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Observation on the behaviour of Indian Muntjac (Muntiacus Muntjak) at the Jawaharlal Nehru Biological Park, Bokaro, Jharkhand

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ORIGINAL ARTICLE

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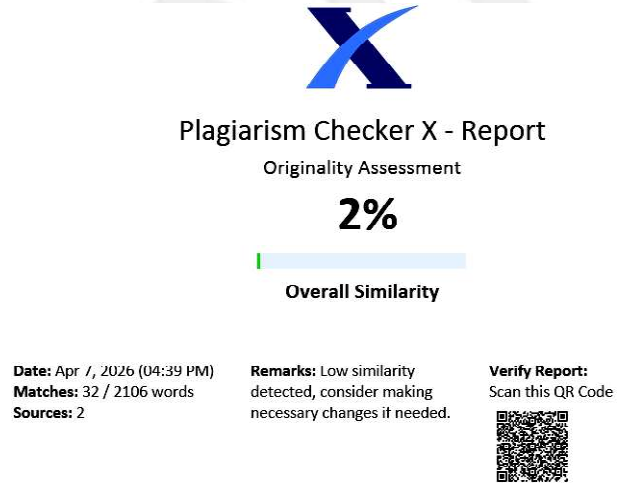


ABSTRACT

Indian Muntjac, Muntiacus muntjak (Zimmerman 1780) is a species under cervidae family, naturally found in the forested regions of south and south-east Asia. To understand their behaviour, a study was made on the Muntiacus muntjak inthe captivity of Jawaharlal Nehru Biological Park, Bokaro, Jharkhand in different season using Scan Sampling Method. It was observed that barking deer spent 52.37 percent of time in activity while rest of time they were in resting during the diurnal hours. Among the daily activities, 20.63% of time spent in movement, followed by 12.10% of time in scanning, 11.11% time in feeding and rest 8.53% time spent in other activities mainly the social activities. The seasonal activity pattern of both male and female Indian Muntjac shows that resting is the dominant behavior, ranging from about 35% to 52% across seasons. Feeding and movement activities are moderate, varying between approximately 10%–20% and 14%–20%, respectively. Scanning behavior remains relatively low (about 6%–14%) but shows a slight increase during winter, especially in females. Social activity is minimal in both sexes, ranging from nearly 5% to 11% with little seasonal variation. Overall, these patterns indicate seasonal influence on activity distribution under captive conditions at Jawaharlal Nehru Biological Park. The study revealed that barking deer in the captivity get equal habitat type, food supply and security from the predators, they have difference in their behaviour, mainly on basic activities. The variation in basic activities might be due to their difference in morphology, size, sex, age, etc.

KEY WORDS

Barking Deer, Muntiacus, Captivity, Behaviour, Bokaro.

INTRODUCTION

Southern Red Muntjac or Indian Muntjac (*Muntiacus muntjak*, Zimmermann 1780) are small solitary tropical forest ruminant deer species (Dubost, 1970; Barrette, 1977; Kurt 1981) is a native to Southeast Asia, commonly called the "barking deer" due to its distinctive alarm call (Arini et al., 2024). Muntjac deer have 9 known species(Shi and Ma 1988, Amato *et al*. 1991, Nowak 1991, Giao *et al*. 1998, Wang & Lan 2000) and 15 subspecies of the *Muntjac* in the world (Ohataishi& Gao, 1990). The species is known to be predominantly a browser, and shrubs are expected to build a major part of its diet (Lekagul and McNeely,1977). Barking deer is classified as an omnivore and is considered both browser and grazer with grass, ivy, thorny bushes, low leaves, barks, twigs, grasses, fruits, eggs, and small blood animals (Habiba *et al.*, 2021)

Behaviour is likely to vary with individuals and age- sexes; as such, an understanding of sex specific behaviour traits may assist in improving management techniques and practices (Lu et al., 2009). The behaviouralpatterns of Muntiacus muntjac by Mondal and Dutta (2023),whileDwi Arini *et al.* (2024) recorded 14 distinct behaviours in Barking deer at captive condition. The behavioural patterns were almost similar for male and female with several patterns showing variations (Akter *et al*., 2015).

