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Record of Indian Giant Flying Squirrel (*Petaurista phillippensis*), Indian Giant Squirrel (*Ratufa indica*) and Madras Tree Shrew (*Anathana ellioti*) from Surguja, Chhattisgarh, India

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ABSTRACT
Small mammals are crucial for maintaining ecological balance as indicators of environmental health, seed dispersers, and prey for various predators. However, insufficient environmental data hinders the conservation of many rare and threatened species. Among these species are the Indian Giant Flying Squirrel *Petaurista phillippensis*, the Indian Giant Squirrel *Ratufa indica*, and the Madras Tree Shrew *Anathana ellioti*. This study aimed to document new distribution records for these species through field surveys supplemented by information from existing literature and newspaper reports. We used this information to map the species' presence in Chhattisgarh state. The findings will contribute to filling existing gaps in the species distribution records and inform future conservation strategies for these less-studied mammals.

Key words: Squirrels, Chhattisgarh

INTRODUCTION

An assessment by the IUCN in 2002 stated that there were 5,487 mammalian species in the world (Menon 2023). A total of 427 species, 7.8% of the global mammalian species, are reported from India (Wilson and Reeder 2005). Tree Shrews - Order - scandentia. Small, squirrel-like mammals, all 19 tree shrew sp., are found only in Asia (Menon 2023). India is home to three species of tree shrews, each with distinct characteristics and distributions. The Madras tree shrew (*Anathana ellioti*) is endemic to southern India, prefers dry deciduous forests, and is often seen on the ground with its bushy tail. The Northern or Malayan tree shrew (*Tupaia belangeri*), found in Northeast India, is more arboreal, slender-bodied, and insectivorous, resembling a squirrel with a pointed snout. The Nicobar tree shrew (*Tupaia nicobarica*), restricted to the Nicobar Islands, is the rarest among them, adapted to dense tropical forests and vulnerable due to its limited range and habitat disturbance.

Rodents represent one of the most diverse groups within the mammalian class, characterized by a single pair of continuously growing incisors in both the upper and lower jaws. They comprise nearly 40% of all mammal species globally, accounting for over 25% of mammalian diversity in India (rats, mice, squirrels, voles, porcupines, Squirrels, hamsters, etc.) (Menon 2023). They belong to this group because they are known for their medium to large size and distinctive bushy tails. Taxonomists classify squirrels into two main subfamilies: Sciurinae and Petauristinae. Within Sciurinae, the tribe Ratufini includes the giant squirrels, Funambulini comprises the striped squirrels, and Callosciurini comprises the diurnal, non-striped squirrels.

India hosts three giant squirrel species with distinct distributions and features. The Indian giant squirrel (*Ratufa indica*) is colourful and found in central and southern forests. In contrast, the Black giant squirrel (*Ratufa bicolor*) is larger, dark-bodied, and found in Northeast India and the Himalayas. The Grizzled giant squirrel (*Ratufa macroura),* with its silvery-grey coat, is the rarest and restricted to parts of Tamil Nadu and Kerala.

Among the flying squirrels, the White-bellied flying squirrel *(Petaurista albiventer)* is found in the Western Himalaya. In contrast, the Red and white flying squirrel (*Petaurista alborufus*) occurs in Northeast India and the Eastern Himalaya. The Indian giant flying squirrel *(Petaurista philippensis)* is widely distributed across peninsular India, and the Western woolly flying squirrel (*Eupetaurus cinereus*)

is restricted to high-altitude regions of Jammu and Kashmir. The Bhutan giant flying squirrel (*Petaurista elegans)* inhabits the eastern Himalayan forests. In contrast, other species, such as Hodgson's, Travancore, Particoloured, and Kashmir flying squirrels, are found in various forested regions across the country.

