respectively. Similar body weights were reported in Chokla sheep (Jain et al. 2009). Body length and height at withers of Chokla sheep were smaller than Lonand. The body biometry reflects that Lonand sheep are large in size with medium tail. Two-tooth animals weighed 35 kg in males and 25 kg in females. The body weights between 12 and 15 months are important from breeding point of view. Substantial sexual dimorphism was observed in all seven morphometric traits (Table-2). Males were 43% heavier than females; however the estimate may be slightly biased due to small sample size of males. Coefficient of variation (%) varied from 3.8 (BL) to 27.8 (BW). The large value of coefficient of variation for ear length may be ascribed to the presence of short and notched ears in some female animals and small sample size in males. Higher values of Coefficient of variation (%) in males may be attributed to small sample size. Similar results were reported by Yadav et al. (2013, 2014) in other Indian sheep breeds.

Management Practices, Production and Reproduction

Lonand sheep are primarily maintained on grazing. Flocks are grazed for 8-10 hours daily walking a distance of 3-10 km/day. The sheep flocks migrate within Satara district to nearby places viz. Saple, Vatar, Masur, Karar and Patan during December–July. Majority of the farmers provide housing especially during night. While on migration the flocks are housed in open fields with temporary fencing of either ropes or iron wires around the enclosures. In most of the cases, the sheep pens are located adjacent to the owner's dwelling. The boundaries of the enclosures are made of tree branches/ bushes/rope or wire netting. Some farmers also housed their sheep in stone wall thatched houses. Water is provided two times a day. Lambs are cared by women, children and elder persons at home for 15-30 days, thereafter they join the flock for grazing. The Groundnut cake, jowar, maize and wheat bran (daliya) are provided to lambs regularly. In addition to suckling mother's milk, most of the farmers feed the lambs on goat milk. Babool leaves (a source of protein) are specially fed to lambs. The lambs lick a hanging mineral brick (chatan) in the paddock to meet out the requirement of essential minerals. Lambs of ewes which give more milk are selected for future stock. Pneumonia, bluetongue (BT), numbness, bloat or tympany, enterotoxemia (ET), foot-and-mouth disease (FMD), ecthyma, haemorrhagic septicemia (HS) and peste des petits ruminants (PPR) were reported diseases.

Table 2. Mean, standard error, coefficient of variation, range and sexual dimorphism of the morphological traits in Lonand ecotype of Deccani sheep

Morphometric Trait	Female (104)			Male (10)			Sexual dimorphism (m/f)
	Mean $\pm$ SE	Coefficient of variation	Range	Mean $\pm$ SE	Coefficient of variation	Range	
BW	29.3 ± 0.45	15.8	18-40	42.0 ± 3.69	27.8	24-65	1.43
BL	71.9 ± 0.26	3.8	62-77	79.9 ± 1.52	6.0	72-86	1.11
HW	69.5 ± 0.29	4.4	59-77	77.0 ± 1.54	6.3	68-83	1.11
CG	74.4 ± 0.37	5.1	65-82	81.3 ± 2.25	8.8	69-92	1.09
PG	74.9 ± 0.45	6.2	63-86	80.1 ± 2.42	9.6	70-95	1.07
EL	14.8 ± 0.35	24.5	4-21	15.4 ± 1.37	28.1	10-21	1.04
TL	15.5 ± 0.22	14.6	11-21	17.3 ± 0.88	15.9	13-21	1.03

BW, body weight; BL, body length; HW, height at withers; CG, chest girth; PG, paunch girth; EL, ear length; TL, tail length

Vaccination against FMD, ET, HS and PPR is done by government agencies. Dipping and deworming are also performed by the farmers themselves. Mortality among the adult sheep and lambs were between 5-10 % and 4-8 % respectively. Breeding rams were raised by the farmers at their flocks. Rams were selected on the basis of body size and conformation. Body weight, lustrous white wool with long staple length, compact body with good height, short face having straight nose line, were some of the preferred traits for selection of rams. Some farmers exchange the rams to avoid inbreeding.

October-November was the main lambing season and March-April, the minor. Lambing rate was reported as 70- 90 %. Lambing interval was stated as 7-8 months. Litter size was single, but 3-5% percent of ewes give birth to twins. Age at first lambing was 16-18 months. Age and weight at puberty in females were around 11-12 months and 24 kg. Age at first breeding in males was 10-12 month and weight at two teeth age was 35 kg. Breeding life of a ram was 6-7 years. Daily milk yield was 200 ml and lactation length was 90 days. Shepherds keep breeding rams with ewes. Most of the farmers kept one or two rams. The average flock size was 85.7 which comprised 65.2 ewes, 1.6 rams and 18.9 lambs. The farmers have introduced Madgyal and other sheep in their flocks. Consequently, the breed purity has been diluted to a large extent. The percentage of Lonand in the surveyed flocks was 14.7. The major income from rearing Lonand sheep is earned from the sale of lambs at 3-4 months of age. Lonand lamb of this age fetches a price of Rs 3000 while its counterpart of Madgyal sheep fetches a price of Rs 4000. This gain in income has tempted the farmers to breed the Lonand ewes with Madgyal rams. State government has also supported the farmers by providing Madgyal rams. The survey indicated that breed purity of Lonand sheep has come down to 15%.

Lonand sheep are shorn twice a year in January/February and June/July. Average annual greasy wool yield is around 500 gm. The price of wool is Rs 15 per kg. Lambs are sold at the age of 3-4 months in local markets (mandies) organised

weekly. These are usually sold in groups and butchers and traders purchase them on visual appraisal. A sheep owner's income depends largely on the number of saleable lambs produced per ewe per year. Three months old male and female lambs fetch a market price of Rs 3500 and Rs 3000 respectively. The main reason for the existence of a ewe is the production of lambs. Sheep farmers generally keep the ewe lambs for replacement lest opt for distress sale to meet out emergency monetary requirements. Depending upon the condition of the animal, prices of adult ewes and rams varies from Rs 8000-9000 and Rs 10000-12000 respectively.

CONCLUSION

Lonand is an important mutton-type sheep of Maharashtra and play important socio-cultural as well as economic roles in the lives of Dhangar and Ramoshi communities. The dwindling population of Lonand sheep indicated its threatened status. The study further showed that there is substantial shrinkage in its breeding tract limiting it to some pockets of Satara district. Lack of remunerative price of wool, disfavour for breed purity due to perceived better growth and monetary gains from Madgyal crossed lambs and non-availability of proven rams were some of the impediments in its proliferation. The existing genetic dilution in the farmers' flocks is posing further dangers to its identity and population status. Planned and concerted efforts for its breeding and improvement are needed to save this important sheep from extinction. Raising true to breed rams is the biggest challenge. It should be taken up with immediate effect. Best pure bred ram competition shows should be organized by the Punyashloke Ahilyadevi Maharashtra Mendhi va Sheli Vikas Mahamandal Ltd., Pune, Maharashtra. For recognizing an ecotype/population as a breed, formation of a breed society is a necessity. Lonand sheep breeder's society may be formed. The true to breed flocks may be raised and when population becomes stable, it should be registered as a breed. This study has contributed to the knowledge of characterization and population structure of Lonand sheep, and would enable to have insight for its conservation and improvement programmes.

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