



## INTERNATIONAL JOURNAL OF PHARMACEUTICAL RESEARCH AND BIO-SCIENCE

### A STUDY ON THE REPRODUCTIVE BEHAVIOUR OF MALE CAMELS AT TWO DIFFERENT LOCATIONS OF RAJASTHAN

RAJA PUROHIT<sup>1\*</sup>, P.R. OJHA<sup>1</sup>, SUBHA GANGULY<sup>2</sup>

1. Assistant Professor, Department of Zoology, Shri Pustikar Shri Purohit Surajraj Roopadevi Smriti Mahila Mahavidyalaya (Affiliated to Jai Narain Vyas University), Dist. Jodhpur, Rajasthan, India

2. Associate Professor, Department of Veterinary Microbiology, Arawali Veterinary College (Affiliated with Rajasthan University of Veterinary and Animal Sciences, Bikaner), N.H. – 52 Jaipur Road, V.P.O Bajor, Dist. Sikar, Rajasthan

Accepted Date: 25/12/2018; Published Date: 27/12/2018

**Abstract:** The present article was constructed to highlight upon the sexual behaviour ethological studies on camel (*Camelus dromedarius*) at two palaces viz., National Research Centre on Camel (NRCC), Jorbeer and adjoining village Gadhwala. The observations were recorded in two seasons i.e., in summer and winter. The meteorological data including minimum and maximum ambient temperature, and rainfall were recorded. During the observation of experiment sufficient numbers of the animals were used. Standard techniques for each experimental work were followed.

**Keywords:** Behaviour, Camel, Ethology, Sexual Behaviour



PAPER-QR CODE

Corresponding Author: DR. RAJA PUROHIT

Access Online On:

[www.ijprbs.com](http://www.ijprbs.com)

How to Cite This Article:

Raja Purohit, IJPRBS, 2018; Volume 7(6): 19-27

## INTRODUCTION

The sexual behaviour of 36 camels (*Camelus dromedaries*) located at NRCC and 40 camels located at village Gadhwala were studied. The various observation recorded were:-

### Sexual Behaviour

- A. Signs of Rut
- B. Act of Copulation

#### A. Signs of Rut

Sexual behaviour was studied on 36 camel at NRCC and 40 camels at Gadhwala. The following courtship behaviour were observed as follows:

##### a) Duration of Rut

The bull camels of NRCC age 6 to 15 years and the bull camels of Gadhwala age 5 to 17 years, exhibited signs of rut from the middle October to the middle of March.

Duration of the rutting seasons is in agreement with the work of Mathur (1960). However, Leese (1927) and Singh et al. (1964) have reported differently.

Though Leese (1927) had reported a bull camels of two years age, showing all the signs of rut, yet in the present study there was not a single male camel in the range of 2 to 5 years which showed the signs of rut.

##### (b) Body Condition

These bull camels which were let loose in the herd, lost much of their weight and became weak and emaciated as compared to those which were not let loose in the herd. This may be so because the camels in rut did not take their normal ration, as they were always sexually excited being all the time with females.

##### (c) General Sexual Behaviour

During rut all the bull camels showed varied degrees of external sings, at both the places. At NRCC 16 camels bull camels were furious out of 36 observation i.e. 47.6 per cent. When these bulls were used for work they were difficult to handle. They were each 10 to 11 years old were let loose in the herd. Thirteen bull camels which was nine years old, exhibited strong sings of rut but was not furious. Out of thirty six observations, Seven bull camels which was sixteen years old, exhibited mild sings of rut out of thirty six observations i.e. 18.33 percent. At the

Gadhwala twenty bull camels exhibited furious signs, age on 12 years, 15 bull camel exhibited strong signs, age on 8 years and 5 animal exhibited mild signs age on 16 years i.e. 50 percent, 37.5 percent and 12.5 percent, respectively as represented in the Table.<sup>[1]</sup>

#### **(d) Intake of Food and Water**

During rut all the bulls which exhibited signs of rut, took very little food and water. Bulls which were let loose in the herd, did not take food even upto 10 to 20 days continuously, because they were busy in controlling the females. Throughout, day and night, they were encircling the herd, so that no single female may escape from the herd or another bull camel may join the herd. Such stopping of food by the females as not been observed spectacularly during the heat.