In a recent study from Rajnandgaon and Khairagarh districts, Thalur et al. (2025) reported 10 rodent species as part of a checklist of 35 mammal species recorded in the region. Small mammals such as rodents, shrews, and bats remain among the least studied faunal groups in Chhattisgarh. Apart from more recognized species like the Indian giant flying squirrel, Madras tree shrew, and Indian giant squirrel, lesser-known species such as gerbils, mouse-tailed bats, and other small mammals appear to be widely distributed across the landscape. However, there is a significant gap in systematic surveys and ecological studies focusing on these taxa, underscoring the urgent need for targeted research and monitoring to understand their diversity, distribution, and conservation status.

MATERIAL AND METHODS

A field survey was conducted across the forested regions of Surguja, Chhattisgarh, documenting wildlife sightings with a Canon Powershot SX70 HS and a Nikon D7500 paired with a 200-500 mm lens. Species were identified using the *Mammals of India* field guide (Menon 2023). Both nocturnal and diurnal surveys were carried out to capture behaviour-specific data. Additional information was gathered from various online platforms, including Google Scholar, researchGate, the iNaturalist app, news websites, and the "Birds and Wildlife of Chhattisgarh" Facebook group. This combined approach of direct observation and secondary research facilitated the precise identification and mapping of species, revealing their presence in previously undocumented locations across the region.

RESULTS AND DISCUSSION

Indian Giant Flying Squirrel

On the night of May 11, during our visit to the Udaipur forest range (22.825697 N, 83.010374 E), we observed and photographed an Indian Giant Flying Squirrel (*Petaurista philippensis*) on a sal tree. When we shone torchlight on the squirrel, it retreated into a tree hole, subsequently jumping to the next tree and disappearing. This species was also sighted at Chendra Dam (23.095572 N, 83.294426 E) in Surguja in 2023. Additionally, an individual was

Figure 1. Rescued Flying Squirrel (Photo by Mr. Suryakant Soni)

rescued in 2019 by the Forest Department of Chattisgarh in Taraju village (22.989857 N, 82.955427 E) in Surguja. This squirrel had a dark grey fur coat with lighter underparts, a head that seamlessly blended with its body, reddish-brown-edged ears, and a bushy tail that darkened towards the tip (Fig. 1). This description was confirmed by matching the features with those documented by Menon (2023). The Indian Giant Flying Squirrel is a solitary, nocturnal, and arboreal species with a wide distribution across China, India, Laos, Myanmar, Sri Lanka, Taiwan, Thailand, and Vietnam (Malik et al. 2023). In Chhattisgarh, this species has been reported from Bastar, Bilaspur, Dantewada, and Koriya (Surguja region) (Chandra and Boaz 2018a, Harshey and Chandra 2001, Chakraborty 2008).

Globally, *P. philippensis* is classified as 'Least Concern' (Walston et al. 2016). However, studies indicate a decreasing population status in India due to hunting (Rajamani 2000, Rajamani et al. 2000), anthropogenic disturbances, habitat destruction, and agricultural encroachment (Kumara and Singh 2004, 2006). According to Walston et al. (2016) the species has lost 20% of its habitat over the past 20 years, with a similar trend expected in the coming years. Koli et al. (2022) describe the Surguja region of Chhattisgarh as having the least suitable habitat for this species. However, our sightings from various locations within the Surguja district suggest a broader distribution than previously documented. This discrepancy highlights the need for further research to understand better, document, and conserve this less-studied species.

Indian Giant Squirrel

On June 18, while photographing a Black-crested Bulbul near Kedma village (22.702998 N, 83.038688 E) in Surguja district, our attention was drawn to the dangling tail of a squirrel. Upon closer inspection, we identified it as *Ratufa indica centralis*, a subspecies of the Indian Giant Squirrel (Fig. 2). The individual exhibited black upperparts, a striking redhead and flanks, and whitish underparts. We also recorded this species from Achanakmar Tiger Reserve, Bilaspur, Kanger Valley Nation Park, and Bastar. In India, there are three recognized subspecies of the Indian Giant Squirrel: *R. i. indica*, *R. i. maxima*, and *R. i. centralis*. *R. i. maxima* can be distinguished from *R. i. centralis* by its tail, which lacks a pale tip, whereas *R. i. indica* is characterized by a pale face and a more prominent pale tip. *R. i. centralis* is distributed across eastern and central India, including Chhattisgarh, Madhya Pradesh, Jharkhand, Odisha, and Andhra Pradesh (Menon 2023). In Chhattisgarh, this subspecies has been reported from Bastar, Bilaspur, Dantewada, Kabirdham, and Koriya