Jawaharlal Nehru Biological Park is located at the Bokaro Steel City, Jharkhand having large collection of herbivorous species including Barking deer. The daily activities of Barking deer are normally influenced by diurnal hours, season, weather, food availability and visitors' presence. Hence, the study was conducted to understand the behaviour of Barking deer and tested with the seasonal influence.

Materials and Method

Study Area: Study was conducted in the captivity at the Jawaharlal Nehru Biological Park (JNBP), Bokaro Steel City, Jharkhand. The total geographical area of the park is about 50 hectors. It maintains a variety of animals belonging to various vertebrate groups, collected from different parts of India and also from abroad. The present study on barking deer (*Muntiacus muntjak)* was carried out on the enclosure situated on the south-eastern portion of park. The surface of the enclosure during the time of the study was mostly bear with some patches of grasses. At the southern part of the enclosure has shed and rest of the area covered by the shed of large trees. The western side of the enclosure is separated by the enclosures of Blackbuck and Sambhar. Northern and Eastern sides of the enclosure is open for visitors.

Methodology: The activities of adult male and female barking deer in captivity at the Jawaharlal Nehru Biological Park, Bokaro Steel City, Jharkhand. Observation was made to record data on the various basic activities of Barking deer covering all seasons. Observation was conducting in three sessions in a day. Data were recorded on the data sheet designed for the study. Data were collected during the normal operating hours of the park, which were generally 0900h to 1800h. Observation hours were equally distributed between dawn and dusk. Activity of both male and female were sampled repeatedly in different hours of the day using scan sampling method (Altman, 1974). The behavioural states recorded were feeding, walking, resting and social. Resting includes standing, scanning and lying activity of the individual.The observed data were used to calculate the percentage time spent in each activity and compared between seasons.

Results and Discussion

A total of 72 hours of observation on the behaviour of barking deer and recorded different basic activities and covered all the season. The time period during the observation hours, the study animal was moving inside the house are not included in the calculation of results.

The results of the study on the time spent in each of the activities in diurnal hours are shown table 1. The study recorded male barking deer spent nearly one-third time (29%) in resting and 71 percent of time they were active (Figure 1), while female spent 41% of time in resting and nearly 60% of time, they are active during the diurnal hours (Figure 2). Comperatively, male spent maximum time in resting, followed by movement, feeding

and social behaviour while minimum time in scanning. The female barking deer spent maximum time in resting, followed by feeding, walking and scanning and minimum time in social activity. The study highlighted that both male and female spent nearly equal time in social activities. Altogether, male barking deer were more active compared to the female barking deer at the JNBP, Bokaro Steel City.

Figure1: Daytime spent (%) on basic activities by adult male at Jawaharlal Nehru Biological Park, Bokaro, Jharkhand