#### **(e) Sound Produced During Rut**

The bull camels during rut produced three types of sounds, like gurgling (huluhulu), metallic (guluhulu) and gurgling metallic (huluhuguluhulu). The observation recorded at NRCC indicated that 63.3% animals produced gurgling sound, followed by metallic (22%) and gurgling metallic (14.60%) sound while at Gadhwala 67.5%, 22.5 and 10.0% camels produced gurgling, metallic, gurgling metallic sound respectively. Infact the gurgling sound is produced by belching the air for which the animal takes his head and neck close to the hump and at the same time protrudes the soft plate from the corners of mouth likewise. The metallic sound is produced by grinding of the lower molars to the upper molars by lateral movements of lower jaw this event was also present at time of copulation. Whereas, the gurgling metallic sound is the mixture of these two sound which was comparatively produced by less number of camels at both places presented in Table 1.<sup>[2]</sup>

#### **(f) Secretion of the Salivary Glands**

All the bull camels along with the sound of the rut of rut produce profuse secretions of salivary gland, which is being classified into three categories viz., copious, medium and scanty. At NRCC equal numbers of animals (33.3% each) showed copious medium and scanty secretions whereas, at Gadhwala, only one animal showed more copious secretion as compared to medium and scanty secretions, presented in Table 1.<sup>[3]</sup>

#### **(g) Secretion of Poll Glands**

The secretion of poll gland considered as to be one of the features of the sexual behaviour of the camel was also classified in three categories viz. copious, medium and scanty. The observations recorded at NRCC indicates that 55.5% animals had medium secretion, followed by copious (25%) and 19.5% scanty (19.5%). Where as in the Gadhwala 50% animals showed medium, 32.5% copious and 17.5% scanty secretions. The secretion was dark redish in colour

with disagreeable smell falls, on both side of neck in the form of small drops, presented in Table 1. [4]

**Table 1. Sexual behaviour of camels at NRCC and Gadhwal Place**

NRCC			
	Furious	Strong	Mild
<b>1. General Sexual behaviour</b>	47.6	35.6	18.33
	16	13	7
	Gurgling	Metallic	Gurgling Metallic
<b>2. Different types sound</b>	63.3	22.1	14.6
	23	8	5
	Copius	Medium	Scanty
<b>3. Salivary gland secretion</b>	33.3	33.3	33.4
	12	12	12
	Copius	Medium	Scanty
<b>4. Poll Gland Secretion</b>	25.0	55.5	19.5
	9	20	7
GADHWALA			
	Furious	Strong	Mild
<b>1. General Sexual behaviour</b>	50.0	37.5	12.5
	20	15	5
	Gurgling	Metallic	Gurgling Metallic
<b>2. Different types sound</b>	67.5	22.5	10.0
	27	9	4

	Copius	Medium	Scanty
<b>3. Salivary gland secretion</b>	35.0	32.5	32.5
	14	13	13
	Copius	Medium	Scanty
<b>4. Poll Gland Secretion</b>	32.5	50.0	17.5
	13	20	7

#### (h) Ejection of the soft palate

Ejection of soft plate known as gulla formation has been, observed in 36 animals at NRCC and 40 animals at Gadhwala showed the gulla formation which mainly occurred in right side and some time in left side. The frequency of gulla formation was found to be 5.44% per minute at NRCC and 5.33% per animal at Gadhwala, presented in Table 2. <sup>[5]</sup>

#### (i) Typical Posture While Standing

During sexual excitement all the bull camels assumed a typical posture. The camel stretched his hind legs wide apart, assumed a crouching posture and made false jerky movements with the his pelvis. While doing so, the animal brought his head and neck close to the hump.

#### (j) Up and Down Movements of the tail

The up and down movement of the tail is an important sexual feature during the rutting period, particularly, when the process of mating start all the bull camels perform up and down movements of the tail and lash it vigorously on their testis and genital organ as observed. By doing this probably show they stimulate there own genital organs. Observations in this regards average tail movements were 25.83 and 27.60 per minutes at NRCC and Gadhwala respectively, presented in Table 2. This process also included, frequent micturation as well as throwing of urine over back again and again. <sup>[6]</sup>

#### (k) Act of Micturation

At the time of sexual excitement the bull camels micturated intermittently. The urine was emitted rhythmically in spurts, indicating the sexual arousal of the male camel. This urine was also broad casted by the animal by up and down movements of his tail.

## 2. Act of Copulation

### It was observed and recorded in

Natural Service: The following details were observed.

### 1. Courtship

Bull camel while moving freely in the herd, first tried to detect the estrus in the female by smelling her external genitalia and the groin. After smelling, he extended his head and neck with upcurled lips. Smelling, was invariably accompanied by "Pinching" (biting the female). Sometime the male bit the female so hard that it resulted in bleeding. The usual place of biting was the vulva lips or the posterior part of the hump.

### (2) Efforts of the bull camel to make the she camel sit on the ground

After detection of estrus, the bull camel made the she camel sit on the ground and followed the following procedure.

- a. Bull camel tightly passed his nose against her head and followed down to her shoulder, flank and as he reached her genitoanal region, his nuzzling generally became more vigorous.
- b. The bull stimulated the vulva of the she camel by the friction of his neck.
- c. He put his neck on the neck of the she camel and pressed down words thus putting his full weight on the she camel.
- d. If the female failed to oblige, then he bit her on the stipple joint which stopped her from walking and she then sat down.
- e. As soon as the female sat down, the male often went off balance and fell on the ground, but soon took the position and mounted the female.