Figure 2. Indian Giant Squirrel at Surguja (Photo by Pratik Thakur)

(Janakpur-Surguja Region) (Chandra and Boaz 2018a, b, c, d, e, f, g, Harshey and Chandra 2001, Chakraborty 2008). Kanoje (2008) documented 224 nests in Sitanadi Wildlife Sanctuary, Gariyabandh. Our photographic records confirm the presence of *R. i. centralis* in the Surguja division.

Madras tree Shrew

On September 18, 2022, while bird watching in the Mainpat Valley, we photographed a Madras Tree Shrew (*Anathana ellioti*). The shrew was observed moving along the rocks and disappearing between them upon noticing our presence. We subsequently sighted the shrew 2-3 more times at the exact location. This species was also reported in the Dongargarh Dhaara Reserve forest of Rajnandgaon district (Thakur et al. 2025). The Madras Tree Shrew is characterized by its chocolate brown fur with pale markings around the eyes and a distinctive white shoulder stripe. Its upper parts are speckled yellow and brown near the shoulder and rufous near the rump, while the underparts are greyish-white (Menon 2023). In India, it is distributed throughout Peninsular and Southern India, south of the River Ganga and Narmada, extending east to Jharkhand and west to the Satpuras, up to an altitude of 1400 meters (Menon 2023), and also in Gujarat (Patel et al. 2020). In Chhattisgarh, it has been recorded from Mahasamund, Raipur, and Koria (Sonhat range) (Chandra and Boaz 2018a, b, c, d, e, f, g, Chakraborty 2008).

Our study provides new photographic records of the Indian Giant Flying Squirrel (*P. philippensis*), Indian Giant Squirrel (*R. i. centralis*), and Madras Tree Shrew (*A. ellioti*) from Surguja district, Chhattisgarh. Our findings reveal a broader distribution of these species in Chhattisgarh than previously documented, highlighting new areas where these species are present (Fig. 4, Table 1). These observations underscore the need for continued monitoring and research to address gaps in these species' distribution records and inform targeted conservation efforts. By expanding our knowledge of their ecological roles and habitat requirements, we can better support conservation strategies and ensure the preservation of these important mammalian species in the Surguja district and beyond.

Threats

The primary threats to the Indian Giant Flying Squirrel (*P. philippensis*), Indian Giant Squirrel (*R. I. centralis*), and Madras Tree Shrew (*A. ellioti*) in Chhattisgarh are deforestation mining activities and tribal hunting. Deforestation, driven by agricultural expansion, industrial development, and urbanization, has destroyed and fragmented their habitats, limiting food sources and breeding sites. Mining activities,

Figure 3. Madras Tree Shrew at Surguja (Photo by Dr. Himanshu Gupta)

