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Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

NOTE

FIRST PHOTOGRAPHIC RECORD OF MISHMI TAKIN *BUDORCUS TAXICOLOR TAXICOLOR* AND RED GORAL *NEMORHAEDUS BAILEYI* FROM KAMLANG TIGER RESERVE, ARUNACHAL PRADESH, INDIA

Cheshta Singh & Deepti Gupta

26 July 2021 | Vol. 13 | No. 8 | Pages: 19149–19152

DOI: 10.11609/jott.7059.13.8.19149-19152



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First photographic record of Mishmi Takin *Budorcus taxicolor taxicolor* and Red Goral *Nemorhaedus baileyi* from Kamlang Tiger Reserve, Arunachal Pradesh, India

Cheshta Singh¹ & Deepti Gupta²

¹ Divisional Forest Officer, Kamlang Tiger Reserve and Wildlife Sanctuary Division, Lohit, Arunachal Pradesh 792102, India.

² Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand 248001, India.

¹ singh.cheshta@gmail.com (corresponding author), ² rics.deepti@gmail.com

The landscape of northeastern India is a highly diverse and a species-rich area. There are many species which are not systematically surveyed in this region. This has led to a far lesser number of records of species than what are actually present in this region. To overcome this, it is essential to increase the intensity of surveys and their scientific documentation. It will help in increasing the awareness of these species which is essential for saving them from the threats of habitat fragmentation, climatic changes, and risks faced through hunting cases. Over the last two-and-a-half decades, advancements of various noninvasive techniques such as camera trapping has strengthened the sampling procedure and approach to reliable scientific data with reduction of time, efforts, and cost. Camera traps have nowadays become very useful to study cryptic and elusive species.

Kamlang Tiger Reserve (KTR) (Figure 1), situated in southeastern part of Lohit District, Arunachal Pradesh was declared a tiger reserve in 2017. It is surrounded by the Kamlang Reserve Forest to the west and north, un-classed state forest (USF) to the east and Namdapha

Tiger Reserve to the south. The total area of KTR is 783 km², which includes a core area of 696 km² and a buffer area of 87 km². Many perennial rivers like Lang, Lathi, Kamlang, Sinabara, Tawa, and Lai flow from the reserve. Glaw lake is a perennial lake at an altitude of 1,168 m. The major indigenous communities inhabiting this region are the Digaru-Mishmi and Mizu-Mishmi.

The reserve has rugged terrain with an altitudinal gradient of 500–4,500 m. KTR represents one of the biodiversity hotspots of India, Himalaya, which supports many elusive and rarely sighted mammals, birds, and other taxa. This area lacks systematic scientific surveys mainly due to extremely complex terrain and hence is very less known for its biodiversity. Kaul & Haridasan (1987) have classified forests of Arunachal Pradesh into six categories, viz., tropical, subtropical, temperate, alpine, subalpine, and secondary forest, out of which KTR contains tropical wet evergreen forests, tropical semi-evergreen forests, sub-tropical semi evergreen forests, moist bamboo forests, Himalayan moist temperate forests, and moist alpine scrub forest.

Editor: Anonymity requested.

Date of publication: 26 July 2021 (online & print)

Citation: Singh, C. & D. Gupta (2021). First photographic record of Mishmi Takin *Budorcus taxicolor taxicolor* and Red Goral *Nemorhaedus baileyi* from Kamlang Tiger Reserve, Arunachal Pradesh, India *Journal of Threatened Taxa* 13(8): 19149–19152. <https://doi.org/10.11609/jott.7059.13.8.19149-19152>

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Funding: This work was funded by National Tiger Conservation Authority and Environment and Forest Department, Arunachal Pradesh.

Competing interests: The authors declare no competing interests.

Acknowledgements: The camera trapping exercise has been attempted for the first time in this region. We thank National Tiger Conservation Authority for funding support and Environment and Forest department of Arunachal Pradesh for facilitating this work. We thank the range forest officer, Kamlang Tiger Reserve for encouraging the field staff. We are grateful to the field staff mainly the Project Tiger protection squad for their contribution in the field work despite facing a challenging terrain.



