



Study on fauna associated with Palash (*Butea monosperma*) in Tadoba Andhari Tiger Reserve.

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Abstract: - *Butea monosperma*, commonly known as Dhak or Palash and often referred to as the 'Flame of the Forest',¹ is a medium-sized deciduous tree native to the Indian subcontinent and Southeast Asia¹. It is widely distributed across India, Myanmar (Burma), Thailand, Malaysia, Indonesia, and Sri Lanka (formerly Ceylon). This species thrives in tropical and subtropical climates and is well adapted to a wide range of soil types. Due to its ecological and cultural importance, it has been designated the State Flower of both Uttar Pradesh and Jharkhand.² A short-term observational study was conducted from 4 to 6 April 2025 in Tadoba Andhari Tiger Reserve, located in Chandrapur District, Maharashtra. Six study sites were selected: three located in the core zone representing undisturbed forest, and three in the buffer zone near human habitation and agricultural fields. Observations were carried out daily between 7:00 AM and 6:00 PM. The point transect method was used for data collection, with direct observations and GPS was used to record site coordinates. The study recorded 43 avian species, 2 mammal species, and 6 insect species interacting with *Butea monosperma*. Birds were observed feeding on nectar and insects, as well as using the tree for nesting and roosting³. The species plays a crucial ecological role due to its drought resistance and soil erosion control capabilities.

Keywords: fauna, *Butea monosperma*, Palash, Tadoba Andhari Tiger Reserve, Maharashtra

Introduction: - Tadoba Andhari Tiger Reserve (TATR), located in Chandrapur District of Maharashtra, is one of India's oldest and most ecologically rich protected areas. Known for its thriving tiger population, Tadoba also harbors a diverse range of flora and fauna within its dry deciduous forest landscape.⁴ Among the prominent native tree species, *Butea monosperma*, commonly known as Palash or the 'Flame of the Forest', holds significant ecological importance. Palash blooms during the dry season, typically from March to April, when most other plant species are leafless or dormant. Its bright orange-red flowers become a vital resource, attracting a wide variety of birds, insects, and mammals that rely on the nectar, pollen, and insect prey found on the blooms. The tree also provides habitat for nesting and roosting, especially for avian species. A short-term biodiversity survey was conducted from 4 to 6 April 2025, specifically during peak blooming, to document the faunal interactions with *Butea monosperma*. This period offers a unique opportunity to study seasonal species dependency on floral resources. The findings emphasize the tree's role as a keystone species in the Tadoba landscape and its broader ecological value across the Indian subcontinent.