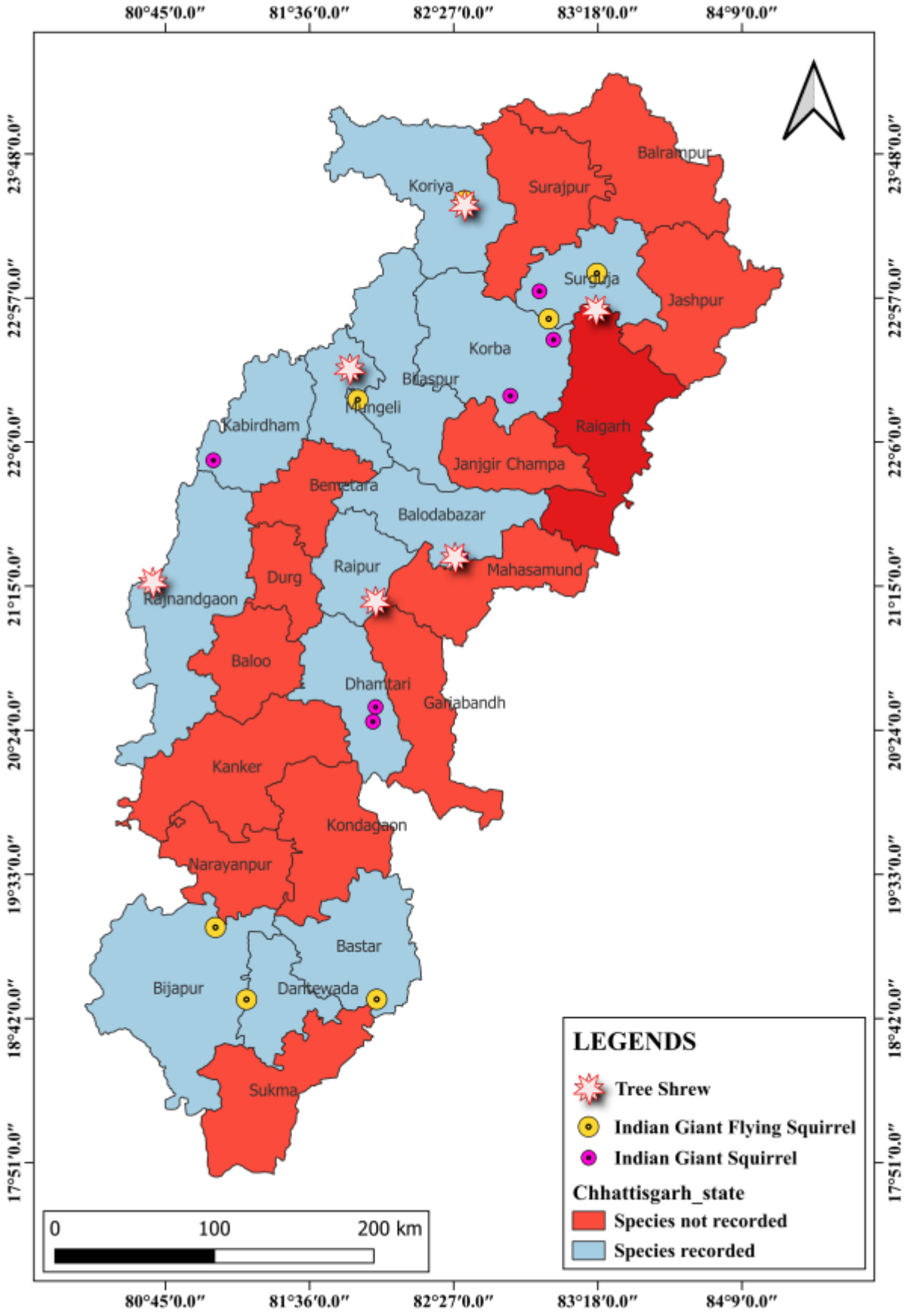

Figure 4. Distribution record of the Squirrels and Tree Shrew in Chhattisgarh

Table 1. Records of siting of the Indian Giant Flying Squirrel, Indian Giant Squirrel and Madras Tree Shrew in Chhattisgarh

