



Characterization, Production and Reproduction Performance of Paralakhemundi and Manda Buffalo

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ABSTRACT: Information from 243 farmers belonging to 45 villages in respective native tract for Paralakhemundi and Manda buffalo is analysed in the present study. The information on body morphometrics was collected by actual measurements and on production and reproduction was collected through questionnaires. The adult male and female Paralekhamundi buffalo weighed 358.21 ± 0.22 and 331.41 ± 0.31 kg, respectively. Respective weights in Manda buffaloes were 352.67 ± 1.75 and 326.44 ± 1.56 kg. Average height of both the buffalo types were recorded as around 120 cm and the body length almost similar to the height. Average daily milk yields of Paralakhemundi and Manda buffalo were 2.58 and 2.43 litres respectively with lactation milk yield of 737 and 692 litres with both fat and SNF at little more than 8%. Average calving interval in both the populations was recorded as little more than 18 months.

Keywords: Characterisation, Performance, Production, reproduction.

INTRODUCTION

Buffaloes are an essential component of traditional Indian farming because of their resilience to harsh weather, limited feed supplies with excessive coarse and lignified fodder and grass. In addition, these animals yield milk of superior quality that is rich in fat and low in cholesterol. The draft power of buffaloes in agricultural operation has been proving its worth since generations. According to the report of the 20th Livestock census, published by the Government of India, the total buffalo population of India is 109.85 million. Buffalo production system in Odisha is with pastoral way of rearing mostly under very low input or nil input basis.

The name 'Paralakhemundi' buffalo has its root from Paralakhemundi, the district headquarters of Gajapati district in Odisha, where heavy concentration of these buffaloes are seen. Whole Gajapati district and adjoining parts of Rayagada and Ganjam district in Odisha and very small pocket in Andhra Pradesh constitute the native tract of Paralakhemundi buffalo (Singh *et al.*, 2018). These buffaloes are morphologically different from other buffalo population in adjoining regions and other indigenous breeds in other parts of the state (Fig. 1). The non-descript

Paralakhemundi has been reported as swamp type in the previous studies.

Manda buffaloes are seen in its purest form around Laxmipur, Kakriguma, the hills of Damanjodi, Petta hills near Jeypore, Balimela and Arku valley hills of Koraput district in Odisha. 'Manda', the name backs to the odia word 'Manda', means group or herd. In the past, the owners of these animals move to different areas with the herd in search of pasture, water and shelter. So the name 'Manda' has been conferred upon these animals since long. Some people name these animals as deshi buffaloes (Fig. 2). High concentration of these animals is found in almost all parts of Koraput district, north eastern part of Malkangiri and southern part of Nabarangapur district (Kumar *et al.*, 2019).

MATERIALS AND METHODS

During the present study, information was collected through survey covering 45 villages in respective native tract for both Paralakhemundi and Manda buffalo. The information on body morphometrics was collected by actual measurements and on production and reproduction was collected through questionnaires, developed by NBAGR with little modifications. The data thus collected was put to standard statistical analysis.



Fig. 1. Paralekhamundi buffalo.



Fig. 2. Manda buffalo.

RESULTS AND DISCUSSION

Paralakhemundi buffalo. Paralakhemundi is a medium sized, horned, strong, dual type buffalo with no dewlap. These animals are docile in the presence of owners but are frightened with strangers. Hence the reaction zone of these animals is more, compared with many counterparts. Males look very strong and the females are having proportionate and compact body with graceful appearance. Necks of these animals are thin. Abdomen is large and spacious, chest is wide and legs are short and stout. The colour of these animals ranges from black to blackish grey. The tail extends below the hock with coarse hairs in the switch. Calves with dark coat colour becomes black and with light coat color becomes blackish grey at adulthood. The milk vein in females is medium in appearance. The body weight and body confirmation traits are presented in Table 1 and 2, respectively.