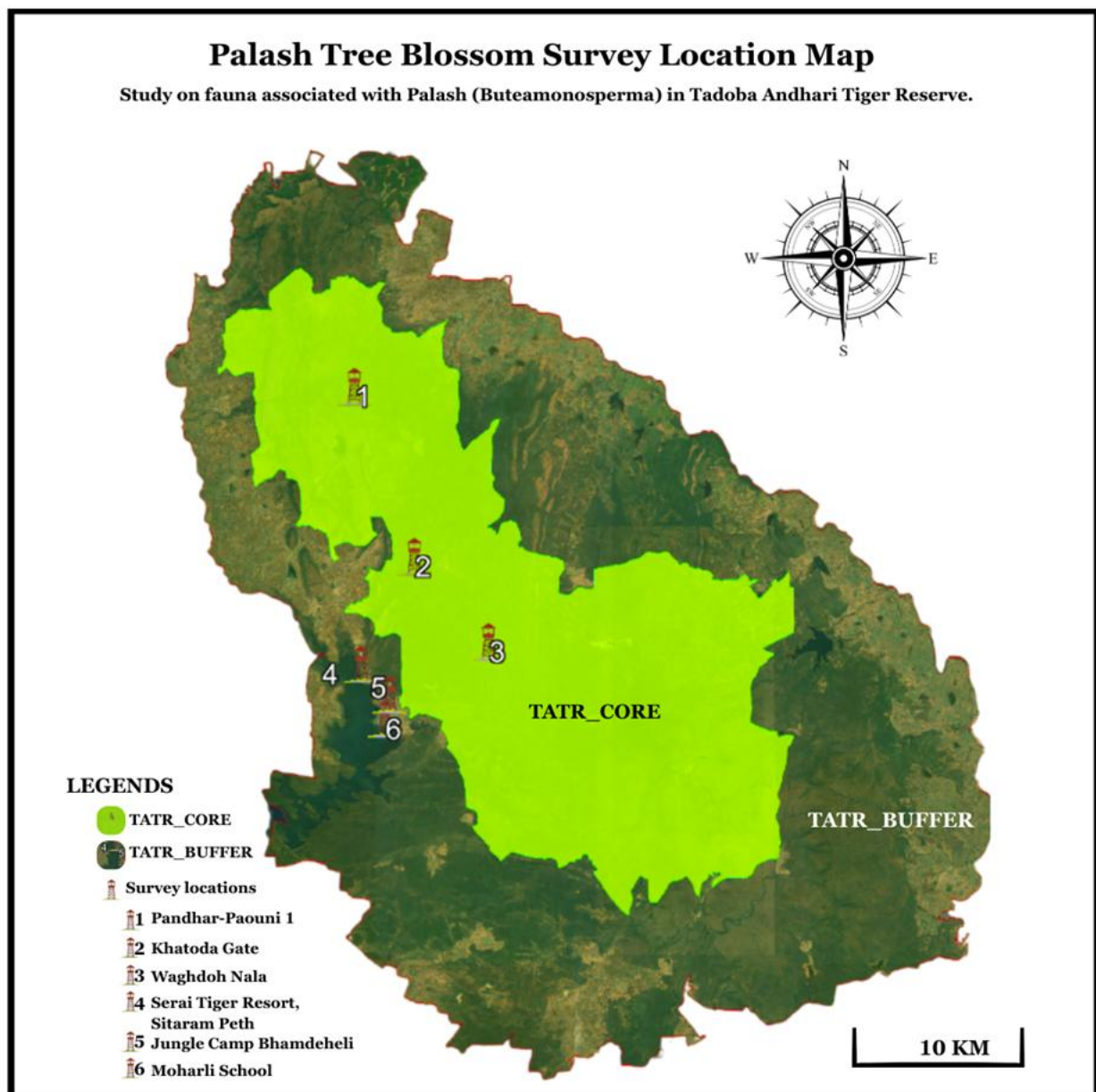
Importance of *Butea monosperma* (Palash) exhibits distinct phenological patterns across India, especially in Central India. It sheds leaves in winter (December–January), blooms with vibrant orange-red flowers from February to April, and fruits from April to May⁵. This timing aligns with the dry season, making it one of the first trees to flower, playing a key role in seasonal transitions. Ecologically, it supports pollinators like bees, butterflies, and birds, acts as a host plant for insect larvae, and enriches soil through leaf litter⁵. It aids in soil conservation and forest regeneration, making it vital for dry deciduous ecosystems. For humans, Palash holds medicinal, cultural, and economic value. Its bark, flowers, and seeds are used in Ayurveda, while its leaves are crafted into eco-friendly plates. The tree produces gum for local adhesives, wood for tools, and natural dyes from flowers used in festivals like Holi. Studying *Butea monosperma* during flowering helps assess biodiversity interactions, phenological shifts due to climate change, and informs conservation planning. Its role as a keystone species and bio-

indicator makes it essential for ecological and ethnobotanical research, especially in forest-dependent communities of Central India.