Source	Indian Giant Flying Squirrel	Indian Giant Squirrel	Madras Tree Shrew
Present study	Chendra Dam - Surguja (23.09 N, 83.29 E) and Udaipur forest range - Surguja (22.82 N, 83.01 E)	Kedma village - Surguja (22.70 N, 83.03 E)	Bisarpani - Surguja (22.88 N, 83.288 E)
Rescue record (Chandrakant Soni, Chattisgarh Forest officer)	Taraju village - Surguja (22.98 N, 82.95 E)		
Chandra and Boaz (2018a). Faunal diversity of Surguja district	-	-	-
Chandra and Boaz (2018a, e, f). Faunal diversity of Surguja district, Chhattisgarh	ITR	Bastar, Bilaspur, Kabirdham, Koriya and Dantewada	-
Chandra and Boaz (2018f). Faunal diversity of Durg district, Chhattisgarh	-	-	-
Chandra and Boaz (2018d). Faunal diversity of Kabirdham district, Chhattisgarh	-	District Kabirdham - Bhoramdev Wildlife Sanctuary and Chilphi range. Other districts - Bastar, Bilaspur, Koriya and Dantewada	-
Chandra and Boaz (2018b). Faunal diversity of Guru Ghasi Das National Park, Chhattisgarh	-	-	-
Chandra and Boaz (2018b). Faunal diversity of Guru Ghasi Das National Park, Chhattisgarh	Bastar, Bilaspur, Dantewada and Koriya	Bastar, Bilaspur, Dantewada, Kabirdham and Koriya	Koriyadist- Sonhat Range, Mahasamund and Raipur
Chandra and Boaz (2018g). Faunal diversity of Bilaspur district, Chhattisgarh	Bastar, Bilaspur, Dantewada and Koriya	District Bilaspur - Achanakmar Range. Other districts - Bastar, Koriya, Dantewada	-
Chakraborty (2008). Mammalia	Kanger Valley National Park (Bastar) and Guru Ghasi Das National Park (Koriya)	District Bastar - Kanger Ghati National Park	Koriya district - Sonhat Range
iNaturalist Website	Korba (Bango), Arjuniand Kanger Valley National Park	Bastar, Bilaspur (Achanakmar Tiger Reserve), Sitanadi Wildlife Sanctuary	Achanakmar Tiger Reserve
Lokmat Times News (17-06-2023)	Korba	-	-
Nidhi et al. (2023). First record of Indian Giant Flying Squirrel (*Petaurista philippensis*) in Korba (C.G.)	Korba (22.37 N - 82.78 E)	-	-
Zee News Reporter - Vandana Yadav (29-05-2018)	Kosronda Village, Antagarh, District - Kanker	-	-
Patrika News Reporter - Shrishti Singh (27-02-2024)	Pali Nursery, Katghora, District - Korba	-	-
Birds and Wildlife Group of Chhattisgarh (Facebook)	-	Achanakmar Tiger Reserve, Bilaspur, Bastar and Barnawapara WLS	Barnawapara, Keonchiand Pithoda -Mahasamund
Thakur et al. (2025). Mammalian diversity and their ecological significance: a survey report from Rajnandgaon and Khairagarh district, Chhattisgarh, India			Rajnandgaon (Dongargarh Dhaara Reserve)

particularly in forested areas, further degrade their natural habitats, causing soil erosion and pollution. Tribal hunting, though culturally embedded, has contributed to population declines, as these species are hunted for meat, fur, and other body parts. Indigenous tree-based hunting has been observed in wooded areas dominated by sal (*Shorea robusta*) trees, using wooden pegs or embedded supports in the trunk to climb and access canopy-dwelling species - primarily squirrels and birds. These combined pressures highlight the need for urgent conservation efforts, including habitat protection, sustainable practices, and stricter enforcement of wildlife protection laws.

CONCLUSION

The photographic records and distribution mapping of the Indian Giant Flying Squirrel (*P. philippensis*), Indian Giant Squirrel (*R. i. centralis*), and Madras Tree Shrew (*A. ellioti*) in Surguja District, Chhattisgarh, highlight their sparsely distributed populations across the state. The findings indicate that these species are limited to specific, fragmented habitats, which raises concerns about their long-term survival. The limited distribution of these species underscores the urgent need for targeted conservation efforts, including habitat protection, restoration, and further research on their ecology and behaviour. Effective conservation strategies are essential to preserve these unique species, safeguard biodiversity, and maintain ecological balance in Chhattisgarh's forests.

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