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Confirming presence of Indian mouse deer from Chhattisgarh, Central India with photographic evidence after 112 years

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Abstract

The present study documented Indian mouse deer from Udanti Sitanadi Tiger Reserve after 112 years of the first photograph taken by Brooks in 1905 from Raipur district of recent Chhattisgarh. A camera trapping exercise was conducted in the Tiger Reserve from December 2016 to April 2017 covering 588 km² area. In total, 13 photo-capture of Indian mouse deer were obtained from the present study and the elevational range of photo-capture locations were between 539 m and 892 m above sea level. The present study confirmed presence of Indian mouse deer in a dry tropical peninsular sal forest and southern tropical dry deciduous mixed forest in Udanti Sitanadi Tiger Reserve, Chhattisgarh. The existing population of Indian mouse deer is probably facing severe threat as the local tribesmen are known to hunt deer species for consumption in this area. More research interventions are needed to know the status of this species in Udanti Sitanadi landscape which will contribute in better conservation of the species in the long run.

Keywords: *Moschiola indica*, smallest ruminant, camera trapping, central India

Introduction

Indian mouse deer *Moschiola indica* is the smallest of all the ungulates species found in India. This species belonged to an ancient group of primitive ruminants, with history dating back to the Miocene [5, 3, 17]. There are two extant genera, *Moschiola* and *Tragulus*, which occur in the South and Southeast Asian region [3]. In a recent taxonomic revision of the Genus *Moschiola* based on skulls (*Moschiola* sp., Artiodactyla) from Sri Lanka and India, Groves and Meijaard (2005) [1] found consistent differences within this taxon and they divided this taxon into three species: *Moschiola indica* from southern India, *M. meminna* from the Dry Zone in Sri Lanka, and *M. kathygre* n. sp. from Sri Lanka's Wet Zone. Their research suggested that there is a probability of fourth new species from Sri Lanka's Hill Zone. The Indian Mouse Deer *Moschiola indica* is the smallest ruminant; body length 50-58 cm; Shoulder height 25-30 cm, Tail length is 3 cm and body weight is about 3 kg [16]. Body coat is reddish brown with lighter spots and stripes on the body. The Indian mouse deer is found in tropical moist deciduous and evergreen forests of peninsular India. Its distribution is still uncertain due to poor sighting records. Presence is recorded from Bihar, Jharkhand, Odhisa, Andhra Pradesh, Madhya Pradesh, Maharashtra, Karnataka, Kerala, Tamil Nadu, Rajasthan and Gujarat [12, 19, 20, 10, 21]. In the Northern part of Indian Subcontinent, presence of India mouse deer is confirmed from Nepal [12, 14, 7, 8, 18] and Terai regions. In most of the areas Indian mouse deer is anecdotally recorded though recent widespread use of camera traps, which documented photographic evidences of their presence from different zones from South and Central India [20, 10, 21].

Indian mouse deer is listed in schedule-I of the Wildlife (Protection) Act, 1972 and declared as Least Concerned species by IUCN (2017). It is already a highlighted species in Indian wildlife research due to its mystic presence across the distribution ranges in India and Nepal. However, a very few studies have been done on the species; the only population estimation study of Indian mouse deer is available from Periyar Tiger Reserve, Kerala by Kumbhar *et al.* 2013 [10] and on resource utilization and distribution of Indian mouse deer by Ramesh *et al.* 2012 [20] in Mudumalai Tiger Reserve, Tamil Nadu. Study by Kumar *et al.*, 2013 [21] in Kanha Tiger Reserve, Madhya Pradesh and an observation of Nandini R., 2005 [15] in Annamalai hills, Tamil Nadu contributed on species occurrence in the respective areas.