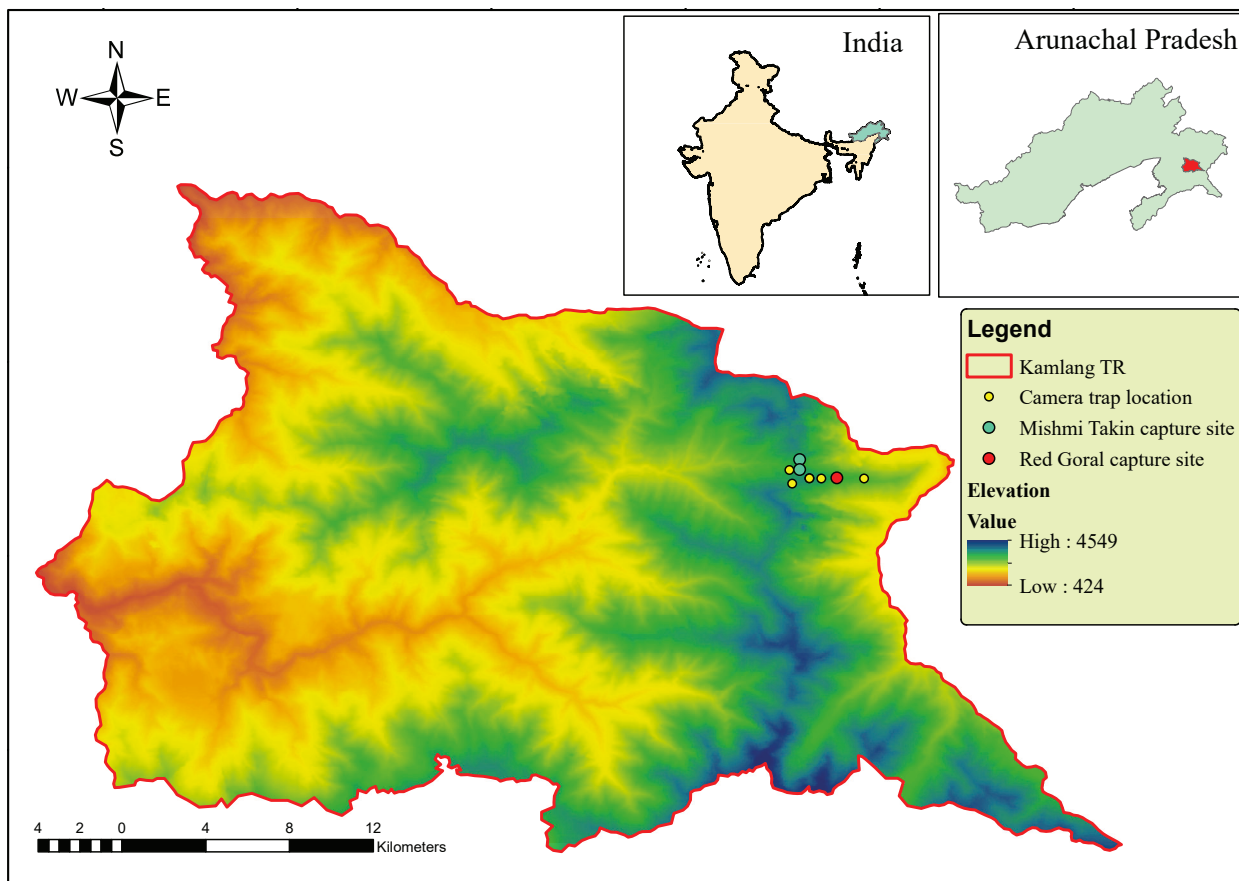


Figure 1. Camera trap locations in Kamlang Tiger Reserve.

