



## Studies on feeding behaviour and daily activities of *Rhinoceros unicornis* in natural and captive condition of Assam

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### ABSTRACT

The present study was conducted on feeding behaviour and daily activities of rhinoceros (*Rhinoceros unicornis*) in natural (Pobitora Wildlife Sanctuary, Assam) and captive (Assam state zoo, Guwahati) condition. The observations were made in both day and night time. The study revealed that the rhinoceros spent maximum time in grazing both on grassland (30.14 per cent) and wetland (21.73 per cent). They were observed to be top grazer and preferred to graze slowly in grassland. Early morning and afternoon were most suitable time for grazing for them. Wallowing, galloping, easy walking, standing, resting, and sleeping were some other myriad behaviour that can be seen while watching the rhino in day and night time in natural condition. In comparison to the natural condition, the rhino in the captive condition wallowed for less time (6 per cent) and sleeping (50 per cent) was primary activities of rhinos in the night time. It was observed that rhino maintained good relation with other animals during grazing in both natural and captive condition. Season had effect on the behaviour of rhino specially on grazing and wallowing where the animals spent more time in grazing during post monsoon season than the pre monsoon, monsoon and winter seasons. Highest per cent of wallowing was in the monsoon season (46 %) as compared to the pre monsoon (14%). Rhinos had tendency to defecate in a particular place for a long time making a huge dung pile both in natural and captive conditions.

**Key words:** Behaviour, Galloping, Grazing, *Rhinoceros unicornis*, Wallowing,

### INTRODUCTION

The Indian Rhinos (*Rhinoceros unicornis*) like all animals naturally found in an area plays an important role in the local ecosystems where they live. However, this endangered species are suffering from poaching for their horns as there are superstitions about the medicinal benefits of said horns for which their number is decreasing. Therefore, there is an urgent need for conservation of this species. Knowledge of the behaviour is essential for successful translocation and *in-situ* conservation. Conservation and captive breeding often fails as a result of behavioural problems and behavioural issues are accepted as important in the management of captive species. Some of the studies regarding daily activities (Yadav 2000), feeding and wallowing behavior (Bhattacharyya, 1991; Patar, 2005) and diurnal and nocturnal feeding, drinking, aggressive behaviour of rhino (Laurie, 1978) provided some information on the rhino. Considering the paucity of information on the behaviour of this species, the present study was undertaken to provide information on feeding behaviour and other daily activities of rhinos both in natural and captive conditions of Assam.

### MATERIALS AND METHODS

The study was conducted in natural condition in Pobitora Wildlife Sanctuary of Assam and in captive condition in Assam State Zoo cum Botanical Garden of Guwahati, Assam.

The study was made by scan sampling methods with the help of an ethogram as per the methods describe by Richards (1966), Chalmar (1968) and Bennet and Mellen (1983). The ethogram was constructed after making a reconnaissance survey in the sanctuary. Three observations were made for each hour in every month for a period of one year. The observations in day time were done covering the period between 6 am to 6 pm and in the night time these were made up to 11 pm. Scan sampling method was made from the road, watch tower and tongi. Rhinos were also observed on foot, from elephant and tree top to record their different activities. Binoculars, electronic torch and stop watch were used as auxiliary means during recording the data. The data for both diurnal and nocturnal activities of two adult male rhinos in the zoo were recorded by direct visual observations.

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The observations were made for 7 days in each months of one year.

## RESULTS AND DISCUSSION

**Feeding behaviour and daily activities:** The finding of the results of the feeding behaviour and daily activities of the rhinoceros in natural condition has been presented in Table 1. The feeding behaviour was associated with the foraging movement for search, intake of grass and mode of grazing. Wallowing, galloping, easy walking, standing, resting, and sleeping were some other myriad behaviour that can be seen while watching the rhino in day and night time in natural condition.

The present study revealed that the rhinoceros spent maximum time in grazing both on grassland (30.14 per cent) and wetland (21.73 per cent). They preferred to graze slowly in grassland. Early morning and afternoon were most suitable time for grazing for them. When the grazing places were found to be undisturbed, the rhino showed easy walking behaviour (14 per cent) which was associated with grazing, wallowing and sleeping. During easy walking they grazed with head down. In the present study, the continuous grazing period ranged from 0.27 to 8.03 minutes. After continuous grazing for long time, the animal used to take rest in the shades of tree or wood land where they expense about 7 per cent of the total day time. During the day time, they were found to spend almost 3 per cent of the day time in standing where the animals were found to be busy in mastication. Normally during day time, the animals were found lying down with reflex to external stimuli for almost 2 per cent of the total day time. The lying was mostly recorded during late evening. The rhinos under observation slept means lying down with no reflex to external stimuli from 46 to 95 minutes in a day which were almost 7 per cent of total day time. Sleeping was mostly found during morning hours after heavy grazing in the night. Similar observation of grazing both grass and wet land were also reported by Dutta (1990), Patar (1977) and Bhattacharya (1991) in different National Park.

When the animal was frightened or gets disturbed by human being or other species of animal, they showed the galloping behaviour where the animal was running by lifting the both fore leg or hind leg at a time and spent about 1 per cent of total day time. It was found that wallowing was the indispensable part of their day to day activities. Irrespective of age, they were found to be wallowed in shallow or static water bodies which were about 14 per cent of total day time. The wallowing continued for 50 to 140 minutes at a time. The wallowing behavior of rhinos might be due to fewer sweat glands in the body and wallowing helps to decapitate heat from the body.

