

COMPARATIVE STUDY ON PHYSICO- MORPHOLOGICAL CHARACTERISTICS OF SEMEN FROM MURRAH BUFFALOES AND JERSEY CROSSBRED CATTLE

Arun Kumar S.¹ and *Prakash Krupakaran R.²

¹Department of Veterinary Parasitology, Veterinary College and Research Institute, Orathanadu-614 625, Thanjavur(Dist), Tamil Nadu

²Department of Veterinary Physiology and Biochemistry, Veterinary College and Research Institute, Orathanadu-614 625, Thanjavur(Dist), Tamil Nadu

*Author for Correspondence

ABSTRACT

Semen from four Murrah buffaloes and Jersey crossbred apparently healthy bulls of approximately 4 to 6 yr of age with good body condition was collected using artificial vagina as per the standard practice. The physico morphological seminal attributes of Murrah buffalo bulls and Jersey crossbred cattle bull semen were analyzed. The average semen volume of Murrah bulls was 2.6 ± 0.13 as compared to 3.4 ± 0.12 in Jersey cross bred bull semen. The pH of Murrah bull semen was 6.46 ± 0.32 as compared to 6.82 ± 0.05 in Jersey cross bull semen. The colour of buffalo bull semen was observed in the present study was white in colour and the colour of Jersey cross bull semen was yellow. The average mass activity of Murrah bull semen was 2.82 ± 0.09 as compared to 3.82 ± 0.22 in Jersey cross bred bull. The average initial motility of Murrah bull semen was 69.53 ± 0.42 as compared to 78.24 ± 0.36 Jersey cross bred bull semen. The average sperm concentration was 992.85 ± 10.56 observed in Murrah bulls. The average live sperm count in buffalo bull semen was 84.23 ± 0.56 as compared to 87.52 ± 0.53 in Jersey crossbred bull semen. The average abnormality (%) in Murrah bull semen was 4.24 ± 0.68 as compared to 5.89 ± 0.29 in Jersey cross bred bull semen.

Keywords: Physico Morphological Characters, Semen, Biochemical Analysis, Murrah Buffaloes

INTRODUCTION

In India, Buffalo (*Bubalus bubalis*) is an important livestock resource, providing milk, meat and draught power in many ecologically disadvantaged agricultural systems, so it is being the mainstay in rural economy contributing dairy and meat industry. More than 50 % of the world buffalo population is found in India contributing 55 % of total milk production and 45 % of total meat production; hence proving that buffalo is a major genetic resource, contributing in a big way towards agricultural GDP. Therefore, development and application of suitable reproductive technologies in buffalo can be expected to lead to a thrust in dairy and meat industry. In the dairy industry, where artificial semination (AI) is the standard, male fertility is defined as the percentage of females inseminated that are not re-inseminated a defined number of days after the first insemination.

This fertility quantification is called as non-return rate (NRR).

The artificial insemination (AI) has played a major role for the past few decades in the genetic improvement of cattle and buffaloes by increasing selection intensities of males and wide dissemination of their valuable germplasm after cryopreservation, but still the result is far behind than the expectation. Although, research on semen preservation for AI purposes has a long history over the centuries, the problem still lies with available semen especially in cross bred bull semen. The present work was carried out to compare the physico- morphological attributes of Murrah buffalo bull semen to cattle bull semen.

MATERIALS AND METHODS

For seminal analysis, each group consisting of four bulls aged about 4.5 years in Murrah and Jersey cattle bull was selected. These animals are maintained by an organized farm near Orathanadu, Thanjavur were used for the collection of semen. These bulls were reared under the identical feeding and managerial

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conditions during the entire duration of the study. Semen was collected during morning hours using artificial vagina as per the standard practice.

The semen samples were carried by using thermoflask with ice cubes and transported to the laboratory within half an hour after collection. Ejaculates were selected based on the basis of mass activity as well as individual motility.

The mass activity of the semen sample was determined by assessing the motility of the spermatozoa just after semen collection. It was observed under the low power of microscope without cover slip and was graded on the scale of 0 to +5. The semen samples showing mass activity of +3 or above were only utilized for experimental work.