Material and Method:

Study Area: - Tadoba Andhari Tiger Reserve (TATR), located in Chandrapur District of Maharashtra, is one of India's premier wildlife reserves. It spans approximately 1,727 km², including 625.4 km² of core area and 1,101.6 km² of buffer zone.⁴ The landscape comprises dry deciduous forests, grasslands, bamboo groves, and water bodies. TATR is home to rich biodiversity, with over 280 bird species, 74 species of butterflies, 76 mammals, 54 reptiles, and more than 1,500 plant species.⁶ The reserve is particularly known for its healthy population of tigers and forms a crucial part of the Central Indian landscape for long-term ecological and wildlife studies.

Fig. 1. Map of Study Area, Tadoba-Andhari Tiger Reserve.



Methodology: A preliminary site visit was carried out to identify *Butea monosperma* trees located within 25 to 50 meters of existing forest machans, ensuring optimal visibility and minimal disturbance for full-day observations. Out of 15 potential sites initially considered, six were finalized based on suitability factors such as accessibility, unobstructed views, and low human interference. These included three sites within the core zone (Tadoba, Kolara, and Moharli Ranges) representing undisturbed forest habitats, and three in the Moharli Buffer Range, near agricultural fields and human settlements.

Prior to the survey, a group of enthusiastic volunteers including STPF staff and biologists were selected and oriented. Study materials were distributed, including Grimmett's bird field guide⁷ and e-books on butterflies of Maharashtra⁸. Custom-designed data sheets were prepared for systematic recording of observations. Training sessions were conducted on camera handling and data entry protocols to ensure consistency and accuracy in field data collection. To support uninterrupted fieldwork, essential amenities such as breakfast, lunch, and drinking water were delivered to observers stationed at machans.

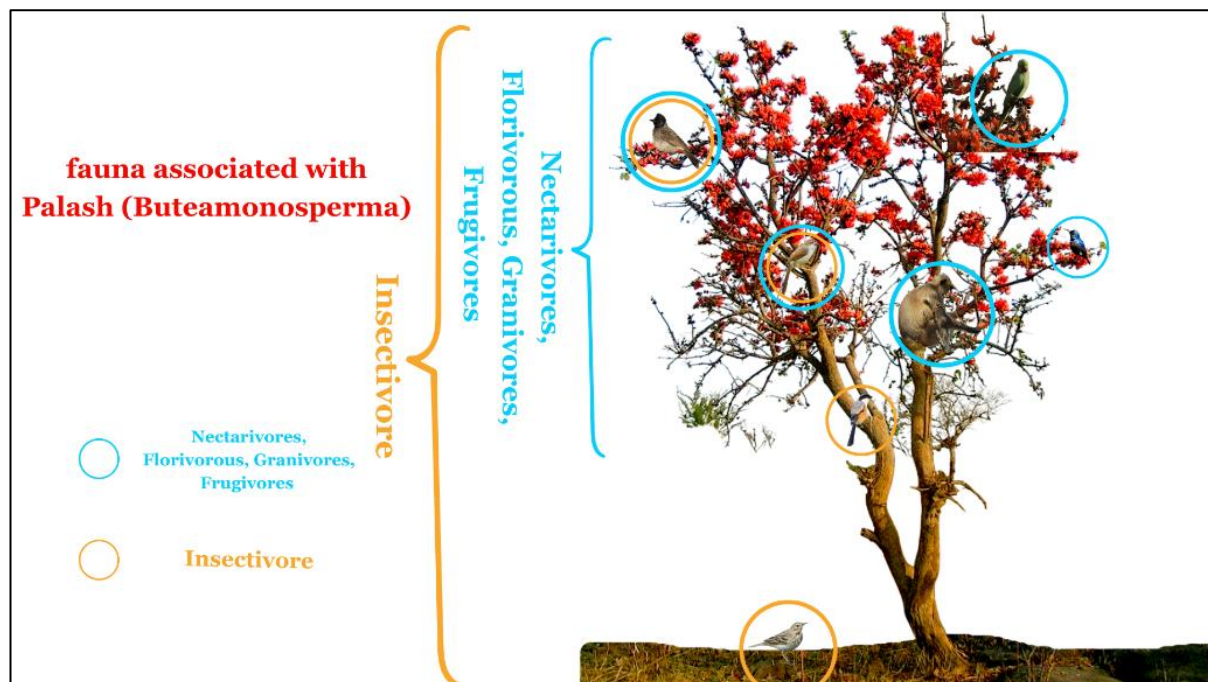
The survey was conducted from **4 to 6 April 2025**, with observations made daily between **7:00 AM and 6:00 PM**. The **point transect method** was used to record faunal activity. Observations were made using **Nikon 10x50 mm binoculars**, while photographs were taken with a **COOLPIX P950 camera**. **GPS coordinates** of each site were recorded for spatial analysis of biodiversity patterns associated with *Butea monosperma* during its flowering phase.