Paralakhemundi buffaloes have slender head, proportionate to the body with flat forehead. Head of these animals is in upright position and almost parallel to the ground while reacts to strangers or frightened. Golden long hairs are seen on fore head. Muzzle is short and nostrils are wide and prominent. Ears are medium in size and horizontal in position. The average length of head in adult males and females are 51.18 ± 0.07 and 50.77 ± 0.06 cm, respectively. The coat colour of these animals ranges from black to blackish grey. About 80% are black and 20% are blackish grey in colour. The calves are usually lighter at birth, which become darker at later age. The colour of the muzzle and switch is usually black. Hooves are usually black. However, grey coloured switch, hooves and muzzle are seen in around 5 % of cases.

Manda buffalo. Manda is a robust, dual-type, medium-sized buffalo without a dewlap. These buffaloes have grey bodies that are ash grey, and their hair is tinted copper. Light-colored hair grows on the lower limbs up to the elbow, and copper-colored hairs are seen at the knee and fetlock. This characteristic may serve as a physical identifier for Manda buffalo. A white mark on the lower neck region is present in about 5% of the animals. The backbone and pin bones are noticeable.

Female milk veins have a medium-colored appearance. Manda buffaloes have slender head, proportionate to the body with flat forehead. Muzzle is short, jaws and nostrils are prominent. Head of these animals is in upright position and almost parallel to the ground while reacts to strangers or frightened. The average length of head in adult males and females are 50.86 ± 0.07 and 50.23 ± 0.06 cm, respectively. The coat colour of these animals is mostly ash grey. The calves are usually lighter at birth, which become darker at later age. The colour of the muzzle and switch is usually black, but lighter. Hooves are usually black. However, grey coloured switch, hooves and muzzle are seen in around 5% of cases. Horns in males are stronger and longer than that of females.

Body weight and Morphometric traits. The adult male and female Paralekhamundi buffalo weighed 358.21 ± 0.22 and 331.41 ± 0.31 kg, respectively. Respective weights in Manda buffaloes were 352.67 ± 1.75 and 326.44 ± 1.56 kg (Table 1). The average adult body length, height at withers, heart girth are given in Table 2. In adults, males had significantly higher estimates than the female counterparts with respect to the measurement of body length, height at withers and heart girth. Average height of these buffaloes were recorded as around 120 cm and the body length almost similar to the height. It was found that, Manda buffaloes were heavier than the Paralakhemundi counterparts at 12 month of age, but lighter at all stages of growth till adulthood. The average body length of Murrah female crossbred buffaloes was 143.07 cm while the average body length recorded was 142 cm in Murrah buffaloes (Andréa *et al.*, 2010), 140 cm in Nili Ravi buffaloes (Ahmad *et al.*, 2013), 140 cm in Azikheli buffaloes in Pakistan (Khan *et al.*, 2013) and 146 cm in Anatolian water buffaloes (Kocaman *et al.*, 2017), which were higher than both the buffalo types in the present study. Similarly the height at withers and body weights of Murrah, Nilli Ravi and Azikheli buffaloes were recorded higher than the estimates in the present study, implying that both Paralakhemundi and Manda buffaloes are smaller in size than Murrah, Nilli Rav, Anatolian and Azikheli buffaloes.

Table 1: Body weight (kg) of Paralekhamundi and Manda buffalo.

Parameter (average)	Paralekhamundi		Manda	
	Male	Female	Male	Female
Birth Weight	20.18±1.23 (287)	19.73±0.24(272)	20.21±0.01 (264)	19.34±0.01 (268)
Pre-weaning Weight	40.76±0.45 (256)	38.56±0.34 (235)	39.42±0.01 (252)	37.27±0.01 (238)
12 month weight	142.48±0.14 (234)	136.93±0.23 (211)	144.37±0.76 (222)	139.07±0.85 (206)
24 month weight	245.43±0.45 (212)	236.58±1.24 (202)	242.48±1.26 (206)	232.58±1.24 (196)
Weight at first meeting	333.54±0.65 (182)	312.48±0.45 (188)	328.62±1.76 (184)	310.48±1.72 (184)
Weight at first calving	—	354.44±2.42 (164)	—	350.44±2.33 (168)
Adult weight (>2 yr)	358.21±0.22 (186)	331.41±0.31 (382)	352.67±1.75 (172)	326.44±1.56 (364)

*Figures in parentheses indicate number of observations

Table 2: Adult body measurements (cm) of Paralekhamundi and Manda buffalo.