A sign survey exercise was carried out for the first time in a particular region of KTR, which falls in Anjaw District, along the northeastern boundary of the reserve. Based on the inputs received from the local people and the results of sign survey, this region seemed to be diversity rich. We therefore carried out a camera trapping exercise for surveying this region. Nine Cuddeback camera traps were deployed over a period of 77 days (Total trap nights= 693), due to limitations of terrain accessibility and suitability of season. We considered a single trap night to be an occasion for example if an individual/group of animals was captured once in 24 hours it was counted as an occasion. We used occasion as a unit to avoid false count from the multiple capture of grazing herbivores. Our trap sites fall in the moist alpine scrub forest type. No camera traps had been previously deployed in this particular region. It was thus selected as a site for camera trap deployment to capture and understand the species that could be found here.

We captured a lesser known ungulate Red Goral *Nemorhaedus baileyi* (Bailey 1912) on two occasions in Anjaw District on a high-altitude ridge area (Image 2). On

an occasion, a female was captured with fawn which is a sign of breeding range in the area. Red Goral has been categorized as a Vulnerable species in the IUCN red list with less than 10,000 mature individuals left worldwide. The presence of this species has been reported from Dibang, Changlang (Datta et al. 2008) and Lohit valley (Nijhawan 2020) before but no photographic records have been reported from KTR so far. The Red Goral remains poorly studied due to its narrow geographic range and low population estimates (Singh 2002). This species prefers a forested habitat, meadow, and scrublands with altitudinal range from 2,000 to 4,500 m. We captured its presence at an elevation of 3,410 m. The forest type is mainly sub-alpine in this area. This species continues to face threats due to habitat fragmentation, illegal hunting, and infrastructure developments (Sung et al. 1997) and hence, needs immediate attention for conserving its range. As KTR is being reported its breeding range, conservation practices should be focused in this region.

We also captured another lesser known species Mishmi Takin *Budorcas taxicolor taxicolor* (Image 1), which has been listed as vulnerable in IUCN Red List (Song

Table 1. Details of camera trapping in reference to the species captured during sampling.

	Species	Number of occasions on which species was captured	Total number of captures	Altitude (m)
1	Red Goral	2	8	3410
2	Mishmi Takins	16	165	3470
3	Barking Deer	1	1	3215
4	Yellow-throated Marten	7	8	3432
5	Hoary-bellied Squirrel	3	7	3248

**Image 1.** Mishmi Takin *Budorcas taxicolor taxicolor* captured in a camera trap.**Image 2.** Red Goral *Nemorhaedus baileyi* (female) captured in a camera trap.

et al. 2008). It is distributed at the northeastern tip of India, however, precise geographic distribution in India is less known. It has been sighted and photographed by Singh (2002) and genome was sequenced using carcass tissue sample collected from Dibang Valley by Kumar

et al. (2019). We captured 165 photographs on 16 trap occasions at an altitude of 3,470 m. Mishmi Takin was captured as solitary, as a group of two individuals and a group of three individual including a calf. Though this species is a group living animal, our solitary records may

be because of camera placements. We recorded species presence mostly from the Himalayan moist temperate forest. Its population trend is decreasing mainly because of hunting for bushmeat consumptions and habitat destructions (Wang et al. 2005) and considered rare in this region. Our findings represent KTR as an important breeding site for this species and demands more attention on this area for conservation efforts.

Apart from this, we captured Barking Deer *Muntiacus muntjak*, Yellow-throated Marten *Martes flavigula* and Hoary-bellied Squirrel *Callosciurus pygerythrus* from the camera traps deployed in this region of KTR (Table 1).

This document assembles a baseline by presenting photographic information on the presence of rare and elusive mammals present in the area. Eastern Himalaya are a great source of biodiversity but are extremely sensitive to climatic changes (Chettri et al. 2009). KTR is mostly inviolate due to inaccessibility and negligible biotic pressure. This protected area together with Namdapha National Park and Kamlang reserve forests forms a landscape for the conservation of large cats like Bengal Tiger, Common & Clouded Leopards, various mountain ungulates and other small mammals. Immediate conservation steps must be taken with necessary supply of resources in order to protect such remaining patches of habitats along with strict enforcement of ban on hunting. Population monitoring studies that provide strong scientific basis should be encouraged for effective conservation strategies.

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ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

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Date of Publication: 26 July 2021 (Online & Print)

DOI: 10.11609/jott.2021.13.8.18959-19190

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