Table 1. Observation sites with Coordinates in study area.

Nu	Site Name	GPS Coordinates	Range Name
1	Pandhar-Paouni 1	20°22'11.70"N, 79°18'10.88"E	Kolara, Pandharpouni
3	Khatoda Gate	20°16'38.42"N, 79°20'16.67"E	Tadoba
2	Waghdoh Nala	20°13'51.52"N, 79°22'51.83"E	Moharli Core
4	Serai Tiger Resort, Sitaram Peth	20°13'6.95"N, 79°18'25.75"E	Moharli Buffer
5	Jungle Camp, Bhamdeheli	20°12'7.24"N, 79°19'25.35"E	Sitaram Peth, Moharli Buffer
6	Moharli School	20°11'19.93"N, 79°19'15.33"E	Moharli Buffer

Observation and Results: -The blooming period of *Butea monosperma* in Tadoba-Andhari Tiger Reserve attracted a wide diversity of fauna, underscoring the species' ecological significance. A total of 43 bird species were recorded, with 21 species observed directly feeding on the flowers. These included nectarivores such as the Purple Sunbird (*Nectarinia asiatica*) and Purple-rumped Sunbird (*Nectarinia zeylonica*), as well as insectivores like the Common Tailorbird (*Orthotomus sutorius*). Trunk- and branch-foraging insectivores such as the Lesser Flame-back Woodpecker (*Dinopium benghalense*), Oriental Magpie Robin (*Copsychus saularis*), and Indian Robin (*Saxicoloides fulicata*) were frequently observed. A significant number of Rose-ringed Parakeets (*Psittacula krameri*) were recorded feeding on Palash flower parts, buds, and seeds, suggesting florivorous and granivorous behavior. Ground-feeding insectivores such as the Paddyfield Pipit (*Anthus rufulus*), Bay-backed Shrike (*Lanius vittatus*), and Black Drongo (*Dicrurus macrocercus*) were often seen beneath the trees, particularly in areas where old blossoms had accumulated indicating that the bloom also enhances insect activity on the forest floor. Social bird species like Mynas and Bulbuls were also commonly observed, reflecting the tree's cross-guild appeal.