Parameter (average)	Paralekhamundi		Manda	
	Male (186)	Female (382)	Male (172)	Female (366)
Heart girth (cm)	173.45±0.24	168.32±0.34	173.23±0.93	168.12±0.94
Body length (cm)	122.44±0.76	120.34±0.56	121.62±0.881	120.86±0.86
Height at withers (cm)	122.9±0.42	120.78±0.21	121.54±0.76	119.47±0.76

*Figures in parentheses indicate number of observations

Production and Reproduction traits. The production and reproduction performance of both the buffalo populations are presented in Table 2 and 3, respectively. Average daily milk yields of Paralekhamundi and Manda buffalo were 2.58 and 2.43 litres respectively with lactation milk yield of 737 and 692 litres with both fat and SNF at little more than 8%. Lactation length of Manda buffalo was found to be one month more than that of Paralekhamundi buffalo. The age at sexual maturity of both the buffalo types was

around 3 year. Paralekhamundi buffalo dropped the first calf at 1458.24±3.43 days and Manda recorded the first parturition around 3 months later at 1534.43±3.76 days. The most important reproduction parameter *i.e.*, calving interval in both the populations was around 18 months. Similar findings in Kalahandi buffaloes were reported by Singh *et al.* (2018) and better production and reproduction performance in Chilika buffaloes (Singh *et al.*, 2021).

Table 3: Production performance (single milking) of Paralekhamundi and Manda buffalo

Parameter (average)	Paralekhamundi	Manda
Daily milk yield (lt)	2.58±0.78 (276)	2.43 ± 0.05 (256)
Peak milk yield (lt)	3.35±0.23(276)	3.62±0.06 (256)
Lactation Length (days)	258.33±0.56 (276)	290.42 ± 1.21 (256)
Lactation Milk Yield (lt)	737.08	692.34
Fat %	8.13±0.65 (154)	8.44 ± 0.01 (146)
SNF %	8.6±0.45 (154)	8.34 ± 0.01 (146)

*Figures in parentheses indicate number of observations

Table 4: Reproduction traits of Paralekhamundi and Manda buffalo

Sr. No.	Traits	Paralekhamundi	Manda
MALE			
1	Age at puberty (days)	1045.56±1.73	1124.43±3.56
FEMALE			
1	Age at puberty (days)	1084.32±1.44	1162.44±3.32
2	Oestrus cycle duration (days)	21	21
3	Oestrus duration (hrs)	18-20	18-20
4	Age at 1 st mating (days)	1127.43±3.52	1203.78±3.65
5	Age at 1 st calving (days)	1458.24±3.43	1534.43±3.76
6	Age at 2 nd calving (days)	1998.67±3.47	2092.23±5.37
7	Interval from calving to conception (days)	236.90±1.32	257.22±1.12
8	Calving interval (days)	540.43±2.64	557.78±2.54
9	Gestation length (days)	303.53±0.12	307.56±0.13
10	Life time no. of calvings	7-8	7-8

*Figures in parentheses indicate number of observations

CONCLUSIONS

According to body measurements, the buffalo types under investigation in this study were medium-sized, with Paralakhemundi buffalo being little heavier than Manda buffalo. Comparing biometric estimates, males showed significantly greater values than females. Both the buffaloes were having similar production potentials. However, the reproduction performance of Paralakhemundi buffaloes were little better than that of Manda buffalo. The conservation, genetic improvement and propagation of these native buffalo breeds are crucial.

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