### (3) Mounting and Positioning

This included the following steps.

- a. The bull camel stood over the sitting females by placing his fore limbs, one each side of her shoulder and his fore limbs, one each side of her shoulder and his hind limbs, one on each side of her pelvis.
- b. Now the bull camels sat down on the female in such a manner that he transferred his full weight on the female though his own chest ped which rested on the rear portion of the hump of the females. In this position the male kept his for legs fully extended but folded his

hind legs completely. Thus while the whole of his front portion was raised up, he was actually sitting on the ground through his hind parts.

- c. When bull camel covered the she camels, he squatted dog, like, with hind limbs flened and resting on the ground from the heels of the hock, the stifle almost touching the ground, the fore limbs extended one on each side of the she camels with the feet planted of the ground. Both animals were facing the same way.

#### **(4) Penile movements to located the Vulva**

The bull camel after mounting started the penile movements to located the vulva. The penis which was found to be rigid and approximately 10 to 20' long, after full erection located the vulva by rotating itself spirally on its own longitudinal axis.

#### **(5) Mating**

After the penis had located the vulva, the bull camel gave strong pelvic jerks from time to time by lifting his haunches. His back was now arched. Mating is observed.

#### **(6) Posture of the bull camel in relation to the she camels during mating.**

During mating, bull camel assumed a typical posture known as the dog sitting position. The relationship of the different male parts to the female was observed as under.

- a. The chest pad of the bull camel related to the posterior part of the hump of the she camel.
- b. The head and neck of the bull camel was fully strained and held high and straight above the neck of the she camel.
- c. The hind parts of the bull camel were pressing tightly against the pelvis of the she camel.
- d. The forelimbs of the bull camel were placed one on each side of the thorax of the female and were related to the shoulder region of the she camel.

#### **(7) Total Copulation time.**

The period from the entry of the penis into the vagina till the completion of the act was recorded as total copulation time.

At NRCC thirty six observation were recorded on mating the average copulation time was 7.61 minutes per one mating, and other at Gadhwala 40 observation recorded on mating the average copulation time was 8.10 minutes per one mating presented in Table 2. <sup>[7]</sup>

**(8) Ejaculation**

At the time of ejaculation the bull camel gave a final theorist by raising his hind portion on the hock joints. During this period shivering was also abdominal muscles. The bull camel further arched his back. Strong contractions were also observed in the sheath. During one act of copulation the bull ejaculated 3 to 4 times.

**(9) Position of the bull camel after ejaculation.**

It was observed that after, the bull camel either fell down on one side or stood up. After continuous service the bull camel got tired and generally fell down, other-wise he was able to stand-up.

**TABLE 2: Gulla Formation, copulation time in matting and tail movements of camels at NRRC and Gadhwal.**

Places	<-----PARAMETERS----->		
	Gulla Formation per Minute	Copulation time in Matting per Minute	Tail Movement per Minute
<b>NRCC</b>	5.44	7.61	25.83
	36	36	36
<b>GADHWALA</b>	5.33	8.10	27.60
	40	40	40

**REFERENCES**

1. Raouf MA, El Maggar MA. Studies on reproduction in camels (*Camelus dromedaries*) J.V. Sci. UAR, 1964; 1: 113-119.
2. Khan AA and Kohli IS. A study on sexual behaviour of male camel (*Camelus dromedaries*). Part - I Indian Vet. J. 1972; 49 : 1007-1012.
3. Khan AA, Kohli IS. A note on the sexual behaviour of the male camel (*Camelus dromedaries*). Indian J. of Ani. Sci., 1973; 43: 1092-1094.

4. Khanna ND, Tandon SN, Rai AK. Reproductive status of Bikaneri camel managed under farm conditions. Proceeding of the workshop 10-12 September, Paris, G. Saint Martin. 1990; pp. 337-352.
5. Rai AK, Tandon SN, Khana ND. Copulation time of Bikaneri male camels. Indian J. Anim. Sci. 1988; 58: 1202-1203.
6. Manivannam B, Rai AK, Khanna ND. A note on the structure of the skin of poll glands in the Indian camels (*camelus dromedaries*). Indian vet. J. 73 : March, 1996; 365-367.
7. Purohit R, Ganguly S. Eco-ethological and eco-physiological behaviours of Camel (*Camelus dromedarius*): a study report. Proceedings of International Conference on Recent Trends in Arts, Science, Engineering and Technology (ICRTASET-2018) on the Scientific Theme "*New and Expanding Horizons in Research Pursuits in Our Current Social and Scientific Scenario Worldwide*" jointly organized by the International American Council for Research and Development, USA, D.K. International Research Foundation (Regd.), International Economics University for SAARC Countries, Republic of Maldives and RIAS Civil Services Academy (Center for Successful Learning), New Delhi, India on December 30, 2018 at DS Hotel, Perambalur, Tamil Nadu, India, pp. xx-xx. ISBN XXX-XX-XXXXX-X, 2018.