Fig 2. Tree used by the all levels

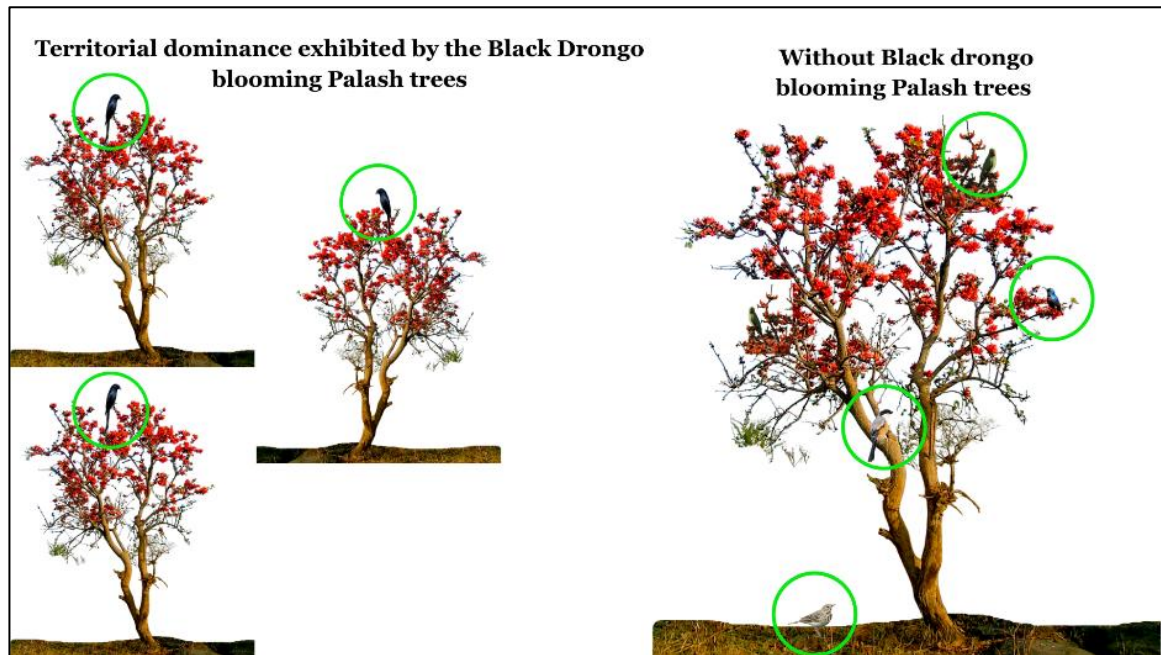


Graphical representation: - fauna associated with Palash (*Buteamonosperma*)

Territorial dominance: - Territorial Dominance and Foraging Behavior of Black Drongo (*Dicrurus macrocercus*) on Blossoming *Butea monosperma* A noteworthy behavioral pattern observed during the study was the territorial dominance exhibited by the Black Drongo on flowering *Butea monosperma* (Palash) trees. On at least five separate occasions, individual drongos were seen actively defending blooming Palash trees. Typically, one or two individuals occupied the upper canopy and exhibited aggressive behavior by chasing away other nectar-feeding birds such as sunbirds and bulbuls. These territorial displays occurred throughout the day, with repeated returns approximately every hour, likely to reassert control over the resource-rich tree. Interestingly, during the early morning and late evening hours, groups of 4 to 5 Black Drongos were observed arriving together. These groups engaged in nectar feeding and insect foraging among the Palash blossoms, often taking brief turns before perching nearby. While group foraging was cooperative in nature, territorial defense was primarily seen during

solo visits in the mid-morning to afternoon, suggesting a time-based shift in foraging strategy. This behavior highlights the dual role of the Black Drongo as both a nectar feeder and insect predator, as well as its ability to monopolize floral resources through active territoriality.