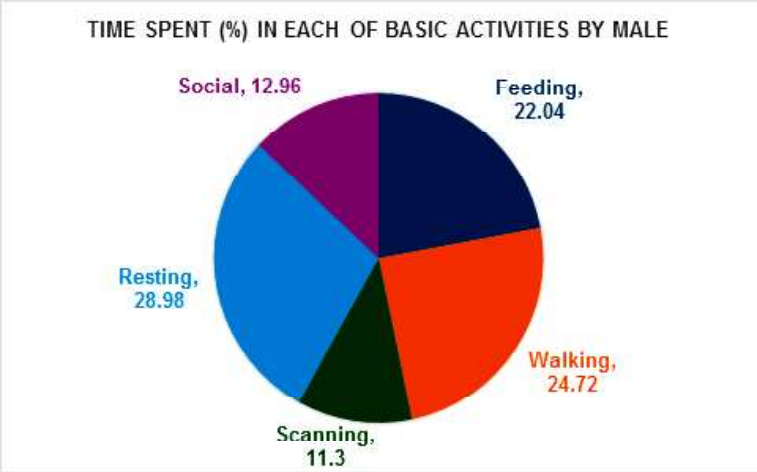
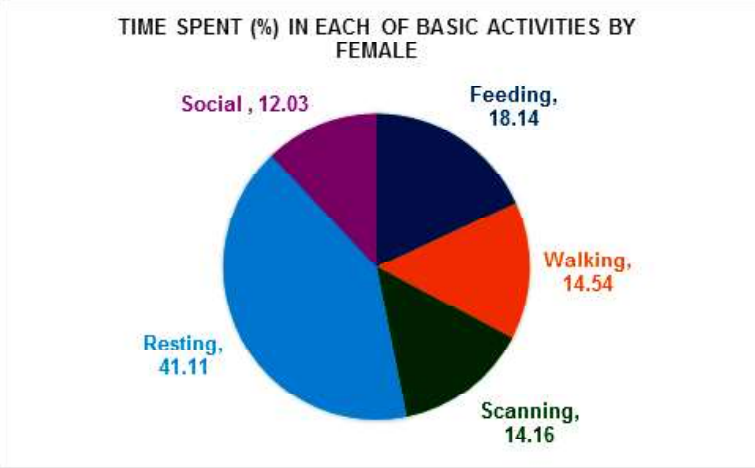


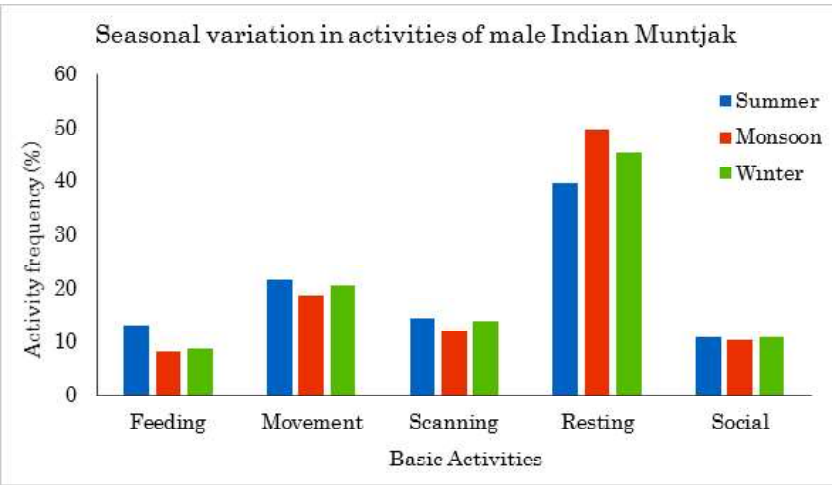
Figure 2: Daytime spent (%) on basic activities by adult female at Jawaharlal Nehru Biological Park, Bokaro, Jharkhand