So far, no other study is available on its population trends and involved risks which may influence the local extinction of the species within its distribution range in India and Nepal. Hence, few distribution records which at least confirm their existence in a specific landscape may definitely be useful to wildlife management authorities. In Chhattisgarh, the only known photographic evidence of Indian mouse deer was obtained by Brook in 1906^[4] from Raipur District of the Central Provinces of then Indian subcontinent, which was reported by Harshey and Chandra (2001)^[2]. The present study documented presence of Indian mouse deer from Udanti Sitanadi Tiger Reserve as well as from State Chhattisgarh with photographic evidence after 112 years of its first photographic record by Brook (1906)^[4].

Study Area

Udanti-Sitanadi Tiger Reserve is constituted of 1842.54 km² area of Gariyaband and Dhamtari Districts of State Chhattisgarh. Udanti Sitanadi is well known for the Asiatic Wild Buffalo *Bubalis arnee*. Forest type of the area consists of Tropical Dry Peninsular Sal forests and Southern Tropical Dry Deciduous Mixed forests^[11]. The topography of the area is mixed of hill ranges and intercepted strips of plains. The Tiger Reserve is adjacent to proposed Sonabeda Tiger Reserve in Odisha State in the eastern side and form Udanti-Sitanadi-Sonabeda Landscape. In the western side the tiger reserve has a significant connectivity with Kanker and North Kondagaon Forest Divisions which extends further up to Indravati Tiger Reserve in Bastar region. In North it connects with Dhamtari and Gariyaband Forest Divisions and though fragmented but further connects to Barnawapara Wildlife Sanctuary in Mahasamund District. This connectivity has a good future if the entire tiger landscape complex (Chhattisgarh-Odisha Tiger Conservation Unit) can be taken under significant wildlife conservation efforts.

Methodology

A systematic 2 km X 2 km grid based camera trapping study was conducted under Phase IV Tiger Monitoring Program in Udanti-Sitanadi Tiger Reserve between December 2016 and April 2017 covering 588 km² area. The entire study area was divided in three study blocks and camera trapping was conducted in 53, 51 and 43 grid-cells (2 km X 2 km) in three blocks respectively in three Ranges of Udanti Sitanadi Tiger Reserve i.e. Kulhadighat, North Udanti and South Udanti. Since, the camera trapping exercise was aimed to estimate the tiger *Panthera tigris* and its co-predator's populations in the study area, cameras were mostly installed in the trails used by the large carnivore species. However, the entire study area was studied through intensive camera trapping covering 147 selected trap sites spread from forest plains to hilly terrain along the busy animal trails, nullahs, rocky and sandy stream beds. The locations of each photo-capture of Indian mouse deer was recorded and mapped over Udanti Sitanadi Tiger Reserve map to understand their geographic distribution in the study area.

Results

A few anecdotal information was available on the presence of

Indian mouse deer based on its vernacular name *Khebdi/Kebdi* (face with protruded teeth) in the study area, however those were not confirmed records based on any evidence. Despite of few camera trapping exercises in the Kulhadighat Range in recent past, Indian mouse deer was never been photo-captured. In the recent camera trapping exercise in the same area, a total of 13 photo-captures of Indian mouse deer were recorded from six different grid cells (Fig. 1) of Udanti Sitanadi Tiger Reserve. Brook (1906)^[4] first photographed and recorded presence of Indian mouse deer from then Central Province of India which now falls in the State of Chhattisgarh. The present camera trapping study confirmed the presence of Indian mouse deer from Udanti Sitanadi Tiger Reserve and State Chhattisgarh with photographic evidences after 112 years of the study conducted by Brook (1906)^[4] (Fig. 2). All the photographic captures were from 2nd and 3rd block of the study area mostly falling in Kulhadighat Range. The elevation of the capture locations were between 539 m to 892 m above sea level which represented mostly the hilly areas of the Tiger Reserve. Although the numbers of captures were very low to infer on their temporal activity pattern, but most of the captures were from 21:00 hrs to 5:00 hrs in the morning.