The present study revealed that the rhinos were active even in the night time. They grazed both in grassland and wetland simultaneously. They also found in wallowing and resting during the early morning hours. The present study was in agreement with the finding of Laurie (1978) and Bhattacharya (1991).

Rhinos in the captivity (Table 2) showed the various activities like grazing, wallowing, resting, sleeping, easy walking, and standing as recorded in natural condition. The animals in the captivity were offered measured quantity of green fodder and feed mixture where they spent about 26 and 4 per cent of the daytime respectively to consume the same. When the grasses were not sufficient in the enclosure, the animals were grazed where they spent about 31 per cent of the day time. Standing activity was recorded in the shed during feeding of offered green feed and during grazing outside the enclosure. It was found that the rhinos preferred to take rest for about 14 and 5 per cent of the total daytime in the shed and outside the shed respectively. In comparison to the natural condition, the rhino in the captive condition wallowed for less time (6 per cent).

The various activities of *Rhinoceros unicornis* in night time in captivity has been shown in table-2. Sleeping (50 per cent) was primary activities of rhinos in the night time. This was because of the fact that the greenfodder or

**TABLE 1:** Various activities of rhinos in day time in natural condition

Activities	Total time (minutes)	Time in per cent	Activities in different seasons in per cent			
			Pre monsoon	Monsoon	Post monsoon	Winter
Grazing (grassland)	217.01	30.14	28.95	25.71	45.68	28.17
Grazing (wetland)	156.45	21.73	15.13	-	40.74	29.58
Easy Walking	100.09	13.90	13.16	17.14	9.87	15.88
Gallop	5.05	0.70	1.32	-	-	-
Resting	52.15	7.24	7.90	5.71	-	8.45
Standing	22.71	3.15	3.95	5.71	-	2.47
Lying	15.14	2.10	3.95	-	-	-
Sleeping	51.31	7.13	11.84	-	-	2.47
Wallowing	100.09	13.90	13.82	45.71	3.70	13.03

**TABLE 2:** Various activities of rhinos in captive condition

Activities	Day time		Night time		Dry period	
	Total time in minutes	Time in Per cent	Total time in minutes	Time in Per cent	Total time in minutes	Time in Per cent
Grazing	224.22	31.14	80.01	11.11	3.00	0.42
Feeding (offered grass)	184.53	25.63	21.67	3.01	283	39.31
Feeding (feed mixture)	25.25	3.51	-	-	30	4.17
Standing insideshed	1.25	0.17	-	-	21	2.92
Standing outside shed	5	0.69	-	-	25	3.47
Resting inside shed	97.92	13.6	3.67	0.51	100	13.69
Resting outside shed	38.25	5.31	-	-	20	2.78
Sleeping inside shed	41.75	5.80	341.91	47.49	77	10.69
Sleeping outside shed	15	2.08	-	-	-	-
Easy walking	46.33	6.43	27.4	3.81	131.5	18.26
Wallowing	38.5	5.35	244	33.89	25	3.47
Drinking	0.5	0.07	-	-	1	0.14
Defecation	1.5	0.21	1.34	0.19	2	0.28

feed mixture was supplied during day time only. The animals used to graze for less time (11 per cent) in night. After consuming the leafy portions of the offered grass, they go for grazing. It was interesting to note that the animals in few occasions brought out some offered grasses from the shed to the nearest water lodging area and soaked and consumed it. This indicated their instinct for grazing in wet land as in natural conditions. Resting and easy walking were found to be the least frequent activity in the night. Wallowing was another important activity showed by the animals in captivity. They spent about 34 per cent of the night time in wallowing.

**Mode of grazing and frequency of picking up the grasses:**

*Rhinoceros unicornis* were observed to be top grazer. They liked to take leafy and tender portion of the grass. The number of pickup of grass per minute for tall and short grasses were 40-48 with continuous grazing time of 1.03-8.55 minute and 48-54 with continuous grazing time of 2-5.39 minute respectively. Bhattacharya (1991) recorded the number of pick up at a time in three different locations as 30-110. It was observed that rhino generally graze with wild buffaloes of the sanctuary and cattle from the fringe villages without disturbing each other. In captivity also, it was observed that the rhinos took feed in the same place with spotted deer. Bhattacharya (1991) noticed that normally rhino do not show any aggressive behaviour to the fellow grazers.

**Defecation and urination behaviour:** It was found that the rhinos in natural and captive condition had the tendency to defecate in a particular place for a long time making a huge dung pile. They used to defecate in the morning and in the afternoon hours. Similar findings were also reported by

Bhattacharya (1991), Hazarika and Saikia (2010). Both males and females rhinos were found to be urinating in backward direction. The urine reached approximately 1.5-2 meter distance from their hind legs in male animals whereas in female animals it was 0.5-1 meter.

**Seasonal variation in activities:** The present study revealed (Table 1) the seasonal effect on the behaviour of rhino specially on grazing and wallowing. From the observation, it was clearly indicated that the animals spent more time in grazing both in grassland and wetland during post monsoon season than the pre monsoon, monsoon and winter seasons. Highest per cent of wallowing was in the monsoon season (46%) as compared to the pre monsoon (14%), post monsoon (14%) and winter (3%). Other activities were not affected by the different seasons. Laurie (1978) observed that rhinos wallowed most frequently between June- October (51% of all observation) and least frequently between December-March (4% of all observation) in lakes, rivers and temporary pools.

It can be concluded from the present study that *Rhinoceros unicornis* exhibited their own feeding behaviour and daily activities both natural and captive condition. Such knowledge on feeding behaviour and other daily activities of the rhinos in natural and captive condition is essential for sound management, successful translocation and in-situ conservation.

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