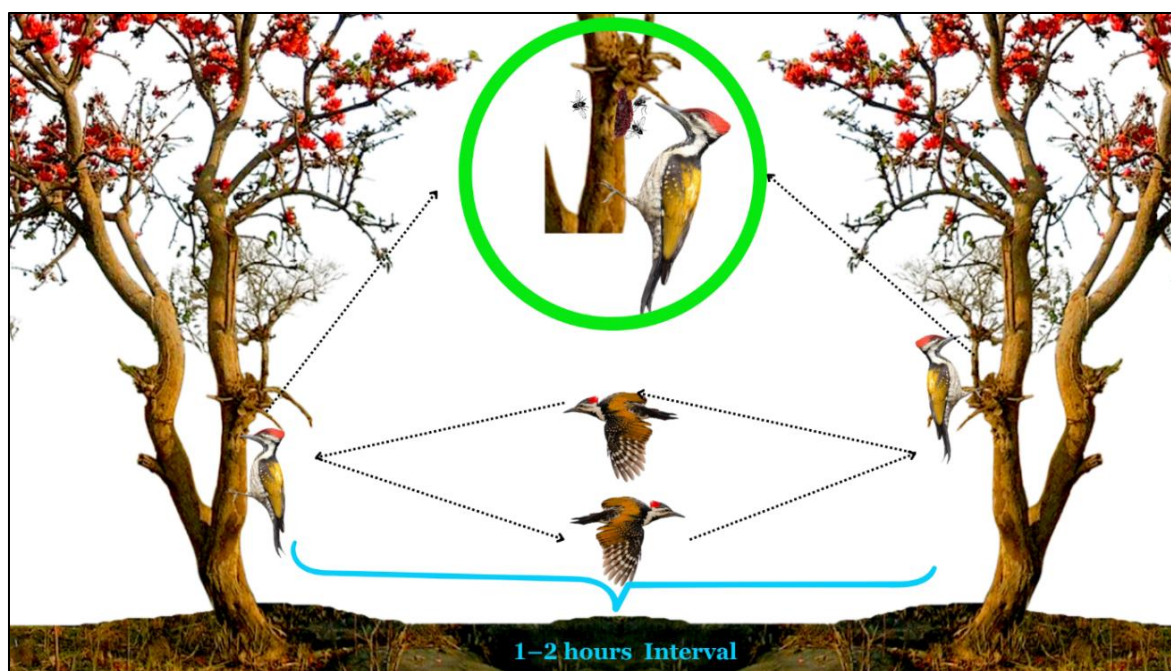
Fig. 3. Territorial dominance exhibited by the Black Drongo



Graphical representation: - Territorial dominance exhibited by the Black Drongo on Palash (*Buteamonosperma*)

Unique foraging strategy: -Another fascinating observation was the unique foraging strategy of the Lesser Flame-back Woodpecker. These woodpeckers created small holes in the bark, which led to the secretion of sticky resin that attracted insects. The birds then returned after 1–2 hours to feed on the accumulated insects demonstrating a highly specialized and efficient foraging method.

Fig. 4. Unique foraging strategy by Lesser Flame-back Woodpecker



Graphical representation: - Unique foraging strategy by Lesser Flame-back Woodpecker on Palash (*Buteamonosperma*)

During the three-day observation period, it was evident that the entire tree structure—from canopy to trunk was utilized by different faunal groups. Nectarivores, florivores, granivores, and frugivores primarily foraged in the flowering canopy and branches, while insectivores covered all levels, from the trunk base to the crown (see Figure: - Figure 1). Additionally, four butterfly species and several insect taxa including wasps, cicadas, and promochis flies were documented, reaffirming *Butea monosperma* as a keystone species and seasonal biodiversity hotspot during its flowering phase.

Table 2. List of Birds associated with Flowers of *Butea monosperma* for feeding

Nu.	Common Name	Zoological Name	Family
1	Red-vented Bulbul	<i>Pycnonotus cafer</i>	Passerines
2	White-Browed Bulbul	<i>Pycnonotus luteolus</i>	Passerines
3	large Gray babbler	<i>Argya malcolmi</i>	Leiothrichidae
4	Jungle Babbler	<i>Turdoides striatus</i>	Leiothrichidae
5	Yellow- eyed Babbler	<i>Chrysomma sinense</i>	Paradoxornithidae.
6	Common Tailor Bird	<i>Orthobomus sutorius</i>	Sylviidae
7	Chestnut-winged Petronia	<i>Petronia xanthocollis</i>	Passeridae
8	House Sparrow	<i>Passer domesticus</i>	Passeridae
9	Ashy Prinia	<i>Prinia socialis</i>	Cisticolidae
10	Plain Prinia	<i>Prinia inornata</i>	Cisticolidae
11	Jungle Prinia	<i>Prinia sylvatica</i>	Cisticolidae
12	Rose-ringed Parakeet	<i>Psittacula krameri</i>	Psittacidae
13	Plum-headed Parakeet	<i>Psittacula cyanocephala</i>	Psittacidae
14	Common Myna	<i>Acridotheres tristis</i>	Sturnidae
15	Brahmani Myna	<i>Sturnus pagodarum</i>	Sturnidae
16	Pied Myna	<i>Gracupica contra</i>	Sturnidae
17	Purple Sunbird	<i>Cinnyris asiaticus</i>	Nectarinidae
18	Purple-rumped Sunbird	<i>Leptocoma zeylonica</i>	Nectarinidae
19	House Crow	<i>Corvus splendens</i>	Corvidae
20	Black Drongo	<i>Dicrurus macrocercus</i>	Dicruridae
21	Golden Oriole	<i>Oriolus kundoo</i>	Oriolidae