Discussion

Indian mouse deer is considered as rare and cryptic species even its status information is scarcely available consequently very few conservation initiatives are taken to save the species in most of its distribution ranges. This study confirmed occurrence of Indian mouse deer in Udanti Sitanadi Tiger Reserve which is a least studied area in Chhattisgarh, eventually, Indian mouse deer was mystically remained uncaught to the wildlife biologists till recent times. Re-discovery of mouse deer in the study area will open new scopes to study the species in Udanti Sitanadi landscape, and eventually this large landscape can be developed as a conservation unit for the species where emphasis from academics and administrators can improve and strengthen conservation strategies.

Conservation threats

Most of the mouse deer captures were recorded in the buffer zone of Udanti Sitanadi Tiger Reserve which are disturbed by several anthropogenic activities like fuel wood collection, NTFP collection and cattle grazing. As noted in southern India, the Indian mouse deer was projected as probably among the most frequently hunted ungulate in the forests^[6]. In case of Udanti Sitanadi Tiger Reserve, famous hunting tribes like Kamars, Bhunjia, Muriya and Gonds inhabit the villages in and around the Tiger Reserve and hunt large to small sized wild ungulates in the Reserve. Consequently, it can be stated that the population of Indian mouse deer in Udanti Sitanadi Tiger Reserve is also threatened by illegal hunting activities by local villagers. Hence, it is imperative to conduct a detailed systematic survey across the Udanti Sitanadi landscape to get a better insight on Indian mouse deer population, their ecology and conservation needs.

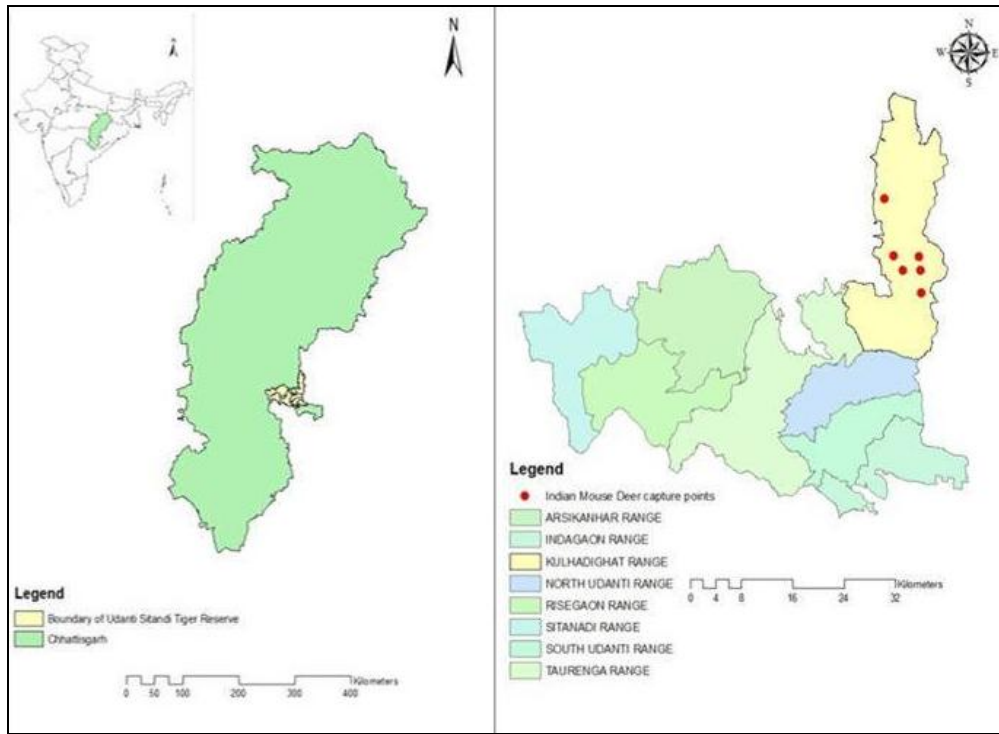


Fig 1: The location of Udanti Sitanadi Tiger Reserve in Chhattisgarh, Central India and the capture locations of Indian mouse deer during the present study.



Fig 2: Indian mouse deer *Moschiola indica* captured in Udanti Sitanadi Tiger Reserve, 2017, Chhattisgarh, Central India.

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