Individual motility was recorded as percentage of progressively motile spermatozoa in a semen sample (Salisbury *et al.*, 1978). This was assessed by placing a drop of the diluted semen on a clean, grease free glass slide mounted on a stage maintained at 37°C and observed under high power magnification (400 X). The semen sample was extended so that approximately 15 to 20 spermatozoa were visible under the visual field of microscope. Samples having individual motility of 70 per cent or above were selected for the study (Salisbury *et al.*, 1978).

RESULTS AND DISCUSSION

The physico morphological seminal attributes of Murrah buffalo bulls and Jersey crossbred cattle bull semen is depicted in Table -1.

Table 1: Mean values of physical and morphological attributes of neat Murrah buffalo bull and Jersey crossbred bull semen

S.No.	Parameter	Buffalo	Cattle
1.	Volume (mL)	2.62 ± 0.13	3.24 ± 0.12
2.	pH	6.46 ± 0.12	6.82 ± 0.15
3.	Colour	White	Yellow
4.	Mass activity (scale)	2.82 ± 0.09	4.32 ± 0.22
5.	Initial motility (%)	69.53 ± 0.42	78.24 ± 0.3
6.	Sperm Concentration (x 10 ⁶ /mL)	992.85 ± 10.561044	65 ± 28.56
7.	Livability (%)	87.52 ± 0.53	84.23 ± 0.56
8.	Abnormality (%)	4.24 ± 0.68	5.89 ± 0.29

The average semen volume of Murrah bulls was 2.6 ± 0.13 as compared to 3.4 ± 0.12 in Jersey cross bred bull semen. In buffaloes, the results are compared to the findings of Prajapati, 1995 whereas in cross bred bull the result observed in the present study was in agreement with the findings of Patel *et al.*, (2013).

The pH of Murrah bull semen was 6.46 ± 0.32 as compared to 6.82 ± 0.05 in Jersey cross bull semen. The higher pH value of both semen was utilized by various vaginal which are secreted by vaginal mucus glands.

The colour of buffalo bull semen was observed in the present study was white in colour which is similar to the report of Kumar (1993) in Indian buffalo bull semen. The colour of Jersey cross bull semen was yellow which is accorded to the report of Fiaz *et al.*, (2000). The yellow colour of semen may be due to lipochrome pigment derived from the epithelium of ampulla during seminal secretion and considered to be a normal colour.

The average mass activity of Murrah bull semen was 2.82 ± 0.09 as compared to 3.82 ± 0.22 in Jersey cross bred bull. Similar to these results, the lower values are observed in Jersey cross bed bull by Fiaz *et al.*, (2000). In buffaloes, the mass activity observed in the present study was similar to the earlier reports

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of Mandal, 2000 whereas in cattle bull semen, the result was in agreement with the reports of Sori *et al.*, (2006) in Gir bulls.

The average initial motility of Murrah bull semen was 69.53 ± 0.42 as compared to 78.24 ± 0.36 Jersey cross bred bull semen. In buffalo bull semen, the results are similar to the results of Ravimurugan *et al.*, (2008). In Jersey cross bred bull semen the results observed in the present study was at par with report of Loyi (2008).

The average sperm concentration was 992.85 ± 10.56 observed in Murrah bulls. The present study was in agreement with the findings of Ram (1988); This might be due to individual variations of bull used in their respective studies. In the present study, the average sperm concentration of Jersey cross bred bull semen was 1044.65 ± 28.56 which was similar to the report of Mohanty (1999).

The average live sperm count in buffalo bull semen was 84.23 ± 0.56 as compared to 87.52 ± 0.53 in Jersey crossbred bull semen. The results of buffalo bull semen were similar to the results of Mondal *et al.*, (2000). The average abnormality (%) in Murrah bull semen was 4.24 ± 0.68 as compared to 5.89 ± 0.29 in Jersey cross bred bull semen. The results of buffalo bull semen was similar to the reports of and in Jersey cross bred bull results was close to the observation of Patel *et al.*, (2013).

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