Table 3. List of Birds associated with *Butea monosperma* for Roosting and Nesting

Nu.	Common Name	Zoological Name	Family
1	Lesser Flame-back Woodpecker	<i>Dinopium benghalense</i>	Picidae
2	Black-shouldered Kite	<i>Elanus axillaris</i>	Accipitridae
3	Green bee-eater	<i>Merops orientalis</i>	Meropidae
4	White -breasted Kingfisher	<i>Halcyon smyrnensis</i>	Halcyonidae
5	Oriental Magpie Robin	<i>Copsychus saularis</i>	Muscicapidae
6	Indian Robin	<i>Copsychus fulicatus</i>	Muscicapidae
7	Long-tailed Shrike	<i>Lanius schach</i>	Lannidae
8	Bay-backed Shrike	<i>Lanius vittatus</i>	Lannidae
9	Spotted Dove	<i>Streptopelia chinensis</i>	Columbidae
10	Eurasian collared dove	<i>Streptopelia decaocto</i>	Columbidae
11	Indian Grey Hornbill	<i>Ocyrceros birostris</i>	Bucerotidae
12	red-breasted flycatcher	<i>Ficedula parva</i>	Muscicapidae

13	Booted warbler	<i>Iduna caligata</i>	Acrocephalidae
14	Brown shrike	<i>Lanius cristatus</i>	Laniidae
15	greater coucal	<i>Centropus sinensis</i>	Cuculidae
16	Sykes's warbler	<i>Iduna rama</i>	Acrocephalidae
17	Indian roller	<i>Coracias benghalensis</i>	Coraciidae
18	blue-tailed bee-eater	<i>Merops philippinus</i>	Meropidae
19	Rufous treepie	<i>Dendrocitta vagabunda</i>	Corvidae
20	Asian koel	<i>Eudynamys scolopaceus</i>	Cuculidae
21	Paddy field pipit	<i>Anthus rufulus</i>	Motacillidae
22	Yellow-crowned woodpecker	<i>Leiopicus mahrattensis</i>	Picidae

Table 3. List of Mammals associated with *Butea monosperma* for feeding & Roosting

Nu	Common Name	Zoological Name	Family
1	Hanuman langur	<i>Semnopithecus entellus</i>	Colobinae
2	Three-striped palm squirrel	<i>Funambulus palmarum</i>	Sciuridae

Table 4. List of Butterfly's associated with *Butea monosperma* for feeding & Roosting

Nu	Common Name	Zoological Name	Family
1	Glassy tiger	<i>Parantica aplea</i>	Nymphalidae
2	Common emigrant	<i>Catopsilia pomona</i>	Pieridae
3	Danaid egg fly	<i>Hypolimnas misippus</i>	Nymphalidae
4	Tamil yeoman	<i>Cirrochroa thais</i>	Nymphalidae

Table 5. List of Insects associated with *Butea monosperma* for feeding & Roosting