Seasonal Variation in activities

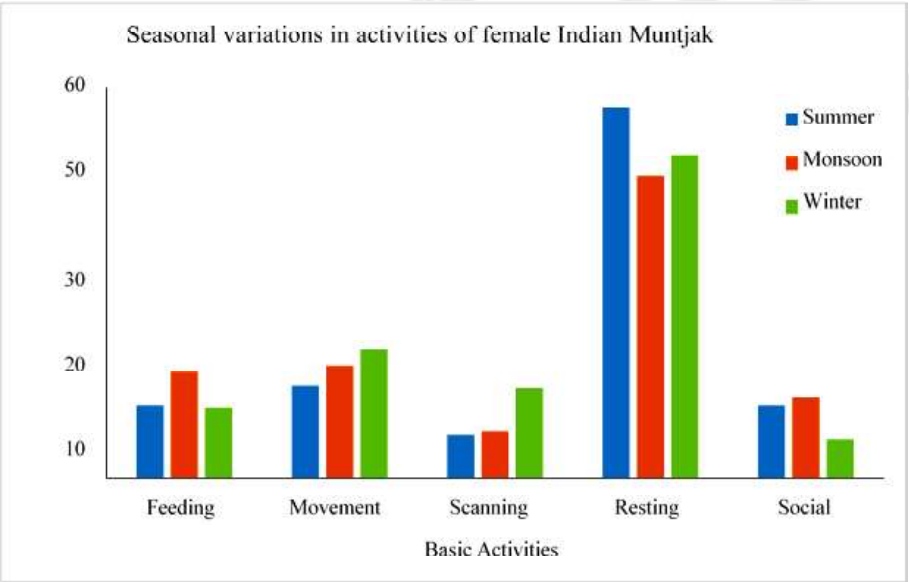
The comparative account of activities of barking deer in different season it was found that the barking deer were engaged in feeding was highest during summer and comparatively lowest in monsoon. Similarly, movement and scanning activities were recorded highest during summer, followed by winter and lowest during monsoon season (Figure 3). A reverse trend was observed on resting activity of barking deer. It was observed that maximum resting activity was recorded during monsoon, followed by winter, and minimum during summer. While, the social activities including communication, fighting, playing, grooming, sexual activities were recorded more or less equal in all the season.

Figure 3: Frequency (%) of basic activities of *Muntiacus muntjak* in different season at Jawaharlal Nehru Biological Park, Bokaro, Jharkhand



The activity pattern of male Indian Muntjac shows that resting is highest in monsoon (49.7%), followed by winter (45.5%) and lowest in summer (39.6%). Feeding is highest in summer (13.2%) but decreases in winter (9.0%) and remains lowest in monsoon (8.3%). Movement is comparatively higher in summer (21.5%), slightly lower in winter (20.5%), and lowest in monsoon (18.8%), while scanning shows a similar trend with maximum in summer (14.6%). Social activity remains almost stable across seasons, with slight variation between 10.4% and 11.1% at Jawaharlal Nehru Biological Park.

Figure 4: Frequency(%)of basic activities of adult female of Muntiacus muntjak indifferent season at Jawaharlal Nehru Biological Park, Bokaro, Jharkhand



The activity pattern of female Indian Muntjac shows that resting is highest in summer (57.5%), followed by winter (50.3%) and lowest in monsoon (47.8%). Feeding is highest during monsoon (16.8%) compared to summer (11.5%) and winter (11.8%). Movement increases from summer (15.2%) to monsoon (18.7%) and reaches its peak in winter (21.0%), while scanning is also highest in winter (16.5%). Social activity is comparatively higher in monsoon (16.8%), followed by summer (15.2%), and lowest in winter (11.2%) at Jawaharlal Nehru Biological Park.

The observation on various behavioural repertoire of barking deer was recorded similar result as other studies conducted in captivity. Mondal and Dutta (2023) studies on the behaviour of barking deer at the captivity of Alipur Zoo and they also found that males showed more sexual behaviour and less submission behaviour

towards females. Further, they observed highest frequency (33.25 %) of foraging and the lowest (1.28 %) of sexual behaviour in Barking deer at captive environment. McCullough et al. (2000) observed on *Muntiacus reevesi* showed somewhat more activity during daylight than night, with peaks of activity in morning and evening in most months. Females consumed food and took rest more frequently than males, who spent more time in foraging and movement. Males also showed higher frequency of sexual behaviours and less submissive behaviours (Akter et al., 2015). The present findings reveal that majority of the behaviours resemble that of other cervids but nibbling and barking are unique to this species.

CONCLUSION

Keeping animal in captivity captured from their wilderness is a kind of conservation technique for threatened animal population. Barking deer is one among the threatened animal kept in various zoo's all over the world. In captivity, due to various artificial condition, and changing habitat, barking deer engaged in various activities to survive in new habitat. As result their activities varied as compared to wilderness. Some behaviour of barking deer minimisedin captivity like feeding, movement and social activities while behaviour like scanning and resting was found increased as compared to their wilderness.

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