Nu	Common Name	Zoological Name	Family
1	Cikada insect	<i>Unknown</i>	Unknown
2	green-eyed robber fly, promochis flies	<i>Promachus vertebratus</i>	Asilidae
3	Wasp	<i>Unknown</i>	Unknown

Results and Discussion: -

The blooming period of *Butea monosperma* in Tadoba-Andhari Tiger Reserve clearly highlights the species' role as a seasonal keystone in the dry deciduous ecosystem. The observation of 43 bird species—21 of which directly fed on Palash flowers—illustrates the tree's importance as a rich food source for nectarivores, insectivores, florivores, and granivores. Behavioral patterns, such as the territoriality displayed by the Black Drongo and the unique resin-foraging strategy of the Lesser Flame-back Woodpecker, further emphasize the ecological interactions centered around this flowering tree. The structural use of the entire tree from the canopy to the trunk by diverse faunal groups, including birds, mammals, butterflies, and insects, demonstrates its multifunctional value as a provider of food, perching, roosting, and nesting sites. Rose-ringed Parakeets, mynas, bulbuls, and a variety of insect taxa reinforced the importance of *B. monosperma* as a biodiversity hub during its flowering phase.

Fig. 5. Survey Sheets

Photo Plates: -





Common Tailorbird (*Orthotomus sutorius*)



Golden Oriole (*Oriolus oriolus*)



Purple-rumped Sunbird (*Nectarinia zeylonica*)



Purple Sunbird (*Nectarinia asiatica*)



Pied Myna (*Sturnus contra*)



Brahmani Myna (*Sturnus pagodarum*)



Red-vented Bulbul (*Pycnonotus jocosus*)



Yellow-eyed Babbler (*Chrysommastus sinense*)



Ashy Prinia (*Priniasocialis*)



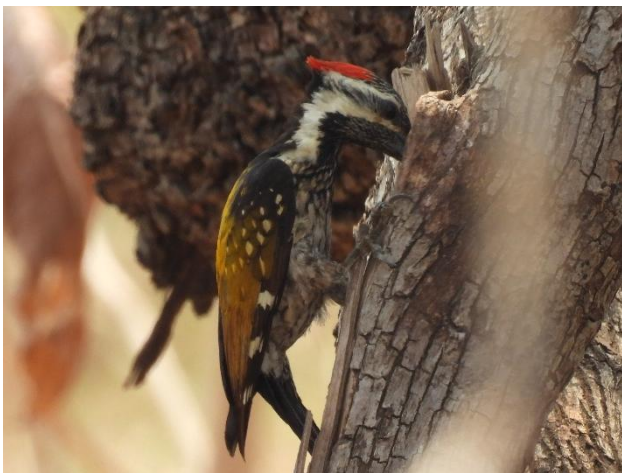
Chestnut-winged Petronia (*Petronia xanthocollis*)



Plum-headed Parakeet (*Psittacula cyanocephala*)



Black-shouldered Kite (*Elanus caeruleus*)



Lesser Flame-back Woodpecker (*Dinopium benghalense*)



Blue-tailed bee-eater (*Merops philippinus*)



Hanuman langur (*Semnopithecus entellus*)



Common emigrant (*Catopsilia pomona*)



Survey Participants. STPF officers & Biologist

Participants: -

1. Vinayak Sapte (Biologist)
2. Zishan Shaikh (Biologist)
3. Sumedh Waghmare (Birdman)
4. Pravin Garate (Guest House manager)
5. Motika vandivale (STPF)
6. Pallavi Dhok (STPF)
7. Roshani Muddamwar (STPF)
8. Suvarna Piturkar (STPF)
9. Akshay Sahane (STPF)
10. Karan Kotanmbe (STPF)
11. Kunal Barwakar (STPF)
12. Balaji Gopnar (STPF)

Abbreviations: -

STPF = Special Tiger Police Force.

(TATR) = Tadoba Andhari Tiger Reserve

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